

**NATURE AND
THE ENVIRONMENT
IN EARLY BUDDHISM**

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PREFACE

In 2000 I spent a week in the forest around Jamui in Bihar. Although badly degraded in parts and unsafe in others because of bandits, the forest and its wildlife are still relatively intact. This short sojourn offered a rare glimpse of India's natural environment that would have been familiar to the Buddha but which has now almost completely disappeared. I saw nilghis, troops of langur, the quills of a porcupine, the glorious *Butea superba* in full bloom, a peacock and its mates and numerous other birds. At nearly every turn I was reminded of the Buddha's descriptions of the forest and of some of the bucolic poetry in the Jātaka stories. It was during these few pleasant days that I conceived the idea of writing something about nature and the environment as depicted in the Pali Tipiṭaka.

I would like to thank Prof. P. D. Premasiri, Prof. K. R. Norman and Dr. Alexander Wynne, all of who helped me in various ways with this book. I must also thank Ānandajoti Bhikkhu who read through several drafts of the book making numerous corrections and suggestions and bringing my attention to things I had missed. This book would probably not have seen the light of day without his help. Finally I must also express my gratitude to Dr. S. K. Jain, former Director of the Botanical Survey of India, who took a great interest in my research and offered me much encouragement.

PREFACE TO THE SECOND EDITION

I am delighted that the Buddhist Publication Society is bringing out a second edition of my *Nature and the Environment in Early Buddhism*. In preparing it Bhikkhu Nyanatusita has been exceptionally helpful in correcting the mistakes in my Pali, providing me with additional information I was unaware of, and making numerous helpful suggestions concerning the identification of some plants and animals. I express my thanks to him.

FOREWORD

The first attempt to identify the plants in the Tipiṭaka was made by Robert Childers in his *A Dictionary of the Pali Language* of 1876. Childers gave about 165 plant names and provided the Linnaean nomenclature for most of these. However, more than half these names are from Pali works composed in Sri Lanka and are not mentioned in the Tipiṭaka itself. Rhys Davids and Stede's *Pali English Dictionary* published between 1921–25, includes about 420 Pali plant names with the botanical names for about a third of these. Included also are about 185 animal names of which only eight include the zoological names. It is unclear what authority Rhys Davids and Stede used for the nomenclature they did give but they seem to have relied heavily on Monier-William's *Sanskrit English Dictionary*.

In her translation of the Vinaya Piṭaka published between 1938 and 1966, I. B. Horner tried to identify the various medical plants mentioned in that work and in her subsequent 1975 translation of the Buddhavaṃsa, she identified the various trees associated with the 28 Buddhas and other plants. In this first translation, Horner seems for the most part to have followed Rhys Davids but where not she gave her reasons for preferring a different identification. In the Buddhavaṃsa she followed George Luce who in turn must have relied on the Burmese *sayadaws* whom, it would seem likely, were not familiar with plants endemic to northern India.

Studies in the flora and fauna in Sanskrit literature are very extensive, especially so in the case of flora because of the interest in Ayurvedic medicine. As many Sanskrit names have Pali equivalents such studies are relevant to the present book and I have consulted as much of this research as I have been able too. Modern Indian colloquial names for certain plants and animals likewise have proven helpful in making some identifications, although I have kept in mind Klaus Karttunen's comment that these are 'to be used with caution'.

A thorough compilation of material on flora, fauna and the environment from the Pali Tipiṭaka is more than justified. Despite

being a rich source of information on these subjects Indian scholars have largely ignored Pali literature. In their contribution to the magisterial *History of Science, Philosophy and Culture in Indian Civilization* series, Rajan and Sridhar use a wide range of religious and secular literature but have only three brief references to Pali canonical or post-canonical works. Ghosh and Sen's study of botany in the post-Vedic period for *A Concise History of Science in India* utilize no Pali material. Many other examples of this neglect could be given.

In trying to identify the flora and fauna in Pali literature I chose not to rely on my predecessors so as to avoid perpetuating any mistakes they might have made, and only looked at their works after having finished my own. In some cases I found that I had come to the same conclusions as them although in other cases I had not. On many occasions I was unable to identify a plant or animal but found that Rhys Davids, Horner, etc. had done so, although I could find no justification for their conclusions. It should be pointed out however, that the identity of many plants and animals mentioned in ancient Indian literature is very conjectural. As G. J. Meulenbeld has shown, there is wide disagreement amongst scholars as to which Sanskrit plant name can be identified with which plant and this comment is equally valid for Pali. I have no doubt made some mistakes. My hope is that in the future someone will be able to correct these mistakes and also fill in the many gaps I have left.

S. Dhammika

NATURE AND THE ENVIRONMENT AS DEPICTED IN THE PALI TĪPIṬAKA

There are 6400 species of fish in Jambudīpa, 4500 species of birds and 2400 species of animals. There are 10000 species of trees, 8000 species of grass, 740 types of medicinal herbs and 43 types of aromatic plants.

*Dvādaśaviharaṇa Sūtra*¹

The Buddha was born in and spent his whole life in what was then called the Middle Land, (*majjhima-desa*), the broad fertile plains surrounding the Ganges and Yamuna rivers. After his passing his teachings were committed to memory and later compiled into what is now known as the Pali Tīpiṭaka, the sacred scriptures of the Theravada school of Buddhism. The age of the Tīpiṭaka is problematic but the core material in the Sutta Piṭaka probably dates from between the 5th and 3^d centuries BCE. The exception to this are some of the books in the Khuddaka Nikāya, particularly the Jātaka. Most of the verses (*gāthā*) of the Jātaka book, the only part considered canonical, are probably about the same age as the Vinaya Piṭaka (4th to 3rd centuries BCE). The prose stories (*atīta-vatthu*) are somewhat later and the ‘introduction’ (*nidāna-kathā*), the ‘story of the present’ (*paccuppanna-vatthu*) and the ‘connection’ (*samodhāna*) are later still, although exactly how late is difficult to say. All these parts of the Jātaka will be used in this study. The Jātaka also reflect a knowledge of a wider geographical area than do the Sutta and Vinaya Piṭakas and include what is now lower Gharawal and Kumaon and the desert regions of Rajasthan.

While the bulk of the Tīpiṭaka is concerned with the Buddha’s teachings, it nonetheless contains a great deal of incidental information about the social, economic, cultural and

1. *Shieryou jing*, 十二遊經 or 佛說十二遊經., “Sūtra of the Life of Śākyamuni to His Twelfth Year”, Taisho edition of the Chinese Tripiṭaka, T4n195, p, 147b14–16. The Sanskrit title is a reconstruction from the Chinese,

political life of the Buddha's time. It also tells us much about the natural environment of ancient northern India and how people were influenced by and related to it. Giving a broad overview of this environment the Buddha said that 'few in number are pleasant parks, forests, stretches of land and lakes, while more numerous are the steep rugged places, uncrossable rivers, dense thickets of scrub and thorns and inaccessible mountains' (A I 35).

The flora and fauna found in any area are determined to a large extent by the seasons, the climate and the soil and the Tipiṭaka contains information about all three. Following the system found in the R̥g Veda the first Buddhists divided time into years made up of 12 months of 30 days each, divided into two fortnights totaling 360 days altogether (A IV 252). These time divisions were based on the observation of the sun, moon and stars (D III 86). The year was divided into three main seasons of four months each summer (*gimhāna*), the rainy season (*vassāna*) and winter (*hemanta*; A IV 138–39). During the summer (mid-March to mid-July), temperatures in north India can get as high as 43 °C. The trees flower and loose their leaves while hot winds blow dirt and dust into the air (S V 321). Even animals would be affected by the heat. The Buddha said that by the end of summer 'the grass and the water' would disappear and the deer became emaciated and listlessness (M I 152). During the rainy season or monsoon (mid-July to mid-November) the temperature drops to about 20 °C and as much as 20 cm of rain can fall in a day. Every day, usually in the afternoon, one is sure to see 'a great rain cloud, thundering and pouring down refreshing rain everywhere, drenching the highlands and lowlands...' (It 66). Sometimes it would pour down for seven days straight (Ja II 269; 445; III 73). As still happens today, rivers would break their banks, insects proliferate and the landscape would become green. During this time Buddhist monks and other ascetics would stay in one place because of the difficulty in travelling.

The importance of the monsoon for farmers and also plant and animal life was emphasized by the Buddha when he said: 'Rain sustains the life of all creatures on earth' (S I 37), and: 'Abundant rain brings to perfection all crops for the good, the welfare and happiness of the many' (A IV 244). If the monsoon failed, as it sometimes did, it would spell disaster for all life. The resulting

drought would cause 'destitute people to wander here and there with their children in tow' and compel others to resort to banditry (Ja II 367; VI 487). Crows would abandon the cities for the forest because people no longer fed them scraps, and fish and tortoises would bury themselves in the mud of their rapidly evaporating ponds in a desperate struggle to survive (Ja I 331; II 149). Too much rain could also cause havoc. 'In hope farmers till their fields, their sons and wives coming to help. But rain destroys all their labour or lightning blights it' (Mvu II 59). With the coming of winter (mid-November to mid-January) the temperature drops considerably, as low as 5 °C and in the morning the grass and trees are covered with dew. The ancient Indians did not understand the process of evaporation and thought dew disappeared into the ground as the sun rose (A IV 137; Ja IV 120). Occasionally winter nights get cold enough for frost to form (M I 79, A I 136).

Two minor seasons are occasionally mentioned as well; autumn (*sārada*), the month-long transition between the rainy season and the winter, and spring (*vasanta*), the transition between winter and summer. During the autumn 'the air is clear, the sky cloudless and the sun breaking through the morning mist is hard to look at' (D II 183; Sn 687). This is also the time when the crops start to grow more robustly (M I 116). During the last month of the rainy season the soil would still be moist and easy to turn so farmers would plough their fields in preparation for the winter planting (D II 183; S III 155). In the *Nidānakathā*, Udāyī Thera described the beauty of the countryside at the beginning of spring like this: 'The winter is ended, the spring has begun, people have gathered in the harvest and are taking it along the roads. The ground is covered with fresh green grass, the forest trees are in bloom and the roads are suitable for travelling' (Ja I 86). A character in the *Therīgāthā* says: 'The sweet smell and the pollen of the flowers are spread in all directions by the towering trees. Indeed, early spring is a happy time' (Thī 371).

Although there is no direct reference to the solstices in the Tipiṭaka the mention of the regular and irregular courses (*pathagamana* and *uppathagamana*, D I 10) of the sun and moon suggest an awareness of them. The mention of 'the eights' (*antaraṭṭhakāsu*), the four nights on either side of the full moon of summer and winter months also point to the solstices. The Buddha

said that before his enlightenment as an austerity he would spend the days of the summer 'eights' and the nights of the winter 'eights' in the open, alternately scorched and chilled (M I 79). The Vinaya describes how he tried to calculate the number of robes monks would need to keep warm during the winter 'eights' (Vin I 288).

The Tipiṭaka includes some observations about various meteorological phenomena related to the seasons and the weather. The Buddha identified different types of clouds which correspond in some ways to the modern cloud formation classification. The five types he mentioned are cool clouds (*sita*), warm clouds (*uṇha*), storm or thunder clouds (*abbha* or *thaneti*), wind-blown clouds (*vāta*) and rain clouds (*vassa*, S III 254). He also mentioned *mahikā* which might refer to the thick mist or fog that often occurs in early morning during the winter months (Vin II 295). Alternatively it may refer to nimbostratus clouds, those low, dark cloud formations which often produce hail or snow. Likewise, the 'hundred-peaked cloud, thundering, garlanded in lightning and which pours down rain' would be a good description of cumulonimbus clouds, sometimes also called thunderheads, the dense, towering, vertical cloud formations associated with the monsoon (A III 34).

The Buddha observed that rain falls in at least two different ways: in large drops (*thulla phusitaka*) as during a monsoon downpour, and in small scattered drops (*ekaṃ ekaṃ*), as when it is drizzling (A I 243; S I 104). He also commented that the failure of the rains for agriculture could be due to such things as heat, wind or the rain falling in the sea. Changes in the temperature, specifically the heat (*teja*), or the wind in the upper atmosphere (*uparī ākāsa*), would disperse the clouds (A III 243). Simple people believed that gods like Sakka and Vassavalāhakadevarāja, the Rain Cloud King, could also make it rain (Ja I 330). It was commonly held that widespread immorality or an unjust ruler would disrupt rainfall, a belief the Buddha subscribed to. 'It rains at the wrong time and fails to rain at the right time because of the bad king' (A II 74–5; Ja II 124). Some ascetics preyed on people's anxieties about the rains by claiming to be able to predict good or bad rainfall (D I 11).

A meteorological phenomenon common during the monsoon is lightning (*vijju* or *akkhana*). Some of the early Upaniṣads such as the Brhadāraṇyaka attributed to lightning various mystical meanings and associations whereas the Buddha treated it matter of

fact as something that occurred together with storm clouds, thunder and rain (D I 262). He had personal experience of how dangerous it could be. Once when he was staying in a particular village ‘the lightning flashed and the thunder crashed and two farmers, brothers, and four oxen were killed’ (D II 131). The mention of lightning destroying all a farmer’s labors probably refers to it striking a field and setting fire to the crop (Mvu II 59).

Another meteorological phenomenon the Buddha discussed was the winds that ‘blow back and forth across the sky’ (S IV 218). He differentiated them according to the direction they blow from, their temperature, strength, and whether or not they carry dust. Thus they blow from either the north, south, east or west, they can be hot or cool, squalls (*adhimatta vāta*) or breezes (*paritta vāta*) and they can carry dust (*saraja vāta*) or not (*araja*). The only aspect of wind included in modern analysis that the Buddha did not mention is velocity. Another type of wind mentioned in the text is the air currents or thermals (*veramba*) that can rise to great altitudes. The Jātaka specifically says that vultures use these thermals to glide and soar (Ja III 255; 484). There is also a brief mention of whirlwinds (*maṇḍala vāta*, Ja I 72).

There is some evidence that the early Buddhists attempted to give naturalistic explanations for certain atmospheric phenomena related to seasonal changes. The *Milindapañha* asks why it is that the sun appears to shine with more glare in the winter when it is cool than in the summer when it is hot. The answer given is because in the summer the wind blows dust into the atmosphere and the resulting airborne dust particles deflect the sun’s rays (Mil 274).

The soils found in the Ganges plain are mainly entisols, alfisols and ultisols with some vertisols. The *Vṛkṣāyurveda*, an ancient work on trees, mentions three soil types—arid, marshy and ordinary—and further sub-divides these according to colour and fertility. The Tipiṭaka mentions a variety of soils—clay (*mattikā*), fine clay or kaolinite (*saṇhamattikā*), yellowish clay (*paṇḍumattikā*), sandy (*vālikā*), black alluvium (*kālijallikā*), deep, compact alluvium (*kalalagahara*), pebbly and gravelly (*pāsāṇasakkharā*), compact soil (*bhūmighana*), and sweet soil and sour soil (*madhuraṃ paṃsu*, *amadhuraṃ paṃsu*). Salty soil (*ūsara*), known as *usar* in Hindi, refers to those patches of ground found in parts of Bihar which contain high concentrations of carbonate of soda, sulfate of soda, lime and

magnesium (A IV 237; Ja III 580; M III 94). The Tipiṭaka also comments that the soil in deforested areas might be poor (*dubbhūmi*, D II 353), and that the top soil in Avanti is dark and hard (*kaṇhuttarā bhūmi kharā*, Vin I 197).

A wide variety of habitats are mentioned in the Tipiṭaka, most of them recognizable even today. Some of these are mixed thicket (*omissaka-gahana*), dense jungle (*vana-saṇḍa*), sal forests (*sāla-vana*), grassland (*gaccha*), plains (*thala*), thickets (*pagumba*), mixed woodland (*kaṇṭaka-gumba* or *jaṅgala*), expanses of low scrub (*khuddaka-gacchavana*), thorny scrub (*kubbanaka*), undergrowth (*vanatha*), grass thickets (*tiṇa-gahana* or *tiṇa-dāya*), bamboo jungle (*veḷugahana*), uninhabited forest (*nimmanussaka brahārañña*), waste land (*vivana*), rugged hills (*pabbata-visama*), tablelands or plateaus (*pabbatatala*) and denuded hills (*muṇḍa-pabbataka*). Included also are the various wetland habitats such as river banks (*kūla* or *naditīra*), lakes (*daha* or *sara*), ponds and seasonal pools (*talāka*), flooded meadows (*kaccha*), swamps (*anūpa*) and marshes (*palipa* or *udaka-daha*) with their reed banks (*naḷa-vana*), water plants and floating vegetation (*sevāla-panaka*). The Jātaka mentions semi-arid tracts (*kantāra*) and deserts (*maru-kantāra* or *nirudaka-kantāra*), which may be an early reference to Rajasthan's Thar Desert just beyond the western edge of the Middle Land.

Also mentioned are lowlands (*ninna*) which could have included floodplains: the Jātaka describes a lake around which 'some high ground, in hardened mud, grew lush green grass on which fed hares, deer and other light animals' (Ja II 26).² The large silt and sand islands (*pulina*) formed by the annual flooding of the major rivers and which provides a home for animals like the swamp deer, are also mentioned. One Jātaka describes a body of water near a river which would join the river during floods (Ja II 79). This is a good description of what are called *jeels* or *chauras* in Hindi, old river-beds now cut off from the present river and which form long marshes or lakes. Other habitats included man-made ones such as the muddy, stagnant village ponds (*jambāla*) and the irrigation reservoirs and tanks (*pokkharanī* and *vāpi*) that dotted the

2. According to Ayurvedic theory, the flesh of animals described as light (*lahu*) supposedly have a drying effect when eaten and produce little mucus.

countryside. These are filled with reeds, lotuses and other aquatic plants and became a home for crabs, mussels, fish and frogs as well as the birds that fed off them. Paddy fields (*sālikhetta*) too, were an excellent habitat for various animals.

The most important topographical feature of the Middle Land and one that had a profound impact on the environment was its rivers, the main ones mentioned in the Tipiṭaka being the Ganges, the Yamunā, the Aciravati, the Sarabhū, and the Mahī (A V 22). The first two of these retain their names, the third is now called the Rapti, the fourth Sarayu while the identities of the last river is uncertain. Historically, natural watercourses have been categorized according to their size, from large to small, as rivers, streams and brooks, although these hydrologic distinctions are imprecise. Nothing like this categorization exists in the Tipiṭaka. Words such as *gaṅgā* and *nadī* were prefixed with *mahā* to indicate major rivers while other words like *āpagā*, *kunadī*, *sara* and *savantī* were combined with adjectives to indicate other types of watercourses, e.g. mountain brook (*girinadī*, Th 310), fast-flowing creek (*sīghasara*, Sn 3), shallow stream (*kunnadīm uttānataḷaṃ*, Ja III 221) or uncrossable rivers (*nadīvidugga*, A I 35). The *Milindapañha* mentions intermittent rivers, i.e. those that dry up in the summer, saying that they cannot be rightly be called rivers for this reason (Mil 114). An intermittent river is described as having ‘large undulating sandbanks along its twisting and meandering course’ (Mil 297). The Nerañjarā which flows passed Bodh Gaya and several other rivers in the Middle Land could well fit this description. The meandering of natural watercourses was noted and a Jātaka observes that: ‘All rivers wind as they go’ (Ja I 289).

Some of the rivers that flow through the Ganges plain are two, three or even more kilometres wide. When the Buddha and the monks and nuns who were accompanying him on his sojourns arrived at a river, they would often have to look for a boat or other craft or try to make a raft out of reeds and branches in order to get across (D II 89; M I 135–36). So for the Buddha, who spent much of his life traversing the country, rivers were, more than anything else, a challenging obstacle. It is not surprising, therefore, that he often used rivers and things associated with them as metaphors for the spiritual quest and its goal. He called the ordinary worldly state ‘this bank’ (*ora*) and Nirvana ‘the further bank’ (*pāra*). He named the

first stage of enlightenment 'entering the stream', which would be a preliminary to swimming across a river. Attitudinal and emotional negativities like greed, hatred and desire were 'torrents' or 'floods' (*ogha*) that could sweep one away. He said of a monk who studied the Dhamma diligently that he is 'one who knows a ford' (*titthaṃ jānāti*, M I 221). The cowherd Nanda assured the Buddha of his determination and ability to be a good monk by saying: 'Lord, I will not get stuck on this bank nor will I get stranded on the far bank. I shall not sink in midstream and I shall not run aground on a sandbar. May the Lord accept me as a monk' (S IV 181). In one of his most famous similes the Buddha likened his teachings to an improvised raft, which, after it had been used to cross a river, could be abandoned; the idea being that even something as precious as the freedom-giving Dhamma should not be clung to (M I 136). Every time wayfaring monks or nuns found their progress blocked by a great river sliding silently along, or a simple cowherd like Nanda took his animals down to a river to drink, they would have been reminded of some aspect of the Buddha's teaching.

The Buddha described rain storms in the mountains filling pools and lakes from where the water fed brooks and creeks (A II 140). He also described a mountain river (*nadī pabbata*) as 'winding this way and that, cascading, carrying everything along with it, not stopping for a minute, a second, an instant, rushing and swirling forward' (A IV 137). Such rivers might have grasses, reeds and trees overhanging both banks (S III 137). Streams and rivers shape the landscape particularly when they are in flood. The Acivaratī (i.e. Rapti) was, and still is, notoriously prone to flash floods. When it rained in the river's upper reaches in the Himalayan foothills, it would break its banks and sometimes wash away crops (Ja IV 167). Flooding rivers allow for the migration of aquatic animals, the dispersal of seeds, the rejuvenation of wetlands (Ja II 79–80) and the enrichment of the soil by depositing silt (*kalalagahaṇa*) and mud (*kaddama*) over the surrounding countryside. Mountain streams such as those in the lower Himalayas carry away sand, gravel and even rocks when in flood (Mil 197).

Not actually in the Middle Land but forming its northern border are the Himalayas, sometimes called the Lord of Mountains (*Pabbatarāja*, S II 137).

These mountains are only occasionally mentioned in the Tipiṭaka, as when it comments that the Buddha once stayed in a hut in a part of the Himalayas administered by Kosala (S I 116). This must refer to the subtropical broadleaf forests or perhaps even the higher subtropical pine forest zone of Nepal or Uttarakhand. Rugged (*dugga*) and undulating (*visama*) areas, tableland (*bhūmibhāga*), inhabited and uninhabited places and areas of great natural beauty in the Himalayas are also mentioned (S V 148). The *Milindapañha* says that 500 rivers have their source in the Himalayas (Mil 114). Most of the other references to these mountains are either stereotyped or idealized. The southern perimeter of the Middle Land is defined by the Mizrapur Hills, the Rajmahal Hills and the Vindhyachal Range. These may have been the Dakkhiṇagiri the Buddha sometimes mentioned and occasionally visited (Vin I 207).

Pāṇini classified all life broadly into two types—moving and still. Animate creatures were divided into humans and animals, and animals were sub-divided as either domestic or wild. The Buddha also sometimes classified life forms as moving (*tasa*) and still (*thāvara*, Sn 146; 394), and further classified animate life according to either the number of their legs or their mode of birth. Thus living beings are either legless, two-legged, four-legged or multi-legged (A V 21), or alternatively, womb-born, egg-born, moisture-born or spontaneously-born, as in the case of divine beings (S III 240). On one occasion only the Buddha differentiated animals according to their habitat as those living in burrows, in water, in the forest or in the air (A II 33). This may be an earlier version of the habitational classifications proposed by the ancient Ayurvedic physicians Caraka and Suśruta.

Some later Buddhists attempted to classify life forms according to the fineness of the food they ate. In this schema crocodiles were the lowest because they were known to sometimes eat pebbles, higher still were peafowl which feed on snakes and scorpions, then came hyenas which can digest horn and bone, then elephants, deer, cows, hares, etc. in ascending order. Higher than these were humans, first villagers, then urbanites, followed by kings and their courtiers, and at the top were the gods who lived on ambrosia (As 331).

According to the ancient Indian reckoning, all plants were of seven types: medicinal herbs (*oṣadhī*), forest trees (*vanaspati*), fruit

and flower-bearing trees (*vrkṣa*),³ shrubs (*gulma*), grasses (*trṇa*), plants with tendrils (*pratāna*) and vines (*vallī*). The Buddha classified them as either medicinal herbs, grasses or forest trees (*osadhī*, *tiṇa*, *vanappatayo*, A IV 100). He considered plants to be a one-facultied life form (*ekindriya*), although he did not mention which faculty they possessed. He distinguished plants according to whether they were propagated by roots (*mūla*), stems (*khandha*), joints (*phalu*), cuttings (*agga*) or seeds (*bīja*, D I 5).

The various theories of kamma that were emerging in both orthodox and unorthodox circles during the 6th to 3rd centuries BCE may have been based in part on speculation on the analogy of generation in the plant world. Certainly, the concept of kamma was often explained in such terms. 'Whatever type of seed is sown, that is the type of fruit one reaps. The doer of good reaps good, the doer of evil reaps evil' (S I 227). The Buddha called intentional good or bad deeds 'seeds' (*bīja*) and their kammic results 'fruits' (*phala*). He spoke of his order of monks and nuns as being 'an unsurpassed field of merit' (*anuttaraṃ puññakkhettaṃ*) where seeds of merit could be sown. To make some of his ideas more understandable he sometimes equated them with various agricultural tasks: 'Just as when a seed is sown in a field and grows depending on two factors, the nutrition in the soil and a good supply of water, so too, the aggregates, elements and the six bases of sense contact have come to be dependent on a cause and when the cause breaks up they will cease' (S I 134). In another discourse he compared the various steps in the spiritual life to the process of ploughing: 'Faith is the seed, austerity the rain, and wisdom is my yoke and plough. Modesty is the plough-pole, mind the strap and mindfulness is my ploughshare and goad' (Sn 77).

Like any sensitive person, the Buddha was fascinated by the diversity of the natural world he saw around him. He commented: 'I know of no other type of living beings as diverse as those of the animal kingdom' (S III 152). This awareness of and sensitivity to animals meant that he took them into account in his Dhamma, particularly in his cosmology and his ethics. According to his

3. The *Vṛkṣāyurveda*, an ancient treatise on trees, says that *vanaspati* are trees that bear fruit without flowers and *duma*, probably the equivalent to *vrkṣa* are those that have both.

understanding, the animal kingdom (*tiracchānayoṇi*) is one of the six realms of existence beings can be reborn into, the others being purgatory, the realm of hungry spirits, of jealous spirits, heaven and the human realm. The Buddha believed that more human beings were reborn as animals than as humans (A I 35) and that it was a distinct disadvantage to be an animal. It would be difficult, he said, to describe the suffering animals have to endure given that their whole world is dominated by 'eating each other and preying off the weak' (M III 169). The *Buddhacarita*, a Sanskrit biography of the Buddha from about 2nd century CE, put it like this: 'As soon as they meet one another, those creatures who live in the sky are attacked by those who live in the sky; those who live in water, by those who live in water; those who live on the ground, by those who live on the ground.'

Likewise animals lack the ability to comprehend the Dhamma and have only the most rudimentary moral sense. As evidence of this he pointed out that animals will even mate with their offspring (A I 51). Animals' moral and cognitive inferiority to humans did not mean that the early Buddhists considered them unworthy of consideration. As far as sensitivity to pain and the desire to avoid it are concerned, all beings are the same. The *Jātakamāla*, a retelling in Sanskrit of a selection of Jātaka stories, says: 'Because animals are dull by nature we should have sympathy for them. When it comes to being happy and avoiding suffering, all beings are the same. Therefore if you find something unpleasant you should not inflict it on others.' (Jm XXII.25–6).

It should also be pointed out that on several occasions the Buddha acknowledged that in some ways animals can be better than humans (M I 341). Once he commented that an old jackal that was howling before sunrise had more gratitude than a particular monk he knew (S II 272). On another occasion he rebuked some monks who were arguing and then added: 'If animals can be courteous, deferential and polite towards each other, so should you be' (Vin II 162). The Jātaka makes this comparison between animals and humans: 'Easy to understand is the yelp of jackals and the song of birds. But to interpret what humans really mean when they speak is difficult indeed' (Ja IV 217). It is interesting to note that some two centuries after the Buddha, one of the points discussed during the Third Buddhist Council was whether or not animals

could be reborn in heaven. Those who believed that this was possible pointed out that Erāvaṇa, the mount of the god Indra, was an elephant. The Theravādins countered this by saying that if this was taken literally it would require that there also be stables, fodder, animal trainers, grooms, etc. in heaven, something that was considered to be clearly ridiculous (Kv XX.4).

While marvelling at the diversity of animal life, the Buddha was a careful enough observer to notice that humans are a single species, despite the widely accepted Brahminical claim that each caste represented a significantly different type. The Buddha's response to this claim was to say that the different biological and zoological species are separated by barriers to reproduction, with hybrids usually being sterile (M II 153). Different human groups, by contrast, are clearly interfertile and thus must be a single species. He said:

‘Consider the grass and the trees. Although they do not speak of it, their characteristics are due to their species and truly there are many different species. Consider grasshoppers and ants... quadrupeds great and small... snakes with their long backs and which go on their bellies... water-living fish in their watery home... and birds, those wing-goers, those sky-travellers... In these species there are many different characteristics but amongst humans the differences are few. Not in hair or head, ears, eyes, mouth or nose, lips or eyebrows; not in neck or shoulders, belly, back or buttocks, chest, vagina or testicles; not in hands or feet, fingers or nails, calves or thighs, colour or voice is there any different characteristics due to species as in other creatures. The bodies of humans are not significantly different from each other as in animals.’ (Sn 601–10)

For the Buddha, if a distinction were to be made between human beings, it should be based on their individual behaviour or their level of comprehension, not on what caste they were born into. ‘Whether it be a castor oil bush, a *pucimanda* or a *pālibhaddaka*, if a man looking for honey finds it there, then for him that is the best tree. Likewise, the best person is he from whom one learns the Dhamma, whether he be of the warrior, Brahmin or merchant caste, low caste or outcaste’ (Ja IV 205).

That special regard for animals which later became such a feature of Indian civilization and which in part was due to the influence of Buddhism, was still in its infancy during the Buddha's time. Animals were still being slaughtered at Vedic sacrifices although this was being looked upon with increasing unease. Indeed, the Buddha was one of the most vocal critics of these bloody rituals (A IV 41; 50). He condemned animal sacrifices as being both cruel and wasteful. He said his monks might attend a sacrifice but only on condition that no bulls, goats, sheep, poultry or pigs were slaughtered, no trees were felled to make sacrificial posts and no grass was cut for use in the sacrificial ritual (D I 141). For the Buddha, gentleness and kindness to all was a fundamental moral principle and also an essential step in an individual's spiritual development. The first requirement in his code of moral discipline is to 'abstain from killing, to lay aside the stick and the sword and to live with care, kindness and compassion for all living creatures' (D I 4). Anyone who wanted to be his disciple was expected 'not to kill, encourage others to kill or approve of killing' (A V 306).

For the Buddha, love and compassion were incomplete if they were not extended to all sentient beings. He said that if a monk found an animal in a trap and out of compassion set it free, he would not be guilty of theft, even if conventional opinion considered the animal to be the property of the hunter who had set the trap (Vin III 62). Even the most insignificant life forms should, the Buddha said, be included in the ambit of a person's kindly regard. One of the eight things that he allowed his monks and nuns to have as their personal property was a strainer to filter tiny creatures from water (Vin II 118). Monastics were expected to check water before using it to make sure there were no creatures in it (Vin IV 48-9). It was these tiny creatures that the Buddha was alluding to when he said that he had 'compassion even for a drop of water' (M I 78). Monks and nuns were also asked to avoid unnecessarily damaging plants and their seeds (M I 345).

These and similar ideas amongst the Jains had a profound effect on the Indian attitude to animals and later on all the peoples amongst whom Buddhism spread. In India, it became a custom during the summer to draw water from wells and put it in troughs for wild animals to drink (Ja II 70) and to put baskets in trees or

under the eaves of houses for birds to nest in (Ja II 361). People would observe what were called non-killing days (*māghāta*) when no animals would be slaughtered and no meat would be available in the markets (Vin I 217). Such days would be announced by the beating of a drum (Ja IV 428). At a later period such non-killing days were given legal sanction by various Buddhist, Jain and Hindu monarchs. Vegetarianism eventually became common in India although Buddhism, at least early Buddhism, did not have a direct role to play in this development. Vegetarianism was practised by some of the unorthodox sects of the time. One of the ascetic practices the Buddha adhered to before his enlightenment was abstaining from meat and fish (M I 77). The Ājīvakas and Jains were vegetarian (M I 238), although others were not. The ascetic Kaḷāramuṭṭhaka, for example, had taken a vow to consume only meat and alcohol although this did not prevent him being highly esteemed by the people of Vesālī (D III 9). The Buddha did not require either his monastic or lay disciples to abstain from meat. As far as monks and nuns were concerned, it was acceptable to eat meat on the condition that they did not see, hear or suspect that the person offering the meal had killed the animal specifically for them (M I 368–71).

There are several places in the Tipiṭaka that mention in passing the Buddha or certain monks or nuns eating meat. The Aṅguttara Nikāya comments that a man sent his servant to the market to buy meat so it could be prepared and offered to the Buddha (A IV 187). Another text describes how a group of people ‘boiled porridge and rice, made soup and minced meat’ (*maṃsāni koṭṭenti*) while preparing a feast for the Buddha and his monks (Vin I 239). On another occasion some men slaughtered a cow, cooked it and then one of them gave ‘the choice cuts of the cooked meat’ (*maṃse pakke varamaṃsāni*) to a nun who subsequently dressed it and offered it to the Buddha (Vin III 208). A monk who was possessed by a malevolent spirit is said to have gone to ‘the place where pigs are slaughtered’ and eaten raw flesh and drunk blood, apparently the accepted cure for this affliction. According to the Vinaya the Buddha permitted this rather drastic remedy (Vin I 201–02).

There are sufficient references in the Tipiṭaka to show that meat-eating was the norm during the Buddha’s time. Slaughter houses are occasionally referred to (Ja VI 62; M I 130; Vin I 202) and

people are often mentioned consuming the meat of domestic and wild animals. Meat would be roasted or minced and it would be preserved by drying or salting (Ja I 243; II 245). It was usual to eat meat or fish while drinking spirits (Ja II 211; III 287; V 12; 466) and all three were considered acceptable as offerings to the various nature gods people propitiated (Ja I 425; 489). The fact that hunters were grouped with bamboo workers, flower scavengers and carriage makers as those practising a despised occupation (A I 107) is not evidence that killing animals was widely disapproved of. These occupations may have been looked down upon, not because they were considered immoral or impure, but rather because the groups that did them, *caṇḍāla*, *pukkusa* and *sudda*, were considered so.

That the early Buddhists were familiar with the complex food taboos of Brahminism is evidenced by the comment in the Jātaka that 'those of the warrior caste may knowingly eat the meat of the five five-clawed creatures' (Ja V 489). According to Brahminical legal texts it was forbidden to eat the meat of animals that had five claws and two rows of incisor teeth. The exceptions to this rule, the so-called five five-clawed creatures (*pañca pañcanakha*) were, according to the Jātaka commentary, the hare (*sasaka*), porcupine (*sallaka*), monitor lizard (*godhā*), monkey (*kapi*), and tortoise (*kumma*). Brahminical texts list somewhat different animals.

The Buddhists argued against or more usually simply ignored many of the superstitions of the time, including Brahminical food taboos. Monks and nuns were not allowed to eat the flesh of certain animals, although the reasons given for such prohibitions were rational ones. Eating elephant and horse flesh for example, might bring unwelcome attention from kings who regarded such animals as symbols of royalty. Dogs and snakes were widely considered loathsome and eating them would attract social disapproval. Lions, hyenas and other large predators were believed to be able to smell the meat of their kind on someone who had eaten it and would attack them. The evidence given for this last reason was that some hunters had offered lion meat to a forest-dwelling monk who ate it and was subsequently mauled by a lion. A similar thing happened to monks who ate tiger, leopard and bear flesh (Vin I 219–20).

In the Tipiṭaka it is the Jains who are depicted as the strongest advocates of vegetarianism and on this issue they were also noisy critics of the Buddha. In one Sutta they are depicted as follows: 'Many Jains went through the town, through the main roads and side streets, the alleys and the lanes, waving their arms and shouting; "The general Sīha has this very day slaughtered a large creature to feed to the monk Gotama and he is going to eat it knowing that it was slaughtered specifically for him".' (A IV 187; Vin I 237). This accusation was actually false.

Unlike the four Nikāyas, the somewhat later Jātakas have divergent voices on the issue of vegetarianism. Adhering to the earlier position that monastics can eat meat if they have not seen, heard or suspected that an animal was killed specifically for them (M I 369), the Telovāda Jātaka goes as far as to say that even eating the flesh of one's parent would be acceptable if such conditions were met (Ja II 263). This is clearly hyperbolic but it does suggest that the non-vegetarian side of the debate was feeling pressure from the advocates of vegetarianism. At least three Jātakas (No. 75, 434 and 451) hint at a shift towards vegetarianism.

Whether or not the Jātaka stories can really be attributed to the Buddha as tradition maintains, they do give a good idea of the early Buddhist attitude towards animals. The animals in these stories are often depicted in a most sympathetic manner and sometimes in contrast to the greed, thoughtlessness and cruelty of humans. Even plants were sometimes attributed with having the noblest human-like qualities. According to one Jātaka story, wayside trees lowered their branches so that hungry and weary travellers could reach their fruits (Ja VI 513).

Despite the humanizing influence of the Buddha's teachings, cruelty to animals was common enough both during his time and later. Butchers, hunters and fishermen are occasionally mentioned and the Jātaka comments that 'elephants are killed for their tusks and leopards for their skins' (Ja VI 61). There are also incidences in the Tipiṭaka of children tormenting animals and the Buddha admonishing them for doing so (Ud 11). Despite claiming privileges because of their priestly role, some Brahmins built huts in the forest and set traps to catch hares, cats, monitor lizards, fish and tortoises, something the Buddhists criticized them for (Ja IV 364). Villagers supplemented their diets by hunting wild animals in

nearby forests and gathering honey and eggs from them.

Early Buddhist texts warn that those who kill animals; fishermen, hunters of wild pigs and butchers who slaughter bulls and goats; will all be reborn in purgatory (Ja V 270; VI 111). Later Buddhist texts such as the *Mahāvastu* describe some of these infernal realms and the actions that could lead to rebirth in them. In doing so, it also gives an idea of the cruelty that was sometimes inflicted on animals:

‘Those who in the world cause worms to be squashed, the earth to be dug up... who beat creatures with clubs with the leaves still on them, or who crush nits, lice and *sāṃkuśas*, are reborn there as a maturing of their karma ... Those who in the world enslave beings who are without protection or refuge, who set houses or forests on fire, who light a fire at the openings of the dens, burrows, lairs and nests of *sāhikas*, monkeys, rats, cats, and the holes of snakes, watching their exits, who destroy bees with betel leaf or fire, have rebirth there as a maturing of their karma ... Those who have crushed the heads of living creatures such as snakes, centipedes and scorpions, have their heads crushed as the maturing of such karma ... Those who in the world have caused living beings to be fed to lions, tigers, leopards, bears and hyenas, are themselves devoured as the maturing of such karma ... Those who in the world scatter grain as bait for deer, buffaloes, pigs and wild cocks, saying: “We shall kill them and eat their fat flesh” are blown on by icy wind as a maturing of such karma.’ (Mvu I 21–5)

In later centuries some Buddhists came to consider even unintentionally and indirectly causing animals to die to be morally wrong. The Chinese pilgrim Yijing who travelled through India during the 7th century mentioned that some monastic communities rented out the land they owned and took a percentage of the crop, which was in accordance with the Vinaya (Vin I 250). Less scrupulous monks did the same but also supervised and even participated in the farming. Yijing criticized this, saying: ‘By ordering about the hired men who work the fields, they inevitably arouse their resentment, and by digging the soil to plant seeds as well as ploughing land are libel to injure ants and other insects...’

Then he added: 'Nothing is more harmful to insects and more obstructive to good deeds than the cultivation of land.' No doubt Yijing was reporting the general attitude of the more strict Indian Buddhist monks of his time.

The *Paramatthajotikā* defines a forest (*vana*) as 'a collection of trees growing in close proximity to each other' (Pj 191). By the 5th century BCE large areas of forest in the Ganges plain had already been cleared to make way for agriculture. The Buddha described how a fire would 'burn through the undergrowth, ignite the woods and keep burning until it came to a clearing, a cliff, rocks, water, beautiful greenery or a patch of bare ground where it would burn itself out for want of fuel' (A IV 73–4). This could well be a description of the fires that were set to push back the forests. The Vinaya mentions a fire spreading to some dwellings from the adjacent forest and of burning a firebreak (*paṭaggaṃ dātum*) to prevent such a thing reoccurring (Vin II 138). The Buddha also mentioned 'a farmer taking a plough and seed, going to a forest clearing with poor soil covered with stumps and planting the seeds' (D II 353). The Jātaka tells of a Brahmin felling trees on the bank of the Aciravati River in order to cultivate the land (Ja IV 167). There was a class of people known as forest burners (*dava-ḍāhaka*, Vin II 138). Whether they were farmers engaged in slash-and-burn cultivation or men employed to clear forested areas we do not know. Whatever the case, these and other references to clearing the forest by axe or fire suggest that at the time the Pali Tipiṭaka was composed there were still extensive forests and that fires in them were common occurrences. King Asoka's 5th Pillar Edict issued 243 BCE in which he forbade setting fire to forests is further evidence of this. Of course, not all such fires were man-made. The Jātaka describes a forest fire (*davaggi*) being started by the friction of two tree branches rubbing together (Ja I 216).

That some forest tracts were spared human encroachment may have sometimes been due to the fauna they sheltered. The Vyaggha Jātaka tells of two tree gods who shared their forest with a lion and a tiger. Because of the stench of carrion left by the two predators, one of the tree gods decided to frighten his neighbours away, against the good advice of the second tree god. As soon as the nearby villagers noticed the absence of lion and tiger tracks 'within days they cut down the forest, made fields and brought

them under the plough' (Ja II 356–57). There is evidence that some forests were able to re-established themselves when, whether due to natural or man-made causes, human habitation went into decline. The Buddha mentions a man stumbling across the ruins of an ancient city deep in the forest (S II 105–06).

Some stretches of forest wilderness were extensive enough that running out of supplies while travelling through them or losing one's way in them could spell disaster. A lone traveller might be reduced to drinking water from a puddle in a cow's footprint because nothing else was available (A III 188). Villagers living near forests sometimes acted as guides for those wanting to travel through them. (Ja II 335). There are records of this still being done some 500 years later. When the Chinese monk Faxian was in India in the early 5th century, the road from the Middle Land to the Deccan passed through such wild and thickly forested country that travellers had to pay local rulers to provide them with guides for the journey. Such guides would accompany the traveller for a certain distance before passing them on to another guide, and so on, until they emerged from the wilderness. Sometimes it was not distances or remoteness but humans that made forests potentially frightening. Lonely forest roads were the perfect place for robbers to operate from (Ja I 332). These outlaws were well-known to strike from and then disappear back into 'impenetrable grass or trees, a gully or a great forest' (A I 153–54; M III 158). Some of these robbers would capture a party of travellers and release one of them to go and try to get a ransom for the others (Ja IV 115). One of the most famous and dramatic incidences in the Buddha's life was his encounter with the murderous robber Aṅgulimāla who operated in the forested area in Kosala (M II 97–8).

The state regarded some forests tracts as important sources of products and revenue. The Rakkhitavanasaṇḍa, the Protected Forest Grove, near Kosambi, was probably so named because it was off limits to villagers who might otherwise harvest its resources (Ud 41). The Buddha encountered an elephant in this forest suggesting that it was a reserve for this animal, so important in warfare. Unauthorized removal of timber from state forests could result in being flogged, imprisoned or banished, even for a monk (Vin III 44). Where allowed, people gathered fruit, nuts, grasses, leaves, honey and leaf manure in nearby jungles and forest

tracts. Forests provided them with the flowers they used in their religious ceremonies and with which they adorned themselves. When the Buddha was living in the forest before his enlightenment he would sometimes encounter cowherds grazing their cattle, grass-cutters, people gathering twigs and wood-cutters (Ja V 417; M I 79). He observed that there were whole forests of reeds and tall grasses (D III 75), both of which were used to make thatch and various household objects such as mats, ropes and brooms. Both leaves and grass were used as thatch (*chadana*) on dwellings (Vin II 154). Waste land at the edge of villages or between fields and forest were a source of fodder, mainly grass. Those who harvested this important resource were known as fodder collectors (*ghāsahāraka*, Th 910), or grass collectors (*tiṇahāraka*, Ja I 121). These workers also supplied fodder for cattle, horses and donkeys kept in towns and cities.

People cleaned their teeth by chewing the twigs of particular trees. The Buddha spoke of the advantages of using such tooth-sticks (*dantakaṭṭha*). It is good for the eyes, the breath does not have a bad smell, the taste buds are cleaned, bile and phlegm do not mix with the food, and food becomes more palatable (A III 250). Another type of tooth cleaner (*dantapoṇa*, Ja IV 363), perhaps a toothpick, was also used (Ja IV 363). Twigs from the Toothbrush Tree (*Streblus asper*), Neem (*Azadirachta indica*) and Babul (*Acacia nilotica*) may have been used too, as they are by village folk in Bihar even today.

Poisons were another product derived from forests, or at least from the wild. The *Arthaśāstra*, the ancient Indian treatise on statecraft, states that one of the jobs of forest officers was to collect floral and faunal poisons.

Toxicology (*visavijja*, D I 8) was a recognized science by the Buddha's time although he designated trade in poisons an unethical means of livelihood (A III 208). Poisons were used in warfare, in hunting, in baits laid to destroy vermin and probably sometimes in food to kill enemies and rivals, although no incidents of these kind are mentioned in the Tipiṭaka. The Ṛg Veda, the *Suśrutasaṃhitā* and other later literature mention the use of poisoned arrows in combat. On several occasions the Buddha described a man being shot with a poisoned arrow and a physician's attempts to extract it, draw off the poison and heal the

wound (M I 429; II 216; see also Ja I 273; V 49). Snake venom, putrid snake flesh and plants provided poisons. The poison used on arrows was probably derived from plants of the *Aconitum* genus, in particular *Aconitum ferox*, the tuber of which is highly toxic. Tribal people in India were still using this poison on their arrows in the early 20th century.

Uses were even found for India's numerous thorny trees and bushes otherwise considered a curse. They would be planted to make formidable hedges and their branches were cut and made into kraals where cattle were penned at night to protect them from predators (Vin II 154). They were planted along the moats around cities and towns (Ja I 240). Villagers clustered thorny branches around the base of their fruit trees to discourage people climbing up and stealing the fruit (Ja VI 348). The more extreme ascetics sometimes lay on beds of thorns as a form of self-mortification (D I 167; Ja III 235). Given how baneful thorny trees could be it is hardly surprising that the Buddha often used them and their thorns and prickles as similes. Noise is a thorn to meditation, living with unrestrained senses is like walking along a path strewn with thorns, and greed is full of thorns (A V 134; S IV 195; Thī 352). Someone who is constantly asking for money is 'a thorny branch' (Ja V 450). He described a man finding himself in the middle of a thorny forest not knowing how to proceed because there was 'thorns in front and behind him, thorns to his left and to his right, thorns above and below him'. In such a situation, however he proceeded, he would do so very mindfully. One should live, the Buddha said, with a similar care and attention (S IV 189; 198. Being pierced by a thorn was but one of many ways a person could die (Ja III 345).

Modern botany recognises three types of spinose structures; thorns, which are modified branches; spines, which are modified leaves; and prickles, which are extensions of the plant's skin or bark. The ancient Indians did not make such distinctions

But of course the most important resource derived from the forests was timber. Buildings, agricultural implements, boats, buckets, household articles, musical instruments, carts and wagons all required wood (Ja I 250; Vin II 170) as did cooking fires. The fundamental importance of wood for maintaining daily life can be understood by the comment that depriving a besieged city of food

and water but also of firewood would bring it about its rapid capitulation (Ja I 409). Without wood no food could be cooked. The Alinacitta Jātaka suggests that even forests remote from human habitation were being exploited for timber on a large scale and in a systematic manner. According to this story, all the carpenters from a particular carpenter's village would embark on regular trips up a river to where it ran through a thick forest. They would chop down suitably large trees, shape beams and planks for house building, and put together the framework of one-story and two-story houses, numbering all the pieces from the central post outwards. When they had enough they loaded all the timber onto boats and rowed downstream to their village. There they would build houses to order as and when they were required (Ja II 18).

As timber was the major building material the carpenter's trade was important although there is no mention of it being considered a high or a low one. On several occasions the Buddha conversed with a carpenter named, or more likely nicknamed, Five Tools, suggesting that there were five standard tools used by these tradesmen (M I 396). We are not informed what these tools were but in other places carpenters are mentioned using a *kuṭhāri* or axe, a *vāsi*, perhaps an adze or chisel, a *muggara* or hammer, a *kālasutta*, a measuring line, a *nikhādana*, perhaps an iron rod for splitting logs and a *kakaca* or saw (Ja IV 30; 344). There is a reference to a double-handled saw, the type two men would use to saw large logs into planks (M I 129).

The fortifications of some cities and towns were wooden. There is mention of a royal lumber yard in Rājagaha which provided wood for repairs in the city, probably including the city's walls (Vin III 42). Kusinārā, where the Buddha passed away, was described as a *kuḍḍa-nagaraka*, *ujjaṅgala-nagaraka*, *sākha-nagaraka* (D II 146) which probably means that its fortifications consisted of a long mound of rammed earth or mud with a palisade running along its top, or perhaps with sharpened stakes projecting from it.

Potash and lye, probably derived from burned wood, were used as cleaning agents (A I 209; S II 131). Wood must have been used to bake bricks, although interestingly, there is only one reference to baked bricks or baked brick structures in the Sutta Piṭaka, the Brick Hall at Nādikā (D II 200). The Buddha described a potter's kiln belching smoke on first being ignited, indicating that

wood rather than charcoal was used in the pottery industry (A IV 101). However, large amounts of charcoal must have been required for the newly emerging iron industry. A choice estate granted to a Brahmin by a king was described as having 'abundant grass, wood, water and grain' (D I 87).

Others who depended on the forest only more so were the tribal people, sometimes called *aṭavī* or *milakkha*. The Jātakas mention these people hunting birds and worshipping water (Ja IV 291; VI 207). The Buddha considered it a distinct disadvantage to be reborn in the border areas (*paccantimesu janapadesu*) where the uncivilized tribal people (*aviññātāresu milakkhesu*) lived (A IV 226; S V 466), probably a reference to those places where farmland met forest and where settled Aryans came into contact with hunter-gatherers. He also mentioned that one of the fears a mother could have for her son was that she might not be able to reach him during a raid by forest dwellers (*aṭavi saṅkopa*, A I 178). In his 13th Major Rock Edict King Asoka pleaded with the tribal people to stop causing trouble and warned them that he had the power to chastise them if they did not. Reading between the lines we can assume that troublesome tribes were doing no more than resisting encroachment of their forest homes by farmers, foresters and hunters.

Scholars have pointed out that the ancient Indians saw the forest as the setting for either the hunt, the hermitage or exile. Only the second of these has any significance in early Pali literature. Hunting is occasionally mentioned, usually in a condemnatory manner, and there is only one mention in the four Nikāyas of people being exiled to the forest. According to the Buddha, his clan, the Sakyans, traced their origins back to the four sons of King Okkāka who he had exiled to 'the slopes of the Himalayas beside a lotus pond in a great grove of teak trees' (D I 92). Being somewhat later than the four Nikāyas and dealing with a broader range of subjects, the Jātaka includes several stories in which forest exile features. In some stories, royal personages flee to the forest to escape political intrigue (No. 461 and 478) and in one a courtier goes to live in the forest so as not to be a party to a murder (No. 530). The kings in two stories are banished to the forest because their behaviour is deemed unacceptable (No. 337 and 347) and in another story a king renounces his throne and retires to the forest because he is afflicted with an incurable disease (No. 519).

Others who are occasionally mentioned as resorting to the forests were those wanting to escape from oppressive rulers. One Jātaka story tells of a king so bad that many villagers simply abandoned their homes and went to live in the forest. Such villagers fled to the surrounding forest during the day, only returning in the evening so as to escape harassment by the king's men (Ja V 98–9). It was possible for such groups to establish small settlements in the forest and sustain themselves by hunting and gathering (Ja IV 289). It would seem therefore, that there were still forests extensive enough or wild enough to be beyond the king's writ.

Domestic plants and their by-products were equally important in the lives of the people. The mention of a royal safflower nursery (*kusumbhavatthu*) suggests that royal courts may have maintained gardens to provide them with vegetables and various plant products (Ja I 499–500). Farmers cultivated numerous types of grains in their fields, vegetables in their gardens and fruit trees in their orchards. These crops could be damaged by 'afflictions' such as strong winds, mice, grubs, parakeets and stem borers (Ja V 401).

They could also be damaged by hail (*karakavassa*, Ja IV 167; Mil 308). If the damage was extensive enough people would die of starvation and whole villages and towns would be depopulated (A I 160). Fields bordering forested areas might also be raided by deer (Ja I 152) and to prevent this farmers would 'dig pits with sharpened stakes and set snares, gins and traps' (Ja I 143).

The Tipiṭaka also mentions animals and plants or their by-products that were not native to or produced in northern India but were nevertheless known, either through hearsay or because they were imported from elsewhere. Sindh horses, sandalwood, marine turtles, yak tails, coral, pearls and whales are all examples of this. The Himalayas were already known to be a source of potent medicinal herbs and some of these were imported into northern India also.

Plants and animals had an important part to play in the cultural life of the Buddha's India. Some were admired enough for children to be named after them. Thus the Tipiṭaka mentions names such as Lion (Siha), Banyan (Nigrodha), Lizard (Godha), Jackal (Sigāla) and Blue Water Lily Hue (Uppalavaṇṇa). On the other

hand, being called a camel, a ram, an ox or an ass was considered an insult (Vin III 12). The Buddha's clan name was Gotama meaning 'best cow' and his father's name, Suddhodana, means 'pure rice'. Some topographical features were given faunal or floral names either because they resembled or they were in some way association with certain plants or animals. Examples of these toponyms are Snake River (Sappinī-nadi), Black Worm River (Kimikālā-nadi), Cuckoo Lake (Kuṇāla-daha), the Buffalo Ground (Mahisa-vatthu), Crocodile Hill (Susumāra-giri), Snakes' Hood Cave (Sappasonḍika-pabbhāra), Pigeon's Cave (Kapota-kandara), Boar's Cave (Sūkarakhata-lena) and Vultures' Peak (Gijjha-kūṭa). A small selection of the many man-made features similarly named include Horse Town (Assapura), Mango Village (Ambagāma), Black Plum Village (Jambugāma), Squirrel Village (Kalandakagāma), the Red Lotus Hall (Kokanada Pāsāda) and the Seven Mango Shrine (Sattambaka Cetiya).

Feminine beauty was likened to objects from nature. A young woman could be as slender as a *kālā* bush (Ja VI 269), have hands as soft as cotton (Ja V 204), be doe-eyed (Ja V 215), have teeth like pearls (Ja V 203), lips as red as *bimba* fruit (Ja V 452) or nipples swollen and firm like ripe dates (Ja V 302). Less flatteringly, she might also have a mind like a monkey (Ja V 445). A maiden could be as fair as 'a *kaṇikāra* tree blossoming in a sheltered glade' (Ja VI 269) while a comely youth could be 'young, handsome and tender as a bean sprout' (Ja III 394).

The Buddha and his enlightened or more advanced disciples were often compared to or equated with various animals, the most frequent being the bull-elephant (*nāga*), the lion (*sīha*), the bovine bull (*āsabha*) and the thoroughbred horse (*ājāṇiyya*, DhP 322; S I 28–9; Sn 684). These very animals are depicted on the abacus of the capital of the pillar King Asoka erected at Isipatana where the Buddha delivered his first sermon. The first three are also the crowning animals of all surviving Asokan capitals while the last is mentioned in one literary source as crowning the pillar in Lumbini. Different opinions have been given as to why Asoka chooses to feature these four animals on his pillars. It has been suggested that they represented the four directions, that they were symbols of royalty, of fertility, or because of their supposed cosmological or astrological significance. It is much more likely that Asoka's choice

was simply a continuation of what the earliest texts had done; identifying the Buddha with animals that were revered for their perceived stateliness, nobility and admirable habits.

The Buddha and the bull-elephant both favoured living in the forest away from others (A IV 435–37; Ud 41–2). His bold and confident claim to be enlightened was reminiscent of the lion's fearless roar (A II 33; V 33; S V 227). Like sincere monks thoroughbred horses respond quickly to training and move with deliberation and mindfulness (A I 244–46; II 114; III 248; M I 446). And just as the bull is recognized as the natural and rightful leader of the cows and calves, the Buddha's spiritual attainments made him pre-eminent amongst humankind (M I 226). Even in later texts such as the *Mahāvastu*, the Buddha was still being called a bull-elephant man, a lion man, etc. (Mvu I 229; II 133).

