



Hornbills of North Bengal

An information booklet about the forest hornbills found in North Bengal.

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Photo: Aparajita Datta

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Introduction

Nature Mates-Nature Club (NMNC), Kolkata in collaboration with Nature Conservation Foundation (NCF), Mysore initiated the North Bengal hornbill project from November 2017 onwards.

In Buxa Tiger Reserve, Nature Mates & NCF have been engaged in studying the breeding biology of four sympatric hornbill species, conducting an occupancy survey to understand the distribution / abundance of hornbills through field surveys and monitoring hornbill roost sites. Along with this, the project is also exploring opportunities for partnership with the Forest Department, Tourist Guides Association and local

community members to enable a long-term hornbill monitoring and protection program.

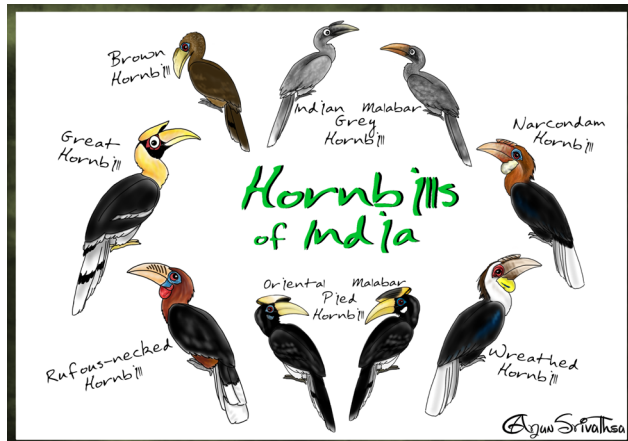
In Mahananda Wildlife Sanctuary and Neora Valley National Park an occupancy framework-based survey was conducted in November 2018 - February 2019.

NCF has been working for over two decades on hornbill conservation and research, partnering with local communities and the forest department in the North-east and Western Ghat landscapes of India. Some of the information in this brochure has been extracted from NCF's ongoing hornbill research in Arunachal Pradesh and Assam.

Hornbill facts

- Large bills, often with horn-like structures on top called casques
- Distinctive calls, often harsh, loud or noisy
- Prominent long eyelashes
- Loud wing beats of some large hornbills like the Great and Wreathed hornbill
- Known as “farmers of the forest” for their ability to disperse seeds over long distances

In India, there are nine species of hornbills.



Artwork: Arjun Srivathsa

Breeding biology of hornbills

- Hornbills nest in already existing cavities of large trees
- They cannot make or build their own cavity. Therefore, they are called secondary cavity-nesters
- Hornbills also exhibit site fidelity. Most pairs re-use the same cavity in the next breeding season
- The pair selects a nest and cleans it together
- The female enters the cavity and seals herself by plastering the cavity opening mainly with her droppings, leaving only a tiny slit in the seal
- The female lays eggs within a few days to a week of entering the nest
- The incubation period varies across hornbill species, but is estimated to be 40-55 days for the large-sized hornbills such as the Great and Wreathed hornbill

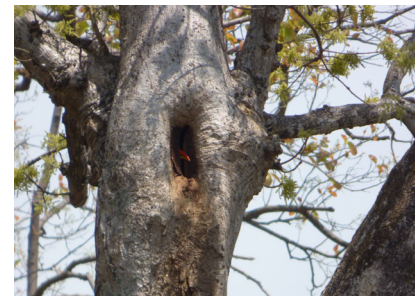


Photo: Karishma Pradhan





Artwork: Maya Ramaswamy

- After the female seals herself, the male delivers food at the nest throughout the breeding season
- For the Great hornbill, the female exits the cavity after three months in June, leaving the chick alone in the nest for another month
- For the Wreathed, Oriental Pied and Rufous-necked hornbills, the mother and chick may exit together or the chick may exit 1 or 2 days later
- The nesting duration: the period from female entry till the chick fledging varies from 3 to 4 months depending on the hornbill species

