



urn:lsid:zoobank.org:pub:103CB32E-CE9C-417B-B23A-09E7840A7400

ON TWO POORLY KNOWN, INSULAR SKINKS, *Eutropis tytleri* (THEOBALD, 1868) AND *E. andamanensis* (SMITH, 1935) (REPTILIA: SCINCIDAE), ENDEMIC TO THE ANDAMAN ISLANDS, INDIA

Section Editor: Jakob Hallermann

Submitted: 28 March 2020, Accepted: 30 April 2020

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Abstract

We examined the holotype of *Eutropis tytleri* and one of the syntypes of *E. andamanensis* collected from the Andaman Islands, currently deposited at the Zoological Survey of India (ZSI). Information on taxonomy, morphology, distribution, behaviour and natural history of these two poorly-known, insular endemic skinks are presented here based on individuals recorded and examined *in-situ*, in the field as well as preserved material. Their types are illustrated and redescribed. A distribution map is presented based on records from the present study; threats and conservation status are discussed.

Key words: Andaman grass-skink, distribution, *Mabuia*, natural history, *Sincus*, taxonomy.

Introduction

The genus *Eutropis* Fitzinger, 1843 in the Andaman archipelago is represented by only two species: *E. tytleri* (Theobald, 1868) and *E. andamanensis* (Smith, 1935). These species are endemic to the Andaman Islands (Das 1999, Amarasinghe *et al.* 2020). Although described in the 1860s and 1930s, *Eutropis tytleri* and *E. andamanensis* remain among the most poorly known species within this genus, possibly because of their narrow distribution, and the difficulty of access to the Andaman Islands. The

Andaman archipelago, located south of the Burmese peninsula is believed to be a submerged extension of the Arakan Mountains, which date back to the middle Miocene (15 Mya) with a general faunal affinity with the Indo-Chinese region (Hall 1997, Das 1999).

Theobald (1868) described *Scincus tytleri* based on the specimen ZSI 2273 from ‘Andamans, India’. This was the first skink to be named from the Andaman Islands. Subsequently, Boulenger (1887) transferred it to *Mabuia*. Later, Smith (1935) in his monograph

on lizards of the Indian subcontinent used the combination *Mabuya tytleri*, with the corrected generic spelling *Mabuya*. He also described a new species, *Mabuya andamanensis*, from the Andaman Islands based on two syntypes, one deposited in London: BMNH 1946.8.3.62 and the other in Kolkata: ZSI 15084. The comprehensive generic revision of skinks by Mausfeld *et al.* (2002) and Mausfeld and Schmitz (2004) resulted in the transfer of *Mabuya tytleri* and *M. andamanensis* to the genus *Eutropis*, the currently accepted combination.

Recent literature on Indian lizards such as Daniel (2002), Das (2002), and Das & Das (2018) could not provide any reliable novel data on either species, but only provide anecdotal information owing to a lack of field data based on recent surveys. Hence, the present paper aims to provide additional information on various aspects of these poorly known, insular endemic species.

Material and methods

Field surveys were carried out on several islands of the Andaman Archipelago to record the target species. Individuals were observed in the field, gently restrained, measured and released at the point of capture.

We compared specimens (including types), original descriptions, and other specimens of *Eutropis tytleri* and *E. andamanensis*, as well as specimens of their congeners (Appendix 1). Museum acronyms are those of Uetz *et al.* (2019). We examined the external morphology of specimens by using a Wild M3Z stereomicroscope. Sex was not determined from specimens unless the hemipenes in males were everted. All locality records are based on our personal observations and data recorded in museums. Altitudes are given in meters above sea level (a.s.l.). The following measurements were taken to the nearest 0.1 mm on the left side of the body with a Mitutoyo digital caliper: snout–vent length (SVL, from tip of snout to anterior margin of vent), axilla–groin distance (AG, from the posterior margin of the forelimb at its insertion point on the body to the anterior margin of the hind limb at its insertion point on the body), thigh length (FEL, from the anterior margin of the hind limb at its insertion point on the body to the knee while flexed 90 degree), shank length (TBL, from the posterior surface of the knee while flexed 90 degree to the base of the heel), head length (HL, from posterior edge

