

Movements, Home range and Social organization. The Greater Asian False-vampire is believed to reside year-round within its home range, although there is movement among diurnal roosting sites over the year. Colonies contain a few individuals up to several thousands. Colony size can vary over time: during a four-year study of one cave colony in India, numbers varied from more than 600 individuals to less than 100, and at another colony, numbers changed from c.2000 to c.150 during surveys in March and August, respectively. Both sexes often roost together, although females typically outnumber males in maternity roosts. Males can form separate male-only roosts. A radio-tracking study of a colony roosting in a temple found that each individual flew at dusk to a non-exclusive foraging area of c.10 ha where it spent the night. Bats did not return to the diurnal roost except in heavy rain. Foraging areas were often within 500 m of the diurnal roost, sometimes up to 4 km away. Individuals often used the same foraging area for many nights. In other areas, they regularly returned to their diurnal roost sites to eat their prey, presumably indicating a nearby foraging territory. They do not share roosts with other species, although a mixed roost with the Lesser Asian False-vampire (*Megaderma spasma*) has been reported.

Status and Conservation. Classified as Least Concern on *The IUCN Red List* (as *Megaderma hyra*). In some areas, populations may be threatened by local hunting for food. Mining and cave development may also result in disturbance or loss of roosting sites.

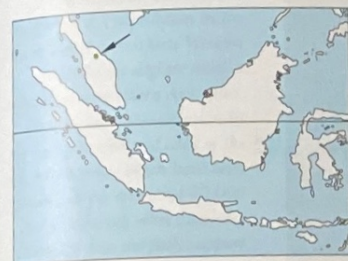
Bibliography Audet *et al.* (1991), Bates & Harrison (1997), Brosset (1962b), Corbet & Hill (1992), Emmanuvel Rajan & Marimuthu (1999), Raghuram & Marimuthu (2007), Raghuram *et al.* (2006), Ratcliffe *et al.* (2005), Ray-Chaudhuri *et al.* (1971), Schmidt *et al.* (2000).

Genus EUDISCODERMA

Soisook *et al.*, 2015

5. Thongaree's False-vampire *Eudiscoderma thongareeae*

French: Mégaderme de Thongaree / German: Thongarees Falscher Vampir / Spanish: Megaderma de Thongaree



Taxonomy. *Eudiscoderma thongareeae* Soisook *et al.*, 2015, "Sirindhorn Waterfall, Bala Forest, Halabala WS [= Wildlife Sanctuary], Wang District, Narathiwat Province, S. Thailand, 5°48'08" N, 101°49'37" E, 135 masl."

This species is monotypic.

Distribution. Known only from a small area around type locality in Hala-Bala Wildlife Sanctuary in S peninsular Thailand; it might also occur in adjacent areas of similar forested habitat in Peninsular Malaysia.

Descriptive notes. Head-body 75–80 mm (tailless), ear 32–37.5 mm, hindfoot 16–18 mm, forearm 64–66.5 mm; weight 30–36 g. Thongaree's False-vampire has large ears, joined over head for c.30% of length of inner margins, and forked tragus, with long pointed posterior branch about one-half the ear length and short anterior branch. Posterior noseleaf is disk-shaped, about the same width and height, with thickened ridge down the middle that connects to heart-shaped median noseleaf, creating an arrow effect. Anterior noseleaf is roughly square, about the same width as posterior noseleaf. Wings are broad and large, with large uropatagium but no visible tail. Fur is long and woolly; dorsum is brownish, with hairs having mid-brown bases and darker tips, and venter is pale gray-brown, with hairs having whitish bases and gray-brown tips. Ears, noseleaf, and wing membranes are dark brown. Baculum has long shaft with two short prongs. Rostrum of skull is stout with a deep frontal depression but no frontal shield and no conspicuous preorbital or postorbital processes. C₁ lacks anterolingual cusp; P₂ is lacking; M₁ has well-developed mesostyle on labial side; and coronoid process of mandible is well developed, much taller than C₁. Dental formula is I 0/2, C 1/1, P 1/2, M 3/3 (x2) = 26.

