

Survey of the Somali Lesser Bushbaby (*Galago gallarum*) and Northern Lesser Bushbaby (*Galago senegalensis*) in Kenya and Ethiopia

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During a 9 days survey in Meru National Park and Kora National Reserve, Kenya, the Somali bushbaby (*Galago gallarum*) was encountered at a rate of ca. 0.7 individuals/h in *Commiphora* spp./*Acacia* spp. woodland and bushland on the north bank of the Tana River (300-800 m a.s.l.). *G. gallarum* was found sympatric in some areas in Meru N.P. (north bank) with the Kenya lesser bushbaby (*Galago senegalensis braccatus*), a taxa more abundant on the south bank of the Tana River (Kora N.R.). *G. senegalensis* was encountered at an overall rate of 0.3 individuals/h. No *G. gallarum* were observed south of the Tana River.

During an 11 days survey in southern Ethiopia and northern Kenya, *G. gallarum* and *G. senegalensis* were encountered at a rate of 0.6 and 0.5 individuals/h, respectively. *G. gallarum* was only observed in Kenya.

The highest altitude the Somali bushbaby was observed at during this survey was 1100m. A total of 35 to 41 *G. gallarum* individuals were observed during this survey.

This report presents details of our observations on *G. gallarum* and *G. senegalensis* during this survey, as well as notes on the diurnal primates we encountered.

Galago gallarum (Thomas, 1901).

Recognized as a species distinct from *G. senegalensis* by Olson (1979), Nash et al. (1989), Groves (1989), Grubb et al. (in press).

Distribution: southern Ethiopia, southern Somalia, northern Kenya. Groves describes their range as "broadly between Tana, Kenya - Webi Shebelyi Rivers, Somalia - west to Lake Turkana and Rift Lakes in Ethiopia".

Conservation status: At risk (Oates, 1996). The restricted area *G. gallarum* occupies is undergoing severe habitat disruption because of human activity. Designated as Near Threatened by the IUCN (Nowak, 1999).

Field Descriptions De Jong & Butynski (2003)

Galago gallarum

Face: Face off white (blond/buff). Dark, narrow but distinctive circumocular ring. Thin white interocular stripe. Nose blackish, slightly up-turned at tip. Eyelids greyish (picture present). Bright orange eye shine.

Ears: big, black front and back, highly mobile.

Forearms: light buff, darker buff at shoulders.

Hands & feet: long fingers. Palms black, fur dorsal side hands light and in no contrast

with arms.

Flanks and dorsum: Buff, light sandy brown/reddish (pale). Lighter towards the head.

Ventrum: Off-white, greyish on lower belly. Ventrum darker than face.

Tail: Lighter at very base, rest darker brown, nearly black. Contrast with body. Broader towards tip.

Overall: small in size, light in colour, big eyes with bright orange eye shine. Black eye rings, nose, and ears contrast against white face. Near black tail contrasts against pale body. Best characteristics for distinguishing *G. gallarum* from *G. senegalensis* are the great contrast between the front of the black ears and the whitish face, and between the blackish tail and the pale body of *G. gallarum*.

The animals observed in Northern Kenya (8 October 2003) are possibly more rufous on upper arms and flanks than the animals observed in Meru N.P, Kenya.

The light face, black eye-rings, black ears and dark tail of *G. gallarum* seem to be similar to that of *G. matschiei*, present in DRC and isolated forest patches in Uganda.

*Galago senegalensis*_(in comparison with *G. gallarum*)

Face: Not white but greyish/brown. Ears not black but rather pinkish-brown. Eye-rings and nose do not contrast with face.

Flanks and dorsum: Greyish/brown. Less contrast in fur colour for the animal overall.

Tail: Tail less dark. No contrast between tail and body.

The National Museums of Kenya holds one *G. gallarum* specimen collected at 29/9/1911, Ewaso Ng'iro, Kenya, altitude 1400m. This specimen is described below and compared with a *G. senegalensis* specimen, also present at the National Museums of Kenya, collected at Kora N.P., Kenya.

	<i>G. gallarum</i>	<i>G. senegalensis</i>
Ears	Black skin front & back	Greyish or flesh colour
Dorsum	Light reddish – brown	Greyish
Hind legs	Nearly same colour as dorsum	Distinctive colour change on back of hind legs (reddish) to back of rump (greyish)
Tail	Very dark brown/black	Medium brown
Ventrum	Off white with yellowish tint	Off white with yellowish tint

Body measurements of *G. gallarum*, National Museums Kenya, 1911 are taken from the official label:

Head/body – 167 mm
Tail – 280 mm
Ears – 35 mm
Hind foot – 69 mm

In March 1987, J. Kingdon collected one adult *G. senegalensis* specimen between Shisha and Shawa rivers, Harenna Forest, Ethiopia (N 6° 33'; E 39° 43') 1770m.