The ancient Indians were sophisticated connoisseurs of aromatics and odorants. As part of their efforts to explain and understand the world they analyzed the senses, their objects and sense experience, including olfactory experience. The Buddha listed pleasant odours as coming from either roots, heartwoods or flowers (S III 157). He sometimes expanded this list to include aromas from softwoods, bark, fruit, leaves, shoots and resins or saps (S III 250). Later the Dhammasaṅgaṇī expanded these lists further to cover odours in general and their aesthetic properties. 'Odours which are derived from the four great elements, are invisible and have an effect are root odours, heartwood odours, bark odours, leaf odours, flower odours, fruit odours, raw flesh odours, putrid odours, pleasant odours and unpleasant odours' (Dhs 625). It will be noticed that all the odours in the first two lists are derived from plants as are the majority in the Dhammasaṅgaṇī list. When the Buddha's contemporaries thought of perfumes and scents they thought of plant substances. What was called 'the four types of perfume' (*catujātigandha*) is occasionally referred to but what the four were is not given (Ja I 265; V 79).

People washed themselves with fragrant bath powders (*nahānacūṇṇa*), applied perfumes and unguents (*gandhālepa*) after their baths and sprinkled perfumed water on the floors of their homes as a sort of ancient air-freshener (Ja I 399). Valuable brocades would be stored in scented chests (A I 248) and when clothes were returned from the laundry they might be put in a

scented chest to remove the smell of the cleaning agents (S III 131). However, because perfumes and scents were associated with luxury and sensual indulgence, the Buddha asked his lay disciples to forgo their use, at least during Uposatha, the monthly full moon and half moon days (A I 212). Perfume, probably in the form of incense powder or sticks, was as essential a part of a funeral as were sweet-smelling garlands (D II 159; Ja III 163) and the rich might have sandalwood burned in their funeral pyres (Ja V 136). Perfume played a part in religious practices. Incense was offered during *pūjas*, scented oil was burned in lamps (Ja II 104) and perfumed water was sprinkled around sacred trees (Ja II 104–06; III 23). The Buddha approved of offering garlands, perfume and coloured paste (*vaṇṇaka*) at the shrines of enlightened saints (D II 142).

Then as now the perfume *par excellence* was sandalwood. This wood was used as a powder (*cunṇa*) or an unguent and fragrant oil was extracted from it also (D II 137; Ja IV 440; Mil 321). That Vārāṇasi was already a centre for perfume manufacturing and trade is implied by the Buddha's comment that when he was a layman he used no sandalwood unless it came from that city (A I 145, Ja V 302). Perfumes were probably also included in the various cosmetics and salves people used, the 'eye ointments, garlands, scents, face powders and face creams' (*añjanaṃ mālā vilepanaṃ mukhacunṇakaṃ mukhālepanaṃ*, D I 7). Although several flowers used in perfumery are mentioned in the texts the only perfume actually named other than sandalwood is *sabbasaṃhāraka*. As its name suggests this must have been made from a mixture of the most expensive and fragrant aroma compounds.

A character in the Umaṅgajāta Jātaka says she could never afford *sabbasaṃhāraka* and that she perfumed things with *piyaṅgu*¹ flowers (Ja VI 336). The Tipiṭaka makes no mention of saffron or perfumes made from animal products such as musk or ambergris.

Mineral but also animal and vegetable substances were used as cleaning agents. The Buddha once asked rhetorically how the body is usually washed and then answered: 'By means of a scraper, *kakka*, clay, water and having a good scrub' (A I 207). On another occasion he described how a bath attendant would take bath powder and knead it into a ball of lather while sprinkling it with water and oil (D I 74). Soap is made by combining fatty acids with a

strong alkaline solution. Cow urine and the residue of mustard or sesame oil production (*sāsapakakka* or *tilakakka*) typically provided the first, while *ūsara* soil, clay or ash was used for the second (Ja VI 232). The clay mentioned was probably fuller's earth which is mined in Bihar and Uttar Pradesh even today. The bath powder (*nahānacūṇṇa*) is likely to have been made from some of these ingredients with a perfume added. The Vinaya recommends these same substances together with cow dung and urine be applied to the skin of a snake bite victim, probably not as a medicine but to thoroughly clean the wound or perhaps in the belief that it would draw out the venom (Vin I 206).

Naturally, fabrics would require different treatment and different cleaning agents. These would include boiling, scouring with salt earth (*ūsa*),⁴ lye (*khāra*) and dry cow dung (*gomaya*), then rinsing (A I 209; S III 131)

Massage (*parimaddana* or *ucchadana*) and limb rubbing (*sambahana*) were already well-known during the Buddha's time. Attentive children would massage their aged parents limbs (A I 62) and sensual massage that stopped just short of being sexual was also known (A IV 54). There is an account of nuns having their forearms, backs, hands, calves, feet, thighs and faces massaged with a cow's leg bone. Probably the rounded ends of the epiphyses of long bones were used for such procedures. The Buddha forbade monks to have massages for pleasure (D I 7) although he seems to have approved of therapeutic massage. On one occasion he is recorded as having been 'oiled' (*sinehati*) over several days when he was suffering from a particular illness (Vin I 279). The meaning of this term is uncertain. It may refer to the Ayurvedic practice of administering medicine in oil applied to the skin, in the nose or to an oil massage. There is also a reference to Ānanda massaging the Buddha's limbs when he was old (S V 217). What types of oil were used in massages is not given in the Tipiṭaka but other early sources mention fat (*vasā*), ghee and mustard oil.

Plants and animals provided the ancient Indians with opportunities for recreation and entertainment. The earliest mention of horticulture from India is to be found in the Tipiṭaka,

4. Probably one or another of the chemicals extracted from *ūsara*. See page 5.

although admittedly the details are scant. There are many references to parks, gardens and pleasure gardens (*ārāma*, *upavana* and *uyyāna*).

The Buddha commented that Rājagaha, the capital of Magadha, was adorned with numerous such places; Jīvākārāma, Latthivana, Paribbājak-ārāma, Sītavana, Taporāma, Udumbarika Paribbājakārāma and Veḷuvana (D II 116). Some of these places may have been small surviving patches of wild forest on the outskirts of towns and cities, others were orchards and a few were undoubtedly carefully designed and cultivated gardens. The purpose of these last places was to provide the enjoyment that can be derived from natural beauty; greenery, cool shade, and the colour and fragrance of flowers. It is perhaps significant that the common word *ārāma* means both garden and delight.

Some gardens may have been part of royal palaces or the mansions of the rich but most of these seem to have been beyond city walls. Archaeological investigation has shown that at least two of them, the Jetavana, Jīvakambavana and the Veḷuvana, both offered to the Buddhist order by royals, were within walking distance of a major city, Sāvatti and Rājagaha respectively. The first of these was described by the Buddha as being 'not too near (the city), not too far, convenient for coming and going, quiet, secluded from people, good for sitting without being disturbed and conducive to spiritual practice' (Vin I 39). Such attributes would have been an obvious attraction for meditating monks but they may of also have been valued by the Veḷuvana's original owner, Bimbisāra the king of Magadha. Lay people too may have retreated to gardens to temporarily 'get away from it all' and to reflect in the peace and quiet they offered.

The fact that Buddhist monks and other ascetics are often mentioned as congregating in parks and gardens and that their lay devotees would sometimes visit them there, indicated that some at least were open to the public. Other were reserved for their owners' use only. These private gardens might be surrounded by a wall with a gate, laid out and maintained by gardeners (*ārāmaropa*, S I 33) and protected from intrusion by park wardens (*ārāmapāla*, *ārāmarakkhaṇaka*, Ja I 251, Vin II 109). A royal pleasure garden might have a stone bench, a swing and inevitably a pond or lake with lotuses and water lilies of different colour, steps leading down to

the water at certain places and inlets to enhance its interest (Ja II 189). Later references to pleasure gardens in India mention other enhancements such as artificial mountains, bowers, bridges, pavilions and water machines, i.e. fountains (*jalayantra*). A king would retire to his pleasure garden to be entertained by female musicians and dancers (Ja III 40) and during festivals and holidays he and his court would participate in what the commentary calls 'garden games' (*uyyāna-kīlana*). Unfortunately we have no information about what these games consisted of. In one Jātaka story a man says to a prostitute he is living with: 'My dear, we are always cooped up in the house like a chicken in a cage. Let us amuse ourselves one day in the garden.' She agrees and the two take a carriage to the garden (Ja III 60). Another activity people enjoyed in gardens was feeding animals. The Veḷuvana in Rājagaha had a place for feeding squirrels and another for feeding peafowl (e.g. M I 145: II 1).

A few very brief references suggest that beautiful or interesting trees and shrubs would be laid out in particular patterns to enhance the attractiveness of gardens. One source mentions a line of palm trees and borders or walkways of sand (Ja I 201). The careful design, layout and cultivation of these gardens is further hinted at by the comment that it could take from two to four years for one with good soil (*sārabhūmi*) and proper management to be up to standard (Ja II 188). So much did the ancient Indians enjoy their gardens that they assumed there must be some in heaven. The description of a celestial garden may add something to our knowledge of their earthly equivalents. Near the heavenly palace there were ponds with different coloured lotuses, stocked with fish and bordered on two sides by well-trimmed fruit and flower-bearing trees (Vv-a 190). The gods were believed to delight in watching the flowers as they budded, bloomed and faded, discussing each blossom's colour, perfume and shape, just as humans must have done (A IV 117).

A pastime less edifying than enjoying oneself in a garden was staging and watching animal fights. Large animals such as elephants, buffaloes, bulls, goats and rams were set to fight each other. Cock and quail fighting were also popular. The Buddha disapproved of monks watching such fights, probably because of the cruelty involved and perhaps because gambling took place during them (D I 6). Another pastime involving animals was the

chase. Apart from hunting as a livelihood, to supplement the diet and to provide commodities such as ivory and hides, people hunted for entertainment. Most of the hunting methods used today are mentioned in the Tipiṭaka; trapping, stalking, netting, pursuit with dogs, the use of decoy animals, building hides and tree stands, and attracting prey with lures or by imitating their calls (Dhp 252; Ja I 157; 173; 208). Big game hunting had already reached the form that was to maintain well into the 20th century. Local villagers were recruited or compelled by kings to provide labour for such hunts. They would form a long line, and then beating the undergrowth and blowing horns, drive the animals before them. Eventually they would form a circle and gradually decrease its size so that the animals trapped within could be dispatched by the king and his guests (Ja I 150). We read of a king who threatened to fine any of his beaters who let a deer slip past them (Ja III 325; IV 267).

Some forests were maintained specifically as hunting reserves. The Nigrodhamiga Jātaka briefly describes the setting up of one of these. Within a selected forested area fodder was sown, water was provided and a number of deer were driven in and confined there, although exactly how they were confined is not explained (Ja I 150; IV 431). The *Arthaśāstra* described royal hunting reserves in very similar terms, adding that they were surrounded by a steep ditch so that access was only possible through a single entrance and that they were stocked with game animals and predators that had their claws and teeth removed. When the chase was on 'deer would dash around, trembling for their lives, but after one or two wounds they would faint and be slain' (Ja I 150). The Vidhurapaṇḍita Jātaka includes a long, detailed and realistic list of do's and don'ts for one wanting to survive and prosper in the potentially dangerous world of the royal court. One thing it warns against is hunting deer in the king's forest (Ja VI 294). Buddhist authors pointed out that hunters did not always make a 'clean kill'; a good number of their quarry 'escaped wounded into the bushes and thickets of the forest, into clumps of grass, reeds and brambles, and died, and were devoured by ravens and vultures' (Mvu I 359). One aspect of hunting which Buddhists particularly deplored was using one animal to hunt others or using an animal as a decoy to catch others. Doing such things was a sure road to an unpleasant rebirth (Ja V 270; 375).

The most popular game animal was the deer of which several species are mentioned in the Tipiṭaka as being hunted. Venison was considered a tasty, literally a sweet, meat (Ja I 155). We have a description of a deer hunter returning to the city with a cart full of venison with the intention of selling it (Ja III 49). There are numerous references to hunting deer by villagers wanting to supplement their diets or protect their crops, by professional deer stalkers (*migaluddaka*) and by kings for sport and for the royal table (Ja I .137; II 153; III 49; IV 431; VI 170). Villages dug pits and set traps to catch deer and hunters built tree stands. Kings and nobles preferred bows and spears and sometimes trained thoroughbred dogs (Ja I 173; IV 437). Because of their timidity and alertness and because they were as 'swift as the wind' or as 'fast as wind-scattered clouds' (Ja III 325; IV 268), it was no easy thing to bag a deer.

Of the austerities practised by the various ascetic sects during the Buddha's time some consisted, in part at least, of imitating animal behaviour. The *Buddhacarita* says of some ascetics that they 'eat gleanings like birds, others graze grass like deer, yet others spend their time with snakes and some stand like anthills blown by forest winds ... others plunge into the water and live with the fish, their bodies nibbled by turtles' (Bc VII.15–17). Some ascetics walked on all fours (*cātukunḍika*), a practice the Buddha did for some time before his enlightenment (M I 79). Some went naked and acted like cows, others imitated dogs, eating only what was thrown on the ground and curling up in a canine manner to sleep (M I 387). The rationale behind such practices is not given in the texts. The Buddha disparaged all austerities, particularly ones that involved imitating animal behaviour. He said that to act like an animal would cause one to be reborn as an animal (M I 387–88). Some ascetics acted like birds by eating only seeds they picked from wild grasses or gleaned from fields after the harvest. The Buddha allowed his monks to glean (*uñcha*), not as an austerity but as a way getting sustenance when food was scarce (A III 66; 104; Thī 329).

As in other religious traditions, the first Buddhists had stories about humans and animals interacting to the degree of being able to understand and respond to each others' wishes, or even to talk to each other. It is not difficult to imagine how such stories could have begun. Animals would soon get used to any

monks or nuns who shared their forest and no longer flee from them and perhaps even become tame, especially if they were fed. An outsider visiting a hermitage and seeing normally timid animals in the vicinity might well conclude that the hermit and the animals had some sort of relationship. The Jātakas contain numerous stories in which humans interact in a variety of ways with animals.

A good example of such stories would be the Amba Jātaka (Ja I 450). Once, the Bodhisatta was born as a Brahmin in the North who, after he grew up, renounced the world and became leader of 500 ascetics living at the foot of the mountains. It happened that a terrible drought occurred in the Himalayan country so that all the water dried up and the animals suffered terribly. Seeing this and moved by compassion, one ascetic cut down a tree, hollowed it into a trough and filled it with any water he could find. The animals came in droves to drink and the ascetic had to spend all his time finding water to keep the trough filled. Heedless of his own needs he toiled for the benefit of the forest creatures to the degree that he had no time to gather his own food. Seeing this the animals agreed amongst themselves provide food for the ascetic. When they came to drink they brought mangos, *jambus*, breadfruit and other fruit until it equalled 250 wagon loads, enough for all the ascetics with some left over.

The four Nikāyas and the Vinaya also included several such stories. Once Venerable Moggallāna offered to get Venerable Sāriputta the medicine he needed for a fever he was suffering from—lotus stalks. He went to a great lotus lake, an elephant saw him there and asked how he could help him. Moggallāna told the elephant what he needed and the creature instructed another elephant to get it for him. This second elephant uprooted a trunk-full of lotus stalks, washed the mud off them, tied them into a bundle and then gave them to Moggallāna (Vin I 214–15). Another story of animal helping humans is told in the Udāna. The Buddha left Kosambi in disgust at the quarrelsome monks there and went to a nearby forest at Pārileyya where he spent a few days staying at the foot of a sal tree. The elephant who lived in the forest cropped the grass around the Buddha and brought him water in its trunk (Ud 42; Vin I 352–53). The Dhammapada Commentary adds that a monkey also provided him honey comb to eat (Dhp-a I 59). This

story ends by saying that great sages like the Buddha and noble animals such as bull-elephants both seek silence and solitude.

Once a certain monk told the Buddha that he was staying in a grove near a large area of low-lying swampy ground (*ninnaṃ pallalaṃ*) where flocks of birds foraged. In the evening the birds would roost in the monk's grove and disturb him, probably with their noise and their droppings. The Buddha advised the monk to go to the birds three or four times a night and ask them for a feather. They would, he said, soon get sick of these continual requests and go somewhere else. The monk did this and the birds eventually went away, just as the Buddha had predicted. The Buddha used this incident to warn his monks to be circumspect about asking lay people for things (Vin III 147–48).

Stories based on the belief that animals can respond to human kindness and love are very common in the Buddhist tradition. The earliest of such stories concerns the Buddha and the tamed but unruly and dangerous elephant Nālāgiri. Once, in an attempt to kill the Buddha, his evil cousin Devadatta arranged for Nālāgiri to be released onto the road the Buddha was walking down. Trumpeting and with tail erect, the elephant charged the Buddha who, on seeing the furious creature coming, suffused it with loving-kindness. The elephant was suddenly transformed from fury into docility. It approached the Buddha, took dust from his feet and sprinkled it on his own head, while the Buddha spoke to it gently and stroked it (Vin II 195). In popular imagination saintly monks and nuns might even be able to influence the behaviour natural prey and predators have towards each other. One Jātaka story relates how a kindly ascetic taught a snake and a mongoose to overcome their instinctive fear of each other (Ja II 53). This story might have been the basis for a similar one the Chinese pilgrim Faxian heard when he was in Sri Lanka. A particular revered monk had developed loving-kindness to such a level that the snake and rat who shared his cave lived in complete harmony with each other.

The theme of animal devotion to their human owners or to those they had become fond of, and then dying of a broken heart (*hadayena phalitena*) when parted from them, occurs several times in the ancient commentaries. According to the *Nidānakathā*, when Prince Siddhattha renounced his princely life to become a

wandering ascetic his horse Kanthaka pined away and died (Ja I 65). The elephant who had looked after the Buddha when he was on retreat in the Pārileyya forest was likewise said to have died when the Buddha left to return to the city (Dhp-a I 63). Another story tells of a dog who pined away when the saint it has become fond of decided to reside somewhere else (Dhp-a I 173).

The forests of the Ganges and Yamuna plain were the environmental mainstay of the numerous religious sects that were proliferating between the 6th and 3rd centuries BCE. The Buddha, and not only he, believed that the solitude and simple living which forest wilderness offered, were essential for meditation. Non-Buddhists ascetics are typically described as living in the forest, either alone or in small communities. Some of the more extreme of these rejected almost all the conveniences of civilization and subsisted entirely on what the wilderness provided. One such ascetic is described thus:

‘Becoming a forest-dweller he never stayed in a village. He did not make a leaf hut for himself but lodged at the foot of a *vārunika* tree, in the open air, usually sitting, sometimes lying down. Eating only once a day and at one sitting, his teeth having become little pestles, he ate uncooked food with the husk still on it ... He did not go in search for wild fruit. Rather, when there were flowers on his tree he ate them, when there were leaves he ate them, and when there were no leaves he ate the shoots. In the morning he would pick up the fallen fruit, but never out of greed did he get up to eat the fruit of other trees. As he sat there he would gather the fruit that was within arms’ reach, making no distinction between the pleasant and unpleasant’ (Ja IV 8).

Practices such as these were called ‘the howling austerities’ (*ghorataṭṭa*) or ‘extreme austerities’ (*paramataṭṭa*).

Time and again the Buddha encouraged his monks and nuns to spend as much time as they could away from human habitation and in the jungle: ‘Here are the roots of the trees, here are empty houses. Meditate, monks! Do not be slothful so that you reproach yourself later. This is my instruction to you’ (A III 87). He mentioned that some of his disciples would spend the whole year except the three months of the monsoon ‘at the roots of trees and in

the open air' (M II 8). More commonly they would 'go to remote forest lodgings and having plunged into the forest, and only join the monastic community every half month to recite the rules' (M II 87). However, Buddhist monks and nuns could never go too far into the wilderness. Ascetics of other sects were allowed to pluck wild fruit and dig up edible roots, while Buddhist monks were not allowed by their rule to do either. As a result, they always had to be near habitation in order to get their food.

But even living in the forest within walking distance of a settlement or village could be a challenge. One had to conquer the fear of predatory animals and the constant irritation of insects. The monk Ghavaratiriya counselled a heroic stoicism towards this second problem: 'Annoyed by flies and mosquitoes in the forest, in the great jungle, be like an elephant in the thick of the battle and endure mindfully' (Th 31). For some monks at least, the long periods of solitude were even more difficult to put up with. Concerning this, the Buddha commented: 'Remote jungle lodgings in the forest are hard to endure. It is difficult to live in solitude, it is not easy to enjoy solitude. One might think that the forest must disturb a monk's mind, if he has no concentration' (M I 17).

There were others who positively exalted in living in nature and away from their fellow humans. The monk Bhaddiya used to reside in the forest and every now and then let out the cry 'Oh joy! Oh joy!' The other monks found his behaviour rather peculiar and told the Buddha of it. The Buddha called Bhaddiya to him and asked why he was letting out this cry. Bhaddiya answered: 'Formerly, when I enjoyed the happiness of royalty, guards were set inside the palace and outside in the area beyond. Yet, although I was well-guarded, I lived in fear. I was anxious, trembling and afraid. But now that I live in the forest, all alone, I am assured, confident and fearless. That is why I utter the cry "Oh joy! Oh joy!"' (Ud 19).

Contemplating the future of the Saṅgha and suspecting that the desire for the forest life would be likely to fade, Venerable Phussa said that coming generations of monks would probably find 'the jungle wilds uncomfortable and go and live in the villages' (Th 962). During the Buddha's last years he too predicted that the Saṅgha would probably degenerate. One sure sign of this, he thought, would be that monks would no longer spend time in the

forest (A IV 21–2). The beginning of this trend is already present in the Vinaya. With the Saṅgha becoming more legalistic, a precise definition of ‘the forest’ was necessary. Technically, a monk’s abode could be designated ‘a jungle lodging’ if it was 500 bows (*dhanu*) from the border of a village (Vin IV.183). By the time of the *Visuddhimagga* (5th century CE) a monk qualified to be ‘a forest dweller’ if he lived the distance a stone thrown by man of average height standing at the precincts of a village landed (Vism 71–2).

The Tipiṭaka indicates that the attraction Buddhists monks and nuns had towards the natural environment sometimes went beyond the needs of their spiritual practice. Some of them were moved by the sheer beauty of the groves and hills, the flowers and the jungle pools, the rustle of the leaves and the songs of the birds. When someone told the Buddha that he found the forests frightening, he replied: ‘At the midday hour when the birds are quiet, I find the rustle of the great forest delightful’ (S I 7). He specifically mentioned that he decided to settle down to do his meditation at Uruvelā, in part because of the bucolic surroundings: ‘Then, being a seeker for the good, searching for the incomparable, matchless path of peace, while walking on tour through Magadha, I arrived at Uruvelā, the army township. There I saw a beautiful stretch of ground, a lovely woodland grove, a clear flowing river with a delightful bank and a village nearby for support. And I thought “Indeed, this is a good place for a young man set on striving”. So I sat down there, thinking “Indeed, this is a good place for striving”.’ (M I 166–67). The monk Bhūta claimed that the sylvan surroundings he meditated in filled him with the highest joy. ‘When the storm clouds rumble and pour down their torrents and the birds take to the sky, the monk who has gone to his grotto to meditate finds no greater delight than this. When happily meditating on the flowery river bank surrounded by the many and varied plants, he finds no greater delight than this. When night comes to the lonely grove with a shower of rain and the roar of the fanged beasts, the monk who has gone to his grotto to meditate finds no greater delight than this’ (Th 522–24). It was even suggested that the beauty of the landscape could be enhanced by the enlightened ascetics who chose to make it their abode: ‘Whether in village or forest, on hills or plain, wherever saints live, that is a delightful place’ (Dhp 98).

One of the most charming descriptions of the natural environment and its inhabitants in all of Indian literature is to be found in the eighth chapter of Bāṇabhaṭṭa's *Harṣacarita*, a 7th century biography of King Harṣa. Fanciful and romanticized though it be, it invites the reader to imagine humans and animals living in complete harmony with each other through the benign influence of the Buddha's Dhamma. Bāṇabhaṭṭa describes a beautiful woodland scene and then the sight that unfolded before King Harṣa as he approached the hermitage of the monk Divākaramitra nestled in the Vindhyan Hills. Ascetics of different sects, usually so quarrelsome, sat on rocks, in bowers of flowering creepers, amongst the bushes and at the foot of trees, quietly discussing points of philosophy:

Here some monkeys who had taken the Three Refuges were gravely bowing to the shrine, there some parakeets skilled in the Buddhist texts were explaining the *Abhidharmakośa*, and elsewhere a group of mynas whose practice of the Vinaya had imparted to them great composure, were giving a sermon on the Dharma. Some owls having gained wisdom by attentive study recited various Jātaka stories. Several tigers who had given up meat-eating under the calming influence of the Buddha's teachings quietly waited in attendance. Two lion cubs sat undisturbed near Divākaramitra, forming as it were, a natural 'lion throne' for him and emphasizing his spiritual greatness. Several deer seemed to imbibe his calmness as they licked his feet and he radiated loving-kindness while a dove sat in his left hand pecking grains of wild rice and looking like lotus buds that had dropped there from his ear. With his other hand Divākaramitra flicked refreshing water on a peacock, its neck like an emerald vase, and sprinkled panic seed or rice for the ants to eat, as the rays of light emanating from his body dazzled those assembled before him.

The beauty of the natural world was a recurring and popular theme in the literary arts. The 'Long Description of the Forest' from the Vessantara Jātaka names about a hundred plants and nearly as many animals (Ja VI 534–39). When recited by a bard, this long passage must have created a vivid picture of the beauties of the forest and its inhabitants in the minds of the audience. Several other

shorter eulogies to nature are found in the Jātaka and the Theragāthā (e.g. Ja VI 529–30; Th 1062–70; 1135–37). The Buddha too would sometimes conjure up a charming if idealized vision of the natural environment: ‘Imagine that a man tormented and overcome with heat, wearied, craving and thirsty, were to come across a pool of clear, sweet water, a lovely resting place shaded by all kinds of trees. He would plunge into that pool, bathe and drink and coming out would sit and then recline in the shade of the trees’ (A III 190).

Poets used imagery from nature in their compositions, sometimes to the most pleasing effect. Trees were described as ‘swaying in the breeze like young men full of their first drink’ (Ja VI 534) or as being ‘studded with flowers of many hues like the night sky studded with stars’ (Ja VI 529). In a eulogy to detachment and solitude, the Khaggavisāṇa Sutta says:

Be like the lion not frightened by noise.
Be like the wind not caught in the web.
Be like the lotus not stained by the mud.
Be alone like the rhinoceros’ horn. (Sn 71)

Pañcasikhā’s unusual but lovely poem about ‘the Buddha, the Dhamma, saints and love’ uses imagery from nature:

The elephant, oppressed by summer heat,
Seeks out a lotus pool upon which float
Petals and pollen of that flower,
So do I plunge into your sweet breast.
As an elephant urged on by the goad,
Ignores the sting of lance and spear,
So I, unheeding, know not what I do,
Intoxicated by your beauteous form.
By you my heart is tightly bound,
My thoughts disrupted, my mind and I
Can no longer find my former course:
Like a fish caught on baited hook. (D II 266)

The Jātaka includes these verses, amongst the most beautiful in Pali literature.

I revere the lions and tigers,
Those princely jungle creatures,

And the healing herbs and vines
That grow in forest glades.
I revere the night sky,
As blue as the lotus
And garlanded with stars,
And the River Ganges
Whose waters spread and flow.
I revere too those rocky
And regal mountains
The mighty Himalayas. (Ja V 92–3)

Erotic dalliance in the sylvan flower-filled forest was a common and favourite literally trope in Indian literature. An early example of this is found in the Tipiṭaka. When the Buddha was travelling from Benares to Uruvelā he turned off the road to rest in a certain forest grove. After some time he was approached by a group of 30 young men wandering about in search of something. They had come to spend the day in the forest with their wives and because one of them was unmarried the others had paid a prostitute to accompany him. While they ‘were enjoying’ themselves the prostitute had run off with their valuables (Vin I 23).

Plants and even more so animals were the subject of numerous superstitions and folk beliefs. Some people were believed to be able to make trees bear fruit out of season and to understand the cries of animals with the help of magic charms (Ja II 105; IV 200). It was thought to be good luck first thing in the morning to see a white bull, a pregnant woman, a *rohita* fish, a pot full to the brim or newly-made ghee, or to touch grass, fresh cow dung, a clean robe or a *rohita* fish (Ja IV 72–3). Likewise people believed that it was possible to foretell the future by examining the holes gnawed in cloth by rats or mice (D I 9).

The existence of various fantastic creatures was also taken for granted. The *kinnara* was believed to be a creature with a bird’s body and a human head and the *garuḷa* was a giant eagle-like raptor. More menacing beings that were believed to lurk in dark and lonely places were *yakkhas*, *nāgas*, *dakarakkhasas*, *rakkhasas*, and *pisācas*.

The Buddha envisaged a time in the future when all India would be ruled by a king whose justice and wisdom would usher in an ideal society. This king would, he believed, not only act for the

welfare of his human subjects but for domestic and the wild animals as well (A III 149; D III 61). It seems very likely that King Asoka, the third emperor of the Mauryan Dynasty, saw himself as just such a 'universal monarch'. Apart from his many other innovations and reforms, Asoka 'made provision for two types of medical treatment; medical treatment for humans and medical treatment for animals. Wherever medical herbs suitable for humans or animals are not available I have had them imported and grown. Wherever medical roots or fruits are not available, I have had them imported and grown. Along roads I have had wells dug and trees planted for the benefit of humans and animals'. In 257 BCE Asoka publicly announced that the royal household was going to gradually become vegetarian. 'Formerly, in the kitchen ... hundreds of thousands of animals were killed every day to make curry. But now, with the writing of this Dhamma edict, only three creatures, two peacocks and a deer, are killed and the deer not always. And in time, not even these three creatures will be killed.' Nine years later he had published a list of animals that were to be protected from then on and designated certain days as non-killing days. 'On the three Caturmāsis, the three days of Tisa and during the fourteenth and fifteenth of the Uposatha, fish are protected and not to be sold. During these days animals are not to be killed in the elephant reserves or the fish reserves either. On the eighth of every fortnight, on the fourteenth and fifteenth, on Tisa, Punarvasu, the three Caturmāsis and other auspicious days, bulls are not to be castrated, billy goats, rams, boars and other animals that are usually castrated are not to be. On Tisa, Punarvasu, Caturmāsis and the fortnight of Caturmāsis, horses and bullocks are not to be branded.'

Much has changed in northern India since the time of the Buddha. Except for remnants on the northern fringes of the Ganges and Yamuna plain the great stretches of forest have gone forever and with them numerous species of plants and animals. Many others are critically endangered and the pressure on them increases year by year. Whatever happens in the future, the Pali Tipiṭaka will remain an important record of India's natural heritage and a valuable resource for environmental historians and others interested in India's past.

FLORA AND FAUNA IN THE PALI TĪPIṬAKA

There is no living being or thing that is not called by a name. The trees of the forest and the mountains are the business of the country folk. For they, on being asked 'What tree is this?' say the name they know, such as *khadira* or *palāsa*. Even when they do not know the name of a tree they will say 'That is a no-name tree.' And further, that will be accepted as the name for that tree. And it is the same for fish and tortoises in the ocean, and so on.

Atthasālinī 392

A

Akka. Swallow Wort or Giant Milkweed, *Calotropis gigantea* (Vin I 306). A small stout shrub with a beautiful purple or sometimes white flower. The juice of the leaves have medical properties, floss from the seeds is used as stuffing and in ancient times fibre from the stem was used to make bowstrings (M I 429).

Agaru, sometimes *agalu* or *akalu*. agarwood, *Aquilaria malaccensis* (Ja VI 144; 510; 530). This slender straight tree has bright green leaves, snow-white flowers and can grow up to 20 metres high. The resinous heartwood, also called *agaru*, is prized for its fragrant smell and the oil extracted from it is widely used in traditional medicine. As with sandalwood, aloes was ground into a paste on a stone and then rubbed on the limbs as a perfume (Ja IV 440; Mil 338). The gods are described as being 'draped in garments of red and gold and fragrant with aloes, **piyaṅgu**¹ and sandalwood' (Vv-a 235).

Agārasappa. Common Wolf Snake, *Lycodon aulicus*. The Pali name means 'house snake'. The colour and markings of this snake are variable but it is usually light to dark-brown with yellow crossbars and it can grow up to 765 millimetres. Of all Indian snakes this is the one most commonly found in human habitation, whether in

rural areas or crowded cities. It hides during the day and comes out at night to hunt geckos, skinks, mice, cockroaches and birds nesting in roofs. Although non-venomous, the wolf snake closely resembles the very dangerous krait and is often mistaken for it. Its discovery in a house usually causes consternation. The Jātaka describes a man carrying an unlucky robe on a stick 'as if he were carrying a house snake' (Ja I 372).

Aṅkola. Sometimes *aṅkolaka*, *Alangium salviifolium*, (Ja VI 535). A small thorny bushy tree with oblong leaves, an ellipsoid black succulent fruit and beautiful white flowers. The flowers were used to make garlands (Ja IV 440). Today, the bark and roots are used as a medicine for jaundice and the fruit is eaten.

Aṅgahetuka. A type of bird (Ja VI 538).

Accha. Sloth Bear, *Melursus ursinus*, also called *ikka* (Ja V 70; 197, VI 538). This medium-sized bear has a shaggy black coat, a white v-shaped mark on its breast and a long white snout. It has a slow lumbering gait but can attack swiftly and without provocation. Sloth bears could attack forest-dwelling monks (A III 100). Monks were allowed to have a bear skin mat for wiping their feet (Vin II 174) and to use bear fat as a medicine (Vin I 200). Sloth bears have black hair and one cannot escape them even by climbing a tree (Ja VI 507). One Jātaka story describes villagers finding a bear near their village and attacking it with arrows, sticks and staffs to drive it away (Ja IV 327).

Acchiva. A type of tree (Ja VI 535).

Aja. Domestic Goat, *Capra hircus*, also *ajaka* and *ajiya* (It 36; Ja II 278; V 241; M I 344; III 167). Goats are medium-sized mammals related to sheep with backward-sloping horns and short tails. They were kept for their milk, meat and wool. We read of goats being slaughtered at sacrifices, of long-haired goat getting caught in thorn bushes (S II 228) and of a man keeping goats, living on the milk and making smoke to protect them from mosquitoes (Ja III 401). There is an unusual Jātaka story in which an abandoned child is suckled by a goat (Ja V 429).

Ajagara. Indian Python, *Python molurus* (Ja III 484), sometimes *ajakara*. This powerful constrictor is marked with distinctive irregular brown saddles over yellow or grey and can grow up to 5

metres in length. The Pali name means ‘goat-eater’ and indeed the Indian Python can grow big enough to kill and swallow goats, calves or small deer. The comment was made that ‘pythons are not poisonous but they are very strong. Any man or animal who comes near they wrap their coils around and crush’ (Ja VI 507).

Ajamoda. Ajowan Caraway, *Trachyspermum ammi*. It is an erect branched annual herb with grooved stems and small white flowers. The small fruits, often incorrectly called a seeds, are small, pale brown, oval-shaped schizocarps widely used in cooking because of their aromatic smell and pungent taste. They are also eaten raw and taken as a medicine. In the Vimānavatthu commentary *ajamoda* is said to be one of the pungent spices along with asafoetida, cumin and garlic (Vv-a 186).

Ajjaka. Hoary Basil, *Ocimum americanum* (Vin IV 35) also *ajjuka*. A slender erect, aromatic herb with a four-angled stem and elliptic leaves covered with fine hairs.

Ajjukaṇṇa. A type of tree (Ja VI 535).

Ajjuna. *Terminalia arjuna*, sometimes also *kakudha*. A large tree sometimes attaining a girth of 3.6 metres and a height of 30 metres and commonly found growing on the banks of rivers (Ja VI 518). It has pale greenish or grey bark, long inclined branches and white flowers. The bark is sometimes boiled in water to make a tonic. After washing his robe, the Buddha climbed out of the Nerañjarā River by grasping a branch of a *kakudha* tree (Vin I 28). The *Mahāvastu* gives the name as *kakubha* and describes the tree as being beautiful and having wide-spreading branches (Mvu III 302). The past Buddha Anomadassī attained enlightenment under an *ajjuna* tree (Bv VIII.23).

Ajjhohāra. A large and probably fantastic marine creature (Ja V 462). See **Timi**.

Añjanarukkha. A type of tree (Ja I 331). The name means ‘black tree’ or ‘collyrium tree’.

Aṭṭhikadali. A type of banana tree (Ja V 406). See **Kadali**.

Atimuttaka. Uncertain, but perhaps *Hiptage benghalensis*. A large woody shrub with showy white flowers (Ja IV 28; 440). According to the Jātaka it is a type of vine or creeper (Ja V 422). Together with lotus and jasmine the flowers were used to make garlands (M I 32).

Ativisa. Monk's Hood or Friar's Hood, *Aconitum palmatum*, *A. ferox*, and or *A. spitacum* (Vin I 201; IV 35). These hardy perennial plants grow in the Himalayas between an elevation of 3000 and 5000 metres. They have dark-green glossy leaves, a fleshy spindle-shaped root and purple helmet-shaped flowers that grow in erect clusters. The leaves, stem, flowering tops and particularly the root are poisonous and all have numerous medical uses. In ancient times arrow heads were coated with the poison.

Adda. See **Siṅgivera**.

Adhipāta. See **Kīṭa**.

Anojā. A type of plant with red flowers (Ja I 9; VI 536).

Andhaka. See **Kīṭa**.

Aparaṇṇa. A general term for raw cereals (Vin III 50). See **Dhañña**.

Apphoṭā. A type of creeper (Ja VI 336).

Amarā. Eel, a scaleless, snake-like fish of the order *Synbranchiformes*, of which there are nine species in northern India. The most common and widespread eel in northern India is the Mud Eel, *Monopterus albus*. Growing up to 60 cm in length and weighing as much as 1 kg, the mud eel is greenish or chestnut brown with black spots and has an elliptical head, small fins and a flat stumpy tail. The mud eel is found in rivers, swamps and paddy fields situated near rivers. The Buddha referred to teachers who equivocated when asked a question as 'eel-wrigglers' (D I 24; M I 521).

Amba. Mango, *Mangifera indica*. A large evergreen tree of which there are about 700 varieties in India and which is cultivated mainly for its delicious fruit. The fruit can be nearly round but are more commonly elongated and turned up slightly at the end and are yellow colour when ripe or 'the colour of fine gold' (Ja II 104). The fruit was eaten with relish and it was also made into a drink (Vin I 246) and when mixed with sugar was taken as a medicine (Ja II 393). Mango peel was put in curries (Vin II 109). The colour of monks' and nuns' robes were compared to that of the mango (Th 197). Groves of mango trees were, and indeed still are, found outside many villages in India. People planted such groves to provide fruit and to picnic in during the spring, and wandering

ascetics often used to reside in them. The monk Meghiya described one such grove thus: ‘Truly lovely and delightful is this mango grove; a good place for one wanting to meditate’ (Ud 34). Several mango groves are mentioned in the Tipiṭaka; Pāvārika’s Mango Grove at Nālandā, Cunda’s Mango Grove at Pāvā, the Grove of Wild Mangoes at Macchikāsaṇḍa and Jīvaka’s Mango Grove which was outside the east gate of Rājagaha (A V 263; D I 47; S IV 281).

One who wants mangoes will knock them out of the tree by throwing a mango at them (Mil 189). The famous trick where a mango seed is made to apparently sprout, grow leaves, flower and then bear fruit, all within a few minutes, was already being performed by conjurers during the Buddha’s time (Ja IV 324). See also **Kosamba**.

Ambakamaddarī. Eurasian Golden Oriole, *Oriolus oriolus*. A thrush-sized bird, golden yellow with black wings and tail and a black streak through the eye. The bird’s Pali name is probably due to both its ripe mango colour and the fact that it arrives in northern India in spring just as the mangoes ripen, although in some areas it is resident. The Eurasian golden oriole is arboreal and feeds on fruits, berries and nectar. The Buddha mentioned that its harsh screeching call is not as impressive as that of the domestic fowl (A I 188).

Ambāṭaka. Hog Plum, *Spondias pinnata* (Th 466). A common medium to large tree with smooth white bark and small white flowers. The yellow ellipsoid plum-sized fruit is unpleasantly astringent but becomes edible just as it ripens. The leaves have a distinct mango-like smell.

Ambuja. See **Maccha**.

Ambusevāla. A type of moss or aquatic plant (Th 113).

Araññabiḷāla. See **Biḷāla**.

Ariṭṭha. The Soap Nut Tree, *Sapindus mukorossi*, a large deciduous tree which bears small white flowers. Its fruit is called *ariṭṭhaka*. When ripe it is ovoid and covered with a soft rusty-coloured flesh which contains saponins, a type of natural detergent. When rubbed with water it produces a rich lather which is used as a substitute for soap. *Ariṭṭha* was also the name given to a type of alcoholic drink used as a medicine although it is not clear if this was made from the soap nut tree (Vin IV 110).

Alagadda. See **Sappa**.

Alattaka. A red substance women used to dye their feet with (M II 64; Th 771). This may have been an alternative name for lac (Ja IV 114). See **Lākhā**.

Alābu. Bottle Gourd, *Lagenaria siceraria*, also *alāpu*, *lāpu*, *lābu*. An annual climber with a large white flower and a fruit that can take various shapes, sometimes dumb-bell-shaped or round with an elongated top (M I 80). The fruit contains an edible thick, white pulp and when dried its shell becomes hard and is commonly used as a container. There is mention of honey being kept in such a container (Ja VI 528). The shell of the fruit is very hard and is used as containers and for the body of musical instruments (Ja I 158; V 37). When the Buddha commented that human bones resembled bottle gourds laying scattered in the autumn he was probably referring to the fruit's resemblance to a skull (Dhp 149). The monk *Soṇṇakontarika* washed the Buddha's feet with water he had collected in a bottle gourd (Ap II 389). The Buddha said that he sometimes wore robes made out of cloth 'as soft as the down on a bottle gourd leaf' (M II 7). The *Jātaka* mentions a man clearing a patch of ground and cultivating bottle gourds and other vegetables (Ja I 312).

Avāka. *Blyxa aubertii*. A short, tufted aquatic plant often found growing in paddy fields (Ja III 522).

Asana. *Terminalia elliptica* (Ja VI 535). A very common large tree with its bark cracked into oblong segments and with elliptic or sometimes oblong leaves.

Asoka. Ashoka Tree, *Saraca asoca* (Ja V 188). One of India's most beautiful trees, the Asoka is a small erect evergreen producing bunches of fragrant orange or orange-yellow flowers which gradually turn red. The pulp of the fruit is used as a cure for dysentery.

Assa. Horse, *Equus caballus*, also called *haya*. The horse is a large herbivorous mammal adapted for running and which has been domesticated for at least 5000 years. A thoroughbred was called *assājāniya* (A I 77; M I 124), a nag *assakhalunka* (A I 287), a mare *vaḷavā* (M II 153) and a foal *assapotaka* (Ja II 288). The finest horses were imported into northern India from Sindh (Dhp 322) and were

called *bhojjha* (Ja I 180) or *sindhava* (Ja I 175; II 96; III 287). The Kathiawari, India's indigenous horse, was probably derived from the cross-breeding of Sindh and Arab horses in the 12th century. Horses were too expensive to be used for ordinary transport and were reserved mainly for royalty, to pull chariots and for cavalry during war. Chariots and cavalry were two of the four branches of the army. How many horses were used to pull chariots is not mentioned in the Tipiṭaka, but the half dozed or so chariots depicted on the gateways of the Sānchi stupa (circa 150 BCE) are drawn by two horses, except for one on the front of the northern gateway which is a four-horse chariot. The importance of horses in ancient India is suggested by the space given to their care, maintenance and training in the *Arthaśāstra*.

A horse fit for a king was expected to have eight qualities: to have a good stud line; when given food whether green or dried it should eat it carefully and not scatter it about; it will not lay in its own dung; it should not fight with the other horses; it should show itself as it is to its trainer; it is able to carry even heavy loads; when galloping it does not swerve from one side to the other; and it should pull the carriage properly (A IV 188).

Horses were trained using gentle means, harsh means and a combination of both (A II 112). The *Aśvaśāstra*, an ancient treatise on horses, also advises that a combination of gentleness, rewards and punishment is the best way of training horses. Training took place in special grounds, and the horses were penned either in stables or in circular corrals and fed steamed rice (Vin III 6). We read of the best three-year-old rice fed to a king's Sindh horse (Ja I 178). A good horse would respond even to the shadow of the whip (A II 14) and a thoroughbred was expected to be endowed with beauty, stamina, speed (A I 244) and be finely proportioned (A I 288). A highly-strung horse would not move when urged on, upset the carriage, kick up its hind legs and break the shafts of the carriage, rear up in the air and pull at the bit (A IV 190–94).

Ropes and cords were made out of horsehair (A IV 129; S II 238) as were sieves (M I 229), brushes (A I 208) and bird snares (Ja V 362), and couches were stuffed with it (Vin II 170). Being able to judge a good horse was a respected skill and horsemanship was an art taught to princes (A III 152; 326). The Vedic horse sacrifice (*assamedha*) was still being performed by kings (A II 42; S I 76) and

fight between stallions were arranged for entertainment (D I 7). Horses' tails were sometimes plaited (D I 105). The Tipiṭaka mentions the castration of animals and the men who preformed this job, although there is no specific mention of this being done to stallions (Ja IV 364; M I 383). The Buddha urged his disciples to imitate the well-trained good horse: 'Like a well-bred horse touched by the whip, be eager and swift' (Dhp 144). King Asoka's 5th Pillar Edict mentions that branding horses and cattle was banned on certain full-moon days. According to the Jātaka, the Bodhisatta was once reborn as a Sindh horse (Ja I 178).

Assakaṇṇa. A type of tree (Ja II 161; VI 528). The name means horse ear. Some ancient sources say that this is an alternative name for the *sāla* which has long sepals enclosing the flowers resembling a horse's ear. However, in many Pali and Sanskrit sources the two names are listed separately, suggesting that they are different.

Assatara. Mule, the hybrid of a horse and a donkey, combining the size of the first and the endurance of the second (A I 229; S II 241). Mules were used as pack animals and to draw carts and chariots (S I 211). The best mules were bred in Kamboja in north-west India (Ja IV 464). The ancient Indians knew that mules were sterile (M II 153). The Buddha once said: 'Well trained mules are excellent as are thoroughbred Sindh horses and noble tusked elephants; but better still is he who has trained himself' (Dhp 322).

Assattha. Bodhi Tree, *Ficus religiosa*. This species of fig has large spreading boughs with leaves ending in a characteristic pointed tip. The *assattha* sometimes grows on other trees and stunts them (S V 96). It can also grow on the walls of buildings causing them great damage. Like other figs, it grows from a tiny seed into a huge tree (S V 96). It was said that a mother's heart beats on seeing her son 'as the tender leaves of the *assattha* tremble in the breeze' (Ja V 328; VI 548).

The *assattha* was considered sacred in India centuries before the Buddha and is represented in seals from Mohenjodaro dating from before 1000 BCE. The Buddha stated that he had attained enlightenment at the foot of an *assattha* tree (D II 4) and the actual one he was sitting under at the time was sometimes called 'The Tree of Knowledge' (*Jñānadruma*, Bc XIII.65). This tree is referred to in the four Nikāyas as 'The Tree of Awakening' (*Bodhirukkha*)

although it is only mentioned twice (D II 4; Ud 1 repeated at Vin I 1) in the earliest part of the Tipiṭaka. Before the Buddha's enlightenment, the area around the Bodhi Tree was covered with silvery sand without a blade of grass growing on it and all the surrounding trees and flowering shrubs were bending as if in homage towards it (Ja IV 233).

According to the *Nidānakathā*, the Buddha spent his second week at Uruvelā (i.e. Bodh Gaya) gazing at the Bodhi Tree out of gratitude for the shelter it had offered him (Ja I 77). The same text adds that as the Buddha sat meditating beneath the Bodhi Tree, *aṅkura* the colour of red coral sprinkled down on him as if they were an offering (Ja I 75). *Aṅkura* usually means a shoot but here it must refer to the glossy crimson sheathing stipules that are cast off as the new leaves of bodhi trees develop.

In the early centuries of Buddhism, the *assattha* tree became a symbol of the Buddha and in the sculptures of both Bharhut and Sānchi he is depicted as such. In the *Mahāvastu*, he is actually given the epithet 'Great Tree' (*Mahādruma*, Mvu II 280). A branch of the Bodhi Tree was brought to Sri Lanka by the nun Saṅghamittā, the daughter of King Asoka, in the 2nd century BCE and is believed to still grow in Anurādhapura. A distant ancestor of the original Bodhi Tree grows behind the Mahābodhi Temple at Bodh Gaya.

Ahicchattaka. Mushrooms, toadstools and fungi of the classes *Hymenomycetes* and *Gasteromycetes*. The Pali name mean 'snake umbrellas' (Ja II 95) as does the Hindi for mushrooms, *sarpchatr*. There are over 50 species of edible mushrooms in India, some of them growing in the north. They were, according to the legend, the first plants to appear after the formation of the earth (D III 87). See **Bhūmipappaṭaka**.

Ā

Ākucca, also *ākuccha*. A type of lizard (Ja VI 538).

Ākhu. See **Mūsika**.

Āṭa. A bird described in the commentaries as *dabbimukha*, 'spoon-mouth' (Ja VI 539). If this is correct it must refer to the Eurasian Spoonbill, *Platalea leucorodia*, a large bird with a long neck and legs, pure white plumage and a distinctive spoon-shaped bill. The

spoonbill is seen either individually or in flocks feeding in marshes, mudflats and estuaries.

Ānandamaccha. A large and probably fantastic marine creature. See **Timi**.

Ābhujī. See **Bhujapatta**.

Āmānda. See **Āmalaka**.

Āmalaka. Indian Gooseberry, *Phyllanthus emblica*, (Ja IV 363; VI 529; Vin I 201; 278; II149), also *āmānda*. A medium-sized tree with greenish-grey bark, yellow flowers and a pale-green sour fruit with a large hard fluted seed. Together with *harītaka* and *vibhītaka* this fruit is one of the *triphala* or 'three fruits', long credited in traditional Indian medicine with powerful curative properties. It contains high concentrations of gallic acid and is rich in vitamin A, C and iron and either fresh or dried is taken for diarrhoea and dyspepsia. It is also used in tonics or eaten dried, pickled or made into a tasty marmalade. Wood chips from the tree are used to clarify muddy water and wood cutters and honey gatherers working in the forest often take the fruit to suppress their thirst.

Āli. See **Maccha**.

Āluka. Sometimes *ālu*. This is used generally to mean a tuber, and may have also been a name for *Dioscorea alata* (Ap 17; Ja IV 371; 373; VI 578), the Purple Yam, a stout climber commonly cultivated for its large edible tuber.

Āsītika. Possibly the Sea Bean, *Entada rheedii* (M I 81). A huge woody climber with cream-coloured flowers and large pods. The central stem of this climber can attain a girth of 1.5 metres and has pronounced flanged segments sometimes with cork-screw-like projections. The Buddha said that when he was practising austerities before his enlightenment he became so thin that his limbs looked like a *āsītika* stem (M I 245).

I

Ikka. See **Acchaka**.

Ikkāsa. See **Jatu**.

Indagopaka. Red Velvet Mite. An arthropod of the family *Trombididae* (Ja IV 258; VI 184; 497; Th 1063) of which several

species live in northern India. The Pali name for these small creatures means 'Indra's herdsman' and was probably related to the fact that they emerge from the ground during the rainy season (Indra was the Brahminical god associated with thunder and storms). These mites have a bright-red rounded body with a velvety appearance and are parasitic on spiders and insects. We read of a monk who made a round hut out of red clay which looked 'beautiful, lovely and pleasing like a little red velvet mite' (Vin III 42). A type of cloth made in Gandhāra and used to upholster chariots was said to be the colour of these mites (Ja VI 500).

Indavāruṇi. Bitter Apple, *Citrullus colocynthis* (Ja IV 8). An attractive grey-coloured creeper covered with small rough hairs and with green and white flowers and climbing by means of simple tendrils. The cucumber-like fruit is bitter, acidic and poisonous if taken in large amounts.

Indavāruṇika. A plant with leaves, flowers or perhaps fruit in some way similar to the *indavāruṇi* (Ja IV 8).

Indasāla. A type of tree (Ja IV 92). According to tradition, a cave in the mountains around Rājagaha where the Buddha used to stay was so named because one of these trees grew at its entrance (D II 263).

Isikā. See **Nalā**.

Isimugga. Unknown (Ap 16; 193). Perhaps a type of bean related to Green Gram. See **Mugga**.

U

Ukkaṇṇaka. See **Vitacchikā**.

Ukkapiṇḍaka. Uncertain. The name means something like 'finding food in a house'. Perhaps it is a general term for commensal animals such as sparrows and pests like rats and mice. Once some monks put food out to dry and it was eaten by these creatures (Vin I 211).

Ukkusa. A type of raptor (Ja IV 291; 397), possibly another name for the *kurara*. It is described as living on the edge of a lake and the king of the birds. The commentary describes it as a black fish eagle and if this is correct the *ukkasa* could be Palla's Fish Eagle (*Haliaeetus leucoryphus*). This large bird has a dirty white head and breast and a dark brown or black wings, back and tail. It is often

seen patrolling lakes and waterways where it feeds on fish but also wading birds. According to the Jātaka, the Bodhisatta was once reborn as one of these birds (Ja IV 392).

Uccāliṅga. A type of arthropod or caterpillar. It is mentioned together with the scorpion, the centipede and the spider, as an example of a multi-legged animal (Ja II 146). It is also said to be one of the things that can cause an erection in males (Ja II 146; Vin III 52; 112). The *Kāma Sūtra* mentions a procedure men used to enlarge their penis. The soft but irritating bristles of a particular caterpillar were rubbed on the organ and the resulting swelling would become permanent. There may be some connection between this caterpillar and the *uccāliṅga*.

Ucchu. Sugar Cane, a tall perennial grass with sharp-edged leaves and a purplish segmented stem from which a sweet juice can be extracted (Vin III 59). Many recent hybrid varieties of sugar cane grow in India today. *Carakasaṃhitā* mentions two types of sugar cane, *Suśrutasaṃhitā* mentions twelve while only one type is specifically named in the Tipiṭaka, *ucchagaṇṭhikā*. (Ja I 339; VI 114). One type grown in northern India since ancient times and was probably known to the Buddha's contemporaries is *Saccharum barberi*.

To make sugar, cane stems were crushed in a mill and the juice reduced by boiling (Ja I 339). We read of the creaking sound made by the sugar mill (Bv II.168). It was said of a particularly oppressive king that he 'crushed the people like sugar cane in a press' (Ja II 240). Three by-products of the juice are mentioned; *phāṇita*, *guḷa* and *sakkharā* (Ja I 50). The first is molasses, the second jaggery and the third crystallized sugar. Molasses was sometimes mixed with water and drunk (Ja III 372; Vin II 177), and when mixed with hot water was taken as a medicine (S I 175). Jaggery was rolled into balls (*guḷapiṇḍa*, Vin IV 112) and crystallized sugar was referred to as granulated or powdered sugar (*sakkharā-cuṇṇa*, Ja IV 17). The *Saddharmasmṛtyupasthāna Sūtra*⁵ describes the whole process thus: '...the sugarcane juice is put in a vessel and boiled

5. *Zhengfanian chu jing*, 正法念經, "Sūtra on the Establishment of Mindfulness of the True Dharma", Taisho edition of the Chinese Tripiṭaka, T17n721,p.17. The Sanskrit name is a reconstruction from the Chinese.

over a fire. During the first stage it is separated from impurities and is called *phāṇita*. At the second boiling, it becomes thicker (or more heavy) and is called *guda*. When boiled the third time it becomes white and is called *sarkarā*.’ During the first stage of the processing flour and ash were added (Vin I 210), the flour probably to thicken it and the ash as a clarificant, something that is still done in village sugar production.

Ambila, meaning tart, sour or piquant, was one of the six tastes according to Indian reckoning. It was also the name given to a type of vinegar. As today, this vinegar was made from fermented sugar cane juice and was no doubt used in cooking and pickling. In the Jātaka ascetics living in the Himalayas are often said to leave for the lowlands in the winter to procure salt and vinegar (*loṇambila*, Ja I 361; II 72; IV 23). Tipplers would sip vinegar, eat dried pungent fish (*pūtimaccha*) or lick salt while drinking strong spirits, much as people today bite into a lemon while drinking vodka or tequila (Ja I 252; 349).

Rice porridge with ghee and sweetened with sugar was a popular food (Ja IV 39), and there was a type of confectionary called sugar cake (*suguḷa*, Ja VI 524). An alcoholic beverage was made from sugar cane juice (Ja IV 161; Vin IV 109). There is a reference to a caravan transporting 500 jars of sugar (Vin I 224). Ripe sugar cane could be struck by a disease called *mañjiṭṭhika* (A IV 279). Sugar cane was usually propagated from a segment of stem but also from seeds (A I 32). See **Mañjiṭṭhikā**.

Uṇṇā. Wool, sometimes *unnā*, the hair of sheep, goats or camels which can be spun into thread and then woven into cloth (D II 188; Vin II 174) or made into felt (Vin I 315). Woollen cloths and blankets were necessary to keep off the cold of the Indian winter. Monks were not allowed to wear certain types of woollen clothes (Vin II 108) nor sandals made out of wool (Vin I 190). Despite being soiled by children and chewed by rodents, a good woollen rug could last for five or six years (Vin III 227). Young women were expected to be good at spinning and weaving wool (A III 37). Knitting was unknown in ancient India.