of the retro-articular process of the mandible to tip of snout); head width (HW, width of head at the temporo-mandibular articulation / angle of the jaws), orbit diameter (ED, the greatest horizontal diameter of the orbit); tympanum–eye length (TYE, from posterior border of orbit to anterior border of tympanum), snout length (ES, from anterior border of orbit to tip of snout), eye–nostril length (EN, from anterior border of orbit to the midpoint of posterior border of nostril), and toe lengths (from tip of toe, to the junction with the adjacent digit, excluding the claw). Supralabial and infralabial scales were counted from the gape of the lips to the rostral and mental scales respectively. Ventrals included all scales from the scale posterior to the postmental to the last scale bordering the vent, counted along the ventral midline. Paravertebral scales are between postparietal / nuchal (included) to the level of the posterior margin of the thigh in a straight line immediately left of the vertebral column. Subdigital lamellae on toe IV from the first proximal enlarged lamellae wider than the width of the largest palm scale to the distal-most lamella at the base of the claw. Total number of longitudinal scale rows was counted around the midbody.

Geographic coordinates of the skink's localities were recorded with a GPS (WGS 84 datum) and mapped with ARC MAP 10.

Taxonomy

Eutropis tytleri (Theobald, 1868)

(Figs. 1–3, 6, 7; Tables 1–3)

Scincus tytleri Theobald, 1868

Mabuia tytleri — Boulenger 1887

Mabuya tytleri — Smith 1935

Eutropis tytleri — Mausfeld and Schmitz 2003

Holotype. Adult male, ZSI 2273 [*vide* Das *et al.* (1998)], SVL 153.7 mm, collected from Andamans, India, by Lt. Col. Robert Christopher Tytler [a handwritten note “confirmed as a type by Dr. Malcolm Smith” on the original label is present].

Other specimens (n=4). ZSI 2371, 2296, 4624; CSPT/L-33a, collected from Andamans, India: collector and date unknown.

Diagnosis. A large species of *Eutropis* from the Andaman Islands, SVL 125.0–153.7 mm; tail long, about 1.5–2.2 times as long as the body; prefrontals and supranasals in contact with each other; temporals smooth; nuchals in a single pair; tympanic opening relatively large; as large