Diet

- Asian forest hornbills mainly eat fruits: 90-95% of their diet
- Figs are a significant part of their fruit diet but they also feed on other non-fig fruits
- Hornbills also feed on variety of insects, crabs, lizards and snakes, amphibians, birds and eggs of other birds



Artwork: Arjun Srivathsa

Hornbill roosting

- Hornbills gather in the evenings to roost together
- They often roost along streams/rivers in open habitat on riverside trees
- Social interactions between individuals are observed at roost sites
- Occasionally, individuals of different species may also roost together. This is called communal roosting



Photo: Aparajita Datta

North Bengal Hornbills

Five species of hornbills are found in North Bengal (the Indian grey hornbill, the Great hornbill the Wreathed hornbill, the Oriental Pied hornbill and the Rufous-necked hornbill), with the last four species found in forests. The Indian grey hornbill is found in rural landscapes and near villages and towns. North Bengal forms the westernmost distributional

limit for two species -Wreathed hornbill and the Rufous-necked hornbill. Apart from the Oriental Pied hornbill which is listed as 'Least Concern' by the IUCN Red List, all the other three species found in forests of North Bengal - Great hornbill, Wreathed hornbill and Rufous-necked hornbill- are listed as 'Vulnerable' in the IUCN's Red List of Threatened Species.



Buxa Tiger reserve landscape. Photo: Kabir Pradhan

Great hornbill

Scientific name:

Buceros bicornis

Local names:

Bengali: *Dhanesh*;

Nepali: *Hongrayo*; Dukpa: *Ghora*

Identifying

characteristics:

This hornbill has a large yellow beak and a large casque on top of its upper beak. It has a white tail with a horizontal black band. The male has red eyes with black skin around the eyes. The female has white eyes with red skin around the eyes. The male also has black colour between the casque and beak, and behind the casque. The female has a red colour behind the casque.

Its white tail with a horizontal black band, and its white neck and wing bars, are striking in

flight. The wing edges are tipped with white. Male: red eyes with black skin around the eyes. Female: white eyes with red skin around the eyes.

Call: It has a loud call that sounds like kok-kok. When this bird flies, the flapping of the wings can also be heard from a distance.



Artwork: Arjun Srivathsa

Size: It is the largest among Asian hornbills and weighs over 3 kg. 2.1-3.9 kg; 112-150 cm

Breeding biology:

Pre-breeding (nest searching and courtship): January - February.

Nest entry and sealing by female: Last week of February to March (February 27 - 6 March in Buxa Tiger Reserve).

Female emergence: Three months after female entry (May 25 - June 11 in Buxa Tiger Reserve).

Chick fledging: About four months after female entry (June 21 - 3 July in Buxa Tiger Reserve).

Total nesting duration: 103 - 137 days (mean 121 days) in Pakke Tiger Reserve and 114 - 117 days (mean 115 days) in Buxa Tiger Reserve.



*Left: Female, Right: Male
Artwork: Saniya Chaplod*

Distribution:

In India: rainforests of the Western Ghats, the rainforests of north-east India, and along the lower Himalayan mountains of north Bengal and Uttaranchal. Bhutan, Nepal, Thailand, Myanmar, Bangladesh, Cambodia, Vietnam, Laos, parts of Malaysia, Indonesia and China, and some islands in South-east Asia.

Best places for sightings in North Bengal:

Lower to mid-elevation areas in and around Buxa TR, Gorumara WS and Mahananda WS.

During the non-breeding season in winter, sightings are also reported from areas around Darjeeling and Kalimpong.



A Great hornbill chick's first look outside the nest Photo: Karishma Pradhan



A Great hornbill chick on the day of chick fledging Photo: Karishma Pradhan

Oriental Pied hornbill

Scientific name:

Anthracoceros albirostris

Local names:

Bengali: *Dhanesh*; Nepali:

Dhanesh

Identifying

characteristics: A black and white coloured hornbill, with an almost cylindrical casque that has black marks on its tip. It has brown irises with light blue skin around them. It has a black tail with white tips and pale blue throat patches and circumorbital skin.

Male and female are similar, but females are smaller and have black markings at the tip of bill and casque and a red spot on the lower mandible.