Udakakāka. Both the Great Cormorant, *Phalacrocorax carbo*, and the Little Cormorant *P. niger*. The Pali name means ‘water crow’ and the two birds are called *pan kowwa* in Hindi which has the same

meaning (Ja II 441). Both these cormorants are black with a small patch of white on the throat. The main difference between them is their size, the first being about as big as a domestic duck and the second about half that size. Also, the great cormorant has a yellow beak while the little cormorant's is black. Both birds are commonly seen singly or in small flocks on lakes where they hunt fish by diving and chasing them underwater. According to the Jātaka, the Bodhisatta was once reborn as a cormorant (Ja II 149).

Udakadeḍḍubha. See **Deḍḍubha**.

Udakapicchillo. See **Paṇṇaka**.

Udakasappa. Checkered Keelback, *Xenochrophis piscator* (Ja II 238; III 275), sometimes also *udakāsīvisa*. A snake with an oval head, slit-like nostrils and five rows of black spots on its yellowish brown-coloured body. It grows up to 175 centimetres long, the tail making up to one fourth of its total length. The checkered keelback is India's most common freshwater snake and frequents lakes, ponds, river banks and paddy fields where it feeds almost exclusively on frogs and fish. It is also an aggressive snake, striking rapidly, with great determination and holding on to its prey tenaciously.

Udakāsīvisa. See **Udakasappa**.

Udumbara. Cluster Fig, *Ficus glomerata*. A large tree with a buttressed trunk, dark-green ovate leaves and which produces reddish mildly sweet figs that grow in clusters on short branches. A spendthrift or a wastrel was called an 'udumbara eater', i.e. one who shakes all the figs out of the tree and then only eats a few (A IV 283). There was a grove of these trees near the Bamboo Grove at Rājagaha where wandering ascetics used to stay and where the Buddha had a discussion with the ascetic Nigrodha (D III 36).

Like several other species of Indian figs, this one was an object of curiosity to the ancient Indians because it appeared to produce fruit without first bearing flowers. The Buddha said that one cannot find an essence in existence any more than one can find a flower in a cluster fig (Sn 5; Vv-a 213). The *Mahāvastu* says: 'It is no easier to win sight of the Buddha, great in glory, empathy, compassion and beneficence, than it is to see a flower in a cluster fig' (Mvu I 270). In fact, the fruit of the cluster fig itself is the flower. The head of the flower turns inward to produce a vase-like fleshy casing inside

which are numerous tiny flowers. The previous Buddha Koṇāgamana was enlightened under a cluster fig tree (D II 4).

The wood of the cluster fig had a special significance in Brahminism and certain ritual objects were made of it. The staff Brahmins carried were made of the wood as was the seat a king sat on during his coronation (Ja IV 450; S I 117).

Udda. Otter, also called *uddārakā*, (Ja III 52; V 416). Of the three species of otter found in northern India the most common is the Smooth-Coated Otter, *Lutrogale perspicillata*. This creature has a long graceful body with short legs and a beautiful smooth, shiny, chocolate-brown coat with a lighter underside. Otters live in rivers and streams and feed on fish, crustaceans, frogs and birds. Slippers were sometimes made out of otter skin (Vin I 186). One of the most famous Jātaka stories concerns two otters who ask a jackal to arbitrate a disagreement between them (Ja III 333).

Uddārakā. See **Udda**.

Uddālaka. Hairy Sterculia, *Sterculia villosa*, sometimes also *uddāla*, (Ja IV 301; V 199; VI 269). A large tree with grey bark, large leaf scars on the branches and with a red or crimson flower. This deciduous tree is usually found growing on the cool side of hills. The crushed root is administered as a cure of dysentery and the bark is believed to have contraceptive properties.

Uddhumāyikā. This Pali name means 'one that swells up' (M I 143) and probably refers to a genus called *Uperodon*, commonly called balloon frogs or globular frogs. A common example of this genus is the Indian Balloon Frog (*Uperodon globulosus*). Grey or dark brown in colour and growing up to 65 mm this frog feeds on termites and ants and needs damp soil, usually near riverbanks or swamps to live. When threatened it blows itself up to almost twice its size and makes a huffing sound as if angry.

Undura. Rat, sometimes *undūra*, (Ja III 123). The rat is a small mammal with an elongated body, a moderately pointed snout, approximately equal-length legs and a long sparsely-haired tail. The two most common species of rat in India today are the House Rat, *Rattus rattus*, and the Brown or Norwegian Rat, *R. norvegicus*. Both rats live in houses and barns but also in fields, jungles and along the banks of waterways. They chewed holes in clothes (Vin I

109) and rugs (Vin III 227) and sometimes overran monasteries (Vin I 209).

Upacikā. Termite. Sometimes called white ants, termites are small soft-bodied insects of the order *Isoptera* that eat wood and live in large colonies (M I 306; Vin I 284; II 113). The Pali name means ‘mound builder’. Snakes and monitor lizards are often described as living in holes in termite mounds, *vammika*. Winged termites, called *makkhikā* or *vammika-makkhika* are virgin queens and drone males that sometimes swarm, particularly after rain (Ja I 480; 488). At such times lizards and other animals gorge themselves on them (Ja I 480–81). Termites move from one place to another only after having built a tunnel in which to conceal themselves (Mil 392). The Buddha said that a diligent layman’s wealth will grow like a termite’s mound (D III 188).

Upayānaka. An aquatic animal, perhaps a type of crab (Ja VI 530).

Uparibhaddaka. A type of tree (Ja VI 269).

Uparopa. A general name for plants meaning ‘that which grows up’ (Ja II 345; IV 359; Vin II 154).

Uppala. Blue Water Lily, *Nymphaea nouchali* (Vv-a 196) sometimes also *indīvara*. The rhizome of this plant grows in the mud of ponds and swamps and its rounded leaves float on the surface. The large flowers have numerous spear-shaped petals spiralling out from the bright yellow stamen and are a beautiful deep blue but sometimes crimson, white or pink. Their perfume was said to last for a week (Ja VI 536) and a starry night sky is compared to their colour (Ja V 92). The eyes of a beautiful woman were compared with a water lily bud (Thī 382). Inhaling the perfume of the water lily was believed to have a curative effect (Vin I 279). Very similar to the blue water lily is the Small White Indian Water Lily, *Nymphaea esculenta*, with its white or sometimes yellow flower (Vv-a 200). Water lilies are often incorrectly called and confused with the lotus. See **Sogandhika**.

Uppāṭaka. Fleas are small rust-coloured wingless insects of the order *Siphonaptera*. They feed on blood and have enlarged muscular hind legs adapted for leaping. Fleas can infest human habitation, hiding in bedding and clothing. In one place we read of a blanket being covered with fleas (S I 170). See **Pāṇaka**.

Ummāpuppha. See **Khoma**.

Ulūka. Brown Fish Owl, *Ketupa zeylonensis* (Ja II 353; V 120; VI 500), also *ulūkasakuṇa*. A large brown bird with a lighter breast covered with vertical black streaks, prominent tufts or 'horns' on its head and large yellow staring eyes. The fish owl favours thick jungle near water and feeds on crabs, fish, frogs, mammals and birds, and like all owls they are silent and stealth creatures (A V 289). According to one Jātaka story an assembly of all the birds once selected the owl to be their king but finally decided against it when the owl's serious and sour expression was pointed out (Ja II 352). Some ascetics made coats out of owl's wings or feathers (A I 241; D I 167), and sandals were made out of their skins (Vin I 186). Owls could be observed sitting on the branch of a tree waiting for prey and giving the appearance that they were 'meditating, contemplating, ruminating, speculating' (M I 334). When owls appear during the day they are mobbed by crows (Ja II 208). See **Kosika**.

Usīra. See **Bīraṇa**.

Uhuṅkāra. Perhaps a generic word for owls or a the name of a particular type of owl (Ja VI 538). See **Kosika**.

Ū

Ūkā. Head Lice, insects of the order *Anoplura*. Head lice are a small flattened blood-sucking insect found in human hair. There are many references in the Tipiṭaka to people asking others to pick the lice or their eggs out of their hair (Ja I 453; II 324; III 393; V 298). One of the reasons Buddhist monks and nuns shaved their heads was probably so they could not get and therefore did not have to kill head lice. One ancient Indian system of measurement took as its basic unit the louse's egg, *likkhā*. Seven eggs equal the length of one louse.

E

Eni. Also *eṇeyyaka* and *eṇimiga* (A I 48; D III 143; 157; Ja V 416; Thī 1135), synonyms for the Blackbuck. One of the 32 special characteristics of a Mahāpurisa is that he has legs like an *eṇi*. See **Miga**.

Eṇeyyaka. See **Miga**.

Eraka. Sometimes *eragu*. A type of coarse grass which could be used for making coverings (Vin I 196; IV 88).

Eraṇḍa. Castor Oil Shrub, *Ricinus communis*, (M II 152), sometimes *elaṇḍa*. A tall perennial with large blue-green leaves and which produces spiky pods containing seeds from which a colourless oil can be extracted. Castor oil is used as a lubricant, in lamps and the oil extracted from the seeds was used as a medicine (Vin III 250). The castor oil tree was considered the lowest of all trees (Ja II 440). According to the Jātaka, the Bodhisatta was sometimes reborn as a god living in a castor oil tree (Ja I 423; II 440).

Elambaraka. A type of creeper or vine, sometimes also *elambāraka*, *elambaka* or *elamphuraka*. The perfume of the flower was said to last for seven days (Ja VI 536).

Elāluka. See **Kakkārika**.

Eḷaka. Domestic Sheep, sometimes *elaḥā*, *elakā* or *elikā* (A I 252; D I 9 Ja I 166; III 480; S II 228), hollow-horned ruminants of the order *Ovis*, of which several species and breeds are found in northern India. Ewes were called *uraṇi* (Ja V 241) and rams *meṇḍa* or *urabbha*.

Sheep were known for their long fleece which was used to make cloth and carpets (S II 228; M I 228). Mutton must have been eaten too because there is mention of sheep butchers (M I 343; S II 256). Bows were sometimes made out of rams' horns (Ja II 88; V 130; VI 68). The Buddha considered sheep to be gentle harmless creatures, like cows (Sn 309). A group of monks who spent the three months of the rainy season without doing any spiritual practice other than maintaining strict silence were rebuked by the Buddha as being like dumb sheep (Vin I 159). In the Jātaka, there is a story of a proud Brahmin who was flattered when a ram lowered its head to him only to find that it butted him rather than paid him reverence. See **Uṇṇa**.

Eḷagalā. Sickle Senna, *Senna tora* (Ja III 222; S III 6). An erect herb growing up to 2 meters high with bright green leaves and small yellow flowers. The long seed pods contain numerous oblong brown seeds. Generally considered a weed it is nonetheless used a fodder for cattle, its leaves and seeds can be eaten and also used as a medicine.

O

Ojā. See **Jatu** and **Rukkha**.

Oṭṭha. Camel, *Camelus dromedarius* (Vin III 51). A sturdy ungainly animal with a long curving neck and a humped back that thrives in dry and arid habitats. Camels were used for transportation and also for their wool, milk, meat and hides and were probably introduced from Persia centuries before the Buddha. The Buddha said that when practising austerities before his enlightenment, the dry and calloused skin on his buttocks came to resemble a camel's hoof (M I 245). Pāṇini mentions bags made out of camel wool and containers made from their leather and intestines.

K

Kakaṇṭaka. Common Garden Lizard, *Calotes versicolor* (Ja I 487), sometimes *kakaṇṭa*. A common medium-sized lizard, brown or grey in colour, with an oval head and a laterally compressed body. Males have large cheek pouches and a row of lance-shaped scales from the nape of the head to the end of the body. The common garden lizard is largely arboreal, favouring bushes and undergrowth and quickly moves to the far side of the branch it is resting on when observed. During the breeding season the male's head and forelegs become bright scarlet and it makes an unusual bobbing movement with its head to attract females and threaten rival males (Ja I 442).

Kakuṭa. A general term for doves, birds of the Order *Columbiformes*, of which there are five species in northern India. The mythological female creatures called *accharā*, Sanskrit *apsarā*, were believed to have legs like doves. After becoming a monk, the Buddha's half-brother Nanda could not stop thinking of his former girlfriend. The Buddha transported him to one of the heaven realms and showed him the *accharā* 'with feet like doves' whose beauty made the girlfriend look, by comparison, 'like a mutilated monkey' (Ud 22).

Kakudha. See **Ajjuna**.

Kakkata. Barking Deer or Muntjac, *Muntiacus muntjak* (Ja VI 538), called *kākar* in Hindi. This small deer has a glossy brown coat, forelimbs longer than the hind limbs and short antlers curved

inwards at the end. The barking deer prefers thick forest and makes a sharp barking call when alarmed. The Pali name is probably an onomatopoeia of this call.

Kakkaṭaka. See **Kulira**.

Kakkārika. Cucumber, *Cucumis sativus* (Vin III 59; Vv-a 142), sometimes *kakkārī*. A creeper producing a long rounded fruit with dark-green skin and succulent light-green flesh and which is usually eaten raw. Other varieties of cucumber were *elāluka* (Ja I 205; V 37; Vv-a 142) and *tipusa* (Ja V 37). The cucumber is probably indigenous to India.

Kakkāru. White Gourd or Winter Melon, *Benincasa hispida* (Ja VI 536), also *kumbhaṇḍa* (Ja I 312; 411; V 37). A large climber with soft hairs all over and which produces oblong rounded fruit which is eaten cooked or crystallized in sugar and eaten as a sweetmeat. Its fruit could be as big as a large clay pot (Ja VI 536).

Kaṅka. A general term for cranes and herons (M I 364), of which there are several dozen species in India. The Mahābhārata mentions *kaṅka* circling overhead with vultures and crows and prowling around the battlefield together with jackals. As neither herons nor cranes are carrion-eaters, the name *kaṅka* must have included the Greater Adjutant Stork, *Leptoptilos dubius*. This large, sad-looking bird has a black back and wings, a dirty-white breast, a naked neck and head and a huge yellow wedge-shaped bill. Hanging from the neck is a long naked red pouch. With its measured gait, the bird is often seen alone or in pairs around garbage dumps in cities and villages or at the edge of lakes, where it eats frogs, fish, large insects and carrion. The feathers of cranes and herons were used to make flights for arrows (Ja V 475; M I 429).

Kaṅgu. Millet. A hardy grass cultivated for its edible seeds. Several varieties of millet grow in and are probably indigenous to northern India, common ones being *Pennisetum glaucum*, Pearl Millet; Pali *sāmāka* (Sn 239); *Echinochloa colona*, Sawa Millet; *Paspalum scrobiculatum*, and *Setaria italica*, Foxtail Millet. Millet is one of the seven kinds of grain sometimes mentioned in the Tipiṭaka (Ja VI 581; Vin IV 264). See **Kudrūsa**, **Piyaṅgu**².

Kacaka. A type of tree (Ja VI 536).

Kaccikāra. Uncertain. The name might be an alternative form of *kaṇṇikāra*. On the other hand it might be *Caesalpinia digyna* (Ja V 420; VI 535), a large many-branched evergreen shrub covered with thorns. It bears beautiful pale-yellow flowers.

Kacchaka. A type of tree which the Buddha names along with the *assattha*, *nigrodha*, *pilakkha*, *udumbara* and the *kapitthana* as having ‘tiny seeds, huge bodies and growing around other trees so that they bend, twist and split’ (S V 96; Vin IV 34). This is probably the Dye Fig, *Ficus tinctoria*, a small tree with grey bark and shiny bright green leaves. Although not actually parasitic, the dye fig is hemiepiphytic, i.e. for part of its life cycle it grows up against other trees, which no doubt prompted the Buddha to think of it as parasitic. The tree’s small rusty brown figs are used to make a red dye widely used to dye fabrics.

Kacchapa. Turtle, sometimes also *kuma* or *kumma*, reptiles of the order *Chelonia*. Turtles live in marine or freshwater habitats while tortoises, sometimes called land turtles, are terrestrial. Four species of marine turtles swim in Indian waters, the most common being the Hawksbill Turtle, *Eretmochelys imbricata*. The Buddha was probably referring to this turtle in his well-known statement about the rarity of being born human and of coming into contact with the Dhamma:

‘Monks, suppose this great earth were covered with water and a man were to throw a yoke in it and blown by the wind it were to drift north, south, east and west. Suppose also that once every hundred years a blind turtle were to surface. What do you think? What are the chances that the blind turtle were to put its head through the yoke?’ ‘It is very unlikely, Lord.’ ‘Monks, it is just as unlikely that one will be reborn as a human, just as unlikely that a Tathāgata should appear in the world, just as unlikely that the Dhamma should be taught to the world.’ (S V 456–57)

Freshwater turtles are mentioned in the Tipiṭaka although it is not possible to identify any of the several species that inhabit the rivers and ponds of northern India. They were described as having four legs, a neck like a pole and a body round like a banyan tree (Ja II 152). Freshwater turtles were eaten and we read of those living in

lakes being speared with harpoons (S II 227). Some of the behaviour of turtles that were observed included floating on the surface of the water but on seeing someone quickly submerging, coming out of the water to bask in the sun and digging burrows in the banks of rivers. If a turtle was on the bank of a river and a predator like a jackal approached, it would withdraw into its shell and remain still (S IV 177–78; Mil 370–72). They were believed to be able to tell when there was going to be a drought (Ja II 80) and at such times would burrow into the mud trying to keep wet (Ja I 331). A thing or event that was impossible was referred to as ‘a turtle’s hair’ (Ja III 477). The Buddha said the meditative monk should in some ways imitate the turtle: ‘Just as the turtle withdraws its limbs into its shell, a monk should withdraw his mind and thoughts’ (S I 7). See **Cittacūlā Kacchapa** and **Gajakumbha**.

Kaṭukaroḥiṇī. *Picrorhiza*, *Picrorhiza kurroa*. This small herb has elongated leaves with serrated edges and small purple flowers and grows between 3000 and 5000 metres in the Himalayas. A fragrant but bitter oil is extracted from the rhizome of the plant. The Buddha recommended the *Picrorhiza* as a medicine (Vin I 201). It also was, and still is, used to make incense and perfume (Ja II 416).

Kaṭeruha. A type of flowering bush (Ja VI 537).

Kaṭṭhaka. See **Naḷa**.

Kaṇa. See **Taṇḍula**.

Kaṇavīra. See **Karavīra**.

Kaṇikā. *Premna integrifolia* (Ap 17), sometimes *kaṇṇikā*. A small tree with a thorny trunk and a beautiful white or green flower. The wood of this tree is hard, even-grained and pleasantly-scented.

Kaṇikāra. *Pterospermum acerifolium* (A V 61; Bv XVII.19; D II 111; Ja V 295; IV 535; M II 14), sometimes also *kaṇṇikāra*. A tall majestic deciduous tree with rounded leaves, green on top and greyish-white beneath and a large creamy-white, sweet-smelling flower that turn brownish-yellow as they mature. Monks’ robes were described as being as yellow as the *kaṇikāra* flower (Ja II 25). In the *Jātaka* there is a story in which a young woman tells her mother that if she dies ‘collect my bones, burn them, raise a monument and plant a *kaṇikāra* tree there. Then, when it breaks into blossom in the

spring, when the winter is over, you will remember me, my mother, and say “Such was the beauty of my daughter” ’ (Ja V 302). The Chinese pilgrim Xuanzang mentioned that all the roads around Rājagaha were lined with *kanikāra* trees and in the spring the forests would become golden-coloured with their blossoms.

Kaṇṭakalatā. This name means ‘thorn vine’ (Ja V 175) and must refer to thorny or prickly vines and creepers in general or perhaps one of the many such plants in the Indian forests.

Kaṇṭakuraṇḍa. See **Koraṇḍa**.

Kaṇhasappa. Sometimes *kālasappa*, meaning ‘black snake’ both terms are as much descriptions as names and refer to the King Cobra, *Ophiophagus hannah* (Ja I 336; III 269; V 446). The king cobra has a blackish-brown body with lighter bands around it, a creamy or orange throat and can grow up to 5 metres long. It is an aggressive snake, sometimes attacking without provocation and when biting it holds on tenaciously, injecting poison into the victim with a chewing motion of the jaws. It prefers thick jungle and feeds exclusively on other snakes. The king cobra is described as having a hood (Ja III 347). The Buddha said that king cobras are dirty and odorous, terrifying and frightful and that they always betray their friends (A III 260–61). See **Nāga** and **Sappa**.

Kaṭamāya. A type of animal, the commentary says it is a large deer (Ja VI 538).

Katthu. See **Soṇa**.

Kadamba. *Neolamarckia cadamba* (Ja VI 535), also *kalamba*. It is also known as *nīpa* or *mahānīpa* (Ja I 13; Bv II.51; XII.24). A large straight tree with a simple leaf and a pinkish or orange flower which hangs down on drooping branches. The fruit, which is extremely sour, is round and covered with a whitish down. The *kadamba* has nearly disappeared in the wild and is now found mainly in gardens. Wine was flavoured with *kadamba* flowers.

Kadalimiga. Sometimes *kadalīmiga* and *kādalīmiga*. A type of deer (D I 7; II 187; Ja V 406; VI 277).

Kadalī. Banana, of which the species that grew in ancient India may have been *Musa balbisiana*. A tall perennial plant with a stem consisting of long stiff leaf sheaths rolled around each other and

large bright green paddle-like leaves. The fruits, which grow in large bunches are oblong, slightly curved, yellow when ripe and edible. After it fruits, the stem of the plant dies away (A II 73; M I 233; S I 154; II 241). When unrolled, the trunk is found to be porous and empty (S III 141). The bud of the flower is compared with the colour of teeth (Thī 260). Banana leaves, which resemble a large paddle or banner (Ja V 195), were used as plates as they still are today (Ja V 4). See **Moca**.

Kanda. The root of a plant which could be (Ja I 273; IV 373; VI 516).

Kapi. A general term for monkeys, sometimes also *makkaṭa* (Ja II 269; III 355; V 68), primates of the superfamily *Cercopithecidae*. The various words for monkey in the Tipiṭaka seem to be used loosely and interchangeably as is suggested by the mention of a large black-faced monkey, a clear reference to the Hanuman Langur, and a small red-faced monkey, a reference to the Rhesus Macaque. In both cases the word *makkaṭa* is used (Ja II 445). However, many of the numerous stories about monkeys in the Jātakas would seem to refer mainly to the macaque because this monkey would have been more familiar to most people and because of its more human-like appearance and often amusing antics.

Monkeys pull faces and threaten people (Ja II 70) and while moving through the forest they grab a branch and let go of it only to grab another (S II 95; Sn 791). Hunters used to go into the forests of the Himalayan foothills and set traps of sticky pitch to catch them. The more curious monkeys would touch the pitch, get stuck and while trying to free one paw would get their other paws stuck. The hunters would then kill them, put the carcass on a spit and cook them over a fire (S V 148). Mahākassapa said that a monk who wears rag robes and yet is conceited, is like a monkey wrapped in a lion's skin (Th 1080). Street entertainers had monkeys which were trained to play with snakes and to do tricks (Ja III 198). In the Jātaka, monkeys are depicted as having the best and worst human traits and attitudes. According to the Jātaka, the Bodhisatta was often reborn as a monkey (e.g. Ja III 355). See **Sākhāmiga** and **Vānara**.

Kapikacchu. The Velvet Bean, Cowitch or Lyon Bean, *Mucuna pruriens*, sometimes *mahākacchu*. A climbing vine-like shrub with trifoliate leaves, dark purple flowers that hang down, and elongated seed pods encasing six to eight shiny black or brown beans. It is a

useful plant: its stems and leaves are used as fodder, its beans are edible and are used in traditional medicine. However, the plant is notorious for the fine orangey-coloured hairs on the seed pods which cause intense itching if touched. The Petavatthu tells of a wife who sprinkled her husband's bed with these hairs because she was angry at him (Pv-a 84).

Kapiṇjāla. Grey Francolin, *Francolinus pondicerianus*, sometimes *kapiṇjara* (Ja I 212; VI 538; Vin III 48). About half the size of the domestic chicken, this bird has a blotched-chestnut back, wings and tail, a lighter-coloured breast and a rufous throat circumscribed by a black line. The sexes are the same except that the male has spurs on its legs. The grey francolin favours dry scrub and grassland and feeds on insects 'rough grass and seeds' (Ja III 312). When disturbed it flies off with a loud whirling sound. It is also a fast runner. Hunters would imitate the francolin's call to attract them and then catch them with nets (Ja I 208). The Buddha said that too much or too little exertion could be detrimental to concentration, just as holding a francolin too tightly would kill it or holding it too loosely would allow it to fly through one's fingers (M III 159).

The Jātaka says that the reason why francolins are plump is because their minds are content and still, because they do not stray far from home and because they maintain themselves with whatever food they get (Ja III 313). The *Nidānakathā* mentions monasteries being decorated with rows of geese and francolins, probably painted or moulded in plaster (Ja I 92). See **Lāpa** and **Vatṭakā**.

Kapittha. Wood-Apple Tree, *Limonia acidissima*, sometimes *kapiṭṭha*, *kaviṭṭha* (Ja V 38; VI 529; Vin IV 35), a medium-sized deciduous tree with spiny branches and a large, globular, greyish-coloured, hard woody fruit containing numerous seeds embedded in an aromatic pulp. The pulp has an acidic taste and is used to make chutneys and to acidify curd, and the gum from the tree is used to treat diarrhoea. One who wants wood apples will knock them out of the tree by throwing a wood apple at them (Mil 189).

Kapitthana. A type of tree often mentioned together with the *assattha*, *nigrodha*, *pilakkha*, *udumbara* and the *kacchaka* as having 'tiny seeds, huge bodies and growing around other trees so that

they bend, twist and split' (S V 96; Ja II 445) . Thus it is likely that it is a species of *Ficus*.

Kapota. Blue Rock Pigeon, *Columba livia*, sometimes also *pārāvata* (Ja I 244). A familiar bird the world over, the blue rock pigeon is slate grey with a shining metallic green and purple sheen on its breast and neck and pink legs and eyes. The English name is due to the pigeon's habit of nesting and roosting on cliffs and in rocky places. The pigeon is as much at home in lightly-forested and open country as it is in villages and towns and eats mainly grass seed (Ja I 242). The Buddha described old bones as being pigeon-coloured (Dhp 149). One of the places around Rājagaha where monks sometimes used to stay was called Pigeon's Cave (Ud 39). According to the 5th Pillar Edict, King Asoka forbade the killing of white pigeons and village pigeons. The *Arthaśāstra* mentions tying messages to the pigeon's legs. According to the Jātakas, the Bodhisatta was once reborn as a pigeon (Ja I 242). See **Kakuṭa**.

Kappāsa. Cotton Bush, (Ja I 350; VI 184), of which about eight species grow in northern India. The species mentioned in the Tipiṭaka might be *Gossypium arboreum* as Brahmins make their sacred threads only from this type, suggesting its antiquity. This species of cotton is a large shrub with slender, sometimes purple branches, small, smooth leaves and large, beautiful purple flowers. The round black seeds are embedded in a white fluffy wool-like fibre which can be made into thread (S V 284; Th 104; Vin I 271). Leaves of the cotton bush were used as a medicine (Vin I 201) and an oil can be extracted from the seeds. Cotton fibre and thread were called *picu*. Cotton cloth was the most common fabric used in ancient India. After being harvested and separated from the seed, the fibre was spun into thread and then woven into cloth (D II 351).

Nakulamātā, one of the Buddha's female disciples, was very accomplished at spinning cotton (A III 295) and the Brahmin Velāma once made a gift of 84,000 lengths of cotton cloth (A IV 394). Cotton was used for a variety of purposes including padding sandals (Vin I 196). When asked what should be done with his body after his final Nirvana, the Buddha said that it should be wrapped in new cloth, then in teased cotton wool and then in new cloth. That being done, it should be placed in an iron coffin and then cremated (D II 141–42). Referring to one of his supernatural

powers, the Buddha once said: 'Just as a wisp of fluff or cotton when blown by the wind easily rises up into the air, so too, when the Tathāgata immerses the mind into the body and the body into the mind and he abides in a blissful and buoyant perception towards the body, his body easily rises into the air' (S V 284). Cotton was ginned with an instrument resembling a bow called *dhanuka* (Ja VI 41), *dhunaith* in Hindi.

Kappūra. Camphor, *Cinnamomum camphora*. The name of a tree and a whitish crystalline aromatic substance extracted from it and certain other trees (Ja VI 537). Camphor was used as a perfume (Ja I 290, II 416), a medicine, to flavour water and in religious ceremonies. Ancient texts distinguished two types of camphor: 'unheated', i.e. crystals found in the wood or on the bark; and 'heated', i.e. prepared by steam distillation. Both the *Carakasamhitā* and *Suśrutasaṃhitā* mention the medicinal qualities of camphor and it is still used to treat diarrhoea and as a cardiac stimulant. Because it burns with a strong incandescent light and leaves no ash, camphor has long been favoured for lamps in religious offerings.

Concerning the harvesting of camphor in India, Xuanzang wrote: 'The tree from which camphor scent is procured is in trunk like the pine, but with different leaves, flowers and fruit. When the tree is first cut down and sappy it has no smell but when the wood gets dry it forms into veins and splits; then in the middle is the scent, in appearance like mica, in colour like frozen snow.'

Apart from the camphor tree, camphor can also be extracted from *Blumea balsamifera* (Sanskrit *kukudru*, *kukkuradru* or *kukundara*), *B. densiflora*, *B. junghuhniana* and *Nardostachys jatamansi* although only the first two of these plants is mentioned in the Tipiṭaka.

Kamala. A type of grass from which sandals could be made (Vin I 190).

Kamala. See **Paduma**.

Karañja. Indian Beech, *Millettia pinnata* (Ja VI 518), a small deciduous tree whose new leaves are bright green and glossy. The flowers are white and purple and the fruit is a woody oval oblong pod containing one or two seeds. The timber of the Indian beech is used for furniture and oil extracted from the seeds is used as an antiseptic for cuts and sores and also as an insecticide. See **Nattamāla**.

Karamadda. *Carissa carandas*, sometimes *karamanda* (Ja VI 536). A large shrub covered with strong forked thorns and bearing an ellipsoid edible berry.

Karavīka. Cuckoo, sometimes *karavī*, of which four species are found in northern India (Ja V 416). The bird mentioned in the Tipiṭaka is probably the Indian Plaintive Cuckoo, *Cacomantis passerinus*. When young, this cuckoo is a mottled rufous and when mature, dark-grey above, light-grey and white below, and with a black tail tipped with white. The cuckoo is frequently celebrated in the Tipiṭaka and other Indian literature for its beautiful call (Ja V 204), a high pitched *pteer, pteer, pteer* and at other times a whistling pleasantly mournful *pi pi pi pee pee pee*. This call was considered 'sweeter, more beautiful, charming and delightful than that of any other bird' (D II 20). One of the 32 special characteristics of a Mahāpurisa is that his voice is beautiful like that of the cuckoo (D II 18; III 173).

Karavīra. Oleander, *Nerium oleander*, sometimes also *kaṇavera* or *kaṇavīra* (Ja III 62; VI 406). A medium-sized shrub with erect rod-like branches, narrow leaves tapering at either end and rose-coloured or sometimes white flowers (Ja IV 92). Oleander is poisonous and even prolonged smelling of the flower can cause nausea. A garland of oleander blossoms was put around the neck of condemned criminals as they were led to execution (Ja IV 191) and one type of arrowhead was called 'oleander leaf' because its shape resembled the leaf of the oleander (M I 429).

Karumbhaka. See Nīvāra.

Kareri. See Varaṇa.

Kalandaka. Squirrel, also called *kāḷakā* and *kālāya*. The two species of squirrel common in northern India are the Three-Striped Palm Squirrel, *Funambulus palmarum*, and the Five-Striped Palm Squirrel, *F. pennantii*. The first has a greyish-brown coat with three parallel black stripes running from its head to the end of its long bushy tail while the second is almost identical except that it has five stripes. Both squirrels are bold, inquisitive and endearing little creatures with a shrill metallic call which is accompanied by a vigorous jerking of the tail. They are commonly seen in urban areas where they dart up walls and lay on tree branches warming themselves in the sun.

Sandals were sometimes decorated with squirrel skin (Vin I 186). In the Bamboo Grove at Rājagaha there was a place where people came to feed the squirrels (M II 45; Vin II 74). See **Sākhāmiga**.

Kalamba. See **Kadamba**.

Kalambaka. A tree or shrub, and perhaps the same as *nīcakalambaka* meaning 'little *kalambaka*' (Ja VI 535).

Kalambuka. Possibly *Ipomoea aquatica*, variously known as Water Morning Glory, Water Spinach, River Spinach, or Swamp Cabbage (D III 87; Ja VI 535). This vine-like plant grows in water or soggy ground and has slim pointed leaves and trumpet-shaped white flowers with a mauve centre. The leaves and stems are widely eaten. Quick-growing and requiring no care, it is considered a noxious species outside its native domain as it chokes rivers, canals and lakes.

Kalaviṅka. See **Kuliṅka**.

Kalāya. Sometimes also *varaka* (Ja III 370; M II 51; S I 150). Identification uncertain, but possibly the Pigeon Pea, *Cajanus cajan* or Horse Gram *Macrotyloma uniflorum*. The first is an erect woody annual shrub with trifoliate leaves spiralling around the stem and yellow flowers sometimes with purple or red streaks. The pod contains up to nine round seeds varying in colour from light beige to dark brown. The plant is now widely cultivated but also grows wild. Horse Gram is a twining annual with a hairy stem and trifoliate leaves and a greenish-yellow flower. The slightly curved pod containing six to eight light brown to black collared flattened bean-shaped seeds. The seeds are mainly used as a cattle feed (Ja II 74) but sometimes also eaten by the poor. *Kalāya* were sometimes steamed and fed to cattle (Ja II 74). While practising austerities before his enlightenment, the Buddha ate soup made from *kalāya* (M I 245). In a famous Jātaka story, a foolish and greedy monkey let go of a handful of *kalāya* in order to retrieve one that it had dropped (Ja II 74–5).

Kaliṅgu. A type of tree (Ja VI 537).

Kallahāra. See **Sogandhika**.

Kālānusārī, see **Narada**.

Kasāya. A reddish, brown or tawny-coloured substance used to dye ascetic's robes, sometimes also *kasāva*. So associated was *kasāya*

with renunciation that the word came to be used for the monk's robes (Dhp 307; Ja IV 114; Th 966). Any astringent medicinal decoction was also called *kasāya* (Ja V 198; Vin I 201). This suggests that *kasāya* was derived from a plant or plants. Yijing, the Chinese monk who travelled through India in the 7th century, said that the *kasāya* was understood to be the same colour as pulverized sandalwood.

Kāka. Crow, also called *apandara*, *bala*, *dhañka*, 'the dark feathered one', *vantāda*, 'scrap-eater' and *vāyasa* (DI 9; Ja II 439; V 268; SI 190; Th 599). Several species of crow live in northern India, the most common being the House Crow, *Corvus splendens*, and the Jungle Crow, *Corvus macrorhynchos*, also called *vanakāka* in Pali (Ja III 247). The first is black with a grey neck, mantle and breast while the second is a glossy black all over. Both are alert, aggressive and daring birds that do not hesitate to attack animals much larger than themselves either to rob them or to protect their young. The Buddha said that crows are truculent and pushy, greedy and gluttonous, cruel and pitiless, rough and harsh-voiced, muddle-headed and given to hoarding things (A V 149). They are described as making a *kā ka* sound (Ja IV 72). One monk was said to have had a voice like a crow (Vin I 115), meaning that it was harsh and unpleasant.

Commenting on the fact that crows are always lean, the Jātaka says: 'Their hearts are always agitated and they vex the whole world, therefore crows have no fat on them' (Ja I 486). In one place a crow is described as turning over dry cow patties to eat the insects under them (Ja I 242), and in another we read of an abandoned infant surrounded by crows (Vin I 269). We also read of crows picking out the eyes of an impaled criminal with 'their dagger-like beaks' (Ja I 500). As soon as a devotee leaves a shrine, crows appear and examine the offering for anything edible (Ja V 107). An old man is described as having feet like a crow, perhaps meaning that they were dry and scaly or that the toes were spread (Ja VI 548).

The crow often featured in the proverbs of the Buddha's time. Leftover food was called 'a crow's meal' (Ja II 149) and a presumptuous boastful person was called a 'crow hero' (Dhp 244). A boy of seven or eight was said to be 'big enough to frighten the

crows' (Vin I 79) and to have 'the wisdom of a crow' meant making a decision based on greed rather than common sense (Ja V 255). To be helpless was to be 'like a crow with its wings clipped' (Ja I 304). A river or pool could be 'full enough for a crow to drink from' (D I 244) and crops growing well were 'high enough to hide a crow' (Ja II 174). Crows often appear in the Jātaka, where they are usually depicted as cunning, greedy creatures.

Kākola. Common Raven, *Corvus corax* (Ja III 247; VI 566; Sn 675). With jet-black plumage, the raven is larger and heavier than the crow and has a wedge-shaped tail. Common in Punjab and Rajasthan during the winter, the raven is only occasionally seen in northern India.

Kādamba. A type of goose with grey wings (Ja V 420), probably an alternative name for either *cakkavāka* or *haṃsa*.

Kāra. Curry Leaf Tree, *Murraya koenigii* (Ja IV 238), a medium-sized tree with fragrant white flowers and small pointed serrated-edged leaves. Being very aromatic and having a sharp taste, these leaves are used to flavour food and chewed as an appetizer (Ja VI 24). They are also eaten during famines and by the poor. According to the Jātaka, when the Bodhisatta was an ascetic living in the forest he used to eat curry leaves after having soaked them in water without salt, buttermilk or spices in it, suggesting that that was the usual way to eat them, perhaps as a sort of salad (Ja VI 21).

What is called curry today is a combination of spices powdered and then added to food to flavour it. The Pali word for a curried dish is *sūpa* and is usually used together with a variety of condiments (A III 48). It is not known what was used to make curry powder at the time of the Buddha, but the essential ingredients of most modern curries are turmeric, *halidda*; black pepper, *marica*; cumin, *jīraka*; coriander and chilli. Chillies were not known in India until the 16th century.

Kāraṇḍava. Some kind of wading bird; a heron, duck, moorhen or coot. The *Buddhacarita* mentions one of these birds standing on a lotus leaf (Bc V 53).

Kālakokila. See **Kokila**.

Kālasappa. See **Kaṇhasappa**.

Kālasīha. Black Lion (Ja IV 208). This may have been a name given to the occasional male lions that have dark-brown or black manes. Even in the 19th century, lions in India were informally classed as either 'black maned' or 'tawny-maned'. Alternatively, the term may refer to the panther, i.e. the occasional all-black cubs born in leopard litters. See **Dīpi** and **Sīha**.

Kālavalli, also *kālā*. A type of plant, its name meaning black vine. It was said to be comparable to a beautiful, slim woman (Ja VI 269). Apparently, the swaying movement of this vine, when moved by a breeze, was suggestive of the way a young woman would move her hips when passing a group of young men (Ja III 394–95). The joints of the lean limbs of the forest-dwelling ascetic were compared to the knots in the stems of the *kālā* plant (Th 243; 683). The Buddha said that when he was practicing austerities before his enlightenment he became so thin that the joints in his limbs looked like the knots in the stems of this plant (M I 245).

Kālameyya. A type of bird (Ja VI 539).

Kālīya. A type of shiny sandalwood, sometimes *kālīya* (Ja VI 536).

Kāsa. *Saccharum spontaneum* (S III 137). A tall grass sometimes reaching up to 1.5 metres high which often grows in thick clumps along the banks of rivers and streams. The leaf is very narrow and the flower produces a silvery-white down which can be carried by the wind for kilometres.

Kāsumārī. Ceylon Oak, *Schleichera trijuga* (Ja V 324). A large deciduous tree which looks particularly attractive when covered with new leaves. The small greenish-yellow flowers grow in spike-like clusters and the fruit has a pleasant acid taste. Oil extracted from seeds of the Ceylon Oak is used to make soap and hair oil and a dye is made from the flowers.

Kimsuka. Flame of the Forest, *Butea monosperma*, also *palāsa* (Ja II 265). The Pali name means 'thing-me-bob.' It was also known sometimes known as *dviguṇapalāsa* or *diguṇapalasa* (Ja V 365). The *kimsuka* is a common, small to medium-sized tree usually with a blackish crooked trunk, broad leaves shiny on top and velvety underneath and which look greyish from a distance. A profusion of red or orange flowers appear after the leaves fall. The pods are velvety-brown, about 15 cm long and contain flat oval-shaped

seeds. When flowering a blood-red juice issues from the trunk and branches and hardens into an astringent gum which has medicinal uses. Lac insects are often cultivated on this tree.

Once, a monk asked several of his fellows how insight is attained and each gave him a different answer. Confused, he went and told the Buddha what the other monks had said and the Buddha replied:

‘Suppose a man who had never seen a *kiṃsuka* tree went and asked another man what such a tree looked like. The other might answer “A *kiṃsuka* tree is blackish, like a charred stump”. So for the first man it would appear as the other man sees it. Then he might go to another man and ask him what a *kiṃsuka* tree is like and the other might reply “It is reddish, like a piece of meat”. So for him it would appear as the other man sees it. Then he might go to yet another man and ask him what a *kiṃsuka* tree is like and the other might say “Its bark hangs down in strips and its pods burst like a *sirīsa*”. So for him it would appear as the other man sees it. Finally, the man might go to one more person and put his question again and the other might reply “A *kiṃsuka* tree has a thick foliage and gives a close shade like a banyan tree”. So for him it would appear as the other man sees it. In the same way, those advanced men each gave you their answer according to their purified vision.’ (S IV 193).

According to the Jātaka the Bodhisatta was reborn as a god living in a Flame of the Forest tree worshipped by the people of Vārāṇasi (Ja III 23).

Kikī. Indian Roller, *Coracias benghalensis* (Ja V 408). About the size of a pigeon, the Indian roller has a large head, a heavy black beak and short legs. The bird is most well-known for its beautiful blue wings and harsh raucous call. It gets its English name from its spectacular courtship display which involves dramatic somersaulting, darting and nose-diving. The Pali name is probably an onomatopoeia of the bird’s call.

Once the Bodhisatta used the example of the contrasting screech of the beautifully coloured roller to teach a beautiful but shrewish queen to speak more pleasantly (Ja II 350). Popular tradition attributed the roller hen with strong maternal instincts, a

belief reflected in a passage from the Jātaka: ‘The Teacher checks his disciples as a roller protects her egg, a yak guards her tail, a mother her beloved child or a one-eyed man his only eye’ (Ja III 375; see also Vism 36).

Kiṇṇa. Yeast, a fungus of the class *Ascomycetes* which is used to ferment the sugars in grains and fruits, to raise dough and to produce alcohol (Vin IV 110). Five main types of alcoholic beverages are mentioned in the Tipiṭaka. *Meraya* (M I 238) was distilled alcohol made from sugar or fruit and sometimes flavoured with sugar, pepper or the bark of *Gymnema sylvestre*. *Majja* and *surā* (Sn 398; Vin I 205) were brewed from rice or flour but later these names were used generally for any fermented beverage. The Jātaka says that *surā* was made from sugar cane juice (Ja IV 161). *Āsava* was also a generic name (Ja IV 222) and later five types were recognized—that made from flowers, fruit, honey, sugar or a mixture of some or all of these ingredients. The *Arthaśāstra* gives this recipe for *āsava*: 100 *palas* of *kapittha* pulp, 500 *palas* of sugar cane juice and 1 *prastha* of honey.

Jalogi or *jaḷogi* was the juice of the *khajjūra* or the wild date palm and the *tāla* or the palmyra palm either brewed or distilled. Whether *jalogi* could be drunk by monks and nuns even before it had been fermented, was one of the points discussed during the Second Council (Vin II 301). This debate probably concerned the fact that before palmyra or wild date sap is properly brewed, it spontaneously ferments within a few hours of being tapped, producing approximately 3% alcohol. For this reason it was known as *taruṇasurā*, young or early alcohol. Other types of alcoholic beverages were *kapotika* (Vin IV 109), *madhu* (S I 212), *vāruṇi* (A III 213; V 13) and *taruṇasurā* (Vin II 301).

The Jātaka tells a legendary but plausible story of how alcohol was discovered. Long ago in a certain forest there was a fruit tree which had a large forked trunk with a depression in it. Rain water collected in the depression, fruit fell into it and warmed by the sun it fermented. In the summer, thirsty birds drank from the depression, became intoxicated, fell to the ground and after sleeping for a while, flew away. A hunter observed this and curious as to its cause, he too drank some of the liquid and became intoxicated. Later, he introduced this drink to his friends and so it

was that alcohol became known. According to the Jātaka, this discovery opened the way for innumerable social ills (Ja V 12–20).

Concerning the consumption of alcohol, the Buddha said: ‘Whoever follows the Dhamma should not drink or encourage others to do so, knowing that intoxication is the result. Because of intoxication the fool commits evil deeds and makes others negligent too. So avoid this root of wrong, this folly loved only by fools’ (Sn 398–99). See **Muddikā**.

Kipillikā. See **Pipīlikā**.

Kimi. Worm. Like its English equivalent this Pali word is a descriptive term for a wide variety of unrelated creatures that have soft, elongated bodies without any appendages, including the larvae of certain insects, i.e. maggots (A III 241; Sn 201). *Kimi* were also said to destroy crops so the word must have also been used for caterpillars (Mil 307). The *Milindapañha* says that camels, oxen, asses, goats and humans all get worms (Mil 100) and the *Visuddhimagga* mentions 32, and in another place, 80 different species of intestinal worms that infect humans (Vism 235; 258). See **Puḷava**.

Kimphala. A tree similar to the mango but bearing poisonous fruit (Ja I 271; 367). A possible candidate for this tree is the Suicide Tree, *Cerbera odollam*, a small hardwood tree commonly found growing in coastal swamps and marshes. Its dark-green oval leaves and white star-shaped flowers could not be mistaken for the mango tree but the fruit does resemble the mango fruit. This fruit is highly poisonous and is used by people wanting to commit suicide or murder. Although not growing in the Middle Land the tree’s reputation may have been known there by hearsay.

Kīṭa. Insects, sometimes *kīṭaka* (M III 168; Vin I 188). Insects are small six-legged invertebrates of the class *Insecta*. Some of the different types of insects mentioned by the Buddha include those attracted to the smell of dung, those that live in dark places, others that live in rotting or putrid matter (M III 168) and still others, *adhipāta*, that are attracted to lamps at night (Sn 964; Ud 72). Then there were various insects that monks and nuns living in the forest had to learn to endure: *ḍaṃsa*, biting flies (M I 10) and *andhaka*, meaning ‘blind’ (Sn 20). According to the commentaries they are called ‘blind’ because they were easier to swat than house flies .

Four other insects mentioned are the *cīrīlikā*, *hiṅgujālaka* or *hiṅgujālīka* (Ja VI 536), *paṭaṅga* and the *salabha*.

Monks and nuns were expected to examine water before using it to make sure there were no tiny creatures in it, most of which would have been either insects or their larvas, that might be injured or killed when the water was used (Vin IV 48). The justification for the rule about not travelling during the rainy season was that in doing so a monk might kill some of the insects that proliferate and swarm during that time (Vin I 137). Scrupulousness towards tiny creatures came to be seen as a sign of the most sensitive compassion as is suggested by Aśvaghoṣa's description of Prince Siddhārtha's reaction to seeing ploughing being done: 'Clumps of grass turned up by the plough lay scattered on the ground and were covered with tiny dead creatures, insects and worms, and as he saw this he grieved as if one of his own kinsmen had been killed' (Bc V.5). See **Makkhikā**.

Kukutthaka. Watercock, *Gallicrex cinerea*, a rail-like bird commonly seen haunting thick vegetation on the edges of lakes and ponds (D III 202; Ja VI 538–39; Ap II 347). Both sexes have brown plumage while the male becomes black during the breeding season, and develops a bright red fleshy horn on the front of its head and its legs and eyes turn bright red. Its call is a series of booming metallic *utumb, utumb, utumb*, rapidly repeated. The watercock feeds on any insects or molluscs it finds as it searches for succulent leaves, shoots and other vegetation which is its main diet.

Kukkuṭa. The name for both the Domestic Fowl, *Gallus domesticus*, and the Red Jungle Fowl, *Gallus gallus*, the first being the direct and recent ancestor of the second, sometimes also *kukutaka* (D III 202; Ja I 436; VI 538; Vin IV 63). Domestic chickens were kept for their eggs and meat. Cocks woke people early in the morning and cock fighting was a popular entertainment (D I 6). The Buddha said that in the distant future, villages would be so close together that a cock would be able to fly from one to the other (D III 75). A hen might hatch a brood of eight or ten eggs and if she brooded them properly, warmed them properly and turned them properly, the chicks would safely break out of the shell using the claws on their feet and their beaks (A IV 125–26). When King Milinda expressed doubt to Nāgasena about the Buddha's statement that the

beginning of *saṃsāra* cannot be known, Nāgasena asked him in reply: 'As an egg comes from a chicken and a chicken from an egg, is there an end to this series?' (Mil 51) This seems to be the earliest use of the well-known and popular 'chicken and egg' dilemma.

The male red jungle fowl has glossy rufous and black plumage, a red comb and a long sickle-shaped tail. It has 'wings that flash so gaily and a comb that droops so gracefully' (Ja III 265). The hen has a light-brown breast, a dark-brown back and tail and a mottled neck. A park at Pāṭaliputta called Kukkuṭārāma (M I 349) gradually evolved into a monastery and was the venue for the Third Council convened by Asoka.

Kukkura. See **Soṇa**.

Kukkusa. See **Taṇḍula**.

Kukkuha. A type of bird (Ja V 406; VI 538).

Kuṭaja. *Holarrhena pubescens* (Ja IV 92; 497). A small shapely tree with a creamy white flower and brownish bark which peels off in long papery flakes. A decoction of *kuṭaja* was used as a medicine (Vin I 201).

Kuṭaji. A type of tree (Ja VI 497; 530).

Kuṭṭha¹. Leprosy, a chronic infectious disease caused by the *Mycobacterium leprea* bacillus (Ja VI 197; 383), probably also *kilāsa*. This pathogen invades the nerves, skin and mucous membranes, causing insensitivity. White or pale patches appear on the skin, particularly on the hands and feet (Ja V 69). A leper is compared to the *koviḷāra*, perhaps meaning that his skin is cracked like the bark of this tree or that his fingers are twisted the way its seed pods become when dry (Ja V 69). In time, the loss of fingers, toes and nose, muscular paralysis and blindness can occur. Mahā Kassapa once ate the food from his bowl even though a finger of a leper who had offered him the food had fallen into it (Th 1054–56). Once a 'pathetic, poor, wrenched leper' named Suppabuddha stood at the edge of a crowd listening to the Buddha preach. Noticing this and sensing that he was receptive to the Dhamma, the Buddha modified his talk to suit Suppabuddha's disposition and level of understanding and as a result he attained enlightenment (Ud 48). The Buddha mentioned that lepers would sometimes get maggots in their sores (M I 506).

Kuṭṭha². Crepe Ginger, *Costus speciosus* (Ja VI 535). A tall plant with large dark green leaves arranged on the stalk in a spiral. It can grow to 3 meters tall. The pure white flowers grow from a large red cone-shaped bract which remains after the flowers fade. A popular garden plant, its rhizome is also used in traditional medicine.

Kutumbaka. A type of flower (Ja I 60).

Kudrūsa. Kodo Millet or Indian Crown Grass, *Paspalum scrobiculatum*. A small perennial grass usually growing wild but sometimes cultivated for its seeds which can be eaten as an inferior food. Kodo millet grows well in poor soil and is drought resistant. The Buddha said that in the distant future, when society degenerates, this grain will be the staple food (D III 71).

Kuṇālā. A generic name for cuckoos (A IV 101; Ja V 419).

Kunta. A type of bird (Ja IV 466).

Kuntanī. A bird, perhaps a type of heron (Ja III 134; 135).

Kunthakipillaka. A type of ant (Ja I 439; IV 142; Sn 602). The Buddha said that a monk should not intentionally take the life of anything, not even that of a *kunthakipillaka* (Vin I 97). See **Tambakipillaka**.

Kumuda. See **Paduma**.

Kumbhaṇḍa. See **Kakkāru**.

Kumbhīla. See **Susu**.

Kumbhīlaka. A type of bird (Ja IV 347). It was said to gather in flocks and be prone to attack by hawks (*sena*) if separated from the flock.

Kumma. Sometimes *kuma*. See **Kacchapa**.

Kummāsa. See **Yava**.

Kuyyaka. A type of flower (Ja I 60).

Kurañjiya. A type of plant (Ap 448).

Kuraṇḍaka. See **Koraṇḍa**.

Kurara. A raptor described as being spotted or variegated (Ja VI 501; 539). This could refer to at least six north Indian birds, the most common being the Laggar, *Falco jujjer*. About the size of a crow, this hawk has a grey back and wings and a white breast with grey and brown streaks. The laggar preys on pigeons, rodents and

lizards and used to be trained for hunting. Its call is a high-pitched prolonged 'whi-ee-ee'. In ancient Indian literature the cry of a woman in distress is often compared to this bird's call. In Avanti there was a place called the Laggar's Haunt on the side of a steep mountain (A V 46; S III 9).

Kuravaka. A type of tree (Ja I 39, IV 440), also called *bimbijāla* (Ja V 155). According to the commentaries it is a 'red kuravaka tree' that has red leaf shoots (*rattāṅkuravanena sañchannaṃ*, Ja V 154), and it is said to have been the tree the past Buddha Dhammadassī was enlightened under (Bv XVI.19).

Kuruṅga. The Four-horned Antelope, *Tetracerus quadricornis*, also *kuraṅga*. This small slender animal varies in colour from yellowish-brown to reddish with white underparts. Unique amongst animals, the male has four horns, two between the ears and the others smaller ones on the forehead. It prefers open dry forest near water and generally shies away from human habitation and is still relatively common in isolated pockets of forest in northern India and the lowlands of Nepal. The skins of this animal were used as mats (Vin I 192) and ascetics sometimes used them as clothes (Ja I 173; II 153).

Kuruvinda. A type of tree (Ja IV 92).

Kulattha. Horse Gram, *Dolichos biflorus*. A small widely cultivated herb covered with long soft hairs and which produces grey kidney-shaped seeds. These seeds are considered to be a low quality food and are eaten by the poor or fed to cattle. Before his enlightenment, while practising austerities, the Buddha ate soup made from horse gram (M I 245). Pāṇini said that horse gram grows at the end of the rainy season.

Kulala. Black Kite, *Milvus migrans*, a medium sized brown to black hawk with the alternative name *sena* (D II 295; M I 364; S II 255). It is often seen in towns and villages and is immediately recognized by its forked tail, the only Indian hawk to have one. More a scavenger than a raptor, this bird is often seen snatching food from other birds and even from humans, a behaviour mentioned several times in the Buddhist texts (Ja III 100; M I 364). In one Jātaka story a man even claims, falsely as it happens, that a kite carried off a baby (Ja II 182).

Kulāva. A type of bird, perhaps a variation of *kuliṅka* (Ja VI 538).

Kulāvara. A type of tree or shrub (Ja VI 535).

Kuliṅka. House Sparrow, *Passer domesticus* (Ja III 478; 541; IV 250; V 357), sometimes *kalavinka*, *kuliṅga* and *kulunka*. Probably India's most common and recognizable bird, sparrows live almost exclusively in towns and villages. The male is a mottled chestnut-brown with a black throat and a white breast while the slightly smaller female is a lighter chestnut-brown all over. Sparrows are omnivorous, eating grain, flower buds, grasshoppers and kitchen scraps and make their large untidy nests under the eaves of village houses.

Kuḷīra. Crabs, sometimes also *kulira*. Crabs are decapod crustaceans which live in salt water, fresh water and on land. They were also called *kakkaṭaka* or *kattaka*. In northern India crabs are commonly found on river banks, ponds and in paddy fields (Ja I 222; III 293) where they feed on vegetable matter, carrion, small insects, snails and fish. They are described as having claws, a bony shell, projecting eyes, being hairless and being born in water (Ja III 295). They make a clicking sound in their holes (Ja II 376). Village children would sometimes pull crabs out of ponds and kill them with sticks and stones (M I 234; S I 123). The ancient Buddhists were also aware that there were marine crabs (Ja II 344). The commentary to the *Vimānavatthu* says the Buddha once recommended crab soup as a cure for an ear ache (Vv-a 54).

Kuḷīraka. The name for birds of the order *Coraciiformes*, i.e. kingfishers and related birds (D III 202). The name is probably related to the kingfisher's habit of catching crabs, *kuḷīra*, and smashing them on tree branches.

Kuviḷāra. See **Koviḷāra**.

Kusa. *Desmostachya bipinnata*. A type of perennial grass with a sharp spiky leaf growing up to 0.9 metre high and with deep roots (S III 137, Th 27). The leaves margins are serrated and prickly and the dense silvery hair at the base of the leaves can cause itching. As a penance, ascetics sometimes wore garments made out of *kusa* grass (A I 240; D I 167) and it was used in the Vedic sacrifice and other Brahminical rituals (A V 234). *Kusa* grass is used for thatching roofs and making mats and brooms. Fishermen would string their catch on a blade of *kusa* grass (It 68). Clumps of *kusa* indicate water

below (Ja I 108). There is mention of a type of blue or dark-coloured *kusa* (Ja IV 140). The Buddha said: 'Just as *kusa* grass not properly grasped cuts the hand, so too the monastic life not properly lived leads to purgatory' (Dhp 311). He described a man walking through a stand of this grass and having his feet pierced and his limbs scratched by its thorns (*kusa kaṇṭaka*, S IV 198). As grasses do not have thorns as the word is understood in English this must refer to the sharp edges of the *kusa*'s leaves. Legend says that the Buddha sat at the foot of the Bodhi Tree on *kusa* grass which had been offered to him by a man named Soththika or Soththiya (Bv XXII.25; Ja I 70). According to the Jātakas, the Bodhisatta was once reborn as a god living in a clump of *kusa* grass (Ja I 441). See **Dabba**.