Head/body – 180 mm
Tail – 284 mm
Ears – 42 mm

Hind foot – 78 mm

Field description by Perkin & Butynski (Unpublished notes)

Face: ashy grey around the forehead, cheeks and muzzle giving the impression of large eye rings. Nose stripe grey white. Nose tip appeared to be black and the eyes had faint black rings with a black 'tear' mark. Eyes relatively large and gave bright orange eye shine.

Forearms: shoulders and tights orange brown

Hands: dorsal part grey

Flanks and dorsum: grey reddish- brown from base of the tail to the top of the head.

Tail: distal two thirds, even length fur grey-brown color. Proximal third bushy and dark brown-black in color.

Vocalizations were found similar to the mild-alarm call of *G. senegalensis*.

G. gallarum and *G. senegalensis* are marginally sympatric (Olsen, 1979, 1986; Nash *et al.*, 1989; Groves 2001; Grubb *et al.* in press). No evidence of nest building is reported.

Description by Groves (2001)

'Shorter hind limbs than other members of this species-group; medium sized ears, narrow brown eye-rings incomplete laterally, face otherwise almost white; dorsally brownish buff with yellowish outer surface of limbs; ventrally off-white with a yellowish boundary between the two zones; tail mostly black. Size like that of *G. senegalensis* but tail slightly shorter, hind foot and ear markedly so'.

Description by Yalden *et al.* (1996)

G. gallarum is slightly smaller than *G. senegalensis*. *G. gallarum* is distinctively colored, buff to sandy-brown above with a blackish tail.

Description by Nash, Bearder and Olson (1989)

'Moderate size, being slightly smaller than the Senegal galago; head broad with short muzzle and relatively large eyes; dorsal pelage buff to sandy-brown; ventrum white to light gray; flanks of limbs brightly colored; face lighter in color than ventrum; interocular stripe prominent because of circumocular rings, brown and usually incomplete laterally; tail not bushy, being black over much of its length; nails not pointed'.

'Occurs with the Senegal galago along the north and southeast margins of its range. May be found with the Zanzibar and Garnett's galagos along riverine forest margins of the lower reaches of the Tana and Giuba Rivers, but this has yet to be established'.

Museum measurements by Olson & Nash (in press).

Lengths	<i>G. gallarum</i>	<i>G. senegalensis</i>
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	<i>Mean (N)</i>	<i>Range</i>	<i>Mean (N)</i>	<i>Range</i>
Head/body	167 (25)	130-200	165 (508)	132-210
Tail	252 (25)	205-293	255 (498)	195-303
Ears	35 (27)	30-40	40 (483)	21-57
Hind foot	62 (25)	57-75	67 (498)	52-78
Weight (g)		ND	266 (388)	112-300

Description by Preston – Mafham (1992)

G. gallarum was once included as a subspecies of *G. senegalensis*. Reported to feed on insects and the fruit of various trees subject to seasonal availability. Typical leapers with long hind-limbs and, despite their small size, they can perform vertical jumps in excess of 2m. It became obvious this is a full species when overlapping ranges were found but maintaining their identities without interbreeding.

Description by Osman Hill (1953)

'The somali galago is a drab-colored animal with yellowish limbs, larger and with a shorter muzzle than *zanzibaricus*; otherwise similar to *braccatus*. Hairs dark grey at the base and for half its length, thereafter fulvous, except for a sub-terminal whitish band and a blackish tip. Circumorbital rings almost black; interocular stripe and dorsum nasi white; hands and feet yellowish-white; chin, throat, under parts white, with bases of hairs slaty-grey on belly, but not on throat or inguinal region. Tail smokey-grey with an almost black tip'.

Observations 11th of September – 19th of September, Meru & Kora N.P., Kenya

Date: 11 September 2003

Time: 20.45 – 23.00h

Location: Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), Kenya. Elevation: 599m

Weather: Clear sky, full moon

Habitat: *Acacia* spp. (dominant)/*Commiphora* spp. bush land. Trees up to 15m.

Observations:

Two *G. gallarum* sightings in an *Acacia* spp./*Commiphora* spp. tree clump (four trees), female with juvenile. Juvenile ~ 80% of adult size and more slender build. Both animals feed on gum provided by *Commiphora* spp. (0.5m from ground, picture present) and both are seen catching insects (most likely benefiting from the torch light the observers provided) in either *Acacia* spp. and *Commiphora* spp. No interactions between the animals are seen.

Vocalizations heard of several animals in surrounding area (recordings made). Most likely vocalizations heard are loud calls (named 1, 2, 3 and 4 note 'quack'), a loud call substantially different from the loud call known of *G. senegalensis* named 'honk'. In total four animals are seen (of which three well) in an area of 0,3 ha in size.

Date: 12 September 2003

Time: 05.00 – 07.30h

Location: Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), Kenya. Elevation: 599m

Weather: Clear sky, full moon

Habitat: *Acacia* spp. (dominant)/*Commiphora* sp. bush land. Trees up to 15m.

