



The
Gibbon Experience

***AN INTRODUCTION TO
NAM KAN BIODIVERSITY***

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1 WELCOME TO THE NAM KAN NATIONAL PARK

THANK YOU FOR JOINING THE GIBBON EXPERIENCE

Nam Kan National Park stands in the immediate surroundings of booming, hungry China and is not untouched. Still, it is in a much better condition than most other Lao national parks. There is a multitude of birds, mammals, amphibians, reptiles and plant biodiversity present. Some are easier to observe than others.

In this binder, we invite you to learn more about the species that we have found living in Nam Kan thus far. Having a chance to encounter some of these animals can be rare due to their low densities, behavior and life style.

Perched in your tree house, you are in a unique position to marvel at the Nam Kan mixed-deciduous forest. The Gibbon Experience was founded on the belief that a treetop perspective offers not only a visually stunning view of the forest and its wildlife, but also a symbolic understanding: if your home or workplace is in a tree, you wouldn't want it to be felled.

Currently, The Gibbon Experience provides full-time employment to over 100 individuals, including the forest guards of the National Park. This initiative not only protects the forest but also contributes to the local economy.

By coming on The Gibbon Experience, you contribute to the sustainable development of the local communities and the conservation efforts of the National Park.

HERE ARE SOME TIPS TO MAXIMISE SIGHTINGS:

- > **Early Mornings:** *This is the prime time for bird watching and listening to gibbons.*
- > **Quiet Observation:** *Keep your voices low and break into smaller groups for a less intrusive presence.*
- > **Stay Alert:** *Maintain a state of silent awareness as you walk through the forest.*
- > **Nighttime Watch:** *In your tree house, use your torchlight to spot the glowing eyes of nocturnal mammals. Please note that ziplining is not permitted after dark.*

If you're interested in contributing to our biodiversity inventory, particularly in the areas of invertebrates and plants, you can share your photos with us or record your observations on the iNaturalist citizen science platform. Your contributions can make a difference in our understanding of species distribution and ecology.

2

BLACK CRESTED GIBBON NOMASCUS CONCOLOR

1 GEOGRAPHIC RANGE & HABITAT

Nomascus concolor is a critically endangered species. They are primarily found in Southern China (Yunnan) and within restricted ranges in Northwestern Laos and Northern Vietnam. They live in evergreen, semi-evergreen and deciduous forests, in subtropical and mountainous areas. The sub-species we observe within the Nam Kan National Protected Area (NPA) is *Nomascus concolor lu*, or Lao Black Crested Gibbon. The population in the Nam Kan NPA is thought to be the only viable population outside Yunnan.

2 APPEARANCE & CHARACTERISTICS

Black Crested Gibbons are not monkeys but apes like humans. Males are all black with black hairless faces while females are yellowish-beige with black hairless faces and black patches on the top of their head, chest and abdomen. Females and males generally weigh between 7–10 kg. Gibbons have the longest arm length relative to body size of any primate. **Their arms are about twice the length of their body and one and a half times the length of their legs!** What is surprising is that gibbons are the most bipedal primate after the humans but they very rarely walk on the ground but rather on branches and they can't swim.

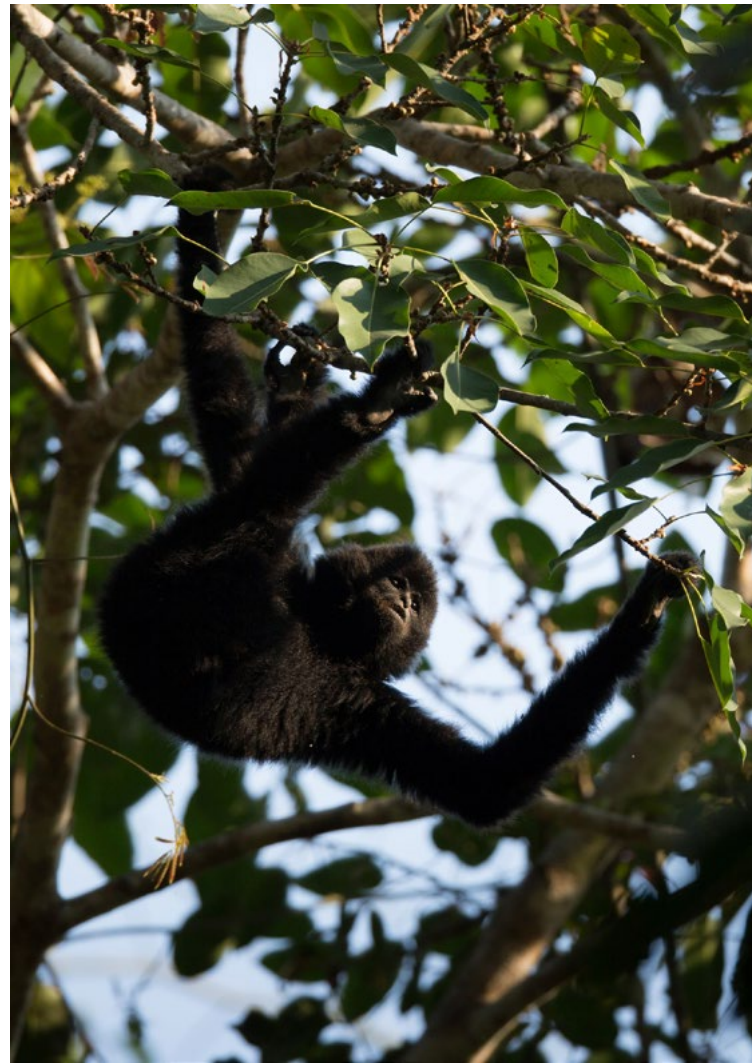
Recent research (Clarke et al. 2015) has unveiled the fascinating ability of gibbons to communicate with each other using over 450 unique “hoo” calls. These calls are not random but are employed in specific scenarios such as foraging, encountering neighbors, and identifying predators. Interestingly, not only do the contexts differ, but there are also subtle variations within each context. For instance, gibbons use different calls to distinguish between various types of predators. This intricate system of vocal communication offers invaluable insights into the evolution of primate communication, and potentially, **the origins of human speech.**

3 ECOLOGY

Black Crested Gibbons live in small family groups consisting of an adult male and female and up to 5 offspring. A gibbon family moves within its home range from day to day in search of a new food sources.

Although most Black Crested Gibbons are monogamous, there have been occasional observations of multiple females in a single breeding group. These observations have created some debate about the existence of polygyny among males. Huang Bei *et al.* recently published evidence of males and females replacing existing mating pairs.

Gibbons have a low birth rate with usually only one offspring born, spaced out by periods of 2-3 years. Gestation lasts about 7-8 months. Offspring of Black Crested Gibbons are born with white fur. For the first





couple of months, the infant clings to the mother's belly while she swings around the canopy. The infant's fur color regardless of gender begins to slowly change from white to grey to end up fully black at around 1 year old. The mother nurses the infant until the age of 2, during this time the male and older offspring also provide infant care. Juvenile fur color remains black and only changes once reaching sexual maturity at the age of 7 or 8. Therefore it is not possible to distinguish the sex of subadults from coloration. Reaching sexual maturity, females change from black to a yellowish-beige color and both males and females leave their natal family groups. Crested Gibbons have been estimated to have a lifespan of 30-40 years.

Gibbons are almost completely arboreal as their Latin name *Hylobates* refers, "dweller in the trees", spending most of their time in the tall trees of the canopy. *N. concolor* are diurnal and sleep in tall, thick trees near a food source. Their diet consists of fruits, buds, leaves, bark, flowers, small vertebrates, insects, and eggs; although the majority of their diet is composed of sugar rich fruits such as figs.

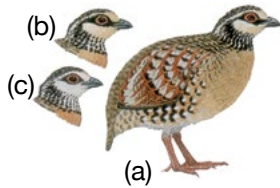
They move from tree to tree by an arboreal form of locomotion called brachiation, in which the Gibbons swing from branch to branch only using their long arms to support their body weight. Only a few other

apes (Tarzan included) and monkeys have adapted this unique form of movement. Gibbons are masters at brachiation reaching airborne distances of 15 m and going as fast as 56 km/h.

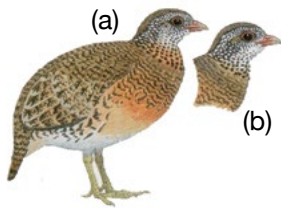
Gibbons are known for the distinctive loud complex siren-like vocalizations. Commonly songs are heard at dawn but season and weather seem to influence the timing, frequency and duration of singing. Elaborate vocalizations are used for a variety of purposes including the strengthening of a pair bond, attracting a mate, and establishing family territory. In the mornings before feeding, songs can be heard from either a solo gibbon or a female and male pair will perform a duet. These songs are produced from the top of the trees with individual notes and very elaborate patterns. The unique notes in the songs allow researchers to distinguish sexes and different species of Crested Gibbons. Each subspecies and even each family have their own vocal patterns and notes!

THE FOLLOWING CONTENT IS BASED ON BIRDS OF SOUTHEAST ASIA
CONCISE EDITION BY CRAIG ROBSON

GALLIFORMES, PHASIANIDAE



BAR-BACKED PARTRIDGE
A. brunneopectus



SCALY-BREASTED PARTRIDGE
A. chloropus

MEASUREMENTS 26.5-29.5 cm

(a) Adult *brunneopectus*: Pale buffish supercilium/upperthroat, black mantle-bars, brown breast, black-and-white flank markings. (b) Adult *henrici* (N,C Indochina): Pale of head richer buff. (c) Adult *albigula* (S Annam): head whiter.

VOICE Males give loud *brr* notes (increasing in volume), then *wi-wu* couplets (also becoming

louder before ending abruptly). Partner often adds *chew-chew-chew*...

HABITAT Broadleaved evergreen forest; 500-1,525 m; rarely to 1,850 m in S Annam.

RANGE Un/iC R C, (Uncommon Resident in C = Central), E (= East), S Myanmar, Tenasserim, W, NW, NE Thailand, northeast Cambodia, Laos, Vietnam (except Cochinchina).

MEASUREMENTS 27-31.5 cm

(a) Adult *chloropus*: Plain; greenish legs, reddish bill with dull yellowish tip, indistinct flank markings. Juvenile: Whitish shafts and tips on breast/flank feathers. (b) Adult *cognacqi* (S. Indochina, except Cambodia): Duller.

OTHER SUBSPECIES *A.c.peninsularis* (south W Thailand): Similar to *cognacqi* below. *A.c.olivacea* (Cambodia, N,C Laos, W Tonkin).

VOICE Slowly accelerating clear notes (often

doubled), then 5-7 loud, harsh, undulating couplets: *tu-tu...tu-tu-tu..tu-tu. tutu-tu-tututututu-tutu TCHIRRA-TCHWIU-TCHIRRA-TCHWIU-TCHIRRA-TCHWIU...*

HABITAT Broadleaved forest, secondary growth, bamboo; up to 1,000 m.

RANGE Co R (Common Resident) N, C, S Myanmar, north Tenasserim, W, NW, NE, SE Thailand, Indochina (except E Tonkin, N, C Annam).

MEASUREMENTS c.80-127, f 56-71 cm

(a) Male *nycthemera* (inc. *rufipes*, *occidentalis*, *ripponi*, *jonesi*, *beaulieui*; ? *berlioz*): White above with black chevrons/ lines, red legs. Whitest in north-east. (b) Female: Plain-looking brown (sometimes warmish) above, blackish-and-whitishbarred outertail, broad blackish and white scales below (duller/buffier with browner scales to west/south-west). In E Tonkin, underparts like upperparts (tinged greyer) with whitish shaft-streaks and paler throat; tail may be rather plain with finer vermiculations on outer feathers.

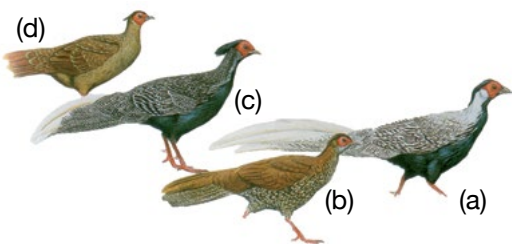
OTHER SUBSPECIES: Group 1 (c) Male *lineata* (S Myanmar east of Irrawaddy, south E Myanmar, W, western NW Thailand) and *crawfordii* (Tenasserim, south W Thailand): Much denser markings above, legs often dark grey/pinkish-brown (particularly *lineata*). (d) Female: Light scaling above, black-and-white V-shapes on hindneck, mostly dull chestnut breast/belly (blackish on *crawfordii*) with white streaks, paler central tail. Group 2 (e) Male *lewisi* (SE Thailand, SW Cambodia), *engelbachi* (S Laos), *beli* (C Annam), and *annamensis* (C southern, S Annam): Bolder markings above than *lineata*, red legs. (f) Female *lewisi*: Chestnut-tinged above with greyish scaling, greyer and relatively plain below. Females of other races in this group

have underparts like upperparts (warmer on *engelbachi*) with whitish shaft-streaks and paler throat (*beli* and *engelbachi* may have blackish and whitish vermiculations on lower breast to vent); tail may be rather plain compared to *nycthemera*. Juvenile: As female but may have black spots/bars on scapulars/coverts; males soon obvious.

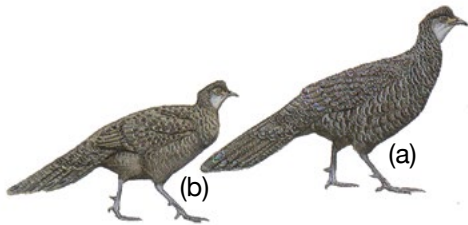
VOICE Grunting *WWERK* in alarm, and *WWERK wuk-uk-uk-uk...* with sharp *HSSiik*. Rising *swiieeik*. Throaty *wutch-wutch-wutch..* and *UWH*.

HABITAT & BEHAVIOUR Broadleaved forests; up to 2,020 m. Often in small flocks; usually shy.

RANGE Un/lc R (Uncommon and local Resident in) N (south-eastern part), E, C & S (east of Irrawaddy) Myanmar, north Tenasserim, Thailand (except C,S), Indochina (except Cochinchina ?).



SILVER PHEASANT
L. nycthemera



GRAY PEACOCK PHEASANT
P. bicalcaratum

MEASUREMENTS 56-76, f 50 cm

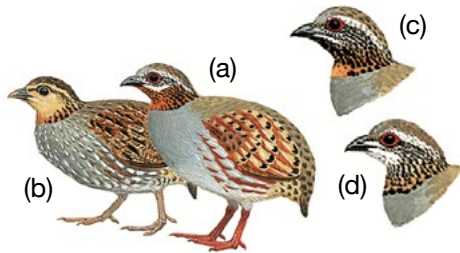
(a) Male *bicalcaratum*: Greyish; white throat, green/purple ocelli above, pink face-skin. (b) Female: Darker/plainer; less distinct ocelli. Juvenile: As female.

OTHER SUBSPECIES *Pb. ghigii* (Vietnam).

VOICE Loud airy *PU PWOI* (*PWOI* drawn/rising) from male. Growling rattles, then harsh/loud notes: *uhrrrrr uhrrrrr uhrrrruk orrokhokhokh OKH-OKH-OKH-OKH ORKH-ORKH-ORKH ORKH-ORKH-ORKH...*

HABITAT Broadleaved evergreen forest; up to 2,320 m.

RANGE Un/lfc R Myanmar, W, NW, NE, S (north) Thailand, north-east Cambodia, Laos, W, E Tonkin, N,C (north) Annam.



RUFOUS THROATED PARTRIDGE
A. rufogularis

MEASUREMENTS 26-29 cm

(a) Adult *tickelli*: Black-streaked rufous throat/neck, grey breast, chestnut flank-streaks. (b) Juvenile: Plainer/buffier throat, white spots/streaks below, small black markings but no broad pale grey to buffish-grey markings on scapulars/coverts. (c) Adult *intermedia* (SW,W,N,S Myanmar): Mostly black throat. (d) Adult *annamensis* (S Annam): Whitish throat, often a black necklace.

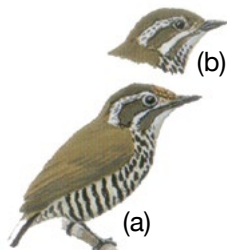
OTHER SUBSPECIES *A.r.euroa* (N Indochina); *guttata* (C Annam).

VOICE Territorial call is long clear whistle followed by whistled couplets: *whu-whu whu-whu...*, gradually ascending scale and increasing in pitch. Partner may add monotonous *kew-kew-kew...*

HABITAT Broadleaved evergreen forest; 1,000-2,590 m.

RANGE Co R Myanmar (except C), W,NW,NE Thailand, Laos, W,E Tonkin, N,C,S Annam.

PICIFORMES, PICIDAE



SPECKLED PICULET
Picumnus innominatus

MEASUREMENTS 9-10.5 cm

(a) Male *malayorum*: Bold olive-slate and white head-pattern, black-barred rufous-buff forehead, whitish below with blackish spots/bars. (b) Female: Olive-slate forehead. Juvenile: As respective adults but bill pale.

VOICE Territorial call is high *ti-ti-ti-ti-ti*. Tinny drumming. Sharp *tsit* and squeaky *sik-sik-sik*.

HABITAT Broadleaved evergreen and mixed deciduous forest, secondary growth, bamboo; up to 1,935m (915-1,370 m in Pen Malaysia).

RANGE Co R (except SW Myanmar, C, SE Thailand, Singapore).

VOICE High trilled *chi rrrrrrrrrrr* from male. Tinny drumming: *tit rrrrrrrrrit*. Sharp *chi*.

HABITAT Bamboo, broadleaved forest, secondary growth; up to 1,910 m.

RANGE Fc/c R (except C,SE,southern S Thailand, Pen Malaysia, Singapore).



WHITE-BROWED PICULET
Sasia ochracea

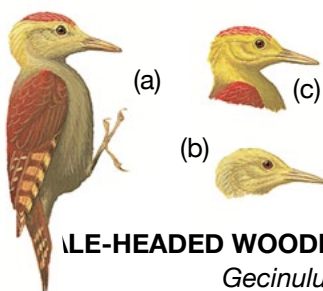
MEASUREMENTS 8-9.5 cm

(a) Male *reichenowi*: White supercilium, rufescent-olive mantle/scapulars, buffish-rufous below. (b) Female: Forehead rufous. Juvenile: Like Rufous. (c) Male *hasbroucki* (Tenasserim, S Thailand): Blackish eyering.

OTHER SUBSPECIES *S.o. ochracea* (N,E Myanmar to N Indochina): More dark olive crown/mantle (looks collared), deeper rufous below.

HABITAT Bamboo, broadleaved evergreen and semi-deciduous forest; up to 1,900 m.

RANGE Ra/un R SW,W,N,C Myanmar, north NW Thailand (ra), north-east Cambodia, Laos, Vietnam.

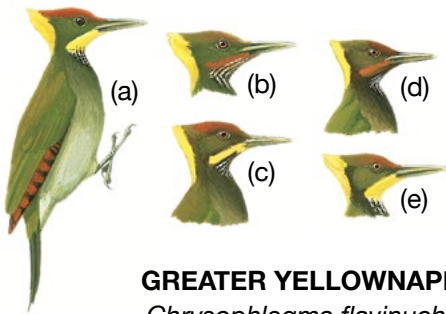


RED-HEADED WOODPECKER
Gecinulus grantia

MEASUREMENTS 25 cm

(a) Male *indochinensis*: Maroon-chestnut above, pinkish-red crown-patch, barred wings. (b) Female: No crown-patch. Juvenile: As female but mostly dark brown above, darker/greyer below. (c) Male *grantia* (Myanmar): Redder crown-patch/upperparts, yellower head-sides, more olive below, less wingbaring.

VOICE Strident laughing *YI wee-wee-wee* from males. Shortish, quite loud, full, even drumming. Harsh *grrrit-grrrit-grrrit* etc.



GREATER YELLOWNAPE
Chrysophlegma flavinucha

MEASUREMENTS 31.5–35 cm

(a) Male *lylei*: Rufescent crown, yellow throat, streaked fore-neck, barred primaries. (b) Female: Olive hindcrown, rufescent chin/submoustachial, streaked/mottled throat. Juvenile: Duller below, may show faint belly-bars. Male initially has olive-scaled crown, more buffy-whitish throat. (c) Male *wrayi* (Pen Malaysia): Smaller/darker, defined yellow chin/submoustachial, crown duller with olive at rear, crest shorter with less yellow. (d) Female: Darker, more uniform below, crest differs as male. (e) Male *flavinucha* (Myanmar, W Thailand):

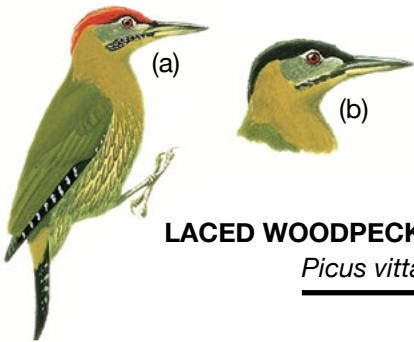
Rufescent fore-crown, darker neck-/breast-sides.

OTHER SUBSPECIES *P.f. archon* (east NW, north NE Thailand, Laos, W Tonkin, N,C,S Annam) and *pierrei* (south NE, SE Thailand, Cambodia, Cochinchina): Black streaks go further up throat on males. *P.f. styani* (E Tonkin).

VOICE Drums infrequently. Loud disyllabic *kyaa* or *kiyaep*.

HABITAT Broadleaved forest, locally pine forest; up to 2,745 m (above 915 m in Pen Malaysia).

RANGE Co R (except C,S Thailand, Singapore).



LACED WOODPECKER
Picus vittatus

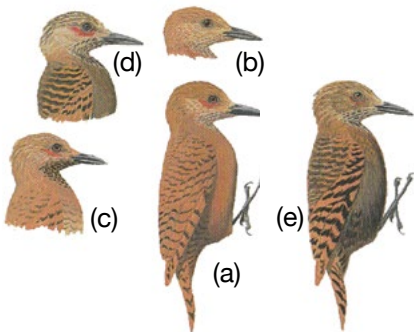
MEASUREMENTS 27–33 cm

(a) Male: Red crown, blackish submoustachial, plain yellowish-olive neck/throat/upper breast, dark streaks/loops on belly. (b) Female: Black crown/nape. Juvenile: Duller; scapular belly, can have faint throat/breast-streaks; male crown with less, paler red.

VOICE Male's call faster than Grey-headed (notes shorter/lower). Steady drum. Abrupt *ik*.

HABITAT Broadleaved forest, mangroves, plantations, bamboo; up to 1,525 m (lowlands Pen Malaysia, Singapore).

RANGE Un/co R E Myanmar, Tenasserim, Thailand (except S), southern Pen Malaysia (and Langkawi Is), Singapore, Indochina (except W,E Tonkin).



RUFOUS WOODPECKER
M. brachyurus

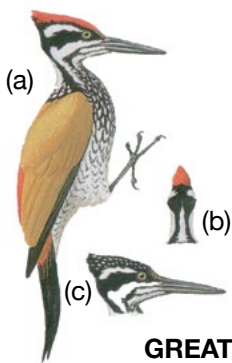
MEASUREMENTS 25 cm

(a) Male *phaiiceps*: Red cheek-patch; short black bill, speckled throat. (b) Female: No cheek-patch. (c) Male *squamigularis* (S Thailand southwards): Heavier marked throat, barred belly. (d) Male *fokiensis* (Tonkin, N Annam): Creamy head, heavy crown/throat-streaks, darker body. Female creamier-headed and darker below than *phaiiceps*. (e) Male *annamensis* (southern Indochina, N Laos): Darker-headed than *fokiensis*.

VOICE Laughing *kweep-kweep-kweep* from males. Also, slightly descending and accelerating series of notes. Drumming slowly grinds to halt: *bddddd d d d dt*.

HABITAT Broadleaved forest, secondary growth; up to 1,450 m (below 1,050 m in Thailand/Pen Malaysia).

RANGE Un/co R (Uncommon to common Resident throughout mainland South-east Asia).



GREATER FLAMEBACK
Chrysocolaptes lucidus

MEASUREMENTS 29-32 cm

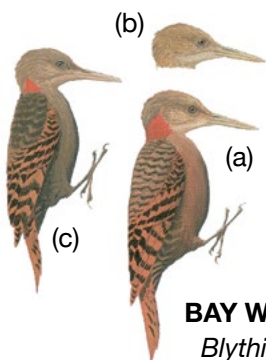
(a,b) Male *guttacristatus*: Long bill, submoustachial loop, white centre of hindneck. (c) Female: White-spotted black crown. Juvenile: More olive above, duller/more obscurely marked below; male has less red and pale spotting on crown.

OTHER SUBSPECIES *C.l. chersonesus* (Pen Malaysia): Smaller, slightly more olive above, more red on back, broader supercilium/underpart markings.

VOICE Rapid metallic monotone *titititititit...* Loud drums. Single *kik* notes.

HABITAT Broadleaved forests, mangroves, old plantations; up to 1,200 m.

RANGE Co R (except C Thailand); local/coastal Pen Malaysia.



BAY WOODPECKER
Blythipicus pyrrhotis

MEASUREMENTS 26.5-29 cm

(a) Male *pyrrhotis*: Long bill; paler head, black bars above, red neck-patch. (b) Female: No red on neck. Juvenile: Head darker with paler crown-streaks, bolder bars above, darker below with faint rufous bars; male with less (duller) red on neck. (c) Male *cameroni* (Pen Malaysia): Darker; smaller neckpatch.

OTHER SUBSPECIES *B.p. annamensis* (S Annam): Similar to *cameroni*.

VOICE Harsh descending laughter: *keek keek-keek-keek-keek-keek*. Cackling *dit-d-d-di-di-di-di-*

dit-d-d-di-di..., squirrel-like *kecker-rak-kecker-rak...*, loud chattering *kerere-kerere-kerere...* in alarm.

HABITAT Broadleaved forest; to 2,745 m (above 1,065 m Pen Malaysia).

RANGE CO R (except C Myanmar, C, SE, S Thailand, Singapore).



**BLACK-AND-BUFF
WOODPECKER**
M.jugularis

MEASUREMENTS 17-19 cm
(a) Male: White nuchal-patch, dark throat. (b) Female: No red submoustachial. Juvenile: Duller; clearer head-barring.
VOICE Males give rattling *titititi tit'weerk'weerk'weerk...*, sometimes mixed with nasal *ki'yew*.
HABITAT More open broadleaved evergreen/semi-evergreen forest, bamboo; up to 915 m.

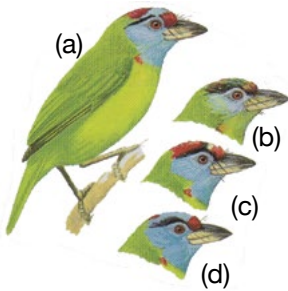
RANGE Un/lfc R SW, S, E. Myanmar, Tenasserim, W, NW, NE, SE Thailand, Indochina (except W, E Tonkin).

MEGALAIMIDAE



GREEN-EARED BARBET
Megalaima faiostricta

MEASUREMENTS 25-27 cm
(a) Adult *faiostricta*: Mostly dark bill, dark around eye, green ear-coverts, all-green mantle, red spot on breast-side.
OTHER SUBSPECIES *M.f.praetermissa* (E Tonkin).
VOICE Throaty *took-a-prruk* (more than once a second) from male. Mellow fluty, rising *poouok*.
HABITAT Broadleaved forests; up to 1,015 m.
RANGE Co R Thailand (except C,S), Indochina.



BLUE-THROATED BARBET
Megalaima asiatica

MEASUREMENTS 23 cm
(a) Adult *davisoni*: All-blue head-sides and throat. Red crown with blue band across centre, narrow black supercilium. (b) Juvenile: Duller; fainter head pattern. (c) Adult *asiatica* (Myanmar; except Tenasserim): Black and yellow bands across mid-crown. (d) Adult *chersonesus* (S Thailand): Bluer crown.
VOICE Loud, quickly repeated *took-arook* from male.
HABITAT Broadleaved evergreen forest, secondary growth; 400-2,400 m (mainly 600-1,830 m).

RANGE Co R Myanmar, Thailand (except C,SE), N Laos, W,E Tonkin, N Annam.



LINEATED BARBET
Psilopogon lineatus

MEASUREMENTS 27-28 cm
(a) Adult *hodgsoni*: Thick yellowish bill, broad whitish head- and breaststreaks, yellow eyering.
VOICE Male territorial call is loud mellow *poo-poh* (*poh* higher), about once a second. Rapid bubbling *koh-koh-koh-koh-koh...*

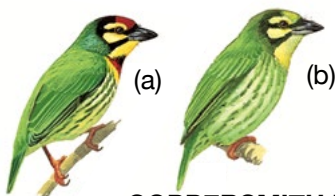
HABITAT Deciduous forest, scattered trees in open areas, plantations; up to 1,220 m (below 800 m Thailand, lowlands Pen Malaysia).
RANGE (except south Pen Malaysia, Singapore, W,E Tonkin, N Annam).



GREAT BARBET
Megalaima virens

MEASUREMENTS 32-33 cm
(a) Adult *virens*: Large; pale bill, dark head, brownish mantle, streaked on belly, red undertail-coverts.
OTHER SUBSPECIES *M.v.magnifica* (SW, W, west S Myanmar); *clamator* (east N Myanmar).
VOICE Loud *kay-oh* (once a second). Continuous *piou-piou-piou-piou...* (female?), often with former in duet. Grating *keeah*.
HABITAT Broadleaved evergreen (rarely deci-

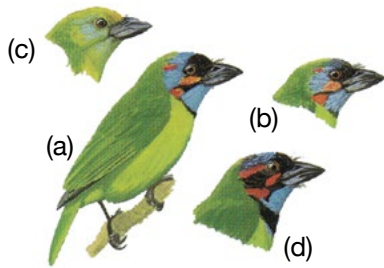
duous) forest; 600-2,800 m (locally 440 m N Myanmar).
RANGE CO R Myanmar (except southern Tenasserim), W, NW, NE (northwest) Thailand, N, C Laos, W, E Tonkin, N Annam.



COPPERSMITH BARBET
Psilopogon haemacephalus

MEASUREMENTS 17 cm
(a) Adult *indica*: Small; yellow head-sides/throat, black eye- stripe/submoustachial, pale greenish below with dark green streaks. Crown red at front, black towards rear; red breast-band. (b) Juvenile: Dark of head duller, yellow of head-sides and throat paler, no red on crown or breast.

VOICE Resonant *tonk-tonk-tonk-tonk-tonk..* (<100+ notes).
HABITAT Deciduous forest, scattered trees, mangroves, parks, gardens, plantations; up to 915 m.
RANGE Co R (except W,E Tonkin).



BLUE-EARED BARBET
Megalaima australis

MEASUREMENTS 17-18 cm

(a) Male *cyanotis*: Small; black forehead, orange-red cheekpatch, red above and below blue ear-coverts, blue throat with narrow black border. (b) Female: Duller head pattern. (c) Juvenile: Very uniform; blue-tinged ear-coverts/throat. (d) Male *duvaucelli* (Pen Malaysia): Black ear-coverts with larger red patches above/below; red cheek-patch, broad black band on upper breast.

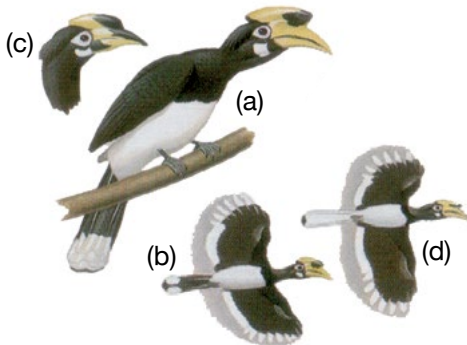
OTHER SUBSPECIES *M.a.stuarti* (Tenasserim, W,S Thailand).

VOICE. Monotonous, rapidly repeated *ko-tek*. Shril whistled pleow notes (c.1 per s).

HABITAT Broadleaved forests; up to 1,525 m (below 975 m in Pen Malaysia).

RANGE Co R (except C Thailand); formerly Singapore.

BUCEROTIFORMES, BUCEROTIDAE



ORIENTAL PIED HORNBILL
Anthracoceros albirostris

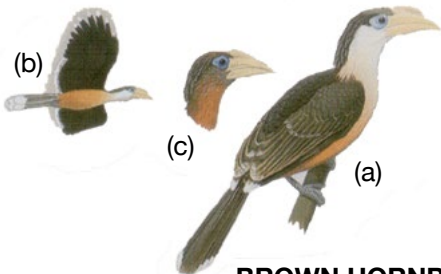
MEASUREMENTS 69 cm

(a,b) Male *albirostris*: White belly and vent, white facial markings, pale yellowish bill and casque with dark markings; black wings with broad white trailing edge, black tail with broadly white-tipped outer feathers. (c) Female: Bill and casque smaller, more extensively dark distally. Juvenile: Plain bill and very small casque, less white on tail. (d) Male *convexus* (extreme S Thailand southwards): Mostly white outertail (tail often looks white from below).

VOICE Loud *yelping kleng-keng kek-kekkek-kek-kek* and *ayip-yip-yip-yip..* etc.

HABITAT & BEHAVIOUR Broadleaved evergreen and mixed deciduous forest, island forest, secondary growth, plantations, gardens; up to 1,400 m (below 150 m S Thailand southwards). In flocks, sometimes quite large.

RANGE Un/lc R (except C Thailand); rare Singapore.



BROWN HORNBILL
Anorrhinus austeni

MEASUREMENTS 73-74 cm

(a,b) Male *austeni*: Whitish throat/foreneck and upper breast, brownish-rufous belly. Pale yellowish bill with small casque, pale blue orbital skin, white-tipped outertail. Narrowly white-tipped secondaries and outer primaries. (c) Female: Smaller casque, dark brownish below (foreneck paler). Juvenile: Like female but dull greyish-brown below, no white primary tips, smaller bill, pinky orbital skin. (d) Male *tickelli* (Tenasserim, W Thailand): Bright brownish-rufous below. Female has horn-coloured to blackish bill.

VOICE Piercing yelps and squeals; upward-inflected *klee-ah*

HABITAT & BEHAVIOUR Broadleaved evergreen and sometimes nearby mixed deciduous forest, locally pines in Laos; up to 1,500 m, locally 1,800 m. Usually in flocks.

RANGE Un/lc R W, N Myanmar, Tenasserim, W, NW, NE Thailand, Cambodia, Laos, W, E Tonkin, N, C, north S Annam.

TROGONIFORMES, TROGONIDAE



RED-HEADED TROGON
H. erythrocephalus

MEASUREMENTS 31-35.5 cm

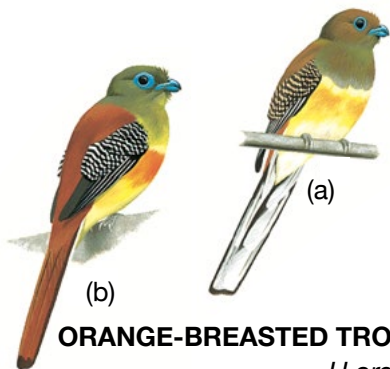
(a) Male *erythrocephalus*: Dark red head/breast, white breast-band, pinkish-red belly, whitish wing-barring. (b) Female: Head and upper breast brown, concolorous with mantle, vermiculations on wings pale warmish brown. Juvenile: Like female but head, breast and upperparts rufescent; has less red on underparts. Male has broad buff bars on wings and soon attains red on head and upper breast.

OTHER SUBSPECIES *H.e.helena* (N Myanmar); Largest. *H.e.chaseni* (S Thailand, Pen Malaysia); Smallest. *H.e.klossi* (SE Thailand, Cambodia); *annamensis* (NE Thailand, N [south-east], C, S Laos, N,C,S Annam, Cochinchina); *intermedius* (north-east N Laos, W,E Tonkin).

VOICE Deep, well-spaced, descending 4-5 note *taup taup taup taup taup...* Coarse rattling *tewirr*.

HABITAT & BEHAVIOUR Middle to upper storey of broadleaved evergreen forest, 305-2,590 m; 700-1,680 m Pen Malaysia, locally 50 m Indochina. Unobtrusive, spends long periods motionless.

RANGE CO R (except C Thailand, Singapore); local S Thailand.



ORANGE-BREASTED TROGON

H. oreskios

MEASUREMENTS 26.5–31.5 cm

(a) Male *stellae*: Head and upper breast greenish-olive (throat and central breast more yellowish-tinged), upperparts chestnut-maroon, underparts yellowish-orange with paler, yellow lower vent. (b) Female: Head to back uniform drab olive-brownish, rump and uppertail-coverts duller/paler, throat and upper breast distinctly grey-washed, rest of underparts paler and yellower, broader pale bars on wings. Juvenile: Head, upperparts and breast tinged rufous-chestnut, pale wing-barring broader, belly/vent paler/whitish; males have chestnut mantle, scapulars and back.

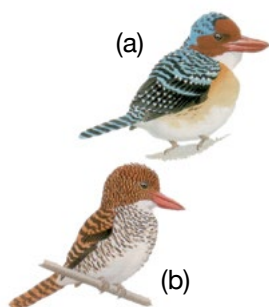
OTHER SUBSPECIES *H.o.uniformis* (south Tenasserim/S Thailand southward).

VOICE Territorial call of male is subdued, even, rather rapidly delivered 3–5 note *teu-teu-teu...* or *tu-tau-tau-tau...* Female may utter a slower, lower-pitched version.

HABITAT Middle to upper storey of broadleaf forests, bamboo; up to 1,220 m.

RANGE Co R (except W,N,C Myanmar, C Thailand, Singapore, W,E Tonkin, N Annam).

CORACIIFORMES, ALCEDINIDAE



BANDED KINGFISHER

Lacedo pulchella

MEASUREMENTS 21.5-24.5 cm

(a) Male *amabilis*: Chestnut forehead/mask, blue hindcrown and nape, and bars above. (b) Female: Rufous-and-black bars above; white below with dark-scaled breast/flanks. Juvenile male: Dusky scales/bars on ear-coverts/breast, brown bill with orange lower mandible and pale tip. Juvenile female: Heavy blackish scales/bars above; bill as juvenile male.

OTHER SUBSPECIES *L.p.deignani* (S Thailand); *pulchella* (extreme S Thailand, Pen Malaysia).

VOICE Long whistle, then <15 slow couplets: *wheeeoo chi-wiu chi-wiu chi-wiu chi-wiu...* Sharp *wiak wiak...*

HABITAT & BEHAVIOUR Broadleaved evergreen and mixed deciduous forest, bamboo, often away from water; up to 1,100 m. Slowly raises/lowers crown.

RANGE EC R S,E(south) Myanmar, Tenasserim, Thailand (except C), Pen Malaysia, Cambodia, Laos, C,S Annam, Cochinchina.

CORACIIFORMES, MÉROPIDÉS



BLUE-BEARDED BEE-EATER

Nyctyornis athertoni

MEASUREMENTS 33–37 cm

(a) Adult *athertoni*: Blue forecrown and shaggy beard, green-streaked yellowish belly, golden-yellowish undertail with darker tip. Juvenile: Apparently some brown on crown and throat-centre, more golden-brown undertail.

VOICE Loud, guttural croaking and harsh cackling. Purring *grrew-grrew-grrew...*, harsh *kow kow-kow kowkawkow...*, repeated *gikhu* and *gikh* etc.

HABITAT Broadleaved evergreen, semi-evergreen and mixed deciduous forest, rarely wooded gardens; up to 2,200 m.

RANGE Fc/co R Myanmar, Thailand (except C,S), Indochina.

CUCULIFORMES, CUCULIDAE



HODGSON'S HAWK CUCKOO

H. nisicolor

MEASUREMENTS 27-29.5 cm

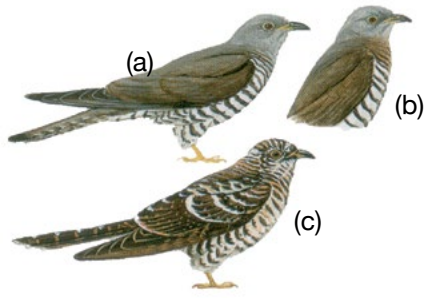
(a) Adult: Greyer above than Malaysian, no rufous bars on wing, inner tertial usually whiter, pinkish-rufous on breast (quite uniform if fine-streaked), penultimate dark tail-band is narrowest. (b) Juvenile: Warmer/buffier fringes above than Malaysian, usually paler innermost tertial.

VOICE Like Malaysian, but followed by rapid *trrrr-tititititrrrrr...*

HABITAT Broadleaved forest; up to 1,550 m (B above 500 m).

RANGE tin R/BV S,E Myanmar, Thailand (except C, S), N, C Laos, W Tonkin, C Annam. Un WV and PM S Thailand, Pen Malaysia, Singapore. Sc/un PM W, C Thailand, Cochinchina. Rc (status?) Cambodia, S Laos, E Tonkin, N, S Annam.

Note Recently split from *fugax* (see King 2002).



INDIAN CUCKOO
Cuculus micropterus

MEASUREMENTS 31-33 cm

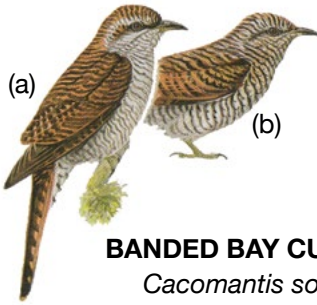
(a) Male *micropterus*: Brownish tinge to mantle, wings and tail, prominent broad dark subterminal tail-band, dull yellowish to greyish-green eyering. (b) Female: Rufescent wash across breast. (c) Juvenile: Crown and head-sides browner than adult, with very broad buffish-white feather-tips, prominent rufous/buffish to whitish feather-tips above, buffish below with broken dark bars; may have rufous-washed throat/breast.

OTHER SUBSPECIES *C.m.concretus* (resident extreme S Thailand southwards): Smaller and darker-toned.

VOICE Male territorial call is loud *whi-whi-whi-wu* or *wa-wa-wa-wu*, with lower last note or alternating high and low (may omit last note). Loud hurried bubbling (female only?).

HABITAT Broadleaved evergreen and deciduous forest; up to 1,830 m (below 760 m Pen Malaysia).

RANGE Fc/co R (except C,SE Thailand, Singapore). Fc WV and PM W, C, S Thailand, Pen Malaysia, Singapore.



BANDED BAY CUCKOO
Cacomantis sonneratii

MEASUREMENTS 23-24 cm

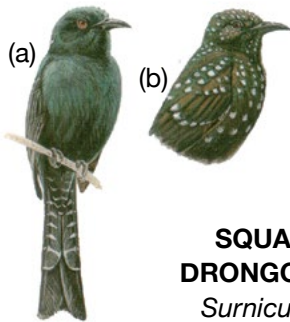
(a) Adult *sonneratii*: Like hepatic female Plain-tive but dark mask isolated by broad supercilium; whiter below with narrower bars. (b) Juvenile: Whitish to pale buff bars on headsides/upperparts, weaker mask, coarser and more spaced dark barring.

OTHER SUBSPECIES *C.s.malayanus* (Tenasserim and S Thailand southwards): Smaller, more rufescent.

VOICE Male utters repeated loud *pi,hi-hi hi* or *pihu-hihu* on descending scale. Secondary calls include rapid *pi pi pihhi-pi pihhi-pi* on rising scale.

HABITAT Broadleaved forests; up to 1,500 m.

RANGE Un/fc R (except C Thailand, W Tonkin).