Kusumbha. Safflower, *Carthamus tinctorius*. A erect branching herb with broad serrated leaves and large orange-red flowers. The safflower was used for making a red dye and we read of it being grown in a king's garden (Ja I 499; V 211). An edible oil is also extracted from the seeds. The down of an adolescent boy's chin is described as being the colour of the flower (Ja IV 482).

Kusumbhara. A type of plant (Ja VI 535).

Keka. *Garuga pinnata* (Ja V 405). A large tree with smooth grey flaky bark, yellowish-green globose fruit and yellow flowers. Juice from the leaves mixed with honey is said to soothe asthma attacks.

Ketaka. Screw Pine, *Pandanus odorifer* (Ja VI 269). A many-branched tree having long spirally-arranged leaves with toothed edges and a large fruit looking something like a pineapple having a sickly sweet smell when ripe. A fibre is made from the tree and the flower can be eaten. The screw pine usually grows in sandy soil on the coast, or near swamps. A beautiful girl was said to have eyes like the flower of this tree (Ja IV 482).

Kesari. A type of lion, sometimes also *kesarasīha*. The name means 'the maned one'. It is not certain whether this is an alternative name for the lion or refers to a mythological lion or to a sub-species of the Asiatic lion which lived in the lower Himalayas and is now extinct (Ja II 244; III 460). According to the *Milindapañha*, these lions were light in colour (Mil 400). See **Sīha**.

Koka. Wolf, *Canis lupus pallipes*, also called *vaka* (Ja I 336; V 525; Sn 201; Vin III 58). A large dog-like animal with brownish fur

intermingled with black especially on the forehead and tip of the tail. Wolves attack livestock and have been known to carry off children. Using a proverb similar to the English one, the Jātakas say that some ascetics and priests are ‘wolves disguised in sheep skins’ (Ja V 241).

Kokanada. See **Paduma**.

Kokanisātaka. A type of animal (Ja VI 538). The name means ‘wolf killer’ and may refer to the leopard or lion.

Kokāsaka. See **Paduma**.

Kokila. Asian Koel, *Eudynamys scolopacea* (Ja II 350; Vv-a 56). Two types of koel are mentioned, the black koel (*kālakokila*) and the speckled koel (*citrakokila* or *phussakakokila*), which refer to the male and the female respectively (Ja V 416; 419). The Buddha contrasted the soft call of the female to the with that of the *ambakamaddhari* and the domestic fowl (A I 188). The male koel is a glossy black with a yellow bill and crimson eyes while the female is brown coloured with white spots and bars. Koels are a type of cuckoo and lay their eggs in the nests of crows (Ja III 102). During the summer the bird’s pleasant ‘koo-koo-koo’ call is often heard at dawn. The nun Ambapālī said that when she was a young courtesan her sweet singing was like that of the Asian koel (Thī 261). The bird was also known as *parabhata* (Ja V 416).

Koñca. Demoiselle Crane (*Grus virgo*), a small crane with a black head and neck, white tufts behind the eyes, the feathers on the lower neck are long and lanceolate. The bird is migratory, arriving in India in the winter where large flocks are commonly seen in open fields feeding on shoots, insects and wheat. It has an loud attractive trumpeting call (Ja V 304), which to the Indian ear resembled the trumpeting of an elephant (Ja IV 233; Mil 76). Consequently, one of the words for elephant was *koñca* (Vin III 109). The Buddha said: ‘Those who have not lived the holy life, who have not acquired wealth in their youth, pine away like old herons at a pond without fish.’ (Dhp 155; S II 279; Th 1113). There was a curious belief in ancient India that this bird and other herons had the ability to separate milk from water. The Buddha said: ‘The wise person shuns evil, like a heron that drinks milk and leaves water’ (Ud 91).

Koṭṭisimbali. See **Simbali**.

Koṭṭha¹. Possibly Jew's Mellow, *Corchorus olitorius* (Ja V 420). A small herb with slender leaves, a yellow flower and sometimes cultivated for its jute-like fibre.

Koṭṭha². Woodpecker, sometimes also *rukkhakoṭṭasakuna* (Ja II 162; III 25) or *satapatta* (Ja II 153; II 386), birds of the family *Picidae*. Woodpeckers have short legs for gripping tree trunks and a sharp pointed bill designed for chiselling holes into wood. There are eight species of woodpeckers in northern India although it is not possible to identify any of them from the information given in the Tipiṭaka. Woodpeckers peck at trees until the insects come out and then eat them (Ja II 162). In a well-known Jātaka story, a lion with a splinter of bone stuck in its mouth begged a woodpecker, actually the Bodhisattva, to remove it and promised to help the bird in return. The woodpecker removed the splinter but later the selfish ungrateful lion refused to keep its promise (Ja II 162).

Kotthu. See **Sigāla**.

Koraṇḍa. Porcupine Flower, *Barleria prionitis*, also *koraṇḍaka* (Bv I.57; Ja V 473, VI 536), and *kuraṇḍaka*. A thorny shrub which has yellow flowers, and whose elliptic leaves with a spine at their base. The flowers have no perfume (Ja III 253). According to the Apadāna, the monk Koraṇḍapupphiya was so named because he had a beautiful yellow complexion. The reason for this was because in a former life he had offered a *koraṇḍa* flower to the Buddha Tissa (Ap II 206).

Kolaṭṭhi. See **Badara**.

Koviḷāra. Variegated Bauhinia or Orchid Tree, sometimes *kuviḷāra*, *Bauhinia variegata* (Ja V 29), an ornamental tree with thick broad leaves, a stocky trunk and large beautiful mauve and white flowers splashed with purple. The tree drops its leaves before flowering. The *Sutta Nipāta* says a monk should give up the marks of a householder the way the leaves drop off the Bauhinia tree (Sn 44). A type of Bauhinia called *pāricchattaka*, meaning literally 'giving broad shade', was believed to grow in the Tāvatiṃsa Heaven where it gave great delight to the gods (A IV 117; M III 200). The leaves of the Variegated Bauhinia are used to make country cigarettes and the buds are sometimes pickled and eaten.

Kosakāraka. Silk worm, the caterpillar of several species of moths that produce a fine fibre which can be woven into cloth (A I 181; IV 394). Chinese mulberry silk from *Bombyx mori* became known in India by about the 2nd century BCE and is mentioned in some of the late texts in the Tipiṭaka (Bv XXIV.11; Ja I 43). However, most silk in ancient India was wild silk produced by moths such as *Antheraea mylitta*, *A. paphia* and *Samia cynthia ricini*. The cocoons were collected from the wild and only after the silk worms had gnawed through them and thus the thread was not unravelled but carded and then spun into yarn. This meant that the cloth made from it was heavier and rougher than Chinese silk, although still beautiful and much-sought-after. To loosen the silk threads, cocoons had to be boiled and silk-making was a recognized trade (Vin III 224). The famous brocade of Vārāṇasi called *kāsika*, which Prince Siddhattha wore before his renunciation, was made of silk (A I 145). Monks were allowed to have silk robes (Vin I 281) although they were not allowed to have carpets which had silk in them (Vin III 224).

Kosamba. Himalayan Mango, *Mangifera sylvatica* (Ja V 8; VI 456), sometimes *kosambha*. Similar to the common cultivated mango this tree is found growing up to an altitude of 1200 meters. Its fruit is like a small common mango but with scant pulp. It is now rare. See **Amba**.

Kosātakī. Angled Gourd or Bitter Luffa, *Luffa acutangula* (A I 32; V 212), an annual creeper with large leaves and tendrils and often seen growing all over the roofs of village houses. The long, strongly ribbed gourd is very bitter and is eaten before ripening and the flat black elliptic seeds have emetic and purgative properties. We read that a lay woman once offered four of the large orange flowers of the *kosātakī* to a stūpa (Vv-a 200).

Kosika. A generic name for owls, sometimes also *kosiya* (Ja II 353; V 120). An adulteress would be dubbed ‘an owl-like one’, perhaps because like the bird, she would slink around at night (Ja I 496). See **Siṅgila**, **Uhuṅkāra** and **Ulūka**.

Khagga. Greater One-Horned Rhinoceros, *Rhinoceros unicornis*, also called *khaggamiga*, ‘sword creature’ and *khaggavaja*, (Ja III 76; IV 497; V 406; 416; VI 277; 538). Unlike the African varieties, this rhinoceros has thick slate-grey armour-like plates on its body and a single horn. This last characteristic, unique among animals, is referred to

in the refrain of the famous Khaggavisāṇa Sutta to ‘be alone like the rhinoceros’ horn’ (Sn 35–75). The rhinoceros was once widely distributed throughout northern India as far as the Indus River delta but is now restricted to small forest reserves in Nepal, West Bengal and Assam. See **Palasata**.

Khajjūra. Date Palm, *Phoenix dactylifera* (Ja VI 269). A tall stately palm tree with a bushy crown that produces numerous oblong elliptical reddish-brown berries with a single seed and a sweet taste, which were a popular food.

According to the Jātaka, the Bodhisattva once made a living by selling dates (Ja I 269). Although the date palm grows in northern India, it is not common. *Khajjūra* probably refers mainly to the Wild Date Palm, *Phoenix sylvestris*. This tree is smaller than the date palm, its fruit has only scanty flesh and it is cultivated mainly for the sweet sap it produces and from which an alcoholic beverage is made (Vin II 301). The wild date is commonly found around north Indian villages and is easily recognizable by the wedges cut into the top of the trunk from where sap has been extracted. See **Kiṇṇa**.

Khajjopanaka. Firefly, insects of the *Lampyridae* family that have luminous glands in one or more segments of their abdomens which emit a light used as a mating signal (Ja II 415; VI 441). The Buddha used the term “firefly worm” (*kimi khajjopanaka*) so he was referring to the larval stage of this insect which also have bioluminescence and females which remain worms throughout their lives (M II 34). A proverb said: ‘When you want a fire, you do not blow on a firefly’ (Ja VI 372). The Buddha said that just as a firefly’s glow lasts only as long as the sun has not risen, in the same way, other religious teachers shine only as long as the fully enlightened Buddha had not appeared (Ud 73).

Khadira. *Acacia catechu* (Ja IV 87). A medium-sized tree with black bark, slender branches covered with hooked thorns and a small white or sometimes pale-yellow flower. The leaf consists of spine with tiny leaflets on it. The timber of this tree is strong and durable, and wood chips are boiled to produce a substance which is added to betel and sometimes used in medicine. We read of stakes for impaling criminals being made out of *khadira* wood (Ja IV 29) and of woodpeckers living in a grove of *khadira* trees (Ja II 162). The

Buddha commented that because of their size and shape, the leaves of neither the *khadira*, the *palāsa* or the *āmalaka* can be made into a container to carry water (S V 438).

Khīrapaṇṇi. Probably the Milk Tree, *Manilkara hexandra*. A large tree with rough grey bark, leaves clustered on the end of the branches and small white flowers. The leaves and fruit contain a milk-like latex which also drips from the bark, probably giving the tree its Pali name. The wood of this tree was used to make the shafts of arrows (M I 429).

Khīrarukkha. A tree or trees the name of which literally means ‘milk tree’. When cut, they exude a white sap (Ja II 274; S IV 160). This is probably a general name for *Ficus* or fig trees. A monk who saw a beautiful woman and was suddenly overcome by desire was said to have become ‘like a milk tree felled by an axe’ (Ja I 303). See **Assattha**, **Nigrodha**, **Pilakkha** and **Udumbara**.

Khuddakamakkhikā. A name meaning ‘small fly’ (Ja II 90), which may refer to insects of the *Hippelates* and *Siphunculina* genera, particularly *Siphunculina funicola*. Known as the Eye Gnat or Eye Fly, this small fly feeds of the bodily fluids of humans and animals and is particularly troublesome by getting into the eyes and nose. It will also feed on blood from wounds, lacerations and scratches. The Jātaka mentions the miniscule amounts of blood small flies drink (Ja II 19).

Khuddamadhu. A type of honey produced by the Little Bee, *Apis florea*, also *khuddamadu* (A III 369) or *khuddakamadhu* (D III 85; M II 5; Vin III 7). It is one of the eight types of honey listed by the *Carakasaṃhitā*. The Buddha described it as being ‘clear and sweet’ (A III 369). He also describes a man at a crossroad squeezing this honey from the comb as an expectant crowd stood around waiting (M II 5). The bee itself is called *khuddabhamara* and is a small wild bee native to India. See **Bhamara** and **Madhukara**.

Khoma. Linen, a cloth made from the fibres of the Flax plant also sometimes called Linseed, *Linum usitatissimum* (D II 188; 351; Vin I 58; 296). The stems of this annual herb are soaked in water for several weeks and then beaten and scraped so that the fibre can be removed. The seeds also produce a useful oil. The beautiful blue flax flower was called *ummāpuppha* (D II 260; Th 1068).

G

Gajakumbha. Elongated Tortoise, *Indotestudo elongata*. Largely a forest dweller, this slow moving tortoise has stumpy pillar-like legs and a moderately humped yellowish shell with black blotches. The Pali name means ‘elephant pot’. It is described as a sluggish creature that takes all day to move just a short distance (Ja III 140). See **Kacchapa**.

Gaṇī. A type of deer (Ja V 406). The name means ‘of the herd’.

Gaṇḍuppāda. Earthworm (Ja V 210; M III 168), sometimes *gaṇḍuppāda*. Earthworms are segmented worms belonging to the class *Ologochaeta*. They burrow through the soil eating decaying organic matter, usually by swallowing the soil containing it, and then depositing the waste on the surface. The Buddha commented that earthworms spend their whole lives in darkness (M III 168). The small balls of soil excreted by earthworms around the entrance of their holes was applied to walls, perhaps because its colour or because it made a smooth surface (Vin II 151). Earthworms are mentioned together with *kimi* and *puḷava*.

Gaddha. See **Gijjha**.

Gadrabha. Donkey, *Equus asinus* (A I 229; Ja II 109). A short sturdy mammal with grey hair, long ears and a white muzzle. In one place a donkey recently relieved of its load is described as standing around looking sad and contemplative (M I 334). Because of their ability to carry heavy loads donkeys were used mainly as pack animals. Donkey fat was used as medicine (Vin I 200).

Gavaya. Gaur, *Bos gaurus* (Ja III 76; VI 497). Often mistakenly called a bison, the gaur has a massive head and chest and muscular shoulders. Males are a glossy black and females and the young are a coffee-brown. Despite being the world’s biggest bovine, the gaur is a gentle and timid creature. Gaurs are now extinct in northern India except in several national parks, and are still found in Assam and parts of central and southern India.

Gavi. A creeper the fruit of which forest-dwelling ascetics used to eat (Sn 239). This may refer to *Ampelocissus latifolia*, the Wild Grape Vine, a common jungle creeper with deep red-brown flowers and sweet black succulent berries.

Gaha. See **Susu**.

Gijjha. Vulture, sometimes *gaddha*, also *sakunta*. The two commonest species of vultures in northern India are the Long-billed Vulture, *Gyps indicus*, and the Indian White-backed Vulture, *Gyps bengalensis*. The first is light to dark-brown with paler tips to the feathers and pale brown below. It is a sociable and silent bird. The second is brownish-black with a whitish ruff at the base of the neck. It is a gregarious bird, roosting and nesting in groups and producing an occasional harsh screech. Both birds have naked heads and necks.

Vultures were often seen with dogs and jackals eating bodies in charnel grounds (Sn 201). Hunters used to trap them (Ja III 330; IV 48; M I 130) for their feathers, which were used as flights on arrows (M I 429) and perhaps for their meat. They were believed to be able to see a carcass from a hundred *yojanas* away (Ja III 331). A famous rocky crag in Rājagaha where the Buddha sometimes used to reside was called the Vulture's Peak, Gijjhakūṭa, apparently because vultures perched on the rocks there. According to the Jātakas, the Bodhisatta was occasionally reborn as a vulture (Ja II 50; III 330; IV 485).

Guñja. See **Jiñjuka**.

Girikaṇṇika. Mussel Shell Creeper or Butterfly Pea, *Clitoria ternatea* (Ja VI 536), a small slender vine with glorious azure blue or sometimes pure white flowers.

Giripunnāga. A type of plant (Ja VI 530).

Guggula. A plant mentioned together with others which either are particularly fragrant or from which perfume is made (Ja VI 537). This possibly refers to *Commiphora wightii*, or *Ailanthus triphysa*, known in Maharashtra as *gugguladhup*, although it is not clear whether this second plant grows in northern India. Both trees have a fragrant gum used in perfumes and incense. The first of these is a small deciduous tree with greenish papery bark and yellowish flowers.

Gūthapāṇaka. One or another of the several beetles of the *Scarabaeidae* family found in northern India (Ja II 211; S II 228). Commonly called the Scarab Beetle or Dung Beetle, these black or metallic-coloured, stout-bodied beetles have distinctive club-shaped antennae and broad front legs adapted for digging. Dung

beetles are commonly seen around villages rolling balls of cow dung or human faeces, which they later lay their eggs in and then bury.

Go. Domestic Cattle, also *gāvī*, *siṅgī*, 'the horned one' and *vasā* (Sn 26; Vin I 191). Large mammals of the order *Bovidae*, the most common species in India being *Bos indicus*. The different types of domestic cattle recognized included suckling calves, *dhenupa*; yearlings, *taruṇavaccha*; milch cows, *dhenu* or *khīranikā*; red cows, *rohiṇī*; heifers, *vacchaka*; cows ready to be mated, *godharaṇī*; breeding cows *paveṇī*; bulls, *usabha*; oxen, *goṇa* and draught oxen, *balivadda* (A II 109; M I 226). Cattle were of different colours; black, white, red, tawny, dappled and grey (A III 214).

There is little evidence in the Tipiṭaka of cows being regarded with the universal reverence they were to be given in later Hinduism. The Buddha described cows as harmless creatures, gentle like sheep, who willingly give pails of milk (Sn 309). He condemned Vedic sacrifice at which cattle were slaughtered. After being convinced by the Buddha of the cruelty and futility of such blood sacrifices the Brahmin Uggatasarīra released all the cattle he was about to slaughter with this benediction: 'I hereby grant them life. Let them be fed with green grass, let them drink cool water, and let the cool breezes blow upon them' (D I 148). For some people at least, beef was an ordinary part of their diet. We read of a butcher or his apprentice displaying a butchered cow for sale at a cross-road (M I 58). Leather, including that made out of cow hides, was used to make harnesses, bags, shields, sandals, mats, drums, and water skins (Bv I.31; Ja VI 432; 454; Vin I 193; II 122). There is mention of a man killing a calf, flaying it and using the skin to make a scabbard (Ja V 106). Leather working was a recognized craft although it was considered a lowly one (Vin IV 7).

Cattle were a symbol of wealth and to have many was a source of pride and joy (S I 6). Cattle rearing is mentioned together with accountancy, archery and royal service as a worthy occupation (M I 85; Vin IV 6). Dairy products, or what were called the five bovine bounties (*pañcagorasā*, Vin I 244), were an important part of the diet. These five were milk, curd, butter, ghee and the skimming of ghee (A II 9). The process of making these foods was thus: Milk was boiled and when cooled a small amount of old curd

was added, gradually turning the whole into curd. The curd was churned until it became butter, which was then slowly heated so that clear oil rose to the top and a residue settled on the bottom. The golden-coloured ghee was then separated from the residue becoming the skimming of ghee (*sappimaṇḍa*, D I 201; Mil 322) and this was considered the superior dairy product. Sometimes *takka*, is included as one of the five bounties (Ja I 340; Vin I 244). This word is usually translated as buttermilk which in English is the name given to the opaque liquid that runs off as churned cream turns into butter. The Pali *takka* probably refers to the runoff from churned curd mixed with a little milk or curd, a liquid slightly thicker and more sour or tart than Western buttermilk. One of the disputed practices discussed at the Second Buddhist Council was whether it was permissible for a monk to drink *takka* if it was offered to him after he had made it clear that he had finished his meal (Vin II 301).

Cattle were usually kept in stalls (*goṭṭha* or *vaja*) which probably doubled as dairies and would have been situated at the edge of towns and cities (M III 186). Some were also of a temporary nature owned by several families. They would graze their cattle at the edge of forests or on waste land or fallow land, until the fodder was exhausted and then move on. Sometimes several, perhaps even many, stalls would gradually cluster together to form what were called cattle villages (*gonisādiniviṭṭha gāma*, Vin I 44). With the stalls being situated near population centres, farmers would have been able to get their main product, milk, to customers as quickly as possible.

The cowherd's job was to take the animals out in the morning to graze and bring them back each evening (A I 204), pick the eggs of parasitic flies off them, dress their wounds and light smoking fires at night to protect them from mosquitoes (A V 347). During the growing season, watchmen had to make sure cows did not wander into the crops and eat them or tread them down (D III 38; S IV 195).

Cattle wandered through the streets of towns and villages and could injure or even kill people (Ud 8). Aggressive bulls would have their horns cut off to prevent them from hurting anyone (A IV 376). Cattle were marked, probably by cutting, as is done today, rather than by branding, and according to Pāṇini these marks

should be made on either the ears or the rump. According to the *Arthaśāstra*, brand marks had to be registered with the king's superintendent of cattle. Bulls were castrated (Ja IV 364; Thī 440). Cattle pulled ploughs and carts, their dung was smeared on the floor of homes (Ja VI 413; Vin III 16), and when dried was used as a fuel (Ja III 385; VI 508) and as a cleaning agent (S III 131). A concoction of cow

Cattle also had a part to play in certain Brahminical rituals. The Tipiṭaka describes a ceremony where the king would drink milk from a teat of a cow with a calf of the same colour, the queen would drink milk from a second teat, the court Brahmin from the third teat and milk from the fourth teat would be offered to the sacred fire (A II 207). Brahmins believed they could make themselves ritually pure by touching cow dung (A V 266). It was observed that if cows have cause to be frightened they would give less milk (Ja I 388).

One of the 32 special characteristics of a Mahāpurisa is having eyelashes like those of a cow (D II 18).

Gokaṇṇa. Nilgai, also called *gokānā*, *Boselaphus tragocamelus* (Ja III 76; V 406). The Pali name means 'cow ear' while the Hindi name from which the English comes, means 'blue bull'. Looking like a cross between a horse and a bull, the nilgai is India's largest antelope. The males have an iron-blue coat and small conical horns while females are tawny brown. Both have high shoulders that slope down to a low rump. The nilgai is most often seen at dusk lurking in the jungle bordering fields in preparation for raiding them when darkness falls. Because the Buddha stood aloof from debates, at least at some period of his career, he was accused of lacking the confidence to participate in such events. The ascetic *Nigrodha* said of him: 'As a nilgai circling around keeps to the fringes, so does the monk Gotama' (D III 38).

Goṭṭhaphala. Very uncertain. It may refer to the fruit of *Solanum torvum*, a small erect shrub, the yellow berries of which are used as a medicine. Alternatively, it may be the Towel Gourd, *Luffa cylindrica*, a climber with tough, smooth, angled stems and a cylindrical fruit about 15 to 46 centimetres long with dark coloured stripes. The fruit of the *goṭṭha* was used as a medicine (Vin I 201).

Goṇasira. Probably another name for the wild buffalo (Ja VI 538). See **Mahisa**.

Godhaka. A type of bird (Ja VI 358). The name means 'little monitor' and could refer to Tree Creepers and/or Nuthatch, small birds of the *Sittidae* and *Certhidae* families. These small birds are able to move up, down and sideways on tree trunks and branches in a way similar to young monitors.

Godhā. Common Indian Monitor, *Varanus bengalensis* (D I 9). This large lizard is olive, brown or grey above, yellowish below and with a dark streak on the temples. It can grow up to 1.70 metres in length with the tail often being longer than the body. It lives comfortably in almost any environment and is commonly seen peering out of burrows in termite mounds and from between rocks. Although the Indian monitor is completely carnivorous, eating small animals, birds, eggs, insects and carrion, there is a reference to one eating figs (Ja II 118). This belief may have arisen because the monitor is sometimes seen high in fig trees where it lies in wait for birds. When termites would swarm after rain, monitors would dash about trying to catch them (Ja I 488). Monitors were hunted, their flesh being considered a delicacy. Men would go into the forest with spades and dogs to track them down. They would light fires at the mouth of termite mounds to drive the monitors out and then catch and roast them (Ja I 480–81; 488; III 107). According to the Jātaka, the Bodhisatta was once reborn as a monitor (Ja I 487).

Godhūma. Wheat (D III 71; Vin IV 264). Wheat is an annual or sometimes perennial grass of which there are many varieties. It has flat leaves and spiked seeds which are ground to produce flour. Two very ancient variety of wheat in India and perhaps the ones mentioned in the Tipiṭaka, are Emmer *Triticum dicoccum* and Indian Dwarf Wheat *T. aestivum*. Rice, barley and wheat were the most important grain in northern India. There is mention of 'edibles made of flour, piṭṭha, which would have included wheat flour (Vin I 248).

Gonaṅgula. See **Vānara**.

Gharagolikā. Gecko (Ja II 147), also *gharagolika*, small lizards belonging to the infraorder *Gekkota*. These creatures have soft bodies often with striking markings and colours, lidless eyes and toe pads which allow them to walk up walls and across ceilings.

Several species of Indian geckos live almost exclusively in houses and can be seen at night around lamps waiting to snatch insects attracted to the light. The Pali name means 'house lizard'.

Ghuṇapāṇaka. One or another of the two dozen or more wood boring beetles that live in northern India. These beetles lay their eggs under the bark of trees and the larvas (*pāṇaka*) burrow into the wood. The larvas could eat fig wood but not that of harder trees (Ja III 431).

C

Cakora. A type of quail or partridge, perhaps the same as *caṅkora* (Ja V 416; VI 538; Vv-a 163).

Cakkavāka. Brahminy Shelduck, *Tadorna ferruginea* (Ja III 520; VI 189). A large orange-brown duck, its head being slightly lighter in colour and with black wing tips and tail. Shelducks are often seen in pairs or small flocks on river banks where they eat vegetation, mollusc, insects and fish. The Jātakas describe the shelduck as reddish in colour, rounded in body and feeding off moss and green leaves (Ja IV 70). The compound word *cakravāka* occurs in the *Ṛg Veda* and mean something like 'circle of sound'. Shelducks were probably given this name because pairs keep in touch at night by calling to each other. In later Indian literature the bird came to be associated with numerous virtues but especially with marital fidelity, although this gets no mention in the Tipiṭaka. However, the *Milindapañha* says: 'As a shelduck never forsakes his mate as long as life lasts, even so, a meditator, an earnest student of meditation must not forsake clear comprehension for as long as life lasts' (Mil 401).

Candana. Sandalwood. Both the Pali and the English words are used loosely for a group of related trees that produce fragrant wood and oil. *Candana* refers primarily to *Santalum album* (Dhp 54), a small-sized evergreen tree with a small pale flower gradually becoming crimson. The heartwood of this tree, called *haricandana*, ranges in colour from whitish to yellowish and is strongly scented.

The Tipiṭaka also refers to Red Sandalwood, *lohitacandana* or *rattacandana*, *Pterocarpus santalinus* (A III 237; V 22; Ja IV 442; Mil 321). Both red and white sandalwood grow in the Deccan and South India and must have been imported into the north.

Sandalwood had many uses. It was pulverized and smeared on the body as a perfume and for its supposed cooling properties (Thi 145; 267). The paste was made by grinding a piece of wood on a stone (Ja IV 440). Being soft, fine-grained and easy to carve, it was made into luxury objects (A I 9). We read that a wealthy merchant had a bowl carved out of sandalwood. He even kept the off-cuts to use for other purposes (Vin I 110). The Buddha said that when he was a prince he used only sandalwood from Vārāṇasi (A I 145). Powered sandalwood (*candanacuṇṇa*) was sometimes rubbed on the body or burned as an incense, and it is said that sandalwood powder fell from the sky just before the Buddha's final Nirvāṇa at Kusinārā (D II 137).

The early Buddhists frequently equated sandalwood with things thought of as virtuous or holy: 'Just as a man who came across a piece of yellow or red sandalwood and he smelled it at the root, in the middle or at the top he would experience a beautiful, sweet and pleasant fragrance, even so, when one hears the good Gotama's Dhamma in all its parts one experiences elation and joy' (A III 237). The *Milindapañha* compares Nirvana to the precious and rare red sandalwood: 'As red sandalwood is hard to obtain, even so, Nirvana is hard to obtain. Again, red sandalwood is unequalled for its lovely fragrance, even so is Nirvana unequalled for its lovely fragrance. Yet again, red sandalwood is praised by good people; even so is Nirvana praised by the Noble Ones. These are the three special qualities of red sandalwood that are present in Nirvana' (Mil 321).

Xuanzang was told this tale concerning the harvesting of sandalwood and a tree similar to it: 'In the south of this country (Malakūta), bordering the sea, are the Malaya Mountains, remarkable for their high peaks and precipices, their deep valleys and mountain torrents. Here is found the white sandalwood tree and the *candaneva* tree (i.e., a tree similar to sandalwood. These two are much alike and the latter can only be distinguished by going in the height of summer to the top of some hill and then looking at a great distance great serpents may be seen entwining it; thus it is known. Its wood is naturally cold and therefore serpents twine round it. After having noted the tree, they shoot an arrow into it to mark it. In the winter after the snakes have gone, the tree is cut down.' Similar stories about where sandalwood grows and the

serpents or dragons that live around it are to be found in Sanskrit works such as the *Kāvya-mīmāṃsā*.

Camara. Yak, *Bos grunniens* (Ja I 149), a thick-set long-haired bovine native to the Tibetan plateau. Yak tails have been imported" into India from ancient times. A yak tail fly whisk became associated with status and was also one of the symbols of royalty, along with the white umbrella, turban, shoes, sword and conch (Ja II 330). The Buddha said that ascetics committed to virtue and simplicity would not use yak tail whisks (D I 7). Gods holding such whisks often flank images of the Buddha and bodhisattvas from ancient India.

Campaka. Champak or Yellow Jade Orchid Tree, *Michelia champaca* (Ja V 420; VI 151). A shapely tree of medium height with smooth grey bark, large elliptical leaves and a creamy yellowish flower famous for its strong sweet perfume. The city of Campa in Aṅga, modern Bhagalpur, took its name from the tree and the commentary says that when the Buddha was in the city he resided in a grove of champak trees on the bank of Gaggara's Lotus Lake (D I 111). Freshly made ghee was said to be the same colour as the champak flower (Ja V 289). Champak has a beautiful mottled wood from which a kind of camphor can be extracted as well as an oil used in making soaps and perfumes. See **Kappūra**.

Calani. A type of animal mentioned together with the yak and the *laṅghi* (Ja VI 537).

Cāpalasūṇa. A type of pungent vegetable which monks and nuns were allowed to eat (Vin IV 259). The name means 'bow garlic'. This might refer to the Leek, *Allium ampeloprasum*. This hardy, erect vegetable has a long cylinder of bundled leaf sheaths emerging from the ground which gradually become separate and green. Both parts are eaten for their strong onion-like flavour.

Ciñcā. Tamarind, *Tamarindus indica* (Ja V 38). A large attractive semi-deciduous tree with small oblong leaves and a yellow flower splashed with red. The tamarind bears large irregularly curved pods containing a tart-tasting pulp in which are embedded large shiny seeds. The pulp is eaten and used in food preparation. The timber of the tamarind is hard and termite-resistant and the wood ash is used for tanning while the leaves, flowers and pods are used in dyeing.

Cittacūlā Kacchapa. This is the personal name for a turtle in a Jātaka story and means ‘Marked Crest’ (Ja VI 162–64). The name suggests that the character could be a Chitra Turtle, also called the Indian Narrow-headed Softshell Turtle, *Chitra indica*. This turtle has a large round soft shell, olive or grey in colour, a long narrow head and eyes situated close to its comparatively short snout. The distinctive inverted chevron mark on its neck probably gave the turtle its Pali name. This turtle is common in all Indian rivers including the Ganges, Yamuna and their tributaries where it feeds on fish and carrion. In ancient Indian cosmology, the four elephants that held up the world were believed to stand on the back of such a turtle. The *cittakadhara kumma* mentioned in the *Milindapañha* cannot be this creature because it was said to avoid going into the water (Mil 408).

Cittamiga. See **Citraka**.

Citraka. Spotted Deer, sometimes also *cittamiga* (Ja VI 538), *pasatamiga* or *pasadamiga* (Ja V 418), *Axis axis*. This beautiful animal has a brown coat covered with lines of white spots. Both sexes are the same except that the male is slightly larger and has antlers. The animal’s sharp ‘ack ack ack’ call often rings out from the forest fringes where it prefers to live. The spotted deer is one of India’s most common deer and sometimes form herds of up to 50 or more animals. The Buddha said that ‘geese, herons, elephants and spotted deer are all frightened of the lion, regardless of the size of their bodies’ (S II 279).

Cirīṭa. a type of bird. The tinkling of the ornaments in a woman’s hair was said to resemble the chirping of the *cirīṭa* (Ja V 202).

Cīnaka. Broomcorn or Proso Millet, *Panicum miliaceum*. A erect, sparsely-branched type of millet growing wild but sometimes cultivated. Ascetics used to eat this grain (Ja V 405; Sn 239). Broomcorn is eaten by the poor or fed to cattle.

Cīrīlikā. Cricket, sometimes also *cīrika*, a small slender jumping insect of the order *Orthoptera*. Crickets are nocturnal, similar in appearance to grasshoppers, with long antenna and ranging in colour from black to dark brown. About twelve species of cricket are found in northern India. The Buddha mentioned crickets chirping in the forest at night (A III 397). In Sanskrit literature the

equivalent of Pali *cīrīlikā* is also used for an insect that sings loudly in forests during hot summer days and probably refers to the cicada. Perhaps the Pali and Sanskrit names were used interchangeably for both creatures.

Celakedu. Asian Paradise Flycatcher, *Terpsiphone paradisi*, variant readings are *cetakedu* and *celakeṭu*. (Ja VI 538). One of India's most beautiful birds, the adult male flycatcher is silvery white with a black crested head and two long ribbon-like tail feathers. The female is similar, only with a chestnut brown back and without the long tail. The paradise flycatcher is common in light forest and gardens where it feeds mainly on flying insects. When perching the male flycatcher often flutters its tail which probably accounts for its Pali name which is a variant of *celakelu* meaning 'one who plays with cloth.'

Celāvaka. A type of bird, sometimes also *celāpaka* (Ja V 416; VI 538).

Coca. A tree or, according to some sources, a fruit from which drinks were made (Ja V 420; Vin I 246). In other ancient Indian literature, the name is used for the fruit of *kadalī*, *nāḷikera*, *panasa* and *tāla*.

Coraka. Smooth Angelica, *Angelica glauca*, a tall erect perennial growing up to two meters high with white flowers and a strong pungent smell (Ja VI 537). The root is used as a medicine and the leaves and stems are used to flavour food and homemade alcoholic beverages. It grows in the subalpine Himalayas but is now rare due to over-harvesting.

J

Jatu. Modern science uses the words gum, resin, sap, latex and mucilage very specifically according to the distinct properties of each. No similar distinctions can be detected between *ikkāsa*, *jatu*, *ojā* and *sajjūlasa*, the names given in the Tipiṭaka for the substances extracted from or exuded by various plants. The four types of *jatu* mentioned are *hiṅgujatu*, *taka*, *takapattī* and *lakapaṇṇa* (Vin I 201). The first of these came from the *hiṅgu* but the trees from which the others came are unknown. *Jatu* is also one of the medicines mentioned in the Vinaya, the others being tallow, roots, astringents decoctions, leaves, fruits, salts and ointments (Vin I 251). *Ojā* means 'nutriment' and was sometimes used to mean tree sap. *Ikkāsa* had

some adhesive properties because it would be mixed with whitewash to help it adhere to a surface (Vin II 151). The sticky lime (*lepa*) used to trap birds and animals was apparently made from a type of resin or sap (S.V.148; Th 454). Today birdlime is made from the sap of *Cordia myxa*, *Ficus benghalensis*, *Ficus religiosa*, *Loranthus odoratus* and several other trees and plants. The latex (*khīra*) found in certain plants was so called because of its resemblance to milk. See **Khīrarukkha**.

Jantu. See **Tiṇa**.

Jambu. Black Plum Tree, *Syzygium cumini* (Ja II 160; V 6; S V 237), a medium to large-sized tree with smooth grey bark, long leaves and a greenish-white flower which bears an oval dark purple fruit containing a single seed (Ja IV 363). The black plum was said to be the finest tree in India and one of the ancient names for India was Jambudīpa, the Black Plum Land or Jambusaṇḍa, the Black Plum Grove (A I 35; Sn 552; Th 822). Drinks were made out of the fruit (Vin I 246). When he was a young man, Prince Siddhattha fell into a spontaneous meditative state while sitting at the foot of a *jambu* tree (M I 246). While at Uruvelā the Buddha ate a *jambu* fruit which was 'full of colour, aroma and flavour' (Vin I 30). According to the Jātakas, the Bodhisatta was once reborn as a god living in a grove of *jambu* trees (Ja II 438).

Jambuka. See **Sigāla**.

Jayasumana. *Pentapetes phoenicea* (Ja V 163). A attractive medium-sized branched herb with sharply-toothed leaves and a large red flower. It grows in wet or soggy soil and the root has various medical properties.

Jātisumanā. See **Sumanā**.

Jiñjuka. Indian Liquorice, *Abrus precatorius* (Ja IV 333), an attractive twining slender shrub, its leaves shiny on top and silky below, and with pinkish-white flowers. The smooth shiny seeds are scarlet with a black eye and in the Tipiṭaka are said to resemble a peacock's eye (Ja IV 334). Liquorice seeds, called *guñja* or *raktikā* in Sanskrit, were used as the basic unit of weight in ancient India. The seed weighs 109 milligrams. It is also powdered and used in snuff, taken to relieve headache or used as a poison. The root is used in the same way as the liquorice root.

Jiraka. Cumin, *Cuminum cyminum* (Ja II 363), an annual herb with long thin leaves and attractive pale-pink or white flowers. The pungent, aromatic seeds are powdered and used in curry and to flavour food. We read of meat being soured in a mixture of ground ginger, salt, cumin seeds and sour buttermilk (Ja I 244). See **Kāra**.

Jīvajīvaka. Pheasant-tailed Jacana, *Hydrophasianus chirurgus* (D III 201; Ja V 406; VI 276; 538), also *jīvajīva*. About half the size of the domestic hen, the jacana has a chocolate-brown body, white wings, a yellow strip on the side of its neck and a black 'necklace' on the upper breast. The toes are elongated for walking over lily leaves and floating vegetation. During the breeding season the male grows a long, slender sickle-shaped tail. The jacana is often seen singly or in large flocks in lakes and ponds and eats vegetation, insects and molluscs. It has a nasal mewling 'tewn tewn' call sounded to the Indian ear like 'Live! Live!' and gave the bird its name. The Mahābhārata describes the pheasant-tailed jacana as being 'red, yellow and brown'. In later Indian literature the *jīvaṃjīvaka* was mythologized into a two-headed bird.

Jhāpita. A type of animal (Ja VI 537).

Jhāmaka. A type of plant (Ja II 288; VI 537).

D

Ḍaṃsa. A general name for the many biting flies common in India. These include those of the *Tabanus*, *Chrysops*, and *Haematopota* genera. All these flies drink blood and some can transmit diseases. According to the commentary they were called 'blind' because they were easier to swat than house flies and thus were assumed to have poor or no eyesight. They were said to be tawny coloured (Ja III 263). The Buddha said that a monk should reflect that the purpose of his robe is only to offer protection 'from cold and heat, biting flies and mosquitoes, wind, sun and creepy-crawlies' (M I 10). One of the things that the herdsman Dhaniya told the Buddha gave him satisfaction was that there were no *ḍaṃsa* in his pastures (Sn 20). See **Kiṭṭa**.

Ḍāka. Possibly *Antidesma acidum*, a large common shrub bearing rounded fruit ranging in colour from red to black and leaves which

turn crimson before dropping off (Vin I 246). The young leaves are boiled and eaten while the fruit is eaten raw.

T

Takkaḷā. A type of plant with a bulbous root (Ja IV 46; 371).

Takkārī. *Sebania sesban* (Thī 297). A large straight legume shrub with long pinnate leaves and bearing lovely yellow, orange or red flowers.

Takkola. A sweet substance made from *Ziziphus oenopolia*, a thorny evergreen straggler that produces a small black edible berry (Ja I 291). The roots, leaves and bark and an extract is chewed with *tambūla*.

Taca. See **Rukkha**.

Tagara. *Tabernaemontana divaricata* (Dhp 54; It 68; Ja IV 286; VI 173). A small attractive shrub with dark green leaves and a beautiful pure white flower. The flower's perfume is imperceptible during the day but very noticeable at night. An incense was made from the powdered wood and it was also used as a medicine (It 68; Vin I 203). The Buddha said: 'Of all fragrances—sandalwood, *tagara*, blue water lily and *vassika*—the fragrance of virtue is the best' (Dhp 55). The *tagara* is widely grown in gardens.

Taṇḍula. The seed of the Rice Plant, *Oryza sativa*. Rice is a type of swamp grass and was the main food crop in northern India during the Buddha's time. There are thought to be as many as 200,000 varieties of rice in India today. The *Śunyapurāṇa* names 50 varieties while the Tipiṭaka mentions about nine, although only one of them can be identified with those known today. *Daddula* was an inferior type (A I 241; D I 166; M I 78; 156) while *nīvāra* was, according to Pāṇini, a low quality wild rice (D I 166). *Vīhi* (Th 381) were common varieties while *sāli* was considered the best type (A I 8; 32; III 49); IV 231; D I 105; Ja I 327; III 519). The Buddha commented that *sāli* with meat was considered the finest meal at that time (D III 71). *Sāli* was probably an earlier variety of the famous *mahāsāli* often praised in ancient sources.

The Chinese pilgrim Xuanzang was given this rice when he was in India in the 7th century. He wrote: 'This rice is as large as a

black bean and when cooked is aromatic and shining, like no other type of rice. It grows in Magadha and nowhere else.’ Another variety was called *rattasālī*, red *sālī* (Ja I 324–25; V 37). According to Pāṇini, *sālī* was harvested in the winter and *vīhi* in the rainy season. The whiter the grains of *sālī*, the finer it was considered to be (Ja VI 516). The rich ate *sālī* and meat but fed their slaves and servants broken rice and sour gruel (A I 145). Wild or self-sown rice, *sayāñjātasālī*, is also sometimes mentioned (Ja I 325). One wild variety was called *sūkarasālī*, pig’s rice, also known as *saṃsādiyā* (Ja VI 531).

Being the main staple in northern India, the Tipiṭaka contains a great deal of information about the cultivation, harvesting and consumption of rice, some of which would apply to wheat and barley as well. Paddy fields were square or rectangular and had embankments around them (Ja IV 167). A good paddy field had to be level, have deep fertile soil, a reliable water supply, an inlet and outlet for the water and sturdy embankments around it (A IV 237; Vin II 180). There is mention of paddy fields being near ponds or lakes, either natural or man-made, or of them being situated near rivers (A III 26; Ja III 293; IV 167; V 35), and we read of hollow tree trunks being used as irrigation pipes (A IV 170). Farmers would indicate which fields were theirs with marker stones (Ja IV 281). To get a good yield the seed had to be unbroken, capable of sprouting and then well-watered (A I 135). It was believed that rice seeds would absorb the essence of the earth and water and that this would determine its taste (A V 212–13).

The most important implement used in agriculture was of course the plough, of which there were two types; heavy ones (*naṅgola*) and the lighter ones (*sīra*), with their iron-tipped ploughshares (*phāla*). So fundamental to the economy was the plough that according to Pāṇini for purposes of taxation farmers were classed as either not owning a plough, i.e. needing to hire one, having a good plough or having a poor one. He also mentioned that farmers were taxed by the number of ploughs they owned.

There is mention of a large plough suggesting that they came in different sizes (S III 155). Other agricultural implements were the hoe or spade (*kuḍḍāla*), the sickle or grass cutter (*tiṇalāyana*) and a tool sometimes translated as a weeding hook (*niddāna*, A I 204; Ja V 45; Sn 77–8). The sowing season was called *vappakāla* (Ja IV 318; S I

172). Before ploughing the previous harvest's straw and uprooted weeds would be burned, the ash becoming a fertilizer (Ja I 238; III 163). A ceremony called *vappamaṅgala* was conducted just before the first ploughing in the belief that it would guarantee a good harvest (Ja I 57; IV 167).

The growing rice had to be protected from cattle straying into it and from wild birds and animals eating it. Field watchers (*khettagopaka*), those employed to watch the paddy fields as the crop ripened, would be fined to the amount of any of the crop that was eaten by birds or deer (Ja IV 278). The ripening crop was sometimes attacked by a disease called *setaṭṭika* (A III 52; IV 278). Several texts describe the process of harvesting in detail (A I 241–42; Vin II 180–81). It consisted of reaping the rice, gathering it up and putting it in piles (sheaves or stooks, *kalāpin*) to dry. The next step would take place at the threshing floor (*khala* or *khalaṃḍala*, Ja II 341). The monk Tekicchakāni went to the local threshing floor with his begging bowl after the sheaves had been taken there expecting the workers to offer him some rice. To his consternation they offered him nothing (Th 381). Most threshing floors would have been in the open but some must have had walls and a roof because the Buddha mentions going out of the door of one he was staying at (D II 131). To thresh out the grain, cattle were driven over the stalks or they were beaten with flails (Thī 113; S IV 201). The winnowing was done by dropping the grain from a height and allowing the wind to separate the grain from the chaff. The harvesters would take care to keep the grain and the chaff separate and use a broom to sweep them apart (A IV 170). Alternatively, winnowing baskets shaped like an elephant's ear were used to fan the grain from the chaff and then to remove grit (Ud 68). There were three steps in winnowing; first the straw was removed, then the chaff and finally the grain was sifted (Vin II 181).

After the harvest the rice was stored in a granary (Vin I 240) and every now and then it would be taken out to be aired (Ja I 484; Vin I 211). Royal palaces had their granaries too. The Jātaka describes the master of the royal granaries (*doṇamāpaka*) sitting at the granary entrance and measuring the rice peasants brought as the king's share. He placed a marker on each heap as it was measured so as to keep track of who had brought what amount (Ja II 378). The revenue due from farmers was calculated by an officer

who measured the field with a cord; he holding one end and the farmer the other (Ja II 376).

In the Vinaya, the Sakyan Mahānāma characterized the farmer's life as a dreary and endless round of ploughing and sowing, weeding and harvesting: 'Having brought in (the crop), exactly the same has to be done next year and exactly the same the year after that. The tasks never stop, no end to the tasks can be seen' (Vin II 181).

Plain boiled rice was called *odana* or *bhatta* and was usually eaten with various curries and condiments (A IV 231). The rich would have the blackened grains removed from their rice while the poor might be reduced to eating even the scum formed by cooking rice (A I 241; Ja II 289). Bran, *kuṇḍaka*, the brown covering of grains removed during polishing or milling, was considered the most humble of foods and was made into cakes and gruel (Ja I 423; II 289).

People considered milled and polished white rice to be superior to unmilled brown rice. The guest in one Jātaka story noticed that at the beginning of his stay his host served him white rice but as time progressed it became brown, indicating that he had worn out his welcome (Ja V 233; VI 16). *Kaṇṇajaka* was a gruel made from the broken grains that had been removed while cleaning the rice (Ja V 230). An even more humble version of this preparation called *udakakaṇṇjika* had almost no rice in it (Ja I 238). A preparation called cow's rice (*gobhatta*, Ja IV 67) may have been broken and shrivelled rice grains cooked and fed to cows or given to beggars. A porridge of rice boiled in milk was called *khīrodana* (Vv-a 147) or *pāyāsa* (Ja IV 391; S I 166). An idiom said that a loving couple were as inseparable as ghee mixed into *pāyāsa*, which must have been another way of serving this porridge (Ja I 457). One recipe for a similar rice dish reads—one *pattha* of rice, four *bhāga* of milk, an *acchara* of granulated sugar and a *karaṇḍaka* of honey (Ja V 385). Unfortunately we do not know what the equivalents to these units of measure are. Leftover cooked rice would be dried so it could be kept. When needed brief boiling would make it edible again (Vin IV 86). A feature of various auspicious occasions was to scatter grains of popped rice (*lāja*) together with flower petals of different colours (Ja II 240; VI 42). Rice would have been popped as it still is, by either the raw grains being mixed with hot sand which was then sifted out, or putting cooked and dried rice in boiling oil.

A confection called *madhulāja* was made of balls of popped rice held together with honey or molasses (Ja IV 214; 281). A gruel called *yāgu* (A III 49; D I 76) was probably made as it is today in India by boiling rice in water to a thin consistency and adding salt, a garlic clove, and a few pepper corns. The Buddha said there were five benefits of this rice gruel: it dispels hunger, quenches thirst, regulates wind, cleanses the bowels and helps digest the remnants of food (A III 250). Another type of gruel was called *bilāṅga* (Vin II 77).

A type of alcoholic beverage was prepared from cooked rice with yeast added (Vin IV 110) and an ingredient for another type was rice flour (*sālīpīṭṭha*, Ja V 13). A preparation called *thālīpāka* was made, according to one of the *Gṛhya Sūtras*, Brahminical texts on domestic rituals, of either rice or barley cooked with either milk or water and was used as an offering to the gods. After being offered this food was eaten (A I 166; D I 97; S II 242). The *Nidānakathā* gives the recipe for a rice dish called *gavapāna*. To make it, one would boil milk until it thickened, add rice a little at a time, then add a cooked mixture of honey, palm sugar, flour and ghee and then allow it simmer until the rice was soft (Ja I 33). In several places in the *Tipiṭaka* women are dismissed as having a ‘two-fingered wit’ (S I 129). According to the commentary, this refers to the housewives’ habit of squeezing grains of boiling rice between the thumb and first finger to see if it is cooked. See **Pasādiyā**.

Tamāla. Indian Cassia, *Cinnamomum tamala* (Pv-a 213). A medium-sized straight tree with shiny oblong leaves and a small cream-coloured flower. The bark of this tree produces an inferior cinnamon now rarely used, and the leaves have medicinal properties and are also used in cooking. The *Mahāvastu* mentions the use of a perfumed powder made from the leaves of Indian Cassia (Mvu II 15).

Tambakipillika. The name means ‘copper-coloured ant’ and refers to the Red Weaver Ant, *Oecophylla smaragdina*, also *tambakipillaka*. This common large red or rusty-coloured ant lives in trees where it makes its nest by weaving leaves together (Ja IV 375) and feeds on flies, moths, beetles and caterpillars. It is an aggressive ant, sinking its large mandibles into any intruder and squirting it with formic acid from a gland at the base of its abdomen. One Jātaka story

describes a mass of dry twigs, leaves and red weaver ants falling out of a sal tree onto an elephant (Ja V 39). See **Kunthakipillaka**.

Tambūla. Betel Vine, *Piper betle*, Ja I 266. A deciduous creeper with a semi-woody stem and shiny green heart-shaped leaves. Combined with lime and various spices the leaf is chewed with the nut of the betel palm, *Areca catechu*. as a mild stimulant. The leaves and nuts were kept in a little bag (Ja VI 367). The Jātaka mentions the leaves being chewed together with *takkola* (Ja I 291; II 320; V 315).

Chewing betel nut is not mentioned in the four Nikāyas, the Vinaya, the Mahābhārata, the Rāmāyaṇa or other early literature, suggesting that it must have only been introduced into northern India from the south around the time of the composition of the commentary to the Jātaka. See **Nāgalatā**, **Bhujalaṭṭhi** and **Pūga**.

Taraccha. Striped Hyena, *Hyaena hyaena* (A III 101; Ja V 416). An ungainly sulking carnivore with long ears, a sloping back with a light grey body with black stripes and a black chest. Hyenas have an eerie laughing call ending in a cackle and live in scrub and around villages where they scavenge. Although thought of as scavengers they are also effective predators. Forest-dwelling monks were sometimes attacked by hyenas and they were not allowed to eat hyena flesh (Vin I 220).

Tāla. Palmyra Palm, *Borassus flabellifer*, sometimes *tālataṛuṇa* (D II 171; 182; M I 187; Vin I 189), a tall unbranched palm having large fan-like leaves with thorns on the margins of the stalks. The round yellow fruit appears in large bunches. The leaves of the palmyra were used to make huts, fans, sunshades and various household articles (Th 127). The sap of the male flower was used to make an alcoholic beverage called *jalogi*. Whether or not it was allowable for monks and nuns to drink unfermented *jalogi* was discussed at the Second Buddhist Council (Vin II 301). When reduced by boiling, this sap was also made a gritty brown sugar which was called *sakkharā* (Ja I 251; 348). The Buddha often describes the enlightened person's destruction of the defilements to a palmyra trunk which, unlike many other trees, will not grow again after it is cut down (A I 137). Hatred, he said, should be separated from the mind with the ease that a ripe palmyra fruit separates from the stalk (It 84). The Buddha's radiant complexion was compared to the translucent yellow fruit from the palmyra palm just loosened from the stalk (A

I 181). The height of the tree was used as a rough unit of measurement. Something of significant height was said to be as high as seven palmyra palms (D III 27). See **Kiṇṇa**.

Tālisa. Indian Plum or Coffee Plum, *Flacourtia jangomas*, sometimes *tālisa* or *tālissa* (Ja IV 286. A small erect tree with a fragrant blue-green flower. When young the trunk is covered with very long thorns while older trees have smooth pale bark. The tree is cultivated for its pleasant-tasting plum. The Buddha recommended a medicine made from this tree, probably from the wood or bark (Vin I 203).

Tiṇa. Grass, also *saddala* (A I 145; D II 19). Grasses are variable and widespread plants of the family *Gramineae*. More than a dozen species of grass are mentioned in the Tipiṭaka. The Buddha said that a monk or nun should not steal anything, not even a blade of grass (Vin I 96). Various useful items were made out of grass. We read of grass mats (Vin I 286) and of houses being thatched with grass (A I 101; Vin II 148). Growing amongst the crops, grass becomes a weed and a curse (Dhp 358). There is mention of whole jungles of grass (A I 153; S II 152) which were sometimes set on fire so that many creatures died (S II 152). This probably refers to the Terai-Duar grasslands ecoregion on the northern edge of the Ganges plain. The Buddha required his monks and nuns to stay put during the monsoon so that they would not tread down crops and grass and injure the tiny creatures that lived among them (Vin I 137). He described graminivores (*tiṇabhakkha*) as ‘cropping both green and dried grass with their teeth’ and mentioned elephants, horses, cattle, donkeys, goats and deer as examples of them (M III 167).

The Buddha mentioned that on retiring to the forest for meditation he would gather grass and leaves for a seat to sit on. (A I 182). On one occasion a Brahmin had prepared a bed of grass for the Buddha to sleep on in his fire hall. When the ascetic Māgandiya saw this he commented disapprovingly to the Brahmin: ‘It is a sorry sight indeed when we see the bed of the Master Gotama, that destroyer of growth’ (M I 502). Perhaps Māgandiya belonged to a sect that considered even cutting plants to qualify as killing. Several species of grass mentioned in the Tipiṭaka which cannot be identified include *jantu*, a pale-coloured grass (Vin I 196), *poṭakila*, a soft grass (Ja VI 508; Th 27; Vin II 150) and *kamala*, a grass used to

make sandals (Vin I 190). Other types of grass were *tiriyā* (A III 240), *majjāru* (Vin I 196) and *eragu* (Vin I 196). See **Babbaja, Dabba, Kusa** and **Sara**.

Tiṇahaṃsa. A type of water bird (Ja V 356). The name means ‘grass goose’ or ‘grass duck’.

Tittakalābu. Bitter Gourd, *Momordica charantia*, also *tittakālābu*. A common slender climber covered with velvety hairs and with a yellow flower. The fruit is long and thin, ribbed, tapering to a point at both ends and yellow when ripe. It is also extremely bitter but is eaten in the belief that it is good for the health. The Buddha mentioned the seeds of this plant along with those of the *nimba* and the *kosātakī* as being very bitter (A I 31). He said that the doctrines of some of the other teachers of the time were like a concoction of bitter gourd and poison, unpleasant now and with unpleasant consequences later (M I 315). He also mentioned that when he was practising austerities before his enlightenment he became so emaciated that his scalp looked like a bitter gourd withered by the sun (M I 80).

Tittira. Sometimes also *daddara*. One or another of the several grouse found in northern India, a common one being the Chestnut-bellied Sand Grouse, *Pterocles exustus* (Ja I 218; III 537). This is a small yellowish-brown ground bird with a thin black stripe across its breast and brownish-black belly. Hunters would catch one sand grouse and then train it to lure others into traps (Ja III 65). According to the Jātakas, the Bodhisatta was once reborn as one of these birds (Ja I 218).