Observations:

Juvenile was present in same clump of trees (*Acacia* spp. - *Commiphora* spp.) as where it was when we left the evening before (*parked?*). Adult female arrives shortly after our arrival, moving through *Commiphora* spp. to reach the tree. Both feed on gum. Animals settled for the day after sunrise in the *Acacia* spp. tree at a height of ~ 7m. Total of four animals are seen during dawn hours in same area as evening before. A 3-note 'quack' is heard grading into a 2-note 'quack' (recording present). A true dawn chorus is heard since 4-5 animals are vocalizing during 5.40 -5.50h. Seems likely that the 'quack' vocalization is the advertisement call of *G. gallarum*. One adult animal was followed by one of the observers for ~ 50m (moving through bushes and trees). The animal started resting around 06.05h in a nest located in an *Acacia* spp. tree (holding ~6 more nests, picture present). It is unknown if this nest is made by *G. gallarum* or by a bird or rodent.

In total four animals are seen in an area 0.3 ha in size.

Date: 12 September 2003

Time: 18.58 – 21.37h

Location: Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), Kenya. Elevation: 599m

Weather: Clear sky, 1 day after full moon

Habitat: *Acacia* spp. (dominant)/*Commiphora* spp. bush land. Trees up to 15m.

Observations:

The adult female together with juvenile are present in the same clump of trees (seen most of the time, picture present). The adult female approaches the observers followed by the juvenile. Short after that a quick interaction seems to occur over a gum source at a lower branch (0.5m from ground). The female chases off the juvenile by approaching the juvenile fast accompanied with vocalizations. Short after that the juvenile is allowed to approach the gum source after the female fed and left the source.

Third individual is found in a *Commiphora* sp., ~20m from the tree clump housing the adult female with young.

Fourth individual is found in an *Acacia* sp. (~7m), closest to the campsite.

Fifth animal (or individual that moved) is found moving (1 hour and 25 minutes after last sighting) in a tree 30m away from the tree clump housing the adult female with young. The animal travels through the lower, bushy part of the tree into a neighboring tree ~ 2.5m from the ground.

Two 'quacks' are heard and one other vocalization. No 'real' dusk chorus heard
In total 4/5 animals are seen in an area 0.3 ha in size.

Date: 13 September 2003

Time: 05.28 – 06.53h/ 10.00 – 10.20h

Location: Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), Kenya. Elevation: 599m

Weather: Cloudy, moon covered, no wind

Habitat: *Acacia* spp. (dominant)/*Commiphora* spp. bush land. Trees up to 15m.

Observations:

Two *G. gallarum* (eye shine) encountered while heading to tree clump with adult female & young. Both adult and young found in neighboring tree of tree clump. Female moves promptly to the tree clump upon our arrival, followed by her young (which goes and feed on gum). The female moves to some lower branches of the tree from where she jumps into some shrub on the ground, forages for several seconds before she returns to the branch (by leaping up). She does that for 3-4 times. Both animals forage up to 06.23h, after that the animals start resting and social grooming takes place (~6m from ground). 06.36h the female takes her young on belly and moves to a higher and denser branch (~ 11m, dense, no leaves, thorny). Both sit in contact in a fork of the tree (branch diameter ~ 2cm diameter). 10.10h, Female and young rest at ~ 11m (tree ~13m in height) in the fork of the tree on a branch (~3cm) (pictures present). 10.15h the animals move to a larger fork (diameter of branch ~ 10 cm) halfway in a *Commiphora* sp.

In total four animals seen in an area 0.3 ha in size.

Date: 13 September 2003

Time: 19.42 – 21.01h

Location: Meru N.P. Camp 2 (N 0° 11' 31"; E 38° 03' 41") near Nyati Forest (west corner of Meru), Kenya. Elevation: 790m

Weather: Clear sky, moon (2 days after full moon)

Habitat: Forest, bush land & thickets

Observations:

No galagos heard or seen during night drive and walk.

At camp 2 (after 21.01h), 3 sightings of *O. garnettii* (recordings present) all adult size. 15-20 m high in trees. Animals seem similar to the one seen in Ngaia Forest but no white tip on tail present. ~ 25% of last part of tail is black (more descriptions in other primate sightings chapter).

Date: 14 September 2003

Time: 20.33 – 22.20h

Location: Meru N.P. Camp 3 near Adamson falls (north bank of Tana river, where Kora and Bisanadi National Reserve meet)(S 0° 04' 14"; E 38° 24' 52"), Kenya.
Altitude: ca. 400m

Weather: Clear sky, moon (3 days after full moon), windy

Habitat: *Commiphora* spp. wood land. *Commiphora* spp. dominant, denser and more diversity than public campsite habitat. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., *Euphorbia* spp.

Observations:

Two, but most likely four *G. gallarum* sightings along main road (from bridge toward the interior of the park). Third sightings of adult individual in *Commiphora holtziana*. of ~ 5m (2-4m from ground).

Fourth, adult male in *A. mellifera* near *Commiphora* spp., 2-3m from ground. Feeding on *A. mellifera* gum.

No vocalizations heard.