Plate 12

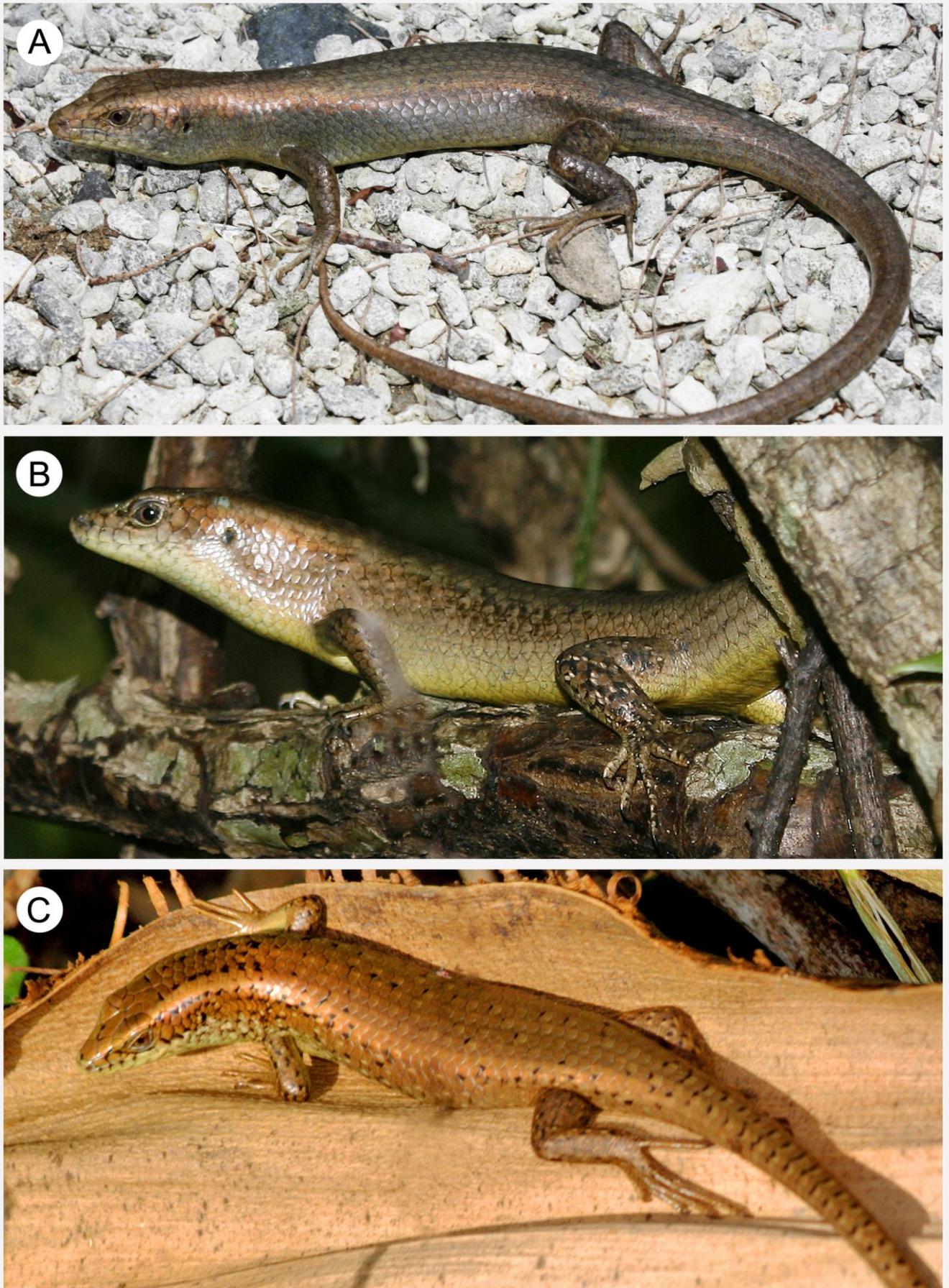


Figure 1. *Eutropis tyleri* in life (not collected) from (A) Long Island, (B) South Andaman, and (C) Rutland in Andaman Islands. Photograph © S.R. Chandramouli