Call: They are noisy and have a cackling call that sounds like kek-kek-kek-kek.

Size: They are medium-sized hornbills, weight ranges from 500-800 gm; 60-85 cm length.

Male: Creamy bill with black base on lower mandible, casque cylindrical, projecting front part



Artwork: Arjun Srivathsa

black; Female: Smaller bill and casque marked with black, red spot on lower mandible. Both have pale blue bare skin around eyes. White on outer tail tips and trailing wing edges seen in flight. Size: 500-900 gm; 60-85 cm.

Breeding biology

Pre-breeding (courtship and nest searching): January – March.

Nest entry and sealing by female: late March – early May (March 26 – May 8 in Pakke TR and April 12 – April 18 in Buxa TR).

Chick fledging: June - July (June 28 – July 27 in Pakke TR).

Total nesting duration: 76-110 days (mean 94 days) in Pakke Tiger Reserve. There has been no successful chick fledging till date from Buxa TR in both the years.



A pair of Oriental Pied hornbill Photo: NCF

Left: Female, Right: Male

Distribution:

In India: foothills of the Himalaya in Uttaranchal, parts of Bihar, North Bengal and North-east India.

Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Cambodia, Laos, Vietnam, parts of China and Malaysia.

Best places for sightings in North Bengal:

Lower elevation areas of Buxa TR, Mahananda WS and Gorumara WS. Secondary forests and sometimes near human habitation adjoining these forests.



An OPH chick after emerging from nest
Photo: Vijay Tachang

Wreathed hornbill

Scientific name:

Rhyticeros undulatus

Local names:

Bengali: Dhanesh;

Nepali: Ghek bhako dhanesh

Identifying

characteristics: This large hornbill is mostly black, with a fully white tail. The casque on the beak have neat furrows or wreaths.

The male is coloured chestnut -brown on the head, and has a bright yellow throat pouch. The female is coloured black and has a bright blue throat. Both have an incomplete black bar on their throat pouch.

This hornbill is mostly black, with a fully white tail.

Male: Chestnut-brown on the head with a yellow throat pouch.
Female: black with a blue throat.
Both have an incomplete black bar on their throat pouch. There are neat furrows or wreaths on the upper beak.

All juvenile birds look like males, if they are female, they change to female colouration after 1-2 years.



Artwork: Arjun Srivathsa

Call: They have a call with three notes that sounds like oek-uk-uk. The flight of these birds can also be heard from a distance.

Size: Average weight is about 2.5 kg. Variation between sexes: 1.4-3.6 kg; 84-117 cm.

Breeding biology:

Pre-breeding behavior (courtship and nest searching):

January – February.

Nest entry and sealing by female: March – early April (March 5 – April 10 in Pakke TR and March 20 – March 28 in Buxa TR).

Chick fledging: late July-early August (July 18 - August 6 in Pakke TR and first week of August in Buxa TR – based on one known exit date in Buxa TR).



Left: Male, Right: female
Artwork: Saniya Chaplod

Total nesting duration: 118-142 days (mean 128 days) in Pakke TR. Nesting duration is not known from Buxa TR as either the entry date or exit date is not known from any of the active nests of Wreathed hornbill in Buxa TR.

Distribution: In India: forested hills of north Bengal and north-east India. North Bengal is the westernmost limit of their

global range. Bangladesh, Nepal, Bhutan, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, Indonesia and some islands in South-east Asia.

Best places for sightings in North Bengal:

Lower to mid-elevation forests of Buxa TR.



Male Wreathed hornbill delivering a fruit of *Chisocheton cumingianus* at nest.

Photo: Aparajita Datta



A Wreathed hornbill chick at a nest in Pakke Tiger Reserve. Photo: Khem Thapa

Rufous-necked hornbill

Scientific name:

Aceros nipalensis

Local names:

Bengali: Lal galla dhanesh;

Nepali: Kukur dhanesh, Raato

khaley/ghek dhanesh;

Dukpa: Tekte

Identifying

characteristics: It gets its name from the colour of the male, which is rufous-brown on its head, neck and breast.