Date: 15 September 2003

Time: 05.30 – ~07.00h

Location: Meru N.P. Camp 3 near Adamson falls (north bank of Tana river, where Kora and Bisanadi National Reserve meet),(S 0° 04' 14"; E 38° 24' 52"), Kenya.
Altitude: ca. 400m

Weather: Clear sky, moon (3 days after full moon), windy

Habitat: *Commiphora* spp. wood land. *Commiphora* spp. dominant, denser and more diversity than public campsite habitat. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., *Euphorbia* sp.

Observations:

Two *G. gallarum* sightings (of which one young animal about the same size of young at camp 1) ~100m from camp in *Commiphora* spp. (picture of tree present), no vocalizations heard. 1 animal is seen particularly well while it approaches the observers. Both move fast at 0.5 to 5m from the ground through low twiggy bushes and between trees. Sleeping site in upper part of *Euphorbia bussei* (~5m)(picture present).

No vocalizations heard (no 'quack' or 'honk')

No *O. garnettii* heard or seen

Date: 15 September 2003

Time: 18.38 – 20.00h

Location: Meru N.P. Camp 3 near Adamson falls (north bank of Tana river, where Kora and Bisanadi National Reserve meet), (S 0° 04' 14"; E 38° 24' 52"), Kenya.
Altitude: ca. 400m

Weather: Sunny, windy

Habitat: *Commiphora* spp. wood land. *Commiphora* spp. dominant, denser and more diversity than public campsite habitat. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., *Euphorbia* spp.

Observations:

One *G. gallarum* sighting near camp in *Commiphora* spp.

Second *G. gallarum* sighting near camp in mixed *Acacia* spp., Doum Palm, etc forest.

Date: 15 September 2003

Time: 20.27 – 04.00h (16 September)

Location: Meru N.P. & Kora N.P. from Camp 3 near Adamson falls (bank of Tana river, where Kora and Bisanadi National Reserve meet), (S 0° 04' 14"; E 38° 24' 52"), Kenya. Altitude: ca. 400m

Weather: Clear sky, moon half

Habitat: *Commiphora* spp. wood land. *Commiphora* spp. dominant, denser and more diversity than public campsite habitat. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., *Euphorbia* spp.

Observations:

20.45h - One *G. gallarum* sighting in Meru N.P. (just before the bridge crossing the Tana River into Kora N.P.) in *Acacia* spp. bush. Two times eye shine (most likely *G. gallarum*)

20.55h - crossing the bridge over the Tana River into Kora N.P. (south bank)

21.10h - Two galago sightings in *Commiphora* spp. bush land. Animals moved away before identification.

21.30h - Sighting of a *G. senegalensis*.

From this time onwards we hear at least 37 'honks' (recordings present) and see 10-12 individuals (*G. senegalensis*) in Kora N.P. (last two near bridge)

~03.00h crossing the bridge over the Tana River into Meru N.P.

Two *G. gallarum* sightings right after crossing the bridge (on Meru side) in *Acacia* spp. bush land. Although the difference between the species is obvious, one of the two animals has a more greyish face (*G. senegalensis* like) than the other *G. gallarum*.

05.21 - 05.30h, two animals vocalizing 1-note and 2-note 'quacks' near camp in the same time.

Date: 16 September 2003

Time: 18.55 - 03.00h

Location: Meru N.P. road north bank of Tana River from near Elsa's camp towards camp 3, (S 0° 03' 06"; E 38° 18' 58"), Kenya. Altitude: 370m

Weather: Sunny

Habitat: *Commiphora* spp. wood land. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., baobab.

Observations:

- Six *G. gallarum* sightings between 21.00 and 01.27h of which five in *Commiphora* spp. and one in *Acacia* spp.

- Before road mark 88 (01.39h) one sighting of bushbaby in *Commiphora* spp. (near ground).

- After road mark 88 (01.43h) *G. gallarum* sighting in mixed bush land (*Acacia* spp. *Commiphora* spp.) (~ 4m from ground).

- 01.48h *G. gallarum* sighting in *Commiphora holtziana* (2-4m from ground)

- Between 02.02 and 02.18h, 4 bush baby sightings of which three in *Commiphora holtziana*. Reason for the lack of identification is their flight behaviour. It is obvious though for some of the sightings that it is not *G. gallarum*

- 02.47h 'Honk' vocalization and sighting of *G. senegalensis* .

In total we encountered seven *G. gallarum*, five *galago* spp, one *G. senegalensis*. Several vocalizations heard. One call best described as a long 'au' which is not identified yet.

In total 17 'honks' are heard after 02.47h until the morning

Habitat description: In the area *G. gallarum* and *G. senegalensis* are sympatric, *C. holtziana* and *Commiphora* spp. are dominant mixed with some *Boscia coriacea*, *A.*

mellifera, and *Acacia* spp. (comparable with camp 1). Fairly dense vegetation, 1-2m bushy undergrowth

Date: 17 September 2003

Time: 19.30 – 22.40h

Location: Meru N.P. road north bank of Tana River from camp 3 to airstrip. (S 0° 03' 06"; E 38° 18' 58"), Kenya. Altitude: 370m

Weather: Sunny

Habitat: *Commiphora* spp. wood land. Dry, rocky ground with *Acacia* spp., *Commiphora* spp., baobab.