SQUARE TAILED DRONGO CUCKOO
Surniculus lugubris

MEASUREMENTS 24.5 cm

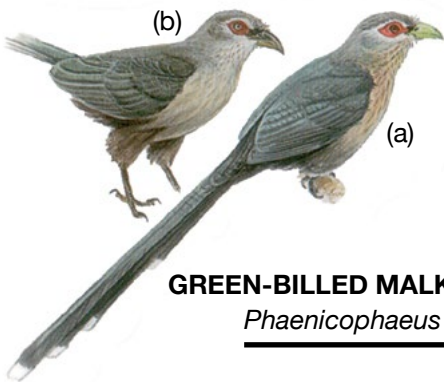
(a) Adult *dicruroides*: Glossy black, forked tail, typical cuckoo bill, white-barred undertail/undertail-coverts; some white on nape (often hidden). (b) Juvenile: Browner; white spots on body and coverts.

OTHER SUBSPECIES *S.l.brachyurus* (southern S Thailand southwards).

VOICE Fairly quick, steadily rising, 5-7 note *pi pi pi pi pi..* (territorial). Secondary call is shrill *phewphew phewphewphewphewphew phew phew...* speeding up/rising, then falling.

HABITAT Broadleaved forest, secondary growth, occasionally parks, gardens, mangroves etc. (mainly on migration); up to 1,300 m.

RANGE Fc R throughout. BV to some northern areas? Un WV C(south),S Thailand, Pen Malaysia, Singapore; probably Cochinchina. Un PM S Thailand, Pen Malaysia, Singapore, E Tonkin.



GREEN-BILLED MALKOHA
Phaenicophaeus tristis

MEASUREMENTS 52-59.5 cm

(a) Adult *longicaudatus*: Large, long-tailed; greyish head and underparts with dark shaft-streaks, dark vent, white-edged red facial skin, green bill. Greyish-green above, tail feathers broadly tipped white. (b) Juvenile: Brown-tinged above, browner vent, blacker bill, duller face skin with less defined border.

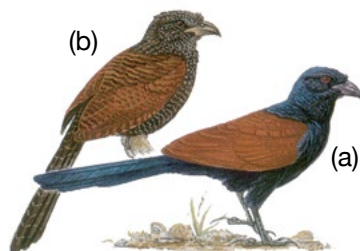
OTHER SUBSPECIES *P.t.tristis* (W Myanmar); *saliens* (N, north E Myanmar, east NW Thailand, north Indochina).

VOICE Mellow, slightly nasal, spaced *oh...oh...oh...oh..* (territorial). Typically a clucking,

croaking *ko.ko.ko..*, sometimes with added gruff flurry: *co-co-co-co...* Harsh chuckles in alarm.

HABITAT & BEHAVIOUR Broadleaved forests, secondary growth, bamboo, plantations; up to 1,600 m. Forages slowly amongst dense foliage.

RANGE Co R (except south Pen Malaysia, Singapore).



GREATER COUCAL
Centropus sinensis

MEASUREMENTS 48-52 cm

(a) Adult *intermedius*: Large; glossy black, plain chestnutback/wings. (b) Juvenile: Duller above with blackish bars; otherwise blackish with whitish streaks/flecks, buffish-barred lowerbody, brownish/greyish-white tail-bars, paler bill.

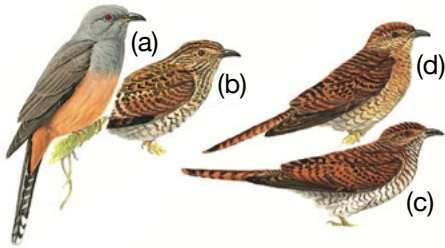
OTHER SUBSPECIES *Cs.bubutus* (south Pen Malaysia, Singapore),

VOICE Territorial call is loud deep, mournful *puup puup puup puup..or wuup-uup-uup-uup-uupuupuupuupuup* (latter speeding-up/ascen-

ding, then lower and more even; or ascending scale again). Scolding, hissing *shaeooooo*.

HABITAT Open forest, secondary growth, scrub, mangroves; up to 1,525 m.

RANGE CO R throughout (un Singapore).



PLAINTIVE CUCKOO
Cacomantis merulinus

MEASUREMENTS 21.5–23.5 cm

(a) Male *querulus*: Grey hood, peachy-rufous below. (b) Female hepatic morph: Usually in this plumage but can resemble male. Rufescent with even blackish barring, paler with duller barring below, faint supercilium, barred tail. (c) Female hepatic morph variant: Whiter below, more evenly barred. (d) Juvenile: Paler/buffier than hepatic female, whiter below, prominent blackish streaks on crown to upper mantle, throat and upper breast.

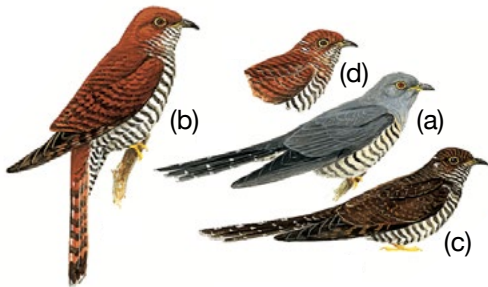
OTHER SUBSPECIES *C.m.threnodes* (Pen Malaysia, Singapore): Smaller/paler; male with more contrasting head.

VOICE Male territorial call is clear high whistled *phi phi phi phi phi-pipipi*, hurried/fading at end.

Secondary call is ascending *pii-pi-pii...pii-pi-pii...pii-pi-pii*. (accelerates and sounds more agitated).

HABITAT Secondary growth, open woodlands, scrub, grassland, cultivation, parks, gardens; up to 1,830 m.

RANGE Co R throughout (sc Singapore).



LESSER COUCAL
Centropus bengalensis

MEASUREMENTS 26–26.5 cm

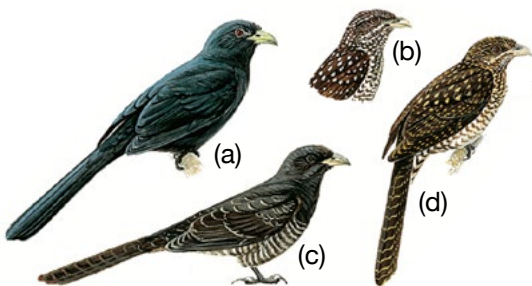
(a) Male: Smaller than Oriental, darker rump and uppertail-coverts (less contrast), usually buffier below, with wider-spaced and bolder black bars. (b) Female hepatic morph: Typically hepatic but can resemble male. Usually more rufous than Oriental, can have almost plain crown/nape and rump/uppertail-coverts. (c) Juvenile: Dark grey-brown above with narrow whitish/rufous bars and whitish nape-spots. Crown/head-sides and mantle darker/more uniform than Oriental, whiter below with bolder bars. (d) Juvenile female hepatic morph: More prominent bars on crown and mantle, white on nape.

VOICE Territorial males call with 5–6 loud shrill whistled notes: even *wit-wit-witi-wit-wit-wit-witi-wit-wit-witi-wit*. (witi prolonged and stressed) or rising and falling *wit,it-iti-witu wit,it-*

iti-witu wit,it-iti-witu... Starts higher, then gets slower and deeper or lower-pitched.

HABITAT Broadleaved evergreen forest, deciduous forest on migration; 915–2,285 m (can be lower on migration).

RANGE Sc/un BV W,N Myanmar, NW Thailand, N Laos, W,E Tonkin. Sc/un PM C Myanmar. Rc (status?) S(east) Myanmar, C Annam, Cochinchina.



ASIAN KOEL
Eudynamis scolopaceus

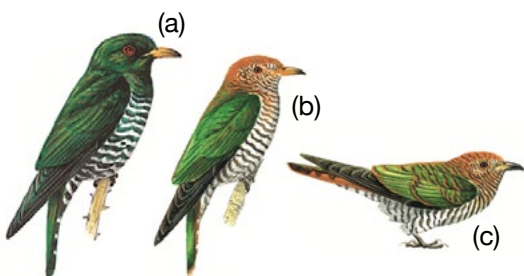
MEASUREMENTS 40–44 cm

(a) Male *chinensis*: Glossy black, greenish bill, red eye. (b) Female: Mostly streaked/spotted/barred whitish. (c) Juvenile: White/buff tips on brownish-black upperside, warm brown tail-bars, white/buff belly/vent-bars. (d) Female *malayana* (R W,C Myanmar and W[south], C, SE Thailand southwards): Usually rufous/buff markings.

VOICE Territorial call is very loud *ko-EL*, repeated with increasing emphasis. Secondary call is descending, bubbling *wreep-wreep-wreep-wreep-wreepwreep-wreep...*

HABITAT Open woodland, secondary growth, cultivated areas, parks, gardens; up to 1,220 m.

RANGE Fc/co R, subject to some movements (except W,E Tonkin). BV to some northern areas? Un/fc WV and PM S Thailand, Pen Malaysia, Singapore. Fc PM E Tonkin. Rc (status?) W Tonkin.



ASIAN EMERALD CUCKOO
Chrysococcyx maculatus

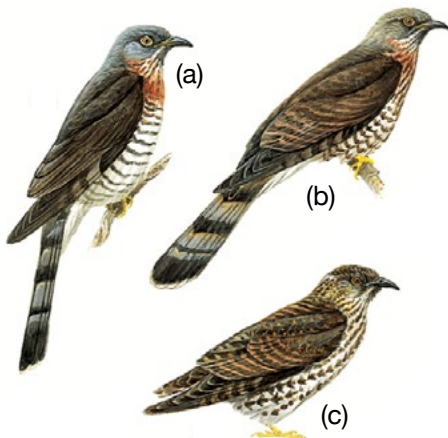
MEASUREMENTS 17 cm

(a) Male: Glossy gold-tinged emerald-green; white-barred from lower breast to vent, dark-tipped yellowish bill. (b) Female: Plain rufous crown/nape, coppery-green above, all-barred below. (c) Juvenile: Less green above than female, with rufous feather-tips and dark and buff bars on crown to mantle, dark tail with more rufous/no white on outer feathers and less white at tip; darker bill, rufous throat/breast-wash.

VOICE Loud, descending 3–4 note *kee-kee-kee..* (male). Sharp *chweek* or *chut-week* in flight.

HABITAT Broadleaved evergreen forest, plantations and gardens on passage/in winter; up to 2,440 m (breeds above 600 m?).

RANGE Un R Myanmar, W,NW Thailand, N,C Annam. Un WV Thailand, Cambodia, C,S Laos, S Annam, Cochinchina; parts of Myanmar? Rc (status?) N Laos, W,E Tonkin. V Pen Malaysia, Singapore.



LARGE HAWK-CUCKOO
Hierococcyx sparverioides

MEASUREMENTS 40 cm

(a) Adult *sparverioides*: Slaty-grey on head, brownish-grey on upperparts, extensively dark chin, dark rufous breast-patch, obvious dark streaks on lower throat/breast, dark-barred lower breast/belly/flanks, broad dark tail-bands. Underwing-coverts white with dark brown bars. (b) Juvenile: Dark brown above with rufous bars, pale rufous nape with dark brown streaks, white below with buffish wash and bold drop-like breast-streaks, then bars on belly/flanks. (c) Immature/subadult: Greyish-brown crown, dull pale rufous bars above, more like juvenile below but pale rufous breast-patch. Larger than adult Hodgson's (*C.f.fugax*), narrower penultimate dark tail-band, narrow grey-ish band between that and last dark tail-band, buffier tail-tip (very tip narrowly whitish), more dark on chin, heavier throat-streaks; flanks tend to be barred.

OTHER SUBSPECIES *H.s.bocki* (resident Pen Malaysia): c.33 cm; dark streaks below restricted to breast, broad orange-rufous breast-band.

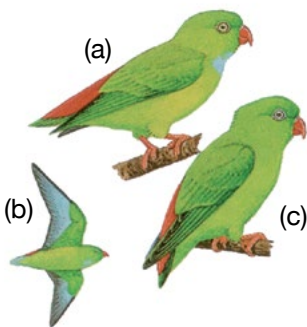
VOICE Very loud, shrill, spaced, stressed *pwi pwee-wru* (*sparverioides*) or *pi- phu* (*bocki*), repeated on rising pitch to screaming crescendo (territorial). Secondary call (*bocki*) is rapid,

more hurried *pipi-pipi-pipi-pipi..* or *phuphu-phu-phu..*, rising to fever-pitch, then fading.

HABITAT Broadleaved evergreen and deciduous forest, more open habitats, gardens, mangroves etc. on migration; up to 2,565 m (mainly breeds above 650 m).

RANGE Fc R (some movements) Myanmar (except S and southern Tenasserim), W,NW,NE Thailand, Cambodia, Laos, W,E Tonkin. Sc/un WV W,C,NE,SE,S Thailand, Pen Malaysia, Cochinchina; ?Cambodia. Also PM S Thailand, Rc (status?) S Myanmar, N,C,S Annam. V Singapore.

PSITTACIFORMES, PSITTACULIDAE



VERNAL HANGING PARROT
Loriculus vernalis

MEASUREMENTS 13-15cm

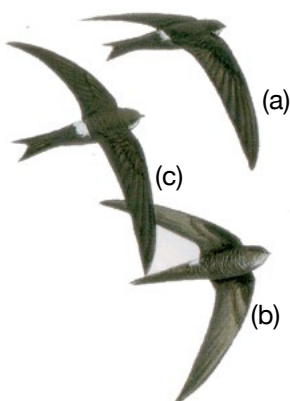
(a,b) Male: Very small; bright green, red back to uppertailcoverts, light blue on throat/upper breast, red bill, orangey legs; turquoise underwing with green coverts. (c) Female: Little/no blue on throat/breast, duller head/underparts, duller red on upperparts (some green on back/rump). Juvenile: Like female but back to uppertail-coverts mixed green, duller eyes and legs.

VOICE High shrill squeaky *tsee-sip* or *pi-zeez-eef* flight-call.

HABITAT & BEHAVIOUR Broadleaved forests, clearings; up to 1,525 m. Fast direct flight; hangs upside down.

RANGE Co R Myanmar (except W,N), Thailand (except C), north Pen Malaysia, Indochina (except W,E Tonkin, N Annam).

APODIFORMES, APODIDAE



PACIFIC SWIFT
Apus pacificus

MEASUREMENTS 18-19.5 cm

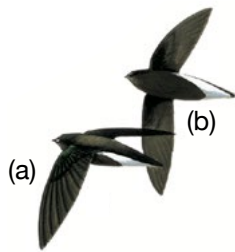
(a,b) Adult *cooki*: Relatively large, with long sickle-shaped wings, and sharply forked tail (may be closed); blackish with clear-cut narrow white rump-band (hard to see at distance). Has slightly paler throat, indistinct whitish scales on rest of underparts, and darker shaft-streaks on rump-band and throat (all hard to see in field). Juvenile: Secondaries and inner primaries narrowly tipped whitish. (c) Adult *pacificus* (widespread PM): Browner and almost glossless above, head and nape slightly paler than mantle with narrow greyish-white feather margins, white rump-band broader, dark shaft-streaks on rump-band and throat narrower and less obvious, throat whiter.

OTHER SUBSPECIES *A.p.kanoi* (VS Indochina, Pen Malaysia): Said to be intermediate between *cooki* and *pacificus*.

VOICE Shrill *sreee*.

HABITAT Forested and open areas; up to 2,600 m.

RANGE Un R (some movements) E Myanmar, NW Thailand, N,C Laos, W Tonkin, C Annam. Un/lc WV Thailand (except C), Pen Malaysia, Cambodia. Un/lc PM C,S Thailand, Pen Malaysia, Singapore, Cambodia, W,E Tonkin, N,S Annam, Cochinchina. Re (status?) Myanmar (except E), S Laos.



BROWN-BACKED NEEDLETAIL
Hirundapus giganteus

MEASUREMENTS 21–24.5 cm

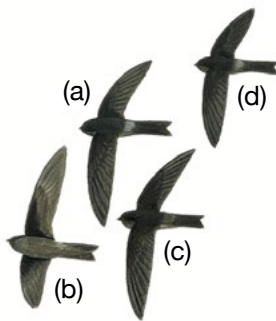
(a,b) Adult *indicus*: Large and bulky; blackish above and dark brown below, brown saddle (lower mantle/back), bold white V on lower flanks/vent. White loreal spot (visible at close range), often slightly paler chin/upper throat-centre. Juvenile: White loreal spot less obvious, white underpart V faintly marked darker.

OTHER SUBSPECIES *H.g.giganteus* (R south Tenasserim, S Thailand, Pen Malaysia): 24.5–26.5 cm; no white loreal spot.

VOICE Rippling trill, slower than White-throated; 2–3 squeaky *cirwiet* notes, thin squeaky *chiek*.

HABITAT Forested and open areas; up to 2,000 m. Has fast gliding flight; wings make loud whooshing sound when zooming overhead.

RANGE Un/co R throughout. Only BV to some more northerly areas? Also un WV and PM Pen Malaysia, Singapore.



HIMALAYAN SWIFLET
A. brevirostris

MEASUREMENTS 13–14 cm

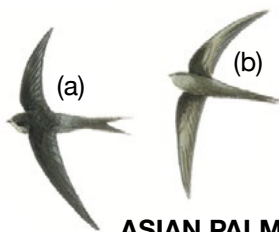
(a,b) Adult *brevirostris* (N Myanmar): Wing 128–137 mm, tail 56–62 (outer), 46–52 (inner). Blackish-brown above (faint gloss), greyish rump-band, quite uniform throat/breast, darker chin, slightly darker ear-coverts; brownish-grey belly/vent. In hand, darker shaft-streaks below (not throat), variable leg-feathering and rami (can be lacking?). Darker than Germain's; from Germain's and Black-nest by deeper tail-notch. Juvenile: Rump-band less defined, fewer leg feathers. (c) Adult *inopinina* (WV N Myanmar?, W Tonkin): Slightly longer wings, rump almost as upperparts. (d) Adult *rogersi* (B E Myanmar, NW,W Thailand; VS S Thailand;

RC C Laos; has been split as species): Smaller/shorter-winged than *innominata*; in hand, no white rami, no/slight leg-feathering.

OTHER SUBSPECIES *C.b.innominata* (VS): Intermediate between *brevirostris* and *inopinina* (?valid).

VOICE Low rattling twitter.

RANGE Un R W,E Myanmar, W,NW Thailand. Un WV Thailand (except SE), Pen Malaysia, Singapore, E Tonkin, N,C,S Annam, Cochinchina. Also PM Pen Malaysia, Singapore. Rc (status?) N,C Myanmar, N Laos, W Tonkin, Annam, Cochinchina. Re (status?) Myanmar (except E), S Laos.



ASIAN PALM SWIFT
Cypsiurus balasiensis

MEASUREMENTS 11–12 cm

(a,b) Adult *infumatus*: Small; rather uniform greyish-brown, long slender wings, long, deeply forked tail. Tail appears long, narrow and pointed when closed; rump, head-sides, breast and belly somewhat paler, throat paler still. Resembles some swiftlets when viewed distantly and tail closed, but wings and tail much more slender, never glides with wings held stiffly

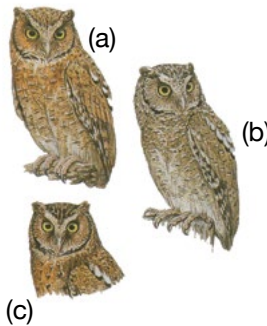
below horizontal. Juvenile: Tail somewhat less sharply and deeply forked.

VOICE Frequently uttered, high trilled *sisisi-soo-soo* or *dee-dle-ee-dee*.

HABITAT & BEHAVIOR Open country, urban areas, often near palm trees; up to 1,525 m. Often found in small, highly active groups.

RANGE Un/co R throughout.

STRINGIFORMES, STRINGIDAE



MOUNTAIN SCOPS OWL
Otus spilocephalus

MEASUREMENTS 20 cm

(a) Adult *siamensis*: Short ear-tufts, rufescent above, large white scapular markings, unstreaked buffish/rufous below with white markings and dark vermiculations, yellow eyes. (b) Adult *spilocephalus* (SW, W, N Myanmar): More greyish-brown variant. Ranges from less to more rufescent. (c) Adult *vulpes* (Pen Malaysia): Deeper rufous (particularly below), coarser blackish markings above.

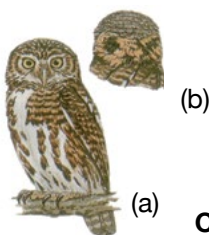
Head/body paler/buffier with dark bars, scapulars unmarked.

VOICE Clear spaced *phu-phu* or *toot-too*, every 5–7 s (territorial).

HABITAT Broadleaved evergreen forest; up to 2,200 m, mainly mountains (above 800 m Pen Malaysia).

RANGE Fc/co R (except C Thailand, Singapore).

OTHER SUBSPECIES *O.s.latouchei* (northern Indochina): Quite plain and very rufous above (rufous to buffy-brown), dark crown-streaks. Juvenile:



COLLARED OWLET
Glaucidium brodiei

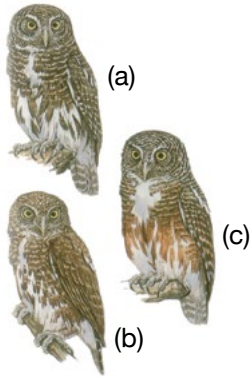
MEASUREMENTS 16–16.5 cm

(a,b) Adult *brodiei*: Very small; buff and blackish imitation face on nape, speckled crown, streaked belly, no obvious white on coverts. Adult rufous morph (rc northern Vietnam at least): Very rufous, except for white of eye-brows/underparts. Juvenile: Crown to mantle unmarked, but whitish streaks on forecrown.

VOICE Loud, rhythmic, hollow, *pipip pho pho-pho pho* (often in daytime).

HABITAT Broadleaved evergreen forest; up to 3,100 m (mostly above 400 m).

RANGE Fc/co R (except SW Myanmar, C Thailand, Singapore, Cochinchina).



ASIAN BARRED OWLET
Glaucidium cuculoides

MEASUREMENTS 20.5-23 cm

(a) Adult *bruegeli*: Broad rounded head, no ear-tufts, dull brown with pale buffish bars, narrow whitish eyebrows, white ventral line, whitish belly and lower flanks with broad brown streaks. (b) Juvenile: Diffuse pale bars above, diffuse dark bars below, streaking more diffuse, crown more speckled. (c) Adult *deignani* (south-eastern Thailand, southern Indochina): Rustier belly-streaks, grey head with whiter bars.

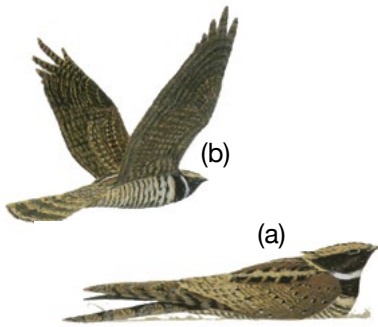
OTHER SUBSPECIES *G.c.rufescens* (Myanmar except northern N and Tenasserim) and *asterum* (west N Myanmar): Larger, darker and more rufescent. *G.c.delacourii* (N Laos, W Tonkin), *whitelyi* (east N Myanmar, E Tonkin).

VOICE Descending, eerie quavering trill: *wu'u'u'u'u'u'u'u'u'u..* (c. 10 s long), gradually

increasing in volume. Mellow hoop notes, then long series of raucous double-notes, increasing in pitch/volume.

HABITAT & BEHAVIOUR Relatively open broadleaved forests, clumps of trees; up to 1,980 m. Often perched in open during day.

RANGE Co R Myanmar, W, NW, NE, SE, C, north S Thailand, Indochina.



GREAT EARED NIGHTJAR
Eurostopodus macrotis

MEASUREMENTS 41 cm

(a,b) Adult *cerviniceps*: Much larger, longer-winged and longer-tailed than other nightjars, lacking whitish or pale markings on wings/tail. Buffish-grey crown with a few dark central markings, contrasting dark head-sides, narrow collar (white on throat, pale buff on nape), relatively dark/uniform upperparts with paler scapulars and distinctly chestnut-tinged shoulders; uppertail distinctly and broadly barred blackish and buffishbrown, throat and upper breast blackish-brown, rest of underparts barred blackish and pale buff. Pronounced ear-tufts (sometimes visible when perched). Juvenile: Paler, plainer and buffier above with fewer, more contrasting markings, paler/plainer and more pale chestnut-tinged wing-coverts, diffuse barring below.

VOICE Long double whistle, introduced by a short, well-separated note (audible at close range): *put PEE-OUW*.

HABITAT & BEHAVIOUR Open areas and clearings in or near broadleaved evergreen and deciduous forest, freshwater swamp forest; up to 1,220 m. Flies with slow leisurely wingbeats, resembling smaller harriers *Circus*; often feeds high in air.

RANGE Fc Myanmar, Thailand (except C), north Pen Malaysia, Cambodia, Laos, E Tonkin (lo), C Annam, Cochinchina.



ORIENTAL BAY OWL
Phodilus badius

MEASUREMENTS 29 cm

(a) Adult *badius*: Dark-framed buffy discs, rudimentary ear-tufts, rufescent above with sparse black and white marks, pinkish-buff below with sparse spots, mainly golden-buff nape and scapulars.

OTHER SUBSPECIES *P.b.saturatus* (W,N Myanmar?): Brown parts darker.

VOICE Eerie upward-inflected whistles, rising then fading: *oo hlii hoo hu-i-li hu-i-li hu-i-li hu-i-li*.

HABITAT & BEHAVIOUR Broadleaved evergreen forest, plantations, edge of mangroves;

up to 1,220 m, rarely 2,200 m. Often low down on vertical stems.

RANGE Un R (except W,C Myanmar, C Thailand, Singapore, W Tonkin, S Annam). Frc Singapore.



BROWN BOOBOOK
Ninox scutulata

MEASUREMENTS 30-31 cm

(a) Adult *burmanica*: Mostly dark slaty-brown above, whitish between eyes, broad drab chestnut-brown spots/streaks below, longish barred tail, golden-yellow eyes. Juvenile: Paler/warmer above, more diffuse markings below.

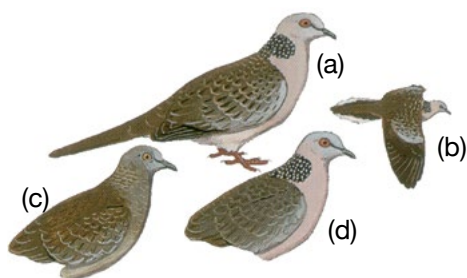
OTHER SUBSPECIES *N.s.scutulata* (resident Pen Malaysia, Singapore): Darker head-sides/upperparts (vaguely warm), darker/denser belly and vent markings (slightly more chestnut-tinged). *N.s.japonica* (VS): A little darker above, colder/darker markings below.

VOICE Haunting deep, rising *whu-up*, just over once per s (territorial).

HABITAT & BEHAVIOUR Open forest, mangroves; migrants also parks/gardens; up to 1,200 m.

RANGE Fc/co R (except C Thailand, W Tonkin, S Annam). Un WV C,S,?W(south) Thailand, Pen Malaysia (also PM), Singapore, Cambodia.

COLUMBIFORMES, COLUMBIDAE



SPOTTED DOVE
Streptopelia chinensis

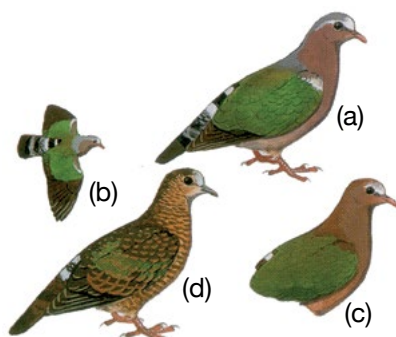
MEASUREMENTS 30-31 cm

(a,b) Adult *tigrina*: Broad, white-spotted black neck-patch, long graduated tail with broadly white-tipped outer feathers, pale greyish bar across greater coverts (prominent in flight). Otherwise greyish-brown above, with indistinct dark streaks and narrow light edging, pale grey crown and ear-coverts, pale vinous-brownish neck/underparts, whitish throat and vent. (c) Juvenile: Much browner; warmer and less vinous-pink below, distinct buff fringes above and on breast, little grey on crown and wing-coverts, faint dark brown neck-patch with buffish-brown bars. (d) Adult *chinensis* (north E Tonkin): Bluer-grey crown, unstreaked brown upperparts, deeper pinkish neck and breast, greyer undertail-coverts and darker slaty-grey on wing-coverts.

VOICE Song is soft *wuhu'crrroo*; *wu-crrroo* or *wu huuu-croo*, or more hurried *wu-hwrrroo.. wu-hwrrroo..* etc.

HABITAT Open areas, open woodland, scrub, cultivation, parks and gardens; up to 2,040 m.

RANGE Co R throughout.



ASIAN EMERALD DOVE
Chalcophaps indica

MEASUREMENTS 23-27 cm

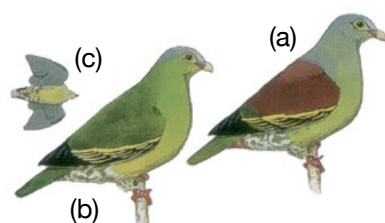
(a,b) Male *indica*: Metallic green mantle/wings, blue-grey crown/nape, white forehead/eyebrow, dark vinous-pinkish below; whitish/pale grey back-bands, white shoulder-patch, red bill. (c) Female: Head, mantle and breast much browner, belly paler and more buffish, grey restricted to forehead/eyebrow, no white on shoulder. (d) Juvenile: Crown, mantle and breast darker brown than female, plumage mostly barred rufous-buff (less on crown/mantle-centre, boldest on breast), almost lacks green above.

VOICE Song is deep soft *tit-whoooo* or *tik-whooOO* (clicking *tit/tik* barely audible), repeated after c.1 s intervals.

HABITAT & BEHAVIOUR Broadleaved forest; up to 1,500 m. Often flushed from forest trails and stream-beds.

RANGE Un/co R, subject to some movements (except C Thailand).

OTHER SUBSPECIES *C.l.maxima* (Cocos Is, S Myanmar).



THICK-BILLED GREEN PIGEON
Treron curvirostra

MEASUREMENTS 25.5-27 cm

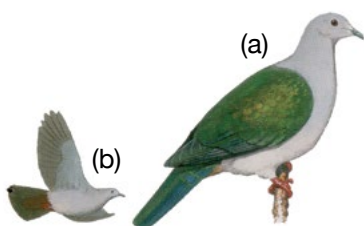
(a) Male *nipalensis*: Thick, red-based, pale greenish bill, broad greenish-blue eyering, grey crown, maroon above, green below. Undertail-coverts dull chestnut. (b, c) Female: No maroon above, undertail-coverts creamy-buff with dark green scales, thighs dark green with whitish scales. Juvenile: Initially as female but rusty fringes on scapular/tertiary/primary tips.

VOICE Song similar to Little Green but fuller, lower-pitched and more phrased. Guttural hissing and growling when foraging.

HABITAT Broadleaved forests; up to 1,280 m.

RANGE Co R (except C Thailand, Singapore, W Tonkin); local movements. Ra/un NBV C Thailand, Singapore (FR).

OTHER SUBSPECIES *T.c. curvirostra* (S Thailand southwards).



GREEN IMPERIAL PIGEON
Ducula aenea

MEASUREMENTS 42-47 cm

(a,b) Adult *sylvatica*: Similar to Mountain but upperparts mostly dark metallic green (may be hard to discern) with variable rufous-chestnut gloss; head, neck and underparts rather uniform vinous-tinged pale grey, undertail-coverts dark chestnut, tail all dark. Juvenile: Duller above than adult; head, neck and underparts paler, with almost no vinous tones.

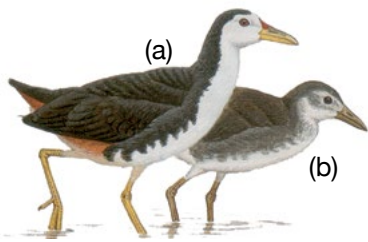
HABITAT Broadleaved evergreen, semi-evergreen, mixed deciduous and island forest, mangroves; up to 915 m.

RANGE Sc/lfc R (except C Thailand); mostly coastal in Pen Malaysia. Sc NBV (FR and may still be locally) Singapore.

OTHER SUBSPECIES *D.a.polia* (southern S Thailand southwards).

VOICE Song is very deep, repeated *wah-whhoo*; *wah-whhrrroo* or *wah-wahrroo* etc. Also gives a deep *hooool* or *huoooo* and rhythmic purring *crrhoo*.

GRUIFORMES, RALLIDAE



WHITE-BREADED WATERHEN
Amaurornis phoenicurus

MEASUREMENTS 32 cm

(a) Adult *phoenicurus*: White face to belly, rufous-chestnut vent. Yellowish bill (red at base) and legs. (b) Juvenile: Browner; darker lores, forehead and ear-coverts, broken bars below, dull bill.

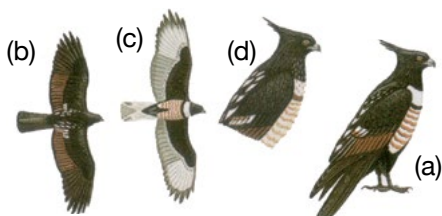
OTHER SUBSPECIES *A.p.insularis* (Coco Is, S Myanmar): Often more white on forecrown, abdomen has less white (bordered black), vent richer chestnut.

VOICE Weird bubbling, roaring, quacking and croaking: *kru-ak kru-ak kru-ak-a-wak-wak* etc *kwaak* and *kuk* notes. Quick pwik notes.

HABITAT Wide variety of wetlands, tracks, roadsides; up to 1,525 m.

RANGE Co R throughout. Fc WV S Thailand, Pen Malaysia, Singapore, N Laos. Also P M S Thailand, Pen Malaysia.

ACCIPITRIFORMES, ACCIPITRIDAE



BLACK BAZA
Aiceda leuphotes

MEASUREMENTS 31.5-33 cm

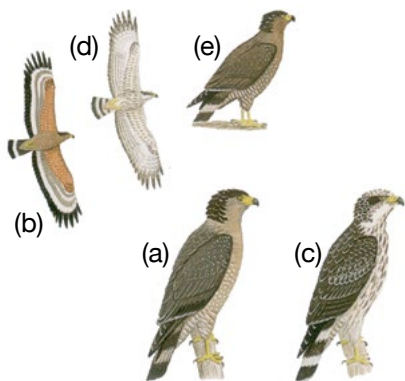
(a, c) Adult *syama*: Relatively small, head black with long crest, mostly black above, bold white on scapulars, white and chestnut on greater coverts and secondaries, whitish underparts with black and chestnut bars, black vent; underwing shows black coverts and primary tips, white remainder of primaries, grey secondaries. (d) Juvenile: More white markings above; small streaks below.

OTHER SUBSPECIES *A.l.leuphotes* (breeds SW,S,E Myanmar, W, NW Thailand): Apparently tends to have more chestnut and white above, mostly chestnut breast-band, less barring on more rufous-buff lower breast and belly.

VOICE High, rather shrill *chi-aah*, *tchi'euuah* or *tcheeoua* (first syllable stressed).

HABITAT & BEHAVIOUR Broadleaved forests, other habitats on migration; up to 1,500 m. Often in flocks, particularly when migrating.

RANGE Un/co R Myanmar (except Tenasserim), W,NW,SE Thailand, Cambodia, Laos, N,C,S Annam, Cochinchina. Un/fc WV and PM Tenasserim, Thailand, Pen Malaysia, Singapore. Un/fc PM Cambodia, C Laos, E Tonkin, N Annam. Rc (status?) Tenasserim.



CRESTED SERPENT EAGLE
Spilornis cheela

MEASUREMENTS 56-74 cm

(a,b) Adult *burmanicus*: Large head, mostly dark brownish, yellow cere/face-skin/eyes, full, white-marked blackish nuchal crest; small white spots on median/lesser coverts, paler, warmtinged head-sides/neck/underparts, with black-edged whitish speckles turning to short bars on lower breast to vent. Very broad-winged in flight; broad white band, then broad black trailing edge across underwing, black tail with broad white central band. (c,d) Juvenile: Head scaled black and whitish with blackish ear-coverts; whitish tips/fringes above, whitish below, usually with faint buffish wash and dark streaks on throat-centre, breast and belly; whitish tail with three blackish bands. In flight, mostly whitish underwing, with buff-washed and dark-streaked wing-coverts, many fine dark bars across underside of flight feathers, indistinct broad darker trailing edge. (e) Adult *malayensis*

(south Tenasserim and S Thailand southwards): Distinctly smaller, darker head-sides and underparts, more pronounced markings below.

OTHER SUBSPECIES *S.c.ricketti* (E Tonkin): Averages larger; somewhat paler above, thin whitish bars on breast, fewer spots/bars on rest of underparts.

VOICE Loud plaintive, high 2-4 note *hwiii-hwi*; *h'wi-hwi*; *h'wee hew-hew*; *hii-hwi-hwi* etc., sometimes preceded by spaced *hu-hu-hu-hu...* 'Song' is sustained crescendo: *ha-ha-ha-ha hu-hu-hu-hu-h'weeoooleeo*.

HABITAT & BEHAVIOUR Broadleaved forests; up to 2,470 m. Soars with wings in shallow V. Displaying pairs soar with head and tail raised, dive at one another and make short flights with wings winnowed shallowly below horizontal.

RANGE Fc R (minor movements) throughout; ra (still breeds?) Singapore.



PIED FALCONET
Microhierax melanoleucos

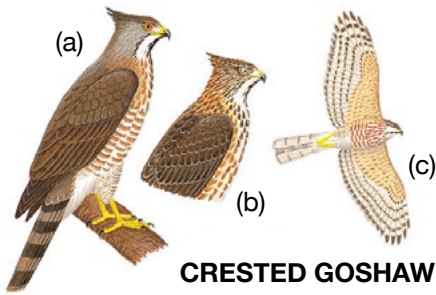
MEASUREMENTS 19-20 cm

(a) Adult: Larger than black-thighed, no chestnut below.

VOICE Shrill whistle, low chattering; prolonged hissing in alarm.

HABITAT Clearings in broadleaved evergreen forest, forest edge; up to 1,080 m.

RANGE Sc R N, C Laos, W, E Tonkin, N, C Annum.



CRESTED GOSHAWK
Accipiter trivirgatus

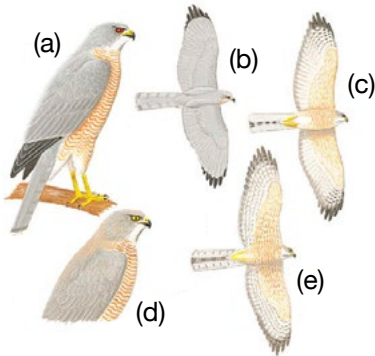
MEASUREMENTS 40–46 cm

(a,b) Male *indicus*: Relatively large, short crest, slaty crown and head-sides, brownish-grey above, dark mesial streak, streaked breast, barred belly; uppertail greyish with equal-width bands. In flight, wings broad and rounded. Female: Larger; browner-tinged crown and head-sides, browner breast-streaks and bars on belly. (c) Juvenile: Like adult but browner head/upperparts (latter fringed buff), neck/under- parts mostly streaked brown.

VOICE Shrill, screaming *he he hehehehe* and squeaky *chiup* in alarm.

HABITAT & BEHAVIOUR Broadleaved and mixed broadleaved/coniferous forest; up to 1,950 m (below 245 m in Pen Malaysia). Display-flights with shallow, winnowing, bowed wings and fluffed-out undertail-coverts.

RANGE Fc/co R (except SW Myanmar, C Thailand); ra Singapore.



SHIKRA
Accipiter badius

MEASUREMENTS 30–36 cm

(a–c) Male *poliopsis*: Pale grey head-sides, upperparts and tail, dark primary tips, white throat with faint grey mesial streak, dense narrow orange-rufous bars on breast and belly; under- wing whitish with some dark bars across outer primaries, undertail with four dark bands in centre. Eyes reddish. (d,e) Female: Larger; yellow eyes, washed brownish above; more dark tail-bands. (f,g) Juvenile: Crown and upperparts brown with paler fringing, darker mesial streak, tear-drop breast- streaks (bars on flanks and spots on thighs), five dark bands on brown uppertail; even dark bars across whitish underside of flight feathers.

VOICE Loud harsh thin *titu-titu* and long, drawn-out screaming *iheeya iheeya...*

HABITAT Open forest and other open areas, cultivation; up to 1,600 m.

RANGE Co R, subject to some movements (except S Thailand, Pen Malaysia, Singapore, W Tonkin). Ra/sc WV S Thailand, northern Pen Malaysia. V southern Pen Malaysia, Singapore.

PASSERIFORMES, PITTIDAE



EARED PITTA
Hydrornis phayrei

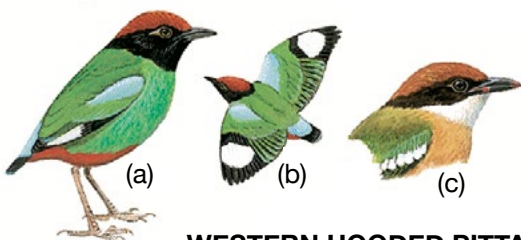
MEASUREMENTS 20–24 cm

(a) Male: Blackish crown/head-sides/nape, elongated buffy-white supercilium; buffish below with dark scales. (b) Female: Browner head, heavier markings below. Juvenile: Duller than female, all-buffish crown-side/supercilium, short 'ears', no submoustachial, dark brown breast with rufous shaft-streaks.

VOICE Airy whistled *wheow-whit*.

HABITAT Broadleaved evergreen and mixed deciduous forest, bamboo; up to 900 m, sometimes 1,500 m.

RANGE Un R C, S, E Myanmar, north Tenasserim, W, NW, NE, SE Thailand, Cambodia, Laos, W,E Tonkin, C Annam.



WESTERN HOODED PITTA
Pitta sordida

MEASUREMENTS 16.5–19 cm

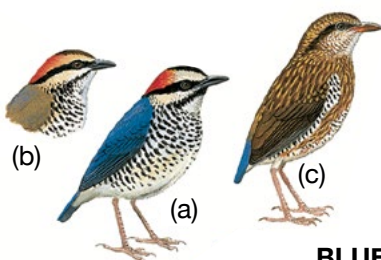
(a,b) Adult *cucullata*: Black head, brown crown/nape, green body. (c) Juvenile: Browner above, whitish throat, brownish below.

OTHER SUBSPECIES *P.s.muelleri* (extreme S Thailand, north Pen Malaysia): Black crown, more white on primaries.

VOICE Song is perky *whep-whep* or *whew-whew*. Short squeaky *skyeew* in alarm.

HABITAT Broadleaved forest, old plantations; up to 915 m.

RANGE Fc R extreme S Thailand, north Pen Malaysia. Un/lc BV Myanmar, W,NE,SE,S Thailand, Cambodia, N,S Laos, W Tonkin. Un/fc PM NW,C Thailand, Pen Malaysia (also winters), Singapore. Rc (status?) CochinChina.



BLUE PITTA
Hydrornis cyaneus

MEASUREMENTS 19.5–24 cm

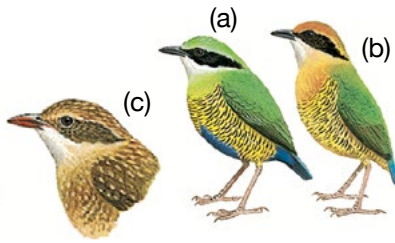
(a) Male *cyanea*: Blue above, vivid red rear crown-side/nape, bluish-whitish below, spotted/barred black. (b) Female: Dull; browner above. (c) Juvenile: Buffish-brown crown/nape with darker scales and crown-/eyestripe, mostly dark brown body with warm buff streaks.

OTHER SUBSPECIES *Pc.aurantiaca* (SE Thailand, south-west Cambodia): More yellowish-orange on head. *Pc.willoughbyi* (C Laos, S Annam): Brighter; often red on breast.