The skin on the throat pouch of both is red with a blue patch around each eye. Black ridges on the upper half of the beak and no casque. Upper half of the tail is black, while the lower part is white.

Male: Rufous-brown on its head, neck and breast. Female: fully black.

Call: Their call sounds like short barks - "thok - thok".

Size: 2.3-2.5 kg; 99-122 cm.

Breeding biology:

Pre-breeding behavior (courtship



Artwork: Arjun Srivathsa

and nest searching): January - February.

Nest entry and sealing by female: Usually in the last 2 weeks of April (ranges from 22 March to 1 May) in Buxa TR.

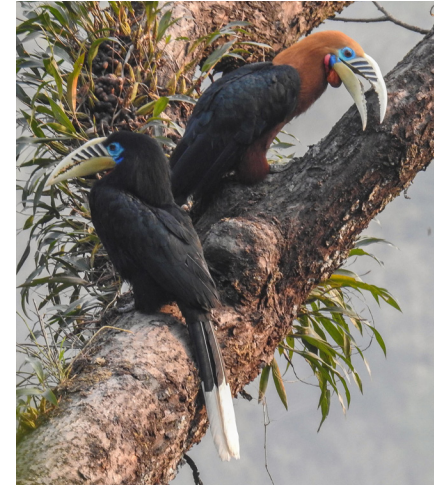
Chick fledging: July - mid-August (19 July to 8 August in Buxa TR)

Total nesting duration: 99-121 days in Buxa TR

Distribution:

In India: Himalayan foothills, north Bengal, Sikkim, eastwards to Arunachal Pradesh, and in the hills of Nagaland, Manipur and Mizoram. The elevational range where they are seen is usually from 500 m up to 2500 m.

Bhutan, Myanmar, Thailand, parts of China and Vietnam. They are believed to be extinct in Nepal.



A Rufous-necked hornbill pair

Left: Female, Right: Male

Photo: Parag Gurung



A juvenile hornbill with its parents. The black ridges on the beak help estimate the age of the hornbill

Photo: Anmol Rai

Best places for sightings in North Bengal:

Higher elevation areas of Buxa TR, Mahananda WS and Neora Valley NP.



A Rufous-necked hornbill chick before fledging Photo: Parag Gurung

Competition for nests

Hornbills cannot make or build their own cavities. Hornbills may also lose their cavity due to loss of nest tree during storms, felling of nest trees, shrinking of cavity, sinking of nest floor or competition from other animals. The availability of suitable nesting cavities, thus, act as a limiting factor to the hornbill population.

This often leads to intra and/or inter-specific competition between hornbill pairs during the breeding period.

In Buxa Tiger Reserve, a Great hornbill pair was observed disturbing a breeding Rufous-necked hornbill female and chick that were enclosed in the cavity.

In Pakke Tiger Reserve and the surrounding Reserve Forest, there are many instances of nest takeovers by different hornbill species which indicates inter-specific competition for limited nest sites.



A male Great hornbill at the cavity occupied by a breeding Rufous-necked hornbill female Photo: Sitaram Mahato

Hornbill diet

Hornbills love to eat the ripe, soft fruits of many trees in the rainforest. Around 90-95% of the diet of the large Asian forest hornbills is fruits. The fruits that they eat are usually black, orange or red in colour. They fly over large distances in search of food, and when they find fruits, they swallow them, eating only the flesh and throwing out the big seeds, mostly unharmed. They also love fig fruits. The tiny seeds of figs are passed out in their droppings.

Our study in Buxa TR has shown that during the breeding season, the diet of the Great hornbill consists of 42% of figs, 47% of non-fig fruits and 11% animal items.



A male Rufous-necked hornbill delivering fruits at a nest in Latpanchar, a village located in the fringes of Mahananda Wildlife Sanctuary
Photo: Anmol Rai



A male Great hornbill delivering Tokay gecko at the nest
Photo: Karishma Pradhan

Seed dispersal

Hornbills are like the farmers of the forest, sowing seeds wherever they go. Our studies have documented that hornbills eat and disperse the seeds of around 100 tree species in Pakke TR. Hornbills swallow the fruits whole, and regurgitate the seeds unharmed away from parent fruiting trees. Hornbills were estimated to disperse 600-11,600 seeds per day per km² in a study in Namdapha TR.