Observations:

Several 1-note 'quacks' heard and one *G. gallarum* encountered (19.45h) with slightly grayish face in *Acacia* spp., feeding on gum.

Two *G. gallarum* sightings (22.35h), first in *Acacia* spp., ~7m from ground

(*Commiphora* spp. wood land) and second in *Commiphora* spp. (~20m away)

One *G. senegalensis* sighting (clear) (22.40h), four 'honks' heard from different directions.

No *O. garnettii* seen or heard in this part of Meru N.P.

In total three *G. gallarum* sightings.

Date: 18 September 2003

Time: 17.00h

Location: Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), Kenya. Elevation: 599m

Weather: Sunny

Habitat: *Acacia* spp.(dominant), *Commiphora* spp. bush land. Trees up to 15m.

Observations:

Juvenile active in clump of trees (4 trees), possibly because of disturbance by observers.

Date: 18 September 2003

Time: 20.45 – 22.00h

Location: From Meru N.P. Camp 1 (N 0° 09' 57"; E 38° 12' 27"), road leading north (towards entrance gate), Elevation: 599m.

Weather: Clear sky

Habitat: *Acacia* spp. (dominant), *Commiphora* spp. bush land. Trees up to 15m.

Observations:

Two, possibly three, *G. gallarum* sightings. First in *Acacia* spp. (~10m from ground)(habitat dominated by *Acacia* spp.). Animal was foraging for insects in spotlight. Second *G. gallarum* sighting in *Acacia* spp. (3-4m from ground), foraging.

Date: 28 September 2003

Time: 20.00 – 22.30h

Location: Camp 1, Bale Mountains, Southern Ethiopia, 2300m down to 1900m

Weather:

Habitat:

Observations (by Tom Butynski):

No galagos seen or heard (in 3 days)

Date: 1 October 2003

Time: 20.50 - ca. 22.15h

Location: Camp 2, Bale Mountains, Southern Ethiopia, 1900m (N 6° 38' 23"; E 39° 41' 01")

Weather:

Habitat:

Observations (by Tom Butynski):

Two *G. senegalensis* observed (both ~25m height in tree when encountered), both at ~ 1800m elevation. Possibly this is the upper limit for *G. senegalensis* in the montane forest of Bale Mountains since it is little higher than where J. Kingdon (1987) collected a specimen.

No 'honks' heard

Date: 3 October 2003

Time: 17.40 – 18.15h; 20.20 – 21.45h and 22.30 – 23.17h

Location: Camp 3, South of boundary Bale Mountains, Southern Ethiopia (N 06° 31' 13"; E 39° 44' 43"), 1620m.

Weather:

Habitat:

Observations (by Tom Butynski):

Three *G. senegalensis* encountered (one at 20:50, 21:12, and one at 22:45h). One individual was ~18m up in tree, came down to ~ 6m disappeared in tree hole. The species is not common in this area it seems. Both other animals were seen at ~10m and 25m height.

No 'honks' heard

Date: 4 October 2003

Time: 3.45 – 5.52h

Location: Camp 3, south of boundary Bale Mountains, Southern Ethiopia

Weather:

Habitat:

Observations (by Tom Butynski):

No vocalizations heard or animals seen.

Date: 5 October 2003

Time: 5.25 – 6.00h

Location: Camp 4, Genale River, Haremma Forest, Southern Ethiopia.

Weather:

Habitat:

Observations (by Tom Butynski):

Probably a distant set of *G. senegalensis* 'honks' were heard.

Date: 6 October 2003

Time: 19.00 – 20.30h

Location: Camp 5, 3 km north of Bidree Village (N 05° 56' 31"; E 39° 39' 45"), 1680m.

Weather:

Habitat: Limestone plateau, *Acacia* spp. wood land.

Observations (by Tom Butynski):

Three *G. senegalensis* were observed all within 100 m of each other. Vocalizations heard and recorded. Most calls were heard between 00.01 and 01.00h. One animal jumped to the ground from two meters. No other galago species encountered.

The *G. senegalensis* density is much higher here than in Bale Mountains (*probably for that reason more calling?*).

Date: 7 October 2003

Time: 20.25 – 21.13h

Location: Camp 6, road to Wachi & Mega, Southern Ethiopia (N 04° 13' 01"; E 38° 26' 41"), 1500m.

Weather:

Habitat: *Commiphora* spp. – *Acacia* spp. wood land.

Observations (by Tom Butynski):

No galagos seen or heard.

Date: 8 October 2003

Time: 5.15 – 5.50h

Location: Camp 6, road to Wachi & Mega, Southern Ethiopia (N 04° 13' 01"; E 38° 26' 41"), 1500m.

Weather:

Habitat: *Commiphora* spp. – *Acacia* spp. wood land.

Observations (by Tom Butynski):

No galagos seen or heard.