Plate 13

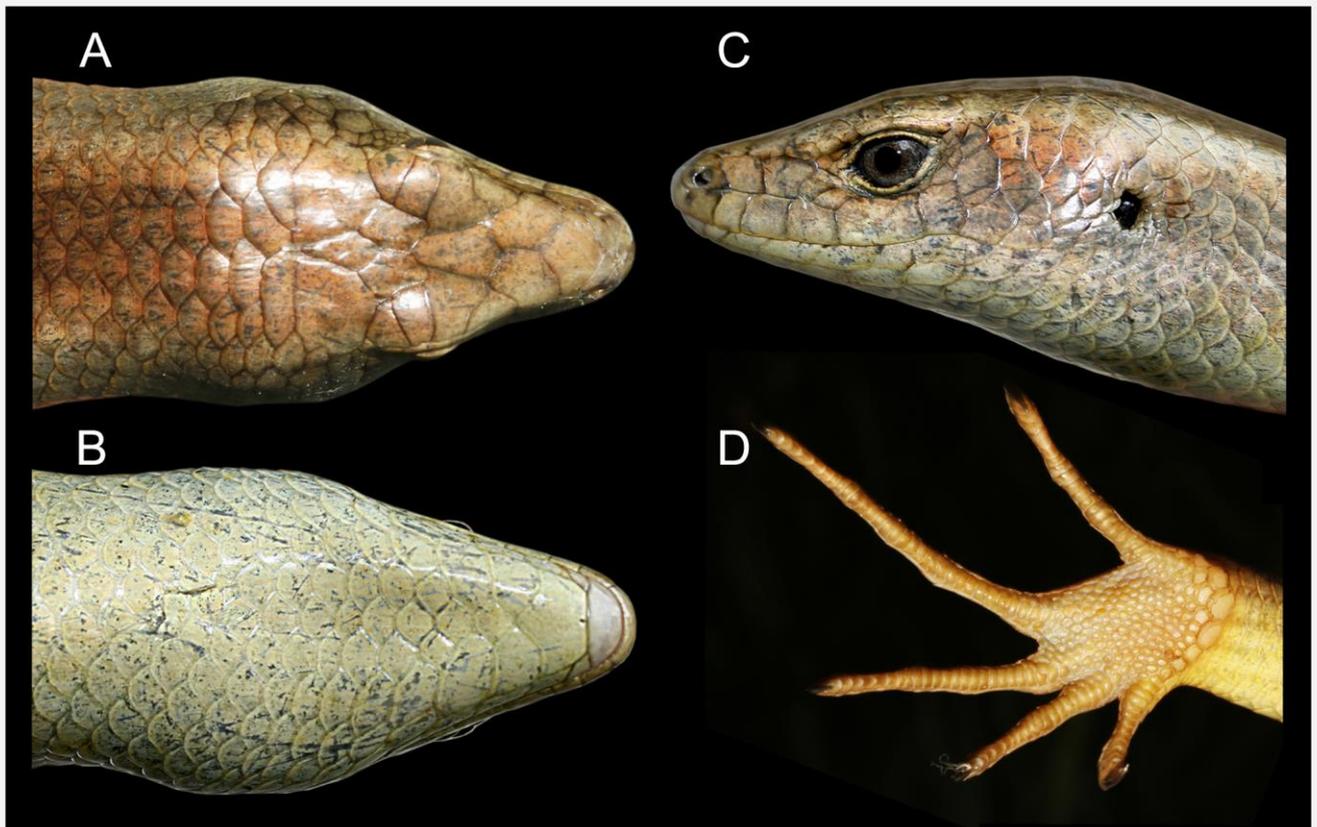


Figure 2. *Eutropis tyleri* in life (not collected) head in (A) dorsal view, (B) ventral view, (C) lateral view, and (D) ventral view of the left foot. Photograph © S.R. Chandramouli



Figure 3. A road-killed individual of *Eutropis tyleri* from near Chidiyatapu, South Andaman Island. Photograph © S.R. Chandramouli

as an adjacent lateral scale, lacking visible auricular lobules; 24–30 midbody scale rows; 40–43 paravertebrals; dorsals tricarinate; anterior genials in contact; posterior genials separated by a single scale; cheeks swollen in adult males; 50–53 ventrals; 27–30 subdigital lamellae on toe IV; dorsum uniform bronze brown with a greenish yellow venter.