Habitat. Only reported from one locality in lowland, tropical rainforest.

Food and Feeding. One Thongaree's False-vampire was seen hunting a large beetle, and remains of beetles were found under a roost. It presumably also eats other large insects and invertebrates, but it is unknown if it feeds on vertebrates.

Breeding. A female Thongaree's False-vampire caught in mid-May was post-lactating, suggesting young had been born earlier in the year.

Activity patterns. Thongaree's False-vampires are active mainly at night, roosting during the day, although they might roost for part of the night in a different roost. One individual was found in a day roost in a hollow tree near a small stream and caught foraging along a forest path nearby. Another individual was found roosting in a building at night during a storm. Echolocation calls are very short (1.8–2.6 milliseconds), with interspersed intervals of 30–90 milliseconds. Calls are strongly FM, with up to six strong harmonics. Greatest energy is usually in third harmonic, with peak energy at 53–55 kHz. First harmonic (fundamental) drops from c.19 kHz to c.13 kHz and can be audible at close range to humans with good hearing, although it usually has much less energy than the higher frequencies.

Movements, Home range and Social organization. The only reported diurnal roost had a single male.

Status and Conservation. Classified as Critically Endangered on *The IUCN Red List*, as it is only known from three individuals captured in a single locality in southern peninsular Thailand, with a known area of occupancy of less than 4 km². This area is protected, but much forest nearby has been lost. It might also occur in adjacent areas of forested habitat in Peninsular Malaysia where there is also ongoing loss of lowland forest.

Bibliography Soisook, Prajakijtr *et al.* (2015).

Genus MACRODERMA

G. S. Miller, 1906

6. Ghost False-vampire *Macroderma gigas*

French: Macroderme d'Australie / German: Australische Gespenstfledermaus / Spanish: Megaderma de Australia

Other common names: Australian False-vampire, Ghost Bat



Taxonomy. *Megaderma gigas* Dobson, 1880, "Mount Margaret, Wilson's River, Central Queensland, Australia."

This species is monotypic.

Distribution. Found only in Australia, with known populations in disjunct areas of N Western Australia, N Northern Territory, and NE Queensland; also on a number of offshore Is, including Koolan, Milingimbi, Elcho, Groote Eylandt, and Pellew.

Descriptive notes. Head-body 100–130 mm

(tailless), ear 44–56 mm, hindfoot 20–27 mm, forearm 96–113 mm; weight 130–170 g. The Ghost False-vampire is the largest megadermatid and one of the largest insectivorous bats in the world. Males average slightly larger than females. Ears are large, joined over forehead for c.40% of their height, and well-developed forked tragus, with tall pointed posterior fork and relatively short rounded anterior fork. Noseleaf is tall and erect, somewhat oval-shaped, generally narrower at top; well-developed central ridge joins to semicircular median noseleaf. Anterior noseleaf is small and does not completely cover muzzle. Anterior part of muzzle lacks fur, and lower jaw protrudes beyond upper jaw. Uropatagium is large; there is no visible bony tail. Overall very pale in color. Fur is pale gray or grayish brown on back and top of head and whitish underneath; wing membranes, ears, and noseleaf are pale pinkish or brownish. Baculum consists of two separate hook-shaped bones. Rostrum of skull has partly developed frontal shield with no depression and moderately developed preorbital and postorbital processes. C₁ has large anterolingual cusp; P₂ is lacking; M₁ has greatly reduced mesostyle; and coronoid process of mandible is shorter than C₁. Dental formula is I 0/2, C 1/1, P 1/2, M 3/3 (x2) = 26.

Habitat. Variety of habitats from rainforest in the east to open and semi-open dry areas in most of its distribution, including rocky areas, open forest, and savanna woodlands.