VOICE Loud *peroo-whit* (*peroo* drawn-out, whit loud- er, sharper). Harsh *skyeew* in alarm.

HABITAT Broadleaved evergreen and moister mixed deciduous forest; up to 1,890 m.

RANGE Un/lc R SW,S,E Myanmar, Tenasserim, W,NW,NE,SE, north S Thailand, Cambodia, Laos, E Tonkin, N,C,S Annam.



BAR BELLIED PITTA
Hydrornis eliotii

MEASUREMENTS 19.5–21 cm

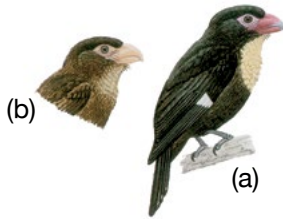
(a) Male: Green above, largely yellow below with narrow dark bars. (b) Female: Buffy-brown crown/breast, blackish headsides with buffish streaks. (c) Juvenile: Brown, with darker head-sides, paler throat, pale buff spots above/on breast.

VOICE Loud whistled *chawee-wu*. Harsh, shrill *jeeow* or *jow* in alarm.

HABITAT Broadleaved forest, bamboo; up to 800 m.

RANGE Fc/co R NE(south-east),SE Thailand (sc), Indochina.

PASSERIFORMES, EURYLAIMIDAE



DUSKY BROADBILL
Corydon sumatranus

MEASUREMENTS 25–28.5 cm

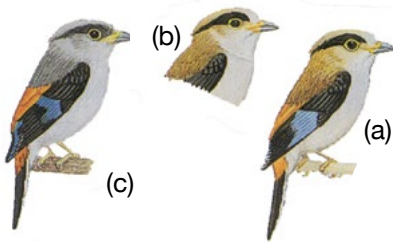
(a) Adult *laoensis*: Blackish-brown, buffy bib, dull reddish bill with greyish tip. (b) Juvenile: Brown; paler bill.

OTHER SUBSPECIES *C.s.sumatranus* (extreme S Thailand southwards).

VOICE 6–8 shrill upward-inflected thin whistles: *hi-ky-ui ky-ui ky-ui..* or *ky-ee ky-ee ky-ee ky-ee...* Shrill thin falling *pseeoo* and piercing high *tsiu*; sometimes repeated quavering *ch wit* in flight.

HABITAT Broadleaved forests; up to 1,220 m.

RANGE Un R S Myanmar, Tenasserim, Thailand (except C), Pen Malaysia, Cambodia, Laos, Vietnam (except W,E Tonkin).



SILVER-BREASTED BROADBILL
Serilophus lunatus

MEASUREMENTS 17 cm

(a) Male *lunatus*: Greyish-brown above, greyish-white below, black supercilium. (b) Female: Thin whitish necklace. (c) Male *rubropygius* (SW,W,N Myanmar): Grey crown to mantle, dark grey supercilium, less blue on wing. Female: Necklace broken in centre.

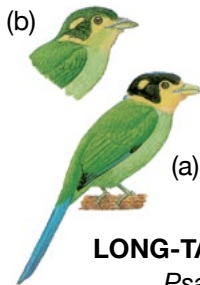
OTHER SUBSPECIES *S.l.rothschildi* (extreme S Thailand southwards): Greyer crown/head-sides/throat/breast, more rufous-chestnut back

to uppertail-coverts and tertials. *S.l.elisabethae* (E Myanmar, NE,SE Thailand, northern Indochina); *impavidus* (SLaos); *stolidus* (southern Tenasserim, northern S Thailand).

VOICE Melancholy *pee-uu* (*uu* lower). Staccato trilled *kitikitikit...*

HABITAT Broadleaved evergreen forest; 50–2,230 m.

RANGE Un/lc R (except C Thailand, Singapore, CochinChina).



LONG-TAILED BROADBILL
Psarisomus dalhousiae

MEASUREMENTS 26 cm

(a) Adult *dalhousiae*: Mostly green; long blue tail, black and yellow/greenish-yellow head, blue on crown and nape. (b) Juvenile: Dark green crown/nape/ear-coverts, more uniformly green below.

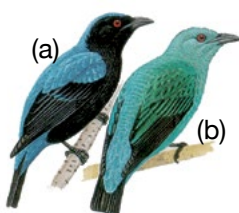
OTHER SUBSPECIES *Pd.pittacinus* (extreme S Thailand, Pen Malaysia); *cyanicauda* (SE Thailand, Cambodia, S Annam).

VOICE Loud, high-pitched, piercing whistles, *tseeay* or *pseew*. Sometimes single sharp *tseeay* and rasping *psweep*.

HABITAT Broadleaved evergreen forest; 500–2,000 m, locally to 50 m.

RANGE Un/lc R (except C Thailand, Singapore, CochinChina).

PASSERIFORMES, IRENIDAE



ASIAN FAIRY BLUEBIRD
Irena puella

MEASUREMENTS 24.5–26.5 cm

(a) Male *puella*: Shining deep blue and black. Eyes red. (b) Female: Dull turquoise-blue, blackish tail/flight feathers, reddish eyes. Juvenile: As female but duller, wings browner.

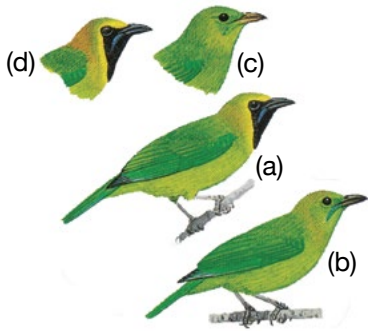
OTHER SUBSPECIES *I.p.malayensis* (extreme S Thailand southwards).

VOICE Loud liquid *tu-lip wae-waet-oo*, and *wi-it, wait, pip* etc.; quavering *u-iu*.

HABITAT Broadleaved forest; up to 1,525 m.

RANGE Fc/co R (except C Thailand).

PASSERIFORMES, CHLOROPSEIDAE



BLUE-WINGED LEAFBIRD
Chloropsis cochinchinensis

MEASUREMENTS 16.5-18.5 cm

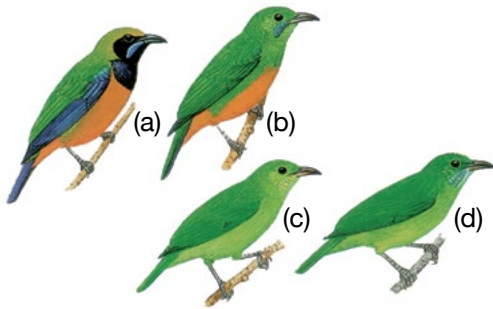
(a) Male *chlorocephala*: Obvious turquoise-blue on wing and tail, extensive yellow-bronze on head/breast. (b) Female: Blue on wings/tail (less than male); more golden-tinged crown/nape than Lesser, fainter malar band. (c) Juvenile: Like female but almost no blue on face/malar, greener crown/nape. (d) Male *C.c. moluccensis* (extreme S Thailand southwards): Even yellower forecrown and bib surround, more defined golden nape. Female: Usually more defined golden nape than *chlorocephala*.

OTHER SUBSPECIES *C.c. serithai* (S Thailand, ? southern Tenasserim): Intermediate between *chlorocephala* and *moluccensis*.

C.c. cochinchinensis (SE, NE [south] Thailand, southern Indochina); *kinneari* (rest of NE Thailand, Indochina).

VOICE Sings with musical liquid *pli-pli-chu-chu*, *chi-chi-pi-i* etc. Also high *chi-chi-chi* and *chi'ii* and slightly rattling *pridit*.

HABITAT Broadleaved forests; up to 1,500m.
RANGE CO R throughout; sc (status?) Singapore.



ORANGE-BELLIED LEAFBIRD
Chloropsis hardwickii

MEASUREMENTS 18.5-20.5 cm

(a) Male *hardwickii*: Yellowish-orange breast and vent. (b) Female: Yellowish-orange abdomen-centre/undertail-coverts, broad purplish-blue malar. (c) Juvenile: Light green below, little blue on malar, no blue on shoulder. (d) Female *melliana* (C Laos, E Tonkin, N, C Annam): Green below, turquoise-tinged forecrown/ear-coverts. Male: Slightly duller than *hardwickii*, greyish-blue-tinged crown, darker blue on shoulder, more bluish-purple upper breast.

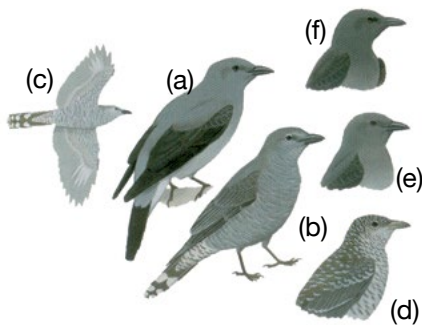
OTHER SUBSPECIES *C.h. malayana* (Pen Malaysia).
VOICE Sings with jumpy phrases of *chip*, *tsi*,

chit and *chi* notes; monotonous shrill *shrittitit* and *shrit* notes; monotonous *chit-wiu chit-wiu chit-wiu..* and melodious *chip-chip-chip-chip-irr chirriwu-i pichu-pi* etc. Loud *chissick* in flight.

HABITAT Broadleaved evergreen forest; 200-2,135 m.

RANGE Un/lc R Myanmar, W, NW, NE Thailand, Pen Malaysia, N, C Laos, Vietnam (except Cochinchina).

PASSERIFORMES, CAMPEPHAGIDAE



BLACK-WINGED CUCKOOSHRIKE
Coracina melaschistos

MEASUREMENTS 23.5 cm

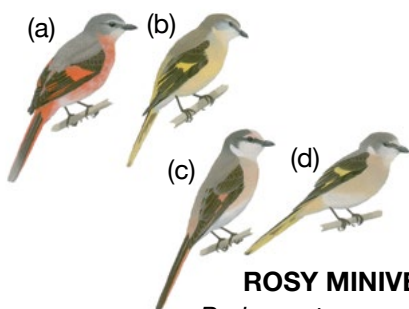
(a) Male *avensis*: Blackish wings, tail more graduated than Indochinese (central feathers >25 mm longer than outer), blackish above and with narrower white tips below; underwing-patch lacking/small. (b,c) Female: Throat to belly typically plainer than Indochinese, usually fainter pale wing fringing, less grey on tail, tail shape/pattern (as male); much smaller/no underwing-patch. (d) Juvenile: Paler; heavy buffish to whitish and dark sooty-brownish bars/scales. Immature: As female but scales/bars on rump/uppertail-coverts, clearer bars below. (e) Male *melaschistos* (B W, N Myanmar, rc NW Thailand): Darker, (f) Male *saturata* (B E Tonkin, N, C Annam, rc NW Thailand, Cambodia, S Laos): Very dark.

OTHER SUBSPECIES *C.m. intermedia* (VS Tenasserim, W, C, NE, SE Thailand).

VOICE 3-4 clear, well-spaced, high whistles: *wii-wii-jeeu-jeeu*, *wi'i-wii-wii-juu* etc.; slower than Indochinese.

HABITAT & BEHAVIOUR Broadleaved evergreen forest; 300-1,920 m. Also more open lowland areas, deciduous forest etc. in winter.

RANGE Ec R (some movements) W, N, E Myanmar, W, NW, NE Thailand, N Laos, W, E Tonkin, N, C Annam. Fc WV C, S Myanmar, Tenasserim, Thailand (except southern S), Indochina. Also PM E Tonkin.



ROSY MINIVET
Pericrocotus roseus

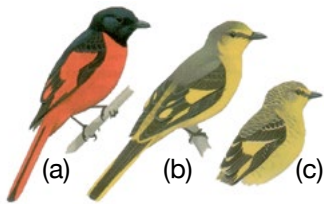
MEASUREMENTS 18-19.5 cm

(a) Male *roseus*: Greyish above, red on rump/wing/tail, largely pinkish below. (b) Female: Red replaced by pale yellow. (c) Male *stanfordi* (rc NE Thailand, Cambodia, Cochinchina): Recalls Swinhoe's but reddish/pinkish on forecrown, outertail, wing, rump and breast. (d) Female: Yellow on wing/tail and tinge to uppertail-coverts. Juvenile/immature male: Differ in similar way to other minivets.

VOICE Similar to Ashy.

HABITAT Open broadleaved forest (mainly deciduous); up to 1,525 m.

RANGE RICO R Myanmar. B E Tonkin. Sc/fc WV Thailand, east Cambodia, N, S Laos, Cochinchina. Also PM E Tonkin. Rc (status?) W Tonkin.



SCARLET MINIVET
Pericrocotus flammeus

MEASUREMENTS 17-21.5 cm
(a) Male *semiruber*: Larger/shorter-tailed than Long-tailed, isolated red on tertials/secondaries. (b) Female: Size, build, yellow forecrown, slaty-grey above, all bright yellow below, isolated yellow on tertials/secondaries. (c) Juvenile: like tailed and Short-billed but yellower below. Immature male: Differs from female like Long-tailed.

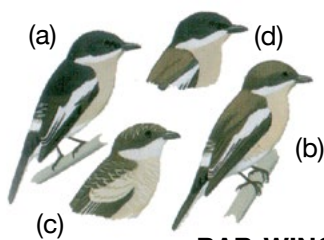
OTHER SUBSPECIES *P.f.elegans* (northern Myanmar, N Indochina and WV range): Larger, mostly black central tail feathers; *flammifer* (W,S Thailand, north-east/east Pen Malaysia) and *xanthogaster* (west/south Pen Malaysia): Smaller (within range given).

VOICE Loud piercing *sweep-sweep-sweep..* and *weeep-weeep-weeep-wit-wip* etc.

HABITAT Broadleaved forests; up to 1,700 m (below 915 m in Pen Malaysia).

RANGE Co R (except C Thailand); sc Singapore. Un WV E Myanmar, NW Thailand.

PASSERIFORMES, VANGIDAE



BAR-WINGED FLYCATCHER-SHRIKE
Hemipus picatus

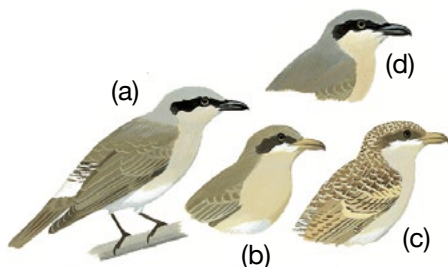
MEASUREMENTS 13 cm
(a) Male *picatus*: Black above, pale below with dusky/vinous wash, long white wing-patch. (b) Female: Brown above, paler below. (c) Juvenile: Buff bars/scales above, buffish wing-patch with dark bars/scales. (d) Male *capitalis* (N,C,E Myanmar, NW Thailand, N Laos, W Tonkin): Dark brown mantle/back/scapulars.

OTHER SUBSPECIES *H.p.intermedius* (S Thailand southwards): Female blacker-brown above, darker below (more like male).

VOICE Rapid thin musical *swit'i'witswit'i'wit...*, *sitti-wittit* and *sittititit* etc.

HABITAT & BEHAVIOUR Broadleaved forests; up to 1,980 m. Usually in groups, often in bird-waves.

RANGE Co R (except C Thailand, Singapore).



LARGE WOODSHRIKE
Tephrodornis virgatus

MEASUREMENTS 18.5-22.5 cm
a) Male *jugans*: Greyish crown/nape, pale greyish-brown above, blackish mask, white rump. (b) Female: Duller, brown-streaked crown, browner mask and bill, buffier wash below. (c) Juvenile: Whitish/buffish shafts/tips/bars above. (d) Male *fretensis* (south-east S Thailand, Pen Malaysia [except north-west]): Smaller, more uniform bluish-slate above. Female has darker crown/throat/breast.

OTHER SUBSPECIES *T.g.annectens* (south Tenasserim, S Thailand [except south-east], north-west Pen Malaysia): Male more greyish-washed, less contrasting above. *T.g.pelvicus* (SW,W,N,E,C,S Myanmar), *vernayi* (south E

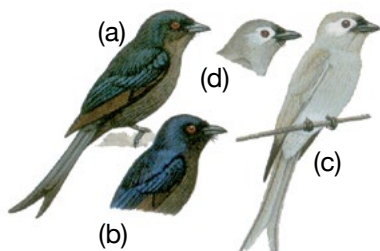
Myanmar, N Tenasserim, W Thailand), *mekongensis* (NE,SE Thailand, southern Indochina), *hainanus* (east N Laos, northern Vietnam).

VOICE Song is airy ringing *pi-pi-pi-pi-pi...* Harsh scolding *chreek chreek chreek...*

HABITAT & BEHAVIOUR Broadleaved forest; up to 1,500 m. Usually in groups high in trees.

RANGE Co R (except C Thailand); formerly Singapore.

PASSERIFORMES, DICRURIDAE



ASHY DRONGO
Dicrurus leucophaeus

MEASUREMENTS 25.5-29 cm
(a) Adult *mouhoti* (B SW,W Myanmar to N,C Laos, C Annam; VS as far as S Thailand, Cambodia): Dark steely-grey (paler below). (b) Adult *nigrescens* (R Tenasserim and S Thailand southward): Blacker. (c) Adult *leucogenis* (widespread VS west to S Myanmar, south to Pen Malaysia): Pale grey, black forehead, whitish face. (d) Adult *salangensis*: (similar range to *leucogenis*): Darker than *leucogenis*, grey on ear-coverts. Juvenile: Dull; paler throat/vent.

OTHER SUBSPECIES *D.l.bondi* (R W,NE (south), SE Thailand, S Indochina); *hopwoodi* (northern Myanmar/Indochina; rc in winter southern Myanmar, NW,NE Thailand, S Laos).

VOICE Thin wheezy *phuuuu* and *hieeeeeer*, repeated loud *tchik wu-wit* etc. Chattering, shrill whistles, harsh notes.

HABITAT Open areas in forest; mangroves etc. in south. Up to 2,750 m.

RANGE Co R (except Singapore). Fc/co WV S Myanmar, Tenasserim, Thailand, Pen Malaysia, Singapore (sc), Laos, Cambodia, Cochinchina. Also PM C Thailand, E Tonkin, C Annam.



HAIR-CRESTED DRONGO
Dicrurus hottentottus

MEASUREMENTS 29-33 cm

(a) Adult *hottentottus*: large, shiny; slender bill, unforked upcurled tail. Juvenile: Duller, flatter tail.

Other subspecies *D.h.brevirostris* (R N Indochina, ? N Myanmar; only VS).

VOICE Stressed *chit-wiii and wiii*.

HABITAT Broadleaved forest; also parks, gardens (migrants). Up to 2,440 m.

RANGE Un/lc R Myanmar, W, NW, NE, SE Thailand, Indochina. Sc/fc WV Thailand (except S). Also PM C Thailand. Rc (status ?) E Tonkin.



(a)
GREATER RACKET-TAILED DRONGO
D. paradiseus

MEASUREMENTS 30-37 cm

(a) Adult *rangoonensis*: Big crest, forked tail (shafts/twisted rackets to 30 cm more). Juvenile Duller; short crest, no tail extension. First winter White-speckled breast, white-barred belly/vent. (b) Adult *platurus* (Pen Malaysia except Tioman I): Smaller, short crest.

OTHER SUBSPECIES *D.p.grandis* (north Myanmar/Indochina): Larger, longer crest. *D.p.hypoballus* (c.4-11°N): Intermediate with *platurus*. *D.p.microlophus* (Tioman I); *paradiseus* (Tenasserim to south Indochina).

VOICE Varied whistles, screeching, churring and mimicry.

HABITAT Broadleaved forest; up to 1,700 m.

RANGE Co R throughout.



LESSER RACKET-TAILED DRONGO
Dicrurus remifer

MEASUREMENTS 25-27.5 cm

(a) Adult *tectirostris*: Short crest, square tail (shafts/straight pendants to 40 cm more). Juvenile: Duller, no tail extension.

OTHER SUBSPECIES *D.r.peracensis* (south of 16°N, except *lefoli* range) and *lefoli* (south-west Cambodia): Thinner/longer pendants (longer on latter).

VOICE Loud, musical and varied. Mimics.

HABITAT Broadleaved evergreen/semi-evergreen forest; 140-2,590 m.

RANGE Lc R (except C Thailand, Singapore).



BRONZED DRONGO
Dicrurus aeneus

MEASUREMENTS 22-23.5 cm

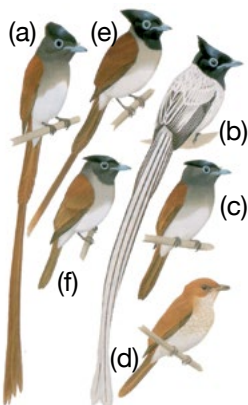
(a) Adult *aeneus*: Small, very glossy. Juvenile/first winter: Less gloss.

OTHER SUBSPECIES *D.a.malayensis* (south Pen Malaysia, Singapore).

HABITAT Broadleaf forests; up to 2,135 m.

RANGE Co R (except C Thailand, Singapore). V Singapore (FR).

PASSERIFORMES: MONARCHIDAE



BLYTH'S PARADISE- FLYCATCHER
Terpsiphone affinis

MEASUREMENTS 21 cm

(a) Male *indochinensis*: Tail <27 cm more. Rufous-chestnut upperside/tail, slaty-grey head/breast, crested black crown. (b) Male white 'morph': Nearly all white, glossy black head. (c) Female: Like rufous male but no tail-streamers, crest shorter, eyering usually somewhat duller. (d) Juvenile: More rufous above, whitish below, initially scaled/mottled dull rufous on breast, brownish/pinkish bill, no eyering. (e) Male *incei* (VS E Myanmar, Tenasserim, Thailand and Cambodia southward): Black hood, grey breast, darker, deeper chestnut above. (f) Female: Throat darker than breast.

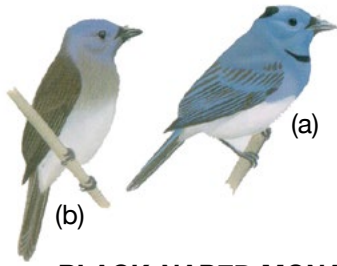
OTHER SUBSPECIES *T.p.saturation* (B N Myanmar; WV Tenasserim/S Thailand southwards) and *nicobarica* (Coco Is): Males duller, paler, more rufous above, buffy vent. *T.p.affinis* (R Pen Malaysia): Male typically richer, more ches-

tnut above, darker throat/breast. *T.p.burmae* (resident SW, S, C Myanmar).

VOICE Song is clear rolling *chu'wu'wu'wu'wu'wu...* Typical call is harsh rasping *whii*; *whi-whu* and *whi-whu'whu* etc.

HABITAT Broadleaved evergreen forest, sometimes mangroves; migrants also in parks, gardens etc. Up to 1,500 m (below 1,220 m in Pen Malaysia).

RANGE Fc/co. R (except N Myanmar, C Thailand, N Laos, W,E Tonkin, N Annam); formerly Singapore. BV (some may overwinter) N Myanmar, N Laos, W,E Tonkin, N Annam. WV C,S,E Myanmar, W,NE(south-west),SE Thailand. PM S Myanmar, N Laos, E Tonkin. WV and PM Tenasserim, C,S Thailand, Pen Malaysia, Singapore.



BLACK-NAPED MONARCH
Hypothymis azurea

MEASUREMENTS 16-17 cm

(a) Male *styani*: Blue with whitish belly/vent, black nuchal tuft and breast-band. (b) Female: Blue duller (mainly on head), warm-tinged greyish-brown above, no nuchal-patch or breastband, greyer breast. Juvenile: Like female.

OTHER SUBSPECIES *H.a.tytleri* (Coco Is) and *prophata* (Pen Malaysia, Singapore): Males deeper, more purplish-blue, less white below, *tytleri* with greyish (blue-tinged) vent. Females are deeper brown above, have deeper blue parts, particularly former which has greyish vent like male. *H.a.forrestia* (Mergui Archipelago), *montana* (W,NW,NE Thailand),

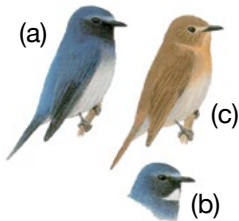
galerita (W[south], SE Thailand).

VOICE Song is clear ringing *wii'wii'wii'wii'wii'wii'*. (c.3 notes pers). Harsh *shweh-shweh* or *chwe-wi*, rasping *tswit* and *tswit-wit*.

HABITAT Broadleaved forest; up to 1,520 m (below 1,065 m Pen Malaysia).

RANGE Co It (some movements), except C Thailand, Tonkin; ra Singapore. Un/fc WV S Myanmar, C, NE, SE Thailand. Un PM C Thailand, E Tonkin.

PASSERIFORMES: MUSCICAPIDAE



HAINAN BLUE FLYCATCHER
Cyornis hainanus

MEASUREMENTS 13.5-14 cm

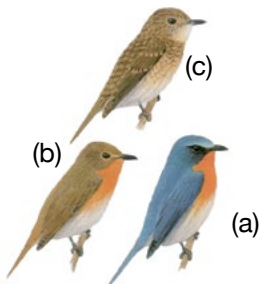
(a) Male: Dark blue throat/breast, then grades to greyish-white. (b) Male variant: White throat-triangle. (c) Female: Duller than Blue-throated (*dialilaema*), brown on throat-/breast-side. Juvenile: Dark tips and buff streaks/spots above, dark-scaled breast. Male has blue on wings/tail.

VOICE Weaker/simpler song than Hill Blue;

rather short, hurried, slurred phrases. Light *tic* notes.

HABITAT Broadleaved forest, bamboo; up to 1,020 m.

RANGE Fc/co R C,S, E Myanmar, Tenasserim, Thailand (except C,S), Indochina (except S Annam). Also PM coastal E Tonkin.



HILL BLUE FLYCATCHER
Cyornis whitei

MEASUREMENTS 14-15.5 cm

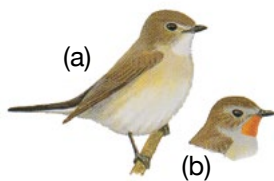
(a) Male *whitei*: Like Tickell's but orange-rufous grades into white belly. (b) Female: Warm above, rufescent tail and wing-fringes, same gradation below. (b) Juvenile female: Dark tips and warm buff spots above; buff-and-dark scales below. Male has blue on wing/tail.

OTHER SUBSPECIES *Cb.magnirostris* (VS E Myanmar; Tenasserim, S Thailand, Pen Malaysia), *lekahuni* (rc NE Thailand) and *deignani* (rc SE Thailand): All bigger-billed. *C.b.coerulifrons* (R south of c.12°N).

VOICE Sweet high, melancholy song. Quicker, longer, more complex than Tickell's. Similar calls.

HABITAT Broadleaved evergreen forest, migrants in non-forest habitats; 400-2,515 m (below 1,220 m Pen Malaysia).

RANGE Un/co R N,E Myanmar, Tenasserim, Thailand (except C), Pen Malaysia, N,C Laos, W,E Tonkin, N Annam. Un WV E Myanmar, Tenasserim, S Thailand, Pen Malaysia. Un PM C,S Thailand, Pen Malaysia. Rc (status?) C Myanmar, E Tonkin, Cambodia.



RED-THROATED FLYCATCHER
Ficedula parva

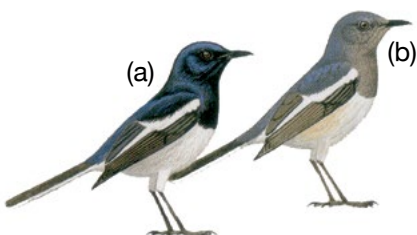
MEASUREMENTS 13 cm

(a) Male non-breeding/female *albicilla*: Buffy-grey breast, blackish tail with white; dark bill. (b) Male breeding: Orange throat, bordered grey. First winter: As female but buffy greater covert/tertial tips.

VOICE Rhythmic song is sharp/high, then clear, descending. Rattled *trrrt*, dry *tek* notes, harsh *zee*

HABITAT & BEHAVIOUR Open woodland, plantations, parks etc.; up to 2,135 m. Cocks tail.

RANGE Co WV (except Pen Malaysia, Singapore). V Pen Malaysia. Also PM Cambodia, E Tonkin.



ORIENTAL MAGPIE ROBIN
Copsychus saularis

MEASUREMENTS 19-21cm

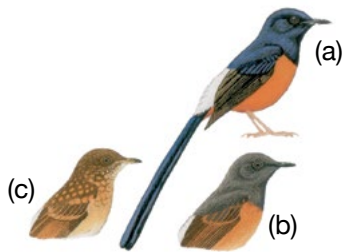
(a) Male *erimelas*: Glossy blackish; white belly, wing-stripe and outertail. (b) Female: Black parts greyer. Juvenile: Duller; brown wing-fringing, buffier wing-stripe, dark-scaled coverts; paler/buffier throat/breast with dark scales. Male darker above, soon shows black.

OTHER SUBSPECIES *C.s.musicus* (south of c.12°N).

VOICE Varied musical warbling song, with churrs and sliding whistles. Clear rising whistle, harsh rasping *che'e'e'e'h* in alarm.

HABITAT Gardens, parks, cultivation, open woodland etc.; up to 1,830 m.

RANGE Co R throughout.



WHITE-RUMPED SHAMA
C. malabaricus

MEASUREMENTS 21.5-28 cm

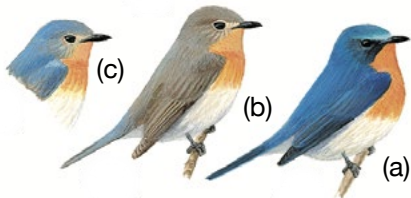
(a) Male *interpositus*: Blue-black; orange-rufous below, white rump, long blackish tail with white outer feathers. (b) Female: Dark parts greyer, paler below, tail shorter. (c) Juvenile: Buff speckles/tips/fringing above, dark-scaled buff-throat/breast.

OTHER SUBSPECIES *C.m.pellogynus* (Tenasserim, S Thailand), *mallopercnus* (south of c.6°N).

VOICE Highly varied melodious song, with mimicry. Harsh *tschack*.

HABITAT Broadleaved forest, bamboo; up to 1,525 m.

RANGE Fc/co R (sc Singapore).



INDOCHINESE BLUE FLYCATCHER
Cyornis sumatrensis

MEASUREMENTS 13.5–15.5 cm

a) Male *indochina*: Cleanly demarcated breast and belly. (b) Female: Greyish/bluish above, demarcated below. Juvenile: No rufous on tail, relatively greyish above, only thin crown-streaks. (c) Female *sumatrensis* (south of c.12°N): Bluer above. Male deeper blue above than *indochina*, paler/buffier throat.

OTHER SUBSPECIES *C.t.tickelliae* (N,C Myanmar?): Male paler blue above than *indochina*; female much bluer.

VOICE Slow, sweet, slightly descending/rising then descending song. Hard *tac* and *trrt* notes.

HABITAT Broadleaved forest, bamboo; up to 915 m (below 600 m in Thailand).

RANGE Laos, Cambodia, mainland Malaysia, Myanmar, Thailand, Vietnam



BROWN BREASTED FLYCATCHER
Muscicapa muttui

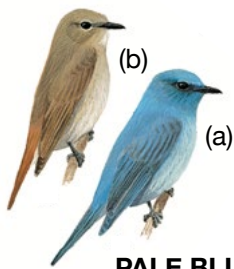
MEASUREMENTS 13–14 cm

(a) Adult (fresh): Autumn/early winter bird. Larger/larger-billed than Asian Brown, pale yellowish lower mandible, colder greyish-brown crown/head-sides contrast sharply with broad whitish eyering/lores, rufescent tinge above, enclosed white sub-moustachial patch, warm greyish breast/flanks, deep buff wing-fringing. Duller when worn.

VOICE Complex weak high song. Thin *sit*.

HABITAT Broadleaved evergreen forest; 1,220–1,645 m.

RANGE Sc BV W Tonkin. Sc/un PM W,C Myanmar. Rc (breeds?) N,E Myanmar, NW Thailand, E Tonkin.



PALE BLUE FLYCATCHER
Cyornis unicolor

MEASUREMENTS 16–17.5 cm

(a) Male *unicolor*: Bluer (less turquoise) than Verditer, paler belly/vent. (b) Female: Rather greyish, rufous uppertail-coverts/tail. Juvenile: Blackish tips and buff spots above, uniformly dark-scaled below. Male has blue on wings/tail.

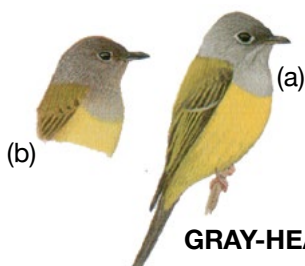
OTHER SUBSPECIES *C.u.harerti* (S Thailand, Pen Malaysia): Greyer crown, warmer elsewhere.

VOICE Relatively melodious, warbling song, phrases, often start with shorter *chi* and end with buzzy *chizz*.

HABITAT Broadleaved evergreen forest; up to 1,600 m.

RANGE Un R Myanmar (except SW,S), Thailand (except C,SE), Pen Malaysia, Cambodia, Laos, N,C Annam. V coastal E Tonkin.

PASSERIFORMES: STENOSTIRIDAE



GRAY-HEADED CANARY FLYCATCHER
Culicicapa ceylonensis

MEASUREMENTS (a) Adult *calochrysea*: 12 cm. Grey hood, bright yellowish below. (b) Juvenile: Browner hood, duller above, paler below.

OTHER SUBSPECIES *C.c.antioxantha* (southern Tenasserim, W [south] and S Thailand southwards): Darker head/breast, less bright green above, less bright yellow belly.

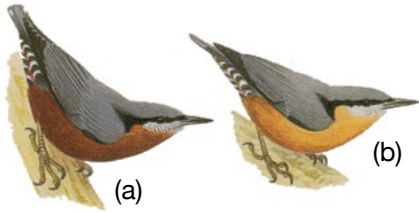
VOICE Song is brief sharp *wittu-wittu-wit*; *chuit-it-ui* or *witti-wuti* etc. Calls with sharp metallic trills and twitters.

HABITAT & BEHAVIOUR Broadleaved forest; migrants also in parks, gardens, mangroves. Up

to 3,050 m (mainly breeds above 650 m), below 1,280 m Pen Malaysia. Often in bird-waves; sallies from perch.

RANGE CO R (local movements) Myanmar, W,NW,NE(north-west), S Thailand, Pen Malaysia, Indochina (except Cochinchina). Un WV S Myanmar, C, NE, SE Thailand.

PASSERIFORMES: SITTIDAE



CHESTNUT-BELLIED NUTHATCH
Sitta cinnamoventris

MEASUREMENTS 13 cm

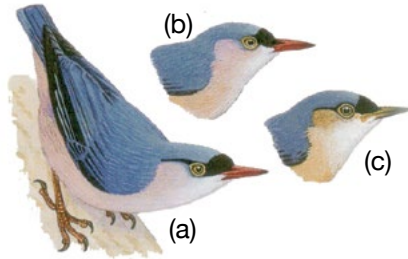
(a) Male *neglecta*: Pale buffish-chestnut below, white cheeks, dark grey and white undertail-coverts. (b) Female: Pale orange-buff below, whiter cheeks. (c) Male *tonkinensis* (NW Thailand [lo], N Indochina): Darker above, deep reddish-chestnut below, black-barred cheeks, darker grey on undertail-coverts. (d) Female: Pale chestnut below.

OTHER SUBSPECIES *S.c.cinnamoventris* (N Myanmar): Like *tonkinensis* but white cheeks, chestnut, grey and white undertail-coverts.

VOICE Song is whistled *wheeu*, trilling *trillililli* and flatter *tututututu..* etc. Sparrow-like *cheep-cheep-cheep..*, mellow *tui-tui-tui* high *seet*, squeakier *vit*, rattling *sitiit sidititit* etc.

HABITAT Deciduous and pine, sometimes broadleaved evergreen forest; 305-1,525m, to 1,700m (?2,200m) N Indochina.

RANGE Lc R Myanmar, W, NW, NE Thailand, Indochina.



VELVET-FRONTED NUTHATCH
Sitta frontalis

MEASUREMENTS 12-13.5 cm

(a) Male *frontalis*: Red bill, violet-blue above, black forehead and postocular line, whitish throat, pale dull beige/lavender below. (b) Female: No postocular line, cinnamon tinge below. (c) Juvenile: Dark bill, greyer above, cinnamon-orange wash below.

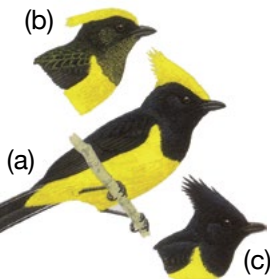
OTHER SUBSPECIES *S.f.saturation* (S Thailand southward): Deeper cinnamon-/pinkish-buff below, washed lilac.

VOICE Song of repeated *sit* notes, sometimes a fast hard rattle. Hard *chit* and thin *sit* notes.

HABITAT Broadleaved forest, mixed oak/pine forest; up to 1,800 m (below 1,450 m S Annam).

RANGE Co R (except Singapore). Rc (status?) Singapore.

PASSERIFORMES: PARIDAE



SULTAN TIT
Melanochloa sultanea

MEASUREMENTS 20.5 cm

(a) Male *sultanea*: Large; black and yellow, yellow crest. (b) Female: Duller/browner above, washed green, yellowish-olive throat/upper breast. Juvenile: Duller than female, shorter crest, whitish greater covert tips, sooty-olive throat/upper breast. (c) Male *gayeti* (S Laos, C Annam): Black crest (both sexes).

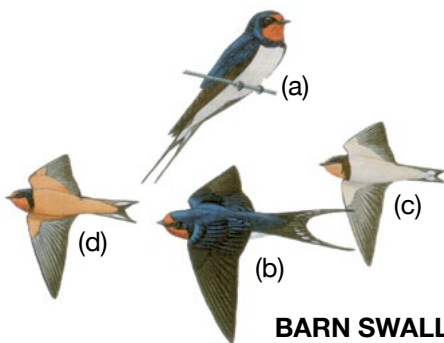
OTHER SUBSPECIES *M.s.flavocristata* (S Myanmar to SE Thailand and southward).

VOICE Clear *piu-piu-piu-piu-piu..* song. Rattling *tji-jup*, shrill squeaky *tria-tria-tria*, *tcheery-tcheery-tcheery* and *squear-squear-squear* etc.

HABITAT Broadleaved forest; up to 1,680 m (below 1,200 m in Thailand and Pen Malaysia).

RANGE Un/lc R (except C Thailand, Singapore, Cambodia, southern S Annam, Cochinchina).

PASSERIFORMES: ARTAMIDAE



BARN SWALLOW
Hirundo rustica

MEASUREMENTS 15 cm (tail <5 more)

(a,b) Adult breeding *gutturalis*: Blue-black above/on breast-band, chestnut-red forehead/throat, whitish below, deeply forked tail with streamers. (c) Juvenile: Browner above/on breast-band, duller forehead/throat (latter may be whitish); short tail-fork. (d) Adult non-breeding *tyleri* (rc SW, N, E, C, S Myanmar, C, SE Thailand, Pen Malaysia, C Annam): Pale rufous below (seasonally lacking tail-streamers).

OTHER SUBSPECIES *H.r.mandschurica* (rc NW Thailand).

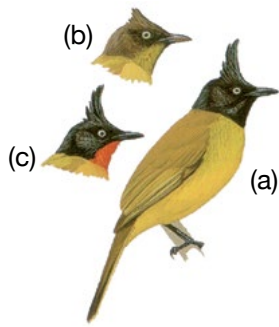
VOICE Song is rapid twittering with croaking sound that extends to thy rattle. High-pitched

sharp *vit* notes, and louder, anxious *vheet vheet* or *flitt-flitt* in alarm.

HABITAT Open areas, often near water and habitation; up to 2,000 m.

RANGE Lo R/BV NW, NE Thailand, N Laos, W, E Tonkin. Co WV and PM throughout. Rc in summer Pen Malaysia, S Laos, Cochinchina.

PASSERIFORMES: PYCNONOTIDAE



BLACK-CRESTED BULBUL
Rubigula flaviventris

MEASUREMENTS 18.5-19.5 cm

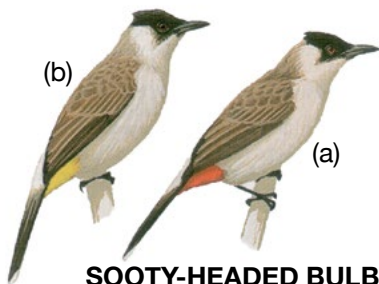
(a) Adult *caecilli* (south of c.12°N): Black head, crest, yellow below. (b) Juvenile: Duller, short crest. (c) Adult *johnsoni* (C,NE,SE Thailand, S Indochina): Red on throat, deeper yellow (often orangey) breast.

OTHER SUBSPECIES *P.m.flaviventris* (SW, W, N, C, S Myanmar), *vantynei* (E Myanmar, north Thailand and Indochina), *xanthops* (SE Myanmar to W(north), NW(south) Thailand), *auratus* (north NE Thailand, C Laos), *elbeli* (islands off SE Thailand), *negatus* (central Tenasserim, south W Thailand).

VOICE Song is quick *whitu-whirru-wheet* and *whit-whaet-ti-whaet* etc.

HABITAT Broadleaved forest: up to 2,565 m.

RANGE Co R (except Singapore). Un FER (established?) Singapore.



SOOTY-HEADED BULBUL
Pycnonotus aurigaster

MEASUREMENTS 19-21 cm

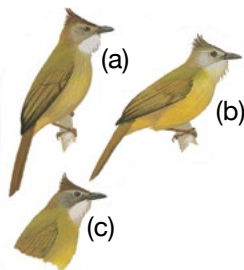
(a) Adult *klossi*: Black cap, white rump, red vent. Juvenile: Browner cap, paler vent. (b) Adult *thais* (C to SE Thailand, C Laos)/*germani* (NE Thailand, S Indochina): Yellow vent.

OTHER SUBSPECIES *P.a.latouchei* (E Myanmar and north NW Thailand to W Tonkin); *resurrectus* (E Tonkin, N Annam); *dolichurus* Annam); *schauenseei* (central Tenasserim, W Thailand).

VOICE Chatty *whi wi-wiwi-wiwi* song. Whistled *u'whi'hi'hu* etc.

HABITAT Secondary growth, cultivation; up to 1,830 m.

RANGE Fc/co R E,S Myanmar, Tenasserim, Thailand (except S), Indochina.



PUFF-THROATED BULBUL
Alophoixus pallidus

MEASUREMENTS 22-25 cm

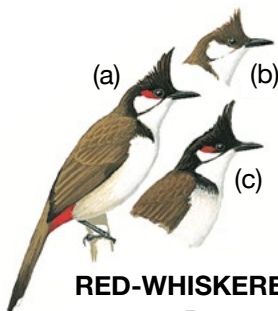
(a) Adult *henrici*: Darker below than White-throated and Ochraceous, strong greenish olive tinge above. (b) Adult *griseiceps* (Pegu Yomas, S Myanmar): Whiter ear-coverts, yellow below. (c) Adult *annamensis* (N,C Annam): Darker breast/flanks, slaty cheeks.

OTHER SUBSPECIES *A.p.robinsoni* (Tenasserim); Intermediate between *henrici* and *griseiceps*. *A.p.khmerensis* (south Indochina): Similar to *annamensis*. *A.p.isani* (NE Thailand).

VOICE Raucous *churt churt churt..; chutt chutt chick-it chick-it..* etc.

HABITAT Broadleaved evergreen forest; to 1,450 m.

RANGE Co R S,E Myanmar, Tenasserim, NW,NE Thailand, Indochina (except southwest Cambodia, Cochinchina).