Redescription of holotype. Meristic characters of the holotype (ZSI 2273). Male, SVL 153.7 mm. Head moderately large (HL 26.1% of SVL), narrow (HW 62.8% of HL, HW 16.4% of SVL), indistinct from neck; snout short (ES 32.7% of HL, ES 52.0% of HW), slightly concave in lateral profile; rostral shield large, hemispherical, visible from above, posterior margin of midpoint concave; frontonasal not contacting rostral; frontonasal wide, lateral border touching first loreal; prefrontals in broad contact, separating frontal and frontonasal, length equals maximum frontonasal length, laterally contacting both loreal scales, posterior border contacting first supraciliary, first two supraoculars and frontal; frontal large, elongate, subtriangular, bluntly pointed posteriorly, length equal to frontoparietals and interparietal combined; frontoparietals two, in contact, larger than interparietal; parietals large and completely separated by interparietal, contacting pretemporal scales anterolaterally; single pair of nuchals, not overlapping behind interparietal. Nostril large and placed in centre of nasal; supranasal single; loreals two, anterior contacting nasal, supranasal, frontonasal, prefrontal, posterior loreal, and second & third supralabials; posterior slightly longer than anterior loreal in the longitudinal axis, contacting prefrontal, first supraciliary, third supralabial, and fourth supralabials slightly; presuboculars two; eye large (ED 21.2% of HL; considerably smaller than TYE), pupil rounded; interorbital distance broad; postoculars four, small; Supraoculars five, all wide, second longest in the longitudinal axis and widest in the transverse axis, 1st supraocular in contact with prefrontal, 2nd in contact with prefrontal, frontal, and frontoparietal, 3rd in contact with frontoparietal, 4th in contact with frontoparietal and parietal; 5th in contact with parietal; supraciliaries six; eyelid moveable, window divided into several tall rectangular scales. Supralabials seven, fifth largest, at the mid orbit position, and contacting granular scales of lower eyelid; pretemporals three; primary temporals

three, secondary temporals four; infralabials seven; ear opening small (approximately one quarter ED), deep, near round. Mental large; postmental single, large; two pairs of chin shield, first pair slightly meeting in midline, first chinshield in contact with first and second infralabial scales, the second pair in contact with second and third infralabials.

With the exception of head shields and nuchals, all dorsal scales are tricarinate, on some scales the median keel is not prominent; all scales imbricate; scales on dorsal surface of thigh moderately tricarinate; body slender, elongate; midbody scale rows 24; paravertebral scales 40; ventrals 51; preanal scales enlarged, four.

Forelimbs short, hind limbs relatively long (FEL 14.2% of SVL, TBL 16.0% of SVL); thigh shorter (FEL 89.0% of TBL); dorsal surfaces of fore and hind limbs moderately tricarinate; subdigital lamellae of toes I–V: 11, 18, 25, 28 and 15 respectively; relative length of fingers IV > III > II > V > I; those of toes IV > III > V > II > I. Tail broken, median scale row of subcaudals of original tail horizontally elongate and entire.

Variation. See Tables 1 & 2.

Coloration. In the preserved holotype, dorsal head, body and limbs appear uniform olive green, limbs darker. Venter lighter. In life (not collected), dorsal head, body and limbs are uniform bronze brown, with scattered black spots on the neck, lateral body, on the limbs, and tail. Lateral body lighter than the dorsum in colour, temporal area pinkish. Throat lemon green and venter light yellow.

Distribution. During the present study, *E. tytleri* was recorded from different localities throughout the Andaman Islands (Table 3).

Natural History. *E. tytleri* is the largest skink species found within the Indian subcontinent. It is crepuscular in habits and is often seen emerging in the evening hours. Diurnal activity is relatively less and is often restricted to basking in the morning and foraging until mid-day.

Based on personal observations, it feeds on insects, frogs and smaller reptiles; and tends to be bulkier on certain small islands, possibly due to the lack of competition from other similar sized lizards.

Unlike other *Eutropis* species, it is arboreal to some extent and can often be seen on tree trunks till a height of about 3 m above the ground. Unlike other skinks, it can be seen moving around actively until about 20:00 h, well

after the dark. Individuals of *E. tyleri* were observed to suffer mortality due to road traffic in reserve forests on three occasions.

***Eutropis andamanensis* (Smith, 1935)**

(Figs. 4–7; Tables 1–3)

Mabuya andamanensis Smith, 1935

Mabuya andamanensis — Greer *et al.* 2000

Eutropis andamanensis — Mausfeld *et al.* 2002

Syntypes (ex. 2). Adult female, ZSI 15084, SVL 102.1 mm, collected from Andamans, India, by C.G. Rogers; BMNH 1946.8.3.62 (formerly ZSI 14658), SVL not measured, other data same as ZSI 15084.