Tinduka. Indian Persimmon, *Diospyros malabarica*, sometimes also *tiṇḍuka*, *timbaru* or *timbarūsaka* (Ja V 99; VI 93). A medium-sized evergreen tree with spreading branches sometimes reaching almost to the ground, a fragrant white flower and globose fruit covered with soft red velvety hair. An oil extracted from the seeds is used to treat dysentery. Queen *Mallikā* built a debating hall near a prominent *tiṇḍuka* tree in a park at Sāvattthī (D I 178). We read of villagers building a bamboo fence around one of these trees to stop the monkeys from eating the fruit (Ja II 76). A torch of *tiṇḍuka* wood, if struck, hisses, sputters and gives off sparks (A I 127). The ideal breasts of a woman were said to be like timbaru fruits: ‘Supreme breasts like timbaru fruits: timbaru fruit breasts are

supreme, ultimate. Her pair of breasts are like a pair of golden colour timbaru fruits placed on a golden tray, well shaped and closely to each other' (Ja VI 457).

Tipusa. See **Kakkarāka**.

Timi. A large marine animal, probably mythological, other types being *ānandamaccha*, *timanda*, *timiṅgala*, *timitimiṅgala* and *timirapiṅgala* (A IV 200; Ja I 207; IV 278; V 462; Ud 54). Seventeen species of whales and also the dugong swim in Indian waters and are occasionally washed up on beaches. It was probably reports of such creatures by fishermen and seafarers that gave rise to stories about sea monsters. It was said of these creatures that they were huge and that they 'draw in and blow out great gulps of water' (Mil 262). The Tamil, Telugu and Malayalam word for whale is *thimingilam* and the Kannada word is *thimingila*. See **Susukā**.

Timira. A type of tree (Ja III 189).

Timbaru. See **Tinduka**.

Timbarūsaka. See **Tinduka**.

Tiriya. A type of grass. In one of the series of five dreams the Buddha had before his enlightenment, *tiriya* grass sprouted from his navel and grew until it reached the clouds (A III 240). The *Mahāvastu* calls this grass *kṣīrikā*, a name suggesting that it had a milky (*kṣīra*) sap (Mvu II 137).

Tirivaccha. A type of tree (Ja V 46).

Tirīṭi. *Symplocos racemosa*, sometimes *tirīṭaka* (A I 240; II 206; D I 166). A small tree with a white flower and a rough bark which is used to make a type of cloth. See **Rukkha**.

Tila. Sesame, *Sesamum indicum* (A I 130; Ja I 67; Vin I 212). A small erect annual whose numerous tiny seeds yield an edible oil. Sesame was considered an essential food along with rice, beans, cereals, butter, sugar and salt (A IV 108). Before being stored, sesame seeds were washed and dried in the sun (Vv-a 54). Rice was cooked with sesame (Ja III 425), the seeds were ground into a paste (Vin I 205) or made into meal (*piṇṇāka*, Vv-a 142) and the oil was drunk or used in cooking. *Tilasaṅgulikā* was probably small balls of sesame seeds held together with jaggery, and is still a popular sweet in India (Vin II 17). A gruel of sesame, rice and green gram was given as a medicine

(Vin I 210). When the Bodhisatta was practising austerities one of the things he ate was *piñṇāka*, a meal made from the pulp left after the oil had been extracted from sesame seeds (M I 78).

Sesame fields could be struck with a blight leaving the plants with only one or two leaves on them (S I 170). Oil from sesame and other seeds was extracted in a mill consisting of a large stone wheel that creaked as it turned (Ja I 25). To extract the oil, sesame meal would be sprinkled with water and then pressed (M III 142). There is mention of white sesame (*setatila*), i.e. sesame seeds with the hull removed (Ja II 278). A pimple or freckle was called *tilaka* for its resemblance to a sesame seed (M I 88). The Buddha mentioned that a border fortress would be supplied with fuel and food, including sesame, presumably to feed the inhabitants and to use when under siege (A IV 108). Some monks once asked the Buddha how long the lifespan of beings in the Paduma Purgatory was. He replied: 'Imagine a Kosalan cart filled with twenty measures of sesame seeds and imagine that once every century one seed was removed from it. That cart would be empty sooner than the time in purgatory would be over.' (A V 173).

Tilaka. *Wendlandia heynei*, (Vv-a 41; 43). A small erect tree, pubescent all over, with light brown bark and bearing fragrant creamy-white flowers.

Turī, also *tūrī*. What this name refers to is very uncertain. The eyes of the nun Subhā were compared to those of a *turī* (Thī 381) which suggests it might be a deer, as ancient Indians often compared women's eyes to those of a doe. However, the commentary says the name refers to a species of bird. On the other hand, Turī was the name of the wife of the god Vāsudeva.

Tulasi. Holy Basil, *Ocimum tenuiflorum* (Ja V 46; VI 536; Vin IV 35) sometimes *sulasī*. A small many-branched herb with leaves covered with down and which grows throughout India. When crushed, the leaves have a pungent smell and taste and are chewed as a mouth freshener or an appetizer. Two other common species of basil are *Ocimum gratissimum* and *Ocimum basilicum*. Hindus consider basil sacred to the family and the more religious will always have a bush growing somewhere near the house. When boiled, the leaves give a bright yellow oil which has antibacterial and insecticidal properties.

Tuliya. Indian Flying Fox, *Pteropus giganteus* (Ja VI 537), an animal with a chestnut-brown coat, black ears and large black wings that are wrapped around its body when roosting, which it does by hanging upside down in trees. This flying fox eats fruit and is found all over India. The commentaries give the flying fox the alternative name of 'winged cat' (*pakkhibiḷārā*) and say it has the colour of a reed flower. See **Pakkhabīḷāla** and **Rukkhasunakkha**.

Tūla. Down or cotton-like fibre from either trees, creepers or grasses (Vin II 150). It was used to stuff quilt blankets, pillows and mattresses.

Tūlinī. A type of tree (M I 128).

D

Daṇḍamāṇavaka. This compound means 'little stick man' and was the name given to a particular type of bird, possibly a crane, lapwing or stork (D III 202). Brahmins who had been presented with a staff at their investiture ceremony were called 'stick man'. The north Indian bird with the most stick-like legs is the Black-winged Stilt, *Himantopus himantopus* a small wading bird with a black or grey head Black wings and white neck and belly. It has long pink legs and a long thin black beak. Solitary birds or small groups are often seen in marshes and shallow ponds where they eat fish, crustaceans and frogs. Sanskrit literature mentions a bird named *koyaṣṭi*, meaning 'stick-like legs' which may refer to this bird also. See **Dindibha**.

Daddara. See **Tittira**.

Daddula. See **Taṇḍula**.

Dabba. Spear Grass or Sword Grass, *Imperata cylindrica*, a type of grass (A II 207; Th 27), sometimes also *dabbha* and possibly the same as *babbaja* (Dhp 345). There is a great deal of confusion going back to ancient times between this and *kusa* grass. Likewise, there is little agreement between modern researchers as to their identity, some saying they are the same, others that they are different, and giving different botanical names for each. The ancient commentary on *Suśrutasaṃhitā* makes a clear distinction between the two, saying: 'Kusa is short and soft and has leaves like a needle while *darbha* has

leaves which are broad, long and rough.’ The Theragāthā mentions them as different types (Th 27) and that position will be taken here. As for their Linnaean nomenclature, Patrick Olivelle’s opinion is followed here.

Dabba grass is mentioned in the Vedas, the *Manusmṛti* and other Brahminical text as being used in various religious ceremonies. The *Buddhacarita* mentions the sharp edges of *darbha* leaves (Bc VI.28).

Dālikā. Pomegranate *Punica granatum* (Thī 297), sometimes *dālīma*, *dāḍīma* or *dālīma*. The pomegranate is a medium-sized shrub with small leaves, thorny drooping branches and a fleshy red flower. The fruit has a woody rind and separate compartments containing numerous seeds encased in a semi-transparent pink or red flesh.

Dāsīma. A type of plant (Ja VI 536).

Dindibha. One or another of the four species of lapwing found in northern India, probably the Red-wattled Lapwing, *Vanellus indicus* (Ja VI 538), known as *tiṭṭibha* in Sanskrit. This large plover is brown above, white below, with black breast, head and neck and a white band running from the eyes down the side of the neck to the breast. It also has a bright red wattle in front of each eye. The lapwing is commonly seen in fields, open country and near water, running in short bursts as it hunts for food. At the slightest intrusion or sign of danger it makes a loud piercing ‘did he do it’ call becoming increasingly frantic until the danger or the intruder passes. See **Daṇḍamānavaka**.

Dīpi. Leopard, *Panthera pardus*, sometimes also *dīpika* or *saddūla* (A III 101; Ja I 132; II 44; VI 538). This large cat has a yellow coat marked with black rosettes and a white underside. Nocturnal and solitary by habit, leopards live in thick jungle and lurk around villages where they prey on livestock and sometimes even kill and eat humans. Black leopards, called panthers in English, are sometimes born in the same litter with the normal spotted ones. The monk Tālaputa described himself as living in a forest grove ‘resounding with the cries of peacocks and herons and favoured by leopards and tigers’ (Th 1113). Royal chariots were upholstered with leopard or tiger skins (Ja VI 503). Leopards are now almost extinct in northern India. See **Kālasīha**.

Dukūla. A type of plant, the fibres of which were used to make a fine cloth (A IV 393; Ja II 21; S III 146).

Deḍḍubha. A water snake described as small, harmless, with a large head and a needle-like tail (Ja VI 194). It was also called *udakadeḍḍubha*, ‘the water *deḍḍubha*’ (Ja I 361; III 16). This could be the Buff-striped Keelback, *Amphiesma stolata*. This little snake has a relatively short body and a long thin tail, almost a quarter of its total length, large eyes and is usually olive-brown with buff stripes around its body. A common snake, it is often seen along river banks and in marshy areas where it feeds almost exclusively on frogs and toads. The keelback is described as ‘a remarkably inoffensive and gentle little snake’. When alarmed, rather than fleeing, it curls up, flattens its body and distends itself by deep inhalations.

Devadāru. Deodar or Himalayan Cedar, *Cedrus deodara* (Ja V 419; V422). The Pali name and its Sanskrit equivalent means ‘wood of the gods’. One of India’s most beautiful trees, the deodar cedar grows in the Himalayas between 1500 and 3200 meters where it forms dense forests. When young the tree had a pyramidal shape maturing to becoming flat-topped with horizontal spreading branches, often drooping at the ends. The timber is durable, rot-resistant and widely used in construction.

Dviguṇapālāsa. See **Kiṃsuka**.

Dhañka. See **Kāka**.

Dhañña. Grain. Grains are the seeds of various cereal grasses. The seven types of grain usually mentioned in the Tipiṭaka are *sāli*, *vīhi*, *yava*, *godhūma*, *kaṅgu*, *varaka* and *kudrūsa* (Vin IV 265). Elsewhere, the first two of these are included in a list of edible seeds (M I 57). Grains like wheat and barley have a awn (*sāka*) at the end of the husk. The bran or pollard (*kaṇa*, *kukkusa*, *kuṇḍaka* or *palāpa*) of rice, wheat, barley or other grains was considered the most humble type of food, worthy only for slaves and beggars. The Jātaka tells of a once wealthy couple now reduced to penury asking help from a friend they had once helped when he was in a similar position. All he was prepared to give them was some *palāpa*. The poor man debated with himself whether he should demean himself by accepting such a paltry handout (Ja I 467–68).

Sometimes rice or barley was cooked and then dried, probably to preserve it. Once, during a famine, some monks were given such food which was meant to feed horses. They pounded it in a mortar and then ate it (Vin III 6). During various auspicious occasions grains of popped rice or wheat (*lāja*) together with flower petals of different colours would be scattered (Ja II 240; VI 42). Small balls of popped rice held together with honey or molasses (*madhulāja*) were a popular sweet, as they still are today (Ja III 539; IV 281). In a ritual called *saddha*, done for the benefit of departed ancestors, small balls of either rice or wheat dough called *piṇḍin* were used (A I 166; V 269). Grain merchants had a reputation for mixing chaff with the grain they sold (Ja VI 110). The Jātaka gives this advice to the prudent man: ‘Regularly visiting the threshing floor, the barn, the herds and the fields he should have grain carefully measured and stored in granaries, and have it carefully measured and cooked at home’ (Ja VI 297). See **Aparaṇṇa**, **Nivāra**, **Taṇḍula** and **Yava**.

Dhanukārika. A type of plant (Ja V 420).

Dhanutakkāri. A type of tree bearing beautiful flowers (Ja V 420, VI 535). The name means ‘bow *takkāri*’ so it might be related to or similar in appearance to the *takkāri*.

Dhanupāṭali. A type of plant (Ja V 422). The name means ‘bow trumpet flower tree’.

Dharaṇīruha. A type of tree (Ja VI 497).

Dhava. *Anogeissus latifolia*, A common deciduous medium-sized to large tree with whitish bark and broadly elliptic leaves and which grows on dry ridges and hills (Ja VI 528). It has a very straight trunk and is prized for its timber. The Buddha mentioned it along with *sāla* and *phandana* as being the type of tree people would clear of *māluvā* creepers, presumably because of its usefulness (A I 202).

N

Nakula. Grey Mongoose, *Herpestes edwardsii*, also *maṅgusa* (Ja VI 538), the most common of the three species of mongoose found in northern India. An alert creature with an elongated body, short legs and tawny grey fur, the mongoose is famous for eating snakes

although it also hunts birds, rats and insects. Mongoose were captured and trained to fight snakes for entertainment or to find and kill those that invaded homes. They are a cautious creature and go stealthily when they see humans (A V 289). Indians have long believed that before hunting snakes mongoose eat certain herbs as an antidote against venom. Nāgasena said: 'As a mongoose approaches a snake to seize it only after having supplied its own body with medicine, so too the meditator, the earnest student of meditation, on approaching this world abounding as it is in anger and malice, plagued by quarrels, strife, contention and hatred, must anoint his mind with the medicine of love' (Mil 394). Today, mongooses are said to eat the leaves of the Mongoose Plant, *Ophiorrhiza mungos*, as an antidote. According to the Jātaka, the Bodhisatta once brought a mongoose and a snake together as friends by teaching them about peace and unity (Ja II 53).

Najjuha. A type of bird (Ja VI 528; 538).

Nattamāla. A type of plant (Vin I 201). The *Samantapāsādikā* and several other ancient texts say this is an alternative name for the *karañja*.

Narada. Spikenard, *Nardostachys jatamansi* (Ja VI 537), also *maṃsi*. A erect perennial herb with elongated spatulate leaves and a rosy-pink or sometimes blue flower. The whole plant has a distinct lingering smell but the stout black-coloured rhizome in particular gives off a sweet spicy fragrance. The Buddha referred to the root as *kālānusārī* and considered it to be the foremost of all root fragrances (A V 22). An amber or sometimes greenish oil is extracted from the root by steam distillation. Both the whole root and the oil are widely used in medicines, perfumes and to make incense. Spikenard grows on the southern side of the Himalayas between 3500 and 4500 metres and is usually collected from the wild, although occasionally cultivated. Historical records show that spikenard made its way by trade as far as Egypt in ancient times.

Naḷa. A general term for reeds, grasses that grow in or near water (D III 75). Numerous types of reeds grow in northern India but few of them can be identified with the ones mentioned in the Tipiṭaka. A special caste of people harvested certain reeds (D I 51). They would cut the stalks, grasp them, shake them up and down, throw them aside and then cut more (S III 155). After this, the stalks

would be tied into sheaves (S II 114). The Buddha said: 'By hankering for the future and pining for the past, fools dry up and wither away like a green reed that has been cut' (S I 5). Numerous household articles were made out of reeds such as sandals, stools (Vin IV 39), baskets and mats. Hollow reed stems (*naḷa-daṇḍaka*) were used as needle cases (Ja I 170). They were also used to make small huts (S I 156; IV 185), to thatch the roofs of houses and in the wattle-and-daub construction of walls (Ja IV 318). In the Jātaka, there is a story about merchants who sail to a sea called Nāḷamala which looked like a vast expanse of reeds (Ja IV 140). This almost certainly refers to the Shatt-al-arab below the confluence of the Tigris and Euphrates Rivers in Iraq. *Isikā* (D I 77; M II 17), *kaṭṭhaka* (Dhp 164) and *pabbaja* (Th 27; 233; Vin I 190; S I 77), were all different types of reeds. *Sara* was a tall reed or grass with sharp leaves used to make arrow shafts (S IV 198).

Naḷapi. A type of aquatic animal (Ja VI 537).

Nāga¹. Iron-Wood Tree, *Mesua ferrea* (Ja I 35, 80), also *nāgakesara*. A large evergreen tree with narrow pointed leaves, bright red and shiny when new, and which produces a large fragrant four-petaled white flower. The flower is referred to as *nāgamālīka* (Ja VI 269) or *nāgapuppha* (Mil 283) and even when dried retains its fragrance. When the iron-wood tree is in bloom on a Himalayan mountain, and when the gentle breezes are blowing, they waft the fragrance of the flowers for ten or twenty *yojana* (Mil 283). According to Hinduism, the arrows of Kāma, the god of sensual love, are tipped with these flowers. The tree gets its English name from the exceptionally hard timber which is used for building.

Nāga². Cobra, large snakes of the family *Elapidae* which are capable of flattening the long ribs in their necks into a hood when threatened. There are three species of cobra found in northern India. When referring to the cobra the common words for snakes, *āsīvisa* (Ja II 274), *sappa* (Ja VI 6) and *uraga* (Ja VI 166) are used together with the comment that it has a hood, suggesting that the cobra was also known as 'the hooded snake'.

Snake charmers were a feature of street life in cities and towns (Ja III 198) and they usually used cobras because of their impressive appearance, their ability to stand erect and their tendency to follow and therefore appear to dance to the moving

flute played by the charmer. These charmers were believed to use special herbs and magic spells to mesmerize cobras in order to attract and then catch them. They would approach the snake, seize it by the tail, drag it backwards so that it would be stretched out full length and then use what was called a 'goat's foot stick' to pin its head down. Seizing it by the head and applying pressure to the sides would force the cobra's mouth open so the charmer could spit the juice of certain herbs into it which would, it was believed, break its fangs. Over the next few days the cobra would be subjected to a series of procedures meant to pacify it and get it used to being handled. These procedures were called *cunṇamāna*, *tantamajjita* and *dussapoṭhima* and seem to have involved wrapping the cobra in cloth and then stretching, squeezing, massaging and striking it. After this the cobra was ready to be used (Ja IV 457). During their performances, charmers would make cobras dance and drape them around their necks (Ja I 370). They would feed them with frogs they had killed (Ja IV 458). The species of cobra favoured by charmers has always been the nocturnal Indian Cobra, *Naja naja*, because daylight hampers its ability to strike. See **Kaṇhasappa** and **Sappa**.

Nāgalatā. Uncertain, but perhaps the same as *tambūla* (Ja I 80). The name means 'snake vine. Apparently a twig of this vine would be used to clean the teeth (Ja I 232). See **Bhujalaṭṭhi** and **Nāgavallika**.

Nāgavallika. Uncertain, but perhaps the same as *tambūla* or Betel Vine (Ja VI 536). The name means 'snake vine.' See **Nāgalatā**.

Nādiya. A type of plant (Ja VI 536). The commentary says that it is a kind of garlic, *lasuṇa*, perhaps meaning that it has a pungent smell or sharp taste. This could be one or another of the plants of the *Colocasia* genus in the family *Araceae*, called Taro or Elephant's Ear in English. Other possibilities are Water Pepper, *Persicaria hydropiper* and Watercress, *Nasturtium officinale*. All these plants are commonly eaten and have a strong pungent taste. Exactly why Indian culture from a very early period shunned strong tasting and strong smelling vegetables is not known. See **Lasuṇa**.

Nāmaka. A type of bird (Ja VI 538).

Nālīkera. Coconut Palm, *Coco nucifera* (Ja IV 159, V 384), also called *nārīkera*. A tall palm with large pinnate leaves. The woody flower ranges in colour from creamy white to bright yellow and produces

large oval fruits in which is a round nut with a white edible kernel. Coconut palms are of enormous economic importance, producing oil, copra, fibre and timber.

Niṅka. A type of animal (Ja V 406; VI 277), also *nīka*, *nikka*. A number of ancient sources mention this animal in lists of wild animals, specifically in lists of animals that live in marshes or swamps, including the boar, swamp deer and buffalo. If this is correct it could well be the Hog Deer, *Hyelaphus porcinus*. This small deer is dark brown with lighter underparts, short legs and rounded ears. When alarmed it runs through the forest with its head lowered so it can duck under obstacles rather than leap over them as most other deer do. This lowered head is reminiscent of the behaviour of pigs and hence the animal's English name. The hog deer is found throughout northern India especially in the long grasses that grow in the swampy areas.

Nigguṇḍī. Chaste Tree, *Vitex negundo* (Ja VI 535). A large shrub with a distinct smell, leaves covered with fine hair and white or sometimes lavender flowers. The *nigguṇḍī* is common on waste grounds and on the outskirts of villages. The *Visuddhimagga* says the flower is blue (Vism 257). See **Sinduvārīta**.

Nigrodha. Banyan Tree, *Ficus benghalensis*. This large evergreen tree has a red fruit and produces aerial roots which support the ever-spreading branches, (Ja VI 14; S I 207). The banyan is famous for growing on other trees and eventually stunting them. The Jātaka describes a bird eating banyan figs, later dropping its excrement in the fork of a Flame of the Forest or *palāsa* tree where the banyan seeds germinated, put forth red shoots and foliage and eventually strangled the tree (Ja III 208). The Buddha said that craving is like the trunk of the banyan that clings to and eventually envelops the things it comes into contact with (S I 207). He also said that passions come from oneself just as the aerial roots of the banyan emerge from the trunk (*khandhajā*) and the upper branches.

Banyan figs are about the size of small cherries, red when ripe and could be 'luscious and as sweet as granulated sugar' (Ja III 110; A III 369). People are said to have eaten them (A III 43) although they are not considered edible today, being too dry, tasteless and woody.

During the Buddha's stay at Bodh Gaya, he spent seven days sitting at the foot of the Goatherd's Banyan Tree (Ud 3). Once, he compared the kind, generous and believing lay man to a banyan tree: 'Just as in some pleasant countryside where four roads meet the great banyan tree is a haven of rest for all the birds; even so the believing lay man is a haven of rest for many, for monks and nuns, for lay men and lay women' (A III 42–3). A popular place near Kapilavatthu, the Buddha's hometown, was the Banyan Park, perhaps named after a large banyan tree that grew there (A V 83). People would make vows before banyan trees, offering them flowers and perfume, watering them and reverently walking around them and hence their alternative name 'Vow Tree' (*vaṭarukkha*, Ja I 259). One of the 32 characteristics of the Mahāpurisa's body is that it has the proportions of a banyan tree, i.e. the length of his arm is equal to his height (D II 18). The previous Buddha Kassapa was enlightened under a banyan tree (D II 4).

Banyan is an English word derived from the Gujarati *banyan*, 'a merchant', Pali *vāṇija*. The first English travellers in India noticed that itinerant merchants would often spread out their wares under the local village banyan tree.

Nicula. See **Mucalinda**.

Nimba. Neem Tree, *Azadirachta indica*, sometimes *pucimanda* (A I 32, V 212; Ja IV 205). A large deciduous tree the leaves of which have an extremely bitter taste and medicinal and insecticidal properties. It was believed that a mango tree growing next to a neem would give bitter fruit as a result (Ja II 105). Neem produces a hard durable timber and stakes made from the wood were used to impale criminals (Ja III 34). An extract from the leaves was used as medicine (Vin I 201).

In India today, country folk use neem twigs to clean their teeth in the morning, chewing the twig until it frays and then rubbing it up and down over their teeth. The Buddha recommended using a tooth-stick because it keeps the eyes clear, purifies the sinuses, sweetens the breath, cleans the taste buds, prevents phlegm and mucus getting in the food and makes food more tasty (A III 250). However, he does not say what type of wood the tooth-stick should be made from.

Nisātakā. A type of animal (Ja VI 538).

Nīpa. See **Kadamba**.

Nīlagīva. See **Mayūra**.

Nīlapupphī. A type of creeper with blue flowers (Ja VI 536), perhaps an alternative name for *girikaṇṇika*.

Nīlaphalaka. Uncertain, but possibly *Beta vulgaris*, a variety of spinach (Ja V 478). The name means dark or blue *phalaka*. It has dark green, wrinkled, ovate leaves often with a purple or dark crimson stem and is widely cultivated as a nutritious vegetable.

Nīlamakkhikā. The name means ‘blue fly’ and must refer to flies of the genera *Lucilia*, *Pycnosoma*, *Thelychoeta* and *Pyrellia*, of which there are many species in India (Ja I 165; II 275: III 176). These flies, usually called ‘bluebottles’ in English, have distinctive iridescent abdomens and feed on animal and human faeces, carrion and moist garbage.

Nīlamaṇḍūka. Indian Pond Frog or Green Pond Frog, *Euphlyctis hexadactylus*. This large frog has a flattish snout, smooth skin except on the flanks which are warty and is bright green or olive with a yellow streak extending from the nose to the vent. Pond frogs favour dense aquatic vegetation where they feed on insects, snails and sometimes smaller frogs. According to the Jātakas, the Bodhisatta was once reborn as a pond frog (Ja II 238). The Pali word *nīla* usually means blue but can also mean blue-green, green or dark-coloured. The creature is occasionally given the alternative name *haritamaṇḍuka* meaning ‘green frog’.

Nīlī. Indigo, *Indigofera tinctoria* (A III 230). A small plant of the Legume family from which a blue dye is extracted. Indigo was a major crop in northern India until the development of synthetic dyes. We read of paint made of indigo (S II 101). An extract of the leaves is also used as a medicine.

Nīvāra. Wild Rice or Red Rice, *Oryza nivara*, (D I 166). It is probably the same as what was called *karumbhaka* (Mīl 252) or *sayaṃjātasālī* ‘self-sown rice’, or *rattasālī*, ‘red rice’ (Ja III 247; V 37). Wild rice is an aggressive hardy aquatic grass very similar to domesticated rice except that it has narrower leaves that are a deeper green. They also have a red bran layer, a tinge of which remains even after a high degree of milling. Wild rice is considered a pest because it infests paddy fields, then flowers and sheds its seeds before the harvest,

thereby reducing the yield. A gruel consisting of wild rice, *sāmāka* and the leaves of some other herbs was given as a cure for bloody diarrhoea (Ja III 144). In the Jātaka, ascetics and animals are said to have eaten wild rice. See **Taṇḍula**.

P

Pakkava. A variant reading is *phaggava*. Possibly *Ficus rumphii*, a large spreading tree with grey bark, broadly ovate leaves and a small round fruit that can be eaten. It is often planted in villages and along the sides of roads. The Buddha mentioned *pakkava* as a medicine (Vin I 201).

Accepting the reading *phaggava*, the commentary to the Vinaya says it is a vine. If this is correct the plant might be *Tinospora sinensis*. This large succulent climbing shrub or vine has simple, alternate, broadly ovate leaves, greenish yellow flowers, and ellipsoid fruit, bright orange or red when ripe. Most parts of the plant are used in traditional medicine. See **Paggavavalli**.

Pakkhabilāla. A name meaning ‘winged cats’ (Ja IV 333) which might be a synonym for the flying fox. It was said to be reed-coloured. The sub-commentary gives an alternative interpretation saying that it is a cat-faced owl. Indeed, birds such as the Dusky Eagle Owl, *Bubo coromandus*, the Brown Fish Owl, *Ketupa zeylonensis*, and the Collared Scops Owl, *Otus bakkamoena*, have pronounced ear tufts which could, in the eyes of some, give them a cat-like appearance. See **Tuliya**.

Pakkhin. Bird, literally ‘winged one’, also *aṇḍaja*, *aṇḍasambhava*, both meaning ‘egg-born’, *dija* ‘twice born’, *pattayāna* ‘wing goer’, *sakuṇa* or sometimes *sakunta*, *vakkaṅga* ‘going this way and that’, and *vihaṅga* ‘sky travellers’ (D I 71; Ja I 216; V 8; VI 539; S I 224; 197; Sn 221; 606; 1134; Th 599). Birds are feathered, egg-laying bipeds of the class *Aves*. Numerous kinds of birds are mentioned in the Tipiṭaka but not all of these can be identified. However, birds in general are frequently referred to. In the *Suśrutasaṃhitā* birds are classified as either peckers, scratchers, aquatic or birds of prey, although no attempt is made in the Tipiṭaka to classify them.

Birds leave no track as they fly through the sky (Dhp 92). They flock to big banyan trees to roost, eat the fruit and rest in the

shade (A III 42). They have beautiful songs: ‘peacocks scream, herons cry and koels gently warble’ (D III 201). The call of some birds sounded to the Indian ear like words, a point made by the Sanskrit grammarian Yāska. The *jīvajīvaka*’s cry sounded like ‘Live!’ (*Jīva*) and another bird seemed to say ‘lift up your hearts’ (*utṭhehi citte*, D III 201). The monk Rāmaṇeyyaka said that the chirping and twittering of the birds in the forest did not disturb his meditation (Th 49). Whether in the forest or at the edge of the village, the bird songs always gave delight. The Jātaka says: ‘Around and about the trees can be heard the chorus of flocks of *najjuhā* birds and cuckoos as they fly from one tree to another. Amongst the branches and foliage they sing to passers-by and delight both newcomers and locals’ (Ja VI 534). It was observed that birds like peacocks and pigeons sometimes eat pebbles or grit (Mil 67). Seafarers took birds with them on their voyages and would release them when they sailed out of sight of land. If the bird returned to the ship they would know they were still far from land (A III 368; D I 222).

The Buddha said that just as a bird flies off taking only its wings with it, monks or nuns should wander taking only a few simple possessions with them (D I 71). A god once told a monk that just as a bird removes dust from itself after a dust bath with a vigorous shake, an ardent mindful monk should flick off the dust of the defilements (S I 197). Birds like domestic fowl, quails and partridges were eaten and ‘rice with well-dressed fowl’ was a popular dish (Sn 241). Feathers were used to make fans and flights for arrows. Peacock feathers were used for decorative purposes, and the quills of some feathers were used as sewing needles (Vin II 115).

Some ascetics had cloaks made out of the wings of certain birds. Domestic fowl and their eggs were an important part of people’s diets. Wild birds like quails and pigeons were hunted for food and their eggs were collected. A fowler’s gear might consist of a decoy bird, hair snares, a stick, probably for flushing the birds out of bushes, and a net (Ja II 161). The mention in the Jātaka to those who kill ‘bird by bird’ is probably a reference to hawks and falcons trained to hunt (Ja V 270). People put baskets in trees and under eaves for birds to nest in (Ja I 242). Some of the birds mentioned as being protected in King Asoka’s 5th Pillar Edict are the *cakkavāka*, *haṃsa*, *sāliya* and *suka*.

Paggavavalli. Also *phaggavavalli*. A type of bitter-tasting creeper (Ja II 105). See **Pakkava**.

Paṅgura. See **Mandārava** (Ja VI 535).

Pacalāka. A type of animal (Ja VI 538), sometimes also *pacalaka*. The name means 'shaker'.

Paṭaṅga. A type of insect said to fly into burning lamps at night (Ja VI 234; 506; Sn 602). The same thing is said of another insect called *salabha*. The modern Hindi equivalents of both *paṭaṅga* and *salabha* are used loosely and interchangeably for moths, grasshoppers and locusts.

Paṭikuttaka. A type of bird (Ja VI 538), also *paṭikutthaka*. As the word *paṭikuṭati* means to bend, this might be referring to the Baya Weaver, *Ploceus philippinus*. This bird is similar in size and colouring to the house sparrow except that in the breeding season the male develops a bright yellow head and breast. Large flocks of baya weavers glean grain from harvested fields and sometimes damage growing crops also. Their nests are made out of tightly interlaced and woven rough-edged grasses which are suspended from the end of tree branches.

Paṭola. Pointed Gourd, either *Trichosanthes cordata* or *Trichosanthes dioica*. Both plants are called *patol* in Bengali, have a similar appearance and both have medical uses. The leaves of the Pointed Gourd were used as a medicine (Vin I 201).

Paṭṭa. A type of fine cloth (Bv XXXIV.11; S II 102; Vin II 266). In the *Harṣacarita*, *paṭṭa* is described as a type of naturally yellow silk. See **Kosakāraka**.

Paṇaka. See **Paṇṇaka**.

Paṇḍuhamṣa. A type of water bird (Ja V 356). The name means 'pale yellow goose' or 'pale duck'.

Paṇṇaka, also *paṇaka*, and *udakapicchillo* 'water slime' (Pv-a 53), probably refers to string algae, duckweed and pond slime often found in ponds and slow-moving streams and rivers (Ja II 324; Vin III 177).

Paduma. Sacred Lotus, *Nelumbo nucifera*, also known as *ambuja* and *vārija* 'water born', *bhisa*, *kamala*, *paduminī*, *pokkhara*, *saroruha*, *mulālīpuppha* (D I 75; Ja I 146; Sn 2; Th 1089). The lotus is a perennial

aquatic herb with large, round, pastel-green leaves which sometimes float on the surface of the water or rise above it and with prickly stems (Sn 845). Lotus blossoms can be pink or white and were named *kokāsaka* or *kumuda* (Dhp 285; D II 179) and *kokanada* or *punḍarīka* (A III 239; S I 81) respectively, and also yellow.

It seems that the word *paduma* was sometimes used loosely enough to include the Blue Water Lily, *Nymphaea caerulea*. This is clear from the fact that the Buddha mentions *paduma* as being white, pink or blue (A I 145). As there is no blue lotus this must refer to the blue water lily, more commonly called *uppala* in Pali.

Lotuses grew in the wild but were also planted in bathing tanks and garden ponds for beautification. When in Campa, the Buddha would stay at one such tank, Gaggārā's Lotus Lake (D I 111). Such ponds, whether natural or man-made are described as being full of cool, sweet and clear water and lotus blossoms of different colours (S I 138; Vin I 5). When still a bodhisatta, the Buddha had three palaces, each with a pond of blue water lilies and pink and white lotuses (A I 145). The lotus has a sweet subtle perfume although it is hard to say whether this comes from the petals, the stem or the pistils (S III 130). In one delightful story, a monk who waded into a lotus pool to bathe and smell the flowers was chided by a god for being a 'smell thief' (S I 204). Comely young men or women were described as having 'an excellent lotus-like beauty' (A III 90; 152) and a sincere and generous layman was described as 'the lotus of laity' (A III 206). People would make garlands out of lotus blossoms and also eat the stems and roots (Ja III 308) and a drink was made from the juice extracted from the root (Vin I 246). Moggallāna is described as collecting lotus roots and stalks to make them into a medicine for fever (Vin I 215). Lotus nectar was also drunk (Ja V 466) and the leaves were used to make holders, to wrap food in (S V 438) and even to carry water for short distances (Ja III 107).

There are several things about the lotus that seem to have fascinated the Buddha and were often mentioned by him. The first was that such a beautiful pure flower emerges from dirty muddy water. To him, this was analogous to the enlightened person's transcendence of *saṃsāra*: 'Just as the lotus is born in the water and grows up beneath the water, yet remains undefiled by the water, fragrant and beautiful, even so, the Buddha is born in the world, grows up and dwells in the world but like the lotus unstained by

the water, he is not defiled by the world' (A III 347; S III 140; Sn 71). The second thing was the fact that water will not adhere to the lotus leaf. Because of microscopic waxy papillae on the surface of the leaf water splashed on it turns into quicksilver-like drops and immediately slips off, leaving no trace of moisture. 'Whoever in the world overcomes this low unruly craving, sorrow falls away like drops of water on a lotus leaf' (Dhp 336; 401). See **Lomapaduma** and **Sogandhika**.

Padmaka. This probably refers to one or another trees of the family *Magnoliaceae*, i.e. magnolias (Ja VI 535; 537) also *padumarukkha* (Ja V 406). Only one species of these trees grow in the Ganges plain, *Michelia champaca*, but several others are found in the Himalayan foothills of Uttarakand, Nepal and Sikkim. The flowers of most of these trees resemble small lotuses and have a strong sweet perfume. They range in colour from creamy while, to pink and yellow. The *padmaka* is mentioned together with *tagara* and *narada* as fragrant trees, shrubs and herbs (Ja VI 537). See **Campaka**.

Panasa. Jack Tree, *Artocarpus heterophyllus* (Ja I 450; II160; V 205). A large tree with a dense rounded crown, shining green leaves and large round green fruit which is produced in huge amounts. The fruit, which emerges from the trunk and branches, can be eaten as can the seeds. Thieves would steal fruits from the jack tree, and to prevent this owners hired watchers (Vin III 65).

Xuanzang wrote this of the tree: 'The jackfruit tree though plentiful, is highly esteemed. The fruit is as large as a pumpkin. When it is ripe it is of a yellowish-red colour. When divided it has in the middle many tens of little fruits of the size of a pigeon's egg. Breaking these there comes forth a juice of a yellowish-red colour and of delicious flavour. The fruit collects on the tree branches as prolific as the *fuling*.'

Pabbaja. See **Nala**.

Pampakā. A type of bird, also *pampaṭakā* (Ja VI 538).

Parabhata. See **Kokila**.

Parivadantikā. A type of bird (Ja VI 540).

Palaṇḍuka. Onion, *Allium cepa*. A small plant with long erect leaves and a round bulb, either white, brown or pink, depending on the variety. Monks and nuns were not allowed to eat garlic because the

smell left on the breath could cause offence to others. They were however, allowed to eat onions (Vin IV 259). In most early Indian literature, onion and garlic are considered despised foods.

Palasata. A type of animal, according to the commentaries, another name for the rhinoceros, sometimes *palāsata* or *phalasata* (Ja VI 277; 454). The *palasata* is mentioned in King Asoka's 5th Pillar Edict as being a protected animal. See **Khagga**.

Palāsa. See **Kiṃsuka**.

Pavāla. Red Coral, the stony branched skeleton of the tiny marine invertebrate *Corallium rubrum* (Ja II 88; IV 141). Unlike many other types of coral this species is dense enough to be carved and polished. Red coral was one of the many precious things found in the ocean along with pearls, gems, beryl, conches, crystal, gold and silver, ruby and emerald (Ud 54).

The red coral growing in Indian waters is not suitable for making jewellery. According to the *Arthaśāstra*, there are two types of coral, *ālakandakam* and *vaivarṇikam*. This first name refers to Alexandria in Egypt while the second is thought to refer to one of the Greek islands in the Mediterranean. It is certain that the coral used in India was imported" from the West.

Pasatamiga. See **Citraka**.

Pasādiyā. A variety of wild rice (Ja VI 531). The commentary says it is the same as 'pig rice', *sūkarasāli*. See **Taṇḍula**.

Pākahamṣa. A type of water bird (Ja V 357, VI 539). *Pāka* can mean ripe, cooked or grey.

Pāgusa. Yellowtail Catfish or Pangas Catfish, *Pangasius pangasius*, sometimes also *pāvusa* (Ja IV 70; VI 278). A large silver-coloured fish found in the Ganges and its tributaries, the pangas catfish feeds on shrimps and smaller fish. It is a popular food.

Pāṭali. Trumpet Flower, *Stereospermum chelonoides*, sometimes *pāṭhali* (Ja VI 537; Thī 263). A large tree with the leaves clustered at the end of the branches and which bears a beautiful trumpet-shaped yellow or sometimes pink flower. The village of Pāṭaligāma on the south bank of the Ganges, later to become Pāṭaliputta and now known as Patna, was named after this tree (D II 85). The Buddha Vipassī attained enlightenment under a Pāṭali tree (D II 4).

Pāṇaka. A name meaning ‘small creatures’. The Sasa Jātaka mentions a hare shaking all the small creatures out of its fur (Ja III 55). This no doubt refers to ectoparasites such as the ticks, fleas and particularly the hare lice of the genus *Haemodipsis* that commonly infest hares.

Pāṭhina. Wallago Catfish, *Wallago attu*. A large silvery-coloured fish with long barbs growing up to 1 metres long and commonly found in the Ganges and its tributaries (Ja IV 70; VI 278). It was said to be *mahāmukhamaccha*, ‘a big mouthed fish’ and indeed it is (Ja II 424). The fish had a voracious appetite and wading birds, domestic ducks and even dogs have been found in its stomach. A fine steel sword is described as being the same colour as one of these fish (Ja VI 449). It has the alternative name *pāsāṇamaccha* (Ja VI 450), perhaps meaning ‘spear fish’, possibly due to its slightly pointed head or its barbs.

Pārāvata. Dove or Pigeon, sometimes *pārāpata* or *pārevata* (Ja I 242; V 215; VI 456; 539), are birds of the Order *Columbiformes*. Nine species of doves and pigeons are found in northern India, although it is only possible to identify some of these from the information given in the Tipiṭaka. Amongst other things, they would eat grass seeds (Ja I 242). Some cows are described as being ‘dove coloured’ probably meaning that they were grey (A I 162). A certain precious stone was called the ‘dove’s eye gem’ (Vv-a 166), which probably referred to the ruby. Today rubies of the brightest red are called blood red or pigeon blood and command the highest prices. See **Kakuṭa** and **Kapota**.

Pārichattaka. A type of tree. See **Kovilāra**.

Pārijañña. A type of tree (Ja VI 535), or perhaps another name for the *mandārava*.

Pālibhaddaka. See **Mandārava**.

Pāsāṇamaccha. See **Pāṭhina**.

Piṅgulā. A type of bird, also *piṅgalā* (Ja VI 538). The name may be a misreading of *piṅgalā* meaning ‘red’ or ‘tawny.’

Piñjarodaka. Uncertain. The commentary says this is an alternative name for *siṅghāṭaka* and that its seeds are red (Ja VI 563). However, *siṅghāṭaka* seeds are black (Ja VI 563). Thus *piñjarodaka* is more likely

be the Eurasian subspecies *Trapa natans* introduced into India in ancient times. Its seeds have four straight thorns as opposed to *siṅghāṭaka*'s two curved ones.

Pipīlikā. Ant, sometimes *kipillikā* (Ja II 276; IV 331). Ants are a small insect of the order *Hymenoptera*, of which numerous species live in northern India. Ants were sometimes used to torture people (Ja IV 375), and there are numerous references in the Tipiṭaka of anthills (Ja III 86; Vin III 151). See **Kunthakipillaka** and **Tambakipillika**.

Pippalī. Indian Long Pepper, *Piper longum* (Vin I 201), sometimes also *pipphalī*, *pippala*. A slender aromatic climber producing a long spike covered with small seeds having a pungent pepper-like taste. A cave at Rājagaha where Mahā Kassapa used to stay was probably named after this climber (Ud 4). The seeds were used in cooking (Ja III 85; Vv-a 186) and as a medicine (Vin I 201; Ap I 302). Meat spiced with long pepper was called *sonḍikā* (S I 98). The use of long pepper in cooking has now been largely replaced by black pepper. See **Marica**.

Piyaka. A type of tree with a white flower (Ja V 419; 422; VI 269). The *Amarakośa* says it is an alternative name for the *kadamba*.

Piyaṅgu¹. *Aglaia elaeagnoides*, a small evergreen tree with grey bark, shiny green leaves and small roundish yellow flowers (Ja VI 336; Vv-a 235).

Piyaṅgu². Panic Seed, *Panicum italicum*. A type of millet which was made into a gruel (Ja I 39). It was also used as a medicine (Ja I 419). See **Kaṅgu**.

Piyāla. See **Rājāyatana**.

Pilakkha. Wave-leaved Fig, *Ficus virens* (Ja III 24; S IV 160, V 96; Vin IV 35). A large deciduous tree with smooth ovate leaves with a wavy margin. Although not parasitic it often grows on other trees and is a popular shade tree. The Buddha mentions the wave-leaved fig as an example of 'trees with tiny seeds and huge bodies that encircle the bodies of other trees so that they become bent, twisted and split' (S V 96). In the vicinity of Kosambi there was a cave named after this tree, presumably because one grew near its mouth (M I 513). In Baranasi there was a place called Cow Yoke Pilakkha where the Buddha once went for alms (A I 280). The commentary says that a cattle market used to take place there, probably in the shade of the tree.

Pucimanda. See **Nimba**.

Puṇḍarīka. A type of tree, probably an alternative name for *padmaka*. The former Buddha Sikhī was enlightened under one of these trees (D II 4). *Puṇḍarīka* is also a name for a white lotus. See **Paduma**.

Puttajīva. *Putranjiva roxburghii* (Ja VI 530). A moderately-sized tree with drooping branches. The male flowers, which are small and numerous, are yellow and the female flower, larger and less numerous, are green. The seeds of this tree are commonly used to make prayer beads.

Puthuloma. A general name for fish of the order *Siluriformes*, called catfish in English (Ja IV 466; Vv-a 189; 312). The Pali name means something like ‘wide hair’ and refers to the whisker-like growths which catfish have around their mouths. An ancient lexicon on *prthuroma*, the Sanskrit equivalent of this name, says ‘having long hairs around its mouth’. Several hundred species of catfish are found in India including in the Ganges, the Yamuna and their tributaries. The nun Sumedha said: ‘Do not give up true happiness for the sake of the inferior happiness of sense pleasures. Do not suffer afterwards like a catfish that swallows a hook’ (Thī 508).

Punnāga. *Calophyllum inophyllum*, (Bv II.51; Ja VI 530). A handsome moderately-sized tree with shiny leaves, large white fragrant flowers and a globose pulpy fruit which becomes yellow when ripe. An oil extracted from the seed was used in lamps.

Puppha. Flower, also *kusuma*. Flowers are the reproductive structures of *Angiosperms*, flowering plants. Some of the components of flowers mentioned in the Tipiṭaka include the stem (*daṇḍa* or *vaṇṭa*), buds (*koraka*), petals (*patta* or *dala*), calyx (*gabbha*), filament (*kiṇṇakkha*) pericarp (*kaṇṇikā*) and the pollen (*reṇu*). Flowers were said to be of two types, those growing on land and those growing in the water, although sometimes two more types are added; those growing on creepers and those that emerge from tree trunks or branches (Ja I 51; Vv-a 159).

The ancient Indians had a deep appreciation for flowers; they wore them in their hair, as garlands around their necks, used them to flavour their food and drinks and offered them to their gods. Flowers were associated with auspicious events. The *Nidānakathā* describes

how all the plants in the universe burst into flower as the Buddha attained enlightenment: 'Flowering trees in the ten thousand world-systems sprung into bloom and fruit-bearing trees were weighed down with bunches of fruit. Flowers that blossom on tree trunks, branches and vines did so each in their respective places. Lotuses on stalks broke through the rocky crust and arose in bunches of seven and were heaped together layer upon layer' (Ja I 76).

On Uposatha days, Buddhists would abstain from wearing perfume, makeup and garlands (A IV 250). The Buddha said that flowers, incense and coloured paste should be offered to shrines (D II 142) and people were employed to clear withered flowers from such shrines (Ja V 449; Th 620). A part of the betrothal ceremony consisted of bedecking the bride with garlands (M I 286) and the making of garlands was a recognized craft (Ja V 292). *Kinnara*, mythical creatures with a bird's body and a human head were believed to dress in flowers, eat pollen and entertain themselves by swinging on flowering creepers (Ja IV 283). The Vinaya mentions a variety of garlands, wreaths and bouquets, although the differences between these are not clear (Vin III 180).

Horticulture was in its infancy during the Buddha's time, but we do read of royal pleasure gardens surrounded by walls and staffed by guards and gardeners (Ja I 251). Alcoholic drinks were made out of or flavoured with certain flowers (Vin I 246; IV 109). The Buddha often used flowers as similes in his talks and sayings. For example: 'Just as many garlands can be made from a heap of flowers, so too many good deeds can be done by one born human' (Dhp 53), 'Like a flower that is beautiful but has no scent is the exhortation of one who speaks but does not act accordingly' (Dhp 51). Someone who spoke pleasantly was referred to as 'one who speaks flowers' (A I 128).

Purisālu. A type of animal, perhaps mythological (Ja VI 537).

Puḷava. Maggot, the second of the four stages flies go through in their lives, the others being egg (*āsaṭṭika*), pupa (*kosa*) and adult. Maggots usually feed on faeces and rotting matter but they can also infest living tissue, a condition called myiasis (Ja III 176). The Buddha mentioned that lepers would sometimes get worms (*kimi*) in their sores, a reference to maggots (M I 506). See **Makkhikā**.

Pūga. Betel Palm, *Areca catechu* (Ja V 37; V 323). An attractive palm tree with a single tall straight columnar trunk ending in a tuft of lush green leaves. It bears an ovoid bright orange fruit with a single hard seed. This nut is cut into slivers, mixed with lime and the leaf of the betel vine and then chewed as a mild stimulant. Chewing betel nut is not mentioned in the four Nikāyas, the Vinaya, the Mahābhārata, the Rāmāyana or other early literature suggesting that it must have only been introduced into northern India from the south around the time of the composition of the commentary to the Jātaka. One Jātaka story described wondrous sugar cane growing the size as a betel palm (J V 37).

Pūtilatā. Galancha Vine, *Tinospora cordifolia* (Th 1184), according to the commentaries sometimes also known as *gaḷocī* or *gaḷocīlatā*. A large, deciduous vine or creeper with elongated twining branches, small yellow flowers and pea-sized fruit that turn bright red when ripe looking like bunches of small grapes. The bark is creamy white and the wood is white, soft, and porous. The vine is extensively spreading and quickly grows over other plants and even small trees. Various parts of the plant are used in traditional medicine.

The Buddha used the stem or branches of a Galancha vine as a simile for something “weak, feeble, rotten and coreless” (M I 449). An elephant, he said, would be able to break through a Galancha vine with ease (Sn 29).

Pelaka. Uncertain, but perhaps a type of hare, bandicoot or bush rat (Ja VI 538).

Pokkharasātaka. This name means ‘one who stands on a lotus leaf’ and no doubt refers to birds of the *Jacaniidae*, *Metopidius*, *Rallina* and *Rallidae* families, called jacanas, rails, coots and moorhens in English (D III 202; Ja VI 539). Most of these wading birds have elongated, widely spreading toes which help distribute their weight and allow them to walk over floating vegetation while searching for food.

Poṭākila. See **Tiṇa**.

Potthaka. A type of cloth described as rough and unpleasant to touch (A I 246; Ja IV 251) and which was made from jute, *sāṇa* and some other types of fibrous plants. White Jute, *Corchorus capsularis*, is a herb with pointed, serrated leaves and a yellow flower. It

grows to a height of about 3 metres in the wild or often double that when cultivated. Similar to this and likewise used to make jute is Tossa Jute, *Corchorus olitorius*. Both plants are well-known for the strong, shiny fibre produced from them. In Hindi *patt* is one of several names for the jute plant and the coarse cloth or canvas made from it.

Phañijjaka. Rosha Grass, *Cymbopogon schoenanthus* (Ja VI 536; Vin IV 35). It is described as ‘earth grass (*bhūtanaka*). A broad-leaved fragrant grass which grows mainly on rocky hills and dry forest areas. The plant gives an oil called *palmarosa* or ginger-grass oil which is used in the manufacture of cosmetics.

Phandana. The Pali name for this tree means ‘quivering’ and it was described by the Buddha as being the most pliable and workable of all trees (A I 9). Its timber was considered suitable for making wagon and chariot wheels because its branches would ‘bend but not break’ (Ja IV 209). Along with *sāla* and *dhava* it was the type of tree that people would clear *mālūva* vines from, presumably because of its usefulness (A I 202). This is probably the Sandan or Chariot Tree, *Desmodium oojainense*, a semi-deciduous tree growing up to 14 m high. It is most well-known for its profusion of beautiful pink flowers and its light-brown to red-brown wood which is hard, close-grained, elastic and durable and widely used to make wagon wheels, furniture and agricultural implements. The Sandan is sometimes cultivated but is usually gathered from the wild.

Phāṇita. See *Ucchu*.

Phārusaka. *Grewia asiatica*, (Vv-a 145). A medium-sized tree producing globose fruit, red to purple in colour and with a tart taste. The fruit was made into a drink (Vin I 246) and taken as a medicine for stomach complaints.

Phussaka. A type of bird (A I 188). The name means something like mottled or speckled. The Buddha contrasted the diminutive call of this bird with that of the *ambakamaddarī* and the domestic fowl.

Phussakokila. This name means “spotted *kokila*” or “dappled *kokila*” and may be another name of the female *kokila* or refer to either the Common Cuckoo, *Cuculus canorus*, the Indian Cuckoo, *Cuculus micropterus*, or both (Ja V 19). The males of both birds are similar; having a slate-grey back and wings, a lighter grey throat,

darker tail and a white breast bared with black. This marking may have qualified as *phussa* in the minds of the ancient Indians.

B

Baka. Wading birds of the *Ardea*, *Egretta*, and *Bubulcus* genera, the common ones in north India being the Cattle Egret, *Bubulcus ibis*, the Large Egret, *Ardea alba*, Median Egret, *Egretta intermedia*, and the Little Egret, *Egretta garzetta*. Most of these birds are white with dagger-like orange-coloured or black bills and long S-shaped necks. They feed in on river banks, paddy fields and wetlands where they eat fish, frogs (Ja III 430), insects and other small animals and are often seen around cattle catching the insects disturbed by them. The Jātaka describes an egret catching a fish, wedging it in the fork of a tree and then pecking it to death (Ja I 222).

Bakula. See **Vakula**.

Badara. The fruit of the Jujube Tree, *Ziziphus jujuba* (A I 130), also called *badarapaṇḍu*, *bhadarapaṇḍu* or *kola*. A moderately-sized tree of shrubby form and with a spreading crown. It is sometimes cultivated for the edible fruit. The fruit is described as being egg-shaped, reddish and beautiful (Ja III 21) and on one occasion, Ānanda compared the Buddha's complexion to the beautiful translucent yellow of the jujube fruit in autumn (A I 181). It was sometimes mixed with food (Vin IV 76) and on one occasion the Buddha was offered a meal which included pork with jujube (A III 49). During the time the Buddha practised austerities before his enlightenment, he sometimes ate only one jujube fruit a day (M I 80). The small two-celled stone of the fruit was called *kolaṭṭhi* (Thī 498).

Badālatā. A type of creeper that was said to have appeared during the early evolution of the Earth and which was 'sweet like pure wild bee honey' (D III 87).

Bandhuka. See **Bandhujīvaka**.

Bandhujīvaka. *Pentapetes phoenicea* (A V 62; D II 111; M II 14), also called *bandhuka* (Ja VI 279). A small attractive shrub easily recognized by its long, sharply-toothed leaves and its large red flowers.

Babbaja. A type of grass. The Buddha said: 'The wise say that the strongest fetters are not made of iron, wood or *babbaja*, but of the

longing for jewellery, of precious stones, offspring and wives' (Dhp 345). See **Kusa** and **Dabba**.

Babbu. See **Biḷāla**.

Barihi. See **Mayūra**.

Barihisa. A type of grass used in sacrificial rituals (A II 207; M I 344).

Bala. See **Kāka**.

Balākā. A type of wading bird described as being pure white and having a crest on its head. This most likely refers to the Little Egret, *Egretta garzetta* (Ja III 226; Th 307). With its white plumage, black legs and yellow feet, this small bird is often seen in marshlands and paddy fields where it hunts insects, frogs, small fish and crustaceans. The bird's long drooping crest, made up of two narrow plumes, appears during the breeding season.

Baḷiyakkha. A type of bird (Ja VI 539).

Bahucitra. A type of bird (Ja IV 406).

Bidala. A type of pulse which was made into soup (Ja IV 352).

Bimba. Scarlet Gourd, *Coccinia grandis* (Ja VI 457), sometimes *vimba*. A herb climbing by means of tendrils and with five-angled stems. The cylindrical fruit is narrowed at each end and green with white stripes gradually becoming scarlet as it ripens. The lips of a beautiful young woman are often said to be the colour of this gourd when ripe (Ap 182; Ja III 478; VI 457; 591). The gourd is a popular food item.

Bimbijāla. See **Kuravaka**.

Biḷāra sasakaṇṇika. This is not a name as such but a description meaning 'the hare-eared cat' (Ja V 406), which probably refers to the Caracal, *Caracal caracal*. This medium-sized cat is reddish-grey above fading to buff or white below and has a short tail. The large ears are triangular and pointed, black on the back and with long erect tufts of black hair on the tips. The caracal prefers dry scrubland where it shelters in hollow trees and under boulders during the day and hunts birds and small mammals at night. The caracal is critically endangered in India.

Biḷāla. Domestic Cat, *Felis sylvestris*, also called *biḷāra*, *babbu*, *babbuka*, or *majjāra* (D II 83; Ja I 480; Vin I 186). Cats are small

mammals of the family *Felidae* with rounded heads, erect ears and large eyes with vertical-slit pupils. They also have sharp claws that can be retracted into sheaths. The ancient Indians did not keep cats as pets but only to kill rats and mice and other household pests. The Buddha commented that a cat will sit at a door post, a rubbish heap or a drain patiently waiting for mice (M I 334). Nāgasena said: 'As a cat in caves and holes and inside large houses, seeks only after rats, so too the meditator, the earnest student of meditation, in the village, the forest, at the root of a tree or an empty place should constantly, continually and with diligence seek only the nourishment of mindfulness of the body' (Mil 393).

There are several species of wild cats in northern India; the Leopard Cat, *Felis bengalensis*, the Fishing Cat, *Felis viverrina*, and the Jungle Cat, *Felis chaus*, being the main ones. The mention of jungle cats (*araññabilāla*, Ja VI 334; VI 277) and of the hunting of cats probably refers to these animals rather than their domestic cousin. The cat skin bags the Buddha spoke of were probably made out of the beautifully marked pelts of wild cats such as the leopard cat (M I 128).