Food and Feeding. The Ghost False-vampire mainly eats small vertebrates and large invertebrates. Vertebrate prey includes small mammals such as mice and other species of bats, frogs, lizards, and birds. Invertebrates include many types of large insects such as orthopterans, cockroaches, termites, beetles, moths, spiders, and centipedes. It typically hunts by hanging from a perch while searching for prey and changes perches about every 15 minutes. After a successful capture, an individual returns to a roosting site to eat its prey. Prey is manipulated with thumbs and mouth. Vertebrate prey is typically eaten headfirst. Inedible portions such as wings of large insects are dropped on ground below the roost. When individuals catch large vertebrate prey such as mice, they might not need to feed every day. The Ghost False-vampire relies mainly on prey-generated sounds such as footsteps or rustling of leaves to detect prey, although echolocation is used to assist with prey capture and can be used to detect flying prey. It has among the most sensitive hearing measured among bats. Large ears amplify sounds up to 30 dB, especially in frequencies of 4–10 kHz, which would help them to readily detect sounds created by their prey.

Breeding. In the northern part of the distribution, mating occurs in May, and females give birth to one young in July–August after 11–12 weeks gestation. Farther south, young may be born in October or November. Young remain with their mothers for several weeks, clinging to one of the inguinal false nipples when not suckling. A mark-recapture study found that c.40% of one-year old females and more than 90% of older females breed each year.

Activity patterns. Ghost False-vampires leave their day roosts c.1–1.5 hours after sunset. Typically, they actively forage for 1–2 hours in the evening and again shortly before dawn, although occasionally through the night depending on their hunting success. During the day, they roost in caves, abandoned mines, and boulder piles. They are not known to use torpor or hibernate. Echolocation calls are short (1–3 milliseconds) FM calls, with multiple harmonics. Most energy is in the second (c.40–30 kHz) and third harmonics (c.60–45 kHz).

Movements, Home range and Social organization. Large cave colonies can include several hundred individuals, with one report of 1500 individuals, but many colonies are small with just a few individuals. In some locations and times of year, both sexes roost together, but females and young can form segregated maternity colonies, some of which are quite large. Numbers of individuals in a colony vary through the year, indicating some movement among roosts. There is very strong genetic structuring among different populations, indicating there is little long-distance movement among colonies, especially by females. Ghost False-vampires emit low-frequency chirps as social calls that can be heard by humans up to 100 m away. Individual bats use foraging areas up to 60 ha in size that can be close to their diurnal roosts or up to 2 km or more away. Foraging areas of several individuals overlap.

Status and Conservation. Classified as Vulnerable on *The IUCN Red List*. Overall populations are relatively small (under 10,000 individuals), with ongoing decline. Historically, Ghost False-vampires were known from many sites well south of the current range, including into central Australia, but they are now restricted to more northern areas in Australia. Genetically, different populations appear to be isolated, indicating limited potential for recolonization if colonies are lost. A major threat is loss or destruction of cave roost sites from quarrying or reopening of old mines. Ongoing spread of non-native cane toads (*Rhinella marina*) might also threaten some populations.

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Status and Conservation. Classified as Least Concern on *The IUCN Red List* (as *Megaderma byra*). In some areas, populations may be threatened by local hunting for food. Mining and cave development may also result in disturbance or loss of roosting sites.

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Habitat. Only reported from one locality in lowland, tropical rainforest.

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Status and Conservation. Classified as Vulnerable on *The IUCN Red List*. Overall populations are relatively small (under 10,000 individuals), with ongoing decline. Historically, Ghost False-vampires were known from many sites well south of the current range, including into central Australia, but they are now restricted to more northern areas in Australia. Genetically, different populations appear to be isolated, indicating limited potential for recolonization if colonies are lost. A major threat is loss or destruction of cave roost sites from quarrying or reopening of old mines. Ongoing spread of non-native cane toads (*Rhinella marina*) might also threaten some populations.

Bibliography Churchill (2008), Guppy & Coles (1988), Guppy *et al.* (1985), Hoyle *et al.* (2001), Hudson & Wilson (1986), Richards (1983), White, A.W. *et al.* (2016).