Diagnosis. A medium sized species of *Eutropis* from the Andaman Islands, SVL 75.0–115.0 mm; tail relatively short, about 1.4 times as long as the body; the two prefrontals and supranasals separated from each other; temporals keeled; nuchals in a single pair; tympanic opening relatively large; larger than an adjacent lateral scale, with three small, rounded auricular lobules; 28–30 midbody scale rows; 36–40 paravertebrals; dorsals pentacarinatate; anterior genials in contact; posterior genials separated by a single scale; 48–56 ventrals; 26–28 subdigital lamellae on toe IV; dorsum uniform bronze brown with a greenish yellow venter.

Redescription of a syntype. Meristic and morphometric characters of the syntype (ZSI 15084) are presented, the other syntype (BMNH 1946.8.3.62) not examined. Female, SVL 102.1 mm. Head moderately large (HL 25.6% of SVL), narrow (HW 59.4% of HL, HW 15.2% of SVL), indistinct from neck; snout short (ES 31.8% of HL, ES 53.5% of HW), slightly concave in lateral profile; rostral shield large, hemispherical, visible from above, posterior margin of midpoint concave; frontonasal contacting rostral; frontonasal wide, lateral border touching first loreal; prefrontals not in contact, not separating frontal and frontonasal, length less than frontonasal length, laterally contacting both loreal scales, posterior border contacting first supraciliary, first supraocular and frontal; frontal large, elongate, subtriangular, bluntly pointed posteriorly, length greater than frontoparietals and interparietal combined; frontoparietals two, in contact, larger than interparietal; parietals large and posteriorly not separated by interparietal, contacting pretemporal scales anterolaterally; single pair of

nuchals, overlapping middorsally. Nostril large and placed in centre of nasal; supranasal single; loreals two, anterior contacting nasal, supranasal, frontonasal, prefrontal, posterior loreal, and second supralabial; posterior longer than anterior loreal in the longitudinal axis, contacting prefrontal, first supraciliary, third and fourth supralabials; presuboculars two; eye large (ED 25.7% of HL; slightly smaller than TYE), pupil rounded; interorbital distance broad; postoculars three, small; Supraoculars four, all wide, second longest in the longitudinal axis and widest in the transverse axis, 1st supraocular in contact with prefrontal and frontal, 2nd in contact with frontal, and frontoparietal, 3rd in contact with frontoparietal, 4th in contact with frontoparietal and parietal; supraciliaries six; eyelid moveable, window divided into several tall rectangular scales.

Supralabials nine, sixth largest, at the mid orbit position, and contacting granular scales of lower eyelid; pretemporals three; primary temporals two, secondary temporals three; infralabials eight; ear opening small (approximately one sixth ED), deep, near round. Mental large; postmental single, large; two pairs of chin shield, first pair broadly meeting in midline, first chinshield in contact with second and third infralabial scales, the second pair in contact with third and fourth infralabials.

Nuchals carinate; all dorsal scales are strongly quincquecarinate; all scales imbricate; body slender, elongate; midbody scale rows 30; paravertebral scales 37; ventrals 56; preanal scales enlarged, four.

Forelimbs short, hind limbs relatively long (FEL 17.0% of SVL, TBL 17.7% of SVL); thigh slightly shorter (FEL 96.1% of TBL); dorsal surfaces of fore and hind limbs strongly quincquecarinate; subdigital lamellae of toes I–V: 9, 17, 23, 29 and 17 respectively; relative length of fingers IV > III > II > V > I; those of toes IV > III > V > II > I. Tail complete, median scale row of subcaudals of original tail entire.

Variation. See Tables 1 & 2.

Coloration. In the preserved syntype, dorsal head, body and limbs uniform dark greyish brown, limbs darker. A narrow chestnut brown broken pair of lateral lines starting from back of the eyes until midbody, disappear afterwards. Venter light yellow.