Biḷālī. A kind of tuber or yam, sometimes *bilālī* (Ja IV 13; V 46). The Bhikkhāparampaka Jātaka describes a forest-dwelling ascetic foraging a variety of roots and grains from the forest including *biḷālī* (Ja IV 371).

Bīja. Seed. A seed is a new plant in the form of an embryo. Some of the parts of seeds mentioned in the Tipiṭaka include the husk (*thusa*), the kernel (*miñja*), and in the case of germinating seeds, the sprout or shoot (*aṅkura*). The seeds of certain plants are encased in a pod (*kuṭṭhilika*, *puṭa* or *sipāṭika*). The Buddha mentioned at least two species of trees whose seed pods burst or split (*ādinṇa*) open (S I 193). In order to germinate a seed has to have an intact casing, be fresh, be unspoiled by wind or heat and be sown in a good field with properly prepared soil (A I 135).

The Buddha noticed that some plants are resprouters, i.e. that they are adapted to sprout and grow quickly after a fire. He mentioned that 'When a fire burns down a forest ... the shoots there spring to life once more as the days and nights go by' (S I 69). The seeds of some plants likewise sprout quickly after being burned and the Buddha's observation may have included this phenomena also.

The two factors that enable a seed to grow are nutrition from the soil (*paṭhavī-rasa*) and moisture (S I 134). Whether the leaves or fruit of the plant is sweet or bitter was believed to depend not on the nutrition but on the nature of the seed (A I 32).

The ancient Indians practiced seed selection in order to improve crops. The Jātaka says: 'One who picks the fruit that has ripened on a tree and appreciates its taste does not destroy its seed' (Ja V 243). Commenting on the endless cycle of agriculture the monk Kāḷudāyīn said: 'Again and again they sow the seed; again and again the god king rains; again and again farmers plough the fields; again and yet again the country has grain' (Th 532).

Some of the seeds mentioned in the Tipiṭaka include *sāli*, *vīhi*, *mugga*, *māsa*, *tila* and *tanḍula* (M I 57). Elsewhere, the first two of these are included in a list of edible grains and beans (Vin IV 264). See **Dhañña**.

Bijakanīla. A type of water plant (Vin III 276).

Bīraṇa. Vetiver, *Chrysopogon zizanioides* (S III 137). A common stout tufted grass usually found growing in damp or swampy ground. When dried the root of this grass, called *usīra* in Pali, gives off a pleasant fragrance. The Buddha mentioned the fine fibres of the *usīra* root (A I 204) and recommended the root itself as a medicine (Vin I 201). It was also used to rub down elephants (Ja V 39) and corpses were sometimes laid out on a bed of *bīraṇa* grass (D III 7). The *Mahāvastu* describes a maiden as having a complexion like *usīra*, probably referring to the fresh root's delicate pink colour (Mvu II 59). The Buddha said: 'This I say to you, sirs, who are gathered here; dig up the root of craving as one seeking the *usīra* digs up *bīraṇa* grass' (Dhp 337).

Beluva. Bengal Quince or Wood Apple, *Aegle marmelos* (Ja III 77; IV 363) sometimes also *vilva*. A small tree with thorns near the base of the leaves and a greenish-white flower. The fruit is called *billa* (Ja III 77; VI 578) and is round, yellow when ripe and contains a sweet aromatic pulp. The monk Kokālika developed boils all over his body as big as a Bengal Quince which burst open causing him to die (S I 150). Pañcasikha's lute was made out of yellow wood of this tree (D II 265) and ascetics made their staffs out of the wood also (Ja VI 525). The fruit, leaves, roots and stems are all believed to have medicinal properties.

Bhagīnimālā. A type of flowering tree (Ja V 420; VI 269).

Bhaṅga. Cannabis, *Cannabis sativa* (Vin I 58). Cannabis is a tall annual herb with broad spear-shaped leaves with serrated edges and which emits a particular odour. Steam from cannabis leaves boiled in water was used as a sweating treatment for sore limbs and rheumatism (Vin I 205). Fibre from the stem was used to make ropes and woven into a coarse cloth (D II 350 Vin III 256). There is no mention in the Tipiṭaka of cannabis being taken for its psychotropic effect. The Hindi word *bhang* is now used specifically for the dried leaves of this plant.

Bhañjanaka. A type of red-coloured vegetable (Vin IV 259). This could refer to the red shallot, a variety of onion usually much smaller than most onion bulbs and made up of a cluster of cloves called offsets. Ranging in colour from brown to grey, the skin of the cloves is typically bright red. See **Paṇḍuka**.

Bhaṇḍi. A type of plant (Ja V 420; VI 537). This might be Hill Glory Bower, *Clerodendrum infortunatum*, a gregarious shrub growing up to 2 meters high with oval leaves and pretty five-petaled white flowers with pink centres and unusually long stamens. The leaves and flowers are used in traditional medicine. It should be noted that the *Amarakośa* gives *bhaṇḍi* as an alternative name for madder. See **Mañjetṭhī**.

Bhaṇḍu. A type of bird, possibly the swift (Ja VI 538). The House Swift, *Apus affinis* is a small smoky-black bird with a white throat, long narrow wings and a square tail. It is often seen roosting and nesting near human habitation. During the day it flies about at great speed catching insects and in the late afternoon it congregates in large numbers high in the sky uttering a shrill tittering cry.

Bhaddamuttaka. Nut Grass, *Cyperus rotundus* (Ja VI 537; Vin IV 35), also *bhaddamutta*. A common weed with a pleasant-smelling tuber which was used as a medicine (Vin I 201).

Bhamara. Rock Bee, *Apis dorsata*. A large aggressive wild bee with a shiny black body and which builds huge nests on cliffs and the branches of tall trees. It is one of several native Indian bees which produce honey collected for human consumption (Ja VI 536). The Buddha said that a monk depending on a village for alms should be like a rock bee which collects nectar from the flower without

damaging its colour or fragrance (Dhp 49). He also said that a lay person should accumulate wealth the way a rock bee gathers nectar, i.e. diligently (D III 188).

Glossy black hair was often compared to the colour of the rock bee (Thī 252) as was an arahat's clay bowl (Ja IV 114). One of the strings of the Indian lute was called the *bhamara-tanti* because it sounded similar to the deep resonant humming of this bee (Ja II 253). The Nidānakathā mentions a swarm of 'five-coloured *bhamaras*' (Ja.I,52). The *Carakasamhitā* mentions *bhamara* as one of the eight types of honey. See **Khudda** and **Madhukara**.

Bhallāṭaka. Marking Nut Tree, *Semecarpus anacardium*, also *bhallāṭaka* (Ap 346; Ja VI 578). A medium-sized tree with low spreading crown and large leathery leaves which cluster near the end of the branches. The dark brown bark has an acrid juice and a black resin extracted from the fruit is used by washermen to mark laundry.

Bhaveyya. A type of tree with an edible fruit, perhaps a species of banana (Ja VI 529).

Bhassara. A wading bird, probably either the Black Ibis, *Pseudibis papillosa*, or the Glossy Ibis, *Plegadis falcinellus* (Ja VI 538). In Hindi the first bird is called *baza* or *kala baza* while the second is called *chhota baza*. The black ibis has black plumage with a white patch on its wings and red warty skin on its crown. The smaller glossy ibis has dark brown plumage with glossy black wings. Both birds are found around water, although the black ibis will also feed in dry paddy fields, grassland and lawns.

Bhāsa. Eurasian Sparrow Hawk, *Accipiter nisus* (Ja VI 538), a medium-sized hawk with a brown head, back and wings, a white throat and spotted breast and with four or five black bands on its tail (Sn 790). The Eurasian sparrow hawk preys mainly on other birds, including those much larger than itself. In some countries it is trained and used for hunting.

Bhiṅkāra. Possibly the Greater Racket-tailed Drongo, *Dicrurus paradiseus* (Ja V 416). A glossy-black bird with a tufted forehead and a long tail ending in two wire-like prongs with spatula ends. The drongo is a noisy bird with a variety of calls, is very good at mimicking other birds and is often kept as a pet.

Bhujapatta. The Himalayan Birch, *Betula utilis* (Ja II 114) sometimes also *ābhuji* (Ja V 195; 406). This tree grows in the Himalayas up to 4,500 meters. Often forming forests, it grows up to 20 meters high and has ovate leaves with serrated edges. In ancient times its thin, white papery bark was used to write on.

Bhujalaṭṭhi. A type of vine or creeper (Ja VI 457). The name means ‘snake vine’ and it may be another name for the Betel Vine. See **Nāgalatā**, **Nāgavallika** and **Tambūla**.

Bhūmipappaṭaka. A type of mushroom or fungus that appeared at the beginning of the world (D III 87).

Bheradaka. See **Sigāla**.

Bhobhukka. See **Soṇa**.

M

Mamsi. See **Narada**.

Makaci. A type of coarse cloth. There is a description of pomace being strained through a piece of this cloth to get the last juice out of it (Ja II 96). It is also mentioned as something that would be washed in a river by outcastes (Ja V 429). This may be a reference to the process of soaking the jute plant in water for several days to loosen its fibres. Thus this cloth was probably made from one or another of India’s fibrous plants. See **Potthaka**.

Makara. This name usually refers to a mythical marine creature with a huge head and mouth and a small body (Ja II 442). A *makara*-tooth pattern was cut into the stand monks used to place their bowls on so as to give them a better hold (Vin II 113; 117; 152). This suggests that there was actually a fish of this name.

If so, candidates for such a creature may be the several species of sawfish found in India, e.g. the Freshwater Sawfish, *Pristis microdon*, the Knifetooth Sawfish, *Anoxypristis cuspidate*, and the Green Sawfish, *Pristis zijsron*. These large fish have long, broad and flat snouts with up to 20 sharp teeth down both edges. Although primarily marine fish, they are known to sometimes swim far up rivers and thus might have been known in the Middle Land. Further, their strange and fearsome-looking snouts may have been imported into the Middle Land. In the past, the fins of saw

fish were dried and exported from India to China, an oil was extracted from the liver and the tough skin was used to make sword scabbards and sandpaper. See **Susu**.

Makasa. Mosquito, also *sūcimukha* ‘needle mouth’ (A II 117; S I 52; Sn 20). Small delicate flying insects belonging to the order *Diptera* that feed on blood. Numerous species of mosquitoes are found in northern India including nine species of *Anopheles* mosquito known to carry malaria. Mosquitoes were one of the many things forest-dwelling monks and nuns had to learn to live with. The monk Gahvaratiriya urged a patient endurance to such biting insects: ‘Annoyed by biting flies and mosquitoes in the forest, in the great jungle, be like an elephant in the thick of the battle and endure mindfully’ (Th 31). The affliction called ‘snake-wind-disease’ (*ahivātakaroga*) is thought by some modern scholars to have been malaria (Vin I 78; Ja IV 200). The Saṃyutta Nikāya mentions a man ‘whose testicles were like pots’ (S II 258), a common symptom of filariasis. When this disease takes the form of grotesquely swollen legs it is called elephantiasis, *sīpada* in Pali, (Vin I 91). The commentary calls it *bhārapāda*, “burden leg”. Filariasis is caused by *Wuchereria bancrofti*, *Brugia malayi* and several other species of roundworm transmitted by mosquitoes.

Monks protected themselves from mosquitoes by sleeping under a kind of tent made of robes (Vin II 119) and herdsmen protected their flocks with smouldering fires (Ja III 401). Even wild animals kept away from swamps to avoid mosquitoes. In the Jātaka there is a story of a man who asked his son to swat a mosquito that had landed on his head. The stupid boy hit the insect with an axe and killed his father (Ja I 247).

Makkaṭa. Rhesus Macaque, *Macaca mulattai*, sometimes also *kapi*. This large, aggressive and mischievous primate has a brown coat, a short tail and a bare red and white patch on its rump. When in oestrus the female’s face goes red. Macaques live in close proximity to humans and are often seen in cities, especially around temples, where they eat flower and food offerings. Commenting on the rapidly changing nature of consciousness the Buddha said: ‘Just as a macaque moving through the trees grabs one branch and lets it go only to seize another, so too that which is called thought, mind or consciousness arises and disappears continually both day and

night' (S II 95). The monk Valliya compared the body to a five-doored house and the mind to a macaque racing around inside it. Then he cried to himself: 'Be still, macaque, stop running. Things are not as they were before. Now you are restrained with wisdom' (Th 125–26). Baby macaques were sometimes kept as pets (M I 384) and adults were trained by street entertainers. We read of such an entertainer having a macaque and a snake play together (Ja II 267). Ascetics would sometimes have cloaks made out of macaque skins (Ja V 235–36). Interestingly, while the Jātaka say the Bodhisatta was occasionally reborn as a *vānara*, he was never as a macaque. See **Kapi**.

Makkaṭaka. Spider, also called *makkaṭa*, *aṭṭhapadā* 'eight legs', and *uṇṇānābhi* 'wool-belly' (Ja II 147; V 47; 469). Spiders are insectivorous arthropods of the order *Araneae*. There are dozens of species of spiders in northern India but not enough information is given in the Tipiṭaka to identify any particular type. In one place we read of dew drops hanging on spiders' webs making it look like a net of pearls (Ja IV 120). The Buddha said: 'Those infatuated by passion are carried along by a self-created stream, like a spider following its own web' (Dhp 347). Spiders were said to catch *paṭaṅga*, insects and flies in their webs (Mil 407).

Makkhikā. A general term for flying insects and probably used mainly for those of the order *Diptera*. For example, bees are sometimes called honey flies, *madhumakkhika*. But perhaps the most common and noticeable fly in the Buddha's India would have been the House Fly, *Musca domestica* (A I 280; II 117; M I 10; III 148). A small two-winged insect, grey with dark stripes and often found around human habitation where it feeds off and breed in fresh meat, carrion, faeces and moist garbage. The larvas of flies, the maggot, was called *pulava* (S V 131; Sn 672) and was described by the Buddha as a creature that is 'born, lives and dies in darkness' (M III 168). Maggots are sometimes mentioned together with *kimi* and *gaṇḍuppāda*.

The Buddha mentioned that one of the things a good cowherd will do is remove flies' eggs from his cows (M I 222). This must refer to the Warble Fly, *Hypoderma bovis*, a large biting fly parasitic on goats, deer and particularly on cattle. They lay their eggs on the forelegs of animals, after hatching the larvas burrow

into the skin and migrate through the connective tissue to the oesophagus. After several month they travel back to the skin and emerge as adults. In the past cowherds used a comb to remove the fly's eggs from their cattle. See also **Upacikā**, **Khuddakamakkhikā**, **Ḍaṃsa** and **Ñīlamakkhikā**.

Maṅkuna. Bed Bug, (Ja I 10), also *maṅkula* and *maṅgula*. A small rusty-red nocturnal insect which feeds on human blood, the two most common species in northern India being *Cimex lectularius* and *C. rotundatus*. Bed bugs are often found in bedding and clothes and their bites cause welts on the body and intense itching. People would beat their mattresses in the mornings to get the bed bugs out (Ja III 423). The commentary to the Vinaya says that the most inferior type of bed is one 'heavy with bed bug excrement'. The presence of bed bugs indicates overcrowding and poor hygiene.

Maṅgusa. See **Nakula**.

Maccha. Fish, also called *ambuja* or *vārija* 'water born' (S I 52, Dh 34). Fish are aquatic cold-blooded vertebrates usually covered with scales. Numerous types of fish are found in the rivers and ponds of northern India, many of them edible. However, only a few of those mentioned in the Tipiṭaka can be identified. Fishing was an occupation, although fishermen were despised together with butchers, fowlers, hunters, robbers, murderers, jailers and others 'who follow a blood-soaked work' (A III 383). There is frequent mention in the Jātaka of fish being eaten, even by ascetics and Brahmins (Ja I 390; II 230; III 52). Apparently it was often consumed together with alcohol (Ja I 349; III 435). Fish were caught in nets, including fine-meshed nets (D I 45), traps, hooked lines or were sometimes speared (Ja I 427), and fish was eaten fresh or dried (Ja I 349). When fishermen caught fish they would throw them onto the sand and later spit them and roast them in hot embers (Ja II 178). We read of fish in a garden pond coming to be fed at the sound of a drum (Ja II 227). Fish sense when a drought is coming and try to swim out of their ponds (Ja II 80).

According to the commentary of the Vimānavatthu, one of the gates of Vārāṇasi was called the Fisherman's Gate, probably because it opened on the river where fishermen worked or sold their catch (Vv-a 19). The Buddha compared the way thoughts flit through the mind to the thrashing of a fish when pulled out of the

water (Dhp 34). Once he scolded some noisy monks, saying that they sounded like fishermen pulling in a good catch (A III 30). Fish were sometimes used in idioms of the time; a devious person was said to be as unknowable as 'the course of fish in the water' (Ja I 295; 300), and to 'be tongueless like a fish' meant to be taciturn (Ja VI 295). Sailors who drowned at sea were said to have become 'food for the fishes' (Ja V 75).

One Jātaka story mentions a gold-coloured fish (Ja IV 335) which could refer to either of two fish found in India, the first being the Golden Barb, *Pethia gelius*. This fish is golden-coloured with silver highlights and has a distinct black spot on the base of its tail. Growing up to 8 cm long, the Golden Barb is found in the standing waters of rivers and in lakes and ponds with silty bottoms where it feeds on small crustaceans and insects. Indian peasants consider the Golden Barb to be an auspicious creature and it is also a popular aquarium fish. The second could be the Golden Mahaseer, *Tor putitora*, a large fish found in the rivers of the lower Himalayas.

Another type of fish mentioned without being named is one with a human-like body, a razor-like nose and which leaps in and out of the sea (Ja IV 139). The *Jātakamāla* mentions the same fish and adds that it looks like it is covered with silver armour (Jm XIV.10–12). This could refer to fish of the *Belonidae* family, specifically the Houndfish or Crocodile Needlefish, *Tylosurus crocodilus*. This fish has a long, cylindrical body and a long narrow beak with numerous sharp teeth. The body is covered with silvery scales turning slightly blue along the back and can be up to 1.5 meters long. It prefers shallow waters and swims close to the surface and has a tendency to leap out of the water. Fishermen can be injured by leaping fish and sometimes even suffer serious stab-wounds from their beaks. This, together with the houndfish's unusual appearance, may have encouraged the myth of it having a human-like body.

Other kinds of fish mentioned but which cannot be identified are the *aggaraka*, *āli*, *kāla-mahā-maccha*, *kāla-maccha*, *muñja*, *rohita*, *pāsāṇa-macchaka*, *satavaṃsa*, *savaṅka*, *silutta* and the *vājala* (Ja I 222; IV 70; V 405; VI 278). According to the Jātaka, the Bodhisatta was once reborn as a fish (Ja I 331). See also **Amarā**, **Maṇḍuka**, **Puthuloma**, **Rohita**, **Sakula**, **Silābhu**, **Siṅgu** and **Susukā**.

Majjāra. See **Bilāra**.

Majjāru. A type of grass from which coverings could be made (Vin I 196).

Mañjeṭṭhī. Madder, Hindi *manjit*, *Rubia cordifolia* (Ja VI 279). A spreading herb that climbs over shrubs and bushes by means of tiny hooked hairs on its stems. It has a yellowish-white flower and a crimson dye is extracted from the bark of the root. When the Buddha was residing at the Kassapa brother's hermitage and a multi-coloured light emanated from his body, one of the colours was crimson, the others being blue, red, yellow and crystal (Vin I 25). Artists included in their palette paint made from lac, turmeric, indigo and madder (S III 152). Madder dye used to be known as 'Indian Red' and was widely used in the cloth industry until the development of synthetic dyes.

Mañjittikā. Red Rot, *Glomerella tucumanensis*. A fungal pathogen that attacks sugar cane (A IV 279; Vin II 256). The organism causes longitudinal reddish streaks in the internal white tissue of the plant resulting in stunted growth. Red Rot is most common during the rainy season. See **Ucchu**.

Maṇḍuka. The Dadhivāhana Jātaka includes an incident where a man pricks a mango seed with a *maṇḍuka* so it cannot germinate (Ja II 105). The word *maṇḍuka* is generally taken to mean a thorn. There are variant readings of this word in the commentaries and later Pali literature including *maṇḍūka* and *maṇḍu*, but most sources agree that it refers to the barb of a particular fish, some adding that it is a poisonous barb, others that it is from the tail of the fish. If this is correct it must refer to a stingray. Stingray barbs may well have been imported into the Middle Land but two species of this fish are found in the Ganges and Yamuna rivers and their tributaries.

The Giant Freshwater Stingray, *Trygon fluviatiles*, is one of the world's largest freshwater fish measuring upwards of 1.9 m across and weighing as much as 600 kg. Its tail barb is not poisonous but it is sheathed with a toxic mucus. The Cowtail Stingray, *Pastinachus sephen*, can be as much as 3 meters long and weigh up to 250 kg. Its tail barb is poisonous. The tail barb of both fish must have attracted attention for their formidable and dangerous appearance.

Killing trees with a stingray barb seems to have been proverbial in Pali literature. The *Visuddhimagga* mentions it (Vism

688) as does the commentary to the Vinaya. The *Mahāvamsa* relates the legend that King Asoka's queen killed the Bodhi Tree at Bodhi Gaya using a stingray barb. 'Dhammasoka raised the treacherous Tissarakkha to the rank of queen. In the third year thereafter this fool, in the pride of her beauty, with the thought: 'Forsooth, the king worships the great Bodhi-tree to my cost!' drawn into the power of hate and working her own harm, caused the great Bodhi-tree to perish by means of a *maṇḍu*' (Mhv XX.4–6).

Maṇḍūkā. Frog, also sometimes *bheka*, (Ja III 430, IV 247). Frogs are amphibians of the order *Salientia* of which about 190 species live in India. Frogs have long hind legs adapted for jumping, large heads with protruding eyes and usually live in or near water. The most common and easily seen frog in northern India is the Skittering Frog, *Euphlyctis cyanophlyctis*. This medium-sized smooth-skinned frog is grey, brown or blackish, often with darker spots and a black belly. It is usually seen on the side of ponds and puddles or floating contentedly on the surface. When alarmed, it skitters over the surface, sometimes for a considerable distance, then dives and buries itself in the mud. The skittering frog is seen in all seasons and eats insects and small vertebrates.

We have a description of crows eating frogs in a dried-up pond (Ja V 106). In his poem in praise of the Ajakaraṇī River, the monk Sappaka mentioned the deep-throated croaking of the frogs (Th 310). When told that people could wash away their sins by bathing in sacred rivers, the nun Puṇṇikā quipped that if this were so then all the turtles, crocodiles and frogs would go to heaven (Thī 241). Once, a group of people sat listening to the Buddha preach and a frog, attracted by the sound of his voice, joined the audience. The frog was accidentally crushed by a cowherd's stick and was afterwards reborn in a heaven realm (Vv-a 217). Unripe fruit was said to be 'as green as a frog' (Ja VI 529) and snakes were sometimes called 'frog eaters' (Ja III 16). See *Nīlamaṇḍūkā* and *Uddhumāyikā*.

Maddālākā. A type of bird (Ja VI 538).

Madhuka. Honey Tree, *Bassia latifolia* (Ja IV 434; VI 93; 529). A large tree with a dense rounded crown, large oblong elliptic leaves attractive cream-coloured flower. The Honey Tree is particularly useful although it is very slow growing and only rarely cultivated.

The wood is good and strong, the fleshy corollas of the flower are sun dried and eaten and a sweet spirit can be made from them. It was probably this drink that the Buddha forbade monks and nuns to take (Vin I 246). The unripe fruit is eaten cooked and oil extracted from the seeds is used for cooking and lighting.

Madhukara. Bee, literally ‘honey maker’, sometimes *madhumakkhika*, ‘honey fly’ (Ja IV 265; VI 506). Bees are winged insects belonging to the order *Hymenoptera*. There are three main species of bee native to northern India, the Rock Bee or *bhamara* and the Little Bee, which are both wild, and the Indian Hive Bee, *Apis cerana indica* which is domesticated.

The ancient Indians were intrigued how bees took nectar from different flowers and yet produced honey with a uniform colour, taste, and smell. The *Mahāvastu* comments that ‘... bees come together and gather the essence of various flowers, gathering it in their mouths and on their feet ... Through their concerted efforts is made a syrup that is sweet to the taste and smell, and that, pressed together, becomes choicest honey, goodly in colour, taste and smell and useful as food and medicine’ (Mvu I 297-98).

Honey, *madhu*, was a much sought-after food. It was eaten with rice (Th 23), used as a medicine (Vin III 77) and sometimes made into mead (Vin IV 110). Lumps of crystallized honey are mentioned (Vin I 221) as are honey cakes (A III 237), honey balls (M I 114) and wild honey (D III 87). To find the bees’ hives, honey gatherers would tap the trunks of likely trees (Ja III 200). Bees’ wax was used for various purposes and when mixed with oil was applied to the hair (Vin II 107; 116). Diabetes was known as ‘honey urine’ (Vin IV 8). The Buddha’s first meal after his enlightenment was honey balls and barley gruel offered to him by the merchants Tapassu and Bhalluka (Vin I 4). The Buddha described as ‘honey-tongued’ the person whose speech is ‘harmless, pleasing to the ear, agreeable, going to the heart, urbane, pleasant and liked by everybody’ (A I 128). See **Khudda**.

Madhulaṭṭhikā. Liquorice, *Glycyrrhiza glabra* (Ja I 68; VI 537), also *madhulaṭṭhi*, *laṭṭhimadhuka*. The Pali name means ‘honey stick’. This hardy shrub bearing lavender-coloured flowers and its sweet-tasting root was probably imported from Kashmir or Persia. The root is harvested and then dried and cut into pieces or powdered.

An extract from the root is taken for abdominal pain, vomiting, chesty cough and sore throat.

Manosilāhaṃsa. Uncertain but perhaps the Pink-headed Duck, *Rhodonessa caryophyllacea* (Ja V 356). About the size of the domestic duck this bird has dark-brown plumage, a bright pink bill and head and a pink speculum which is very noticeable in flight. The last pink-headed duck in the wild was seen in 1935 and the last known specimen died in captivity in England in the same decade. It is now presumed to be extinct.

Mandārava. The Indian Coral Tree, *Erythrina suberosa* (Ja I 13; 39; IV 359), also *pañgura* or *pālibhaddaka* meaning ‘very auspicious (Ja IV 205), a medium-sized ornamental tree commonly cultivated in gardens in India. This tree has conical prickles on its trunk and branches, broad trifoliate leaves and beautiful bright red flowers. The flowers appear before the new leaves have grown. It was believed that coral trees grew in heaven (Ja I 202; V 281; 392) and it was the blossoms from these divine trees that fell from the sky just before the Buddha’s final Nirvana at Kusinārā (D II 137). There is also mention of a five-hued coral tree (Bv I.36).

Mandālaka. A type of aquatic plant (Ap 347; Ja VI 564).

Mayūra. Indian Peafowl, also called *barihi*, *mora*, *sikhaṇḍī* and *nilagīva*, ‘the blue-necked one’, *Pavo cristatus*. A large ground bird with a distinctive crest and long tail. The male has a beautiful blue-green neck, breast and tail and chestnut brown wings. Peafowl congregate in small flocks, roost in trees at night and have loud ‘may-aw’ calls which can be heard over a long distance. The early morning cry of the ‘beautiful blue-necked and crested peacock’ would wake sleeping monks (Th 22). They are ‘fair-crested, fair-winged, with beautiful blue necks, fair-faced and have a beautiful song and a fine cry’ (Th 211). The colour of the peacock’s neck was compared with that of beryl (Ja I 207).

For centuries peacock flesh was considered a luxury food in India and a prerogative of kings and the wealthy. And in 257 BCE King Asoka announced that his royal kitchens would no longer serve meat although two peacocks and one deer would continue be slaughtered daily for the royal table. Perhaps connected with this to this, 14 years later he designated various animals as protected and not to be killed, but the peacock was not amongst them. Suśruta

advised kings to eat various types of meat daily including peacock in order to maintain health and vigor.

Fly whisks were made out of peacock feathers (Vv-a 147) and Indian magicians have always used peacock feather fans as their wands. The Buddha compared lay people with the peacock and monks with the goose. The first is beautifully adorned but a clumsy flier, while the second is drab-coloured but can fly with ease (Sn 221). In the Bamboo Grove at Rājagaha, there was a place where people came to feed the peafowl. The peafowl often appears in the Jātaka stories and the Bodhisatta was reborn as a peacock on several occasions and once as a peahen (Ja II 33; III 126; IV 333).

Mayhaka. A bird described as eating the figs and uttering the cry ‘*mayha mayha*’ (Ja III 301). To the ancient Indians this cry sounded like ‘Mine! Mine!’ and consequently in popular imagination the bird was believed to be greedy. It is difficult to identify this bird but it might be the Yellow-Legged Green Pigeon, *Treron phoenicoptera*. This stout yellow, light-green and grey bird has a lilac patch on its shoulders and yellow stripes on its black wings. A gregarious bird, it is often found in large numbers in banyan and bodhi trees eating the figs. The famous ornithologist Salim Ali describes its call as a ‘pleasant, musical, mellow whistle up and down the scale, with a particular human quality’.

Marica. Black Pepper, *Piper nigrum* (Vin I 201). A branching climbing shrub producing long spike on which there are numerous small green round seeds which become black when dried. Pepper, either ground or whole, is used to flavour food and as a medicine (Vin I 201). In its ground form it causes sneezing (Ja I 456). Pepper only grows in south India and must have been imported into the north. See **Pippala**.

Maruvā. Bowstring Hemp, *Sansevieria roxburghiana* (Ja II 115; M I 429), a erect fleshy plant with tufted leaves. The plant yields a very strong fibre that was still being used to make bowstrings at the early 20th century.

Mallikā. See **Sumanā**.

Mahānīpa. The bodhi tree of the Buddha Sumedha (Bv II.51). It is the same as *kadamba* and *nīpa*.

Mahisa. Water Buffalo, *Bubalus bubalis* (A III 121; M I 42; S II 188), also *mahīsa* or *mahiṃsa*. A large slate-grey bovine with sparse hair on its hide and large spreading horns (Ja VI 507). The domestic variety is used to pull ploughs and carts and for its rich milk. The wild water buffalo, *Bubalus arnee*, sometimes called *vanamahisa*, ‘forest buffalo’ (Ja III 26; III 76), is larger and much more aggressive than the domestic variety and is now extinct in northern India. Buffalo fights were a popular form of entertainment (D I 6). According to the Jātakas, the Bodhisatta was once reborn as a wild buffalo (Ja II 385).

Mātulūṅga. Bitter Orange, *Citrus aurantium*, sometimes also *mella* or *bella*. A small thorny many-branched tree, the fruit of which is globose or oblate, with a thin green rind and a juicy flesh similar in taste to the sweet lime. The Jātaka says that the flesh of the wild orange is sweet but the skin is bitter (Ja III 319).

Māluvā. Camel’s Foot Creeper, *Bauhinia vahlii* (Dhp 162; S I 207). This evergreen creeper, the largest in the Indian forest, has soft porous wood, velvety rusty-coloured shoots, paired tendrils and a creamy-white flower. The leaves, which are sewn together to make plates, are downy beneath and have two rounded lobes on the end giving them the shape of a camel’s footprint and hence the plant’s English name. The big woody pods burst open in the summer heat. The seeds can be eaten and the strong rough fibre in the bark is used to make ropes.

Despite its usefulness, the camel’s foot creeper causes great damage to forest trees, twining around them, stunting their growth and sometimes killing them (Ja V 452). It is a fast-growing plant (Dhp 334) and its leaves are large enough to be used as plates (Ja V 389; S V 439) or even mats or covers to sit on (Ja V 205). A man described his lover as ‘clinging to me like a *māluvā* creeper’ (Ja V 215).

The Buddha said that passions spread the way the *māluvā* creeper spreads through the forest (Sn 272). On another occasion he used this plant in a parable in which he warned that although sense pleasures may give immediate satisfaction, they can cause problems later:

‘Imagine that in the last month of the summer the pod of a *māluvā* creeper bursts and a seed drop at the foot of a sal tree ... Being fertile and not being swallowed by a peacock, eaten

by an animal, destroyed by a forest fire, carried away by a forester or destroyed by termites, it was eventually watered by the rains, sprouts and put forth a soft downy shoot which wound around the sal tree. The god living in the sal tree thought “The touch of this *māluvā* creeper is pleasant.” But in time the creeper grew around the tree, made a canopy over it and draped a curtain all around it and broke its branches. And then the god of the sal tree thought “This is the coming danger. Because of this creeper I am now experiencing painful, racking, piercing feelings”.’ (M I 306).

Māsa. Black Gram, *Vigna mungo* (Ja V 37; Vin III 64) is similar to the Green Gram and probably shares a common ancestry with it. Someone who could not make clear distinctions was said to be ‘unable to tell *mugga* from *māsa*’ (Ja VI 355). The bean was also used as a unit of weight in ancient India and was called a *māsa*, equivalent to 0.59 grams.

Miga. A word used loosely for game animals, particularly deer, and especially for the Blackbuck, *Antelope cervicapra*, also sometimes *eṇi*, *eṇeyyaka* or *eṇimiga*. The male blackbuck has a black or dark brown back, with white patches around the eyes, a white chin and underside and long spiralling horns. The female, called *hariṇa*, is similar, only smaller and with a fawn-coloured back and no horns (Ja II 26).

Blackbuck are found in open grassland and light scrub and are now extinct in northern India and endangered elsewhere. A beautiful woman was described as being ‘doe-eyed’ (Ja V 215) and the Buddha said that those monks who followed his instructions lived happily, unruffled and ‘with a mind like a *miga*’ (M I 450). Forest-dwelling monks were often said to be like *miga* in that they were alert, harmless, wandered freely and retreated deeper into the forest when they encountered people (Ja I 390; Mil 212; Sn 39). Grazing blackbuck continually keep their ears erect and twitching in order to detect the slightest sound (Ja VI 559). Ascetics used blackbuck hides, *ajina*, as mats, made cloaks out of them (Sn 1027; Ja IV 387) or sometimes out of strips of the hides (A I 240; D I 167).

The Buddha proclaimed the Dhamma for the first time in a blackbuck reserve called Migadāya near Vārāṇasi and the pedestals of ancient Indian Buddha images depicting this event often include

two blackbuck flanking a Dhamma wheel. One of the 32 special characteristics of a Mahāpurisa is that he has legs like an *eṇi* (D III 143).

A proverb said that a dishonest person is 'as twisted as the horn of an *issā*' (Ja V 425). This would seem to be referring to the male blackbuck's distinctive spiralling horns and thus *issā* may be another name for the animal (Ja V 416). During the Islamic period and perhaps earlier, blackbuck were sometimes tamed and kept as pets and for their meat and milk. In the *Milindapañha*, the blackbuck is included in a list of domestic animals (Mil 267). See **Eṇeyya**.

Migamātukā. A type of animal, perhaps a deer (Ja I 388).

Mīḷhakā. Sometimes also *mīḷhakā* or *piḷhakā*. A type of creature that feeds on faeces, probably an insect. The Buddha described this creature as being 'a dung-eater, stuffed with dung, chock-full of dung' (S II 228). See **Gūthapāṇaka**.

Mugga. Green Gram, *Vigna radiata* (D II 293; Ja I 429; M I 57; S I 150; II 139). A commonly cultivated plant which produces small green edible beans. Before his enlightenment, when he was practising austerities, the Buddha ate soup made from green gram (M I 245). It was said of someone who could not make clear distinctions that they 'could not tell *mugga* from *māsa*' (Ja VI 355). A gruel of sesame, rice and green gram was given as a medicine (Vin I 201).

Muggatiya. A type of plant (Ja VI 536). It was said to grow on the banks of rivers and ponds.

Mucalinda. The Freshwater Mangrove, *Barringtonia acutangula* (Ja V 405, VI 269; 536), also *nicula*. A moderately-sized tree with obovate leaves grey distinctly fissured bark and often with a short but thick trunk. When in flower masses of pink to red flowers hang down on pendulous racemes. The tree is commonly found growing near wetlands and on the banks of rivers and streams. The Buddha spent his third week at Uruvelā sitting at the foot of a *mucalinda* tree. While there a great rainstorm began and the dragon (*nāga*) Mucalinda sheltered him saying: 'Let not cold or heat, the touch of flies or mosquitoes, wind or sun or creeping things disturb the Lord' (Ud 10). On another occasion he stayed at Kimbilā which was on the bank of the Ganges, in a grove of these trees (A III 339; S IV 181).

Muñja¹. Munj Sweetcane, *Saccharum bengalense* (D I 77). A large spiky tufted grass that commonly grows along the banks of rivers and tanks. It was used to make various articles including fetters for cows (M II 17; Sn 28; Th 27, Vin IV 39). The Buddha said that *saṃsāra* was as tangled and twisted as a rope made of *muñja* grass (A II 211). A girdle of *muñja* grass was tied around a Brahmin boy's waist during his initiation into the Vedic tradition (Ja V 202). When Māra tried to talk Prince Siddhattha out of continuing his quest for enlightenment, the prince replied: 'Look, I wear *muñja* grass', meaning that he could not be deterred from his quest (Sn 440). Today, *muñja* grass is used to make mats, ropes and paper. See **Sara**.

Muñja². A type of fish (Ja IV 70; VI 278).

Muttā. Pearl. These small round shiny silvery-white objects are sometimes found in the marine bivalve the Akoya Pearl Oyster, *Pinctada fucata* (Ja III 437; IV 120; VI 489). This mollusc is found all down the east coast of India. Pearls were used as jewellery, usually as strings (Ja VI 345), earrings or nets, and were one of the many precious things coming from the ocean along with gems, beryl, conchs, quartz, coral, gold and silver, rubies and emerald (Ud 54). A beautiful woman's teeth were described as being like pearls (Ja V 203). One of the jobs of the royal assessor was to value the pearls the king wished to buy (Ja IV 137). A story about the theft of a queen's pearl necklace by a monkey is one of the more popular Jātaka stories (Ja I 383). According to the *Gaṇeśa Purāṇa*, a Hindu text from about the 14th century, pearls were harvested in the waters off Sri Lanka, Kathiawar and Tamrilipti and must have been imported from these regions into northern India. See **Saṅkhamuttā**.

Mudayanti. Ajwain, *Trachyspermum ammi*, a slender plant with small leaves (Ja VI 536). The seeds are aromatic and are eaten for their pleasantly pungent taste.

Muddikā. Grapes, the small round fruit of the Grape Vine, usually either green or purple. The Buddha said the essence that the vine absorbs from the earth contributes to the grape's sweetness (A I 32). The grape vine native to the Indian sub-continent is Indian Grape, *Ampelocissus indica* (Ja VI 529). Although grape vines would not grow well in the Middle Land some must have because the Buddha

allowed monks to drink grape juice (Vin I 246). However, most grape wine and grapes, probably dried ones, were probably imported from what is now Afghanistan, then known as Kapiśi. The grapes of Kapiśi were renowned; the *Arthaśāstra* calls them *Kapiśayanī drākshā*. Another grape vine native to India is the Jungle Grape, *Ampelocissus latifolia*, the fruit of which can be eaten but more usually is used as a medicine. Vinegar, *ambila*, was made from sugar cane juice but sometimes from wine also (Ja II 448; V 465).

Mūlaka. Horse Radish, *Raphanus raphanistrum subsp. sativus* (Ja IV 88). An annual or biannual herb with bushy toothed leaves, a prominent root and a white or purple flower. The Indian radish is less developed than the European variety, its root being small, conical and white. Both the root and leaves are eaten either cooked or raw and an oil is extracted from the seeds. The Jātaka tells how a goblin (*yakkha*) ate a child 'as if he were chomping on a radish bulb, and swallowed him down' (Ja IV 491).

Mūsikā. House Mouse, *Mus musculus*, also called *ākhu* (Ja I 478). A small rodent varying in colour from brown to grey and with small ears and a tail usually longer than its body. Commonly found in homes, the mouse also lives in fields and scrub. The Buddha said that there are four types of mice; those that dig holes but do not live in them, those that live in holes that they have not dug, those that neither dig holes nor live in them and those that live in the holes they have dug (A II 107). Mice would sometimes frolic happily in barns (S I 170). Superstitious people believed that it was possible to foretell the future by examining holes chewed in cloth by mice (D I 8).

There are numerous species of field mice, dormice and bandicoots found in northern India and the word *mūsikā* may well have been used for some of these also. According to the Jātaka, the Bodhisatta was once reborn as a mouse (Ja I 460).

Mella. See **Mātuluṅga**.

Moca. A type of banana with seeds (Ja V 405; 406; 465). The fangs of the hounds of purgatory were said to be as big as the fruit of this tree (Ja IV 181). A drink was made from the fruit (Vin I 246). See Kadali.

Mora. See **Mayūra**.

Moragu. A kind of grass (Vin I 196).

Y

Yava. Barley, *Hordeum vulgare* (S V 10; Vin III 15; IV 264). An annual erect tufted grass resembling wheat and producing an edible grain. Cattle had to be prevented from wandering into barley fields and eating the crop (S IV 195). After harvesting, it was tied into sheaves and beaten with flails (S IV 201). Barley was used as food, fodder and in brewing. A popular preparation was called *yāvaka* (Ja VI 373) which Pāṇini says was made by pounding barley in a mortar to remove the chaff, boiling it in either water or milk and then adding sugar. Barley meal, called *sattu*, was prepared as a gruel or made into a dough and baked (Ja III 343; Vin IV 80). The Buddha's first meal after his enlightenment was barley gruel and honey balls offered to him by the merchants Tapassu and Bhalluka (Vin I 3).

Another popular preparation made from barley or sometimes from *mugga* also was called *kummāsa*, a type of porridge or gruel (Ja III 405–06). When the Bodhisatta gave up self-mortification he regained his strength by eating boiled rice and *kummāsa* (M I 247). When Ven. Raṭṭhapāla returned to his home to beg for alms after having become a monk, his parents, failing to recognize him, refused to give him anything. Seeing the household slave about to throw away the remains of the previous evening's meal of *kummāsa* and asked her if she would put it in his bowl (M II 62).

Apart from being a porridge apparently this preparation could also be boiled in a small amount of water so that it was became thick enough to be made into lumps. The Kummāsapiṇḍa Jātaka mentions a lump of dry (*sukkha*) unsalted *kummāsa* being offered to an ascetic (Ja III 408). According to the *Carakasamhitā*, *kummāsa* can be put in a pot and allowed to ferment and then taken as a medicine. *Kummāsa* was considered a low quality food. The Chāndogya Upaniṣad mentions villagers eating it after their crops had been destroyed by locusts.

Monks put barley meal in their needle cases to prevent the needles from rubbing together and becoming blunt (Vin II 116). In ancient India the width of a barley corn was used as a unit of measurement.

The Buddha mentioned that the awn (*sūka*) of a barley corn if positioned wrongly, could pierce the hand or foot and draw blood (A I 8). A proverb said that a person could get irritated the way a

barley awn irritates the eye (Ja VI 294). The Buddha mentioned another type of barley without naming it: ‘When a barley field is ready, the contamination, the chaff, the rubbish of barley may appear, its root, stalk and leaf the same as true barley but without the same head. Only when the head forms do the farmers know “This is the contamination, the chaff, the rubbish of the true barley” and knowing this they pull it out by the roots and throw it outside the barley field. And why? Because they think “Let it not contaminate the true barley”.’ (A IV 169). This probably refers to Wild Barley, *Hordeum spontaneum*, the ancestor of *H. vulgare*, which looks very similar to it except that they has a shorter stem, narrower leaves and a smaller head. Wild barley competes with cultivated barley, lowers yields and is considered a weed.

Yūthikā. *Jasminum auriculatum*, sometimes *yodhikā* (Ja IV 440; VI 537). An erect bush with simple ovate leaves and a beautifully perfumed white flower. It is often cultivated in gardens but also grows wild. See **Sumanā**.

Yodhikā. See **Yūthikā**.

R

Rattasālī. See **Nīvāra**.

Ravihaṃsa. A type of water bird (Ja VI 539). The name means ‘sun goose’ or ‘sun duck’.

Rājahaṃsa. King goose or duck (Ja III 55). It is not clear whether this refers to an individual bird recognized by the others as their ruler or a particular species of bird. In Hindi the name *raj hans* is used for the Greater Flamingo, *Phoenicopterus ruber*, the Greylag Goose and the Bar-headed Goose. The greater flamingo is a long-legged, long-necked bird with white plumage and a large down-turned bill. The legs, parts of the wings, bill and naked area around the eyes are bright pink. The flamingo is occasionally seen in northern India feeding around lagoons, salt pans and estuaries. For the other two birds see **Haṃsa** and **Kādamba**.

Rājāyatana. Chirauli Nut Tree, *Buchanania cochinchinensis* (Ja IV 363), sometimes also *piyāla*. A medium-sized straight tree with rough bark and dense pyramid-shaped clusters of white flowers.

The globose black fruit is very palatable and was eaten (Ja V 324) and today is widely used in confectionery. A light-yellow oil with a sweet aroma similar to almond oil is extracted from seeds. During his stay at Uruvelā, the Buddha spent seven days sitting at the foot of a *rājāyatana* tree. While there, the merchants Tapassu and Bhalluka became his first disciples (Vin I 3).

Rājikā. The dark-brown oblong seed of the Mustard plant, *Brassica juncea*. The plant itself is a slender, long-leaved herb with a bright yellow flower. It grows wild but is also sometimes cultivated for the pungent oil extracted from the seeds. These seeds were used as a unit of weight for measuring gold (Ja VI 510; Th 97). See **Sāsapa** and **Siddhatthaka**.

Rukkha. Tree, also *duma*, *jagatāruha*, ‘earth grown’, *pādapa*, ‘foot drinker’ and *viṭapin* (A III 43; Bv IX.28; Ja I 216; VI 178). Trees are perennial erect plants usually with a single woody stem from which branches bearing leaves extend. The Jātaka say: ‘It is called a tree because it has branches. Without branches it’s just a stake’ (Ja IV 483). The Tipiṭaka mentions many types of trees and trees in general. Some of the structural components and other parts of trees referred to include the roots (*mūla*), trunk (*daṇḍa* or *khandha*), the periderm or outer bark (*papaṭikā*), the phloem or inner bark (*taca*), sapwood (*pheggū*), heartwood (*sāra*), branches (*sākhā*), twigs (*pasākhā*), leaves (*paṇṇa* or *patta*) and crown (*agga*, M I 193–96). Some trees also have thorns. Plant morphology makes a distinction between thorns, spines and prickles, but the Pali word *kaṇṭaka* is used for all three without distinction.

Roots, those parts of trees and other plants that anchor them and absorb and transport water and nutrients, are discussed in detail in the Tipiṭaka. Some of the different root systems mentioned include woody roots which could be either long or short (*dīghamūla*, *rassamūla*, (Ja II 346), tap roots and lateral roots (*mūlāni ahogamāṇiyāni tiriyaṅgamāni*), feeder roots (*nāli*), spreading roots (*mūla-santānaka*), hair roots (*mattāni*, S II 87–8; III 155), and in the case of some other plants, tubers (*āluka* or *āluva*, Ja IV 46) and bulbous roots (*kanda*, D I 101). The aerial roots of banyan trees were called ‘trunk-sprung’ (*khandhaja*, Sn 272). It was understood that roots absorb moisture and nutrition from the soil and that the sap (*ojā*) moves upwards through the trunk into the branches and leaves. The *Visuddhimagga* says:

‘When a great tree is growing on the earth, nourished by the essence of humus and, with that as condition, its roots and trunk, branches and shoots, foliage, flowers and fruit grow so it fills the sky and continues the tree’s species until the end of the aeon, one cannot say that the essence of humus is only found in the roots but not in the trunk or in the fruit but not in the roots, and so on. And why? Because it spreads throughout the whole tree from the roots upwards.’ (Vism 688)

The Buddha said:

‘Just as a tree that has been cut down can grow again if its root is undamaged and complete, in the same way this suffering returns again and again if the tendency to craving is not removed.’ (Dhp 338)

However, it was observed that some plants, palm trees in particular, could not grow again if they were ‘cut off at the root.’ (A I 137) Other trees and plants will send up shoots and regenerate themselves when cut down. This ability to grow back would have been a serious problem for those clearing forests to make way for agricultural land. The Buddha described a man cutting down a *māluvā* creeper, then digging up and pulling out the roots, even the small ones, and burning them all to guarantee that the unwanted plant did not regrow (A I 204).

There were still large forested tracts in northern India during the Buddha’s time. The Mahāvana or Great Forest, extended almost unbroken from the outskirts of Vesālī to the lower Himalayas. Once, the Buddha stayed in a forest near the village of Pārileyya where an elephant looked after him (Ud 42). Other forests visited by the Buddha were the Dark Wood near Sāvatti (S I 130), the Forest of Offering at Kusinārā (A V 78), the Gosīṅga Forest at Vesālī where many *sāla* trees grew (A V 134) and the Cool Forest to the west of Rājagaha near the city’s charnel ground (A III 374). Very large and majestic trees were sometimes called *vanaspati* or *vanappati*, ‘forest lords’ (Ja IV 229; S IV 302; Vin III 47).

The Buddha encouraged monks and nuns to seek solitary lodgings in the forest (A II 250), ‘at the roots of trees, mountain slopes, a glen, a hill cave, a cemetery or a scrubland’ (M III 3). He said: ‘The one who wears rag-robles, who is lean, with protruding

veins and who meditates alone in the forest; him I call a true Brahmin' (Dhp 395). When King Pasenadi visited a quiet park and saw the roots of the trees, they reminded him of the Buddha (M II 117). Some monks tried living in hollow trees and in the fork of trees (Vin I 152). A forest-dwelling monk was advised not to settle down at the foot of a tree on a border, one used as a shrine, one from which resin or fruit was collected, one in which flying foxes roost, a hollow tree or one growing in a monastery (Vism 74).

However, forests could also be frightening places; they were the abode of dangerous animals and bandits, and travellers could get lost in them (A I 153; Ja I 320; S II 98). The Buddha commented that when he lived in the forest before his enlightenment sometimes at night 'an animal would prowl around, a peacock would snap a twig or the wind would rustle the leaves' and he would be filled with terror (M I 21–2). A Brahmin who encountered the Buddha in a forest expressed surprise that he could maintain his serenity in such a lonely and menacing place. 'Having entered the empty and desolate forest, deep in the jungle where many terrors lurk, with body still, stable, steady and lovely, you meditate so beautifully, oh monk. In the forest where no serenade or music is heard, I think it amazing that you, oh sage, having resorted to jungle solitude, to the forest, live with a joyful mind' (S I 180–81). Those entering the forest had to be careful of what fruit they ate as some was poisonous (Ja III 200). Some woodlands were thorny, unpleasant and difficult to walk through without getting cut or scratched (S IV 189).

Trees, whether wild or cultivated, provided people with many useful products; the main ones being fuel for fire and material for building. People gathered fire wood in forests (S I 180) and a Jātaka say: 'Forests are made of [potential] fire wood' (Ja I 289). Once the Buddha met King Pasenadi's minister of works while he was supervising the cutting of timber in a sal forest (S I 179). The Bhaddasāla Jātaka makes the interesting comment that all the royal palaces in India were supported by numerous columns, some of which must have been wooden. It seems that the king of Benares wanted to construct a magnificent palace supported by a single column and commanded his officers to find a tree trunk big enough for the purpose. They went to the forest and located enough such trees but the state of the roads, they reported to the

king, would not allow for the transportation of such a huge log (Ja IV 153).

Fences and kraals were made out of the branches of thorn trees (Vin II 154). The leaves of certain trees were used to make various household articles such as baskets, fans and plates and were used as wrappers for food (Ja VI 510; S V 438). Parasols could also be made out of leaves (Ja III 79). The seed pods (*sipātikā*) of some trees contained down (*tūla*) which could be used to stuff pillows and pad furniture and saddles. We read of wooden tubs (Ja I 250) and of a canoe being made out of a single large log (S I 106). Forest-dwelling ascetics built themselves leaf huts (*pañṇakuṭi*, D III 94; S I 226; Ja II 72; 273) to live in.

Another product of trees that a use was found for was the bark (*taca*, *vāka* or *vakkala*, A I 152; D I 167; Ja II 13; M I 198). Household articles like fans and ropes are occasionally mentioned as being made out of bark (Ja III 204; Vin II 130). Ascetics are often described as being dressed in *vakkala* (A I 240; Ja II 272). Although this is usually taken to mean a type of cloth made from bark this may not be the case; more likely it was made out of fibres from the phloem or inner bark of some type of tree or trees. *Vakkala* clothing made a rustling noise as the wearer moved (Ja II 274). The commentary to the *Nidānakathā* mentions some of the benefits of this unusual type of clothing: It is cheap, it can be made by oneself, it is hard to get dirty and easy to wash, it is easy to mend, it is not difficult to get a new one when the old one is worn out, it is suitable for the ascetic life, thieves do not bother to steal it, it does not beautify the wearer, it is light to wear, it is conducive to contentment, it can be obtained by righteous means and if it is lost it causes no regret (Ja I 9).

There are occasional references to ascetics wearing bast or wood fibres (*dāru*), which might be an alternative name for *vakkala* (Ud 6), or wearing *phalaka*, which may have been wooden slats or even wood shavings (Vin I 305). These and similar unusual clothing are described as the 'characteristic of ascetics of other sects' and were not allowed to be worn by Buddhist monks (Vin I 305). It is difficult to identify the trees, the bark or bark fibres of which was used to make cloth. However, some modern Hindu ascetics wear cloth made from the bark of *Careya arborea*, the trees and bushes of the *Hibiscus* genus, particularly *Hibiscus tiliaceus* and *H. collinus*, and also from banana trees.

The Buddha encouraged the planting of fruit trees along roads to offer both shade and food for travellers (S I 33). We read of a man tapping tree trunks with his axe to find hollow ones to use as water pipes (A IV 171) and another doing so to find hollows where bees might be nesting (Ja III 200). Sometimes as an act of merit, people would repair roads by filling in pot holes, removing large stones and cutting down the trees that might strike the axles of passing chariots and carts (Ja I 199). Certain trees were cultivated for their fruit, flowers, foliage and timber. To grow successfully, a sapling had to have its roots cleared of weeds from time to time, be fertilized with humus (*paṃsu*) and be regularly watered (S II 89).

People believed that gods (*ārāmadevatā*, *rukkhadevatā*, *vanadevatā*, A III 369; M I 306; S IV 302) lived in medical herbs and trees, particularly very old, gnarled or beautiful ones. They lived in the hollow of trees or in their crowns (Ja I 405; 423). We read of a woodsman making offerings to what was believed to be auspicious trees (*maṅgala-rukka*) and informing the gods living in them that they intended to cut the trees down (Ja I 442; IV 153). Such auspicious trees were worshipped and given offerings because the gods were believed to grant wishes. Milk and water were poured on the roots, garlands were hung in the branches, lamps of scented oil were burned around them and cloth was tied around their trunks (Ja II 104). There is the occasional mention of animal and even human sacrifices being made to trees. The victim's blood was poured around the foot of the tree and the entrails were draped over the branches (Ja I 260; III 160).

It was believed that trees would give their bounty on condition that they were treated with a degree of respect and the Buddha told a story that illustrates this point. Long ago, the mythical King Koravya had an amazing banyan tree in his realm which bore fruit of exceptional sweetness. Everyone in the realm enjoyed the fruit freely and so there was no reason to guard the tree. But one day a man ate his fill of the fruit then broke a branch and went away. This act of ingratitude so incensed the tree god that it caused the tree to bear no more fruit (A III 369–70). As with other popular beliefs and superstitions the Buddha did not endorse tree worship. He said: 'Gripped by fear people go to sacred mountains, groves, parks and trees. But these are not a safe refuge, not the best refuge. By going there one is not freed from all suffering' (Dhp 188–

89). However, the Buddha did respect the beliefs of others and when a certain monk cut down a tree worshipped by local people to make way for a monastery he severely rebuked the monk for doing so (Vin III 156).

Some of the most beautiful passages in the Buddhist literature of all traditions relate to trees. The Buddha said of a kindly hospitable person that he was 'like a great banyan tree growing on the side of roads that welcomes weary travellers with its cool shade and soothes their tiredness' (Ja VI 526). The general Buddhist attitude of respect for trees is expressed in these words from the Petavatthu: 'Of the tree in whose shade one sits or lies, not a branch of it should he break, for if he did he would be a betrayer of a friend, an evil doer... Of the tree in whose shade one sits or lies, not a leaf should he injure, for if he did he would be a betrayer of a friend, an evil doer' (Pv-a 114). The *Milindapañha* says that the diligent disciple should try to be like a tree: 'As a tree makes no distinction in the shade it gives, like this, the meditator should make no distinction between any beings, but develop love equally to thieves, murderers, enemies and to himself' (Mil 410). The *Buddhacarita* compares spiritual practice to a tree 'the fibres of which are patience, the flowers virtue, the boughs awareness and wisdom, which is rooted in resolution and which bears the fruit of Dhamma' (Bc XIII.65). The *Mahāvastu* says: 'The meritorious person grows like a banyan tree, while the person of meagre merit becomes stunted like a tree planted in the roadway' (Mvu II 423). In his *Bodhicaryāvatāra*, the poet Śāntideva wrote of his longing for the peace of the forest life in these words: 'The trees do not speak harsh words nor do they try to please by artifice. When shall I have the opportunity to dwell with those happy to live with the trees?' (Bc VIII.26).

Rukkhakoṭṭasakuṇa. See **Koṭṭha2**.