RED-WHISKERED BULBUL
Pycnonotus jocusus

MEASUREMENTS 18-20.5 cm

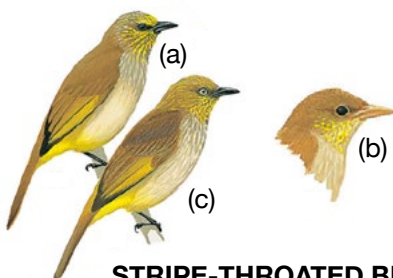
(a) Adult *pattani*: Black crest, red ear-patch and vent. (b) Juvenile: Browner, no ear-patch, vent pinkish to orangey. (c) Adult *monticola* (N Myanmar): Larger; darker ear-patch. Darker breast/flanks, slaty cheeks.

OTHER SUBSPECIES *P.j.emeri* (southern Myanmar, W Thailand): Larger red ear-patch. *P.j.hainanensis* (northern Indochina): Like *monticola*.

VOICE Lively song phrases: *wit-ti-waet; queep kwil-ya; queek-kay* etc. Rolling *prroop*.

HABITAT Secondary growth, scrub, cultivation, parks, gardens; up to 1,800 m.

RANGE Co R (except southern Pen Malaysia, Singapore, where un FER).



STRIPE-THROATED BULBUL
Pycnonotus finlaysoni

MEASUREMENTS 19-20 cm

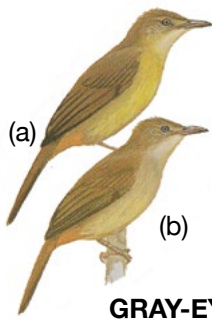
(a) Adult *eous*: Yellow head-streaks, yellow vent. (b) Juvenile: Browner, little streaking. (c) Adult *davisoni* (S Myanmar): No yellow streaks on forehead and ear-coverts, greener crown and rump, pale eyes.

OTHER SUBSPECIES *P.f.finlaysoni* (south of c.12°N).

VOICE Song is throaty measured *whit-chu whic-ic* and *whit whit-tu-iwhit-whitu'tu* etc.

HABITAT Secondary growth, scrub, forest edge; up to 1,300 m.

RANGE Co R (minor movements), except W,N,C Myanmar, C Thailand, Singapore.



GRAY-EYED BULBUL
Iole propinqua

MEASUREMENTS 17-19 cm

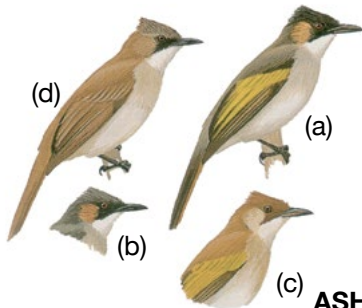
(a) Adult *propinqua*: Yellowish below, rufous-buff vent. (b) Adult *cinnamomeoventris* (south Tenasserim, S Thailand): Smaller; browner above, less yellow below.

OTHER SUBSPECIES *I.p.aquilonis* (E Tonkin, N Annam): As yellow as northern Olive races. *I.p.innectens* (Cochinchina): Very similar to *cinnamomeoventris*. *I.p.simulator* (SE Thailand to S Annam); *lekhakuni* (north Tenasserim, W Thailand).

VOICE Nasal *uuu-wit*; (Cochinchina); less nasal *prrit* (S Thailand)

HABITAT Broadleaved evergreen forest; up to 1,525 m.

RANGE Co R E, S Myanmar, Tenasserim, Thailand (except C), Indochina



ASHY BULBUL
Hemixos flavala

MEASUREMENTS 20.5-21 cm

(a) Adult *hildebrandi*: Black crown/face, brown ear-coverts, grey above, yellowish on wing. (b) Adult *flavala* (SW to northern Myanmar): Grey crown. (c) Adult *remotus* (S Laos, S Annam): Paler and browner. (d) Adult *cinereus* (S Thailand southwards): Much plainer and browner above. Juvenile: Browner-tinged above.

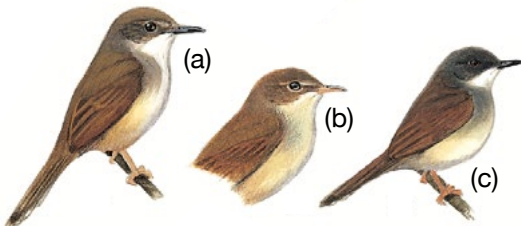
OTHER SUBSPECIES *H.f.davisoni* (Tenasserim, W Thailand); *bourdellei* (NE Thailand, N Laos).

VOICE Song is high *ii-wit'ti-ui* etc. Ringing *tree-tree-tree...*

HABITAT Broadleaved evergreen forest; up to 2,100 m.

RANGE Fc/co R Myanmar, Thailand (except C,SE), Pen Malaysia, E Cambodia, Laos, W Tonkin, N, C, S Annam. Ra NBV Singapore.

PASSERIFORMES: CISTICOLIDAE



GRAY-BREASTED TAILORBIRD
Prinia hodgsonii

MEASUREMENTS 10-12 cm

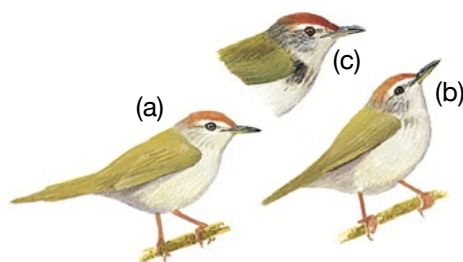
(a) Adult non-breeding *erro*: Like Rufescent (which see for differences); often greyish on neck-sides/breast. (b) Adult breeding: Dark grey head and broad breast-band, whitish throat and belly. (c) Juvenile: Like non-breeding adult but more rufescent above, bill pale.

OTHER SUBSPECIES *Ph.rufula* (N Myanmar): Non-breeders typically warmer above. *Ph.hodgsonii* (SW,W,C,S[west] Myanmar); *confusa* (N Indochina).

VOICE Song is repeated *ti swii-swii-swii-swii* (each *swii* gets louder). Rapid scratchy warbling with thin *tee-tsi* and *tir tir tir...* Calls include high *ti-chu* and laughing *hee-hee-hee-hee*.

HABITAT & BEHAVIOR Dry grassland, scrub, secondary growth; up to 1,525 m. Usually in hyperactive parties.

RANGE Co R (except Tenasserim, S Thailand, Pen Malaysia, Singapore).



COMMON TAILORBIRD
Orthotomus sutorius

MEASUREMENTS 11-13 cm

(a) Male breeding *inexpectatus*: Rufescent fore-crown, pale below (including vent), long bill/tail. (b) Male non-breeding/female: Shorter tail. Juvenile: Crown initially all green. (c) Adult *maculicollis* (southern S Thailand southward): Darker above, darker grey nape, ear-coverts and streaks on breast-sides.

OTHER SUBSPECIES *O.s.longicauda* (north Indochina; E Myanmar?).

VOICE Explosive *chee-yup chee-yup chee-*

yup..., *pitchik-pitchik-pitchik..* or *te-chi te-chi te-chi te-chi..* etc. Calls with *pit-pit-pit..* and quick *cheep-cheep...*

HABITAT & BEHAVIOR Gardens, scrub, bamboo clumps, cultivation borders, open woodland, mangroves; up to 1,525 m. Quite skulking, frequently cocks tail.

RANGE Co R throughout.



DARK NECKED TAILORBIRD
Orthotomus atrogularis

MEASUREMENTS 10.5-12 cm

(a) Male breeding *nitidus*: No supercilium, solidly dark lower throat/upper breast, yellow vent. Male non-breeding: Like female but stronger throat-/breast-streaks. (b) Female: Weakly streaked throat/breast. (c) Juvenile: Duller above than female, initially no rufous on crown.

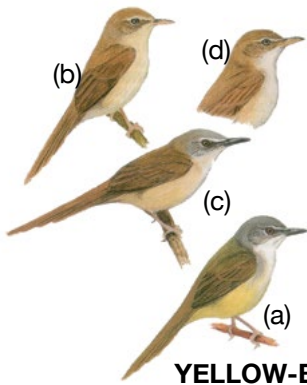
OTHER SUBSPECIES In E Tonkin and N Annam shows darker rufous crown, darker green above (undescribed race?). *O.a.atrogularis* (S

Thailand southwards), *annambensis* (Pulau Tioman, Pen Malaysia).

VOICE Nasal high *kri't'i'i'i* and tew notes. Trilled *churrit churrit churrit- churrit* and *titttrrrt titttrrrt* etc.; ringing *prrrp-prrrp*.

HABITAT & BEHAVIOR Broadleaved forest, secondary growth, mangroves, rarely parks, gardens; up to 1,200 m. Behaves like Common.

RANGE Co R (except SW Myanmar).



YELLOW-BELLIED PRINIA
Prinia flaviventris

MEASUREMENTS 12-14.5cm

(a) Adult *delacouri*: Greyish head, greenish mantle, whitish throat/breast, then yellow. (b) Juvenile: Plain rufescent olive-brown above, pale yellow supercilium/below, buffier flanks. (c) Adult *sonitans* (E Tonkin): More rufescent above, light buffish throat/breast, deep buff belly/vent. (d) Juvenile: Whiter throat to abdomen-centre, duller head.

OTHER SUBSPECIES *P.f.flaviventris* (SW, W, N, C, S [west] Myanmar), *rafflesi* (south Tenasserim and S Thailand southwards).

VOICE Song is rhythmic, descending, chuckling *didli-idli-u didli-idli-u didli-idli-u...* Mewing *pzeew* call.

HABITAT Grassland, mainly in marshes, coastal scrub; up to 1,450 m.

RANGE Co R throughout.

PASSERIFORMES: SCOTOCERCIDAE



ASIAN STUBTAIL
Urosphena squameiceps

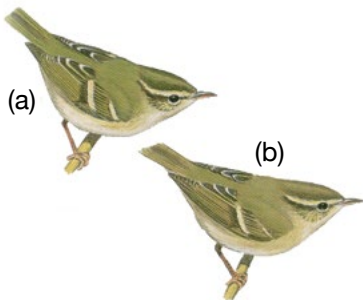
MEASUREMENTS 9.5-10 cm

(a) Adult: Very small, short tail; long buffy-whitish supercilium, black eyestripe, pale pinkish legs.

VOICE Song is insect-like *si'ii'ii'ii'ii'...* Slower *si-si-si-si-si...*, rising in volume. Sharp *sit* notes in alarm.

HABITAT & BEHAVIOUR Undergrowth in broad-leaved forest; up to 2,285 m. On/near ground.

RANGE Un/fc WV W, C, E, S Myanmar, Tenasserim, W, NW, N, SE, C, S (north) Thailand, Indochina (except Cochinchina).



YELLOW-BROWED WARBLER
Phylloscopus inornatus

MEASUREMENTS 11-11.5 cm

(a) Adult (fresh): Smaller/shorter-tailed than Two-barred, tertials whitish-tipped, wing-bars broader, bill weaker (usually darker-tipped). (b) Adult (worn): Narrower wing-bars.

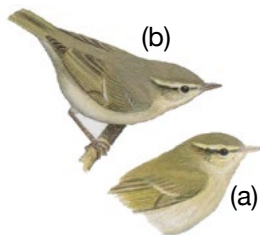
VOICE Song is high *tsitsitsui itsui-it seee tsi tsi-u-eee* etc. High, slightly rising *tswee-eeep* or *tsweet* calls.

HABITAT All kinds of wooded areas; up to 2,440 m.

RANGE CO WV throughout; sc Pen Malaysia, Singapore. Also PM Pen Malaysia, Cambodia, E Tonkin.

HABITAT Broadleaved evergreen forest; up to 2,565 m (mainly mountains).

RANGE Fc WV Myanmar, W, NW, NE Thailand, N Laos, W,E Tonkin.



GREENISH WARBLER
Phylloscopus trochiloides

MEASUREMENTS 12 cm

(a) Adult (fresh) *trochiloides*: Like Two-barred but usually one wing-bar on greater coverts. (b) Adult (worn): Greyer above, narrower wing-bar/s.

OTHER SUBSPECIES *Pt.obscuratus* (widely claimed wintering).

VOICE Song is simple hurried repetition of call-type notes: *chiree-chiree-chiree-chiree-chee-chee witchu-witchu-witchu-witchu* etc. Calls with fairly high slurred *chiree* or *chir'ee*.

mangroves, parks etc.; up to 1,830 m (mainly lowlands).

RANGE Un/co WV Tenasserim, S Thailand, Pen Malaysia, Singapore, S Laos. Un/fc PM S Myanmar, Thailand, Pen Malaysia, Singapore, Laos, W,E Tonkin, N Annam. Re (status?) Cambodia, Cochinchina.



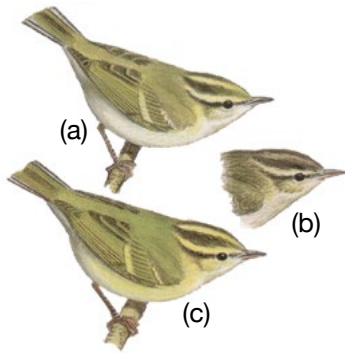
EASTERN CROWNED WARBLER
Phylloscopus coronatus

MEASUREMENTS 13 cm

(a) Adult: Like Arctic but pale crown-stripe, yellow vent; lower mandible pale.

VOICE Clear song ends with harsh squeaky note: *tuweeu tuweeu tuweeu tuweeu zueee* etc.; or short *psit-su zueee*. Harsh *zweet* (quieter than Arctic).

HABITAT Broadleaved forest, migrants also in



BLYTH'S LEAD WARBLER
P. reguloides

MEASUREMENTS 11.5-12 cm

(a) Adult *assamensis*: Like White-tailed but less yellow, less white on tail (thinner fringe to inner web of two outermost feathers). (b) Juvenile: Duller/plainer crown, duller below. (c) Adult *ticehursti* (S Laos, S Annam, ? SE Thailand): Yellower, slightly greener above;

OTHER SUBSPECIES *P.r.claudia* (VS [R?] W Tonkin): Similar/slightly less white on tail. *P.r.fokiensis* (VS Vietnam?): Least white in tail (more than Emei), yellower than *ticehursti*? *P.r.reguloides* (VS Myanmar?).

VOICE Sings with strident, undulating, alternating phrases: *wit tissu-tissu-tissu wit tewi-tewi-tewi-wit chewi-chewi-chewi..;wit-chuit wit-chuit wit chuit chi-tewsi chi-tewsi chi..* etc. High *pit-chee* and *pit chee wi'chit* (*pit* stressed).

HABITAT & BEHAVIOUR Broadleaved ever-green forest; up to 2,700 m (breeds above 1,500 m). Creeps on trunks/branches. Flicks wings one by one (territorial).

RANGE Lc R W, N, E Myanmar, W, NW Thailand, S Laos, W Tonkin, S Annam. Fc/co WW C, S Myanmar, north Tenasserim, Thailand (except S), Laos, W, E Tonkin, N,C Annam.



YELLOW-BELLIED WARBLER
Abroscopus superciliaris

MEASUREMENTS 9.5-11.5 cm

(a) Adult *superciliaris*: Greyish head, whitish supercilium, throat and breast, yellow belly. Juvenile: Paler below.

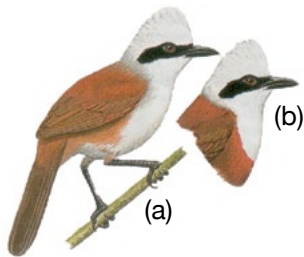
OTHER SUBSPECIES *A.s.smythiesi* (C,S Myanmar): Grey of crown paler and more limited to forehead, yellower above. *A.s.sakaiaorum* (south of c.8°N): White on belly-centre. *A.s.drasticus* (SW,W Myanmar), *bambusarum* (northern S Thailand), *euthymus* (Vietnam).

VOICE Song is thin tinkling *uu-uu-ti* and *uu-uu-ti-i* etc. (*ti* higher). Low thin twittering.

HABITAT Bamboo; up to 1,525 m.

RANGE Co R (except C, SE Thailand, Singapore).

PASSERIFORMES: LEIOTHRICHIDAE



WHITE-CRESTED LAUGHINGTHRUSH
Garrulax leucolophus

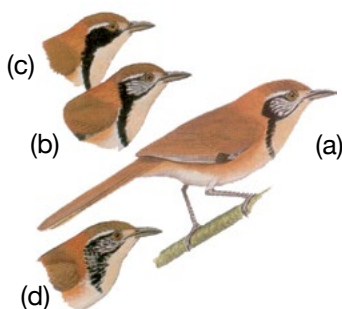
MEASUREMENTS 29 cm (a) Adult *diardi*: Broad white crest, black mask, white below, rufescent flanks/vent. Juvenile: Short crest, warmer above. (b) *patkaicus* (western/northern Myanmar): Chestnut mantle/ lower breast/belly.

OTHER SUBSPECIES *G.l.belangeri* (eastern/southern Myanmar, W Thailand): Between other races.

VOICE Outbursts of loud cackling laughter, often started by low *ow* or *u'ah* notes.

HABITAT & BEHAVIOUR Broadleaved forest; to 1,600 m, rarely 2,135 m. In flocks.

RANGE Co R (except C,S Thailand, Pen Malaysia, Singapore). Co/lo FER C Thailand (Bangkok), Singapore.



GREATER NECKLACED LAUGHINGTHRUSH
Garrulax pectoralis

MEASUREMENTS 31 cm

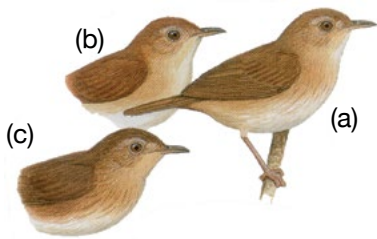
(a) Adult *subfusus*: Pale lores, black line under cheeks and ear-coverts, buff throat/breast, dark primary coverts. (b) Adult *melanotis* (W,N,E,C,S Myanmar): More solid gorget. (c) Adult *variant* Black ear-coverts. (d) Adult *robinii* (N Indochina): Rufous-chestnut collar, grey and black neck-side, broken gorget. Juvenile: Warmer above, faint gorget.

VOICE Loud quavering nervous *wee'ii*, *wee'u* and *wee'ee'u* phrases. Low gruff calls.

HABITAT Broadleaved forests; up to 1,830 m.

RANGE Un/co R Myanmar, W, NW Thailand, N, C Laos, W, E Tonkin, N Annam.

PASSERIFORMES: VIREONIDAE



BUFF-BREASTED BABBLER
Pellorneum tickelli

MEASUREMENTS 14.5 cm

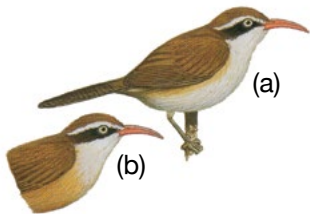
(a) Adult *fulvum*: Buff head-side/breast (latter faintly streaked), paler vent and longer tail than Abbott's. (b) Juvenile: Very rufescent above. (c) Adult *assamense* (N Myanmar): Darker, more rufous above.

OTHER SUBSPECIES *Pt.annamense* (southern Laos/Vietnam)/*tickelli* (Tenasserim/W Thailand southward): More rufous. *Pt.grisescens* (south-west Myanmar).

VOICE Song is rapidly repeated *wi-twee* or *wi-choo*. High laughing *swi-tit-tit-titchoo* etc. Rattling *prree* and explosive *whit* notes.

HABITAT Broadleaved forest, secondary growth, bamboo; up to 1,550 m.

RANGE CO R (except W,C Myanmar, C,SE Thailand, Singapore).



RED-BILLED SCIMITAR BABBLER
P. ochraceiceps

MEASUREMENTS 23 cm

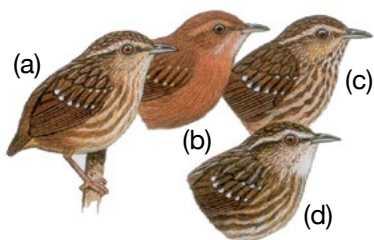
(a) Adult *ochraceiceps*: Thin orange-red bill; breast/belly white. (b) Adult *stenorhynchus* (north N Myanmar): Breast/belly buff.

OTHER SUBSPECIES *Po.austeni* (W,N Myanmar): Duller above. *P.O.alius* (NE Thailand to S Annam).

VOICE Piping *wu-wu-wu* and *wu-wu-whip*. Scratchy *whi-chutututut*.

HABITAT Broadleaf evergreen forest, bamboo; 600-1,800 m.

RANGE Un R Myanmar (except SW), W, NW, NE Thailand, Laos, W,E Tonkin, NCSAnnam



EYEBROWED WREN BABBLER
N. epilepidota

MEASUREMENTS 10-11.5cm

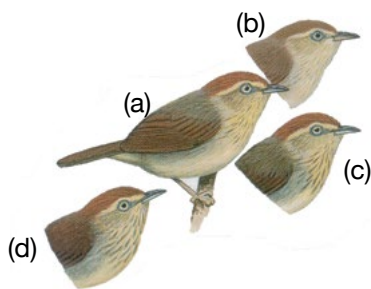
(a) Adult *davisoni*: Small, short tail, long buff supercilium, dark eyestripe, large whitish covert-spots. (b) Juvenile: Plain rufescent brown, vague supercilium/covert-spots. (c) Adult *roberti* (N Myanmar): Duller above, blackish streaks below. (d) Adult *amyae* (east N Laos, north Vietnam): Larger; colder above, whiter throat and supercilium.

OTHER SUBSPECIES *N.e.clara* (S Annam): Whiter throat/supercilium/underpart-streaks (latter also broader). *N.e.granti* (S Thailand southward): Paler-centred breast/abdomen.

VOICE Song is clear falling whistled *cheeoo* or *piiuu*. Rattled *prrrt-prrrt-prrrt* and *chrut-chrut-chrut* etc. in alarm.

HABITAT Understorey of broadleaved evergreen forest; 50-2,135 m.

RANGE Fc/co RN, C, E, S (east) Myanmar, Tenasserim, Thailand (except C, SE), Pen Malaysia, Laos, Vietnam (except Cochinchina).



PIN-STRIPED TIT BABBLER
Macronous gularis

MEASUREMENTS 12.5-14 cm

(a) Adult *sulphureus*: Rufous crown, yellow supercilium, narrow throat/breast-streaks. (b) Juvenile: Plain/paler. (c) Adult *chersonesophilus* (c.12° to 5°N): Bolder throat/breast-streaks, darker/more chestnut above. (d) Adult *gularis* (south of c.4°N): Bolder throat/breast-streaks, much darker (less contrasting) above.

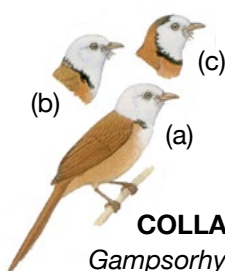
OTHER SUBSPECIES *M.g.lutescens* (east E Myanmar to northern Indochina): Brighter below. *M.g.archipelagicus* (Mergui Archipelago): More rufous-chestnut above, yellower below, bolder streaks. *M.g.kinneari* (C Annam), *versuicola* (east Cambodia, south Vietnam), *connectens* (south Tenasserim to Cambodia), *inveteratus* (SE Thailand/Cambodia islands): Roughly

intermediate between *sulphureus* and *gularis*. *M.g.condorensis* (Con Dao Is, Cochinchina): Darker above than last group, like *gularis* below. *M.g.ticehursti* (SW,W Myanmar); *saraburiensis* (south NE Thailand, west Cambodia).

VOICE Song (northern Vietnam) is loud bouncing *ti chut-chutut-chut* or *tit-chutut-chutut-chutut..*; or (C Annam and Thailand) even *chut-chut-chut-chut-chut...* Harsh *chrrrt-chrr* and *tititit-chrreeo* etc.

HABITAT Open broadleaved forest, mangroves, secondary growth, thickets, bamboo; up to 1,525 m.

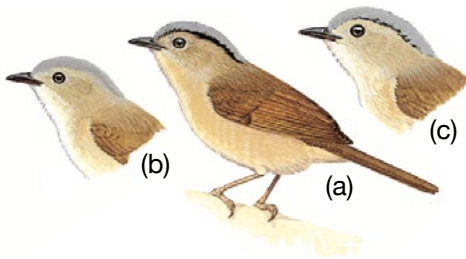
RANGE Co R (except C Thailand).



COLLARED BABBLER
Gampsorhynchus torquatus

MEASUREMENTS

(a) Adult *torquatus*: White hood, rufescent-brown upperside, warm buff below, dark on neck/breast-side. (b) Adult *saturation*: More pronounced blackish collar, indistinct at rear, broken at front, warmer buff below. (c) Adult *luciae*: Blackish hindcrown, rufescent nape, full blackish necklace, warmer buff below.



BROWN-CHEEKED FULVETTA
Alcippe poioicephala

MEASUREMENTS 15.5–16.5 cm
(a) Adult *haringtoniae*: Greyish-buff head-sides, buff below, narrow crown-stripes. (b) Adult *phayrei* (SW,W Myanmar): Paler; no crown-stripes. (c) Adult *karenni* (south-east Myanmar): Between preceding races.
OTHER SUBSPECIES *A.p.fusca* (north W,C,E Myanmar): Only suggestion of crown-stripes. *A.p.davisoni* (Tenasserim, S Thailand): Similar to *karenni*. *A.p.alearis* (north-east Thailand, N Indochina): Duller.

VOICE Pleasant song phrases usually rise at end: *chu' uwi-uwi-uwee; yi'chiwi-wi-uwuuee* etc.

HABITAT Broadleaf forest; to 1,520 m (mainly lowlands).

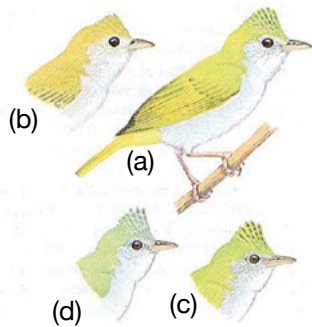
RANGE Co R Myanmar, W,NW,NE,north S Thailand, N,C Laos, W,E Tonkin.



SHORT-TAILED PARROTBILL
P. davidiana

MEASUREMENTS 10 cm
(a) Adult *thompsoni*: Short tail, thick bill, chestnut head, black throat.
OTHER SUBSPECIES *tonkinensis* (north Vietnam).
VOICE Song is thin, high, rapid, rising whistled *ih'ih'ih'ih'ih'ih*. Low twittering.
HABITAT Bamboo and grass in/near broadleaved evergreen forest; 50-1,200 m.
RANGE Un/lo R E Myanmar, NW,NE Thailand, N Laos, E Tonkin, N Annam.

PASSERIFORMES: ZOSTEROPIDAE



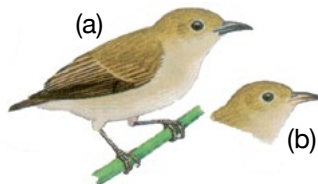
WHITE-BELLIED ERPORNIS
E. zantholeuca

MEASUREMENTS 12-13.5 cm
(a) Adult *zantholeuca*: Yellowish-green above, short crest, pale greyish below with whiter throat, yellow vent. (b) Juvenile: Crest shorter, unsealed. (c) Adult *tyrannula* (eastern Thailand, N Indochina): Greener above, darker grey below. (d) Adult *canescens* (SE Thailand, west Cambodia): Pale grey wash above.
OTHER SUBSPECIES *Yz.interposita* (south of c.12°N): Like *tyrannula*. *Yz.sordida* (south-east NE Thailand, S Indochina): Slightly paler below, possibly duller above.
VOICE High descending trill: *si'iiiiii'* Nasal *nher-nher* and *nhi*.

HABITAT Broadleaved forest; up to 2,000 m, rarely 2,650 m N Myanmar (below 1,220 m Pen Malaysia).

RANGE Co R (except C Thailand).

PASSERIFORMES: DICAIEIDAE



PLAIN FLOWERPECKER
Dicaeum concolor

MEASUREMENTS 8.5 cm
(a) Adult *olivaceum*: Greenish-olive above, pale olive-greyish below, cream belly-centre (sometimes throat), dark bill, quite pale head-sides. (b) Juvenile: Bill pinkish with darker culmen.
OTHER SUBSPECIES *D.c.borneanum* (Pen Malaysia).
VOICE Sings with high *tsit tsi-si-si-si-si* Monotonous *tu-wit tu-wit tu-wit...*

HABITAT Open broadleaved forest; up to 1,700 m.

RANGE Fc R (except S Thailand, Cochinchina); formerly Singapore.



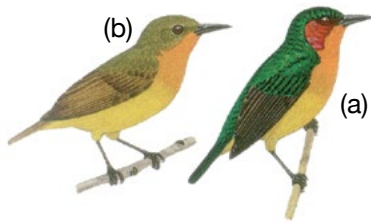
THICK BILL FLOWERPECKER
Dicaeum agile

MEASUREMENTS 10 cm
(a) Adult *modestum*: From Brown-backed by reddish/orange eyes, malar line, greener above, paler below, darker streaks, whitish tail-tips. Juvenile: Bill pinker, fainter streaks.
OTHER SUBSPECIES *D.a.remotum* (Pen Malaysia, Singapore).
VOICE Thin *pseeou*.

HABITAT & BEHAVIOR Broadleaved forest; up to 1,500 m. Wags tail from side to side.

RANGE Un/co R (except SW,W,N Myanmar, Singapore, W,E Tonkin). Sc NBV Singapore.

PASSERIFORMES: NECTARINIIDAE



RUBY-CHEEKED SUNBIRD
C. singalensis

MEASUREMENTS 10.5-11 cm

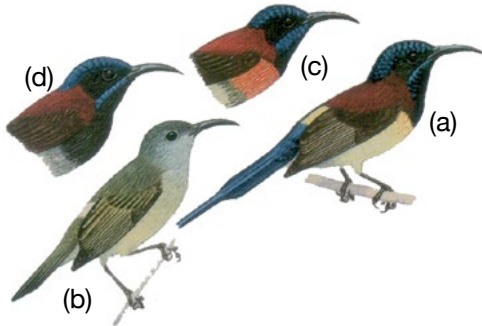
(a) Male *assamensis*: Green above, orangey throat/breast. (b) Female: Greenish-olive above. Juvenile: Yellower below than female.

OTHER SUBSPECIES *A.s.koratensis* (NE,SE Thailand, Indochina): Orange-rufous sharply demarcated. *A.s.singalensis* (Pen Malaysia, Singapore); *internotus* (south-west Thailand, ? Tenasserim); *interpositus* (S Thailand).

VOICE Song is high *switi-ti-chi-chu tusi-tit swit-swit switi-ti-chi-chu...*

HABITAT Broadleaved forest, mangroves; up to 1,370 m.

RANGE Co R (except E Myanmar, C Thailand, Singapore). Rc (status ?) Singapore.



BLACK-THROATED SUNBIRD
A. saturata

MEASUREMENTS 11-15 cm

(a) Male *petersi*: Black throat/upper breast, whitish-yellow belly/rump. (b) Female: Greyer than Mrs Gould's, paler/ narrower rump-band. (c) Male *johnsi* (S Annam): Redder mantle, reddish breast. (d) Male *assamensis* (W,N Myanmar): Black breast, grey belly.

OTHER SUBSPECIES *wrayi* (Pen Malaysia) and *anomala* (S Thailand): Between *petersi* / *lassamensis*, latter without rump-band. *A.s.galenae* (southern NW Thailand); *sanguinipectus* (south E, east S Myanmar, Tenasserim); *ochra* (S Laos, C Annam); *cambodiana* (south-west Cambodia).

VOICE Sings with uneven sharp *swi, tis* and *tsi* notes and metallic trilled *swi'ti'ti'ti'ti'ti'ti* etc. High thin *tit* and *tiss-it* etc.

HABITAT Broadleaved evergreen forest, forest edge; 200-1,700 m.

RANGE Un/co R W, N, C(east), E, S (east) Myanmar, Tenasserim, Thailand (except C), Pen Malaysia, Indochina (except Cochinchina).



LITTLE SPIDERHUNTER
Arachnothera longirostra

MEASUREMENTS 16 cm

(a) Adult *longirostra*: Slaty head, whitish around eye on throat. Juvenile: Throat yellowish-olive.

OTHER SUBSPECIES *A.l.sordida* (east NW Thailand to N Indochina); *pallida* (SE Thailand, Cambodia); *cinereicollis* (S Thailand southward).

VOICE Monotonous *wit-wit-wit-wit-wit-wit..* song. Sharp, abrasive *itch* or *chit*.

HABITAT Broadleaved evergreen/semi-evergreen forest, cultivation; up to 1,670 m.

RANGE Co R (except C Thailand).



STREAKED SPIDERHUNTER
A. magna

MEASUREMENTS 17-20.5 cm

(a) Adult *musarum*: Heavily streaked.

OTHER SUBSPECIES *A.m.magna* (SW,W,N Myanmar, Pen Malaysia); *aurata* (central C,S Myanmar); *pagodarum* (central Tenasserim, south W Thailand); *remota* (S Annam).

VOICE Chattering song. Strident *chit-ik*

HABITAT Broadleaved forest; up to 1,830m (sc in lowlands).

RANGE Co R (except C,SE Thailand, Singapore).



PURPLE-NAPED SPIDERHUNTER
Kurochkinogramma hypogrammicum

MEASUREMENTS 14 cm

(a) Male *H.h.lissettae*: Purple-blue on nape/rump/uppertailcoverts, streaked below. (b) Female: No purple-blue.

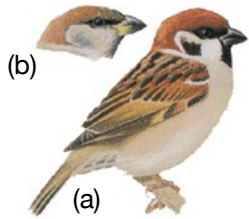
OTHER SUBSPECIES *H.h.nuchale* (south of c.12°N): Bluer patches. *H.h.mariae* (Cochinchina).

VOICE Song is tinkling trill mixed with call notes. High *chip* or *tchu* notes.

HABITAT & BEHAVIOR Lower storey of broadleaved evergreen forest; up to 1,160 m.

RANGE Un/fc R (except SW,W,S,E Myanmar, C,NE,SE Thailand, Singapore).

PASSERIFORMES: PASSERIDAE



EURASIAN TREE SPARROW
Passer montanus

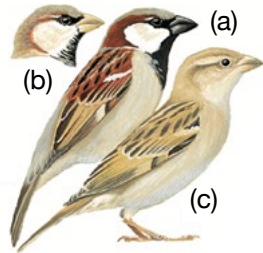
MEASUREMENTS 14-14.5 cm

(a) Adult *malaccensis*: Whitish head-sides with black patch, chestnut, crown/nape, small bib. (b) Juvenile: Duller; crown paler with dark fore-crown markings, fainter ear-covert patch/bib, pale bill-base.

VOICE Sings with call-notes and *tsooit*, *tsreet* and *tswee-ip* notes. Harsh *chip* and *chissip* calls, sharp *tet* and *tsooit*, dry *tet-tet-tet*...

HABITAT Urban areas, human habitation, cultivation; up to 1,830 m.

RANGE Co R throughout.



HOUSE SPARROW
Passer domesticus

MEASUREMENTS 15 cm

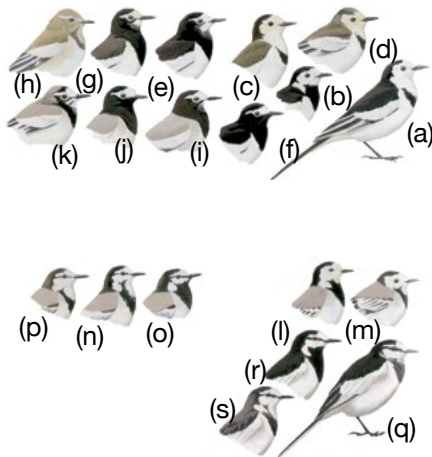
(a) Male breeding *indicus*: Grey crown, whitish head-sides, big black bib. Chestnut from eye to nape-side, streaked mantle, brownish-grey rump/uppertail-coverts. (b) Male non-breeding: Browner crown, greyer mantle, pale-tipped bib and crown-/nape- sides, pale bill. (c) Female: Nondescript; paler supercilium/ underparts, dark streaks above, pale horn bill. Juvenile: Paler/plainer above than female, often bolder supercilium, paler bill.

VOICE Sings with monotonous *chirrup cheep chirp*.. etc. Calls include *chirrup*, *chissick*, shrill *chree*, and rolling *chur'r'r'it'it'it*.

HABITAT Towns/villages, cultivation, scrub, mainly in dry areas.

RANGE Lc/co R Myanmar, W,NW,NE,C Thailand, Cambodia, N,S Laos, west Cochinchina. Un FER Singapore.

PASSERIFORMES: MOTACILLIDAE



WHITE WAGTAIL
Motacilla alba

MEASUREMENTS 19 cm

(a) Male non-breeding *leucopsis*: White head and underparts, black hindcrown, nape and isolated gorget, black above with broad white fringes to wing-coverts and tertials, and white outertail feathers. (b) Male breeding: Black gorget extends up to lower throat and joins black of mantle. (c) Female non-breeding: Slaty-grey above, narrower gorget. (d) Juvenile: Like female but crown and nape grey, gorget more diffuse. (e) Male non-breeding *alboides* (only B race; VS C, S Myanmar, Tenasserim, NW Thailand, Indochina): Black ear-coverts and neck-sides join broader gorget, less white on forehead (supercilium well defined). (f) Male breeding: All-black throat. (g) Female non-breeding: Greyer above than male. (h) Juvenile: Appears more like very washed-out adult than *leucopsis*. (i) Male non-breeding *personata* (VS N Myanmar): Black hood with white fore-crown, eyering and upper throat, grey above. (j) Male breeding: All-black throat. (k) Female non-breeding: Greyer hindcrown/nape than

male. (l) Male non-breeding *baicalensis* (VS Myanmar excepts [SW,W], NW,NE Thailand): Grey above, larger black gorget. (m) Female non-breeding: Crown duller than male, much paler grey above than *leucopsis* (n) Male non-breeding *ocularis* (VS N, C, S Myanmar, NW, NE,C Thailand, Indochina, Pen Malaysia): Like *baicalensis* but has black eyestripe. (o) Male breeding: Black lower throat and upper breast. (p) Female non-breeding: Black of crown/nape greyer and less contrasting than male. (q) Male non-breeding *lugens* (rc SE Thailand, E Tonkin): Like *ocularis* but blackish above, wing-coverts look all-white. (r) Male breeding: More solid black areas. (s) Female non-breeding: Less black but differs from *ocularis* in similar way to male.

VOICE Simple twittering and chattering song. Calls with clear harsh *tsli-vitt*.

HABITAT Various open habitats, often near water; up to 2,000 m.

RANGE Un R/BV N Myanmar, N Laos, W,E Tonkin. Co WV/PM (except S Thailand, Singapore); ra Pen Malaysia. V S Thailand, Singapore.



OLIVE-BACKED PIPIT
Anthus hodgsoni

MEASUREMENTS 16-17 cm

(a) Adult *yunnanensis*: Rather plain greenish-olive above, broad whitish supercilium (buffier in front of eye), whitish spot and blackish patch on rear ear-coverts, bold blackish streaks/spots on buff breast/flanks. Greyer above and whiter below when worn. (b) Juvenile: Initially browner, more boldly streaked above. (c) Adult *hodgsoni* (widely rc N Myanmar to Indochina): Heavier streaks above/on flanks, more streaks on lower underparts.

VOICE Sings with rapid high sweet slurred-together notes, mixed with shortish trills/rattles. Thin hoarse *teez* or *spiz* in flight. Quiet short *tsi*.. alarm.

HABITAT Open forest, secondary growth, wooded cultivation; up to 2,860 m.

RANGE Un R/BV N Myanmar; W Myanmar? Co WV (except S Thailand, Singapore); ra Pen Malaysia. Also PM SW, S Myanmar, Cambodia, P Tonkin. V S Thailand.



GRAY WAGTAIL
Motacilla cinerea

MEASUREMENTS 19 cm

(a) Male non-breeding/female *cinerea*: Slaty-grey crown, ear-coverts and upperparts, narrow whitish supercilium, bright yellow vent. Females may show blackish throat-mottling in spring. Resembles female and non-breeding male Yellow but slatier-grey above, more uniform blackish wing-coverts, yellowish rump and uppertail-coverts; in flight white bar along base of secondaries and inner primaries. (b) Male breeding: Underparts all yellow with black throat and tipper breast. Juvenile: Similar to

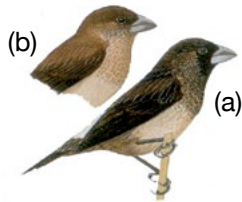
female/non-breeding male but browner-tinged above, supercilium buff-tinged, dark mottling on breast-sides.

VOICE Song is short mechanical series of sharp notes: *ziss-ziss-ziss-ziss...*, often alternated with higher *si si si siu* etc. Calls with loud disyllabic *tittick* or *tzit-tzit*, recalling White but clearly sharper and higher.

HABITAT Various open habitats and open forest, often near flowing streams; up to 2,565 m.

RANGE Fc/co WV/PM throughout.

PASSERIFORMES: ESTRILDIDAE



WHITE-RUMPED MUNIA
Lonchura striata

MEASUREMENTS 11-11.5 cm

(a) Adult *subsquamicollis*: Dark brownish with contrasting whitish rump/belly. (b) Juvenile: Dark parts paler/browner, buffy-tinged rump/belly.

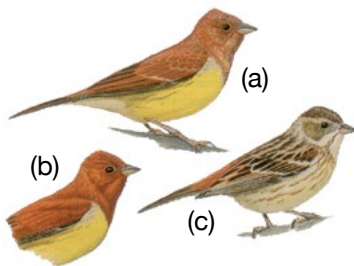
OTHER SUBSPECIES *L.s.acuticauda* (Myanmar [except Tenasserim], north NW Thailand, N Laos, W Tonkin); *swinhoi* (E Tonkin).

VOICE Song is twittering *pitpit pit spee boyee* or *prrt prr prr spee boyee* (*boyee* down-turned). Tinkling metallic *prrrit*, *pint* or *tr-tr-tr* calls.

HABITAT Clearings, secondary growth, scrub and grass, cultivation; up to 1,830 m.

RANGE CO R throughout; local Singapore.

PASSERIFORMES: EMBERIZIDAE



CHESTNUT BUNTING
Emberiza rutila

MEASUREMENTS 14-14.5 cm

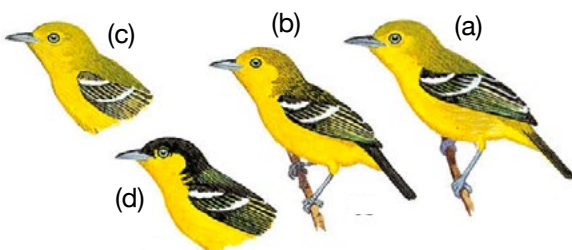
(a) Male non-breeding: Duller than breeding male, with pale fringes to chestnut feathers. (b) Male breeding: Bright chestnut plumage with yellow breast and belly. (c) Female/juvenile: Similar to juvenile Yellow-breasted but plain rufous-chestnut rump and uppertail-coverts, rather plain ear-coverts, no 'braces', almost no white on outertail.

VOICE Song is rather high *wiie-wiie-wiie tzzree-tzzree-tzzree zizizitt* etc. Call is *zick*, similar to Little.

HABITAT Underbrush in open forest, scrub and grass, bamboo, cultivation; up to 2,590 m.

RANGE Un/lc WV Myanmar, W, NW, NE Thailand, N, C Laos, Vietnam.