The two larger hornbill species can disperse seeds as far as 10-13 km. The large gape size of hornbills enables them to handle larger fruits compared to smaller birds, therefore, their role in seed dispersal, especially of large-seeded trees, is very critical in tropical forests.



Regurgitated seeds from below a Rufous-necked hornbill nest. Photo: Debapratim Saha

Predators

Yellow-throated marten, binturong, and raptors are some known predators of hornbills. Occasionally, snakes are also known to prey on hornbill eggs. During the breeding season, hornbills are more vulnerable to predation as the female and chick are imprisoned inside the cavity.

In Pakke TR, a Yellow-throated marten was seen entering the cavity and preying upon on a Wreathed hornbill chick. The chick was preparing to emerge from the nest. In another instance, two yellow-throated martens entered a Great hornbill nest and preyed on the chick.



A Crested Serpent eagle perched above an active hornbill nest. The male GH aggressively chased it away soon after.
Photo: Kishan Das

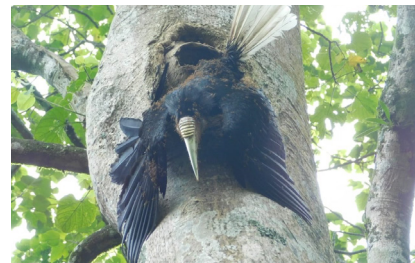


A Yellow-throated marten inside the Wreathed hornbill nest
Photo: Khem Thapa and Tali Nabam

Mortality at nests

Apart from predation, there are other threats that increase the chance of hornbill mortality during the breeding season. Some nest trees are known to fall during heavy storms with the female hornbill and chick still inside. Death of male hornbills (due to poaching of the male) during the breeding season may lead to the abandoning of the nest by the female hornbill, posing a grave threat to the chick's life.

In an unusual instance in Buxa TR, a female hornbill was seen stuck at the cavity entrance - it appears her feet/claws had got stuck. She was observed dead at the cavity while trying to emerge from the nest. This would also lead to chick mortality, since the chick would also be unable to exit the nest, as the cavity was blocked by the dead female. Poaching of nests during the breeding season is another major threat to the hornbill population. Once a hornbill nest is known to a poacher, hornbills nesting in that cavity are prone to getting poached every year.



A female hornbill found dead at the cavity opening, after 125 days of nesting.
Photo: Sitaram Mahato

Table 1: List of hornbill nest tree species from Arunachal Pradesh and North Bengal

S.no	Nest tree species	Family	Hornbill species	Location
1	<i>Tetrameles nudiflora</i>	Datisceae	GH, OPH, RNH, WH	Buxa TR, Latpanchar (fringes of Mahananda WS), Pakke TR
2	<i>Schima wallichii</i>	Theaceae	GH, RNH	Buxa TR
3	<i>Terminalia bellerica</i>	Combretaceae	OPH	Buxa TR
4	<i>Shorea robusta</i>	Dipterocarpaceae	RNH	Buxa TR
5	<i>Syzygium</i> sp.	Myrtaceae	RNH	Buxa TR
6	UNID species	Lauraceae	WH	Buxa TR
7	<i>Ailanthus grandis</i>	Simaroubaceae	GH, OPH, RNH, WH	Buxa TR, Latpanchar (fringes of Mahananda WS), Pakke TR
8	<i>Altingia excelsa</i>	Altingiaceae	RNH	Pakke TR/ Papum RF
9	<i>Terminalia myriocarpa</i>	Combretaceae	RNH	Namdapha TR



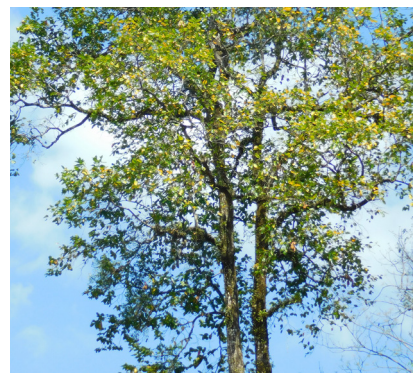
Ailanthus grandis, is locally known as Gokul in North Bengal. A Great hornbill pair has been nesting on this particular tree for many years. This is also the second most common nest tree species in Pakke Tiger Reserve.