Rukkhāsunnakkha. The name means 'tree dog' (Ja V 12; VI 538). What animal this refers to is uncertain, but it could be an alternative name for the flying fox, *tuliya*. Likewise it might refer to the several species of flying squirrels native to northern India.

Ruru. A type of deer (Ja IV 256; V 406; 416). The name may be an onomatopoeia of the call of the Swamp Deer, the *rohita*¹. The commentary says the *ruru* has a golden colour, which might be a poetic way of describing the swamp deer's red-brown coat.

Ruhaṃghasa. Blood-eater, also *ruhugghasa*, probably a term for leopards and or tigers (Ja III 481). See **Dīpi** and **Vyaggha**.

Romā. A type of bird (Ja VI 538).

Rohicca. See **Rohita**¹.

Rohita¹. Swamp Deer, also known as Barasingha, *Rucevus duvaucii* (Ja I 170; VI 537), also *rohicca* (Ja VI 512). This name means ‘the red one’. This large animal has a light reddish-brown coat in the summer, turning darker in the winter, and a creamy-white on the rump, chin and throat. Stags have the biggest spread of antlers of any deer in tropical Asia and can have up to twelve prongs. Swamp deer favour thick forest bordering pools and swamps. Huge herds of swamp deer used to inhabit the flood plains of the Ganges and Brahmaputra Rivers but in this region the animal is now restricted entirely to the Dudhwa National Park bordering on Nepal. See **Ruru**.

Rohita². Rohu Fish, *Labeo rohita* (Ja II 433). An edible carp found in the Ganges and its tributaries, the rohu is orange-brown on the back becoming silvery on the sides and abdomen. Sometimes there is also a red mark on each scale. It can grow up to 91 cm long and is commonly netted in rivers and propagated in artificial ponds. It was believed to be good luck to see or touch one first thing in the morning (Ja IV 72–3). One of the most well-known Jātaka stories concerns two otters quarrelling over the ownership of a rohu fish (Ja III 333).

L

Laṅghi. A type of animal, perhaps a deer, that moves in a series of jumps. It is mentioned together with the yak (*camara*) and the *calani* (Ja VI 537).

Laṭukikā. A type of bird, probably a quail, of which several varieties live in northern India (Ja III 174; M I 449). See **Lāpa**.

Latā. A general word for creepers, climbers and vines. The Buddha compared craving to the fast growing and entangling creeper: ‘The streams (of desire) are always flowing and the creeper (of craving) sprouts and grows. Seeing this creeper, cut it off at the root with wisdom’ (Dhp 340).

Labuja. Bread-fruit Tree, *Artocarpus lacucha* (Ja IV 363; Vv-a 159). A medium-sized deciduous tree with large leathery leaves covered with a soft rusty-coloured down. The tree produces a round yellow fruit which can be eaten either cooked or pickled (Vin III 60). King Ajātasattu mentioned to the Buddha that when he asked Pūraṇa Kassapa questions he could not get a straight answer from him. '[It was] just if on being asked about a mango he were to describe a bread-fruit, or on being asked about a bread-fruit he would describe a mango' (DI 53).

Lasuṇa. Garlic, *Allium sativum*, also *ativisā* (Vin IV 258). An onion-like herb emitting a strong odour, the bulbs of which can be eaten. Because of the strong smell garlic leaves on the breath which others could find offensive, the Buddha forbade monks and nuns eating it, although he allowed it to be taken for medicinal purposes (Vin II 140, IV 259).

Garlic was sometimes also known as *Māgadhaka*, 'of Magadha', apparently because it was commonly grown in that country (Vin IV 259). Indians have long considered garlic to be detrimental to both physical and spiritual well-being. The *Manusmṛiti* says that a Brahmin will lose his caste if he eats garlic. After travelling through India in the 7th century, the Chinese pilgrim Xuanzang wrote: 'Onions and garlic are rarely grown and few people eat them; if anyone uses them as food they are expelled beyond the walls of the town.' See **Nādiya**.

Lākhā. A resinous secretion produced by the Lac Insect, *Laccifer indicola* (Ja VI 55). The tiny red larvae of this insect settle on the young shoots of certain plants and secrete lac to protect their bodies. This is collected, processed and then made into various objects or used as a paint or dye. Lac is red in colour (Thī 440) and was used to make coins, tokens (Vin III 237) and paint (S II 101; III 152). Women painted the palms of their hands and the soles of their feet with lac dye (Ja VI 269). See **Alattaka**.

Lāja. See **Dhañña**.

Lāpa. Quail, sometimes also *lāpasakuṇa* (S V 146 and Ja II 59). The Pali name means 'chattering bird' probably because of the squeaks, whistles and nattering sounds quails exchange when in flocks. Six species of quails are found in northern India, all of them very similar and the most common being the Common Quail, *Coturnix*

coturnix. About the same size as a dove, this squat, plump little bird has light brown plumage covered with pale yellow-brown spear-shaped streaks and mottles, a white band around the front of its neck and above its eyes. Like other quails, it is often seen in pairs or large flocks in grasslands and cultivated fields. Quails could be seen running amongst the clods after the fields had been ploughed (Ja II 59; S V 146).

Once, when the arrogant young Brahmin Ambaṭṭha was visiting the Sakyans, he got the distinct impression that they were whispering about and laughing at him. Later he complained of this to the Buddha who defended his kinsmen by saying: 'But Ambaṭṭha, even the quail, that little bird, can talk as she likes in her own nest' (DI 91). According to the Jātaka, the Bodhisatta was once reborn as an elephant and became leader of a large herd. A quail made her nest in the elephant's feeding ground and the Bodhisatta stood over it to prevent it being trampled by the other elephants (Ja III 174). Again according to the Jātaka, the Bodhisatta was once reborn as a quail (Ja II 59). See **Laṭukikā**, **Kapiñjala** and **Vaṭṭakā**.

Lāpu. See **Alābu**, **Lāpu**.

Lābu. See **Alābu**.

Lāmajjaka. *Cymbopogon jwarancusa*. A tall densely-tufted grass with a very aromatic root. This root is used to soothe fever and also to flavour food. The Buddha was once offered a meal of rice gruel cooked with jujube and sesame oil and mixed with pepper, garlic and *lāmajjaka* (Vv-a 186).

Lepa. See **Jatu**.

Lodda. *Symplocos racemosa* (Ja V 405). A small evergreen tree with dark grey, oblong elliptic leaves and white flowers gradually turning yellow.

Lohapiṭṭhā. A type of bird (Ja VI 538). This name means 'copper back' which would be a good description of the Crimson Sunbird, *Aethopyga siparaja*. The male of this sparrow-sized bird has a glistening crimson back and a metallic green head and tail, while the slightly smaller female is a dusky olive green. It is found throughout India in moist-deciduous and evergreen forests flitting from flower to flower as it drinks nectar. It also eats insects.

Lohitasālī. See **Nīvāra**.

V

Vaṃsa. See **Veḷu**.

Vakkala. See **Rukkha**.

Vakula. Bulletwood Tree, *Mimusops elengi*, also *bakula* (Ja V 420; VI 535). A medium-sized tree with leaves varying in shape from oblong to lanceolate and with star-shaped creamy white flowers and berries that turns yellow when ripe. Oil pressed from the seed is used in lamps and an extract from the flower is used in perfumes.

Vagguli. Bat, winged mammals of the order *Chiroptera*. There are over 100 species of bats in India but it is not possible to identify any particular species from the information given in the Tipiṭaka. Bats sometimes lived in the darker corners of rooms and their droppings caused an unpleasant smell requiring monks to put screens on their windows to keep them out (Vin II 148). One of the austerities practised by some ascetics was called ‘the bat practice’ which involved hanging upside down (Ja I 493; III 235; IV 299). The ancient Indians considered bats to be a type of bird.

Vaca. Sweet Flag, *Acorus calamus* (Vin I 200). The root of this plant has a fragrance reminiscent of violets and is used in confectionery, perfume and in medicine for its stimulant, cathartic and diuretic properties. Sweet flag does not grow in northern India and must have been imported, probably from Kashmir or Persia. The Buddha considered it to be the most fragrant of all roots (S III 156). The rhizome of sweet flag is chewed as a cure for colds and to alleviate asthma and is made into a tonic. The root is used as a vermifuge and for fever.

Vacattha. The root of a plant used as a medicine (Vin I 200).

Vajula. Ashoka Tree, *Saraca asoca* (Ja V 420), also *vañjula*. A medium-sized tree with dark-green leaves and beautiful orange and scarlet flowers. The 19th century botanist Roxburgh said of this tree ‘... when in full bloom, I do not think the whole vegetable kingdom affords a more beautiful object’.

Vaṭarukkha. See **Nigrodha**.

Vaṭṭakā. A type of bird probably a quail or francolin. They were hunted with nets (Ja I 208) and taken home to be fattened up before

being eaten (Ja I 434). Some male quails and francolin can be very pugnacious and setting them to fight each other was a popular entertainment (D I 6). See **Kapiñjala** and **Lāpa**.

Vanakāka. See **Kāka**.

Vanamahisa. See **Mahisa**.

Vantāda. See **Kāka**.

Varaka. See **Kalāya**.

Varaṇa. *Crateva religiosa* (Ja I 222; 317) also known as *kareri* (Ja VI 534). A small spreading tree which bears masses of beautiful white, yellow or sometimes pink flowers. There was a small residence in at Jetavana named after the tree, probably because one grew near it (D II 1; Ud 30). Mahākassapa said that whole earth was beautified by *kareri* blossoms (Th 1062).

Vararukkha. See **Nigrodha**.

Varāha. Wild boar (Dhp 325; Th 101). See **Sūkara**.

Valli. A general term for creepers, climbers and vines (Ja V 37; Vin III 144). See **Lāta**.

Vallibha. Uncertain, but perhaps *Averrhoa bilimbi* (Ja VI 536). A small attractive tree producing a yellowish, sharply five-angled fruit. The juice of this fruit is made into a refreshing fruit drink and also used to remove stains from clothes.

Vassikā. Sometimes also *vassikī*, a plant often identified as jasmine (Dhp 377). However whether this name is a synonym for *sumanā* or some other plant is not certain. The plant's flowers were made into garlands (M I 32) and were considered the most fragrant of all flowers (A V 22). The Buddha said: 'Of all fragrances, sandalwood, *tagara*, blue water lily or *vassikī*, the fragrance of virtue is the best' (Dhp 55).

Vātaghata. A type of tree, sometimes also *vātaghatāka* (Ja V 407; IV 298). The name means 'wind destroying' and may refer to the tree's ability, when taken as a medicine, to dispel bodily wind.

Vātamiga. A type of animal (Ja V 416; VI 538).

Vātingaṇa. Egg Plant, *Solanum melongena* (Ja V 131). An erect plant with large elliptic leaves, prickles on the stem, branches and undersides of the leaves and an elongated oval fruit which can be

eaten. The fruit, either creamy-white, yellow or deep purple, can be very large in cultivated plants but is small in those growing wild. The egg plant probably originated in India.

Vānara. Hanuman Langur, also sometimes *kapi* or *gonaṅgula* (Th 113; 601) *Semnopithecus entellus*. This large primate has a silver-grey body with a white belly and a black face. With its long limbs and tail the langur moves through the trees or along the ground with a series of graceful bounds. Langurs have hands, feet and faces resembling those of humans (Ja III 73). The Buddha said that the distracted person ‘jumps from here to there like a langur searching for fruit in the forest’ (Dhp 334). Sometimes they were kept as pets (Ja II 184). The Jātaka describes a troop of langurs raiding a *tiṇḍuka* tree on the outskirts of a village (Ja II 76).

There is intense competition to become the dominant male and one that does will immediately try to kill all the young so that the females will come into oestrus and he can mate with them. This behaviour seems to have been noticed by the ancient Indians and is probably the basis of the Tayodhamma Jātaka (Ja I 280–82). In this story the dominant male of a troop of langurs castrates with his teeth all the infant males out of fear that they may grow up and replace him. In a story meant to illustrate the idea that greed can make one blind to one’s own benefit, a Jātaka tell of a langur who lets go of all the beans it had just to retrieve one that it had dropped (Ja II 74).

Vāyasa. See **Kāka**.

Vāraṇa. Uncertain but possibly *Crateva religiosa* (Ja VI 535). A moderately sized deciduous tree typically found growing along the river banks. It has grey bark, trifoliate leaves and pretty white or cream-coloured flowers.

Vārija. See **Maccha**.

Vārunika. A type of tree. Ascetics are described as eating the fruit and sometimes the flowers, leaves and shoots of this tree (Ja IV 8).

Vālaja. An aquatic creature, probably a fish (Ja IV 70; 278).

Vālamaccha. A type of fish (Ja III 345).

Vāḷa. Sometimes *vāḷamiga*, a term for dangerous animals (Ja VI 569; Vin I 113). It was used for lions, tigers, rhinoceros and gaurs (Ja VI 497).

Vāsantī. This name means ‘fragrant one’. This may be *Hiptage benghalensis* (Ja VI 537), a woody vine-like climbing shrub often cultivated for its fragrant pink to white flowers. These beautiful flowers have fluffy toothed-edges and grow in clusters. The seeds have three papery wings which allow them to be easily carried away by the wind.

Vighāsāda. ‘Eater of others’ remains’. This was perhaps a general term for scavengers such as vultures and hyenas, jackals, crows and dogs (Ja I 348; VI 538). Monks were allowed to eat the leftovers (*vighāsa*) of certain animals – e.g. tigers, lions, leopards, bears, wolves—after having arranged to have it cooked by a lay person (Vin III 58).

Vicchika. Scorpion, an insectivorous anthropoid of the order *Scorpiones*, of which there are about 40 species in India (A II 73; III 101). Ranging in colour from tawny-brown to blue-black, scorpions have two claws and a long segmented tail that can grow up to 20 cm long and with a sting on its tip. During the rainy season, when scorpions are driven out of their holes by the water, people are more likely to be stung by them. The sting is extremely painful and can occasionally even be fatal.

The Buddha mentioned the scorpion as an example of a creature that moves stealthily, especially when they sense human presence (A V 289). Knowing antidotes for scorpion stings was considered a special skill (D I 9). The *Milindapañha* says the scorpion’s tail is its weapon which it always keeps raised (Mil 394). We read that sandals were sometimes decorated with a design resembling a scorpion’s tail (Vin I 186).

Vitacchikā. Scabies, sometimes *kacchū* (Nidd II 304). Scabies is a skin infection caused by tiny mites of the genus *Sarcoptes* which burrow into the skin where they feed on blood. The mite’s excretion causes intense itching, especially at night. Scabies is highly infectious and was one of the afflictions that could attack the body along with dysentery, leprosy, eczema, boils, etc (A V 110). The Buddha mentioned jackals suffering from a condition called *ukkaṇṇaka* or according to another reading *ukkaṇṭaka*. If this first reading is correct to could have had something to do with the ears (S II 230). Ear mange in canines is caused by the *Otodectes* and *Psoroptes* species of mite. The damage done to the ear by these mites

is compounded by the infected animal's continual scratching.

If the correct reading is *ukkaṇṭaka* this would refer to *Sarcoptes scabiei canis* and *Demodex canis*, both of which infest jackals and other canines. The first lives in the hair follicles while the second burrow into the skin. As a result the infested animal's skin becomes crusted and usually loses all or much of its fur and suffers constant intense itching.

Vibhītaka. Belleric Myrobalan, *Terminalia bellirica*, also *vibhītaka*. A large common forest tree with a tall trunk, broadly elliptic leaves clustered at the end of the branches and greenish-white or yellow flowers. Together with *āmalaka* and *haritaka*, the fruit is one of the *triphala* or 'three fruits' long credited in traditional Indian medicine with powerful medicinal properties (Ja VI 529; Vin I 201).

Vibhedika. A type of tree (Ja VI 529; 537).

Vilaṅga. False Black Pepper, *Embelia ribes*. A common climber with white flowers and deep-purple berries similar in size to peppercorns (Vin I 201). When dried the berries are used in traditional medicine for a wide range of complaints.

Vīhi. See **Taṇḍula**.

Veṇu. See **Veḷu**.

Vetasa. Sometimes also *vetta*. One or another of several climbing palms of the genus *Calamus* found growing in northern India (Ja V 167). These are slender palms armed with long spines and which climb by means of long flagella covered with hook-like prickles. A forest tract with these climbing palms growing in it is virtually impossible to walk without burning or cutting the palm. The Jātaka mention such a thicket (*vettagahana*) so entangled that even a snake could not penetrate it (Ja V 46). The cane or rattan produced from these palms was used to make stands, baskets, furniture and ropes, and a rod of cane was used to flog criminals (A I 47). *Calamus guruba* is considered to produce the best cane.

Vetta. See **Vetasa**.

Vedisa. A type of plant (Ja V 405; VI 550).

Veḷu. Bamboo, also called *veṇu* and *vaṃsa*, grasses of the genus *Bambusa* (Ja V 38; Sn 38). Ranging in height from small to very tall and growing in dense clumps, bamboos have hollow segmented

tube-like stems and branches from which grow long spear-shaped leaves. Over 30 varieties grow in northern India. Bamboo is an economically important plant, its strong but light and flexible wood being used for a wide variety of purposes. Washing was hung on bamboo poles and needle cases were made out of bamboo tubes. It was also plaited and woven into baskets (Vin IV 6) and grown in lines to form hedges (Vin II 154). Bamboo very rarely flowers, but when it does it dies (Ja V 71; S II 241). Its shoots get tangled up with each other (Sn 38) and are hard and difficult to tread down (Th 72). Workers in bamboo were considered low caste (A II 85; III 385).

One of the Buddha's favourite resorts in Rājagaha was the Bamboo Grove, a park offered to him by King Bimbisāra (Vin I 39). To this day dense thickets of the Thorny Bamboo, *Bambusa bambos*, grow around Rajgir, modern Rājagaha, and may be the type that was familiar to the Buddha.

The ancient Buddhists believed that having the flexibility of bamboo would be a virtue. One Jātaka story comments that to live successfully in the royal court it is wise to 'bend like bamboo' (Ja VI 295). Nāgasena said: 'Bamboo does not bend any which way, but the way the wind blows. Likewise the monk, having followed the nine parts of the Buddha's, the Lord's teachings and being established in that which is good and blameless, should go the way of true asceticism' (Mil 372). The popular trick where a man holds a bamboo pole erect and a child ascends it and balances on the top, was sometimes performed as an entertainment (S V 168). A segment of bamboo, called a *nāḷi*, was used as a measure of capacity (Ja IV 67; Vin I 249).

Vyaggha. Tiger, *Panthera tigris* (A III 101; D III 25; Dhṛp 295; Sn 416; Th 1113), sometimes *byaggha*. This large majestic feline has an orange coat patterned with black stripes, a banded tail and black ears. Tigers live in thick jungle and thorny shrub where they hunt mainly deer. The tiger is not mentioned in the Vedas and only occasionally in the four Nikāyas. Perhaps they became common in northern India only as lions died out. In one place, the tiger is described as being striped and is called 'the king of the beasts' a term usually used for the lion (Ja IV 345). We read of a man-eating tiger attacking travellers on the high road to Vārāṇasi (Ja I 357). The

Buddha sometimes stayed with a clan of people known as Tiger's Track, Vyagghapajjā (A II 194). Royal chariots were upholstered with leopard or tiger skins (Ja V 377; VI 503), a fact also mentioned by Pāṇini. In the Jātaka, there is a story about a boastful young magician who shows off his skill by bringing a dead tiger to life only to be eaten by it (Ja I 510).

Vyagghīnaśa. A type of raptor (Ja VI 538; S I 148). This refers to the Shahin Falcon, *Falco peregrinus peregrinator*. About the size of a crow, this powerful falcon has a grey back and wings, a black head, white chin and a rufous breast marked with horizontal black bars reminiscent of a tiger's stripes. The shahin falcon favours hilly areas and feeds mainly on other birds.

S

Saṃsādiyā. A type of inferior self-sown rice (Ja VI 530). According to the ancient commentary it was the same as pig rice. See **Taṇḍula**.

Sakuṇa. See **Pakkhin**.

Sakuṇagghi. The word literally means 'bird killer' and was probably a general term for hawks and falcons (Ja II 59; S V 146).

Sakula. Either the Great Snakehead, *Channa marulius*, or Striped or Common Snakehead, *Channa striata* (Ja V 405), both fish are similar in appearance except that the former is larger than the latter. Found in either fresh, or brackish water, these fish are dark brown with chevron-like markings and grows in the case of the first up to 120 cm and in the case of the second up to 90 cm long. The pectoral fin takes up about half the body. Their heads resembles that of a snake and hence its English name. Snakeheads eat worms, frogs and especially other fish, aggressively lunging at their prey and swallowing it whole. Snakeheads are the most popular food fish in northern India.

Sañkha¹. Conch, *Turbinella pyrum* also called *kumbu*. A marine mollusc with a particularly thick shell which can be polished to a brilliant white (Ja III 447; V 203; Thī 262), as white as milk (Ja VI 572). Conch shells were considered one of the many precious things found in the ocean along with pearls, gems, beryl, crystal, coral, gold and silver, ruby and emerald (Ud 54). During coronation

ceremonies water from three conch shells was sprinkled on the monarch's head (Ja II 409; IV 493). They were blown as trumpets and sometimes played together with different types of drums and other musical instruments (Ja IV 395; IV 464; V 332). According to the Jātaka, the Bodhisatta was once a conch blower (Ja I 284).

The sound of a conch carried far (D I 79; 251). The innermost spiral of the shell could be used as a tube (Vin I 203) and rings of conch were used as bracelets and anklets. Shells spiralling to the right, which are extremely rare, were considered particularly auspicious (Ja IV 350). To have three wrinkles on the neck like the lines of the spiral on a conch was considered a sign of beauty (Ja V 155; IV 130). A young woman was described as having limbs 'as smooth as a conch shell' (Ja V 204). Conch shells are burned and the resulting powder is used as a medicine. According to the *Mahāvastu*, some of the things made out of conch included armlets, vessels for holding oil, perfume and paint, lids, necklaces and girdles (Mvu II 473). The Buddha described the life of a sincere disciplined monk as being 'perfectly clean, perfectly pure and polished like a conch shell' (A V 204; D I 63). Conches were harvested mainly in the Palk Straits between the southern tip of India and Sri Lanka, from where they were imported to northern India.

Saṅkha². A type of water plant sometimes mentioned together with *sevāla* and *paṇaka* (Vin III 177).

Saṅkhamuttā. Nacre or mother-of-pearl, the beautiful pearl-like inside of marine bivalve molluscs of the genus *Pinctada* (Ja V 380; Thī 278). Several species of this bivalve, particularly *Pinctada margaritifera*, are found down the east coast of India and are harvested for their shell and the pearls that are sometimes found in them. Mother-of-pearl was used to make jewellery. See **Muttā**.

Sajjulasa. See **Jatu**.

Satapatha. A type of bird (Ja II 153; Mil II 404).

Satapadi. Centipedes (A II 73). Like its English equivalent, the Pali name for these creature means 'a hundred legs'. Centipedes are arthropods of the class *Chilopoda* the common ones in found in the Ganges and Yamuna plain being *Scolopendra morsitans*, *S. subspines*, *S. indiae*, *S. amazonica*, and *S. occidentalis*. They were one of the

many creatures that forest-dwelling monks had to be careful of. A bite from a centipede could be extremely painful or even fatal (A III 100). The Buddha mentioned the centipede as an example of a creature that moves stealthily (A V 289).

Satapuppha. Indian Dill, *Anethum sowa* (Ja VI 537). A small plant closely resembling fennel and when in flower covered with beautiful white blossoms. An oil extracted from the seeds is given to children to treat flatulence.

Satavaṃsa. See **Maccha**.

Sattapatta. Woodpecker. See **Koṭṭha**².

Sattapaṇṇa. Scholar's Tree, *Alstonia scholaris* (Ja VI 269). An attractive medium to large-sized tree with small whitish-green flowers and is often grown for shade. It has a rosette of leaves at the end of the branches, the number of leaves in each rosette ranging from five to nine, but most commonly seven and hence the tree's Pali name, 'seven-leaf', in Hindi *saptaparni*. According to the commentaries, the cave in Rājagaha where the First Buddhist Council was held, took its name from the scholars tree (Vin II 76). In the past, children's writing boards were made from the wood of this tree which gave it its English name.

Sattali. A flower sometimes used to make garlands (Ja IV 440).

Saddala. See **Tiṇa**.

Saddūla. See **Dīpi**.

Sappa. Snake, also called *aṇḍaja*, 'egg born', *ahi*, *āsīvisa*, *dijivhā*, 'two-tongued', *nāga*, *pannāga*, *pādūdara*, 'whose belly is a foot', *bhogī*, *bhujaga*, *bhujaṅga*, *bhujaṅgama*, *mahoraga*, and *uraga* (A III 97; Ja III 347; M I 130; Sn 1; 604; Th 429). Snakes were also sometimes known as *maṇḍūkabhakkha* 'frog-eaters' (Ja III 16). It is uncertain whether all these words are synonyms or refer to different species of snakes. Snakes are legless, long-bodied reptiles of the suborder *Serpentes*. In Jain literature snakes are classified as either with or without a hood, while the Buddha classified them as either venomous and docile, non-venomous and aggressive, venomous and aggressive or non-venomous and docile (A II 110).

The ancient Indians made some attempt to identify sexual dimorphism in snakes. It was believed that the male's tail was

thicker than the female's, their head was broad while the female's was elongated, they had larger eyes and their head was rounded while the female's was short (Ja VI 339). According to herpetologists, in most species females are of equivalent or larger size than males while the latter typically have longer tails than the former.

Snakes shed their skins (Sn 1), have forked tongues, long backs, crawl on their bellies (Sn 604) and are commonly found living in termite mounds (S IV 199). The reverence people had for snakes was mixed with fear and disgust (Vin I 219). The Tipiṭaka contains several accounts of people being bitten by snakes and dying (A II 70. Vin II 150; IV 166). People wore charms to protect themselves from and to cure snakebites (Ja IV 31). A doctor could give medicine against a snakebite or force the snake to suck the poison out of the wound (Ja I 310). One cure for a snakebite was a concoction of cow dung and urine, ash or clay (Vin I 206).

The Buddha said that one should be careful even of young snakes. 'One should not dismiss the snake one might see in village or forest just because it is young. That snake, fierce, sliding along, with serpentine movements, may attack and bite the foolish man or woman. Therefore, protect your life and avoid that snake' (S I 69). Not everyone tried to avoid snakes. We have an account of children tormenting a snake, probably a small one, with a stick (Ud 11). The Buddha described some species of snakes as being dirty and odorous, terrifying, dangerous and given to betraying their friends (A III 260). To catch snakes charmers would pin their heads down with a forked stick and then grasp them by the neck (M I 134). The Snake River, Sappinī, at Rājagaha was so named because of its winding serpentine course (A II 29). It was believed that some snakes were born in the Himalayas from where they migrated down the streams and rivers to the sea and then grew into sea monsters (S V 47). Several types of water snakes are mentioned (Ja II 238), in particular the *alagadda* which is described as being venomous (M I 133). See **Agārasappa**, **Ajakara**, **Udakasappa**, **Kaṇhasappa**, **Deḍḍubha**, **Silābhu** and **Silutta**.

Samuddakappāsī. This name means sea cotton and may refer to *Calotropis procera*, called French Cotton or Sodom's Apple Milkweed (Ja VI 537). A stout shrub or occasionally small tree often found growing around tidal lagoons or on poor salty soil. It has

attractive purple and white flowers, fissured corky bark and all parts of it exude a white latex when cut or injured. This latex is widely used in traditional medicine. The rounded seed pods are full of air and pop when squeezed and the seeds are attached to a strong, white silky floss. This floss is used to make cloth and ropes and also as stuffing in pillows and mattresses.

Sambuka. See **Sippī**.

Sayaṃjātasālī. See **Nīvāra**.

Sara. Munj sweetcane, *Saccharum benghalense* (S IV 198). The Pali name means 'arrow' (D I 9). This tall grass grows in large tufts up to 5.4 metres high and is usually found along river banks although the Buddha mentioned thick forests of it and other grasses (D III 75, Mil 342), no doubt referring to the grasslands of the Terai region along the India-Nepal border. The stem of the flower is light, strong and straight and was used as the shafts for arrows. See **Muñja**¹.

Sarabha. Sambar, *Cervus unicolor*, India's largest and most common deer (Ja IV 267; VI 537). The sambar has a shaggy brown coat, large spreading antlers and favours deciduous forest and grassland scrub, near water if possible. When alarmed it makes a loud 'donk donk' call and when pursued by predators. The legs of thrones were made to look like the legs of the sambar (Ja III 342) and we read of these animals being annoyed by biting insects (Ja I 267; III 401). See **Sāmāniga**.

Sarabhū The Indian Chameleon, *Chamaeleo zeylanicus*, also sometimes *sarabu*. Growing up to 350 millimetres long the Indian chameleon has a laterally compressed body, a conical casque on the top of its head and large eyes. Its skin is covered with granular scales and is normally green with yellow and black bands and spots but can change colour very quickly when the creature is excited. Indian peasants have a superstitious dread of chameleons, mistakenly believing them to be poisonous. When a monk died of a snakebite, the Buddha taught the others to chant some verses that would protect them from noxious creatures, including chameleons (A II 73).

Sarala. Long-leaved Pine, *Pinus roxburghii* (Ja V 420). A large tree with symmetrically whorled branches high on the trunk which form a rounded crown. The Buddha commented that the leaves of

this tree are not suitable for making into containers to carry things in (S V 438).

Sarīsapa. See **Sirīṃsapa**.

Salabha. A type of insect. The Udāna mentions that one evening as the Buddha sat in the open air he noticed swarms of these insects being attracted to the oil lamp and then falling into it (Ud 72). The same habit is said of this creature in Sanskrit literature. This suggests that the *salabha* is a moth. However, the word commentary on the Jātaka and numerous Sanskrit sources say that swarms of *salabha* sometimes destroy crops (Ja V 401) suggesting that locusts or grasshoppers are being referred to. During the monsoon in northern India swarms of small grasshoppers, crickets and beetles often join moths in buzzing around any light source. See **Paṭaṅga**.

Salāḷa. A type of fragrant-smelling tree (Bv XI.25; Ja I 13; V 420; S V 300). See **Sallakī**.

Sallaka. Indian Porcupine, *Hystrix indica* (Ja V 489). A large thickset rodent covered with long black and white striped quills, the porcupine lives in forests and tall grass where it digs burrows and feeds off fruit, tree bark and roots. They also sometimes raid crops. When threatened, the porcupine erects and then rattles its quills as a warning. The porcupine's name is derived from *salla*, 'arrow', not because its quills resemble arrows but because of the widespread folk belief that it can shoot its quills. Porcupines are one of the animals mentioned in King Asoka's 5th Pillar Edict as being protected.

Sallakī. Indian Frankincense, *Boswellia serrata* (Ja IV 92; VI 535), Hindi *salag* or *salai*. An attractive medium-sized tree with green, reddish or grey bark that peels off in thin flakes and small whitish flowers at the tip of the branches. The flowers only appear when the tree has lost all its leaves. The fragrant golden-coloured and translucent resin that oozes from the trunk has been used as an incense for thousands of years. The leaves of the Indian Frankincense are hung up in cow stalls to drive away flies. Real frankincense, which is produced in the southern Arabian Peninsular, was imported into India. It is not mentioned in the Tipiṭaka.

Savaṅka. See **Maccha**.

Sasa. Indian Hare, *Lepus nigricollis*, also called *sasaka*. This common animal has a reddish-brown coat with black hair mixed throughout and white under parts. Hares have long ears (Ja V 416) and when captured they tremble with fear (Dhp 342). To refer to something as a 'hare's horn' meant that it was impossible or absurd (Ja III 477). To be 'as small as a hare's whisker' was to be insubstantial (Ja IV 233). When the ancient Indians looked at the moon they saw not the face of a human but a hare and a Jātaka story tells how the image of this animal got there (Ja III 51–5; IV 86; VI 539).

Saha. A type of tree (Ja VI 269). The commentary and other sources identifies this tree as the same as *sahakāra* and says it is a type of fragrant mango

Sāka. Indian Teak, *Tectona grandis*, Hindi *sagwan*. A large tree growing up to 46 metres in height and with a straight often buttressed trunk, a spreading crown, large elliptic leaves and white flowers. The yellow to brown heartwood is easily worked, resistant to decay and retains its fragrance for years. The Indian teak is now rare in the wild but is often grown in plantations. There was a legend that the Sakyans, the tribe the Buddha came from, derived their name from this tree. The Buddha once related this legend to Ambaṭṭha:

'In days of old, so say those who remember their family lineage... King Okkāka who loved his queen and wished to transfer the kingdom to his son by her, banished his earlier sons, Okkāmkha, Karaṇḍu, Hatthinīya and Sinipura. Being thus banished, they settled at the foot of the Himalayan foothills beside a lotus pond where there was a *sāka* forest. Not wanting to degrade their lineage, they cohabited with their own sisters. King Okkāka asked his ministers and advisers: "Where are they living now?" and when they told him he said: "They are strong as *sākas*, they are real Sakyans!" and this is how the Sakyans got their well-known name.' (D I 92–3)

Sākhāmiga. Branch animal, a term for monkeys (Ja II 73; V 416). However, as squirrels are often called *sakha mrig* in Hindi the term may have been used for them too.

Sāṇa. Sann Hemp, *Crotalaria juncea* (D II 350; M I 78). A small shrub with long leaves, velvety pods and a yellow flower. Sann hemp

grows wild but is also cultivated for its strong fibres. Mahā Kassapa's rag robe was made out of sann hemp (S II 202). Elephants would gather clumps of this plant in their trunks, take them into the water and thrash them about to get the dirt out of the roots before eating them (M I 375).

Sātaka. A type of bird (Ja VI 538).

Sāmalatā. A type of flowering creeper (Ja I 60).

Sāmā. A type of plant (Ja IV 92; V 405).

Sāmāka. Sawa Millet or Barnyard Millet, *Echinochloa frumentacea*, (A I 295; Ja I 500; IV 371; V 405; Sn 239). A variety of millet with a cream-coloured grain which is eaten and also used as fodder. A gruel consisting of *sāmāka*, *nīvāra* and the leaves of some other herbs was given as a cure for bloody dysentery (Ja III 144). See **Kaṅgu**.

Sāmamiga. This name means dark or black deer (Ja II 44). It is not clear whether this refers to a species of deer or a particular individual animal. However, the sambar ranges in colour from yellowish-brown to dark grey and is sometimes known in Hindi by the alternative name *samar*. See **Sarabha**.

Sāyana. Sometimes also *sayanā*, *sāyanā* or *vāyaṇā*. A type of tree. The Jātaka describes *sāyana* growing at the edge of the *Mucalinda* Lake (Ja VI 535).

Sāra. A type of tree that gives good timber (Ja III 318).

Sāla. Sal, *Shorea robusta*, and perhaps the same as *assakaṇṇa* because the long spatula-shaped sepals enclosing the flower resembles a horse's ear (Ja II 161; VI 528). The sal is a majestic tree growing up to 45 metres in height and having a girth of 3.6 metres, with ovate oblong leaves and pale yellow flowers. The sal and its flower are often referred to in the Tipiṭaka (Th 948). It has dark green leaves, a straight trunk and is beautiful to see (Ja V 251). The huge sal trees that grew in the lower reaches of the Himalayas are described as having leaves and foliage, bark and shoots, softwood and heartwood (A I 152).

The Tipiṭaka describes how a man would make a boat out of a sal trunk. First he would locate a large tree in the forest and cut it down with his axe. After shaping the exterior and hollowing out

the inside, he would then further shape it with a scraper and then smooth it with a rock ball. Finally, he would fix a rudder, make a pair of oars and then slide it down to the river (A II 201). The Buddha describes a man going to a sal forest near a village and cutting down the other trees and the crooked sal saplings so that the already well-established sal trees would grow bigger and straighter (M I 124). Sal trees were sometimes stunted by vines and creepers (Dhp 162; Ja V 452).

The Rukkhadhamma Jātaka uses the thickness of a sal forest to illustrate the advantages of unity. King Vessavaṇa asked all the tree gods to select for themselves a plant as their home. The Bodhisatta, who had been reborn as a tree god, advised his kinsmen to avoid trees that stood alone and select those that grew close to others. Some did as he advised, making their homes in a thick sal forest, but others moved into isolated trees growing near towns and villages thinking that they would receive offerings humans made to such trees. One day a fierce storm swept over the country uprooting even the mightiest and most deeply rooted trees growing in the open. But the sal trees in the forest, supported by each other and with their branches interlaced withstood the storm (Ja I 328–29).

When the Buddha arrived in Kusinārā on his last tour and lay down between twin sal trees, *yamakasālā*, perhaps meaning that they grew so close together that they had partly merged into each other. They burst into flower out of season and sprinkled their petals over him.

When Ānanda expressed amazement that the very trees were revering him, the Buddha said: ‘Ānanda, these sal trees burst into flower out of season in homage to the Tathāgata and covered his body but the monk or the nun, the lay man or the lay woman who lives practising the Dhamma properly and perfectly fulfils the Dhamma, they honour, revere and respect the Tathāgata with the highest homage’ (D II 137–38). In the light of this story and the traditional belief that the Buddha passed away during Vesākha, it is interesting to note that the sal usually blossoms in March–April and occasionally in May.

The Buddha once said that his Dhamma was so convincing that if the great sal trees had consciousness and could comprehend, even they would benefit from it (A II 194). One moonlit night,

Ānanda and Revata went to visit Sāriputta at the sal forest of Gosīṅga which was ‘delightful with all the trees in full bloom and with a heavenly fragrance wafting through the air’ (M I 212). Sometimes gruel was made from or flavoured with sal flowers or perhaps its seeds (A III 49). Even today the sal seeds are sometimes made into a gruel.

The sal was and continues to be even today an important source of timber in India. Oil distilled from the seeds is used for lamps and to make a type of butter and the resin which exudes naturally or is sometimes tapped is used as a medicine, to make incense and also a perfume called *dammar* in Hindi.

The past Buddha Vessabhū attained enlightenment under a sal tree (D II 4).

Sāli. See **Taṇḍula**.

Sāliya. Sometimes *sālikā*, or *sāliyāya* (Ja III 202; VI 421; 425). The Pali means ‘rice bird’ and refers to birds of the genus *Gracula*, usually called mynas in English. Mynas are from 25 to 30 cm long with glossy black plumage and white wing patches which are obvious in flight. The bill and legs are bright yellow or orange, and there are yellow wattles on the head, their shape and position differing according to species. The myna referred to most often in both Pali and Sanskrit literature is probably the Common Hill Myna, *Gracula religiosa* which lives mainly in the hills that border the northern edge of the Ganges plain and feeds on fruit. It has a loud although not unpleasant warbling creaking song and is very good at imitating human speech (D III 202) which even today makes it a popular cage bird. Vaṅḡisa said that the Buddha’s voice was sweet like that of the myna (Th 1232), and Sāriputta’s voice was described similarly (S I 190). Teaching mynas and parakeets to speak is mentioned in the *Kāma Sūtra* as a pleasant pastime. According to the charming Tesakuṇa Jātaka, Ānanda was reborn as a myna and together with an owl and a parakeet, instructed a king on how to be a good and just ruler (Ja V 110 ff).

Sāliyavaka. See **Taṇḍula**.

Sāluka. See **Sogandhika**.

Seleyyaka. Possibly Lasura, *Cordia myxa* (Ap 346), a small tree with drooping branches and fragrant white flowers with a yellow centre.

Common everywhere, the tree grows best in moist areas particularly along rivers and streams. The cherry-sized berry is light pink when ripe and is widely eaten and used in cooking. The unripe berry is pickled.

Sāsapa. Indian Mustard, *Brassica juncea* (A V 170; S II 137). A small annual shrub with a bright-yellow flower and numerous tiny round black seeds from which a pungent edible oil is extracted. Sores were sprinkled with mustard powder (Vin I 204). The Buddha said that craving will not persist in a good monk any more than a mustard seed will balance on the point of a needle (Dhp 401; Sn 625). See **Rājikā** and **Siddhatthaka**.

Sikhandi. See **Mayūra**.

Siṃsaka. A type of water plant (Ja VI 536).

Siṃsapā. North Indian Rosewood, *Dalbergia sissoo*. This large handsome deciduous tree has ovate leaves, their broader ends towards the base and about twice as long as broad. The flowers are small and yellowish. They are widely grown for their fine timber and along roads for shade or on common ground around villages. When in Āḷavī, the Buddha once stayed in the nearby *siṃsapā* grove where he slept on the leaf-strewn ground (A I 136). There was another such grove at Setavya (D II 316). Once, while staying in a *siṃsapā* grove near Kosambī, the Buddha gathered up a few leaves and asked the monks: ‘Which are more numerous, this handful of leaves or those on the trees above?’ ‘The leaves in your hand are few while more are the leaves on the trees’ replied the monks. Then the Buddha said: ‘Likewise, the things I have discovered but not taught are numerous while the things I have taught are few. And why did I not teach all these things? Because they are useless, irrelevant to living the holy life and do not lead to turning away, dispassion, cessation, peace, higher knowledge and Nirvana’ (S V 437–38). Today, the *siṃsapā* is one of India’s main timber trees.

Sigāla. Jackal, *Canis aureus indicus*, also *bheraṇḍa*, *kotthu*, *kotthuka*, *kotthusuna*, *jambuka*, and *siṅgāla* (Ja II 107; V 270). A medium-sized dog-like animal with a scraggy grey-brown coat, the jackal is both a scavenger and a predator. They could be seen sitting by rivers waiting for fish (M I 334) or prowling up and down the banks looking for prey such as tortoises (S IV 177). They would also eat

frogs and mice around the threshing floors in harvested fields (D III 26) and enter cities at night through the sewers to scavenge in the garbage heaps (Ja III 415). Jackals were often seen in the company of lions and lived on the remains of their prey (D III 24). The yelp of the jackal cannot be compared with the roar of the lion (A I 187), rather, it was considered pathetic and comical. The Buddha mentioned an old jackal howling at night because it was afflicted by mange (S II 230). Jackals often feature in the Jātaka stories (e.g. Ja I 425; 460; 491; II 6; 354; III 113).

Siggu. See **Sobhañjana**.

Sigru. See **Sobhañjana**.

Siṅgāla. See **Sigāla**.

Siṅgila. Probably a name for one or another of the four species of ‘horned’ owls of the genus *Bulbo* found in northern India. According to the Jātakas, the Bodhisatta was once reborn as one of these birds (Ja III 73). See **Kosika**.

Siṅgivera. Ginger, *Zingiber officinale* (Vin IV 35). The Pali name means ‘horn-shaped’. Green ginger, i.e. before being dried was called *allasiṅgivera* (Ja III 225). Ginger is a slender herb growing from a stout nodular horizontal rhizome and has a red or crimson flower with a purple lip. The roots are fleshy golden-yellow with a tangy odour and taste and are used in medicine (Vin I 201) and in cooking (Ja III 225). The Jātaka describes a fowl being prepared for roasting with a paste of fresh ground ginger paste, white mustard, salt and cumin, then rolling it in sour buttermilk (Ja I 243). Today the pale-yellow oil extracted from it is used in perfumes and medicines. Xuanzang noted that monks at Nālandā began their meals with salted fresh ginger.

Siṅgu. The Stinging Catfish, *Heteropneustes fossilis* (Ja VI 537). The Pali name is derived from the word meaning ‘horn’ or ‘barb’ and refers to the large serrated barbs on the fishes’ pectoral and dorsal fins. These barbs can inflict serious injuries and are usually broken off as soon as the fish is caught. This catfish is commonly eaten.

Siṅghāṭaka. Water Chestnut, *Trapa bispinosa* (Ja VI 530). The roots of this annual aquatic plant grow in the mud while the leaves float on the surface of the water, often forming a thick mat on ponds and

tanks. The large seed has long curved thorns on either end and a tough black skin which can be peeled off to expose a white, starchy and pleasant-tasting kernel. The water chestnut is very fast-growing and is commonly cultivated in village ponds. The Buddha said that if one were to put a water chestnut with the skin still on it in the mouth, it would lodge in the throat and one would be unable to swallow it down or cough it up (M I 393).

Sithilahanu. Asian Openbill Stork, *Anastomus oscitans*. This small stork is white or greyish with black wings and orange legs. The mandibles of the reddish-black bill are slightly arched, creating a gap between them and thus the Pali name meaning 'slack-jawed'. The openbill stork is commonly found throughout India. Its feathers were used to make flights for arrows (M I 429).

Siddhatthaka. White Mustard, *Brassica campestris* (Ja III 225; VI 537). An erect stout herb with a blue-green flower and pods and that yields numerous small round reddish-brown seeds from which an oil is extracted. It was also used in cooking. We read of fowl being prepared for cooking with several ingredients including white mustard (Ja III 225).

A white mustard seed gets a mention in one of the most famous incident in the Buddha's life. Once a young woman named Kisāgotamī lost her child and mad with grief she ran through the town pleading with people to give her medicine for her child. Eventually she came to the Buddha who gently told her to get a white mustard seed from a house in which no one had ever died. Thinking that this seed would miraculously revive her child she went from house to house asking for one. Everyone was willing to give her one of the tiny seeds but when she asked if anyone had ever died in the house she was always told that someone had. Slowly it dawned on Kisāgotamī that death is an inevitable part of life and her grief gave way to acceptance and understanding (Dhp-a II 273 ff).

In ancient India white mustard was widely used as an ingredient in medicines for children's diseases. It was also a common component in rituals meant to protect children from malevolent influences. This suggests that the storyteller's choice of a white mustard seed in the Kisāgotamī story was not random or incidental but was used to make the reader initially think that the Buddha was going to cure the child by conventional means.

Sinduvārita. Either a synonym for *Vitex negundo* or one of its very similar sub-species (Ja IV 440; VI 269). The *Buddhacarita* says that a bush called *sinduvāra* growing on the bank of a pool resembles ‘a fair woman reclining and clad in fine white cloth’ (Bc IV.49). See **Niggunḍi**.

Sippī. The shell of freshwater or marine mollusc sometimes also *sippika*, *sambuka*, *sotti* or *sutti*. These names seem to have been used loosely as are their Hindi equivalents *sippa*, *sambuk* and *sukti*. The Freshwater Mussel, *Lamellidens marginalis* (A III 395; D I 84; M II 22), is a bivalve commonly found in rivers, ponds and paddy fields throughout northern India. Its rounded elongated shells are dark-brown on the outside and pearly-white on the inside. The *cunṇa* often mentioned as an abrasive in the bath was probably made from ground shells. Sometimes it was perfumed (A I 208; Ja I 290; Vin I 47).

Another abrasive, *samuddapheṇaka*, may also have been made of shell or even of cuttlefish bone or perhaps pumice (Vin II 130). The Buddha said that if a man were to look into a pool of clear, still unstirred water he would be able to see mussel shells, pebbles and gravel (A I 9).

The shell of the cowrie, a marine mollusc of the family *Cypraeoidea*, was known in ancient India. Cowrie shells are humped with flattened bottoms. The opening of the shell has inrolled lips with tooth-like ridges on both sides. The underside is usually white, cream or yellow and the top is glossy and usually speckled. The shells used as money were probably cowries (Ja I 426). The human vagina was compared to the mouth of a shell (Ja V 197).

Simbali. Red Silk-cotton Tree, *Bombax ceiba*, (Ja III 398; IV 430; M III 185). A large prickly tree with silvery-white bark, finger-shaped leaves and large, fleshy, bright red flowers which appear when the tree is leafless. The pods contain seeds embedded in a silky wool and the gum that oozes from trunk is used to treat diarrhoea. We read of parakeets living in a grove of silk-cotton trees (Ja IV 277). An infernal variety of this tree called *koṭisimbali* was believed to grow in purgatory (Ja V 453). It had thorns sixteen finger-breadths long (Ja V 269) which no doubt inflicted suffering on the purgatorial beings.

Sirīṃsapa. Creepy-crawlies, also *sarīsapa*, a term for reptiles and perhaps insects (A II 73; D II 57; M I 10; Sn 52). The Jātaka commentary says the term refers to elongated creatures, presumably snakes, lizards, centipedes and millipedes. See **Kīṭa**.

Sirinigguṇḍī. A type of tree, perhaps the same as *nigguṇḍī* (Ja VI 535).

Sirīsa. *Albizia lebbek*, sometimes *sirisa* (Ja VI 535), a large attractive tree bearing sweet-smelling crimson flowers with distinctive long pedicels. The *sirīsa* is often grown along roads for shade and is most noticeable when leafless and covered with seed pods. These pods were said to break open similar to the way *kiṃsuka* pods do (S IV 193). The previous Buddha Kakusandha was enlightened under a *sirīsa* tree (D II 4).

Silābhu. A snake described in the commentary as ‘green leaf-coloured’ (*nālapaṇṇavaṇṇa*) and thus probably refers to the Vine Snake, *Ahaetulla nasuta* (Ja VI 194). This slender snake is bright green above, a lighter green below and has a distinctive pointed snout. Growing up to 1.8 metres in length it is usually found in trees and bushes where it feeds on birds, small mammals and lizards. When first caught the vine snake is very fierce but soon calms down and can be handled with ease. The vine snake is mildly poisonous, although its bite usually has no effect on humans.

Silutta. A snake described in the commentary as a ‘house snake’ and thus it may be the same as *agārasappa* (Ja VI 194).

Sīha. Asiatic Lion, also *miḡābhībhū*, ‘the lord of the beasts’ and *miḡarāja*, ‘the king of beasts’, *Panthera leo persica* (D III 23; Ja II 244; Sn 684). The Asiatic lion is a large, stately, tawny-coloured cat with a long tail with a tuft at the end. It differs slightly from its African cousin, being smaller and having a fringe of hair down its abdomen and in the males a less luxuriant mane. The lion’s preferred habitat is dry jungle and open grassland where it hunt deer and sometimes domestic cattle.

The Buddha said that of all animals the lion is the best in respect to strength, speed and courage (S V 227), and a bold, confident person was called a lion-like man or was said to be as fearless as a lion (Ja I 273; V 32). One speaking well and truthfully was said to be lion-voiced (Ja V 296). Lions were described as ‘five-

pawed' (*pañcahattha*), the mouth being the fifth 'paw' (Ja V 425). Being a noble creature, they always lie on their right sides, with one paw on the other and with their tails between their thighs (A II 245). The male lion emerges from its lair in the evening, stretches, looks around, roars three times and then goes in search of prey (A II 33). When other animals hear the lion's roar they are frightened: 'Those who live in burrows descend into them, aquatic animals take to the water, forest dwellers make for the forest and birds take to the air' (A II 33). When the lion strikes at its prey, whether it be an elephant, buffalo, ox, leopard, hare or cat, it does so with great skill (A III 121).

In one place we read of monks finding and eating the remains of a lion's prey (Vin III 57) and of the possibility of monks being attacked and killed by lions.

A preparation called lion oil was considered very valuable, but it is uncertain whether it was given this name because of its supposed potency or because it was actually made from lion tallow (Ja I 98). There was a market for lion's hides, claws, teeth and fat (Ja I 388; III 151; Vin I 192).

Siha (Sanskrit *Siṃgha*) has long been a popular name in India. One of the Buddha's disciples, a general, was named Sīha (A III 38) as were several monks (D I 151; Th 83). The Buddha himself said: 'Lion, monks, is a name for the Tathāgata, the Arahāt, the Fully Enlightened One' (A III 122). When the Buddha lay down to rest or to sleep, he always did so in the 'lion posture', i.e. on his right side, with one foot on the other, mindful and fully aware (S I 27; 107). His bold and confident claim to be enlightened was called his 'lion's roar' (A II 9). Two of the 32 special characteristics of the Mahāpurisa are that the front of his body is like that of the lion and his jaw like a lion's (D II 18). Lions often feature in the Jātakas where they are depicted as either noble or fearsome creatures, but also sometimes as foolish or mean-spirited.

Even in the middle of the 19th century Asiatic lions were still found in the less populated parts of the Middle East and northern India but today the last 300 or so are restricted to the Gir Forest in Gujarat. See **Kālasīha** and **Kesari**.

Sumsumāra. See **Kumbhila**.

Suka. Parakeet, sometimes also *suva*, (Ja I 324). Three species of parakeets live in northern India, the most common being the Rose-ringed Parakeet, *Psittacula krameri*. This beautiful bird has bright green plumage (Ja VI 415), a red patch on its wing and a pink band on the back of its neck turning black towards the front. It also has a red beak, as do several other Indian parakeets (Ja III 492; IV 434). Flocks of these lively, noisy birds descend on crops and orchards where they do great damage. We have a description of a field watcher in Magadha frantically running around trying to scare off a flock of parakeets that was eating the ripening rice (Ja IV 277). They would eat *udumbara* figs and when these were finished they would eat the buds, young leaves, bark and shoots (*aṅkuro vā pattam vā taco vā papatikā*, Ja III 491). People kept parakeets as pets and fed them parched grain and honey (Ja III 97). According to the Jātaka, the Bodhisatta was sometimes reborn as a parakeet (Ja II 132; 292; III 97; 491). See **Cirīṭa**.

Suṇa. See **Soṇa**.

Sunakha. See **Soṇa**.

Supāṇa. See **Soṇa**.

Sumanā. The name jasmine is used loosely for a wide variety of sometimes unrelated plants that produce small white star-shaped flowers with a particularly fragrant perfume. Most plants popularly called jasmine are of the family *Oleaceae*, genus *Jasminum*. The Pali names *jātisumanā* (Ja V 420), *mallikā* (Dhp 54), *sumanā* (Ja I 62; VI 537), *vassikā*, *vassikī* and *yūthikā* are usually translated as jasmine. There at least a dozen plants of the genus *Jasminum* that grow in northern India, common ones being *Jasminum sambac*, *J. scandens*, *J. arborescens*, *J. strictum*, *J. caudatum* and *J. flexile*. All these plants are low shrubs with woody stems that have a tendency to climb and have small, simple or pinnate leaves. They all produce small, usually white but sometimes pink or yellow flowers. All grow wild although several are also cultivated. In the case of *J. sambac*, *J. flexile* and *J. auriculatum*, an essential oil is extracted from the flower and is used in incense and perfume. The *mallikā* was considered the most fragrant of all flowers (S III 156). There is a reference to cloth with a *sumanā* and *mallikā* flower pattern printed or embroidered on it (Ja I 62) and the Buddha asked his disciples to

imitate the *vassikā*: ‘Just as the jasmine sheds its withered flowers, so you, oh monks, should shed desire and hatred’ (Dhp 377).

Suriyavalli. A type of creeper (Ja VI 536).

Sulasī. See **Tulasī**.

Suva. See **Suka**.

Suvāṇa. See **Soṇa**.

Susu. A shortened form of *susukā* and or *susumāra*. All three terms were probably used loosely and interchangeably for at least five different aquatic animals living in the Ganges and Yamuna rivers and their tributaries.

The Ganges Dolphin, *Platanista gangetica* (Ja VI 537). This large cetacean varies in colour from slate-blue to muddy brown and has a long thin beak bearing a row of sharp interlocking teeth. The mouth curves upward at the end making it look as if the animal is smiling. Dolphins were hunted for their flesh and the oil rendered from their fat was used as a medicine. The Ganges dolphin is now critically endangered.

The Ganges Shark, *Glyphis gangeticus*, has a rounded head, small eyes and ranges in colour from grey to greyish-brown. Although it only eats fish and carrion, its size and appearance may have led to the belief that it was dangerous to humans (M I 460). The Ganges shark is now critically endangered.

The Bull Shark, *Carcharhinus leucas*, definitely attacks humans and although mainly a marine creature, it has been seen up the Ganges as far as Patna. *Susukā* tallow was used as medicine (Vin I 200).

Susumāra, together with *kumbhīla* and *gaha* were probably used for crocodiles. Marsh Crocodile, *Crocodylus palustris*, a variation being *sumsumāra* (M I 459; Thī 241). A large amphibious reptile growing up to 5 metres long that used to live in all the rivers of northern India but is now confined to a few game parks. They were considered one of the perils of going down into the water (A II 123) and were sometimes put in the moats around cities and fortresses (Ja VI 407). We read of a crocodile being harpooned because it was eating fish (Ja II 227). It was noticed that they sometimes swallow pebbles and grit (Mil 67). To ‘see a crocodile in a drop of water’ was a proverb for imagining danger where there

was none (Ja I 216). Another proverb with the same meaning was to 'see a crocodile in a water pot' (Ja IV 165). When visiting Bhesakalā, the Buddha used to stay at a place called Crocodile Hill (A II 59). Crocodiles appear in several Jātaka stories where they are usually depicted as crafty dangerous creatures (Ja I 278; II 158; III 133).

The other species of crocodile native to northern India is the Gharial, *Gavialis gangeticus* (S IV 157). The Pali name means 'one that seizes'. This species of crocodile differs from the better-known varieties by having a very long narrow snout often with a large fleshy nodule on the end. Gharials live in major rivers but also in small streams and ponds where they eat almost exclusively fish. Although fierce-looking and sometimes growing up to 7 metres long, gharials never attack humans unless provoked. The Buddha said that a man seeing a pleasant-looking river might go for a swim and allow himself to be carried along with the current. Seeing this, a more perceptive bystander might warn the swimmer of the presence of undercurrents, rapids, gharials and demons (It 57; 114). The gharial is now rare in northern India and confined to a few nature reserves. See **Makara**.

Susukā. See **Susu**.

Susumāra. See **Susu**.