PASSERIFORMES: AEGITHINIDAE



COMMON IORA
Aegithina tiphia

MEASUREMENTS 12-14.5 cm

(a) Male non-breeding *philipi*: Yellow below, olive-washed flanks, rather deep olive-green above, blackish wings/tail, two white/yellowish-white winbars. Male breeding: More vivid yellow below, no olive on flanks. (b) Male breeding variant: May show black on mantle to rump. (c) Female non-breeding: Paler/duller body than male non-breeding, duller wings and wingbars. Female breeding: Darker/brighter yellow below. Juvenile: Body slightly paler than female non-breeding, upper wingbar fainter. (d) Male breeding *deignani* (W,N,C,S[north] Myanmar): Often black crown to back with yellow mixed on mantle.

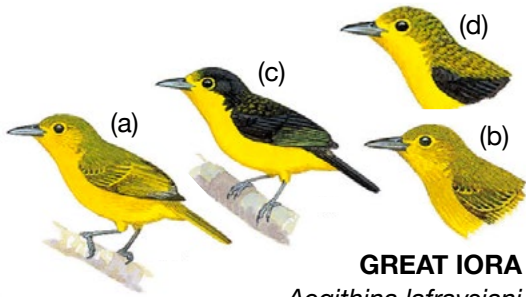
OTHER SUBSPECIES *A.t.tiphia* (SW Myanmar): May have black-mottled crown. *A.t.horizoptera* (S Myanmar to W Thailand and south): Often black hindcrown and mantle (sometimes on

rest of upperparts). *A.t.cambodiana* (SE Thailand to S Annam, Cochinchina): Sometimes black on crown/nape.

VOICE Song is thin drawn-out *whiiiiii piu*. Also whistled *di-di-dwiu and du-i du-i* etc., and low harsh chattering.

HABITAT & BEHAVIOR Open forest, mangroves, secondary growth, parks, gardens etc.; up to 1,500 m.

RANGE Co R throughout.



GREAT IORA
Aegithina lafraysiani

MEASUREMENTS 15.5–17 cm

(a) Male *innotata*: Large size and bill, plain wings. Dark olive-green above, bright yellow below. Female: Slightly paler above, slightly duller below. (b) Juvenile: As female but duller and washed olive below. (c) Male *lafresnaye* (S Thailand southward): Black above. (d) Male variant: Less black.

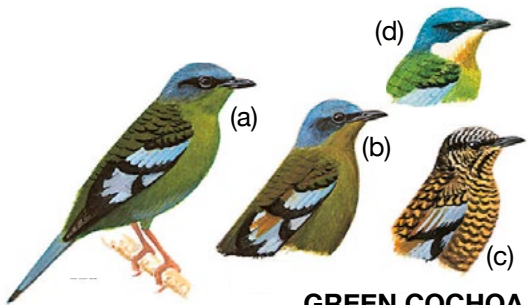
OTHER SUBSPECIES *A.l.xanthotis* (Cambodia, southern Vietnam): Paler/brighter green above.

VOICE Clear *chew chew chew chew*. song.

HABITAT Broadleaf forest; up to 900 m.

RANGE Co R SW Myanmar, Tenasserim, Thailand, Pen Malaysia, Indochina.

PASSERIFORMES: TURDIDAE



GREEN COCHOA
Cochoa viridis

MEASUREMENTS 27–29 cm

(a) Male: Green; blue crown and nape, silvery-blue markings on black wings, black-tipped blue tail. (b) Female: Wings washed brownish, no blue below. (c) Juvenile: White-marked blackish crown, spotted buff above, scaled below. (d) First-summer male: Whitish strip from chin to lower ear-coverts and neck-side, washed golden-buff below. Female differs similarly.

VOICE Sings with loud pure, monotone whistles: *hiiiiiii*, lasting c.2 s.

HABITAT Broadleaved evergreen forest; 700–2,565 m, occasionally down to 400 m.

RANGE Sc R east S,E Myanmar, W,NW,SE Thailand, south-west Cambodia, Laos, W,E Tonkin, N,C,S Annam.

3

FAUNA

3.2

MAMMALS

THE FOLLOWING CONTENT IS BASED ON MAMMALS OF THAILAND AND SOUTHEAST ASIA BY C. M. FRANCIS



NORTHERN TREESHREW
Tupaia belangeri

MEASUREMENTS HB 160-230, T 150-200 (-100% HB), HF 38-45, E 16-17

IDENTIFICATION Hairs on upperparts banded dark and pale, appearing finely speckled brown. Underparts buff. Usually has a pale stripe on each shoulder. Female has 3 pairs of mammae. Moderate geographic variation, generally olive-brown in much of range, but in some northern populations there are also reddish forms similar to *T. glis*. Further studies, including use of genetics, are needed to determine whether additional species are represented.

SIMILAR SPECIES Common Treeshrew, *T. glis*, is more reddish in areas where range overlaps in peninsular Thailand, and female has only 2

pairs of mammae.

ECOLOGY AND HABITAT Diurnal. Mainly terrestrial and in low bushes. Found in a range of forest habitats including evergreen forest, as well as deciduous forest especially near streams and rivers. Tolerant of moderate forest disturbance, and found in gardens and plantations.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam and Cambodia. Also Nepal and S China. Not currently at risk.



SUNDA PANGOLIN
Manis javanica

MEASUREMENTS HB 400-650, T 350-560 (80-90% of HB), HF 61-97. Wt up to 7 kg

IDENTIFICATION Distinctive brownish, scaly mammal, with long claws. Head and tail long and tapered, held below level of body when animal is travelling on the ground. Tail wrapped around body when animal is disturbed, to protect the non-scaly underparts. External ear lobes inconspicuous, reduced to a small ridge; scales on top of head extend nearly to nostrils; front claws less than 50% longer than hind claws; prehensile tail relatively long, with about 30 scales along edge and a well-developed, smooth, glandular pad on underside to grip around branches.

SIMILAR SPECIES Chinese Pangolin, *M. pentadactyla*, has relatively large, conspicuous ears, longer front claws and shorter tail with fewer than 20 scales along edge.

ECOLOGY AND HABITAT Usually nocturnal, sleeping during the day in underground burrows. Food consists exclusively of ants and termites taken from nests in trees, on the ground

or below ground. Insect nests are opened with the strongly clawed feet and the contents licked up with the long, sticky tongue. Occurs in tall and secondary forests as well as cultivated areas, including gardens. Most often seen on roads at night, where it is slow-moving and conspicuous, although the eyes reflect very little torchlight.

DISTRIBUTION AND STATUS SE Asia: S Myanmar, Thailand, S Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Sumatra, Java, Borneo and adjacent small islands. Endangered. Populations have declined more than 90 per cent in some parts of range, due to illegal trapping and hunting.



CHINESE PANGOLIN
Manis pentadactyla

MEASUREMENTS HB 400-580, T 250-380 (50-70% of HB)

IDENTIFICATION Upperparts, including tail, covered with large brown scales. Scales on top of head extend only partway to nostrils; front feet with very long claws, about twice as long as hind claws; external ear lobes well developed and conspicuous; tail relatively short with 16-19 scales along edge, and only small pad under tip.

SIMILAR SPECIES Sunda Pangolin, *M. javanica*, has smaller ears, shorter front claws and longer, more flexible tail.

ECOLOGY AND HABITAT Mainly nocturnal, with similar habits to *M. javanica*. Feeds mainly on termites. Known from tall and secondary forests and cultivated areas, including gardens. In Laos, found mainly in hills and mountains, with *M. javanica* in lowlands.

DISTRIBUTION AND STATUS SE Asia: N Myanmar, N Thailand, Laos and Vietnam. Also E Nepal, E Bangladesh, NE India, C and S China and Taiwan. Endangered. Populations have declined dramatically due to illegal trapping and hunting.



BENGAL SLOW LORIS
Nycticebus bengalensis

MEASUREMENTS H B 300-380, T 10-20, E 20-25, HF 55-70. Wt 1-2kg. Skull: gl 62-67

IDENTIFICATION Overall colour orange-buff to light brown, with extensive greyish frosting on neck, head and forelimbs, making head and neck distinctly paler than back; thin, brown dorsal stripe that ends on neck with, at most, indistinct fork on head; dark rings around eyes.

TAXONOMIC NOTE Sometimes considered a subspecies of *N. coucang*.

SIMILAR SPECIES Sunda Slow Loris, *N. coucang*, averages smaller and has dark stripe continuing to top of head and forking towards eyes and ears; hybrids may occur in area of overlap in peninsular Thailand; Pygmy Loris, *N. pygmaeus*, is smaller, with larger ears.

ECOLOGY AND HABITAT Nocturnal and arboreal. Occurs in both evergreen and deciduous forests, as well as degraded areas such as bamboo groves. Feeds mainly on fruits, tree gums and nectar, but also on some animal matter, including large insects, nestling birds and lizards.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam and Cambodia. Also NE India, Bangladesh and S China. Vulnerable; populations declining due to loss of forest habitat as well as hunting and trapping for pet trade.



PYGMY SLOW LORIS
Xanthonycticebus intermedius

MEASUREMENTS HB 210-290. Skull: gl 48-55

IDENTIFICATION Small loris with finely textured reddish-buff fur, though some animals may be dull brown. Dorsal stripe varies from faint or absent to broad and dark, with indistinct forks on head. Ears long and relatively conspicuous. Some researchers suggest that this may comprise a mixture of two species, while others believe differences are mainly age-related, young animals being more orange-coloured and lacking dorsal stripe. Genetic studies may be required to resolve this uncertainty.

SIMILAR SPECIES Asian Slow Loris, *N. bengalensis*, is larger with less conspicuous ears and a thin dorsal stripe that does not continue onto top of head. Pygmy Loris *Nycticebus*

pygmaeus.

ECOLOGY AND HABITAT Nocturnal and arboreal. Occurs in a wide variety of forest habitats, including semi-evergreen and evergreen forest as well as degraded forests and bamboo, mainly below 500m altitude. Feeds heavily on animal material, especially insects, as well as plant sap and flowers. Also takes some small vertebrates such as lizards, eggs and nestlings of birds.

DISTRIBUTION AND STATUS SE Asia: Laos, E Cambodia and Vietnam. Also extreme S China. Vulnerable. Declining due to hunting and trapping for the food and pet trade.



ASSAMESE MACAQUE
Macaca assamensis

MEASUREMENTS HB 510-735, T 150-300 (30-40% of HB), HF 155-175. Wt 5-10kg

IDENTIFICATION Heavy-set macaque with well-haired, relatively short tail. Fur varies from yellowish-grey to dark brown; shoulders, head and arms tend to be paler than hindquarters; hair on underparts relatively pale and sparse, often with bluish skin showing through. Hindquarters greyish and haired to edge of callosities (thickened bare skin on rump). Head has fringe of dark hair on cheeks directed backwards to ear; hair on crown typically parted in middle; facial skin dark brownish to purplish. Calls include a musical «pio». Subspecies in NE India has a longer tail, about 50-60% of head and body.

SIMILAR SPECIES Rhesus Macaque,

M. mulatta, is lighter in build, with reddish hindquarters, hairs on crown directed backwards and not parted in middle; Long-tailed Macaque, *M. fascicularis*, and leaf monkeys have much longer tails.

ECOLOGY AND HABITAT Found mainly in upland areas, as high as 3,500m in the hills, generally in forested areas. Omnivorous, feeding on fruit, insects and small animals. Spends much of time in trees, but will descend to ground to run from predators, and sometimes raids crops.

DISTRIBUTION AND STATUS SE Asia: N Myanmar, Thailand, Laos and N Vietnam. Also NE India, Nepal, Pakistan and S China. Near Threatened. Declining in most parts of range owing to habitat loss and illegal hunting.



RHESUS MACAQUE
Macaca mulatta

MEASUREMENTS HB 470-585, T 205-280 (40-70% of HB), HF 140-170. Wt 3-6kg

IDENTIFICATION Upperparts brownish, with reddish-brown hindquarters, greyer-colour foreparts; paler underneath. Tail is well haired, about half length of head and body. Face is relatively hairy, with bare areas pinkish. Hairs on crown directed backwards. Voice similar to that of Long-tailed Macaque, *M. fascicularis*, but more squealing and less harsh.

SIMILAR SPECIES Assamese Macaque, *M. assamensis*, has similar length tail, but has heavier build and greyish hindquarters; Long-tailed Macaque, *M. fascicularis*, has relatively longer tail, hindquarters same colour as back.

ECOLOGY AND HABITAT Typically gregarious, forming large troops that vary from 10 to over 50 individuals. Frequents secondary forests and disturbed areas, often in close proximity to human settlements. May become a pest in agricultural areas. Reported to be declining in some areas as a result of loss of habitat and persecution, including trapping for use in medical and other research.

DISTRIBUTION AND STATUS SE Asia: N and C Myanmar, Thailand, Laos, Cambodia and Vietnam. Also Nepal, Pakistan, India and China. Minimal overlap in range with *M. fascicularis*, but some hybridization occurs where ranges meet. Not currently at risk.



PIG-TAILED MACAQUE
Macaca leonina

MEASUREMENTS HB 470-585, T 140-230, HF 140-170. Wt adult males 7-9kg, adult females 4-6kg

IDENTIFICATION Similar to Southern Pig-tailed Macaque, *M. nemestrina*, but lighter build, shorter muzzle; tail slightly hairier, especially at tip, tends to be carried over back arched towards rear, with tip pointing down. Body fur generally brown to golden-brown; whiter on face. Less black on back than *M. nemestrina*, with distinctive red streaks on face pointing diagonally upwards from eyes. Possible hybrids with *M. nemestrina* have been reported from peninsular Thailand around the Isthmus of Kra (around 7°N to 8°N). Identification of animals in some areas is complicated by feral animals that have escaped or been released from captivity.

ECOLOGY AND HABITAT Diurnal. Forages mainly on ground but also climbs trees; inclined to escape into trees if disturbed. Rarely found around temples or gardens, unlike some other macaques. Found in a wide variety of forest habitats, including disturbed forests.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand (S to about 8°N), Laos, Vietnam and Cambodia. Also N India, Bangladesh and S China (Yunnan). Vulnerable. Declining due to degradation of habitat, hunting and trapping for pets or for use in climbing coconut trees.



INDOCHINESE GREY LANGUR
Trachypithecus crepusculus

MEASUREMENTS HB 520-620, T 600-850, HF 170-180. Wt 6-9kg

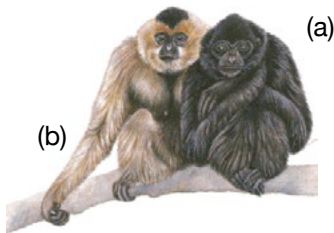
IDENTIFICATION Overall colour of back, legs and head mid- to light grey; underparts whitish. Hands and feet dark grey, blending into lighter grey of arms and legs. Bare facial skin dark grey except for pale greyish-white patch around mouth and large conspicuous pale rings around eyes.

TAXONOMIC NOTES Formerly considered a subspecies of Phayre's Langur, *T. phayrei*.

SIMILAR SPECIES Dusky Langur, *T. obscurus*, has thighs paler than back; Tenasserim Langur, *T. barbei*, is much darker, nearly black, on the back; Phayre's Langur, *P. phayrei*, is browner with hands and feet same colour as legs.

ECOLOGY AND HABITAT Primary or secondary evergreen and semi-evergreen forest, but also in some more disturbed habitats, including bamboo-dominated areas. Also in forest on limestone outcrops.

DISTRIBUTION AND STATUS SE Asia: SE Myanmar, Thailand, Laos and N Vietnam. Also S China. Endangered (as part of *T. phayrei*). In many parts of range has declined severely, owing to loss of habitat and to hunting, including for medicinal values, especially for 'bezoar stones' - mineral deposits that form inside the animals when they drink from springs rich in minerals, and that are thought to have magical powers. Still found in moderate numbers in some protected areas.



WESTERN BLACK CRESTED GIBBON
Nomascus concolor lu

MEASUREMENTS HB -500. Wt 6-9kg

IDENTIFICATION Male completely black, with small throat sac visible only during loud vocalizations. Female greyish-brown with extensive black on underside, as well as dark streak on crown and inside of limbs. Juvenile completely black. Both sexes have hairs on crown of head raised in a tuft. Voice Males produce a low boom (during inflation of throat sac), short staccato single notes, and «whoops» that rise, or fall then rise rapidly in frequency; females produce only the last of these in their great call.

SIMILAR SPECIES Hainan Crested Gibbon, *N. hainanus*, male is very similar, but female lacks black on underparts; other *Nomascus* gibbons have pale cheeks in males; Hoolock Gibbon, Hoolock hoolock, male has white eyebrows.

ECOLOGY AND HABITAT Arboreal and diurnal. Largely restricted to tall forests in subtropical and montane forests. Feeds on fruits, leaf-buds and shoots.

DISTRIBUTION AND STATUS SE Asia: restricted areas in parts of N Laos and N Vietnam, N of about 20°N. Also S Yunnan (China). Critically Endangered. Formerly widespread in much of S China and N Indochina, but global population now estimated at fewer than 2,000 animals, restricted to a few isolated areas with no more than a few hundred in each of Laos and Vietnam. Several known populations have disappeared recently. Threats include loss of habitat, illegal hunting and trapping.



DHOLE
Cuon alpinus

MEASUREMENTS H B 800-1,050, T 300-450, SH 420-550. Wt male 15-21kg, female 10-17kg

IDENTIFICATION Largest and heaviest wild dog in region. Body reddish-brown, often paler underneath. Tail long and bushy, largely black or very dark. Ears rounded with conspicuous long, white hairs inside. Voice Relatively quiet, but occasional yaps or whistling sounds.

SIMILAR SPECIES Domestic Dogs, *Canis familiaris*, are sometimes a similar reddish colour, but if so they lack the long, bushy black tail and rounded ears with white centres. Golden Jackal, *Canis aureus*, is smaller, more greyish-brown, with dark saddle-like pattern on back.

ECOLOGY AND HABITAT Found in a wide variety of forested areas, including evergreen forest, montane forests, and semi-open forest. Avoids contact with humans. Hunts in packs, usually at night. Preys on a variety of animals, including pigs and deer.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also S Siberia to India, Sumatra and Java. Near Threatened. In many areas has declined owing to hunting and trapping, as well as to loss of habitat.



EURASIAN OTTER
Lutra lutra

MEASUREMENTS HB 550-720, T 375-480, HF 100-130

IDENTIFICATION Upperparts rather dark brown, with paler chin and upper throat. Underparts markedly paler. Fur dense, consisting of short hairs and longer paler guard hairs, producing a somewhat grizzled appearance. Rhinarium (tip of nose) hairless; edge of fur and nose forms 'W'-shape. End of tail circular in cross-section. SE Asian form, *L. lutra barang*, is smaller than races found in Europe.

SIMILAR SPECIES Hairly-nosed Otter, *L. sumatrana*, and Smooth Otter, *Lutrogale perspicillata*, generally paler, without frosted appearance, and live primarily in coastal and flatland habitats; Oriental Small-clawed Otter, *Aonyx cinerea*, is substantially smaller.

ECOLOGY AND HABITAT Diet includes fish, other small vertebrates and crustaceans.

Most SE Asian records are from hill or mountainous area in streams and lakes.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos and Vietnam. Also Europe, North Africa, through much of N Asia, India, Sri Lanka, China, Taiwan, Japan, Sumatra, and possibly Borneo. Poorly known in region; although stable in other parts of range, has probably declined considerably in region owing to loss of habitat, including damming of rivers, as well as hunting.



ORIENTAL SMALL-CLAWED OTTER
Aonyx cinerea

MEASUREMENTS HB 360-550, T 225-350, HF 85-110

IDENTIFICATION Upperparts dark brown or greyish-brown; underparts slightly paler. Chin, throat, cheeks and sides of neck buffy. Digits only partially webbed. Claws shorts, not extending beyond the end of the digits.

VOICE Contact call is «wiuk», various other calls are also made.

SIMILAR SPECIES Other otters in region are substantially larger and have prominent claws.

ECOLOGY AND HABITAT Diurnal. Diet includes crabs, other crustaceans and molluscs, as well as some fish. Occurs in many habitats where

there is permanent water and some tree cover, from the coast to inland hill forest, including seacoast, large rivers, small hill streams, ponds and lakes. Solitary individuals sometimes encountered, but often in large groups.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also India, S China, Sumatra, Java, Borneo and Palawan. Endangered. Formerly common and widespread, but has declined dramatically in much of region, due largely to hunting and trapping for fur, meat and traditional medicine.



ASIAN BLACK BEAR
Ursus thibetanus

MEASUREMENTS HB 1.2-1.5m, T 65-100, HF 175-195, E 120-180. Wt up to 100 kg or more

IDENTIFICATION A large bear, mainly black apart from a white «V» on the chest and a pale muzzle. Pale marks on muzzle rarely extend as far back as eyes. Has large erect ears and long shaggy hair. Signs include deep claw marks on trees.

SIMILAR SPECIES Sun Bear, *Helarctos malayanus*, is about half the body weight, has short fur, short rounded ears that barely extend above head in profile, more stooped posture and more extensive pale area on muzzle.

ECOLOGY AND HABITAT Generally solitary, except in breeding season. Mainly in forested areas, both evergreen and deciduous. Some-

times enters cultivated areas near forest. In southern part of range, found only in hill forest. Usually rests during day in hollow trees, caves or rock crevices, emerging in the evening to feed, but sometimes active during day. Feeds mainly on fruits, berries, beehives, invertebrates and small vertebrates such as amphibians and rodents, but sometimes hunts larger mammals as well.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Cambodia and Vietnam. Also Pakistan, India, Nepal, China, Siberia and Japan. Vulnerable; declining due to illegal hunting and trapping, especially for alleged medicinal values.



SUN BEAR
Helarctos malayanus

MEASUREMENTS HB 1.1-1.4m, T 30-70. Wt 27-63kg

IDENTIFICATION Body entirely black, except for grey muzzle and a white or yellowish V-shaped mark on the upper chest. Chest mark normally prominent but occasionally very faint. Ears short and rounded. Fur short and smooth. Has distinct posture when walking, with head held very low. Signs are more often seen than the bear itself: prominent claw marks gouged into a tree trunk where it has climbed be tree, or remains of bee or termite nests ripped open in standing or fallen trees. The claw marks are much more conspicuous than the faint marks of other carnivores or monitor lizards. Voice Occasionally utters hoarse grunts or loud roars; rarely short barks like that of a muntjac, *Muntiacus* spp.

SIMILAR SPECIES Asian Black Bear, *Ursus thibetanus*, is much heavier, with long shaggy fur, large ears; Binturong, *Arctictis binturong*, is much smaller, with a prominent long bushy tail.

ECOLOGY AND HABITAT Active periodically during day and night, on the ground and in tall trees, for sleeping. Diet includes bees' nests, termites, small animals, fruits and the hearts of coconut palms. Occurs in extensive areas of forest, but sometimes enters gardens or oil-palm plantations.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Cambodia, Vietnam and Peninsular Malaysia. Also Sumatra and Borneo. Endangered due to illegal hunting and trapping, and to loss of natural habitat.



BINTURONG
Arctictis binturong

MEASUREMENTS HB 650-950, T 500-800, HF 120-180. Wt 6-9kg

IDENTIFICATION Long, coarse black fur frosted with whitish or reddish grizzling. Grizzling heaviest around head, making head paler than body. Ears round, edged in white, with long tufts of hair at ends. Tail long, thickly haired, especially near base, and prehensile.

SIMILAR SPECIES Sun Bear, *Helarctos malayanus*, is larger, has a short tail and no ear tufts, and very different shape; melanistic (dark) wild cats have shorter hair, a slender, non-prehensile tail and no ear tufts; other civets have shorter fur and are rarely all dark.

ECOLOGY AND HABITAT Mainly arboreal, but also seen on ground. Mainly active at night, but sometimes also during the day. Moves slowly

in trees, using tail for balance and to cling to branches while feeding. Diet includes ripe fruits, especially figs, and small animals. Occurs in tall and secondary forests; sometimes in cultivated areas near to forest.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also NE India, S China (Yunnan), Sumatra, Java, Borneo and Palawan. Vulnerable. Appears to be relatively rare in much of range and declining due to loss of forest as well as hunting and trapping for the pet trade.



YELLOW-THROATED MARTEN
Martes flavigula

MEASUREMENTS HB 450-650, T 370-450, HF 90-110, E 28-40. Wt 1.3-3.0kg

IDENTIFICATION Colour pattern varies geographically. Back colour varies from medium brown to pale yellowish-brown; lower back, hind legs, lower half of front legs and tail contrastingly darker, varying from dark brown to black; conspicuous black stripe on side of neck behind ear; top of head varies from black, continuous with neck stripe, to dark brown. Chin, throat and chest yellowish, whitish or buff, contrasting with slightly darker lower belly. In the field, the long, slender body, long tail and lithe, bounding motion are distinctive. Tail may be held down, up with the tip drooping or almost horizontal (if moving quickly).

VOICE A series of soft, rapid «chuk»s.

SIMILAR SPECIES Stone Marten, *M. foina*, lacks dark border to throat and has shorter tail; weasels, *Mustela spp.* with white throats have shorter tails and lack the contrasting black or

dark brown pattern on the neck, lower legs and tail; mongooses have a more pointed muzzle, tend to hold head and tail down while walking, and walk quickly but rarely bound; civets are normally active only at night and have different colour patterns.

ECOLOGY AND HABITAT Active mainly during the day, but sometimes at night. Agile, moving fairly quickly on the ground or in the tree canopy. Diet includes a wide range of small vertebrates and invertebrates, bees' nests and nectar. Rests in tree holes and on large branches. Usually alone or in pairs, but sometimes in family groups. Occurs in a wide variety of forest types, both natural and disturbed. Often enters plantations and gardens in search of food.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Pakistan, Nepal, India, China, Russia, Sumatra, Java and Borneo. Not currently at risk.



GREATER HOG BADGER
Arctonyx collaris

MEASUREMENTS HB 550-700, T 120-170, HF 115-135. Wt 7-14kg

IDENTIFICATION A large badger with a long, pig-like snout, short tail, dark stripes on head. Overall body colour varies from greyish to brown. Stripes on head vary from dark brown to black, and vary in extent, with lower dark stripe sometimes reduced.

SIMILAR SPECIES Ferret-badgers, *Melogale spp.*, are much smaller, with longer tails.

ECOLOGY AND HABITAT Nocturnal and terrestrial, sleeping during day in burrows. A powerful digger, feeding on tubers and roots as well

as invertebrates such as worms, insects and other small animals. Usually in forests as well as plantations near forests. Mainly in hills, but also in lowlands in Cambodia.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam and Cambodia. Also NE India, China and Sumatra. Near Threatened. Populations have declined due to hunting and loss of habitat.



JAVAN MONGOOSE
Herpestes javanicus

MEASUREMENTS Males: HB 360-420, T 275-315 (70-75% of HB), HF 60-70. Wt 0.88-1.8kg. Skull: cbl 76-82. Females: HB 320-360, T 250-265 (70-75% of HB), HF 55-65. Wt 0.53-0.84kg. Skull: cbl 64-79

IDENTIFICATION Individual hairs of fur finely banded dark brown and pale buff with strong reddish-orange tinge, especially around head. Tail moderately long.

SIMILAR SPECIES Small Indian Mongoose, *U. auropunctata*, averages smaller and lacks orange tinge; Short-tailed Mongoose, *U. brachyura*, is much darker, has shorter tail and is

largely restricted to forest; Crab-eating Mongoose, *U. urva*, is substantially larger, pale grey with pale stripe on neck.

ECOLOGY AND HABITAT Active both day and night. Primarily found in grasslands and scrubby areas; avoids dense evergreen forest. Feeds on rodents and many other small vertebrates including birds, reptiles and frogs, as well as crabs and large insects.

DISTRIBUTION AND STATUS SE Asia: E Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also S China, Java. Least Concern.



LARGE INDIAN CIVET
Viverra zibetha

MEASUREMENTS HB 750-850, T 380-460, HF 110-140. Wt 8-9kg

IDENTIFICATION Large civet with bold black-and-white throat pattern consisting of three black collars separated by white collars. General colour grey or tawny-brown with dark pattern on flanks consisting of wavy lines, often with some spotting on legs; pattern is sometimes very indistinct. Erectile crest of hairs from back of neck to base of tail. Tail banded to tip, with five or six broad black bands separated by narrow but complete white rings. Bottoms of feet heavily haired between pads, with skin sheath over nail on third and fourth toes.

TAXONOMIC NOTES Taynguyen Civet, *Viverra tainguensis*, was recently described from Vietnam, but recent analyses of specimens suggest it is the same thing as *V zibetha*.

SIMILAR SPECIES Malay Civet, *V tangalunga*, is smaller, with many more black bands on tail, and black dorsal crest continues along top of tail. Large-spotted Civet, *V megaspila*, has larger head with longer, more swollen muzzle;

body with distinct dark spots or bands on flanks; black crest continuing along top of tail so that white bands are broken; distal half of tail usually dark.

ECOLOGY AND HABITAT Nocturnal and largely terrestrial, though can also climb trees. Found mainly in forested habitats, but also uses secondary forests and some plantations. Eats any animal it can catch, including lizards, small mammals, birds and fish, as well as fruits and other plant materials.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Nepal, NE India and S China. Not currently at risk.



MASKED PALM CIVET
Paguma larvata

MEASUREMENTS HB 510-760, T 510-640, HF 95-104. Wt 3-5kg

IDENTIFICATION Body colour highly variable, from very light brown, almost blonde, to dark brown or reddish, darker on legs and top of head. Tail may be dark throughout or only on distal half, sometimes with white tip. Dark «mask» around eyes and on muzzle, with white on cheeks or sometimes most of head. White stripe on top of head from nose to back of neck, shorter and less conspicuous in Peninsular Malaysia. Northern forms (near Himalayas) may have head largely dark with only narrow white stripe on forehead.

SIMILAR SPECIES Common Palm Civet, *Paradoxurus hermaphroditus*, has dark face mask, but lacks white stripe on forehead and has dark stripes and spots on back and sides; Small-toothed Palm Civet, *Arctogalidia trivirgata*, has only small white stripe on forehead, no conspicuous «mask», smaller, more slender build, three stripes on back, relatively longer tail.

ECOLOGY AND HABITAT Mainly nocturnal, generally arboreal, but also travels and hunts on ground. Sleeps in tree holes or forks in large trees. Diet includes fruits and small animals. Occurs in tall and secondary forests; may enter plantations and gardens to feed.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Himalayas, including Nepal, N India, China, Taiwan, Hainan, Sumatra and Borneo. Not currently at risk, but populations have declined in some parts of Vietnam and Laos, owing to excessive hunting.



COMMON PALM CIVET
Paradoxurus hermaphroditus

MEASUREMENTS HB 420-500, T 330-420 (usually 70-90% of HB), HF 70-76. Wt 2-3kg

IDENTIFICATION Upperparts vary from olive-brown or occasionally reddish-brown to dark grey-brown; underparts paler. Limbs and tail dark brownish or black. Cheeks and front of face black, forming a dark mask; often with pale spots on sides of head which sometimes extend over forehead in a large white area; pattern varies among individuals. Three indistinct, broken dark lines along midline of back, with irregular rows of spots on flanks, sometimes forming extra lines. In northern part of range, spot pattern can be indistinct and obscured in thick winter coat. Adult females have 3 pairs of mammae.

SIMILAR SPECIES Small-toothed Palm Civet, *Arctogalidia trivirgata*, has tail longer than head and body; three stripes on back but without additional spots on sides of body; dark head usually with narrow white stripe on forehead; larger skull with relatively straight toothrow, narrow molars and widely spaced teeth); and

two pairs of mammae in females. Masked Palm Civet, *Paguma larvata*, is larger, lacks spots or stripes on back or sides, has pale stripe on forehead.

ECOLOGY AND HABITAT Nocturnal; sleeps during day in trees or sometimes in buildings. Arboreal and terrestrial, but more often active on ground than Small-toothed Palm Civet. Diet includes fruits, leaves, arthropods, worms and molluscs. Occurs in tall and secondary forests, plantations and gardens. Often seen near human settlements.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Sri Lanka, India, Nepal, Bangladesh, S China, Sumatra, Java, Borneo, Sulawesi and smaller Indonesian islands and the Philippines. Not currently at risk.



SMALL-TOOTHED PALM CIVET
Arctogalidia trivirgata

MEASUREMENTS HB 440–530, T 480–660 (about 110–120% of HB), HF 75–95. Wt 2–2.5kg

IDENTIFICATION Fur colour varies from olive-brown to greyish, rarely reddish-brown. Underfur reddish-brown. Face, ears, feet and much of tail blackish. Usually has three fine, dark stripes or series of close, dark spots extending along midline from neck to base of tail. Usually has a narrow pale stripe from forehead to tip of nose. Females have two pairs of mammae.

SIMILAR SPECIES Common Palm Civet, *Paradoxurus hermaphroditus*, has a shorter tail, distinct 'mask' on face without white on forehead, additional rows of spots on flanks, smaller skull

but with relatively large, broad teeth, curved tooththrow (Fig. 56a); Masked Palm Civet, *Paguma larvata*, is larger and heavier, with usually broader white stripe on forehead, pale cheeks, no black stripes on back.

ECOLOGY AND HABITAT Usually nocturnal and arboreal, rarely descending to the ground. Very agile. Diet includes fruits and small animals. Occurs in tall and secondary forests.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also NE India, S China (Yunnan), Sumatra, Java, Bali, Borneo and some smaller islands. Least Concern.



BANDED LINSANG
Prionodon linsang

MEASUREMENTS HB 350–450, T 300–420, HF 50–70. Wt 600–800g

IDENTIFICATION Whitish to golden or buff, with a pattern of large, dark brown spots that merge into about five dark transverse bands on upperparts, and longitudinal bands on sides of neck. Tail has black and pale bands along full length, typically about seven dark bands. Small, slender and cat-like. Claws retractile, like a cat's.

SIMILAR SPECIES Spotted Linsang, *P. pardicolor*, has smaller spots on body that do not blend into large splotches or bars, tail with more, narrower bands; Banded Civet, *Hemigalus derbyanus*, has broad bars on upperparts, but no spots, and a mainly black tail; Leopard Cat, *Prionailurus bengalensis*, has a differently shaped head, lacks broad barring along length of tail.

ECOLOGY AND HABITAT Nocturnal. Largely arboreal but also active on the ground. Sleeps during the day in a nest made in a hole, either in the ground or in a tree. Diet includes small mammals, birds, reptiles and arthropods. Occurs in tall and secondary forests, plantations and gardens.

DISTRIBUTION AND STATUS SE Asia: peninsular Myanmar, Thailand and Malaysia. Also Sumatra and adjacent islands, Java and Borneo. Least Concern, though infrequently encountered and likely to be declining somewhat due to loss of forest.



MARbled CAT
Pardofelis marmorata

MEASUREMENTS HB 450–530, T 470–550, HF 115–120, E 35–40. Wt 2–4kg

IDENTIFICATION Sides and back brownish with dark splotches and black lines, reminiscent of Clouded Leopard, *Neofelis nebulosa*, but black-edged blotches on sides of body less distinct, tending to blend together in a marbled pattern, rather than forming discrete «clouds»; black spots on legs smaller and more numerous. Fur soft and thick.

SIMILAR SPECIES Clouded Leopard, *N. nebulosa*, is larger, with patterns forming discrete «clouds».

ECOLOGY AND HABITAT Mainly nocturnal and arboreal, though also forages on ground. Diet probably includes a broad range of small animals, including rodents. Occurs mainly in tall forests, including regenerating forest.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Nepal, NE India, S China (Yunnan), Sumatra and Borneo. Vulnerable. Overall rare, potentially threatened by habitat loss and hunting.



LEOPARD CAT
Prionailurus bengalensis

MEASUREMENTS HB 400–550, T 230–290 (more than 50% of HB), HF 110–125, E 40–45. Wt 3–5kg

IDENTIFICATION Reddish-orange or yellowish-buff, with black spots over entire upperparts including tail; underparts contrasting white with black spots. Pattern and size of spots varies considerably among individuals, ranging from large, round black spots to numerous small spots to large irregular splotches with browner centres. Spots may be rounded or elongate in shape; often form into lines on back; top of head and back of neck with several distinct black stripes.

SIMILAR SPECIES Fishing Cat, *P. viverrinus*, is larger and greyer, with shorter tail, buffy underparts, black spots usually fairly small, forming distinct rows; Marbled Cat, *Pardofelis*

marmorata, has more complex pattern of lines, dark and pale areas, not just spots; Banded Linsang, *Prionodon linsang*, is smaller, with different shape, relatively thick tail with bands, not spots, along entire length.

ECOLOGY AND HABITAT Most widespread and common small cat in region, occupying a wide range of habitats, including forests, plantations and gardens. Usually nocturnal, mainly terrestrial but can climb trees; swims well. Diet includes small mammals, lizards, amphibians and large insects.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Pakistan, India, Nepal, China, Siberia, Taiwan, Sumatra, Java, Bali, Borneo and the Philippines. Not currently



GOLDEN CAT
Catopuma temminckii

MEASUREMENTS HB 760–840, T 430–500 (about 60% of HB). Wt 12–15kg

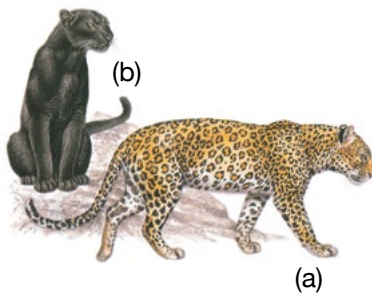
IDENTIFICATION A large cat with relatively plain coat, usually lacking distinct markings except for black and white stripes on sides and front of head. Coat colour quite variable, ranging from golden-brown to light tawny-brown to greyish. Some individuals are very dark brown or reddish. Generally darker along spine and paler underneath. Tail moderately long, darker above, pale below, often with dark tip. Has indistinct spots or blotches on belly, as well as sometimes on legs and shoulder. Race *C. t. tristis*, which may occur in N Myanmar, has extensive dark spots, stripes and splotches on upperparts (somewhat similar to Marbled Cat, *Pardofelis marmorata*), but can be recognised by distinctive face pattern and white underside

to tail. Rarely, some individuals are all dark brown.

SIMILAR SPECIES Jungle Cat, *Felis chaus*, has taller, pointed ears, bands on tail, lacks white stripes on face; Flat-headed Cat, *Prionailurus planiceps*, is smaller with a very short tail.

ECOLOGY AND HABITAT Reported from both dry forests and tropical rainforests. Occurs in disturbed areas but only near forest. Mainly terrestrial but can climb trees. Diet includes various medium and large animals including hares, small deer and large birds.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Nepal, NE India, S China and Sumatra. Near Threatened. Still occurs in much of region, but declining due to loss of habitat and illegal hunting.



LEOPARD
Panthera pardus

MEASUREMENTS HB 1,050–1,300, T 800–1,000. Wt 45–65kg

IDENTIFICATION Large cat with two colour phases. Spotted form has pale yellowish or yellowish-brown base colour, with black spots clustered in rosettes on back and singly on sides. Dark form also has rosettes, but base colour is also black, so rosettes can be seen only in good light. Dark phase is most common in S Thailand and Peninsular Malaysia. Footprints are similar to Tiger, *P. tigris*, but generally shorter (length less than 80mm).

rong, is sometimes mistaken for a black Leopard, but has long shaggy hair, ear tufts, no coat pattern, prehensile tail and very different shape.

ECOLOGY AND HABITAT Found in a wide range of habitats, though mainly in wooded areas.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also throughout much of Africa, Asia as far north as N China and Java. Vulnerable. Populations have declined owing to loss of habitat, declines in prey base and illegal hunting.

SIMILAR SPECIES Clouded Leopard, *Neofelis nebulosa*, is smaller, with irregular pattern of «clouds» on coat; Binturong, *Arctictis binturong*,



CLOUDED LEOPARD
Neofelis nebulosa

MEASUREMENTS HB 650–950, T 550–800. Wt 15–23k

IDENTIFICATION Usually pale sandy-brown to orange, with «cloud» patterns on sides and neck consisting of darker brown splotches with incomplete dark borders. Rarely, base colour is very dark and animals appear almost black. Footprints shorter with narrower pads than those of Leopard. Upper canines very large relative to skull, with clear diastema between them and cheek teeth.

of spots, not clouds, longer legs with more erect posture, thinner tail.

ECOLOGY AND HABITAT Mainly nocturnal and arboreal, but sometimes active during the day. In logged forest, often travels on the ground. Diet includes pigs, deer, primates and smaller mammals. Occurs mainly in tall forests, but also secondary forests and other disturbed habitats.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Nepal, NE India, S China, Taiwan, Sumatra and Borneo. Vulnerable. Threatened by loss of habitat and illegal hunting.

SIMILAR SPECIES Marbled Cat, *Pardofelis marmorata*, is smaller, with more irregular pattern of lines and dark areas that do not form discrete clouds, more extensive small spots on legs; Leopard, *Panthera Pardus*, has rosettes



TIGER
Panthera tigris

MEASUREMENTS HB 1,700–2,300, T 950–1,150. Wt 180–245kg

IDENTIFICATION Easily recognised by very large size and pattern of vertical black and pale orange stripes along the body. Pattern of striping varies considerably, and can be used to recognise individuals in photographs. Tail is proportionately shorter than that of other large cats. Footprints can be distinguished by their large size and by the absence of claw marks (front feet 90mm or longer – Fig. 58g, h).

other animals may be taken, ranging from fish to rodents and birds. Occasionally, tigers may hunt humans or take domestic animals, but most remaining tigers in the region are very shy of humans, after years of persecution.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Peninsular Malaysia, possibly still in Vietnam, Cambodia. Also India, Nepal, China, Siberia and Sumatra. Endangered. Until recently was found in all countries in the region, but has disappeared from much of range and may now be extirpated from Vietnam and Cambodia. Major threats are illegal hunting and trapping, but also suffering from loss of habitat and prey base. Presumed Extinct on Java and Bali.

ECOLOGY AND HABITAT Tigers are found in a wide range of forested and partially open habitats, provided suitable prey is available. Main prey items are deer and pigs, though many



MAINLAND SEROW
Capricornis milneedwardsii

MEASUREMENTS SH 850-940, HB 1,400-1,550, T 110-160 kg

IDENTIFICATION Similar to Southern Serow, differing mainly in colour. Hairs on most of body black with extensive white bases showing through, giving overall greyish colour; black stripe on back; head browner; underside often paler; white or pale brown hairs on throat, often forming pale patch; legs black on upper half, contrasting reddish or whitish on lower half; long mane with long white hairs, sometimes extensively mixed with black.

SIMILAR SPECIES Southern Serow, *C. sumatraensis*, is blacker, without white hair bases on most of body, black legs; could possibly hybridize in areas of overlap in peninsular Thailand.

ECOLOGY AND HABITAT Occurs mainly in hill forest and rugged terrain such as limestone karst, though sometimes in lowland forest. Tolerant of some forest degradation, but not clearing for agriculture.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam and Cambodia. Also S China. Near Threatened. Populations fragmented in many areas, owing to loss of habitat and intervening forest clearance, with excessive hunting in many areas.

MEASUREMENTS SH 600-800, HB

1,350-1,500, T 200-300. Wt of large male 75-200kg

IDENTIFICATION Colour varies from blackish to reddish; muzzle elongate without a beard; long black hairs on upper back and neck, forming a mane. Young are born dark brown with elongate white stripes along body. Footprints more rounded and symmetric than those of deer, with imprints of the dew toes apparent except on very hard ground.

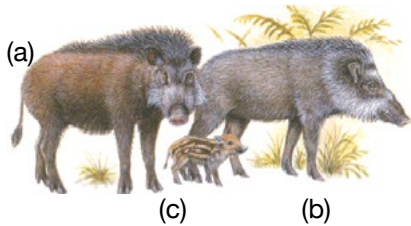
VOICE Pigs in herds relatively noisy, making many grunting and squealing noises; also often sounds of breaking vegetation.