Photo: Karishma Pradhan



Tetrameles nudiflora, is locally called Moina in North Bengal. This species forms 47% of hornbill nest trees in Buxa TR and about 85-90% of nest trees in Pakke TR. This tree species has been used by four species of hornbills for nesting in BTR.

Photo: Karishma Pradhan



Shorea robusta also popularly known as the Sal tree is a fairly common tree species found in the Himalayan foothills. The Sal tree is one of the dominating and important tree species of BTR.

Photo: Sitaram Mahato

Table 2: List of hornbill food plants from Arunachal Pradesh and North Bengal

Sno.	Family	Plant species	Bengali/ Nepali name	Hornbill species	Location observed
1	Anacardiaceae	<i>Spondias pinnata</i>	-	-	Pakke TR (one feeding observation)
2	Annonaceae	<i>Polyalthia simiarum</i>	Lapche	GH, WH, RNH	Buxa & Pakke TR
3	Annonaceae	<i>Polyalthia</i> sp. 2	-	-	Pakke TR
4	Arecaceae	<i>Livistona jenkinsiana</i>	-	-	Pakke TR
5	Bignoniaceae	<i>Oroxylum indicum</i>	-	OPH	Pakke TR (once feeding on flowers)
6	Burseraceae	<i>Canarium resiniferum</i>	-	-	Pakke TR
7	Burseraceae	<i>Canarium strictum</i>	-	GH, RNH, WH	Namdapha TR
8	Burseraceae	<i>Canarium</i> sp.	Lohakat	GH, RNH, WH	Buxa TR, Latpanchar
9	Elaeocarpaceae	<i>Elaeocarpus sphaericus</i>	Rudraksh	-	Pakke & Namdapha TR (two feeding observations)
10	Elaeocarpaceae	<i>Sloanea sterculiaceae</i>	Bhalu katus	-	Buxa & Pakke TR
11	Gnetaceae	<i>Gnetum ula</i>	-	-	Pakke TR
12	Icacinaceae	<i>Platea latifolia</i>	-	WH	Pakke TR
13	Lauraceae	<i>Actinodaphne angustifolia</i>	-	-	Pakke TR (one feeding observation)
14	Lauraceae	<i>Actinodaphne obovata</i>	-	-	Buxa & Pakke TR

15	Lauraceae	<i>Alseodaphne petiolaris</i>	-	-	Namdapha TR
16	Lauraceae	<i>Alseodaphne peduncularis</i>	-	-	Pakke TR
17	Lauraceae	<i>Beilschmeidia assamica</i>	-	RNH,WH	Eaglenest WLS, Namdapha & Pakke TR
18	Lauraceae	<i>Beilschmeidia roxburghiana</i>	-	RNH	Namdapha & Pakke TR
19	Lauraceae	<i>Beilschmeidia gammieana</i>	-	-	Pakke TR
20	Lauraceae	<i>Beilschmeidia</i> sp.	Jungli Jalpai	GH, RNH	Buxa TR, Latpanchar
21	Lauraceae	<i>Cinnamomum cecicodaphne</i>	-	-	Pakke TR
22	Lauraceae	<i>Cinnamomum bejolghota</i>	-	-	
23	Lauraceae	<i>Cinnamomum</i> sp.	-	RNH	Eaglenest WLS
24	Lauraceae	<i>Cryptocarya amygdalina</i>	-	RNH	Eaglenest WLS, Pakke TR
25	Lauraceae	<i>Cryptocarya andersonii</i>	-	RNH	Eaglenest WLS
26	Lauraceae	<i>Litsea panamonja</i>	-	RNH	Buxa & Pakke TR
27	Lauraceae	<i>Litsea chinensis</i>	-	-	Pakke TR
28	Lauraceae	<i>Litsea monopetala</i>	-	-	Pakke TR
29	Lauraceae	<i>Litsea messnei</i>	-	RNH	Eaglenest WLS
30	Lauraceae	<i>Litsea salicifolia</i>	-	RNH	Eaglenest WLS
31	Lauraceae	<i>Litsea cubeba</i>	-	RNH	Eaglenest WLS
32	Lauraceae	<i>Litsea assamica</i>	-	RNH	Eaglenest WLS