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6. MacInnes's Mouse-tailed Bat *Rhinopoma macinnesi*

French: Rhinopome de MacInnes / German: MacInnes-Mausschwanzfledermaus / Spanish: Rhinopoma de MacInnes



Taxonomy. *Rhinopoma cystops macinnesi* Hayman in St. Leger, 1937, "Bat Island, near Central Island, Lake Rudolf (= Lake Turkana)," Kenya.

The form *macinnesi* was considered a marginal subspecies of *R. hardwickii*, distinguished from others by extremely small size. A detailed taxonomic revision of the family by V. Van Cakenberghe and F. De Vree in 1994 demonstrated a distant position of its type series, distinct from all other

samples in canonical morphometric space of *Rhinopoma*, and they also found similar characteristics in two samples from Somalia and southern Eritrea, formerly identified as *R. hardwickii cystops* or *R. muscatellum*. Independent species status of *R. macinnesi* was

generally accepted and is supported by results of molecular analyses by P. Benda and P. Vallo in 2017. In contrast, specimens from extreme south-eastern South Sudan formerly attributed to *macinnesi* were found to belong to *R. cystops*. Monotypic.

Distribution. East Africa, restricted to S Eritrean coast (Assab), N Somalia (Galgala Oasis), W Kenya (six records including four on islands in lakes Turkana and Baringo), and extreme NE Uganda.

Descriptive notes. Tail 55–76 mm, ear 11–20 mm, forearm 45–53 mm; weight 5–11 g. MacInnes's Mouse-tailed Bat is by far the smallest species of *Rhinopoma* (greatest lengths of skull 14.2–16.2 and lengths of tooth row from C¹ to M³ 5.4–6.5 mm), with particularly long tail, longer than other species (137% vs. forearm on average). Dorsal pelage is sepia gray, and ventral pelage is gray and sparse on lower abdomen. Skull is delicate, with shallow sagittal crest in frontal region that can even be absent. Nasal swelling is relatively large, with anterior projection at level of canine alveolus, and dorsal outline is triangular. Palatal incision is between V- and U- shaped, terminating at level of distal margin of M³.

Habitat. Semi-desert zone with sparse grass and shrub vegetation. MacInnes's Mouse-tailed Bat occurs on four islands in large lakes.

Food and Feeding. No information.

Breeding. No information.

Activity patterns. No information.

Movements, Home range and Social organization. No information.

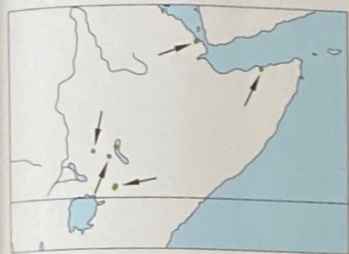
Status and Conservation. Classified as Data Deficient on *The IUCN Red List*. There is insufficient information on extent of occurrence, natural history, and threats to determine the conservation status of MacInnes's Mouse-tailed Bat.

Bibliography ACR (2018), Aulagnier (2013f), Benda & Vallo (2017), Demeter & Topál (1982), Harrison & Bates (1991), Hayman (1937), Hill (1977), Kock (1969d), Koopman (1975), Lanza *et al.* (2015), Van Cakenberghe & De Vree (1994), Yalden *et al.* (1996).

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Habitat. Semi-desert zone with sparse grass and shrub vegetation. MacInnes's Mouse-tailed Bat occurs on four islands in large lakes.

Food and Feeding. No information.

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Activity patterns. No information.

Movements, Home range and Social organization. No information.

Status and Conservation. Classified as Data Deficient on *The IUCN Red List*. There is insufficient information on extent of occurrence, natural history, and threats to determine the conservation status of MacInnes's Mouse-tailed Bat.

Bibliography. ACR (2018), Aulagnier (2013f), Benda & Vallo (2017), Demeter & Topál (1982), Harrison & Bates (1991), Hayman (1937), Hill (1977), Kock (1969d), Koopman (1975), Lanza *et al.* (2015), Van Cakenberghe & De Vree (1994), Yalden *et al.* (1996).