TAXONOMIC NOTES «Banded Pig», *S. scrofa vittatus*, from Peninsular Malaysia and Indonesia, is distinctly smaller with sparser hair, and sometimes considered a separate species.

SIMILAR SPECIES Bearded Pig, *S. barbatus*, averages taller, has longer legs, longer muzzle with beard and bristly warts; domestic pigs, which are descended from *S. scrofa*, are sometimes very similar, but generally tamer, and usually lack a black mane.

ECOLOGY AND HABITAT Found in a wide variety of habitats, including mature forests, disturbed areas, secondary forest, gardens and plantations. Feeds on roots, seeds and a wide variety of other vegetable and animal matter, such as invertebrates, worms and small vertebrates including birds' eggs and nestlings, if encountered on the ground. In gardens and plantations can cause extensive damage to growing crops.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also much of Europe, N Africa and mainland Asia, with introduced populations elsewhere. Not currently at risk.



EURASIAN WILD PIG
Sus scrofa

MEASUREMENTS SH 200-230, HB 400-550, T 60-90. Wt 1.4-2 kg

IDENTIFICATION Upperparts with relatively fine fur, reddish-brown mixed with fine black, appearing fairly uniform coloured overall; centre of nape usually blacker than rest of back, often forming a distinct stripe. Underparts white, with variable brown stripes up middle or along sides of belly; distinctive dark brown and white markings on throat and upper chest, typically with triangular white stripe up middle, bordered by dark brown triangle, then one diagonal stripe on each side, which usually join on chin; in profile white appears as a single line from chin to side of chest. Some geographic variation in colour, with populations in peninsular Thailand and Malaysia darker and more reddish; those on rest of mainland duller, often lacking nape stripe; additional colour variations occur on islands. Footprints similar in shape to other deer, but much smaller

TAXONOMIC NOTE Formerly considered part of species *T. javanicus*, which is now considered to be restricted to Java; population in N Thailand is larger and sometimes considered a separate species, *T. williamsoni*, but only the type specimen is known, and its distinctiveness is uncertain.

SIMILAR SPECIES Greater Mousedeer, *T. napu*, is larger, with more flecked coloration on upperparts and different throat markings; Silver-backed Mousedeer, *T. versicolor*, has orange-brown on sides of neck and shoulders contrasting with finely speckled silver lower back and rump.

ECOLOGY AND HABITAT Active periodically both night and day. Diet includes fallen fruits, leaf shoots and fungi. Usually solitary. Both adults and young rest in any sheltered spot under forest cover. Occurs in tall and secondary forests, sometimes entering gardens and mixed scrub.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also SW China, Sumatra, Borneo and many adjacent islands. Not currently at risk, but populations in many areas are declining as a result of forest loss and excessive hunting.



LESSER MOUSEDEER
Tragulus kanchil



SAMBAR
Cervus unicolor

MEASUREMENTS SH 1,400-1,600, H B 1,500-2,000, T 210-280. Wt 180-260kg Length of antlers along greatest curve typically 300-550

IDENTIFICATION Large deer with dark brown skin and hair; upperparts generally grey-brown, sometimes slightly reddish, usually darker along midline; underparts same colour as back or darker. Tail bushy, mainly blackish except for white on base of underside. Middle of rump sometimes paler than rest of back. Adult males with long, coarse hair on neck. Young usually without spots. Adult males typically have 3 tines to each antler, 1 in front, and 2 at the tip of the main beam; inner branch of terminal fork of antler normally somewhat smaller than the outer, which appears to be a continuation of the main beam of the antler. Two-year-old males have antlers with only 1 point; three-year-old males have antlers with 2 points. Footprints relatively large, pointed at front.

VOICE Call is a distinctive yelp or shrill bark.

SIMILAR SPECIES Eld's Deer, *Rucervus eldii*, is more reddish, underside pale, tail not black, brow tine of antler forming continuous curve with main branch.

ECOLOGY AND HABITAT Active mainly at night, also early morning and late afternoon. Diet includes grasses, herbs, shrubs, young leaves of woody plants and fallen fruits. Often visits natural mineral sources. Usually solitary, but groups of two are sometimes seen, consisting of adult male and female, female and young, or adult females. Nocturnal activity and solitary nature possibly a consequence of heavy hunting pressure. Most common in secondary forests on gently sloping terrain, but also in tall dipterocarp forests on steep terrain and in swamp forests. Enters gardens and plantations to feed.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Sri Lanka, India, S China, Sumatra, Borneo and many larger adjacent islands and the Philippines. Near Threatened: has declined dramatically in many parts of range, especially Indochina, as result of excessive hunting.

MEASUREMENTS SH 500-550, HB 900-1,100, T 170-190. Wt 20-28kg. Antler length 70-130, pedicel length 70-150

IDENTIFICATION Small, reddish deer, males with very large pedicels and relatively small antlers. Upperparts vary from deep reddish-brown or rufous to paler reddish-yellow, generally darker along midline; underparts pale whitish or greyish; tail coloured as back above, white below. Antlers rough with small spike near base, sharp curve near tip. Pedicel thick and straight, with a burr where antler joins; continues as bony ridge down forehead, usually with conspicuous black lines. Female has tuft of stiff hair in place of pedicel or antlers. Young normally with white spots. Footprints with relatively elongate toes, pointed at front, probably indistinguishable from those of other muntjacs except by size.

VOICE Adults of both sexes give short, loud, barking calls.

SIMILAR SPECIES Fea's Muntjac, *M. feae*, is browner, with dark legs, pale top of head; Gongshan Muntjac, *M. gongshanensis*, has black belly and legs; Leaf Muntjac, *M. putaoensis*, is smaller, with short pedicels; Large-antlered Muntjac, *M. vuquangensis*, is substantially larger, with long antlers and relatively short pedicels. Red Muntjac *Muntiacus muntjak*.

ECOLOGY AND HABITAT Found in a wide variety of forest habitats, from tropical rainforest to dry dipterocarp forest, lowlands to hills. Browses on leaves and twigs more often than grazing on grass; also eats fallen fruits. Mainly nocturnal, although also active during day in areas where not hunted. Largely solitary except during breeding season.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also Sri Lanka, India, S China, Taiwan, Sumatra, Java, Borneo and some adjacent islands. Not currently at risk, though declining, owing to excessive hunting in some areas. This is the most widespread muntjac in the region, and the only species in many areas.



NORTHERN RED MUNTJAC
Muntiacus vaginalis

MEASUREMENTS H B 370-405, T 425-500, H F 84-91, E 30-38

IDENTIFICATION Largest tree squirrel in the region. Upperparts typically black in fresh pelage, but some individuals may be dark brown or reddish-tinged black; underparts vary from pale buff to orange. Cheeks white with dark mark like a moustache. Some geographic variation in extent of white on forelegs and presence or absence of ear tufts.

SIMILAR SPECIES Cream-coloured Giant Squirrel, *R. affinis*, is much paler, with little contrast between upper and underparts; Prevost's Squirrel, *Callosciurus prevostii*, is smaller, with distinct white stripe on flank separating black back from orange belly. Some Variable Squirrels, *C. finalysonii*, may have similar colour patterns, but are substantially smaller and usually have more extensive white on head, tail or feet.

ECOLOGY AND HABITAT Primarily in canopy of tall forest, rarely descending to the ground. Feeds mainly on fruits and nuts, but also some insects and animal matter.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also E Nepal, Assam, S China, Sumatra, Java and Bali. Near Threatened; although widespread, has declined considerably in many areas due to loss and fragmentation of tall forest, as well as to hunting.



BLACK GIANT SQUIRREL
Ratufa bicolor



INORNATE SQUIRREL
Callosciurus inornatus



INDOCHINESE FLYING SQUIRREL
Hylopetes phayrei



EASTERN STRIPED SQUIRREL
Tamiops maritimus



RED-CHEEKED SQUIRREL
Dremomys rufigenis

MEASUREMENTS H B 220-230, T 200-240

IDENTIFICATION Upperparts mottled brown (agouti), sometimes with a reddish tinge, underparts uniform grey.

SIMILAR SPECIES Grey-bellied Squirrel, *C. caniceps*, has black tail tip, and does not overlap in range, occurring only to west of Mekong River.

ECOLOGY AND HABITAT Diurnal and arboreal. Evergreen forests including hill conifer forest, as well as degraded forest and scrub.

DISTRIBUTION AND STATUS SE Asia: N and C Laos, and N Vietnam, E of Mekong River. Also S China. Not currently at risk. Genus *Tamiops* A group of small, striped squirrels, distinguished

from most other squirrels by their arboreal habits and pattern of dark and pale stripes on the back. Currently, four species are recognized, differing in size, in the brightness and width of the stripes and in belly colour. However, there is also moderate variation within each species, and further study, preferably involving genetic analysis, is required to determine whether these are actually appropriate species limits. Field identification is aided by the fact that there appears to be relatively little overlap in distribution among the species, although parts of Vietnam and Laos may have more than one species.

MEASUREMENTS HB 145-195, HF 30-36.

Skull: gl 37-43

IDENTIFICATION Overall colour of upperparts greyish-brown to mottled brown and black; individual hairs with dark slaty to blackish base, and very extensive greyish-buff to brown tip. White mark behind ear. Underparts pale buff. Tail narrow at base, then broad, then tapering gradually to tip; rounded above, flattened below; greyish-brown to slightly cinnamon-brown, with darker tip.

SIMILAR SPECIES Particoloured Flying Squirrel, *H. alboniger*, is very similar but larger, with proportionately smaller auditory bullae; Red-cheeked Flying Squirrel, *H. spadiceus*, has tail

flattened above and below, reddish cheeks and base to tail.

ECOLOGY AND HABITAT Nocturnal. Occurs in tall and secondary forests, including disturbed areas and cultivated orchards. Feeds on fruits.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Vietnam. Probably also Laos. Also Nepal through Assam to S China, Hainan. Least Concern.

MEASUREMENTS HB 100-145, T 95-120,

HF 30-35

IDENTIFICATION Upperparts brownish with 5 dark stripes and 4 pale stripes in middle of back. Median dark stripe black, but outer dark stripes tend to be mixed with reddish-brown. Outer pale stripes brighter and more conspicuous than inner stripes, but not connecting with cheek stripes. Pelage relatively thin. Underparts greyish-white, fur having grey bases and white tips.

SIMILAR SPECIES Swinhoe's Striped Squirrel, *T. swinhoei*, is very similar and most reliably distinguished by range; Cambodian Striped Squirrel, *T. rodolphii*, has all 4 pale stripes relatively bright, underparts mixed orange and grey.

ECOLOGY AND HABITAT Diurnal and arboreal, but may be found in low shrubs and sometimes on ground. Occurs in a wide variety of forest types, including disturbed areas.

DISTRIBUTION AND STATUS SE Asia: Laos, Vietnam. Also SE China, Hainan and Taiwan. Not currently at risk. Genus *Sundasciurus* A group of small to medium-sized squirrels with many species in the Sunda Islands and Philippines, but only three species in the region, restricted to S peninsular Thailand and Malaysia. Most species are smaller and plainer-coloured than *Callosciurus*, with the exception of *S. hippurus*, which is relatively large and bright. They are both arboreal and terrestrial, spending more time on the ground than most *Callosciurus*.

MEASUREMENTS HB 170-210, T 143-147, H F 50-51, E 22-24

IDENTIFICATION Upperparts, including top of tail, speckled olive-brown mixed with grey; cheeks, side of face and underside of tail contrasting reddish-chestnut; underside white with light grey underfur, sharply demarcated from olive-brown upperparts. Small white or buff patch behind ear.

SIMILAR SPECIES Red-throated Squirrel, *D. gularis*, has darker underparts with red throat; Red-hipped Squirrel, *D. pyrrhomerus*, has less conspicuous red cheeks, large red patch on thigh; no other squirrels have such contrasting red cheeks.

ECOLOGY AND HABITAT Diurnal. Found both in trees and on ground. Occurs in primary and secondary forests, mainly in hills. Eats both insects and plant material. Animals in northern part of range tend to be more arboreal than those in Peninsular Malaysia.

DISTRIBUTION AND STATUS SE Asia: widespread throughout hillier areas of region, from N Myanmar through Thailand, Laos (also in lowlands), Vietnam and Cambodia to hills of Peninsular Malaysia. Also adjacent areas of S China. Not currently at risk.



PALLAS'S SQUIRREL
Callosciurus erythraeus

MEASUREMENTS HB 200-260, T 190-250, HF 44-55, E 18-23

IDENTIFICATION Considerable geographic variation in colour pattern; may include more than one species, but appropriate species limits uncertain. In most forms, upperparts are speckled olive-brown (agouti), sometimes with a black stripe down the back, and underparts are reddish, though this varies from dark maroon to red-brown. In many populations there is a stripe of agouti down the middle of the belly, separating the reddish belly into 2 bands. The major variations within the region are as follows: *C. e. erythraeus* group (Peninsular Malaysia, W Thailand, S and NW Myanmar, NE India, N Vietnam and N Laos): upperparts agouti, feet and tail as back, underparts reddish, with an agouti stripe up the middle — in some parts of S Myanmar underparts may be all agouti without any red; in W Thailand and S Myanmar, lower back has a distinct, broad black stripe (sometimes considered a separate subspecies, *C. e. atrodorsalis*). *C. e. flavimanus* group (S Vietnam, S Laos and Cambodia): upperparts agouti, feet pale, often yellowish-orange, underparts vary from cream to rich reddish-brown. *C. e. sladeni* group (Myanmar between Chindwin and Irrawaddy Rivers): a highly variable form with some populations similar to typical *C. erythraeus*, but others may be greyish-white above, pale orange below and on the feet; medium grey mixed with agouti above,

cream below and on the feet; or even completely dark rufous-red all over and only slightly paler on the underparts.

TAXONOMIC NOTES *C. flavimanus* is sometimes considered a separate species.

SIMILAR SPECIES Variable Squirrel, *C. finlaysonii*, never has the combination of agouti upperparts and tail with reddish underparts; however, some populations can resemble some of the variations of the *C. e. sladeni* group, though typically not those in the same geographic areas; Phayre's Squirrel, *C. phayrei*, has a black band on the sides; Plaitain Squirrel, *C. rotatus*, has a black and buff band on the flanks.

ECOLOGY AND HABITAT Diurnal and arboreal. In southern part of range mainly confined to hill forests, but elsewhere occurs in a variety of habitats including primary and secondary forests, as well as disturbed areas and plantations.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia (where confined to central mountain range above 1,000m elevation). Also E Nepal, Assam, and S and E China. Not currently at risk.



INDIAN GIANT FLYING SQUIRREL
Petaurista philippensis

MEASUREMENTS HB 400-490, T 400-550, HF 65-90

IDENTIFICATION Moderate geographic variation in colour pattern, and may include more than one species. W Myanmar forms (*P. p. cineraceus*): upperparts, including tail and membranes, medium grey; back heavily frosted with long white tips to hairs; underparts greyish-white. E Myanmar and Thailand (*P. p. lylei*): upperparts very dark grey, heavily frosted with white; dorsal surface of membrane, feet, and tail black; underparts buff. Vietnam (*P. p. annamensis*): upperparts dark brown or dark red, heavily frosted with white, underparts pale orange-brown, tail dark.

SIMILAR SPECIES Red Giant Flying Squirrel, *P. petaurista*, in areas of overlap, is more rufous with paler head, tail with a discrete black tip.

ECOLOGY AND HABITAT Nocturnal. Occurs in hill dipterocarp and lower montane forests.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Cambodia and Vietnam. Also Sri Lanka, India, S China, Taiwan and Hainan. Not currently at risk, but experiencing some declines due to loss of forest and hunting.

MEASUREMENTS HB 590-720, T 60-110, HF 80-95

IDENTIFICATION Generally black; long spines or quills on lower back white with black band in middle; short spines on front parts of body mostly blackish, some with paler bases and tips. Spines along back of neck may form a crest. Tail has hollow, goblet-shaped quills that rattle when shaken.

SIMILAR SPECIES Brush-tailed Porcupine, *Atherurus macrourus*, is smaller, with shorter brown quills, longer scaly tail with brush on tip, beaded tail quills.

ECOLOGY AND HABITAT Mainly terrestrial, digging extensive burrows under forest floor. Feeds on fallen fruits including oil palm, as well as tree bark, roots and tubers. Occurs in forests and cultivated areas.

DISTRIBUTION AND STATUS SE Asia: Myanmar, Thailand, Laos, Vietnam, Cambodia and Peninsular Malaysia. Also India, Nepal, S China, Sumatra and Borneo. Not currently at risk.



MALAYAN PORCUPINE
Hystrix brachyura

3

FAUNA

3.3

REPTILES



SCALE-BELLIED SPINY LIZARD
Acanthosaura rubrilabris

MEASUREMENTS SVL 111mm

Body robust, slightly compressed; head subtriangular; supralabials 11–12; infralabials 9–10; tympanum exposed; low dorsal crest; gular pouch absent; antehumeral fold present; dorsal scales heterogenous; nuchal crest comprises 6 conical scales; dorsal crest low, composed of subtriangular scales, decreasing caudally; tail longer than head-body length; lamellae under Toe IV 22.

COLORATION Dorsum bright green changeable to dark brown; throat and neck dark; forehead black; indistinct diamond-shaped black mark on nape.

HABITAT & BEHAVIOUR Inhabits lowland and submontane forests at elevations of 700–1,400m asl. Diurnal and arboreal. Diet consists of insects and other arthropods. Reproductive habits unstudied.

STATUS Not Evaluated.

MEASUREMENTS SVL 115mm

Body robust, compressed; head rather short; dorsal scales point backwards and upwards; cheek swollen in adult males; supralabials 9–12; infralabials 9–12; long spine above eye and 2 spines above tympanum; fold in front of shoulder; nuchal and dorsal crests continuous; large rectangular supraoculars; crescentic patch of granular scales in axilla; midbody scale rows 45–65.

COLORATION Dorsum olive-brown with dark brown dorsal bars or transverse spots; radiating dark lines from eye; light dorsolateral stripe; venter greyish-cream; breeding males have red gular pouch.

SUBSPECIES Two subspecies are recognized. *C. e. emma*, no enlarged elongated scales on supraoculars. *C. e. alticristatus*, enlarged elongated scales on supraoculars; 2 enlarged chin shields behind postmentals; 5 postrostral scales; chin grey, gular with black interstitial skin; tail-base not swollen.

HABITAT & BEHAVIOUR Inhabits open and evergreen forests in the lowlands and mid-hills, at elevations of 100–1,000m asl. Diurnal and arboreal, ascending trees to a minimum of 10m above substratum. Diet consists of insects. Clutches comprise 4–12 eggs, measuring 11 x 17mm. Incubation period 62–100 days. Hatchlings 32mm.

DISTRIBUTION Southern Thailand, northern Peninsular Malaysia (*C. e. emma*), Myanmar, northern Thailand (Chang Mai Province), Laos, Cambodia, Vietnam and northern Peninsular Malaysia (*C. e. alticristatus*). Also Bangladesh, Assam and Meghalaya (India) (*C. e. emma*), and southern China (*C. e. alticristatus*).

STATUS Not Evaluated.



FOREST CRESTED LIZARD
Calotes emma

MEASUREMENTS SVL 95mm

Body robust, compressed; head rather large, especially in adult males; scales on body point backwards and upwards; no antehumeral fold or pit in front of shoulder; 2 separated spines above tympanum; midbody scale rows 40–50.

COLORATION Variable and also changeable, head becoming orange or bright red, with a black patch on throat appearing in displaying males, fading to dull grey at other times; females too may become yellow, changing to dull greyish-olive after mating.

HABITAT & BEHAVIOUR Inhabits open forests and disturbed habitats such as parks and gardens, ascending to 3,000m asl on the mainland. Diet consists of insects and other invertebrates, although some vegetarian matter, such as unripe seeds, is also consumed. Sexually mature in 9–12 months. Clutches comprise 6–9

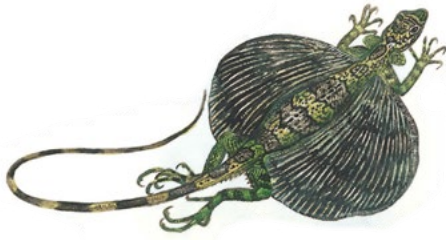
eggs in southern India, and up to 23 in northern India, with eggs measuring 10–11 x 4–5mm. Incubation period 42–67 days.

DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, Vietnam and northern Peninsular Malaysia. Introduced into Singapore, Borneo and Java. Also Afghanistan, Pakistan and north-western India (*C. v. farooqi*), rest of India, Iran, Sri Lanka, Bangladesh, Bhutan, Nepal and the Maldives (*C. v. versicolor* or unassigned subspecies). Introduced into Florida, USA.

STATUS Not Evaluated.



GARDEN LIZARD
Calotes versicolor



ORANGE-WINGED FLYING LIZARD

Draco maculatus

MEASUREMENTS SVL 82mm

Body moderate; nostrils lateral, oriented outwards; supralabials 8–9; tympanum scaly; gular pouch elongated, tapering basally, with tip broad with small scales; dorsals 117–152; males with low caudal crest; subcaudals subequal to lateral tail scales; patagial ribs 5.

COLORATION Dorsum pale blue or olive-grey; male patagium yellow, sometimes with orange outer edge, and narrow white lines and large yellow blotches; ventral surface with large black spots.

SUBSPECIES Three subspecies are recognized. *D. m. haasei*, patagium unpatterned ventrally or with up to 5 spots; base of gular pouch yellowish-cream; no blue spot on each side of base of gular pouch. *D. m. whiteheadi*, patagium unpatterned ventrally; base of gular pouch brown; no blue spot on each side of base of

gular pouch. *D. m. maculatus*, patagium yellow ventrally, unpatterned or with 1–4 black spots; blue spot on each side of base of gular pouch.

HABITAT & BEHAVIOUR Inhabits primary and secondary forests in the lowlands and mid-hills at elevations of 200–1,000m asl. Diurnal and arboreal, associated with large trees. Glides of up to 10m by this species have been recorded. Diet consists of ants. Reproductive habits unstudied.

DISTRIBUTION Myanmar, western and southern Thailand, Peninsular Malaysia, Singapore (*D. m. maculatus*), eastern Thailand, Laos, Cambodia, central and southern Vietnam (*D. m. haasei*), and northern Vietnam (*D. m. whiteheadi*). Also north-eastern India (Nagaland and Arunachal Pradesh), Bangladesh, southern China (*D. m. maculatus*) and eastern China (*D. m. whiteheadi*).

STATUS Not Evaluated.



SMALL-SCALED LONG-HEADED LIZARD

Pseudocalotes microlepis

MEASUREMENTS SVL 85mm

Body slender; head large; snout long, somewhat pointed; body compressed; tail relatively short; dorsal scales feebly keeled, pointing backwards; gular pouch small; nuchal crest in males low; midbody scale rows 65–72.

COLORATION Dorsum light brown with black flecks; colours become intensely dark when stressed; radiating dark lines from eyes.

HABITAT & BEHAVIOUR Inhabits submontane forests at elevations of up to 1,200m asl. Diurnal and arboreal. Diet and reproductive habits unstudied.

STATUS Not Evaluated.



LONG-TAILED GROUND SKINK

Eutropis longicaudata

MEASUREMENTS SVL 140mm

Body slender; head elongated; lower eyelid scaly; frontoparietals in broad contact; supralabials 7; Supralabial IV subocular; paired enlarged nuchals; auricular opening small, with or without lobules anteriorly; middorsals slightly keeled; tail nearly three times as long as body; preanal scales enlarged; midbody scale rows 28.

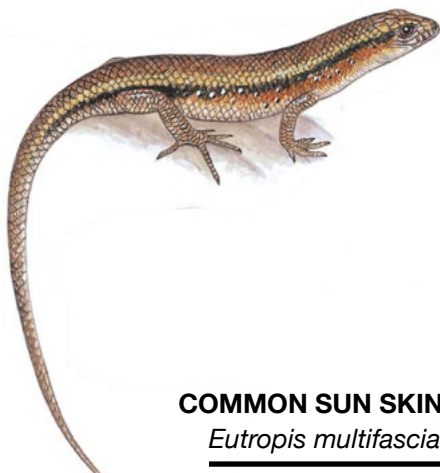
COLORATION Dorsum mid-brown or reddish-brown, sometimes with 7 broken longitudinal black stripes; dark grey band on flanks from eye to beyond inguinal region; supralabials and infralabials yellow barred with black; venter greenish-yellow.

HABITAT & BEHAVIOUR Inhabits the lowlands around open forests, as well as close to human habitations, at elevations of up to ca 500m asl.

Diurnal and terrestrial. Diet consists of large insects such as crickets and grasshoppers, and also earthworms. Oviparous; clutches comprise up to 16 hardshelled eggs, measuring 16mm, which are laid in holes on walls and on the ground. Incubation period ca 45 days.

DISTRIBUTION Thailand, Laos, Cambodia, Vietnam and Peninsular Malaysia. Also eastern China.

STATUS Not Evaluated.



COMMON SUN SKINK

Eutropis multifasciata

MEASUREMENTS SVL 137mm

Body robust; head distinct; snout short; lower eyelid scaly; paired enlarged nuchals; auricular opening small with small pointed lobules; dorsal scales with 3 (rarely 5) keels; midbody scale rows 29–35; vertebrae 42–48; lamellae under Toe IV 17–23.

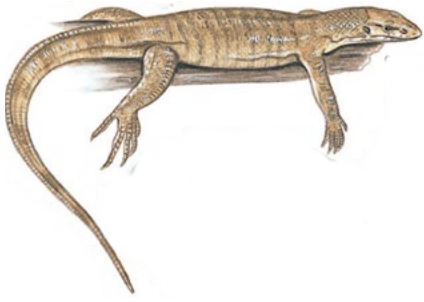
COLORATION Dorsum bronze-brown, usually with yellow or red stripe along flanks; series of white spots or streaks along flanks; breeding males with bright orange or reddish-orange flanks; pale dorsolateral line; venter cream.

SUBSPECIES Two subspecies are recognized. *E. m. multifasciata*, Supralabial I and frontal not in contact; no reddish-brown streak on top of snout and reddish-orange flank stripes in males. *E. m. balinensis*, Supralabial I and frontal in contact; reddish-brown streak on top of snout and yellow flank stripes in males.

HABITAT & BEHAVIOUR Common in forest edges and around human settlements at elevations of up to 1,800m asl. Diurnal and terrestrial. Insectivorous, with diet also including centipedes. Oviviparous; clutches comprise 1–10 neonates, measuring 33.1–43mm.

DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, the Anamba, Natuna, Riau and Mentawai Archipelagos, Borneo, Java (*E. m. multifasciata*) and Bali (*E. m. balinensis*). Also north-eastern India, the Nicobar Islands, southern China (Yunnan Province), Taiwan, the Lesser Sundas, Maluku, Sulawesi, Halmahera, the Sulu and Togian Archipelagos, and the Philippines (*E. m. multifasciata*); introduced into New Guinea, Australia and the southern USA.

STATUS Not Evaluated.



SOUTH-EAST ASIAN MONITOR LIZARD
Varanus nebulosus

MEASUREMENTS SVL 1,200m

Body slender; snout somewhat elongated; nostril nearer eye than snout-tip; nostril an oblique slit; median supraoculars transversely enlarged; nuchal scales rounded, larger than crown scales; midventral scales smooth; tail flattened.

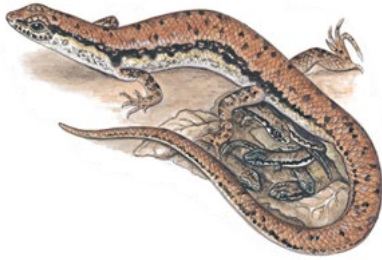
COLORATION Dorsum of juveniles dark grey with yellow bands; adults unicoloured dark grey or with reduced pattern; chin and throat with transverse black bars; tail with transverse bands; venter cream or yellow.

HABITAT & BEHAVIOUR Inhabits the edges of open deciduous forests, and plantations. Diur-

nal, and terrestrial and arboreal. Diet consists of invertebrates and small vertebrates; also known to scavenge.

DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra and Java.

STATUS Not Evaluated.



INDIAN FOREST SKINK
Sphenomorphus indicus

MEASUREMENTS SVL 97mm

Body slender; head distinct from neck; snout short; limbs moderate; supralabials 7; infralabials 7; tympanum deeply sunk; loreals 2; dorsal scales smooth; preanal scales 4; midbody scale rows 34–38; lamellae under Toe IV 14–18, rounded or slightly keeled.

COLORATION Dorsum brown, unpatterned or with dark brown spots arranged to form longitudinal lines; dark greyish-black stripe on flanks extends from eye to tail; lips yellow with black bars; venter unpatterned yellow or cream.

HABITAT & BEHAVIOUR Inhabits lowland evergreen forests to submontane forests at elevations of up to 1,250m asl. Diurnal and terrestrial, associated with leaf litter and fallen

trees, and frequently with rocky biotope. Diet consists of cockroaches, grass-hoppers and earthworms. Ovoviviparous; clutches comprise 4–11 neonates, measuring ca 30mm.

DISTRIBUTION Myanmar, Thailand, Vietnam, Laos, Cambodia and Peninsular Malaysia. Also eastern India, Bhutan, Bangladesh, and southern and eastern China.

STATUS Not Evaluated.



RETICULATED PYTHON
Broghammerus reticulatus

MEASUREMENTS TL 9.83m

Body relatively elongated and slender, except in large individuals; head distinct from neck; rostral as broad as deep; supralabials 12–14; Supralabials I–IV with pits; Supralabials VII or VIII enter orbit; infralabials 23; 2–3 anterior and 5–6 posterior infralabials with pits; infralabial pits better defined than supralabial pits and set in a longitudinal groove; eye small; pupil vertical; midbody scale rows 69–79; ventrals 297–330; subcaudals 78–102, paired; anal entire; cloacal spur present in both sexes (more distinct in males).

COLORATION Dorsum yellow or brown with rhomboidal dark markings; black median line runs from snout to nape; oblique line from posterior of eye to corner of mouth; venter yellow with small brown spots.

SUBSPECIES Three subspecies have been described, of which one (*B. r. reticulatus*) occurs in the region.

HABITAT & BEHAVIOUR Inhabits forests and typically found at water's edge, where it ambushes deer and pigs. Also common in cities and towns in the region, where it inhabits sewers. Nocturnal and terrestrial, with some arboreal and aquatic activity. Diet consists of homoeotherms including mammals and birds, and lizards are also eaten; prey is killed by constriction. Clutches comprise 14–124 eggs, measuring 90–93 x 58–62mm. Incubation period 60–101 days. Hatchlings 600–750mm.

DISTRIBUTION Southern Myanmar (Tenasserim, Taninthayi Division), Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Pulau Bangka, Pulau Beli-

tung, Pulau Weh, Pulau Enggano, Pulau Nias, the Mentawai, Natuna and Riau Archipelagos, Borneo, Java, Bali (*B. r. reticulatus*), Pulau Selayar, south-west of Sulawesi (*B. r. saputrai*) and Pulau Tamahjampea and possibly also small islands off Sulawesi (*B. r. jampeanus*). Also the Nicobar Islands, islands off eastern Indonesia, including Ambon, the Anambas Archipelago, Babi, Batjan, Banda Besar, Bankak, Boano, Buru, Butung, Flores, Halmahera, Haruku, Lang, Lombok, Obira, Saparua, Seram, the Sula Archipelago, Sulawesi, Sumba, Sumbawa, Tanimbar, Ternate, Timor and Verlate and the Philippine Islands, including Basilan, Bohol, the Calamian Islands, Cebu, Leyte, Luzon, Mindanao, Mindoro, Negros, Palawan, Panay, Polillo, Samar, Tawi-Tawi and the Sulu Archipelago (*B. r. reticulatus*).

STATUS Not Evaluated.



THAI CAT SNAKE
Boiga siamensis

MEASUREMENTS TL 1,700mm

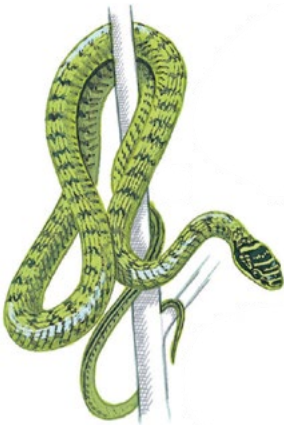
Body slender, elongated, laterally compressed; head distinct from neck; loreal present; single preocular; postoculars 2; supralabials 8; Supralabials III–V contact orbit; infralabials 12–13; anterior temporals 2; eye large; pupil vertical; dorsals smooth; midbody scales 23; vertebrals distinctly enlarged; ventrals 247–270; subcaudals 116–129, paired; anal entire.

COLORATION Dorsum light brown with 87–98 V-shaped dark brown bands, more distinct anteriorly; posteriorly, bands bar-shaped with little posterior extension; scales flecked with white, those comprising dark bands light at posterior tips; flanks with alternating dark and light spots; venter light brown; forehead mid-brown; dark streak from posterior margin of eye to beyond last supralabial; 2 black stripes on either side of vertebral row to first dark band and continuous with it; venter yellowish-brown or greyish-brown.

HABITAT & BEHAVIOUR Inhabits lowland evergreen forests up to submontane limits at an elevation of 1,780m asl. Nocturnal and arboreal, associated with trees as high as ca 6m above substrate. Diet consists of small rodents, and birds and their eggs. Reproductive habits unstudied.

DISTRIBUTION Myanmar (Toungoo and Myitkina), Thailand (Sakaerat, Nakhon Ratchasima Province, Dansai, Loei Province, Chiangmai University Campus, Chiang Mai Province, Bangthaphan and Me Ping River, Chumpon Province, and north of Raheng, Tak Province), Laos, Cambodia and Vietnam (Nam Cat Tien National Park, Lam Dong Province). Also eastern and north-eastern India (northern West Bengal, Assam and Arunchal Pradesh), and Bangladesh.

STATUS Not Evaluated.



ORNATE FLYING SNAKE
Chrysopelea ornata

MEASUREMENTS TL 1,400mm

Body slender; head depressed, distinct from neck; loreal present; single preocular; postoculars 2; supralabials 9; Supralabials IV–VI contact orbit; infralabials 10; eye large; pupil rounded; tail long, slender; ventrals with pronounced keels laterally; dorsals smooth or feebly keeled, with apical pits; lateral keels with sharp notch; midbody scale rows 17; ventrals 213–234; subcaudals 110–142, paired; anal divided.

COLORATION Dorsum greenish-yellow or pale green; head black dorsally with yellow and black cross-bars; scales with dark streak, creating an impression of longitudinal black stripes; venter pale green with a series of black lateral spots on each side.

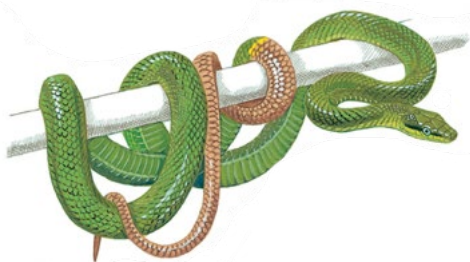
SUBSPECIES Two subspecies are recognized, of which one (*C. o. ornatissima*) occurs in the

region.

HABITAT & BEHAVIOUR Inhabits lowland forests associated with secondary vegetation and cultivated areas, and enters houses. Diurnal and arboreal, making long glides between trees, covering at least 50m. Diet consists of lizards, especially geckos and agamids, and also bats, rodents, birds and other snakes. Oviparous; clutches comprise 6–20 eggs, measuring 26–38 x 13–18mm. Incubation period 65–80 days. Hatchlings 115–260mm.

DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, southern Vietnam and northern Peninsular Malaysia (Pulau Langkawi, Kedah State) (*C. o. ornatissima*). Also northern and eastern India, Bangladesh, Nepal (*C. o. ornatissima*), south-western India and Sri Lanka (*C. o. ornata*).

STATUS Not Evaluated.



RED-TAILED RACER
Gonyosoma oxycephalum

MEASUREMENTS TL 2.4m

Body slender, elongated, compressed; head distinct from neck; snout elongated, squarish; loreal present; single preocular; postoculars 2; supralabials 9–11; Supralabials V–VI, VI–VII or VI–VIII contact orbit; infralabials 12–14; eye large; pupil rounded; tail long, tapering; dorsals smooth or weakly keeled; midbody scale rows 23 or 25 (rarely 27); ventrals 230–263; subcaudals 120–157, paired; anal divided.

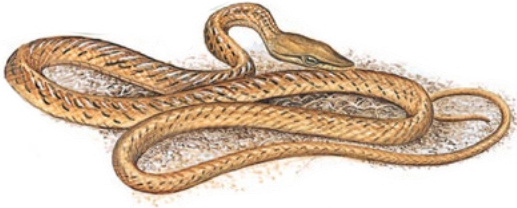
COLORATION Dorsum emerald-green or light green (rarely yellow), with a light green throat and a black stripe along sides of olive-yellow head, from nostril, across eye, to above level of upper jaw; tail-tip yellowish-brown or reddish-orange; venter yellow; juveniles olive-brown with narrow white bars towards posterior; iris grey or yellowish-green; tongue bluish-black.

HABITAT & BEHAVIOUR Inhabits lowland tropical and subtropical forests, including mangrove swamps, and also plantations and gardens, from sea level to 750m asl. Diurnal and arboreal, with some terrestrial activity, especially in juveniles, associated with trees and other foliage. Diet consists of rodents and birds. Oviparous; clutches comprise 5–12 eggs, measuring 65mm, and several clutches are produced

annually. Incubation period 100–120 days. Hatchlings 240mm.

DISTRIBUTION Southern Myanmar, Thailand (Chiang Mai, Trang and Narathiwat Provinces), Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Pulau Nias, Pulau Bangka, Pulau Belitung, the Riau, Mentawai and Natuna Archipelagos, Borneo and Java. Also India (the Andaman Islands), Lombok and Sulawesi (Indonesia), and Balabac, Bohol, Bongao, Dinagat, Lubang, Luzon, Mindoro, Negros and Palawan (the Philippines).

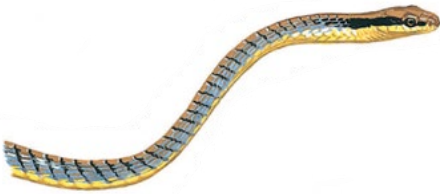
STATUS Not Evaluated.



ORIENTAL VINE SNAKE
Ahaetulla prasina

MEASUREMENTS TL 1,970mm
Body slender; snout elongated; groove along snout; single supraocular; loreals 1–4; single preocular; postoculars 2; supralabials 9; Supralabials IV–VI contact orbit; 4 infralabials contact anterior chin shields; eye large; pupil horizontal; tail long with a prehensile tip; dorsals smooth; midbody scale rows 15; ventrals 194–235; subcaudals 141–207, paired; anal divided.
COLORATION Dorsum typically green, also brown, yellow, dark grey or golden-yellow, speckled with black; yellow stripe along lower flanks; venter light green or dark grey.
SUBSPECIES Two subspecies have been described, of which one (*A. p. prasina*) occurs in the region.

HABITAT & BEHAVIOUR Inhabits edges of forests from sea level to 2,100m asl. Diurnal and arboreal, associated with thick undergrowth and other low vegetation. Diet consists of lizards and birds. Ovoviviparous; clutches comprise 4–10 neonates, measuring 240–490mm.
DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, the Mentawai, Riau and Natuna Archipelagos, Pulau Bangka, Pulau Belitung, Pulau Sibutu, Borneo, Java and Bali. Also Bhutan, north-eastern India, Bangladesh, China (*A. p. prasina*) and the Sulu Archipelago, the Philippines (*A. p. suluensis*).
STATUS Not Evaluated.



BLUE BRONZEBACK TREE SNAKE
Dendrelaphis cyanochloris

MEASUREMENTS TL 1,430mm
Body slender; head distinct from neck; loreal present; single preocular; postoculars 2; supralabials 9 (rarely 8 or 10); Supralabials V and VI contact orbit; infralabials 9; Infralabial V largest; 4 infralabials contact anterior chin shields; eye small; pupil rounded; vertebrae enlarged; dorsals smooth; midbody scale rows 15; ventrals 189–206; subcaudals 137–156, paired; anal divided.
COLORATION Dorsum olive, scales edged with black; broad black temporal stripe to beyond neck at level of Ventral IV, breaking up into spots; all dorsals except first row with black anterior and lower edges; no pale ventrolateral

stripe; venter yellow.
HABITAT & BEHAVIOUR Inhabits lowland forests and agricultural areas. Threat display includes expanding neck to reveal blue interstitial skin, resulting effect being blue with brown-barred neck and body. Diurnal and arboreal. Diet consists of lizards, birds and possibly frogs. Oviparous; clutches comprise 3–5 eggs.
DISTRIBUTION Myanmar, peninsular Thailand, Laos and Peninsular Malaysia (Pulau Pinang, Pinang State and Pulau Tioman, Pahang State). Also Bangladesh and eastern and north-eastern India.
STATUS Not Evaluated.



WHITE-SPOTTED SLUG-EATING SNAKE
Pareas margaritophorus

MEASUREMENTS TL 450mm
Body slender, not laterally compressed; head short, rounded, distinct from neck; snout short; preoculars 1–2; postoculars 1–2; supralabials 6–7; Supralabial IV contacts orbit or separated from orbit by suboculars; infralabials 7; eye large; pupil vertical; tail short; vertebral scale rows enlarged; dorsals smooth; midbody scale rows 15; ventrals 136–159; subcaudals 32–58, paired; anal entire.
COLORATION Dorsum light or dark grey with irregular black cross-bars bordered with white; supralabials and infralabials cream with black mottling; white or yellow nuchal collar sometimes present; venter cream with irregular black speckles.

HABITAT & BEHAVIOUR Inhabits lowland forests, including evergreen forests of bamboo, up to submontane limits, at elevations of 340–1,524m asl. Nocturnal and arboreal, associated with shrubs. Threat response entails curling itself into a tight ball and remaining immobile. Diet consists of snails and slugs. Clutches comprise 6 eggs. Hatchlings ca 70–100mm.
DISTRIBUTION Myanmar, Thailand, Laos, south-western and eastern Cambodia (Cardamom Mountains and Siem Pang District), Vietnam and Peninsular Malaysia. Also eastern China.
STATUS Not Evaluated.



JAVAN RAT SNAKE
Ptyas korros

MEASUREMENTS TL 2.68m
Body robust; head elongated, distinct from neck; loreals 2–3; single preocular; postoculars 2; supralabials 8; Supralabials IV–V contact orbit; 5 infralabials contact anterior chin shields; eye large; pupil rounded; tail long; dorsals smooth anteriorly, weakly keeled posteriorly; midbody scale rows 15; ventrals 160–187; subcaudals 120–151, paired; anal divided.
COLORATION Forehead and anterior of dorsum grey, reddish-brown or olive-brown; posterior of body darkening to nearly black; scales edged with white, becoming more distinct posteriorly, where they appear as white bands on black background; venter, chin and labials brownish-cream.

HABITAT & BEHAVIOUR Inhabits lowland and montane forests from sea level to 3,000m asl. Diurnal and terrestrial, but known to ascend trees to rest and to mate. Diet includes rodents, birds, lizards and frogs. Oviparous; clutches comprise 4–14 eggs, measuring 33.5–48 x 17.1–20.5mm. Incubation period 40–101 days. Hatchlings 290–367mm.
DISTRIBUTION Myanmar, Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Borneo and Java. Also north-eastern India, Bangladesh and eastern China.
STATUS Not Evaluated.