Date: 8 October 2003

Time: 19.15 – 21.10h and 22.30 – 23.50h

Location: Camp 7, 80km south-west of Moyale, Northern Kenya (N 03° 30' 37"; E 38° 40' 03"), 800m.

Weather: Nearly full moon

Habitat: Dry bush land, undergrowth and deciduous trees (lacking leaves at the time of visit). Common trees are: *A. mellifera*, *Commiphora* spp.

Observations (by Tom Butynski):

Circa ten *G. gallarum* seen. Individuals found in bush mostly between 0-3m from the ground (up to five meters from ground recorded).

Vocalizations most often heard between 19.30 – 19.45h but vocalizations heard up to midnight (recordings present). Garnettii like 'yap' call heard, 'chitters', *G. senegalensis* like 'honk' calls (different tone and rhythm though) and 'quacks' comparable with the Meru N.P. population.

The main activity of the animals observed was foraging for insects within the branches of *A. mellifera* and on the ground. Seven of the ten animals' encountered occurred solitary, one group of three was observed.

It seems that *G. gallarum* is the only galago species present and more common than anywhere else surveyed so far. Probably > 5 *G. gallarum* per hectare in this area.

This *G. gallarum* sighting is ~180m higher than the sightings in Meru N.P. Kenya.

Date: 9 October 2003

Time: 4.30 – 5.50h

Location: Camp 7, Moyole, Northern Kenya (N 03° 30' 37"; E 38° 40' 03"), 800m.

Weather: Nearly full moon

Habitat: Dry bush land, undergrowth and deciduous trees (lacking leaves at the time of visit). Common trees are: *A. mellifera*,

Observations (by Tom Butynski):

05.37h one adult was observed jumping ~ 1.3m to the ground, taking three bipedal hops across a 6m wide dirt track, and leaped 1m up into an *A. mellifera*. Most likely this animal was traveling to its day nest.

No real dawn chorus was heard.

Date: 9 October 2003

Time: 21.30 – 22.55h

Location: Camp 8, Marsabit N.R, Lake Paradise, Northern Kenya, (N 02° 15' 54"; E 37° 55' 54"), 1280m.

Weather: Nearly full moon

Habitat: Dry bush land, undergrowth and deciduous trees (lacking leaves at the time of visit). Common trees are: *A. mellifera*,

Observations (by Tom Butynski):

No galagos were seen or heard. This result is similar to the findings of a survey conducted in 1995. *G. senegalensis* seems not to be present here..

Date: 10 October 2003

Time: ~11.00h

Location: Camp 8, Marsabit N.R, Lake Paradise, Northern Kenya, (N 02° 15' 54"; E 37° 55' 54"), 1280m.

Weather: Nearly full moon

Habitat: Dry bush land, undergrowth and deciduous trees (lacking leaves at the time of visit). Common trees are: *A. mellifera*,

Observations (by Maria Dobbs):

One *G. gallarum* observed on 1,100m on Kopje near Torbi Village (N03° 03' 44"; E38° 22' 42").

Conclusions

Sightings Meru N.P & Kora N.R.

G. gallarum: 24, possibly 30 individuals

G. senegalensis: 11 possibly 13 individuals (58 honks)

Galago spp.: 8 individuals

Total nocturnal survey hours: 35.7 hours.

Encounter rate (only identified sightings used)

G. gallarum: 0.67-0.84 ind./h

G. senegalensis: 0.31-0.36 ind./h

Tree species used by *G. gallarum* (tree species recorded with sighting) n= 42

Acacia spp.: 45% (including *A. mellifera*)

Commiphora spp.: 52%

Euphorbia spp.: 2%

Height above the ground when first sighted ranging between 2-10m (n=9), mean 4.7, SD 2.6)

Sightings Southern Ethiopia & Northern Kenya

G. gallarum: 11 individuals

G. senegalensis: 8 individuals

Total nocturnal survey hours: 17.75 hours

Encounter rate:

G. gallarum: 0.62 ind./h

G. senegalensis: 0.45 ind./h

Total survey area

G. gallarum: 35-41 individuals

G. senegalensis: 19-21 individuals

Total nocturnal survey hours: 53.45 hours

Encounter rate:

G. gallarum : 0.65-0.77 ind./h

G. senegalensis: 0.36-0.39 ind./h

Locomotion

G. gallarum seems to be adapted to locomote quickly through very dense and thorny vegetation. The thick and thorny vegetation seems to provide good safety from predators. Birds, cats, genets or snakes would have problems entering the vegetation and yet *G. gallarum* can move quickly in this dense bush. *G. gallarum* was observed making long bipedal hops between trees, but scramble on all four feet (squirrel like) within trees and bushes often holding long thorns. One leap of 2.5m between (thorny) vegetation observed. They move horizontally and vertically on small branches with head first (squirrel like).

Drake-Brockman (1910 In: Nash, Bearder and Olson, 1989) observed it frequently feeding on the ground and jumping on its hind legs. Lönnberg (1913 In: Nash, Bearder and Olson, 1989) observed them leaping with great dexterity in acacia bush.