33	Lauraceae	<i>Litsea khasyana</i>	-	RNH	Eaglenest WLS
34	Lauraceae	<i>Litsea lancifolia</i>	-	RNH	Eaglenest WLS
35	Lauraceae	<i>Machilus duthiei</i>	-	GH, RNH, WH	Namdapha TR
36	Lauraceae	<i>Machilus</i> sp.	-	RNH	Eaglenest WLS
37	Lauraceae	<i>Neolitsea umbrosa</i>	-	-	Pakke TR
38	Lauraceae	<i>Phoebe</i> sp.	Petpete	GH, WH	Buxa & Namdapha TR
39	Lauraceae	<i>Phoebe lanceolata</i>	-	-	Pakke TR
40	Lauraceae	<i>Phoebe attenuata</i>	-	-	Pakke TR
41	Lauraceae	<i>Phoebe cooperiana</i>	-	RNH	Eaglenest WLS, Pakke TR
42	Lauraceae	<i>Phoebe</i> cf. <i>goalparensis</i>	-	-	
43	Lauraceae	<i>Persea</i> sp.	-	RNH	Eaglenest WLS
44	Leguminosae	<i>Milletia pachycarpa</i>	-	-	Pakke TR
45	Magnoliaceae	<i>Talauma hodgsonii</i>	-	-	Pakke TR
46	Magnoliaceae	<i>Michelia champaca</i>	-	-	Eaglenest WLS Namdapha & Pakke TR
47	Magnoliaceae	<i>Michelia velutinosa</i>	-	RNH	Neora Valley NP
48	Meliaceae	<i>Aglaia spectabilis</i>	Lali/Jante Lali	GH, RNH	Buxa & Pakke TR, Eaglenest WLS, Latpanchar

49	Meliaceae	<i>Dysoxylum gotadhora</i>	Dudhelali /Losonilali	GH, RNH	Buxa & Pakke TR, Eaglenest WLS, Latpanchar
50	Meliaceae	<i>Chisocheton cumingianus</i>	Lali	GH	Buxa & Pakke TR
51	Meliaceae	<i>Dysoxylum procerum</i>	Lali	RNH	Buxa TR, Latpanchar
52	Meliaceae	<i>Dysoxylum cauliflorum</i>	-	-	Pakke TR
53	Meliaceae	* <i>Dysoxylum</i> sp.	-	-	Namdapha TR
54	Meliaceae	<i>Dysoxylum hamiltonii</i>	-	-	Pakke TR
55	Meliaceae	<i>Aphanamixis polystachya</i>	Lali/Harelali	GH	Buxa TR
56	Meliaceae	<i>Trichilia</i> sp.	-	RNH	Eaglenest WLS
57	Moraceae	<i>Ficus elastica</i>	-	GH	Buxa TR
58	Moraceae	<i>Ficus altissima</i>	-	GH, RNH, WH	Buxa, Namdapha Tiger Reserve & Pakke TR
59	Moraceae	<i>Ficus clavata</i>	-	-	Pakke TR
60	Moraceae	<i>Ficus maccllelandi</i>	-	-	Pakke TR
61	Moraceae	<i>Ficus nervosa</i>	-	-	Pakke TR
62	Moraceae	<i>Ficus drupacea</i>	-	GH, RNH, WH	Namdapha TR
63	Moraceae	<i>Ficus geniculata</i>	-	GH, RNH, WH	Namdapha TR
64	Moraceae	<i>Ficus microcarpa</i>	-	RNH	Namdapha TR
65	Moraceae	<i>Ficus benjamina</i>	-	-	