SUNBEAM SNAKE
Xenopeltis unicolor

MEASUREMENTS TL 1,140mm

Body robust, cylindrical; head slightly distinct from neck; snout rounded and depressed; large interparietal in middle of 4 parietals; postoculars 2; supralabials 8; Supralabials IV–V contact orbit; infralabials 7–8; mental groove present; maxillary teeth 35–45; eye small; pupil vertical; tail short; dorsals smooth; midbody scale rows 15; ventrals 164–196; subcaudals 24–31; anal divided.

COLORATION Dorsum iridescent brown, each scale light-edged; juveniles with pale yellow, white or cream collar; venter white or cream.

HABITAT & BEHAVIOUR Inhabits primary forests from sea level to submontane areas at elevations of 0–1,402m asl. Nocturnal and subfossorial, inhabiting burrows excavated by rodents, and also leaf litter and crevices within limestones. Occasionally enters human habi-

tation. Diet consists of rodents, birds, lizards and frogs. Oviparous; clutches comprise 3–17 eggs, measuring 18 x 58mm.

DISTRIBUTION Myanmar, Thailand, Laos, southern and eastern Cambodia, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Pulau Bangka, Pulau Belitung, the Riau Archipelago, Pulau Natuna Besar, Pulau Sipura, Pulau Simeuleu, Pulau Siberut, Borneo and Java. Also south-eastern China, the Nicobar Archipelago (India), and Palawan and the Sulu Archipelago (the Philippines).

STATUS Not Evaluated.



 **POPES'S PIT VIPER**
Trimeresurus cf. popeiorum

MEASUREMENTS TL 1,050mm

Body slender in males, robust in females; head distinct from neck; supralabials 9–11; Supralabial I distinct from nasal; occipital scales distinctly keeled in males; hemipenes long, reaching at least Subcaudal XXV; tail prehensile; forehead scales smooth; dorsals smooth or weakly keeled; midbody scale rows 21 (rarely 23); ventrals 165–170; subcaudals 56–64, paired; anal entire.

COLORATION Dorsum bright green or bluish-green, lacking dark cross-bars; postocular streak narrow and white ventrally, broad and red dorsally in males; postocular streak narrow and white or absent in females; iris red in adults, yellow in juveniles; bicoloured ventrolateral stripe, bright red ventrally, white dorsally, in males; stripe white in females; venter light green; tail brown, mottled with green laterally; tail-tip reddish-brown (except in populations from southern Thailand).

HABITAT & BEHAVIOUR Inhabits montane and submontane forests. Nocturnal and arboreal, associated with low vegetation of shrubs and dense undergrowth. Threat display consists of vibration of the tail-tip. Venom neurotoxic and causes human mortality. Diet consists of birds, frogs, lizards and small mammals. Ovoviviparous; clutches comprise 10–15 neonates, measuring 120–200mm.

DISTRIBUTION Myanmar (except Taninthay State), northern Laos, and northern and western Thailand. Also north-eastern India.

STATUS Not Evaluated.



 **KING COBRA**
Ophiophagus hannah

MEASUREMENTS TL 5.85m

Body robust in adults, slender in juveniles; head large in adults, distinct from neck; paired postoccipital scales present; single preocular; postoculars 2; supralabials 7; Supralabials III–IV contact orbit; infralabials 8; eye large; pupil rounded; tail short; dorsals smooth; midbody scale rows 15; ventrals 215–270; subcaudals 74–125, paired or single, or a combination of the two; anal entire.

COLORATION Dorsum brownish-black, nearly unpatterned to distinctly banded in adults, depending on population, with 27–84 yellow bands; scales on posterior and tail slightly lighter centrally; chin and throat yellow, rest of venter dark grey; juveniles dark brown or black with pale yellow or orange bands.

HABITAT & BEHAVIOUR Inhabits primary forests, including semi-evergreen, evergreen, moist deciduous and tropical dipterocarp forests and mangrove swamps, and sometimes observed in more open areas such as alluvial grasslands, from sea level to montane forests at an elevation of 2,181m asl. Diurnal and terrestrial, with some populations more arboreal than others, and juveniles more arboreal than adults. Dangerously toxic, with several

authenticated cases of bites on humans. Diet includes snakes and monitor lizards. Oviparous; clutches comprise 20–51 eggs, measuring 57.6–64.3 x 32.2–36mm, which are laid in a mound nest of fallen leaves that the female constructs with the aid of her body and tail. Incubation period 63–77 days. Hatchlings 288–640mm.

DISTRIBUTION Myanmar, Thailand, Cambodia, Laos, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Pulau Simeulue, Pulau Galang, Pulau Bangka, Pulau Belitung, Borneo, Java and Bali. Also eastern Pakistan, India, Bhutan, Nepal, southern and eastern China, and the Philippines.

STATUS Not Evaluated.



BIG-HEADED TURTLE
Platysternon megacephalum

MEASUREMENTS SCL 184mm

Carapace oval, flattened; vertebral keel present; head large and covered with undivided scales; jaws hooked; throat with flattened rounded tubercles; tail covered with squarish scales.

COLORATION Carapace yellowish-brown, grey to olive, each scute with radiating dark pattern; plastron and bridge yellow, sometimes with darker pattern.

SUBSPECIES Three subspecies are recognized, of which one (*P. m. peguense*), showing dark plastral seams and a black-bordered pale postorbital stripe, occurs in the region.

HABITAT & BEHAVIOUR Inhabitant of cool hill streams that clammers onto rocks and is even capable of climbing trees. Carnivorous, feeding on insects, snails and worms. Clutches comprise 2–3 eggs, measuring 33–37mm. Hatchlings 38–40mm.

DISTRIBUTION Southern Myanmar, Thailand, Laos and western Vietnam (*P. m. peguense*). Also southern and eastern China (*P. m. megacephalum*), and northern Vietnam (*P. m. shiu*).

STATUS Endangered.



IMPRESSED TORTOISE
Manouria impressa

MEASUREMENTS SCL 302mm

Carapace low; vertebral and costal regions slightly concave; carapace scutes mostly smooth; posterior marginals strongly serrated; upper jaw hooked; outer surfaces of forelimbs bear large scales; single tuberculate scale on each thigh.

COLORATION Scutes on carapace translucent brown to yellowish-orange, with brown, black or orange streaks; plastron yellowish-brown with radiating dark lines; head yellow; limbs brown. Juveniles yellowish-brown with fine black speckles.

HABITAT & BEHAVIOUR Inhabits mid-elevation evergreen and bamboo forests at elevations of 900–1,200m asl. Diet consists of vegetation, especially mushrooms. Clutches comprise 17–20 eggs, measuring 44 x 40mm, which are laid in shallow nests. Hatchlings 39g.

DISTRIBUTION Myanmar (Kachin State and Karen Hills), Thailand, Laos, Cambodia (Cardamom Mountains), northern Vietnam and northern Peninsular Malaysia. Also southern China (record from market).

STATUS Vulnerable.



ASIAN SOFTSHELL TURTLE
Amyda cartilaginea

MEASUREMENTS SCL 750mm

Carapace rounded or oval; differentiated from Malayan Softshell Turtle (*Dogania subplana*) by the rounded (vs straight) sides to its carapace and its relatively narrower head; distinct tubercles at anterior carapace margin.

COLORATION Dorsum greenish-grey or olive, sometimes with yellow-bordered black spots or radiating streaks, which tend to disappear with growth; plastron cream in males, grey in females; head with light blotches on dark grey or olive background in northern populations, nearly unpatterned in populations from the Sundas.

HABITAT & BEHAVIOUR Inhabits side streams of large muddy rivers, peat swamps and marshes. Nocturnal and carnivorous, feeding on fish, frogs, shrimps and water insects. Clutches

comprise 4–8 eggs, measuring 21–33mm, which are laid in nests excavated in riverbanks. Incubation period 130–140 days. Hatchlings 37.2–49.5mm.

DISTRIBUTION Myanmar, Thailand, Peninsular Malaysia, Singapore, Laos, Cambodia, Vietnam, Borneo, Sumatra, Java and Bali. Also north-eastern India, and Lombok and Sulawesi (Indonesia), the latter two localities probably based on introductions.

STATUS Vulnerable.

3

FAUNA

3.4

AMPHIBIANS



ASIAN COMMON TOAD
Duttaphrynus melanostictus

MEASUREMENTS

Females 11.5 cm, Males 8.5 cm

One of the commonest of true toads in Southeast Asia, it occurs in a variety of habitats in both rural and urban areas.

DESCRIPTION There is considerable colour variation, but the species is easily identified by the presence of pronounced paratoid glands (a raised ridge behind the eye) and the lines of warts along the back and sides.

HABITAT & BEHAVIOUR At night it can easily be found on grass lawns, and on paths and roads. Concretised drains are also a favoured habitat, and the species can withstand brackish water.

DISTRIBUTION This is a widespread species. As a native it occurs in the Indian subcontinent (including parts of Pakistan, Nepal, Bangladesh, Sri Lanka), southern China (including Hong Kong, Taiwan) throughout all countries of mainland Southeast Asia, and offshore to the islands of Sumatra, Borneo and Java. The species has been introduced to many islands further east including at least Bali, and various localities in Sulawesi, Timor-Leste and New Guinea.



BERDMORE'S NARROW-MOUTHED FROG
Microhyla berdmorei

MEASUREMENTS

Males 25-28 mm females 27-45 mm

Microhyla berdmorei (common names: Berdmore's chorus frog, Berdmore's narrow-mouthed frog, is a species of narrow-mouthed frog).

DESCRIPTION The dorsal coloration varies from grayish-brown to reddish-brown, often with darker blotches or a faint X-shaped marking on the back. The sides of the body may have contrasting light and dark patterns. The body is stout and compact with a rounded snout. The skin is smooth to slightly granular on the dorsum, while the ventral side is smooth and pale. The hind legs are relatively long and strong, allowing for impressive jumping ability compared to other microhylids. This feature is especially helpful for rapid movement in its terrestrial and semi-aquatic habitats. Found in a variety of environments, including lowland forests, hill forests, agricultural fields, and

gardens. Frequently associated with water sources such as ponds, ditches, and temporary pools.

DISTRIBUTION Widely distributed in South and Southeast Asia, including India, Bangladesh, Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia, and southern China.



DARK-SIDED NARROW-MOUTHED FROG
Microhyla heymonsi

MEASUREMENTS

Males reach 16-21 mm and females 22-26 mm

Microhyla heymonsi (commonly known as the dark-sided chorus frog) is a species of narrow-mouthed frog. As microhylids in general, *Microhyla heymonsi* is a small frog.

DESCRIPTION The dorsal colour is pinkish or greyish above with a black lateral band extending from the snout tip to the groin and entirely covering the sides of the head.

HABITAT & BEHAVIOUR It inhabits a variety of disturbed areas as well as secondary vegetation. It breeds in temporary rain puddles, paddy fields, ditches, marshes and slow-flowing streams.

DISTRIBUTION It's found in northeastern India, southern China, Taiwan, and Southeast Asia south to the Malay Peninsula and Sumatra as well as the Great Nicobar Island. It was originally described from Taiwan.



MENGLIEN PADDY FROG
Micryletta menglienica

MEASUREMENTS SVL 25-30 mm
The dorsal surface is generally brown or reddish-brown, sometimes with darker mottling. There may be lighter spots or markings on the back. The body is streamlined, with a rounded snout and relatively short limbs. The ventral surface is lighter, often grayish or white, sometimes with faint markings. The species can be distinguished by subtle differences in skin texture, coloration, and size compared to closely related species in the genus *Micryletta*.
HABITAT & BEHAVIOR This species inhabits moist montane forests and is often found near streams, pools, or other bodies of freshwater. It prefers shaded, humid environments with plenty of leaf litter and understory vegetation.

Micryletta menglienica is primarily nocturnal and is rarely seen during the day. It is known to be elusive, hiding in leaf litter or burrows.
DIET Like many microhylid frogs, it feeds on small invertebrates such as ants, termites, and other small arthropods.
REPRODUCTION Breeding typically occurs during the rainy season when temporary pools and streams are abundant. Females lay eggs in water, and tadpoles develop in these aquatic environments.
DISTRIBUTION Southern Yunnan (China), Northern Laos, northern Thailand and probably eastern Myanmar
STATUS Vulnerable.



LARGE-HEADED FROG
Limnodynastes kuhlii

MEASUREMENTS
Female 6.7 cm, Male 8.7 cm
DESCRIPTION Its dorsal colouration comprises various shades of brown including pale brown, dark brown or orange brown, and this is usually patterned with darker mottles and streaks. There is invariably a dark bar extending between the eyes, and there is often dark barring on the forelimbs and hindlimbs. The belly is white. Skin texture is rough with numerous small tubercles.
HABITAT & BEHAVIOR Found in a variety of freshwater habitats such as streams, rivers, ponds, and forest floors. Prefers forested areas

but can adapt to disturbed habitats, including agricultural lands and urban fringes. Typically located at elevations ranging from lowlands to montane regions. Primarily nocturnal, but may be active during the day in moist conditions. Males are highly territorial, often engaging in combat to defend their territories and mating sites. Carnivorous, feeding on a variety of invertebrates and smaller vertebrates, including insects, worms, and occasionally other frogs.
DISTRIBUTION Southern China, Myanmar, Thailand, Laos, Vietnam, Peninsular Malaysia, Sumatra, Borneo, Java and Sulawesi.



BANDED BULLFROG
Kaloula pulchra

MEASUREMENTS
Female 57-75 mm, Male 54-70 mm
DESCRIPTION They have a stocky, round body with a small head and short, rounded snout. Their coloration includes a dark brown back with lateral stripes varying from copper-brown to salmon pink, and a lighter ventral side. When threatened, they can inflate themselves to appear larger.
HABITAT & BEHAVIOR Banded bullfrogs are highly adaptable and inhabit a range of environments, including urban areas, rural settings, forests, flooded grasslands, roadside puddles, and urban storm drains. They are fossorial, burying themselves underground during dry periods, and emerge after heavy rainfall to

breed. Their diet primarily consists of ants and termites. When threatened, they secrete a noxious white substance and can inflate their lungs to deter predators. While not a true bullfrog (genus *Lithobates* or *Hoplobatrachus*), the name likely refers to its robust, stocky build and loud, resonant call, which can resemble the vocalizations of bullfrogs.
DISTRIBUTION *Kaloula pulchra* is native to Southeast Asia, with a range extending from northeastern India and Nepal through southern China and Myanmar, down to maritime Southeast Asia. Their burrowing ability contributes to their wide distribution.



ASIAN GRASS FROG
Fejervarya limnocharis

MEASUREMENTS
Females up to 6 cm, males up to 5 cm
DESCRIPTION The Field Frog, also known as 'Asian Grass Frog' or 'Rice Field Frog', is one of the smaller species of the genus *Fejervarya*. In the field it can be identified by its relatively pointed snout and flattened head (when compared to closely related species such as *Fejervarya cancrivora*). It has long toes on its hind legs and intermittent raised skin ridges on its dorsal surface. It is typically brownish, with darker blotches, sometimes with a greenish reddish suffusion or tinge. A pale vertebral stripe may sometimes be present: this may be cream in colour, or sometimes greenish. Its belly is white.

HABITAT IT It thrives in wetlands and adapts well to disturbed habitats such as rice paddies, forest clearings, parks, gardens and oil palm plantations. It is generally nocturnal, being most active during the evening and night when temperatures are cooler. It plays a significant ecological role by controlling insect populations and serving as prey for a variety of predators, including birds, reptiles, and larger amphibians.
DISTRIBUTION Within Southeast Asia this species occurs in Myanmar, Thailand, Cambodia, Laos, Vietnam, Peninsular Malaysia, Singapore, Sumatra, Java, Bali, Borneo, Sulawesi, the Philippines.



BLACK-STRIPED FROG
Sylvirana nigrovittata

MEASUREMENTS SVL 40-75mm

Sylvirana nigrovittata, also known as the sap-green stream frog, is a species of frog in the *Ranidae* family.

DESCRIPTION The dorsal surface is light brown or olive with a pair of distinct black stripes running longitudinally from the snout through the sides of the body. The ventral surface is white or pale yellow. Skin Texture: Smooth, with subtle granular regions on the flanks. Limbs: Long and slender, adapted for jumping, with fully webbed hind feet. Distinct Features: A sharply pointed snout and visible tympanum (ear drum).

HABITAT & BEHAVIOUR Found in a wide range of habitats, including lowland forests, agricultural areas, and near freshwater sources such as rivers, ponds, and marshes. It is adaptable to disturbed environments and can often be found near human settlements. Primarily nocturnal, often found near water sources at night.

Carnivorous, feeding on insects and other small invertebrates. Breeds in still or slow-moving water during the rainy season. Females lay clutches of eggs in water, and tadpoles develop in aquatic habitats.

DISTRIBUTION Widely distributed across Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam, and possibly Bangladesh.



GREEN PARACHUTE FROG
Rhacophorus kio

MEASUREMENTS SVL 72-91 mm

Rhacophorus kio is species of frog in the Rhacophoridae family described in 2006.

DESCRIPTION Bright green dorsum with occasional golden-yellow markings. The ventral surface is pale white or yellowish. Webbing: Well-developed, golden webbing between toes and fingers, aiding in gliding and jumping between trees. Smooth skin dorsally and slightly granular ventrally. A flattened body shape and a broad head with large, forward-facing eyes adapted for nocturnal activity.

HABITAT & BEHAVIOUR *Rhacophorus kio* is an arboreal species that has been recorded from primary and secondary evergreen rainforests with a closed canopy, generally at low elevations.

DISTRIBUTION Found in lowland and montane primary rainforests and secondary forests. Nocturnal and highly arboreal, spending its life in the forest canopy it can glide short distances. Predominantly insectivorous, it breeds

during the rainy season, with males calling from vegetation overhanging water bodies to attract females. Females lay eggs in foam nests attached to leaves or branches above water. Upon hatching, the tadpoles drop into the water below and continue their development.

DISTRIBUTION Laos, southern China, northern Thailand, eastern India, Vietnam, and Cambodia, probably Myanmar.

STATUS Vulnerable



WHITE-LIPPED TREEFROG
Zhangixalus pachyproctus

MEASUREMENTS SVL 40-60 mm

Zhangixalus pachyproctus is a species of tree frog in the family Rhacophoridae. It is known for its arboreal lifestyle and distinctive physical characteristics.

DESCRIPTION The dorsal surface is bright green, often with small white or yellowish spots. The ventral surface is pale, ranging from white to light yellow. Elongated body, adapted for climbing. Long and muscular limbs with large, adhesive toe pads, aiding in arboreal movement. The fingers and toes are fully webbed. Smooth skin with a shiny appearance, typical of many arboreal frogs. Distinct Features: The species name *pachyproctus* (meaning "thick behind") refers to a noticeable feature around the cloacal area, which is somewhat thickened.

HABITAT & BEHAVIOUR Inhabits montane forests and is typically found at elevations between 1,000 and 2,000 meters. Prefers moist, dense forests with abundant canopy cover and proximity to water sources like streams or ponds for breeding. Nocturnal and arboreal, spending most of its time in the trees.

During the day, it hides in foliage or under bark to avoid predators. Feeds primarily on insects and other small arthropods. Breeding occurs in temporary or permanent water bodies during the rainy season. Males call from vegetation near water to attract females. Eggs are laid on leaves or other vegetation overhanging water, and the hatched tadpoles drop into the water below to complete their development.

DISTRIBUTION southern Yunnan, northern Vietnam, Thailand eastern Myanmar, northern Laos

STATUS Data deficient



ORLOV'S TREEFROG
Rhacophorus orlovi

MEASUREMENTS SVL 54-56 mm

Rhacophorus orlovi, commonly known as Orlov's Flying Frog, is a gliding tree frog in the family *Rhacophoridae*.

DESCRIPTION Dorsal surface of head and body reddish-brown with some darker markings; flanks light brown with dark brown reticulation and yellow spots; ventral light grey with some indistinct small dark spots; limbs dorsally light reddish-brown with dark crossbars

HABITAT & BEHAVIOUR The natural habitats of *R. orlovi* are sub-tropical or tropical moist lowland forests, rivers, freshwater marshes, and intermittent freshwater marshes. They can

be observed on trees but also lower near the ground. Nocturnal, with peak activity at night for foraging and breeding. During the day, it hides in vegetation or tree crevices. Uses its webbed feet for gliding or controlled descents from higher branches. Excellent climber, relying on its adhesive toe pads for grip.

DISTRIBUTION Vietnam, Laos, southern Yunnan and likely into northeastern Cambodia..

STATUS threatened by habitat loss.



DOTTED BUBBLE-NEST FROG
Theloderma albopunctatum

MEASUREMENTS SCL 750mm

Theloderma albopunctatum, also known as the Rough-skinned Small Treefrog, is a species of frog in the family *Rhacophoridae*.

DESCRIPTION The body is typically dark brown or gray with white or cream-colored spots scattered across its back and limbs. This coloration serves as an effective camouflage in its natural habitat. The skin is rough and granular, resembling moss or lichen or bird feces, a feature that helps the frog blend into its environment. Its eyes are prominent, bug-like eyes, often golden or copper-colored, which contribute to its common name.

HABITAT & BEHAVIOUR

This tree frog lives in montane and submontane moist forests, where it has been observed high in the trees but also on the ground and on low vegetation. This frog has been obser-

ved between 300 and 1350 meters above sea level. Primarily active at night, when it hunts for small insects and other invertebrates. Breeds in small water bodies, often tree holes or leaf axils filled with water. Eggs are laid in these water-filled cavities, and tadpoles develop in these protected environments. Insectivorous, it feeds on small invertebrates like ants, beetles, and moths.

DISTRIBUTION Known from southern China, central and northern Vietnam and Laos and southeastern Cambodia; populations from northeastern India, Myanmar, to and including Thailand are provisionally attached to this species but likely represent a complex of unnamed species.

STATUS threatened by habitat loss



GORDON'S BUG-EYED FROG
Theloderma gordonii

MEASUREMENTS SVL around 5

Theloderma gordonii is an elusive species within the family *Rhacophoridae*.

DESCRIPTION This species features a flattened, stout body with a truncate snout and prominent canthus. Its dorsal surface is rough, covered with large warts and gland ridges. The coloration can vary depending on the situation and varies from light chocolate to dark coffee with orange gland ridges laterally extending from the tympanum to the cloaca on the lateral sides. The ventral surface is smoother with granulated patches and irregular whitish-gray speckles.

HABITAT & DESCRIPTION Found in montane forests (600-1,500 m above sea level), often in karst landscapes. These frogs are arboreal and are often found near streams, perched on branches or other vegetation. Breeding occurs in water-filled tree holes or karst depressions. Tadpoles develop within these water bodies. Nocturnal, often found perched on trees or near streams at night.

DISTRIBUTION It is found in Thailand, Vietnam and Laos.

STATUS It is threatened by habitat loss.



SERRATE-LEGGED TREE FROG
Kurixalus odontotarsus

MEASUREMENTS

Males 32 mm and females 43 mm

Kurixalus odontotarsus is small member of the family *Rhacophoridae*.

DESCRIPTION The dorsal surface is typically a brown or reddish-brown, with a distinct frilled pattern on the sides. The coloration often includes a mix of darker and lighter shades that help camouflage the frog in its natural environment. One of the key identifying features is the serrate (toothed or jagged) edges on the limbs, particularly the legs, which give rise to the species' common name. This adaptation likely plays a role in its arboreal lifestyle, helping it cling to vegetation. The species has large, protruding eyes, common to many treefrogs, aiding in spotting prey and predators from its perch.

HABITAT & BEHAVIOUR *Kurixalus odontotarsus* is typically found in moist subtropical and tropical forests, both lowland and montane. It prefers humid environments such as forested areas near freshwater bodies like streams, ditches, and intermittent marshes. It is known to be nocturnal, which is typical of many species in the *Rhacophoridae* family. Like many other treefrogs, it breeds in temporary water bodies. Males call from elevated positions, and females lay their eggs in suitable aquatic environments.

DISTRIBUTION It is found in southern China, Vietnam, Laos, and possibly Myanmar.

STATUS It is threatened by habitat loss.

4

FLORA

4.1

TREE SPECIES



ALSTONIA SCHOLARIS
Apocynaceae

COMMON NAMES Blackboard tree (Eng), Tin Pet (Lao) Tree grows up to 30-40 m tall, the bark is smooth, thick and light brown. Inner bark is yellow to brown and has white latex. Tree is briefly deciduous. Leaves grouped in whorls of 4-8, oblong or elliptic, apex usually rounded, attenuate base, smooth margin, thick leaves, and surfaces above and below are smooth. Flowers greenish to yellow, in compound umbels grouped at ends of twigs, more fragrant at night, corolla tubes with soft haired calyx. Fruits, in pairs, are green slender cylindrical follicles, 20-40 cm long and 4-5 mm in diameter.

COLORATION Dorsum brown, unpatterned or with dark brown spots arranged to form longitudinal lines; dark greyish-black stripe on flanks extends from eye to tail; lips yellow with black bars; venter unpatterned yellow or cream.

HABITAT & ECOLOGY evergreen forest, dipterocarp of forest. Flowers bloom in October-March

USES The English common name is supposed to derive from its traditional use for school blackboards and pencils. The wood is often used for coffins and as a plywood core. An infusion of the crushed leaves is used to clean infected wounds. The bitter bark and latex yield a tonic and anti-septic medicine. It can be used to treat anemia, dysentery, malaria, colic, arthritis...



ALSTONIA ROSTRATA
Apocynaceae

COMMON NAMES Tin Pet Noi (Lao)

Tree grows up to 30 m tall, straight, flared trunk, inner bark is brownish-yellow, bark is fissured and longitudinally chapped. White latex is found in leaves and trunk.

Simple pedate leaves grouped in whorls, are oblong or oblanceolate, attenuate base, apex usually apiculate. Thick and smooth leaves, with upper surface dark green and light green under with noticeable venation. Inflorescence in terminal cymose panicle. Flowers are white, grouped in an umbel-like shape, corolla tubes 4-6 mm, lobes 2,2-2,5 mm, overlapping, finely velvety on both sides, with a slight sweet fragrance. The fruits are green solitary pods with numerous seeds.

DISTRIBUTION Thailand, China and Laos (Bokeo, Khammaun)

HABITAT & ECOLOGY evergreen forest, dipterocarp of forest. Flowering period: February- April.

USES wood can be used to make utensils, decoction of leaves is prepared to clean wound inflammation.



MANGIFERA CALONEURA
Anacardiaceae

COMMON NAMES "Wild Forest Mango" (Eng), Mak Maung Pa (Lao)

Tree grows up to 10-15 m. Simple pedate leaves grouped in whorls, thick, oblanceolate, with rounded base, acuminate apex. Thick and smooth leaves, with upper surface dark green and light green under with noticeable venation. Inflorescence in terminal cymose panicle. Stalks of white and yellow flowers, usually monoecious. Pedicels are short 0.1 mm, with dense short hair. Male staminate flowers have 5 fertile stamens. Fruit is a large solitary drupe, ripe fruit with mango shape and texture, is red or yellow with pseudocarp, and aril dark seed.

DISTRIBUTION Thailand, China and Laos (Bokeo, Khammaun)

HABITAT & ECOLOGY evergreen forest. Flowering period: June-July.

USES Wood can be used for construction. Ripe fruit can be eaten.



CANARIUM EUPHYLLUM
Burseraceae

COMMON NAMES Keum (Lao)

Tree grows up to 30-40 m tall. Inner bark is pale brown, bark has fissured scales. Imparipinnate compound leaves with ovate to elliptic leaflets in 4-6 pairs, with cordate or rounded base, crenulated margin, caudate or mucronate apex, no stipules, smooth surfaces. Flower is monoecious and white located in upper leaf axils. Fruit is smooth, dark grey, with one elliptic monocarpic seed.

DISTRIBUTION Thailand, Myanmar and Laos (Bokeo, Hauphan)

HABITAT & ECOLOGY mountain ridge evergreen forest.

USES Soft wood is used to make furniture. Ripe fruit can be eaten.



TERMINALIA CITRINA
Apocynaceae

COMMON NAMES Som Mor Khok (Lao)

Tree grows up to 20-30 m tall. Inner bark usually red-gray and fissured. Leaves are thick and sub-opposite, elliptical to oblong-lanceolate in shape, with a size measure about 3-14 cm x 1,8-6,5 cm, rounded to broadly wedge-shaped at the base, pubescent to almost hairless rufous, with detailed venation. Light yellow flowers grouped in a terminal panicle measuring 3-6 cm long. The calyx tube is hairless outside, and has 5 separate sepals. Fruit is smooth, 5-angled with an ellipsoid to slightly globose shape, usually purple-brown.

DISTRIBUTION Myanmar, China, India and Laos (Bokeo, Hauphan)

HABITAT & ECOLOGY Semi Evergreen Forest.

Flowers bloom in June-July

USES source of soft wood. Used as a medicinal plant to relieve intestinal ulcers and diarrhea. It has an astringent taste.



LITHOCARPUS AURICULATUS
Fagaceae

COMMON NAMES Kor va (Lao)

Tree grows 8-15 meters high. Inner bark is dark and longitudinally chapped. Wood is soft and yellow. Simple leaves usually obovate or lanceolate, caudate apex, entire margin with obtuse base. Leaves are thick and smooth. Inflorescence is terminal and monoecious, in an involucre capitulum. White campanulate flower with a sweet fragrance. Fruit has strong exocarp with a cupule and short tail.

DISTRIBUTION Myanmar, Vietnam and Laos

USES The inner bark is used to make paper.



CASTANOPSIS TRIBULOIDES
Fagaceae

COMMON NAMES Masure Katus (Eng), Kor Nam (Lao) Evergreen tree grows up to 40 m tall with an irregular crown. Wood is strong, usually slow grown. Thin bark shallow or quite deeply fissured, brown or brown-gray colour. Simple oblong leaves, with acute or caudate apex, entire margin with obtuse base. Mature leaves are dark green and shiny above, grey-green below with brown dust-like hairs. Inflorescence in spikes. Simple fruit is green with exocarp covered in prickles, two brown seeds in endocarp.

DISTRIBUTION Myanmar, Vietnam and Laos

USES Nuts are edible. Wood is used for general construction, plywood, utensils, and firewood. Leaves can be used as animal fodder.



TETRAMELES NUDIFLORA
Datisceae

COMMON NAMES Sa Phoung (Lao)

Large deciduous tree grows up to 30-50 m tall, it is considered as one of the "forest giant's". Long flared trunk with spreading open crown, smooth shiny thin silver-grey bark with large circular warts, and thick yellow-brown inner bark. Simple leaves alternate or clustered are usually ovate, with apiculate apex, serrate margin and pale green color when mature. Inflorescence is a terminal dioecious panicle, with small light yellow flowers in drooping spikes. Staminate flowers have 4 alternate stamens. Carpellate flowers with inferior ovary. Fruit is pale brown globose, finely ridged.

DISTRIBUTION Myanmar, Vietnam and Laos

HABITAT & ECOLOGY Semi evergreen forest and evergreen forest. Lowland moist forests favoring flat areas close to streams.

USES Timber and bark can be used to make furniture, paper, packing cases, panels, plywood, wooden shoes.



DIPTEROCARPUS COSTATUS
Dipterocarpaceae

COMMON NAMES Khi Shi Peuk Bang (Lao)

Briefly deciduous tree grows up to 40 m tall. Bark pale brown peeling in thin rounded flakes creating distinctive swirling pattern, inner bark brownish-yellow. Simple leaves usually ovate, with young stelliform floccose. Stem has resin. Leaves are thick, asperous upper surface, tangled hairs below, old leaves are covered in short hairs. Leaves have cuspidate apex, crenulate margin, and deccurent or obtuse base. Leaf stalk covered with minute bristles. Inflorescence is a terminal racemose panicle. Flowers are orange-pink. Fruit is ovate up to 12 cm long, with 2 long and 3 short calyx wings covered with short hairs. Young fruit usually bright red standing out against dark green leaves.

DISTRIBUTION Thailand and Laos (Bokeo)

HABITAT & ECOLOGY evergreen forest, secondary forest, mix, semi evergreen forest
USES strong wood used for construction, ship building or furniture. Oil used for fire lighting. Bark resin used in paint industry and is also effective in treating ulcers.



VATICA ODORATA SYMINGTON
Dipterocarpaceae

COMMON NAMES "Fragrant vatica" (Eng), Shi Daeng (Lao) Evergreen tree up to 30 m tall. Stem with resin, dense and smooth bark is brown gray. Presence of stipules. Leaves are simple alternate, elliptic-oblong, penniveined, with obtuse or shortly acuminate apex, attenuate base, entire margin, thick and smooth leaves. Petioles often with long hairs. Inflorescence is a terminal cymose panicle soft brown-red and hairy. Flowers are cream pink. Calyx in a tube with 5 calyx lobes and 5 petals in a twisted aestivation. Fruit is a winged nut, with 3 long wings obtuse to rounded at the tip and 3 small wings four times shorter.

DISTRIBUTION Thailand, China, Myanmar and Laos (Bokeo, Champasak)

HABITAT AND ECOLOGY evergreen forest. Flowering period: January-May; fruiting time: August – October

USES Softwood can make furniture and be used for heavy construction such as bridges or boats. Timber is valuable since it's hard, heavy and insect resistant.



AFZELIA XYLOCARPA
Leguminosae-Papilionoideae

COMMON NAMES Doussie (Eng), Afzelia (Eng) Large tree up to 30 m tall. Bark usually brown-black and fissured. Compound pinnate leaves with 3-5 pairs of leaflets which are alternate distichous. Presence of linear stipules. Thick and smooth leaves which are usually linear or ovate with obtuse base, entire margin, acute or emarginate apex.

Inflorescence is a terminal cymose. Flower is bright green with single green or reddish petal with a long thin stalk. Sweet fragrance. Calyx tube with 4 calyx lobes, 1 red corolla. Fruit is a big woody pod which splits into 2 sections with 2-4 seeds. Young fruits are green brown compared to old fruits which are dark-brown or black.

DISTRIBUTION Vietnam, Thailand, Cambodia and Laos.

HABITAT & ECOLOGY evergreen forest, dipterocarp forest. Flowers bloom in: February-April. Fruiting period: April-may

USES Beautiful timber used to make cabinet and wood carvings, construction of bridges or house posts. Seeds are harvested for medicinal purposes. Young seeds can be eaten raw.



CALLERYA ATROPURPUREA
Leguminosae-Papilionoideae

COMMON NAMES Purple Millettia (Eng)
Evergreen tree, up to 15-20 m tall. This tree can be easily identified from its dense, symmetrical, dome-shaped canopy. Ramulose branches and stem, bark usually brown, young branches are green and densely covered in soft hair. Compound leaves are imparipinnate, alternate distichous with 9 leaflets. Leaves are thick, lanceolate, with a obtuse base, entire margin, and acute apex. Upper surfaces are glabrous and dark green while below surfaces are light green with an obvious midrib. The leaflets are droopy, glossy, and bend upwards at the midribs. Young leaves are light green brown. Inflorescence is a terminal cymose panicle hairy and brown. Flowers are pea-like,

dark purple and have a sweet fragrance. Fruit is brown woody rounded pod, up to 5 cm long, splitting in two sections with mucronated tip. The capsule typically contains two or three seeds.

DISTRIBUTION Thailand, Myanmar and Laos (Bokeo, Hauphan, Vientiane, Bolikhamxay, Khammaun, Savahnakhet, Salavanh and Champasack)

HABITAT AND ECOLOGY evergreen forest, dipterocarp forest. Flowers bloom in: February-April. Fruit in: April-May

USES wood can be used for firewood or to make furniture.



PTEROCARPUS MACROCARPUS
Leguminosae-Papilionoideae

COMMON NAMES Burma Padauk (Eng), Dou Pa (Lao) Large deciduous tree 10-25 m tall with a dome shaped crown with spreading branches. Bark is grey-brown and flaking, it becomes darker and scaly with age, and exudes red sap. The leaves are 20-35 cm long, pinnate, with 9-11 leaflets, both surfaces are glabrous, with a mature bright green color and scattered brown hairs. Sweet-scented yellow flowers are produced copiously in panicles and racemes. Individual flowers measure about 1.6 cm wide. Fruit is a lenticular-shaped pod with a flat wing that circles its edge. Pods have a diameter of 4.5 to 7.5 cm. Large trees may produce one to several quintals of pods annually.

DISTRIBUTION Myanmar, Thailand, Cambodia, Vietnam and Laos (Bokeo, Luang Prabang, Savahnakhet and Salavanh)

HABITAT & ECOLOGY evergreen forest, secondary forest, semi evergreen forest dipterocarp forest. Flowers bloom in: May-June

USES it's first class timber is valuable for furniture and fine art making. Resin, bark and heartwood can be used to make a red-brown dye. Resin can also be employed to treat mouth infections. Roots have medicinal value.



DALBERGIA OLIVERI
Leguminosae-Papilionoideae

Deciduous tree to 20m with delicate foliage and open, spreading crown when mature. Bark dark grey, rather thick, scaly and flaking in small pieces, inner bark yellow, heartwood dark red. Leaf 15-30 cm long, 5-7 pairs of leaflets, 3-8x 1-3 cm, end leaflet only slightly larger than others, blunt or slightly pointed at both ends, vein network clear. Young leaves pale pink with silky hairs, mature leaves dark grey-green, smooth. Flower +/-1.2 cm, purple in bud, later lilac or white, in branched clusters at or near end of twigs, 10-15 cm. Calyx tube 4-5 mm, dull purple, smooth or nearly so, lower tooth much longer than others. Top petal rounded, as wide as long, bottom petal slightly shorter. Fruit 9-14 x 2.5-4 cm, narrow and pointed at both ends, smooth, pale brown

when dry, much thicker near seeds. Usually 1 seed, 12x9 mm, reddish brown.

DISTRIBUTION Upper Myanmar, Cambodia, Viet- nam and Laos

HABITAT AND ECOLOGY common, semi-open forests but avoiding very degraded areas

USES the wood is hard with a beautiful reddish colour. It is used for furniture and agricultural implements.



MAGNOLIA BAILLONII
Manoliaceae

Briefly deciduous tree to 40 m. Leaf 15-22 x 5-8 cm, narrowly elliptic or oblong, pointed or tapering at both ends. Buds narrow and pointed, young leaves with dense silvery-silky hairs, mature leaves smooth or nearly so. 10-15 pairs of side veins with dense network of smaller ones. Stalks 2.5-3.5 cm, stipule scar <1/2 total length. Flower white, 12-18 sepals/petals, outer ones lanceolate, 2-2.5x 0.5 cm, inner ones linear. Stamens 7-8 mm, carpels densely grey-hairy. Fruit 5-8 cm, yellow-green with pale spots, irregularly knobby, breaking up when mature, leaving characteristic skeletal husks which often remain on the tree throughout the year. Seeds bright red.

DISTRIBUTION Assam, Myanmar, Cambodia, Viet- nam, Yunnan and Laos

HABITAT & ECOLOGY common in hill evergreen forests throughout NT.

USES a useful, durable timber, resistant to termites and insects. Used in construction, the making of precious furniture, and for sawing board.



FICUS ALTISSIMA
Moraceae

Large evergreen «strangling» tree to 30 m, usually with few or no aerial roots. Leaf 8-22 x 4-11 cm, alternate, ovate or oval with blunt or slightly pointed tip and blunt or rounded base, no teeth. Young shoots minutely hairy, mature leaves completely smooth, rather leathery. 3(5) basal veins, 6-10 pairs of side veins, joined into a thin marginal vein. Stalks 2.5-4 cm, with triangular stipules 1-2 cm, falling early. Figs are 1.5- 2.5 cm, in pairs at leaf axils, oval or subglobose, yellow-orange ripening red-violet, smooth. No stalks, 3 thick rounded bracts at base, 3-4 mm. Fallen figs leaving broad raised scars.

DISTRIBUTION NE. India, Myanmar, Andaman Islands, Indo-China, Hainan, Sumatra, Java, Sulawesi, Philippines, Yunnan and Laos (Bokeo)
HABITAT AND ECOLOGY widespread and fairly common, eventually becoming one of the largest trees in the forest
USES the timber is not durable, used only for temporary construction. The tree is a host for the Lac insect.



PHYLLANTHUS EMBLICA
Euphorbiaceae

Small deciduous tree to 8 (20) m with open irregular crown and crooked trunk. Bark grey-brown with creamy orange patches, thin, smooth, peeling in broad flakes, inner bark pink. Leaf 0.9- 2 x 0.2-0.4 cm, alternate, simple but strongly planar and appearing pinnate, oblong or linear with blunt or slightly pointed tip and rounded base, usually asymmetric, untoothed. Stalks <1 mm, with tiny red-brown stipules. Twigs slender, to 20 cm, often falling together with leaves. Flower tiny, pale green or creamy-yellow, +/- tinged pink, in dense simple clusters (fascicles) at leaf axils or behind them, sometimes on short side shoots with young leaves at top, usually with a few female and many males in each cluster. Fruit 1.3-2 cm, no stalks, green and semi-translucent with pale veining, ripening yellowish, globose, juicy and edible but rather acidic, with a hard 3-sectioned stone, each section with (1)2 seeds.

DISTRIBUTION Sri Lanka, India, Nepal, Myanmar, Vietnam, S. China, Malay Peninsula, Sumatra, Borneo, Java, Lesser Sunda Islands and Laos
HABITAT & ECOLOGY very common in drier semi-open forests, fire-resistant
USES the timber is dark red, hard and durable even under water, used for wells, furniture, agricultural tools and charcoal. Fruits edible either raw or pickled, extremely high in vitamin C. Used medically for dyspepsia, biliousness and as a diuretic. A fermented juice from the fruits is said to be effective for jaundice and coughs. The tree is sacred in Hindu religion, connected with Shiva and Vishnu.



MACARANGA DENTICULATA
Euphorbiaceae

Small evergreen tree to 18m with very open crown and straight, tapering trunk. Bark pale grey, smooth with ushaped ridges and shield-shaped leaf scars when younger. Inner bark fibrous with watery pinkish sap. Leaf 14-34 x 10-28 cm, alternate, spiral, broadly ovate to almost circular with slightly tapering tip and peltate base, usually unlobed, margin shallowly toothed or almost untoothed. Young leaves densely covered with minute brown hairs, mature leaves thin, smooth, blue-green above, greyish-white below. Several main veins radiating from stalk, smaller veins forming a «spiderweb» pattern. Stalks 5-18 cm, swollen at both ends. Stipules 7-10 mm, narrow and pointed, falling early. Young twigs hollow. Flower minute, greenish, male and female on

different trees. Fruit 0.5-0.8 cm, mostly behind leaves, green with sticky yellow powder, ripening blackish, globose with 2 shallow lobes, leathery, splitting into 2 parts with a persistent central column. Seeds +/- 2.5 mm, black with thin orange coating.
DISTRIBUTION S. China, Vietnam, Malay Peninsula, Sumatra, Java and Laos
HABITAT AND ECOLOGY common pioneer species in moister open areas and secondary growth, also natural gaps in evergreen forest.



MALLOTUS BARBATUS
Euphorbiaceae

Evergreen shrub or small tree to 8 m with widely spreading crown. Leaf 10-34 x 8-26 cm, alternate or sub-opposite, broadly ovate or circular, often slightly lobed with several short-pointed tips and rounded or heart-shaped base, strongly peltate, usually with scattered shallow teeth. Young shoots densely coated with yellowish woolly star-shaped hairs which persist in mature leaves at least on veins below. 7-9 main veins. Stalks 5-22 cm, with linear stipules +/- 7 mm. Flower spikes often crowded together in branched clusters. Fruit 1.5-2 cm, densely pale brown-woolly, depressed-glo-

bose, in strings to 30 cm, splitting irregularly into 4-6 parts each with a glossy black seed, 4-6 mm.
DISTRIBUTION India, Cambodia, China, Philippines, Malay Peninsula, Java and Laos
HABITAT & ECOLOGY locally common in open areas and secondary growth
USES the timber is resistant to termites and insects but is rather soft and used mostly for paper or firewood. The bark is fibrous and is used to make ropes and artificial feathers. The bark and roots have medicinal properties.