Behaviour

Both *G. gallarum* and *G. senegalensis* are often found in pairs during this survey. The animals encountered in Northern Kenya were often encountered solitary. *G. gallarum* has been found to be active for some time after dawn.

G. gallarum possibly benefits from elephants damaging *Acacia* spp. and *Commiphora* spp. trees which then act as a gum source. The animals were mostly found feeding on *Commiphora* spp. gum and insects in all levels of the tree (from ground to canopy).

It seems very likely that *G. gallarum* females park their young in dense and thorny vegetation where the youngster is able to find safety, to forage and sleep. Of the five visits to camp 1, one young was found four times in a possible 'parking tree' (clump of 4 dense and thorny trees). At one visit the young was together with the adult female in a neighboring tree (canopy touching) traveling promptly to the 'parking tree' on our arrival (female first). At all times the observers were present in the surroundings of the 'parking tree', the youngster was present. This tree was also used as a sleeping tree for female and young. Both animals slept in the fork of this tree, mostly in contact. No leaf nests were present in the "parking" /sleeping tree. Only once an individual (other than female with young) has been observed entering a grass nest (12 Sept 03, 05.00 – 07.30h).

G. gallarum was fairly easy to observe once spotted by their eye reflection. Seldom flight behaviour was observed (unlike for *G. senegalensis*) *G. gallarum* seems to be more confident than *G. senegalensis* and in several occasions the light beam provided by the observers seemed to be beneficial for the animals in terms of foraging (insects). Several occasions occurred where *G. gallarum* approached the observers. This behaviour has not been seen in *G. senegalensis* during this survey. On most occasions *G. senegalensis* moved away from the observers making it less easy to identify the individual. This appears to be a true behavioural difference between the two taxa.

Vocalization

The vocalization repertoire heard from *G. gallarum* consisted of 1-note, 2-note and 3-note (4-note, listening back the tape I do not hear it) 'quacks', a call very distinct from the honk made by the *G. senegalensis*. It seems this is the loud call/advertisement call of *G. gallarum*.

11 sept 03, ~21.00 (Meru, public campsite)

Quack notes: 2,2,2,2,2,2,2,2,2,2,2,2,1,1,1,1,1,1,1,2,1,1,1,2,1,1,1,1,1,1,1,1,1,1,1

Repetition scheme: 13-7-1-3-1-11

N= 36 calls

12 sept 03, 05.40 (Meru, public campsite)

Quack notes: 3,3,3,2,2,2,3,2,2,1,1,2,1,1,1,1,1,1,2,1,1

Repetition scheme: 3-3-1-2-2-1-6-1-2

N= 21 calls

12 sept 03, 05.50 (Meru, public campsite)

Quack notes: 1,2,1,2,1,2,1,1,1,1,1,1,1,2

Repetition scheme: 1-1-1-1-1-1-8-1

N=15 calls

The 'quack' can be heard at a distance of over 300m and is not as often expressed by individuals as the 'honk' of the *G. senegalensis*. In several occasions no 'quacks' were heard at dawn and dusk in areas where *G. gallarum* were sighted.

In areas where the density of *G. gallarum* was relatively high (like camp 1, Meru and Camp 7, Niayole) more calls were recorded than in relatively low density areas. Several calls, best described so far as a long 'au', are recorded (16th of sept 03, north bank of Tana river) from which the animals are not identified yet but are most likely *G. senegalensis*.

Vocalizations heard in Northern Kenya (Camp 7, Moyale, 08 October 03) differ from the vocalizations heard in Meru N.P. in that they contained a much wider and complex range of vocalization types. More 'honk' like calls have been heard as well as 'chitters', 'yaps'..The more rhythmic 'quacks' were more commonly heard in Meru N.P.

G. gallarum* in comparison with *G. senegalensis

Differences

- Appearance, especially ear color in contrast with face and tail color in contrast with body (see description)
- Behaviour *G. gallarum* seems less shy around observers, not often was flight behaviour observed. *G. senegalensis* not often seen 'relaxed' around observers. It seems *G. gallarum* moves easier through dense and thorny vegetation than *G. senegalensis* does.
- Vocalizations are very distinct.

Similarities

- Habitat; Both species occur in *Commiphora* spp./ *Acacia* spp. bush land.

Habitat description (*under construction*)

Camp1, public campsite:

It seems only four major tree species occur in this habitat in which the *Acacia* spp. is most dominant. Size of area 0.3 ha, 150 m walk around parameter (306m outer ring),

Tree 1 ~ 10%

Tree 2 ~ 80%

Tree 3 ~ 5 %

Tree 4 ~ 5 %

Of all *G. gallarum* sightings in Meru N.P., Kenya, *G. gallarum* was encountered 73.7% in *Acacia* spp. (13 *Acacia* spp. and five *Commiphora* spp. & other). Gum sources were only recorded in *Commiphora* spp. (picture present).