Sūkara. Pig, *Sus scrofa* (Ja I 197), also called *varāha*. Whether wild or domesticated, pigs are a stout, cloven-hoofed mammals of the order *Suidae*. The Indian pig is usually small, dark-grey and covered with bristles. Today they are rarely eaten but are kept to eat rubbish and human faeces around villages (M III 168).

In his last meal before he passed away, the Buddha ate a dish called *sūkaramaddava*, 'pig's delight', although it is not known whether this contained pork (D II 127). Whatever it was, *sūkaramaddava* served with *badara* fruit was considered a sumptuous dish (A III 49). The Buddha once compared the indolent person to a pig: 'When one is lazy and gluttonous, snoozing and rolling around on the bed like a great pig, he will be reborn again and again' (Dhp 325).

The wild pig, is larger, more hairy and more aggressive than its domestic cousin and males have a thick black manes. Wild pigs live in jungles and grasslands and are omnivorous. Both the domestic and the wild pig are occasionally mentioned in the Jātaka

and once the Bodhisatta was reborn as a pig (Ja III 286).

Sūkarasāli. See **Taṇḍula**.

Sūcimukha. See **Makasa**.

Sūpeyyasāka. A general name for edible vegetable (Ja IV 445).

Sekadhārī. *Ziziphus rugosa* (Ja VI 536). A large shrub with long large elliptic leaves and large greenish-yellow flowers. The white fleshy fruit is palatable and is used as a medicine for ulcers in the mouth.

Setakkhikūṭa, also *setacchikūṭa*. This name means ‘white eye socket’ and refers to the Oriental White-eye, *Zosterrops palpebrosus* (Ja VI 539). About the size of a sparrow this bird has a greenish yellow back and wings, a yellow breast and a pointed slightly curved bill. It gets its Pali and English names from the conspicuous white rings around the eyes. It is usually seen in flocks from five to about twenty busily hunting for insects in the foliage of bushes and trees.

Setageru. A flowering tree or shrub (Ja VI 535).

Setaccha. A type of plant (Ja VI 535, 539).

Setaṭṭhika. A disease that attacked rice (A IV 279) and one of the six crop afflictions (Ja V 401).

It is not clear whether this disease was caused by an insect or a fungal or viral pathogen. The commentary says it was caused by an insect boring into the stem, thereby depriving the head of sap. If this is correct, *setaṭṭhika* could well refer to the larvae of the several moths of the *Crambidae* family, called stem borers. The caterpillars of these small pale-brown moths bore into the stalk of young rice plants and feeds on the inner pith, seriously retarding the plant’s growth.

If *setaṭṭhika* is a fungal or viral disease it may have been something akin to *Xanthomonas oryzae*. This bacterial blight causes the wilting of seedlings and a yellowing and dying of the leaves of rice plants. When the disease first strikes the plant the leaves exude small milky white droplets.

Setapaṇṇi. *Polygonum lanigerum*, a small many-branched herb. The stems are covered with a white woolly tomentum, the lance-shaped leaves are white beneath and also covered with tomentum and the

small flowers are white. The Pali name for this plant means 'white leaf' (Ja VI 535).

Setapārīsa. Uncertain but possibly *Thespesia populneoides*, also *setavārīsa* (Ja VI 535), a small tree with heart-shaped leaves and flowers usually white or yellow fading to pink or purplish. It is grown mainly for its attractively grained wood which is strong and takes a high polish. Several parts of the tree are used in traditional medicine.

Setapuppha. A type of tree or shrub (Ja V 422; VI 537). The name means 'white flower'.

Setavārī. Uncertain but perhaps *Asparagus*, *Asparagus racemosus* (Ja VI 536; Ap II 347). This slender perennial has a woody prickly shoots which can be eaten and a fragrant white flower. The commentaries say it has an edible root. Wild asparagus is very common in the forests of southern Bihar.

Setahaṃsa. A type of water bird (Ja I 418; V 356). The name means 'white goose' or 'white duck'.

Sena. See **Kulala**.

Sepaṇṇi. A tree, the fruit of which spotted deer would eat (Ja I 173). The name means 'having lucky leaves'. It is possibly a synonym for *kāsmarī*.

Semhāra. A type of animal, the sinews of which were used in making arrows, probably to bind the arrow head or flight (M I 429).

Sereyyaka. *Barleria cristata* (Ja III 253). A erect shrub with a bright violet-coloured or sometimes white flower borne in great profusion.

Sevāla. Submerged aquatic plants of the genus *Blyxa*, of which several species are found in northern India, most known as *sewa* in Hindi. Growing in still or gently moving water, these plants spread by runners and have long narrow leaves with rounded tips and raised veins. The delicate white flowers grow on the surface. *Sevāla* is described as growing on or over rocks (Th 1070) and floating on the surface of the water (A III 187). Geese fed on it (Ja III 520; IV 71) and birds could get entangled in it (Ja II 149–50). A sect of Brahmins from the western India who advocated various purification rituals wore wreaths of *sevāla* (A V 263).

The name *sevāla* must have been also used loosely for a number of aquatic plants as there is a comment of it being eaten by sea monsters (Ja V 462). *Sevāla* is sometimes mentioned together with *paṇaka* and *saṅkha* (Vin III 177).

Sogandhika. White Water Lily, *Nymphaea lotus* (Ja V 37; 419; VI 518), sometimes *kallahāra*. This aquatic plant has rounded leaves that float on the surface of the water and a flower with spear-shaped pink, yellow but usually white petals and bright yellow stamens. The Tipiṭaka mentions a drink made out of *sāluka* which the commentary says is the root of water lilies and lotuses (Ja I 563; Vin I 246). The Bengali name for this plant when pink is *saluka*. For reasons which are not clear, one of the purgatorial realms was named after this plant (A V 173; S I 152). Water lilies are often mistakenly called and confused with the lotus. See **Uppala**.

Soṇa¹. Indian Trumpet Flower, *Oroxylum indicum* (Bv IX.22; X.24). A small tree with few branches, long board leaves and a large fleshy purple coloured flower. The inner pulp of the large grey-coloured pods can be eaten and the seeds are used in traditional medicine. The previous Buddhas Paduma and Nārada were enlightened under one of these trees.

Soṇa². Domestic Dog, *Canis lupus familiaris*, also called *bhobhukka* 'bow wow-maker', *kukkura*, *suṇa*, *sunakha*, *supāṇa* and *suvāṇa*. The great diversity in dog breeds is almost entirely due to artificial and selective breeding. With a minimum of human interference dogs are muscular animals with a broad chests, relatively long legs and strong blunt claws. In ancient India dogs were sometimes kept for hunting (Ja IV 437; V 289), but more commonly to warn of the presence of strangers and to eat household scraps. There are occasional references to thoroughbred (*koleyyaka*) dogs (Ja I 175; IV 437), but they were generally considered dirty, loathsome creatures and were rarely kept as pets. They were left to wander through the streets scavenging at the rubbish heaps and eating faeces and the corpses dumped in charnel grounds (A III 324). Dogs are mentioned together with chickens, pigs and jackals as animals that eat dung (M III 168). Unwanted babies were sometimes left out for the jackals and dogs to eat (Thī 303). Brahmins would cover the food they were eating with a leaf if a dog stood near to prevent it being rendered impure by the animal's presence (Ja V 389). The

Buddha said that one of the several unpleasant features of Madhurā, the modern Mathura, was the many fierce dogs in the streets (A III 256).

We read that when a group of Licchavī youths roaming around in the forest with their weapons and hunting saw the Buddha, they put down their bows and called their dogs to heel (A III 75). One of the austerities practised by some ascetics was to behave like a dog; going naked, licking their hands after eating and curling up on the ground to sleep (D III 6, M I 387). Some ascetics would refuse to accept alms if a dog was standing nearby or flies were swarming, probably so as not to deprive them of food (A I 295). In one of his most severe criticisms of Brahmins, the Buddha compared them unfavourably with dogs (A III 221). Outcastes used to eat, or at least were said to eat, dogs (Thi 509,).

The various Pali names for the domestic dog were probably also used for the Asiatic Wild Dog, *Cuon alpinus*. This animal is a reddish brown forest-living canine with shorter legs and a more bushy tail than the domestic dog. Wild dogs hunt in packs and communicate with each other by a whistling sound. The Asiatic wild dog is now extinct in northern India and increasingly rare in other parts of the sub-continent. According to the Jātakas, the Bodhisatta was once reborn as a dog (Ja I 175).

Sobhañjana. Drumstick Tree or Horse Radish Tree, *Moringa oleifera* (Ja V 405; VI 535), sometimes also *sobhañjanaka* or *siggu*. A small tree with grey cork-like bark, small elliptic or ovate leaves, long snake-like pods and white flowers. The leaves, flowers and fruit can all be eaten, the root, which smells and tastes like horse radish, is also eaten and an oil extracted from the seeds is used in perfumes. A woman was described as being as slender as a *siggu* shoot (Ja III 161).

Soma. The Vedas mention a plant called *soma* from which juice was extracted, mixed with ghee and flour, left to ferment and then drunk during religious ceremonies to produce an inebriating effect. The *soma* sacrifice was an integral part of Vedic religion and was still being performed at the Buddha's time, although the drink itself may no longer have been consumed (Ja IV 365; VI 199).

There has been a great deal of discussion about the identity of the *soma* plant but there are two plausible candidates. The first is Syrian Rue, *Peganum harmala*. This perennial woody herb has

bright-green leaves about 5 cm. long and finely divided into long narrow segments, and an attractive white flower with five oblong-elliptic petals. The leathery seed capsules have three compartments, each containing about 50 dark-brown angular seeds. The seeds and roots have medicinal and hallucinogenic properties and also yield a red dye. Syrian rue is found in the western and central part of the Ganges plain and grows best in semi-barren areas.

Another possible candidate for *soma* is the Moon Plant, *Sarcostemma acidum*. This is a leafless jointed shrub with fleshy green straggling branches and fragrant white waxy flowers. It grows upright but often trails over shrubs, stumps or rocks. When cut or bruised the branches exude a milky latex which is used in traditional medicine. Extremely potent, the latex is known by village people as tiger's milk. The plant grows throughout India usually in dry or rocky places.

According to the Jātaka, in two of his former lives the Bodhisatta became so fond of pressing and drinking *soma* and of offering it to the gods that he came to be known as Sutasoma (Ja V 177; 457).

Somarukkha. A type of tree (Ja VI 530). The Jātaka commentary identifies it with *Cassia fistula*.

H

Haṃsa. A term for geese and ducks in general and for the Bar-headed Goose, *Anser indicus*, in particular. It was sometimes also called *rājahaṃsa*, and in Hindi *hans* or *raj hans* (Ja III 208; V 356).

About the size of the domestic goose, this beautiful bird has grey, brown and white plumage with a white head and neck marked by two distinctive black bands. The bird's gentle musical 'aang aang aang' call is often praised in ancient Indian literature. The famous ornithologist Salim Ali describes it as 'one of the most unforgettable and exhilarating sounds' to be heard in nature. Vaṅgisa addressed the Buddha saying: 'Quickly send forth your melodious voice, oh Beautiful One. Like geese stretching out their necks, honk gently with your soft well-modulated voice' (Sn 350).

Bar-headed geese are often seen during the winter feeding in swamps and fields, and then in mid-March they fly off to nest in Tibet. To the Buddha this migratory behaviour was suggestive of detachment: 'Mindful people exert themselves. They are not attached to any home. Like geese that quit their lakes, they leave one abode after another behind' (Dhp 91); 'Geese fly the path to the sun, sages fly by their psychic powers. Having defeated Māra and his army the wise are led away from the world' (Dhp 175). Piṅgiya used the geese's arrival back in northern India in October as a metaphor for the coming of something wonderful: 'Just as a bird might leave a small wood to dwell in a forest full of fruit, so do I, having left narrow-minded teachers, come to He of Wide Vision, like a goose arriving at a great lake (Sn 1134).

One of the most beautiful legends in the whole of the Buddhist tradition comes from the *Buddhacarita-saṃgraha*⁶ and concerns a Bar-headed goose.

Once, while walking through the palace garden, Prince Siddhārtha saw a goose fall from the sky with an arrow lodged in its wing. He gently nestled the bird in his lap, extracted the arrow and anointed the wound with oil and honey. Soon afterwards, Devadatta sent a message to the palace saying that he had shot the bird and demanding that it be returned to him. Siddhārtha replied to the message by saying 'If the goose was dead I would return it forthwith. But as it is still alive you have no right to it.' Devadatta sent a second message arguing that it was his skill that had downed the goose and as such it belonged to him. Again Siddhārtha refused to give his cousin the bird and asked that an assembly of wise men be called to settle the dispute. This was done and after discussing the matter for some time the most senior of the wise men gave his opinion, saying 'The living belongs to he who cherishes and preserves life, not to he who tries to destroy life'. The assembly agreed with this and Prince Siddhārtha was allowed to keep the goose.

According to the Jātaka, the Bodhisatta was sometimes reborn as a Bar-headed goose (Ja III 208; IV 246, 423).

6. *Fo Benxing Ji Jing*, 佛本行集經, "Sūtra of the Compilation of the Past Deeds of the Buddha", Taisho edition of the Chinese Tripiṭaka, T3n190,p17. The Sanskrit name is a reconstruction from the Chinese.

Haṭṭa. *Pistia stratiotes* (D I 166). A floating stemless water plant looking something like a small cabbage and which grows in still waters. Some ascetics used to eat this plant (A I 241). Before his enlightenment, the Buddha ate it as a part of his austerities (M I 78).

Hatthi. Asian Elephant, *Elephas maximus*, also called *vāraṇa*, while large impressively tusked males were called *danta*, *gaja*, *kāhīti*, *kuñjara*, *mahāvarāha* or *nāga* (Ja IV 494; VI 497; Vin II 201). Females were called *kaṇṇerukā* (Ja VI 497; M I 178) or *kareṇukā* (Ja II 343) and a female with protruding tusks was called *kaḷārikā* (M I 178).

An elephant that had reached 60 years was called *saṭṭhihāyana* (M I 229) and those with pink spotted foreheads, a sign of age, were called *padumin* (D I 75; Sn 53). Calves were known as *hatthikalabha*, *kaṇṇeru* or *susanāga* (A IV 435; D II 254). There is an occasional mention of black elephants (*kālavāraṇa*) although whether this was a recognized type or just the occasional dark-coloured animal is not certain (Ja III 113; IV 137). Several other types of elephants are mentioned, such as the *mātanga* but it is not clear what distinguished them from others (Dhp 330; Ja V 416; M I 178).

The Pali, Bengali and Hindi word *hatthi* means ‘one with a hand’ and refers to the dexterous way elephants use their trunks.

Slightly smaller than its African cousin, the Asian elephant has grey wrinkled skin, a long trunk, a two-domed head and drooping ears. They can grow up to 3 metres at the shoulders and weigh as much as 5 tons. Asian elephants prefer thick or light jungle and eat the leaves, bark and fruit of trees, grass and aquatic vegetation. They will also raid fields and orchards. In his famous parable of the blind men and the elephant the Buddha described the elephant’s ears as being like a winnowing basket, its tusks (*danta* or *hatthidanta*) like plough poles, the body like a granary, the legs like pillars, the tail is like a pestle and the tuft of the tail like a broom (Ud 68–9). The frontal lobes of the elephant’s head were called ‘pots’ (*kumbha*). Temporin, the odorous tar-like secretion that oozes from the males during musth (Dhp 324), and the musth itself is called *mada* in Sanskrit.

The ancient Indians revered the elephant for its strength, nobility and intelligence and the creatures are mentioned in the Tipiṭaka more than any other animal. Elephants lived in certain forests (M III 132), probably because they offered better shelter,

food and water than other places. Males were believed to avoid the cows and their calves so that they would not be bothered by them or have to eat the leaves and grass that they had already cropped or drink the water they had muddied (A IV 435). It was noticed that elephants have very particular behaviour; when they charge they spread their ears and make their tails erect (Vin II 195), they sniff the dung of other elephants (A III 157) and they dislike heat (D II 266). Males regularly go into musth when temporin flows from their ears and they become aggressive and unruly so that their mahouts have to hold them in check (Dhp 326). At such times they may kill people or even knock down dwellings (Ja IV 494). Elephants enjoy swimming and they amuse themselves by squirting water into their ears and over their backs (A V 202). They pull up lotus stalks, wash them to get the mud off and then eat them (S II 269). A bull-elephant might be seven or eight *ratanas* high (A V 202) and some could live for 60 years or more (M I 229).

Elephants were tamed in India at least 1,500 years before the Buddha's time. Trackers skilled in reading the marks left by them; footprints, the scrapings of their tusks on trees, broken foliage, etc., were employed to find the animals (M I 178). Tamed elephants would be used to capture the wild ones (M III 132). Once caught, the trainer had to subdue the creature's forest habits, memories and behaviour, subdue its distress, fret and fever over missing the forest, and get it used to towns and people. The tamer used gentle, kind words and the elephant would gradually respond and begin eating again. Then the trainer would teach the elephant commands such as 'Take up!' 'Put down!' 'Go forward!' 'Go back!' 'Get up!' 'Sit down!' After that, it would be taught what was called 'endurance'; a plank was tied to its trunk, a man would sit on its back and then it would be surrounded by other men who would poke it with poles and spears and make a great racket while the trainer would command it not to move (M III 132–33).

To mount a trained elephant the mahout would take his hook and say: 'Give me your foot' and the elephant would bend its knee so the mahout climbs on its back (Thī 49). A trainer might demonstrate his mastery of over his elephant by getting it to stand on two legs (Ja II 445). When tamed elephants heard the roar of the lion they would strain at and break the leather bonds that held them, defecate, panic and run around (A II 33). Because of their

value, there were veterinarians (*hatthivejja*) specializing in elephant health (Ja I 485).

Ivory was a much-prized product. Bracelets, boxes for eye-salve, caskets, ornament boxes in fantastic shapes, vases and anklets were made out of it. There is mention of a mirror handle being made out of ivory (Ja V 302). Ivory taken from an elephant that was alive was considered superior to that taken from a dead one (Ja I 321). There was a bazaar of ivory workers in Vārāṇasi (Ja I 320). A type of curved wall peg was called 'elephant tusk' (Vin II 113) and one way of wearing the monks' under robe was to roll it up at the front rather than fold it, a style known as 'the elephant's trunk' (Vin II 137). Being crushed by an elephant was a form of capital punishment (Ja I 200). Pillars in buildings were sometimes made to resemble elephants feet (Vin II 169).

Trained elephants were used for work, transportation, in warfare and to enhance royal glory. The elephant brigade was one of the four traditional branches of the army, the others being cavalry, chariots and infantry (D I 137; Ja IV 494). In battle, elephants would take great care to protect their softest and most vulnerable part, their trunk (M I 415). A large tusked elephant was an essential possession for a monarch. King Ajātasattu rode his royal tusker from Rājagaha to meet the Buddha at Jivaka's Mango Grove (D I 49). Once, the Buddha and Ānanda were bathing in the river at Sāvattthī when Seta, King Pasenadi's elephant, arrived to the accompaniment of music. Soon an admiring crowd had gathered to watch, commenting: 'What a beauty! What a sight! What a delight for the eye! What a body! Now that really is an elephant!' (A III 345). An elephant fit to be a royal mount in war had to have four qualities; it had to respond well to training; in battle it had to destroy other elephants and their mahouts as well as cavalry, chariots and their drivers and footmen; it was expected to endure the injuries of spears, swords, arrows and axes and the din of drums, conches and other noises; and it was expected to go in whichever direction the mahout directed it (A II 117).

One of the skills taught to princes along with horsemanship, archery, swordsmanship and chariot driving, was the art of training, riding and caring for elephants (A III 152). This was called elephant lore (A III 327). During a food shortage the king's elephant died and people ate it (Vin I 217–18). The rare white elephant was

particularly prized (Ja I 319) and one of the accoutrements of a Universal Monarch was a pure white elephant of sevenfold strength (D II 174). The mount of Indra, the king of the gods, was a magnificent elephant named Erāvaṇa (Sn 379).

Some lay people were rich enough to be able to own elephants. For example, when Soṇa became a monk, he said he had renounced everything he owned including 'a herd of seven elephants', the implication being that he had been very wealthy (Vin I 185).

The Buddha seems to have had a special fondness for elephants. The animal's mindful and deliberate behaviour and particularly the male's penchant for living alone in the jungle, impressed him. He said: 'On this matter the enlightened sage and the elephant with tusks as long as plough poles agree, they both love the solitude of the forest' (Ud 42). In some ways the Buddha even considered elephants to be better than humans. The elephant trainer Pessa once said to him: 'Humans are a tangle while animals are straightforward. I can drive an elephant undergoing training and in the time it takes to make a trip to and from Campa, that elephant will display every kind of deception, duplicity, trickery and fraud. But our servants, messengers and employees, they say one thing, do another and think something else.' The Buddha agreed with this observation (M I 340–41). He often compared himself to or was compared by others with an elephant (A II 38). When Doṇa encountered him sitting at the foot of a tree, he appeared 'beautiful, faith-inspiring, with calm senses and a serene mind, utterly composed and controlled like a tamed, alert, perfectly trained elephant' (A II 38). The Buddha never looked over his shoulder when he wanted to see behind him but turned around completely as does an elephant. This was called his 'elephant look' (D II 122).

Throughout the Tipiṭaka, the Buddha advised his disciples to respond to difficulties as would an elephant: 'I shall endure abuse as a bull-elephant in battle endures the arrows shot from the bow. For indeed, ill-natured people are many' (Dhp 320); 'Formerly this mind wandered wherever it wished, where it liked and as it pleased. But today I shall completely control it as a mahout controls an elephant in musth' (Dhp 326); 'Rejoice in awareness and guard your mind well. Pull yourself out of evil as does an elephant stuck in the mud' (Dhp 327); 'If you do not find a wise, zealous and

virtuous companion to wander with, then like a king abandoning his conquered realm, wander alone like a bull-elephant in the forest' (Dhp 329).

Elephants are frequently mentioned in the Jātakas where they are usually depicted as noble, kindly and intelligent creatures. According to the Jātakas, the Bodhisatta was sometimes reborn as an elephant (e.g. Ja I 319; 444; III 174; IV 90) and once as a human he worked as an elephant trainer (Ja II 94).

Haritamaṇḍuka. See **Nīlamaṇḍuka**.

Hariṇa. See **Miga**.

Haripada. Uncertain, but perhaps another name for the *citraka* (Ja III 184). The name means 'golden foot'.

Harīta. A type of *Allium* (Ja VI 536).

Harītaka. The fruit of the Chebulic or Yellow Myrobalan, *Terminalia chebula* (Ja I 80; M III 127). The tree from which this fruit comes is medium-sized usually with a short crooked trunk, dark-grey bark, elliptic leaves and whitish flowers. Together with *āmalaka* and *vibhītaka* the fruit is one of the *triphalā* or three fruits, long credited in traditional Indian medicine with powerful curative properties. When ripe, the bright-yellow fruits are allowed to fall and then collected and used in tanning and as a medicine. While staying at Uruvelā the Buddha plucked a yellow myrobalan fruit (Vin I 30). According to the *Mahāvastu*, the Buddha planted a Yellow Myrobalan tree when he was at Uruvelā. It adds the comment: 'The myrobalans which grew from this tree are today known as the Consecrated Myrobalan Wood' (Mvu III 311). When the Chinese monk Yijing was in India in the 7th century, he was told of ways to use yellow myrobalan as a medicine:

'Take equal measures of *harītaka* bark, dry ginger and granulated sugar. Pound the first two into a powder and mix it with the sugar and some water and then form the paste into pills. Take no more than ten pills in the morning and do not abstain from eating. No more than two or three doses will be sufficient to cure a patient with diarrhea. It will dissolve the gas in the stomach, dispense cold and help digestion... If no granulated sugar is available maltose or honey can be used. If one chews one piece of *harītaka* and

swallows the juice every day, one will be free from disease the whole of one's life.'

Hareṇuka. Pea, (Ja V 405; VI 537). A very ancient species of pea and probably the one mentioned in the Tipiṭaka is the Field Pea, *Pisum arvense*. This legume has sharply toothed bright-green leaves, pale purple or white flowers and climbs by means of tendrils. The seeds are brown or grey, marbled and easily dried. Before his enlightenment, when practising austerities, the Buddha sometimes ate pea soup (M I 245).

Haliddā. Turmeric, *Curcuma longa*, sometimes *haliddī* or *haliddaka* (A III 230; Ja VI 537; M I 227; S II 102; Vin IV 35). An aromatic herb with yellow flowers. The rhizomes of this plant are added to curry powder to give it a deep yellow colour and a warm spicy taste. It was also used as a medicine and artists included turmeric paint in their palates (S III 152). As a dye though turmeric does not hold (Ja III 525). We read of a bull being washed with turmeric water (Ja VI 340). See **Kāra**.

Hiṅgu. Asafoetida, a strong smelling resin or gum extracted from several plants of the genus *Ferula* (Ja VI 536), the main ones being *Ferula assa-foetida*, *F. foetida* and *F. narthex*. The plants grow in the western Himalayas and Hindukush mountains from where the resin must have been imported into the Ganges and Yamuna plain in ancient times. The gum is extracted when the plant flowers. The stem is cut near the crown, a milky juice exudes from the cut and in a few days dries so that it can be collected. This process is repeated several times over several months and a good plant can yield as much as 1 kg of gum. The Buddha recommended asafoetida as a medicine although he did not mention what it is indicated for (Vin I 201). It is still widely used as a medicine. It is also used in cooking, veterinary medicine and to make incense.

A Jātaka story mentions a man preparing monitor lizard flesh for cooking using ghee, curd and 'pungent spices' (*kaṭuka-bhaṇḍa*). According to the commentary these spices were asafoetida, cumin, ginger, garlic, black pepper and long pepper (Ja III 84-86; Vv-a 186). See **Jātu**.

Hiṅgurāja. A type of bird (Ja VI 539).

Hiṅgulajalaka. See **Kiṭa**.

Hintāla. *Phoenix paludosa* (Ap 346; Vin I 190). A small palm tree with large leaves. The upper part of the trunk usually covered with a fibrous network of sheaths.

Hirivera. Fragrant Pavonia, *Pavonia odorata* (Vin IV 34). A erect herb with pink flowers which grows in dry forest areas (Ja VI 537). The root fibres of the plant are fragrant-smelling and used in traditional medicine and to make perfumes.

MEDICAL PLANTS IN THE PALI TĪPIṬAKA AND THEIR USES

The Bhesajja-kkhandaka of the Vinaya Piṭaka includes a *materia medica* of which 27 are plants. In several other places in the Tīpiṭaka other medical plants or their by-products are also mentioned, together with their application. Given here are the Pali names for all these plants, the parts recommended for use, when mentioned, and each plant's medicinal uses based on *Medical Plants of India* by Jain and DeFilipps.

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| <i>Ativisa</i> | Root | Astringent, tonic, for fevers, cough, diarrhoea and dysentery. |
| <i>Amalaka</i> | Fruit | Bark: applied to sores, pimples, with the bark of <i>Dillenia pentagyna</i> for tubercular fistula; for cholera, dysentery, diarrhoea. Leaf: For gravel, diarrhoea and sores. Fruit: Refrigerant, diuretic, laxative, for indigestion, with <i>Swertia</i> and fenugreek for gonorrhoea. Raw fruit aperient, dried and used in haemorrhagic, diarrhoea, as a liver tonic for scurvy, the juice as an eye drop. Seeds: For asthma and stomach disorders. |
| <i>Uppala</i> | Inhaling the perfume | Rhizome: Powdered and given for dyspepsia, diarrhoea, piles, infusion in emollient, diuretic. Leaf: For erysipelas. Flowers Decoction in narcotic. |
| <i>Usīra</i> | Root | Rhizome: Chewed for cough, cold, as a bitter tonic, emetic, antispasmodic, carminative, promotes flow of bronchial secretion, useful in asthma, diarrhoea and dysentery, oil used as nerve stimulant, sedative and analgesic. Stem: For cough and cold. Whole plant: Sedative, analgesic, depressant for blood pressure, respiration, rubbed on body to relieve aches. |

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| <i>Kappāsa</i> | Leaf | Root: For fever. Seed For constipation, gonorrhoea, catarrh, gleans and chronic cystitis. |
| <i>Kuṭaja</i> | Leaf | Root: Spleen complaints, diarrhoea, discharge in urine and excreta, haematuria, blood dysentery, the bites of dogs or poisonous animals. Bark: For bronchitis, cold, menorrhagia, dysentery and other stomach disorders. Flowers: For worms leucoderma and as an appetite stimulant. Seeds: For epilepsy, post-natal complaints, leprosy and other skin diseases, constipation and indigestion, colic and dysentery. |
| <i>Goṭṭhaphala</i> | Fruit | |
| <i>Candana</i> | Not mentioned | Bark: With root bark of <i>Solanum torvum</i> and <i>Achyranthes aspera</i> for malaria. Oil: For enlarged spleen, with <i>Lepidium</i> , <i>Nerium oleander</i> , <i>Nymphaea</i> , root of <i>Michelia</i> and almonds for dysentery; in a paste and applied for headaches, skin complaints, burns and fever inflammation. Oil from heart wood as diuretic, diaphoretic, refrigerant, expectorant and for dysuria. Oil from seeds: For skin diseases. |
| <i>Tagara</i> | Not mentioned | Root: Bitter-tasting and applied locally as an anodyne, chewed to relieve toothaches. Stem: The bark as a refrigerant. Leaf: Latex used for eye diseases. |
| <i>Tālisa</i> | Not mentioned | Bark: Given together (with the roots of other plants) to women as prenatal and post-natal treatment to purify the blood; for biliousness. Fruit: For biliousness and liver complaints. |
| <i>Tila</i> | A paste of the seed | Seeds: in a poultice externally applied for ulcers, for piles, as an emmenagogue in a decoction, for a lactagogue, emollient, diuretic and tonic Seeds and oil are mixed with other medicines for use as demulcent for urinary problems and dysentery. |

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| <i>Tila, taṇḍula, mugga</i> | The grains boiled together | (1) Sesame seeds and oil are mixed with other medicines for use as demulcent for urinary problems and dysentery. (2) Rice gruel is taken to relieve poor digestion, diarrhoea, dysentery and similar bowel complaints. (3) External and internal uses include remedying of nervous system disorders, rheumatism, paralysis, piles, fever, coughing, and liver diseases. |
| <i>Nattamāla</i> | Leaf | Bark and leaves: as febrifuge, emmenagogue, anthelmintic. Seeds: as tonic, laxative, antipyretic, antiperiodic, for malaria and colic. Seed oil: as emollient, for rheumatism, skin diseases, in ears to stop discharge. |
| <i>Narada</i> | Not mentioned | Root: as an aromatic, bitter tonic, stimulant, antiseptic, for convulsions, inhaled (with other plants) for ulcers of nose and palate, dysentery, constipation, bronchitis (with other plants), as a laxative and to improve urination. |
| <i>Nimba</i> | Leaf | Root: as tonic, antiperiodic, strangulation of intestine. Stems: Bitter astringent, antiperiodic, cholera, vermifuge, demulcent, stimulant, cholera. As a contraceptive, 100 grams of bark from the stem is soaked in 1 litre of water and this infusion is taken by men daily for a month. Leaves: For boils, anthelmintic, on skin diseases, young leaves eaten for heart disease and tuberculosis, diarrhoea, dysentery, promotes lactation. Flowers: Tonic, stomachic, stimulant. Fruit and seeds: Purgative, emollient, anthelmintic, local stimulant, insecticide, antiseptic, astringent, for leprosy, piles, heart and urinary diseases and tuberculosis. |
| <i>Pakkava</i> | Leaf | Whole plant: Juice taken to kill worms, with turmeric, pepper and ghee to relieve asthma. Bark: For snakebite. |

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| <i>Paṭola</i> | Leaf | Root: applied to leprous ulcers fresh or mixed with oil. Dry or powdered root taken for spleen and liver enlargement. Flowers: dried and taken as a stimulant. |
| <i>Paduma</i> | Root and stalks | Tuber: To relieve strangulation of the intestine. Rhizome: Yields nutritious arrowroot useful for diarrhoea and dysentery in children. Carpel: Demulcent. Flower: as astringent and cooling agent for cholera. |
| <i>Pippala</i> | Fruit | Root: For cough, cold fever with thirst, to improve digestion, with root of <i>Magnolia doltsopa</i> , ginger, long pepper and <i>Swertia</i> for puerperal fever; Fruit: as a tonic, aromatic, stomachic, carminative; in liniments for pains and paralysis, a decoction of unripe fruit for chronic bronchitis. Root and fruit: as analgesic for muscular pain, inflammation, as snuff in coma, drowsiness, as sedative for epilepsy, as cholagogue in obstructions of bile duct and gall bladder. |
| <i>Bhaṅga</i> | Leaves | Leaves boiled and steam inhaled and/or rubbed on the skin. Whole plant: Stomachic, antispasmodic, analgesic and sedative, for epilepsy, with root of <i>Cayaponia laciniosa</i> , <i>Solena amplexicaulis</i> and opium for convulsions; on sores, for cough and cold. Leaf: for dyspepsia, gonorrhoea, bowel complaints, narcotic nerve stimulant and for skin diseases. |
| <i>Bhaddamut-taka</i> | Root | Whole plant: For heat stroke. Root: For stomach disorders. |
| <i>Marica</i> | Fruit | Stem and leaves: For post-natal complaints. Fruit: as antiperiodic in malaria fever, for protracted labour, convulsions, constipation, indigestion, post-natal complaints, bites and stings, stomachic, diaphoretic, diuretic, locally applied for sore throat, piles and skin diseases, with root of <i>Globba marantina</i> or <i>Polygala arvensis</i> for cough and asthma. |

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| <i>Lasuṇa</i> | Not mentioned | Bulb: For fever, pulmonary phthisis, gangrene of lung, whooping cough, rheumatism, duodenal ulcer, hyperlipidemia, certain typhoides, flatulence, atonic dyspepsia, juice on skin diseases and as an ear drop. |
| <i>Vaca</i> | Root | Root: Chewed for coughs and colds, promotes bronchial secretion, asthma, diarrhoea and dysentery, the oil is used as a nerve stimulant, sedative, analgesic, epilepsy, constipation. Stem: Cough and colds. Root: Vermifuge, in intermittent fever. Whole plant: Sedative, analgesic, depressant for blood pressure, rubbed on aching body parts. |
| <i>Vacattha</i> | Root | |
| <i>Vibhitaka</i> | Fruit | Bark: As diuretic, cardiotonic, for eczema and sores in the mouth. Fruit: For dysentery, enlarged spleen, externally for measles, applied for inflammation of eyes, constipation (with ginger and other plants), coughs, bronchitis, as a gargle for inflammation of the mouth, laxative, cardiac tonic. |
| <i>Vilāṅga</i> | Fruit | Bark: used for treating cholera. |
| <i>Śiṅgivera</i> | Root | Root: For bronchitis, phthisis, with <i>Ocimum tenuiflorum</i> for body pain; lumbago, with <i>Curcuma domestica</i> and <i>Lea hirta</i> for rheumatism; scabies, with black pepper for constipation; with black pepper and <i>Acorus</i> for indigestion; with <i>Nigella</i> and <i>Carum</i> for prolapsis and fistula ani; with <i>Aristolochia indica</i> for cholera; with onion, garlic and red sandalwood for amenorrhoea; with unripe fruit of <i>Aegle marmelos</i> , black pepper and leaves of <i>Ocimum tenuiflorum</i> for post-natal complaints; puerperal fever, snake, dog bites, insect stings, throat pain and to facilitate delivery. |

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| <i>Sulasī</i> , i.e. <i>Tulasī</i> | Leaf | Root: For sudden collapse, decoction for malaria as diaphoretic. Leaf: as stimulant, antiperiodic, diaphoretic, expectorant, fever, constipation, liver disorders, with black pepper, <i>Polygala crotalarioides</i> and rice for coughs. Seeds: as a demulcent, laxative, cooling drink and for urinary complaints. |
| <i>Harītaka</i> | Fruit | Bark: As diuretic, cardi tonic, for eczema, mouth sores. Fruit: For dysentery, enlarged spleen, externally for measles, applied to inflammation of the eyes, constipation, coughs, bronchitis, as a gargle for inflammation of the mouth, laxative, cardiac tonic. Powder of the fruit dentrifice for gums. |
| <i>Haliddā</i> | Root | Root: For hazy vision, inflammation of eyes, with tobacco for night blindness; subnormal temperature, body pains, rheumatism, with Green Gram for scabies, sores, with <i>Dolichos biflorus</i> for infantile fistula; with mustard and <i>Solanum surattense</i> for coughs; with leaves of sweet potato, <i>Nigella indica</i> and <i>Buettneria herbacea</i> root to stimulate lactation. Flowers: For sores in the throat, with <i>Shorea robusta</i> and bark of <i>Ventilago calyculata</i> for syphilis. |
| <i>Hīṅgu</i> | Gum/resin | For colds and cough. Fruit: For pneumonia and skin diseases. |

APPENDIX

ENGLISH-PALI GLOSSARY

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| Agarwood— <i>agaru</i> . | Birch, Himalayan— <i>ābhuji</i> . |
| Ajwain— <i>mudayanti</i> . | Bird— <i>pakkhin</i> . |
| Ajowan— <i>ajamoda</i> . | Biting fly— <i>ḍaṃsa</i> . |
| Ant— <i>pipīlikā</i> . | Bitter Apple— <i>indavāruṇī</i> . |
| Ant. Red Weaver— <i>tambakipillika</i> . | Blackbuck— <i>miga</i> . |
| Antelope, Four-horned— <i>kuruṅga</i> . | Black Plum Tree— <i>jambu</i> . |
| Asafoetida— <i>hiṅgu</i> . | Bluebottle— <i>nīlamakkhikā</i> . |
| Ashoka Tree— <i>asoka</i> . | Blue Water Lily— <i>uppala</i> . |
| Asparagus—see <i>setavāri</i> . | Boar, Wild— <i>varāha</i> . |
| Balloon Frog— <i>uddhumāyikā</i> . | Bodhi Tree— <i>assattha</i> . |
| Bamboo— <i>veḷu</i> . | Bowstring Hemp— <i>maruvā</i> . |
| Banana— <i>kadali</i> . | Brahminy Shelduck— <i>cakkavāka</i> . |
| Banyan Tree— <i>nigrodha</i> . | Bread-fruit Tree— <i>labuja</i> . |
| Barasingha— <i>rohicca</i> . | Buffalo— <i>mahisa</i> . |
| Barley, Wild—see <i>yava</i> . | Bull Shark—see <i>susu</i> . |
| Bark— <i>vakkala</i> . | Bulletwood Tree— <i>vakula</i> . |
| Bar-headed Goose— <i>haṃsa</i> . | Camel— <i>oṭṭha</i> . |
| Barking Deer— <i>kakkaṭa</i> . | Camel's Foot Creeper— <i>māluvā</i> . |
| Barley— <i>yava</i> . | Camphor— <i>kappūra</i> . |
| Basil, Hoary— <i>ajjaka</i> . | Cane— <i>vetta</i> . |
| Basil, Holy— <i>tulasi</i> . | Cannabis— <i>bhaṅga</i> . |
| Bat— <i>vagguli</i> . | Caracal—see <i>biḷārā sasakaṇṇikā</i> . |
| Baya Weaver—see <i>paṭikuttaka</i> . | Rock Bee— <i>bhamara</i> . |
| Bear— <i>accha</i> . | Cassia, Indian— <i>tamāla</i> . |
| Bed Bug— <i>maṅkuna</i> . | Castor Oil Shrub— <i>eraṇḍa</i> . |
| Bee— <i>madhukara, bhamara</i> . | Cat— <i>biḷāla</i> . |
| Indian Beech— <i>karañja, nattamāla</i> . | Catfish— <i>puṭhuloma</i> . |
| Bengal Cotton— <i>samuddakappāsī</i> . | Centipede— <i>satapadī</i> . |
| Bengal Quince— <i>beluva</i> . | Ceylon Oak— <i>kāsumārī</i> . |
| Betel Palm— <i>pūga</i> . | Champak— <i>campaka</i> . |
| Betel Vine— <i>tambūla</i> . | Chameleon, Indian— <i>sarabhū</i> . |
| | Chaste Tree— <i>niggunḍī</i> . |
| | Chirauli Nut Tree— <i>rājāyatana</i> . |
| | Cicada—see <i>cīriḷikā</i> . |

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| Cluster Fig— <i>udumbara</i> . | Dill, Indian— <i>satapuppha</i> . |
| Cobra— <i>nāga</i> . | Dog— <i>soṇa</i> ² . |
| Coconut Palm— <i>nāḷikera</i> . | Dolphin—see <i>susu</i> . |
| Coral— <i>pavāla</i> . | Domestic Cattle— <i>go</i> . |
| Common Garden Lizard— <i>kakaṇṭaka</i> . | Donkey— <i>gadrabha</i> . |
| Common Hill Myna—see <i>sāliya</i> . | Dove— <i>kakuṭa</i> , <i>pārāvata</i> . |
| Common Indian Monitor— <i>godhā</i> . | Drongo— <i>bhīṅkāra</i> . |
| Common Wolf Snake— <i>agārasappa</i> . | Drumstick Tree— <i>sobhañjana</i> . |
| Conch— <i>saṅkha</i> ¹ . | Earthworm— <i>gaṇḍuppāda</i> . |
| Coots—see <i>pokkharasātaka</i> . | Egg Plant— <i>vātiṅgaṇa</i> . |
| Coral Tree, Indian— <i>mandārava</i> . | Eel— <i>amarā</i> . |
| Cormorant, Great & Little— <i>udakakāka</i> . | Egret— <i>baka</i> . |
| Cotton Bush— <i>kappāsa</i> . | Elephant— <i>hatthi</i> . |
| Cowrie—see <i>sippi</i> . | Elm, Indian— <i>kañcaka</i> . |
| Crab— <i>kulīra</i> . | Eye fly— <i>khuddakamakkhikā</i> . |
| Crane— <i>kañka</i> . | Falcon, Shahn—see <i>vyagghīṇasa</i> . |
| Crepe Ginger— <i>kuṭṭha</i> ² . | False Black Pepper— <i>vilaṅga</i> . |
| Creepers— <i>latā</i> . | Ficus—see <i>khīrarukkha</i> , <i>kacchaka</i> , <i>nigrodha</i> . |
| Cricket— <i>cīrilikā</i> . | Field Pea— <i>hareṇuka</i> . |
| Crimson Sunbird—see <i>lohapitṭhā</i> . | Filariasis—see <i>sīpada</i> . |
| Crocodile—see <i>susu</i> . | Firefly— <i>khajjopanaka</i> . |
| Crocodile Needlefish—see <i>maccha</i> . | Fish— <i>maccha</i> . |
| Crop affliction—see <i>mañjīṭṭhikā</i> , <i>setaṭṭhika</i> . | Fishing Cat—see <i>biḷāla</i> . |
| Crow— <i>kāka</i> . | Flame of the Forest— <i>kiṃsuka</i> . |
| Cuckoo— <i>karavīka</i> , <i>kokila</i> , <i>phussakokila</i> . | Flamingo, Greater—see <i>rājahaṃsa</i> . |
| Cucumber— <i>kakkārika</i> . | Flax—see <i>khoma</i> . |
| Cumin, Black— <i>jīraka</i> . | Flea— <i>uppāṭaka</i> , <i>pāṇaka</i> . |
| Curry Leaf Tree— <i>kāra</i> . | Flowers— <i>puppha</i> . |
| Date Palm— <i>khajjūra</i> . | Flycatcher— <i>sagga</i> . |
| Deer— <i>hariṇa</i> , <i>kuṇṇa</i> , <i>laṅghi</i> , <i>miga</i> , <i>rohita</i> ¹ , <i>ruru</i> , <i>sarabha</i> , <i>sārāmiga</i> . | Flying Fox, Indian— <i>tuliyā</i> . |
| | Flying Squirrel— <i>pakkhabilāla</i> . |
| | Fowl, Domestic— <i>kukkuṭa</i> . |
| | Fowl, Red Jungle— <i>kukkuṭa</i> . |
| | Francolin, Grey— <i>kapīñjala</i> . |
| | Frankincense, Indian— <i>sallakī</i> . |
| | Freshwater Mangrove— <i>mucalinda</i> . |

- Freshwater Mussel—see *sippī*.
 Frog—*maṇḍuka*.
 Frog, Indian Pond—
nīlamaṇḍuka.
 Galancha Vine—*pūtilatā*.
 Ganges Dolphin—see *susu*.
 Ganges Shark—see *susu*.
 Garlic—*lasuṇa*.
 Gaur—*gavara*.
 Gharial—see *susu*.
 Gecko, House—*gharagolikā*.
 Ginger—*siṅgivera*.
 Glossy Ibis—see *bhassara*.
 Goat—*aja*.
 Golden Barb—see *maccha*.
 Golden Oriole—*ambakamaddarī*.
 Goose—*haṃsa*, *kādamba*,
rājahaṃsa.
 Gourd, Angled—*kosataki*.
 Gourd, Bitter—*tittakalābu*.
 Gourd, Bottle—*alābu*.
 Gourd, Pointed—*paṭola*.
 Gourd, Towel—see *goṭṭhaphala*.
 Gourd, Scarlet—*bimba*.
 Gourd, White—*kakkāru*,
kumbhaṇḍa.
 Grains—*dhañña*.
 Gram, Black —*māsa*.
 Gram, Green—*mugga*.
 Gram, Horse—*kalāya*, *kulaṭṭha*,
varaka.
 Grape Vine—*muddika*.
 Grass—*tiṇa*.
 Grasshopper—*paṭaṅga*, *salabha*.
 Grouse—*tittira*.
 Gums—see *jatu*.
 Hanuman Langur—*vānara*.
 Hare Lice—see *pāṇaka*.
 Head Lice—*ūkā*.
 Hare—*sasa*.
 Hare Lice—see *pāṇaka*.
 Heron—*kaṅka*, *kāraṇḍava*, *koṇca*.
 Heron, Indian Pond—*koṇca*.
 Hill Glory Bower—see *bhaṇḍi*.
 Hive Bee—see *madhukara*.
 Hog Deer—see *nīnka*.
 Hog Plum—*ambāṭaka*.
 Honey Tree—*madhuka*.
 Horse—*assa*.
 Horse Radish—*mūlaka*.
 Horse Radish Tree—*sobhañjana*.
 Houndfish—see *maccha*.
 House Fly—*makkhikā*.
 Hyena, Striped—*taraccha*.
 Ibis, Black—see *bhassara*.
 Indian Beech—*karañja*,
nattamāla.
 Indian Gooseberry—*āmalaka*.
 Indian Plum—*tālīsa*.
 Indian Roller—*kikī*.
 Indigo—*nīlī*.
 Insects—*kiṭa*, *siriṇṣapa*.
 Intestinal worms—*kimi*.
 Iron Wood Tree—*nāga*.
 Jacana—*jīvaṃjīvaka*.
 Jack Tree—*panasa*.
 Jackal—*sigāla*.
 Jackal Jujube—see *takkola*.
 Jasmine—see *sumanā*, *vassikā*,
yūthikā.
 Jew's Mellow—*koṭṭha*¹.
 Jujube Fruit—*badara*.
 Jungle Cat—see *biḷāla*.
 Jute—see *potṭhaka*.
 Keelback, Buff-striped—see
deḍḍubha.
 Keelback, Checkered—
udakasappa.
 King Cobra—*kaṇhasappa*.
 Kingfisher—*kulīraka*.

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| Kite— <i>kulala</i> . | Munj sweetcane— <i>muñja</i> ¹ . |
| Koel— <i>kokila</i> . | Mule— <i>assatara</i> . |
| Lac— <i>lākhā</i> . | Mushroom— <i>ahicchattaka</i> . |
| Laggar—see <i>kurara</i> . | Mussel Shell Creeper— <i>girikanṇika</i> . |
| Lapwing—see <i>dindibha</i> . | Mustard, Indian— <i>sāsapa</i> , <i>rājikā</i> . |
| Leopard— <i>dīpi</i> . | Mustard, White— <i>siddhattaka</i> . |
| Leopard Cat—see <i>biḷāla</i> . | Myna— <i>sāliya</i> . |
| Leprosy— <i>kuṭṭha</i> . | Myrobalan— <i>āmalaka</i> , <i>āmanda</i> , <i>harītaka</i> , <i>vibhītaka</i> . |
| Lice— <i>ūkā</i> . | Neem Tree— <i>nimba</i> . |
| Liquorice— <i>madhulaṭṭhikā</i> . | Nilgai— <i>gokaṇṇa</i> . |
| Liquorice, Indian— <i>jiñjuka</i> . | Nut Grass— <i>bhaddamuttaka</i> . |
| Linen— <i>khoma</i> . | Oleander— <i>karavīra</i> . |
| Linseed—see <i>khoma</i> . | Onion— <i>palaṇḍuka</i> . |
| Lion, Asiatic— <i>kālasīha</i> , <i>kesara</i> , <i>sīha</i> . | Orange, Wild— <i>mātuluṅga</i> . |
| Long Pepper— <i>pippalī</i> . | Otter— <i>udda</i> . |
| Lotus— <i>paduma</i> . | Owl— <i>kosika</i> , <i>ulūka</i> , <i>uhuṅkāra</i> , <i>siṅgila</i> , also see <i>pakkhabilāla</i> . |
| Madder— <i>mañjeṭṭhī</i> . | Owl, Brown Fish— <i>ulūka</i> . |
| Maggot— <i>kimi</i> , <i>pulava</i> . | Pagusa Catfish— <i>pāgusa</i> . |
| Magnolias—see <i>padmaka</i> . | Palmyra Palm Tree— <i>tāla</i> . |
| Mange— <i>vittacchikā</i> . | Panic Seed— <i>piyaṅgu</i> ² . |
| Mango, Indian— <i>amba</i> . | Paradise Flycatcher, Asian— <i>celakedu</i> . |
| Mango, Himalayan— <i>kosamba</i> . | Parakeet— <i>suka</i> , <i>cirīṭa</i> . |
| Marking Nut Tree— <i>bhallāṭaka</i> . | Pearl Oyster— <i>muttā</i> . |
| Marsh Crocodile—see <i>susu</i> . | Persimmon, Indian— <i>tiṇḍuka</i> . |
| Milk Tree— <i>khīrapaṇṇi</i> . | Peafowl— <i>mayūra</i> . |
| Millet— <i>kaṅgu</i> , see <i>cīnaka</i> , <i>piyaṅgu</i> ² . | Pepper— <i>marica</i> , <i>pippalī</i> . |
| Millet, Kodo— <i>kudrūsa</i> . | Picrorrhiza— <i>kaṭukarohiṇī</i> . |
| Millet, Proso— <i>cīnaka</i> . | Pig— <i>sūkara</i> . |
| Millet, Sawa— <i>sāmāka</i> . | Pigeon— <i>kapota</i> , <i>pārāvata</i> . |
| Mongoose— <i>nakula</i> . | Pigeon, Yellow-legged Green— see <i>mayhaka</i> . |
| Monkey— <i>kapi</i> , <i>makkāṭa</i> , <i>vānara</i> . | Pine, Long-leaved— <i>sarala</i> . |
| Monk's Hood— <i>atīvasa</i> . | Pomegranate— <i>dālīkā</i> . |
| Moon Plant—see <i>soma</i> . | Porcupine— <i>sallaka</i> . |
| Mosquito— <i>makasa</i> . | Porcupine Flower— <i>koraṇḍa</i> . |
| Moth—see <i>paṭaṅga</i> , <i>salabha</i> . | |
| Mother-of-pearl— <i>saṅkhamuttā</i> . | |
| Mouse— <i>mūsika</i> . | |
| Mud Eel—see <i>amarā</i> . | |

- Purple Yam—see *āluka*.
 Python, Indian—*ajakara*.
 Quail—see *laṭukikā*, *lāpa*, *cakora*,
vaṭṭakā.
 Rail—see *pokkharasātaka*.
 Rat—*undura*.
 Raven—*kākola*.
 Red Coral—*pavāla*.
 Red Rice—*nīvāra*.
 Red Rot—*maññijṭṭhikā*.
 Red Silk-cotton Tree—*simbali*.
 Red Velvet Mite—*indagopaka*.
 Reeds and Rushes—*naḷa*.
 Resins—see *jatu*.
 Rhesus Macaque—*kapi*, *makkaṭa*.
 Rhinoceros—*khagga*.
 Rice Plant—*taṇḍula*.
 Rice Affliction—see *setaṭṭika*.
 Rohu Fish—*rohita*².
 Rose-ringed Parakeet—see *suka*.
 Rosewood, North Indian—
siṃsapā.
 Rosha Grass—*phaṇijjaka*.
 Rushes—*naḷa*.
 Sal Tree—*sāla*.
 Sambar—*sarabha*, *sāmāmiga*.
 Sandalwood Tree—*candana*.
 Sandalwood, Red—see *candana*.
 Sandan—*phandana*.
 Sann Hemp—*sāṇa*.
 Sawfish—see *makara*.
 Scabies—*vitacchikā*.
 Scarab Beetle—*gūthapāṇa*.
 Scholar's Tree—*sattapaṇṇa*.
 Scorpion—*vicchika*.
 Screw Pine—*ketaka*.
 Seeds—*bīja*.
 Sesame—*tila*.
 Sea Bean—see *āsītika*.
 Shallot—see *bhañjanaka*.
 Shark—see *susu*.
 Sheep—*eḷaka*.
 Sickie Senna—*eḷagalā*.
 Silk Worm—*kosakāraka*.
 Sloth Bear—*accha*.
 Sparrow Hawk—*bhāsa*.
 Spinach—*phalaka*.
 Smooth Angelica—*coraka*.
 Snake—*sappa*.
 Snakehead, Common—see
sakula.
 Soap Nut Tree—*ariṭṭhaka*.
 Spider—*makkaṭaka*.
 Sparrow—*kulinka*.
 Spear Grass—*dabba*.
 Spikenard—*narada*.
 Spoonbill—see *āṭa*.
 Spotted Deer—*citraka*.
 Squirrel—*kalandaka*.
 Stilt, Black-winged—see
Daṇḍamāṇavaka.
 Stinging Catfish—*siṅgu*.
 Stingray—see *maṇḍuka*.
 Stork, Asian Openbill—
sithilahanu.
 Stork, Greater Adjutant—see
kaṅka.
 Sugar Cane—*ucchu*.
 Suicide Tree—see *kimphala*.
 Syrian Rue—see *soma*.
 Swallow Wort—*akka*.
 Swamp Deer—*rohita*¹, *ruru*.
 Sweet Flag—*vaca*.
 Swift—see *bhaṇḍu*.
 Tamarind—*ciñcā*.
 Taro—see *nādiya*.
 Teak—*sāka*.
 Termite—*upacikā*.
 Thorn Apple—*dhanutakkāri*.
 Thorny Bamboo—see *veḷu*.

- Tiger—*vyaggha*.
 Toadstool—*ahicchattaka*.
 Tortoise—*kacchapa*.
 Trees—*rukḥa*.
 Trumpet Flower—*pāṭali*.
 Trumpet Flower, Indian—*soṇa*².
 Turmeric—*halidda*.
 Turtle—*kacchapa*.
 Turtle, Chitra—see *cittacūlā*
 kacchapa.
 Variegated Bauhinia—*kovilāra*.
 Velvet Bean—*kapikacchu*.
 Vines—*latā*.
 Vine Snake—see *silābhū*.
 Vulture—*gijjha*, *sakunta*.
 Water Chestnut—*siṅghātaka*.
 Watercock—*kukutṭhaka*.
 Water Lily, White—*sogandhika*.
 Water Lily, Small White
 Indian—see *uppala*.
 Water Pepper—see *nādiya*.
 Wave-leafed Fig—*pilakkha*.
 Weaver Ant—*tambakipillika*.
 Whale—see *susukā*, *timi*.
 Wheat—*godhūma*.
 Wild Dog, Asiatic—see *soṇa*².
 Woodboring beetle—
 ghuṇapāṇaka.
 Wild Rice—*nīvāra*.
 Wolf—*koka*.
 Wood Apple Tree—*kapittha*.
 Woodborer—*guṇa*.
 Woodpecker—*koṭṭha*²,
 rukḥakoṭṭasakuṇa, *satapatta*.
 Wool—*uṇṇa*.
 Worms—*kimi*.
 Yak—*camara*.
 Yeast—*kinṇa*.
 Yellow Jade Orchid Tree—
 champakā.

ABBREVIATIONS

PALI AND SANSKRIT TEXTS

- A *Āṅguttara Nikāya*, ed. R. Morris, E. Hardy, PTS, London 1885–1900.
- Ap *Apadāna*, ed. Mary E. Littey, PTS, Oxford 2000.
- As *Atthasālinī*, ed. E. Muller, PTS, London 1897.
- Bc *Buddhacarita of Aśvaghoṣa*, ed. Edward B. Cowell, Oxford, 1893.
- Bv *Buddhavaṃsa*, ed. N. A. Jayawickrama, PTS, London 1974.
- Cp *Cariyāpiṭaka*, ed. N. A. Jayawickrama, PTS, London 1974.
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- Dhp *Dhammapada*, ed. O. von Hinüber, K. R. Norman, PTS, Oxford 1994.
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- Dhs *Dhammasaṅgaṇī*, ed. E. Müller, PTS, London 1885.
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JOURNALS

- AAH *Asian Agri-History*
JAOS *Journal of the American Oriental Society*
JPTS *Journal of the Pali Texts Society*
JRAS *Journal of the Royal Asiatic Society*
HSPCIC *History of Science, Philosophy and Culture in Indian
Civilization*
UCPCP *University of California Publications in Classical Philology*

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