BALAKATA BACCATA
Euphorbiaceae

Large evergreen tree to 35 m with spreading rounded crown and thick steeply ascending branches with drooping tips. Trunk stout, up to 200 cm diameter, slightly buttressed when older. Bark pale grey and quite smooth with large lenticels when young, becoming dark grey-brown and deeply fissured with age, inner bark pale yellow, no latex in trunk but often with white latex in twigs. Leaf 8-18 x 3-8 cm, alternate, spiral, elliptic or ovate with pointed or tapering tip and blunt or rounded base, slightly peltate in younger trees, untoothed, completely smooth. 11-13 pairs of +/- parallel side veins, tertiary veins ladder-like. Stalks 3-7.5 cm, slender, slightly swollen at both ends. Stipules small and falling early. Flower minute, in branched spike-like clusters at end of twigs and upper leaf axils, 4-22 cm, all males or with males and females in same cluster. Fruit 0.8-1.3 cm, dark green with greyish dusting and whitish sap when young, ripening dark purple-black.

DISTRIBUTION NE. India, Cambodia, Vietnam, S. China, Malay Peninsula, Sumatra, Borneo and Laos

HABITAT AND ECOLOGY common to locally abundant in evergreen and moister deciduous forests. Fruits very attractive to birds.

USES timber of poor quality, only used for temporary construction, firewood and as a substrate for mushroom cultivation. The leaves contain tannin and are used as a black dye. The roots and leaves have medicinal properties. The seed oil is used for lighting, candles and as a soap. The fallen fruits are edible and very attractive to barking deer and other wildlife.



BACCAUREA RAMIFLORA
Euphorbiaceae

Small evergreen tree to 10 m with dense spreading crown and crooked trunk, becoming slightly fluted at base, branching pattern strongly sympodial. Bark pale cream or orange-brown, smooth or slightly flaking, thin. Leaf 10-22 x 5-10 cm, spirally-clustered at intervals along twigs, narrowly elliptic or obovate with shortly tapering tip and pointed base, untoothed or with scattered shallow teeth near top. Young leaves reddish, finely brown-hairy, mature leaves dark green and shiny above, completely smooth. 6-11 pairs of arched side veins, joined at margin, raised above. Stalks 3-7 cm, long and slender, swollen at top. Flower small, pale orange or yellow-green, sometimes with violet tinge, male and female on different trees. Fruit 2.5-3.5 cm, pale orange ripening reddish or purplish, ovoid or ellipsoid, hanging in long string-like clusters from older branches and main trunk. Outer layer leathery,

smooth or indistinctly hairy. 2-4 large seeds surrounded by a juicy translucent or pinkish pulp.

DISTRIBUTION N. India, Cambodia, Vietnam, S. China, Malay Peninsula and Laos

HABITAT & ECOLOGY common understory tree of fire-free forests, often cultivated for the sweet, edible fruits.

USES fruits edible, sweet and juicy, used medically for various skin complaints (shingles, herpes, drawing out puss...). Bark used for constipation and as a dark brown dye.



ARENGA WESTERHOUTII
Palmae

Single-stemmed palm to 20 m, but rarely >3 m in the wild, up to 15 loosely clustered leaves. Stem 40-60 cm diam, densely covered with fibrous sheaths. Leaf up to 8 m, once-pinnate, up to 150 pairs of leaflets, 100-130 x 7-10 cm, closely and regularly arranged in a single flat plane, folded downwards at point of attachment. Leaflets linear with irregularly jagged tips, greyish or silvery-brown below, end pair often broader and partly fused. Main stalks to 100 cm, stout. Sheaths deeply split with a network of black fibres along the edges, not thorny. Flower in pendulous clusters 2-2.5 m long, main stalk 60-90 cm, starting amongst leaves but left behind as trunk grows. Fruit are 5-7 cm, globose.

DISTRIBUTION Malay Peninsula and Laos (Bokeo)

HABITAT AND ECOLOGY moist, fire-free forests up to 900 m. The «heart» is a delicacy, so the trees are invariably hacked down.



POUTERIA SP.
Sapotaceae

Evergreen trees usually with white latex. Leaves simple, alternate, spirally arranged, usually thick and leathery, smooth or with forked hairs, un-toothed, stipules none or tiny and falling early. Flowers inconspicuous, mostly white or greenish, regular, bisexual, often nocturnal, facing downwards in small clusters at leaf axils or behind leaves. 4-8 sepals in 1 or 2 rows, almost free, 4-8 petals fused into a short tube at base. Stamens usually in 2 rows, inner row often sterile, 1-2x as many as petals, filaments often short. Single slender style with tiny stigma, ovary superior. Fruits a fleshy berry with persistent calyx at base, not splitting, with slit-like cavities and 1-5(8) large, hard seeds.

DISTRIBUTION Assam, Myanmar, Cambodia and Laos (Bokeo)

HABITAT AND ECOLOGY uncommon, mostly restricted to the understory of less disturbed lowland evergreen forests.

USES good timber but local species are too uncommon to be of widespread use.



CARYOTA GIGAS
Palmae (Arecaceae)

Large single-stemmed palm to 40 m with 3-15 leaves tightly clustered in the upper 1/5 of the trunk. Stem 50-90 cm diam. distinctly swollen in the middle and narrowed towards base and top. Leaf to 7 m, bipinnate fishtail, 19-22 pairs of pinnae each with up to 27 pairs of leaflets, 20-35 x 7-15 cm, with jagged margins and drooping tips. Main stalks to 1 m, stout. Sheaths to 4 m, with greyish or dark brown dusting and black fibres along the edges. Flower in drooping clusters to 6 m long. Fruit 3-3.5 cm, flattened-globose, reddish, usually 2-seeded.

DISTRIBUTION N. Thailand, Laos (Bokeo).

HABITAT & ECOLOGY evergreen forest at 1400-1600 m.



KNEMA FURFURACEA
Myrsicaceae

Evergreen tree to 20 m with narrow, pyramidal crown, branches horizontal with drooping tips. Bark grey-brown, quite thin, flaking in long strips, inner bark with copious pink sap. Leaf 10-50 x 3-14 cm, oblong-lanceolate with pointed tip and gradually narrowed towards the heart-shaped base. Young shoots densely brown-hairy, mature leaves leathery, dull dark green above, grey-green below, smooth or nearly so. 24-35 pairs of side veins, raised above with dense network of smaller veins. Stalks and twigs stout. Flower yellow-brown, in short clusters with woody main stalks, mostly behind leaves. Fruit 3.5-4.5 cm, oblong, rounded at both ends, densely covered with yellow-brown hairs, skin very thick, +/- 1 cm, stalks 0.4-0.5 cm. Seeds with thin crimson coating (aril), fringed near top.

DISTRIBUTION Indo-China, Malay Peninsula, Sumatra, N. Borneo and Laos (Bokeo).

HABITAT AND ECOLOGY a distinctive feature of less-disturbed lowland forests.

USES the bark is used for sores and pimples.



MORINDA CITRIFOLIA
Rubiaceae

Deciduous shrub or small tree to 8m with straggly crown and short, twisted trunk. Bark brown, fissured. Leaf 15-30 x 4-14 cm, pointed at both ends, completely smooth, shiny above, 5-6 pairs of side veins, tertiary veins flat below, stipules obovate and blunt. Flowers 1.5-1.8 cm, corolla smooth outside, hairy at mouth only inside. Fruits 2.5-4 cm, ripening pale yellow. Native to S. Thailand.

DISTRIBUTION India, Myanmar, Indo-China, throughout Malesia to Pacific Islands, Laos (Bokeo).

HABITAT & ECOLOGY common in semi-open forests.

USES the timber is tough but prone to split. The bark is astringent, used for ague and recurring malarial fever. The leaves, bark and wood produce red or yellow dyes with alum mordants. The pulp of the fruits is used for cleaning the hair and metal objects. It can be mashed with sugar and taken as a mild laxative. The tree is sometimes intercropped with coffee.



ANTHOCEPHALUS CHINENSIS
Rubiaceae

Briefly deciduous tree to 30m. Young trees have a long straight trunk with horizontal side branches clustered near the top. Mature trees develop a large, oval crown with drooping branches. Bark pale grey-brown, smooth when young, becoming coarsely flaky when older, inner bark pale yellow. Leaf 10-30 x 5-14 cm, opposite-planar, oblong or ovate with blunt or slightly pointed tips and rounded or slightly heart-shaped base, often +/- asymmetric. Young leaves pale green and softly hairy, mature leaves dark green and glossy above, smooth or slightly hairy below. 8-14 pairs of +/- straight and parallel side veins, curved and open at margin, tertiary veins ladder-like. Stalks 2-4 cm, stipules falling early but leaving distinct ring-like scars. Buds narrowly conical and pointed, with sticky resin. Flower white turning pale orange, in dense spherical heads, 4-6 cm diam, solitary or in pairs at end of twigs. Fruit heads 3.5-5 cm, green then brown, rather fleshy, individual fruits conical, closely pressed together, splitting into 4 sections with many minute, wingless seeds.

DISTRIBUTION India, SE. Asia and Malesia
HABITAT AND ECOLOGY fairly common, usually in open areas along streams
USES the timber is used for general purposes and light construction work, but is also used for symbolic sculptures of Vishnu on temples. The bark is used for treating uterine complaints, blood diseases, dysentery and leprosy, and is also used in anti-fertility. The fruits are edible.



PTEROSPERMUM SEMISAGITTATUM
Sterculiaceae

Deciduous tree to 20m with a slightly fluted trunk. Bark pale greyish or creamy-brown, peeling in thin flakes. Leaf 12-20 x 3-5.5 cm, oblong or lanceolate with long tapering tip and strongly asymmetrical base, rounded on one side, arrow-shaped on the other. Stalk very short, <2 mm long, with deeply divided stipules. Flower 6-8.5 cm, solitary or in small clusters at end of twigs or upper leaf axils, with a mass of deeply divided bracts at the base. 5 narrow pale green sepals with brown star-shaped hairs outside, velvety inside. 5 white petals with pale hairs outside, wider and slightly shorter than sepals. Style with brown hairs at base only. Fruit 5-7.5 cm, cylindrical, not angled, slightly pointed at both ends, without ridges, densely covered with rusty-brown.

HABITAT & ECOLOGY common understory tree of fire-free forests, often cultivated for the sweet, edible fruits.
USES fruits edible, sweet and juicy, used medically for various skin complaints (shingles, herpes, drawing out puss...). Bark used for constipation and as a dark brown dye.

DISTRIBUTION Sri Lanka, India, Myanmar, Cambodia, Vietnam, and Laos



AQUILARIA CRASSNA
Thymelaeaceae

Single-stemmed palm to 20 m, but rarely >3 m in the wild, up to 15 loosely clustered leaves. Stem 40-60 cm diam, densely covered with fibrous sheaths. Leaf up to 8 m, once-pinnate, up to 150 pairs of leaflets, 100-130 x 7-10 cm, closely and regularly arranged in a single flat plane, folded downwards at point of attachment. Leaflets linear with irregularly jagged tips, greyish or silvery-brown below, end pair often broader and partly fused. Main stalks to 100 cm, stout. Sheaths deeply split with a network of black fibres along the edges, not thorny. Flower in pendulous clusters 2-2.5 m long, main stalk 60-90 cm, starting amongst leaves but left behind as trunk grows. Fruit are 5-7 cm, globose.

HABITAT AND ECOLOGY scattered in semi-open forests, easily recognized by the unique leaf base.
USES the wood is heavy and durable, used for house building and some household appliances. The bark has an astringent taste and is used for chewing with Betel nut.

DISTRIBUTION Malay Peninsula and Laos (Bokeo)

4.2

**BOTANICAL GLOSSARY
OF THE TREE BINDER**

Acuminate (apex): tapering, gradually becoming narrower, with concave sides, usually with a more or less sharp point. *Fig.5*

Alternate (leaf): arranged singly at intervals along a stem. *Fig.2*

Apex: tip of the leaf. *Fig.5*

Apiculate (apex): ending abruptly in a small, slender point.

Aril: an extra seed cover, which grows up from the seed stalk (funicle) and completely or partially encloses the seed, often, fleshy and brightly colored. *Fig.8*

Asperous: having a rough surface due to a covering of short stiff hairs.

Attenuate (base): showing a long gradual taper towards the base. *Fig.5*

Axil: the upper angle between a leaf stalk or branch and the stem or trunk from which it is growing.

Bract: a modified or rudimentary leaf beneath a flower or fruit or their clusters.

Calyx: collective name for the sepals or outer envelope of a flower. *Fig. 10*

Campanulate flowe: bell-shaped, as in campanula. *Fig. 15*

Capitulum or head: a racemose inflorescence in the form of a disc of sessile flowers, the youngest at the centre (eg. flower of a daisy). *Fig.9*

Capsule: a dry fruit which splits into sections or opens by slits or holes when ripe. *Fig. 12*

Carpellate flowers: having carpels which represent the female reproductive organ of flowering plants, consisting of an ovary, style (sometimes absent), and stigma. The carpels are separate or fused to form a single pistil.

Caudate (apex): elongated and tail-like. *Fig.5*

Chapped (bark): cracked, rough.

Compound leaf: a leaf of a plant consisting of several or many distinct parts (leaflets) joined to a single stem. *Fig.3*

Compound umbel: an umbel that is branched into successive umbels, like that of a carrot flower. (see *Fig.9* for «umbel»)

Cordate (base): heart-shaped. *Fig.5*

Corolla: the petals of a flower, typically forming a

whorl within the sepals and enclosing the reproductive organs.

Crenulated (margin): with small rounded teeth. *Fig.6*

Cupule: the outer layer of the fruit in the Fagaceae family, sometimes cup-like and surrounding only the base of the nut but not necessarily so.

Cuspidate (apex): abruptly narrowed into sharp spiny tip. *Fig. 5*

Cymose (cyme): flower cluster with a central stem bearing a single terminal flower that develops first, the other flowers in the cluster developing as terminal buds of lateral stems.

Decurrent (base): leaf base extending down the stem below the point of attachment. *Fig.5*

Dioecious: a plant which bears either male or female flowers.

Dipterocarp forest: type of forest native to South East Asia made up of trees that belong to the Dipterocarpaceae family. Trees in this family are tall and are known to produce resins and timber.

Distichous (leaves): also called «two-ranked leaf arrangement» is a special case of either opposite or alternate leaf arrangement where the leaves on a stem are arranged in two vertical columns on opposite sides of the stem: the main body or stalk of a plant or shrub, typically rising above ground but occasionally subterranean.

Drupe or stone fruit: a fleshy fruit in which the seed is enclosed in a bony casing (stone) eg. a plum. *Fig.12*

Ellipsoid shape: a 3-dimensional object which is elliptic in long section and circular in cross section, like a rugby ball. *Fig.13*

Elliptical shape: 2-3 times as broad, widest in the middle and tapering towards both ends.

Endocarp: (stone) the innermost layer of a drupe, surrounding the seed, typically hard or fibrous. *Fig.1*

Exocarp: the outer layer of the pericarp of a fruit. In a fleshy drupe such as a peach, the skin constitutes the exocarp. *Fig. 1*

Flaking (bark): peeling in thin, irregular pieces, usually remaining partially attached at one end for some time.

Flared (trunk): gradually becoming wider at the bottom.

Floccose: covered with or consisting of wooly tufts.

Follicle: a dry fruit splitting along one side only.

Globose shape: spherical, rounded. *Fig. 13*

Imparipinnate (compound leaf): having pinnate leaves with a single leaflet at the apex. *Fig.3*

Inflorescence in spikes: an unbranched, elongated cluster of flowers arranged along a unique axis, the bottom ones maturing first. *Fig.9*

Inflorescence: the term inflorescence appropriately refers to the arrangement of flowers on the plant. *Fig.9*

Involucre: a ring of bracts beneath or around a flower or flower cluster.

Lanceolate (leaf): narrow and pointed, 3-5 times longer than broad and widest towards the base (lance-shaped) *Fig.4*

Lenticular-shaped: convex on both sides, shaped like a lentil seed margin: the outside edge of a leaf blade.

Midrib: the central or principal vein of a leaf.

Monocarpic: flowering and bearing fruit only once, then dies.

Monoecious: a plant bearing both male and female flowers.

Mucronate (apex): broad apex with a short abrupt point on the end of the midvein. *Fig.5*

Ob lanceolate (leaf): like lanceolate but with broadest part near apex. *Fig.4*

Oblong (leaf): uniformly broad along the whole length as in a banana leaf. *Fig.4*

Obovate (leaf): egg-shaped leaf with the narrower end at the base. *Fig.4*

Obtuse (apex): broad apex with two sides forming an obtuse angle. *Fig.5*

Ovate (leaf): egg-shaped leaf with the widest part towards the base. *Fig.4*

Panicle: a loose, branching cluster of flowers on the main axis, as in oats. *Fig.9*

Pedate (leaf): having radiating lobes, each deeply cleft or divided. *Fig.3*

Pedicel: the stalk of a single flower or fruit. *Fig.7*

Peduncle: the main stalk of an inflorescence. *Fig.7*

Penniveined (leaf): having conspicuous lateral veins that are divergent from the midrib and approximately parallel to one another.

Pericarp: the part of a fruit formed from the wall of the ripened ovary. *Fig.1*

Pinnate (compound leaf): having leaflets arranged on either side of the stem, typically in pairs opposite each other. *Fig.3*

Pod: a dry fruit without a fleshy layer, usually splitting open when ripe and typically elongated or flattened with many seeds. *Fig.12*

Pseudocarp: a fruit that contains, in addition to a mature ovary and seeds, a significant amount of other tissue (e.g. pineapple or strawberry).

Pubescent: covered with short soft hair.

Racemose (raceme): an unbranched more or less elongated flower cluster, where the individual flowers are stalked and the lowest flowers open first. *Fig.9*

Ramulose: having numerous small branches.

Ridged: marked with narrow raised bands.

Rounded (base): with a broad arch at the base.

Rufous: reddish brown color.

Serrate (margin): with sharp teeth pointing upwards like a saw. *Fig.6*

Simple (leaf): a leaf that is not divided into parts. *Fig.3*

Stamen: the male fertilizing organ of a flower, typically consisting of a pollen-containing anther and a filament. *Fig.10*

Staminate flowers: having stamens but no pistils.

Stelliform: shaped like a star.

Stipule: a small leaf-like, scale-like or hair-like appendage to a leaf, typically borne in pairs at the base of the leaf stalk.

Sub-opposite (leaves): nearly opposite.

Terminal: at the tip of a twig.

Twisted aestivation: every petal or sepal is outside its neighbor on one margin, and inside its neighbor on the other margin. *Fig.11*

Umbel: a flower cluster in which stalks of nearly equal length spring from a common center and form a flat or curved surface. *Fig.9*

Vein: veins support the leaf and are filled with vessels that transport food, water and minerals to the plant.

Venation: distribution or arrangement of a system of veins as in a leaf blade. *Fig.14*

Whorl: arrangement of sepals, petals, leaves, stipules or branches that radiate from a single point and surround or wrap around the stem. A whorl consists of at least three elements (a pair of opposite leaves is not called a whorl). *Fig.2*

4.3

FIGURES ILLUSTRATING SOME OF THE DEFINITIONS IN THE GLOSSARY

Fig.1 Fruit Structures

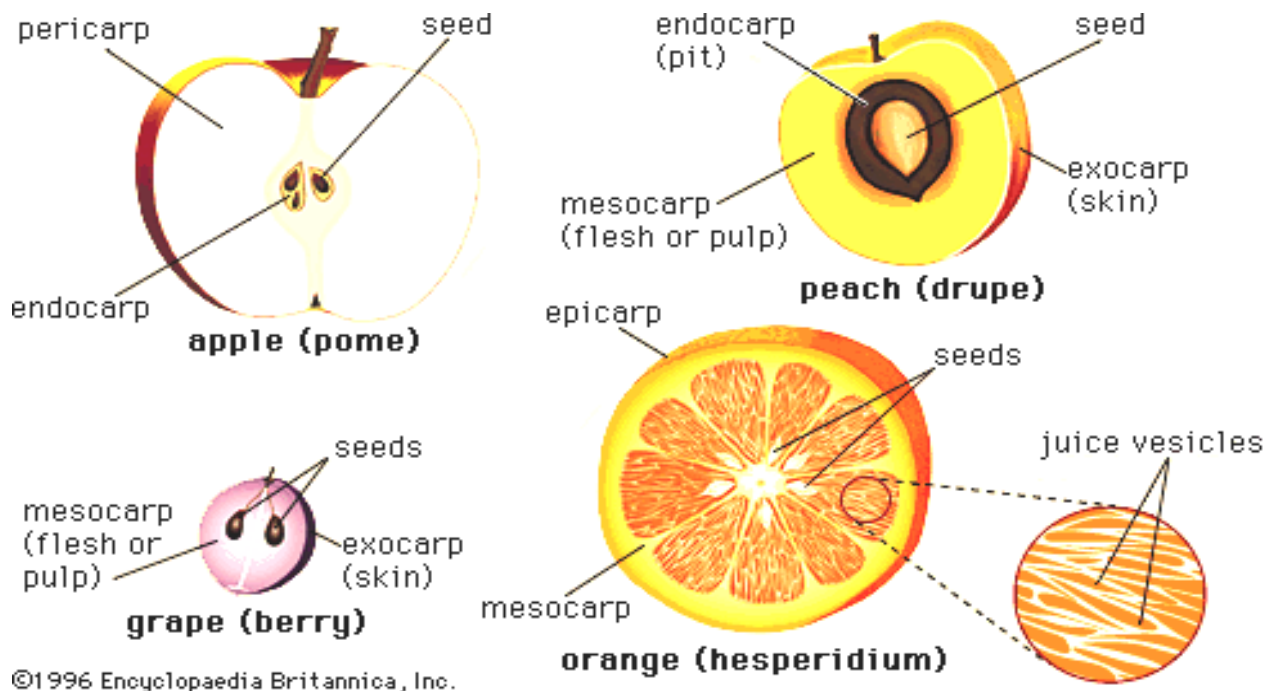
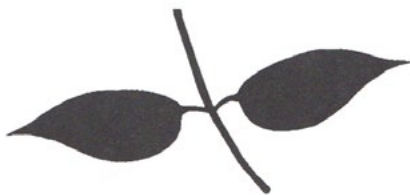


Fig.2 Arrangement of leaves

OPPOSITE:



WHORLED:



ALTERNATE:

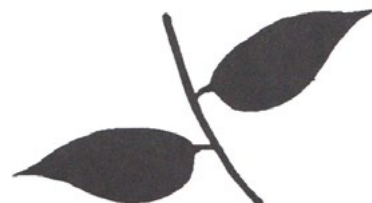
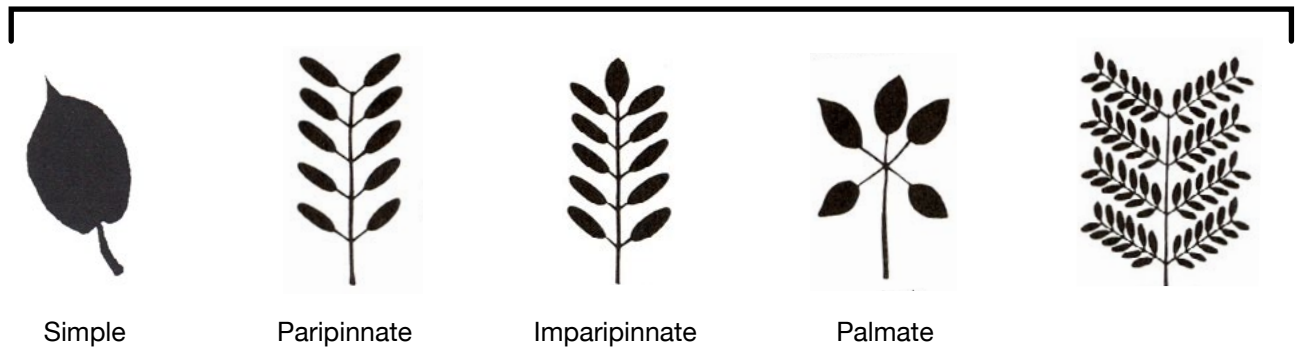


Fig.3 Leaf structures

COMPOUND LEAVES



TRIFOLIOLATE

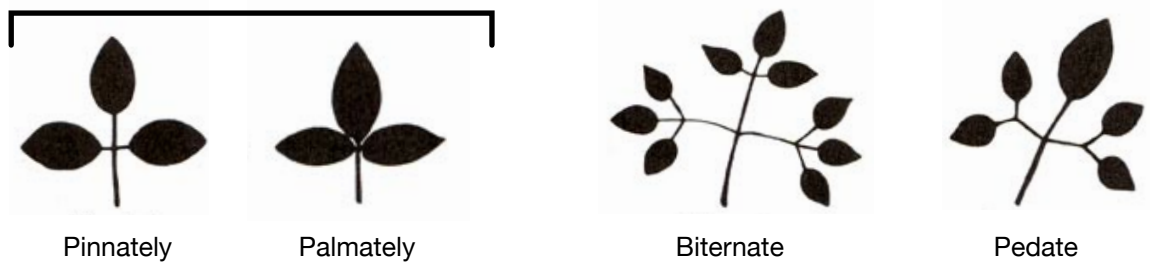


Fig.4 Leaf shapes

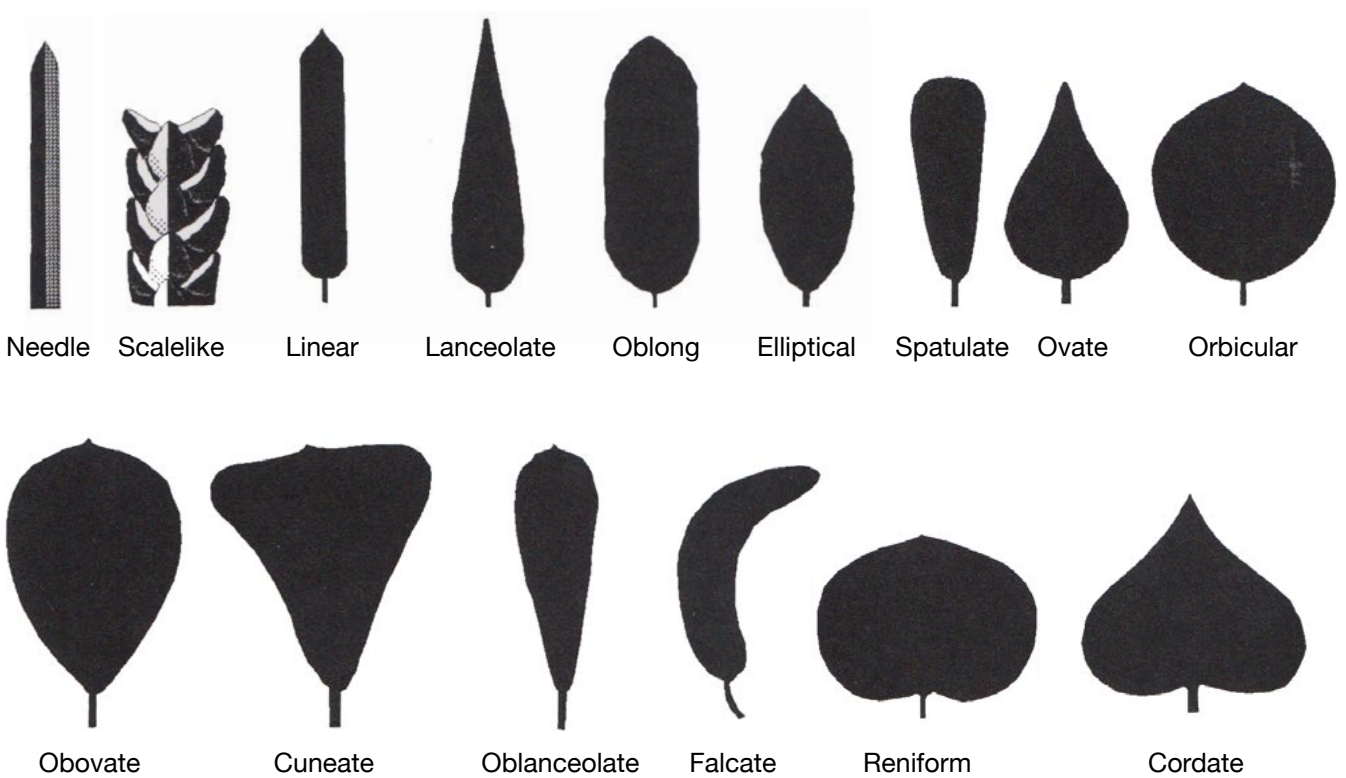
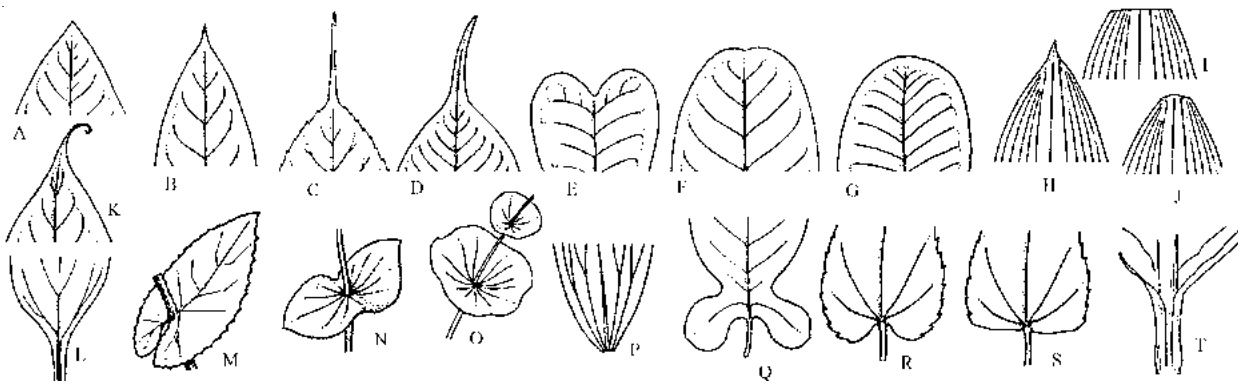


Fig.5 Leaf apex and leaf base



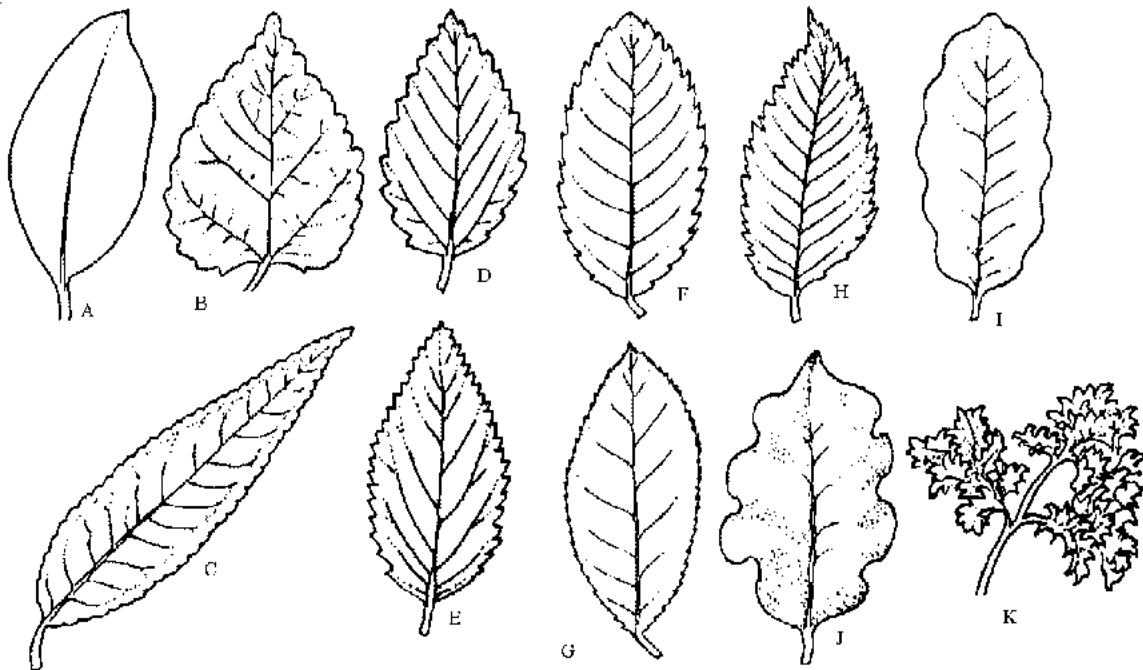
Leaf apex:

A: Acute; B: Acuminate; C: Aristate; D: Caudate;
 E: Emarginate; F: Retuse; G: Rounded;
 H: Mucronate; I: Truncate; J: Obtuse; K: Cirrhose.

Leaf base:

L: Attenuate; M: Amplexicaul; N: Connate-perfoliate;
 O: Perfoliate; P: Cuneate; Q: Auriculate; R: Cordate;
 S: Truncate; T: Decurrent.

Fig.6 Leaf margins



A: Entire; B: Crenate; C: Crenulate; D: Dentate;
 E: Denticulate; F: Serrate; G: Serrulate;
 H: Bi-serrate; I: Undulate; J: Sinuate; K: Crispate

Fig.7 Pedicel and peduncle

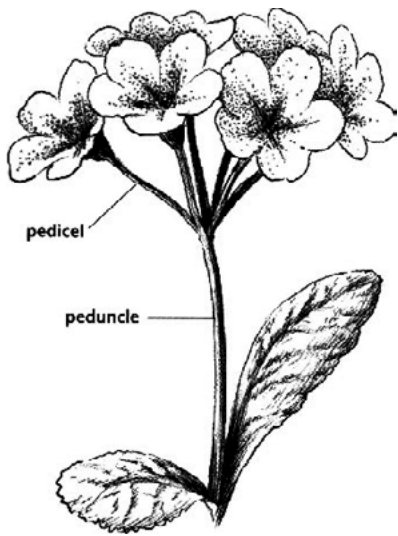
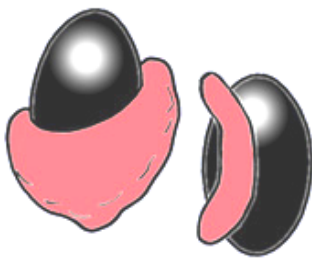


Fig.8 Aril



Seed with aril present

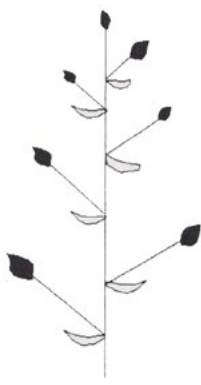


Seed with aril absent

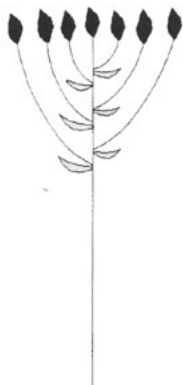
Fig.9 Types of inflorescence



Spike



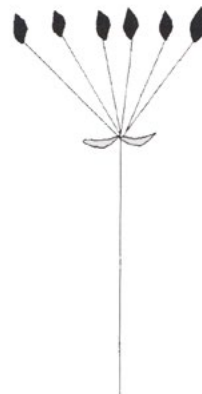
Raceme



Corymb



Panicle



Umbel



Head

Fig.10 Flower structure

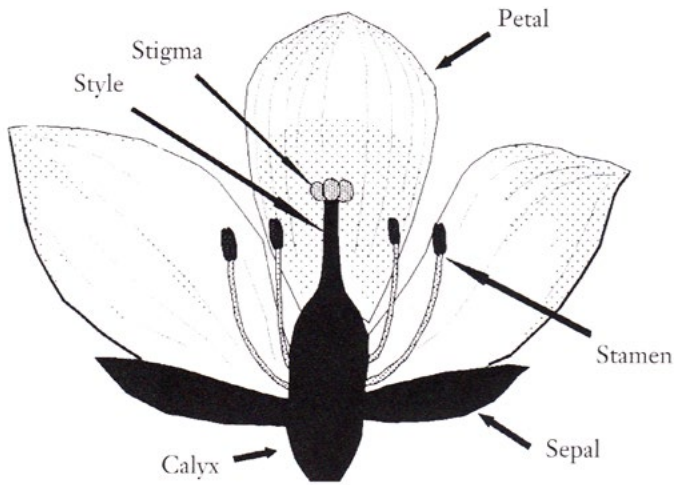
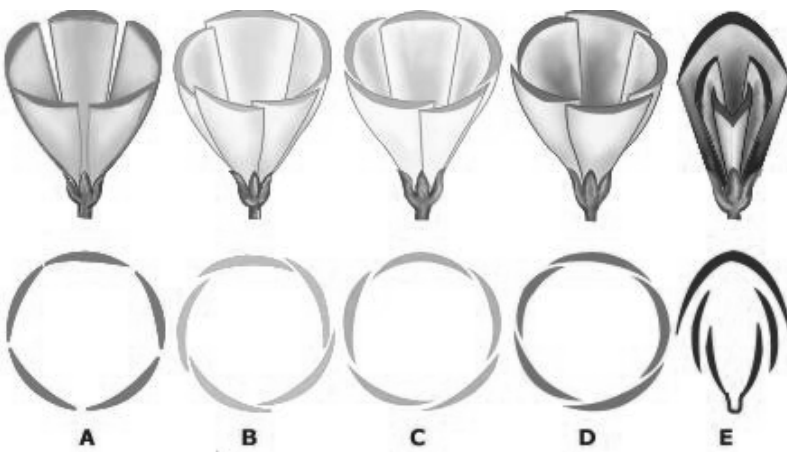


Fig.11 Types of aestivation of calyx and corolla



Different types of aestivation of calyx and corolla

A: Valvate; B: Twisted;
C: Imbricate; D: Quincuncial;
E: Vexillary

Fig.12 Common types of fruits

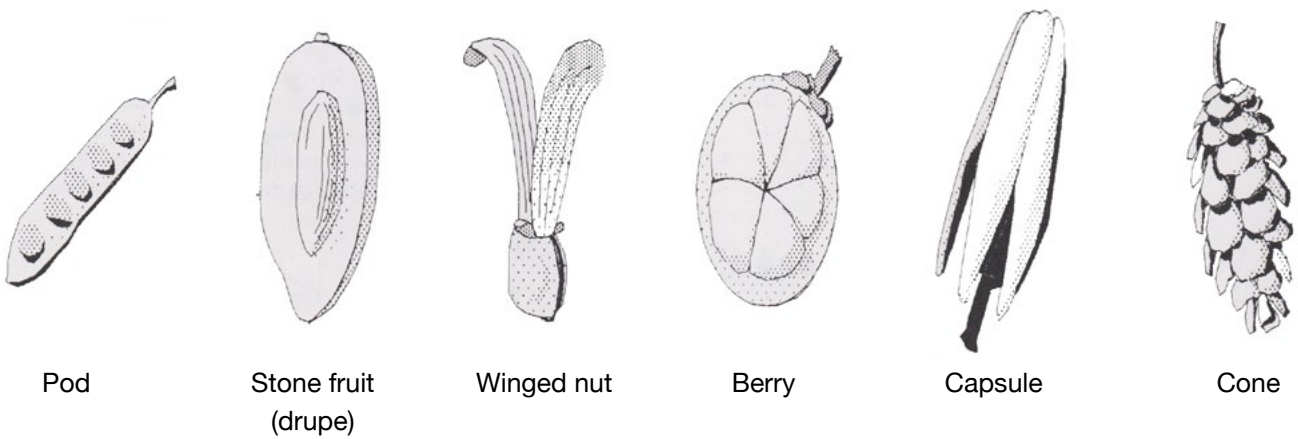
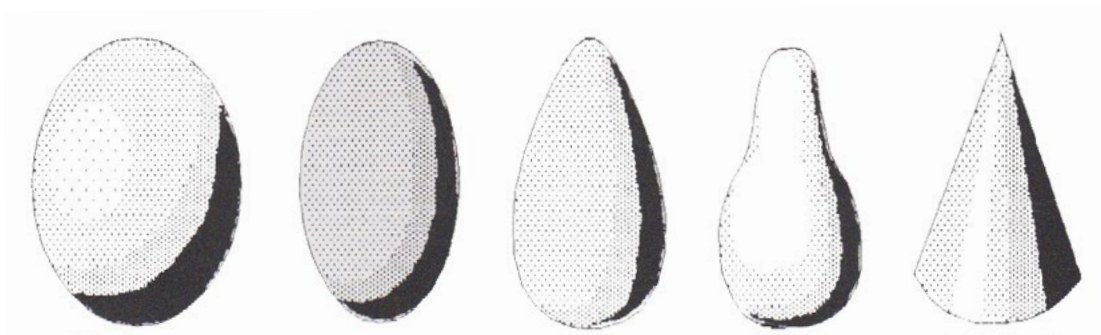


Fig.13 Different fruit shapes



Globose

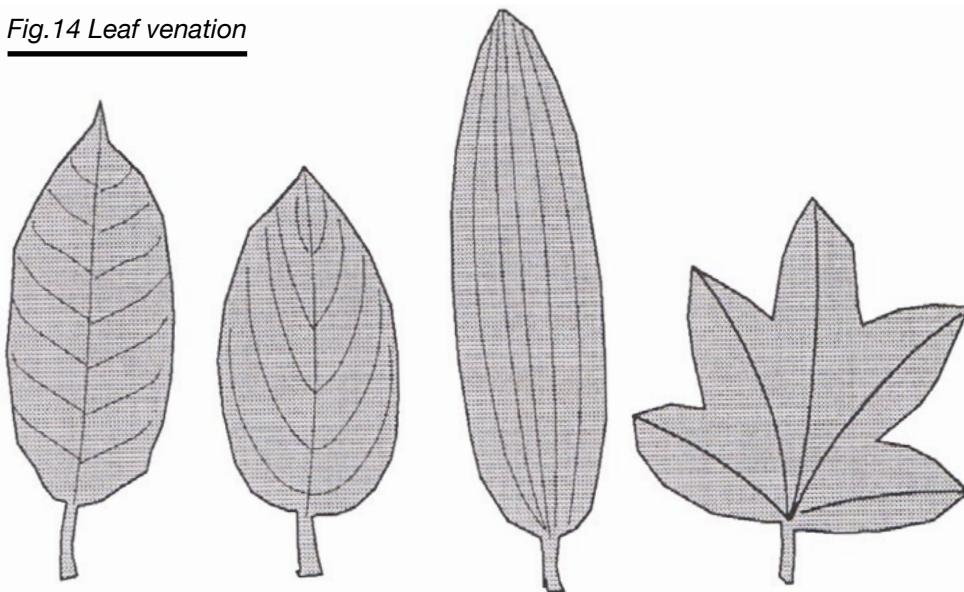
Ellipsoid

Ovoid

Pyriform

Conical

Fig.14 Leaf venation



Pinnate

Arcuate

Parallel

Palmate

Fig.15 Campanulate flower



5

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Trees and Fruits of Southeast Asia: An Illustrated Field Guide (Orchid Guides) de Michael Jensen

FIGURES ILLUSTRATING SOME OF THE DEFINITIONS IN THE GLOSSARY

Plant Systematics, An integrated Approach by Gurcharan Singh

6

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