Diurnal primates found during daytime surveys

Below the census data on primate population (other than *G. gallarum* and *G. senegalensis*) numbers in Ngaia Forest, Meru N.P. and Kora N.R. Data is retrieved from primate surveys conducted by foot (Ngaia Forest) and by car between the 8th and 19th of September. More detailed information on the location and time of the sighted groups can be found in appendix 1.

1. Olive baboon (*Papio anubis*).

Ngaia Forest, vocalizations heard at both camps
Meru N.P., 17 troops encountered.

2. Black & white colobus monkey (*Colobus guereza kikuyuensis*).

Description:

Tail: completely white. Wide, white, dense tuft (1/2) tail. Tail at least as long as body (picture present)

Legs & arms: Black (shiny)

Mantle: very white and long

Ventrum: little bit of white fur extended to belly, all the way down the side

Ngaia Forest: Vocalizations heard (~ 4 groups), 1 group encountered

Meru N.P.: no vocalizations or sightings (possibly colobus present near research camp at entrance HQ according to staff)

3. Sykes's monkey (*Cercopithecus albogularis albotorquatus*).

Description:

Neck: bright white collar around the neck (90%), no white on shoulders

Ventrum: white all the way to the chest, lower belly more off white/grey

Dorsal and head: rusty/brown/olive

Legs: outer legs black

Tail: reddish at base, black for biggest part

Ears: black with small white fringe

Ngaia Forest: vocalizations heard, 3 groups encountered and 1 solitary animal.

Meru N.P.: vocalizations heard, 4 groups encountered

4. Vervet monkey (*Cercopithecus aethiops*), Meru N.P.

Ngaia Forest: no vervet sightings

Meru N.P.: 4 groups encountered

5. Northern greater galago (*Otolemur garnettii kikuyensis*).

Description:

Tail: dusky brown to grey. Some individuals have a white tip of tail for last 1-2cm, others without.

Ventrum: off white

Ears: black

Face: brown

Dorsal: dusky brown (olive) back + outer leg

Hands: same dusky brown as body, inside hands black

Ngaia Forest:

Vocalizations heard, ~11 sighting (probably > 1 animal/hectare), 1 specimen found dead.

Meru N.P.: vocalizations heard, sighting of 3 individuals.

6. Northern lesser bush baby (*Galago senegalensis*)

Ngaia Forest: no *G. senegalensis* present

Meru N.P.: see earlier data

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Appendix 1.

1. Olive baboon (*Papio anubis*).

Ngaia Forest:

- Camp 1: Vocalizations heard
- Camp 2: Vocalizations heard

Meru N.P.

- Camp 1, Public campsite, sighting 1 troop (resident troop it seems since it was there for 3 + 1 days)
- HQ: 1 troop (13.41h)
- Road mark 36 to 38: 1 troop (14.51h)
- Road mark 49: 1 troop (16.10h)
- Camp 2: 1 troop (sleeping site)
- Nyati Forest: 1 troop (sleeping site)
- Off 55 along Rojewero river: 1 troop (09.57h)
- Road mark 17 to 16: 1 troop (10.49h)
- Road mark 15 to 14: 1 troop (12.31h)
- Road mark 78 to 79: 1 troop (12.39h)
- Road mark 95: 1 troop (13.32h)
- Camp 3: 2 troops (dawn)
- First camp at river from road mark 94: 1 troop (~ 11.30h)
- Around road mark 88: 3 troops

2. Black & white colobus monkey (*Colobus guereza kikuyuensis*).

Ngaia Forest:

- Camp 1: Vocalizations heard
- Camp 2: Vocalizations heard (2-3 groups)(06.15h): sighting of 1 group

Meru N.P.: No individuals seen.

3. Sykes's monkey (*Cercopithecus albogularis*).

Ngaia Forest: Cercopithecus albogularis kolbi??

- Camp 1: vocalizations heard, sighting of 1 group (~06.15h) and 1 individual
- Camp 2: vocalizations heard (several groups)(~07.00h), sighting of 2 groups (13.15h; 08.51h)

Meru N.P.: Cercopithecus albogularis albotorquatus??

- Camp 2: vocalizations heard (dawn & dusk)
- Camp 3: vocalizations heard (2-3 groups), sighting of 2 groups (after dawn).
- From airstrip toward roadmark 94 (along Tana): 2 groups (08.32h)(08.44h)

4. Vervet monkey (*Cercopithecus aethiops*), Meru N.P.

Ngaia Forest: no vervet sightings

Meru N.P.:

- Camp 1, Public campsite, sighting 1 group (seen often here, seems resident group)
- Rojewero camp: 1 group (11.18h)
- After road mark 96 toward north (along Tana river): 1 group (14.40h)
- After road mark 88 towards south (towards Tana river): 1 group

5. Northern greater galago (*Otolemur garnetti kikuyensis*).

Ngaia Forest:

- Camp 1: Vocalizations heard, 1 specimen found dead, 1 sighting (probably > 1 animal/hectare)
- Camp 2: Vocalizations heard, ~10 individuals

Meru N.P.: present

Camp 2: vocalizations heard (21.06h – onwards), sighting of 3 individuals (21.20h).

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