66	Moraceae	<i>Ficus obtusifolia</i>	-	-	
67	Moraceae	<i>Ficus roxburghii</i>	-	RNH	Eaglenest WLS
68	Moraceae	<i>Ficus hirta</i>	-	RNH	Eaglenest WLS
69	Moraceae	<i>Ficus cf. tsjahela</i>	-	GH, RNH, WH	Namdapha TR
70	Moraceae	<i>Ficus rumphii</i>	-	-	Buxa & Pakke TR, Kaziranga NP
71	Moraceae	<i>Artocarpus chaplasha</i>	-	-	Pakke TR
72	Myristicaceae	<i>Horsfieldia kingii</i>	Ramgua -	GH, RNH	Buxa & Pakke TR, Latpanchar
73	Myristicaceae	<i>Knema erratica</i>	-	-	Pakke TR
74	Myristicaceae	<i>Knema linifolia</i>	-	-	Pakke TR
75	Myrtaceae	<i>Syzygium cumini</i>	Jam/Jamun/ Jamuna	GH	Buxa TR
76	Myrtaceae	<i>Syzygium syzygioides</i>	-	-	Pakke TR
77	Myrtaceae	<i>Syzygium formosum</i>	-	RNH	Eaglenest WLS
78	Oleaceae	<i>Chionanthus</i> sp.	-	RNH, WH	Buxa & Namdapha TR
79	Phyllanthaceae	<i>Bridelia retusa</i>	-	-	Pakke TR (one feeding observation)
80	Rhamnaceae	<i>Zizyphus</i> sp.	-	-	Pakke TR (one feeding observation)
81	Rosaceae	<i>Prunus ceylanica</i>)	-	RNH, WH	Namdapha & Pakke TR
82	Rosaceae	<i>Prunus</i> sp. 2	-	-	Pakke TR

83	Rubiaceae	<i>Hyptianthera stricta</i>	-	-	Pakke TR
84	Rutaceae	** <i>Zanthoxylum rhetsa</i>	-	-	Pakke TR
85	Simaroubaceae	<i>Picrasma javanica</i>	-	-	Pakke TR
86	Sterculiaceae	<i>Sterculia villosa</i>	-	-	Pakke TR
87	Urticaceae	<i>Laportea crenulata</i>	-	-	Pakke TR (only one feeding observation)
88	Verbenaceae	<i>Vitex glabrata</i>	-	-	Pakke TR
89	Verbenaceae	<i>Callicarpa arborea</i>	-	-	Pakke TR
90	Vitaceae	<i>Leea indica</i>	-	-	Pakke TR
	9 more unidentified species	1 liana, 2 fig and six others	-	-	Pakke TR

*named as *D. gobara* in some publications

**named as *Z. glabrata* in one publication

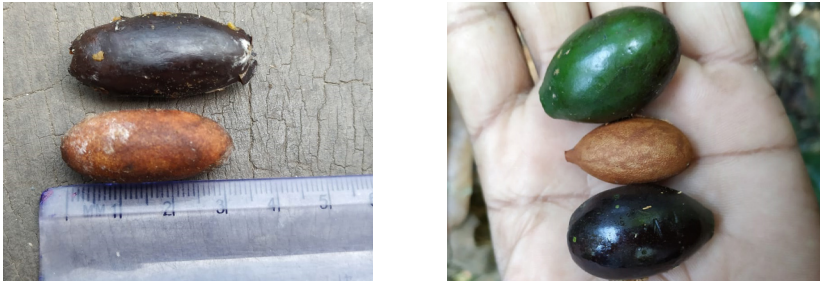
Aglaia spectabilis
Photos: Karishma Pradhan



Horsfieldia kingii
Photo: Sitaram Mahato



Beilschmiedia sp.
Photo: Sitaram Mahato



Polyalthia simiarum
Photo: Sitaram Mahato



Dysoxylum gotadhora
Photo: left: Sitaram Mahato
right: Karishma Pradhan



Left : *Actinodaphne obovata*
Right : *Aphanamixis polystachya*
Photos : Sitaram Mahato



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Buxa TR landscape. Photo Dollar Ganguly