In life (not collected), dorsum rich bronze brown with two dark brown lateral bands along the body from post orbital region till the tail. Intensity of the lateral bands varies with age,

Plate 14

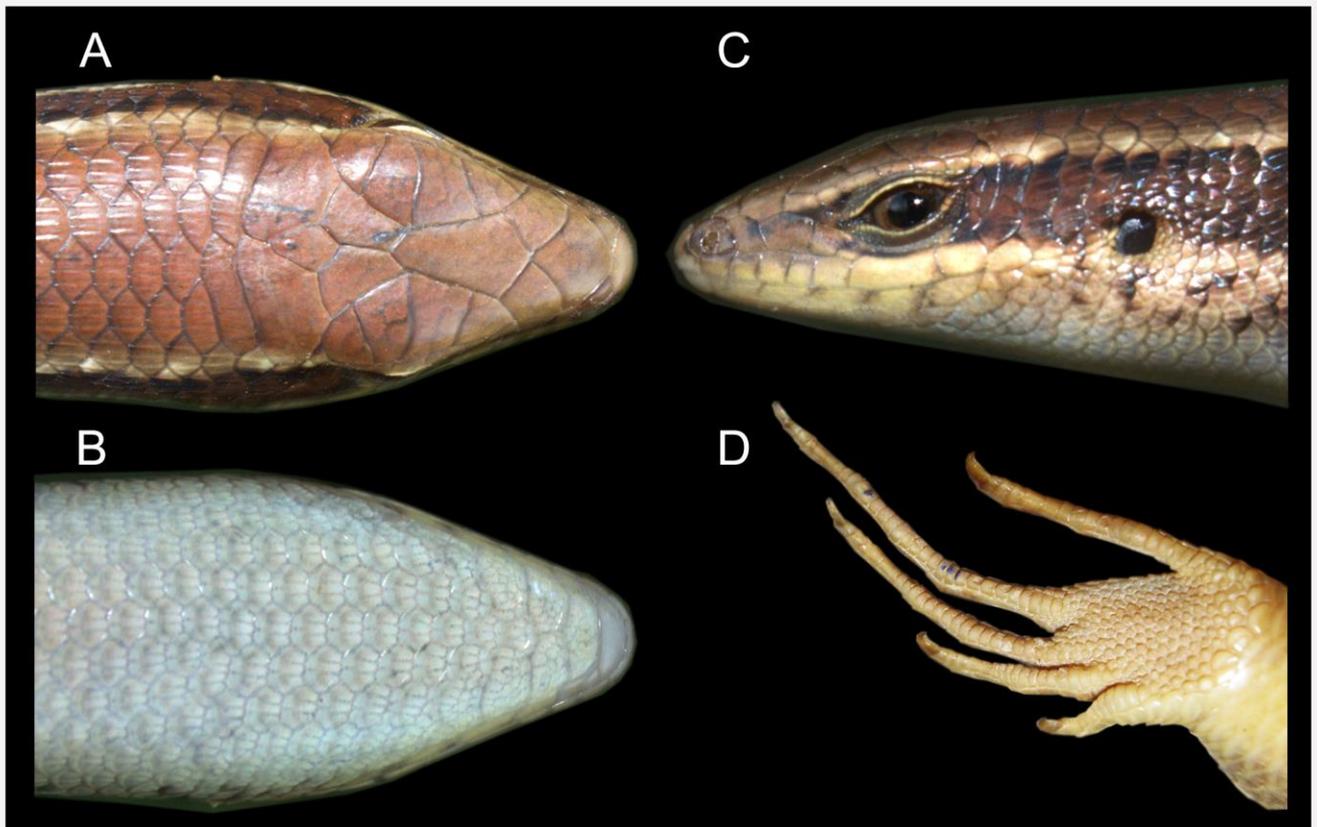


Figure 4. *Eutropis andamanensis* in life (not collected) head in (A) dorsal view, (B) ventral view, (C) lateral view, and (D) ventral view of the left foot. Photograph © S.R. Chandramouli



Figure 5. *Eutropis andamanensis* in life (not collected) from the Andaman Islands. Photograph © S.R. Chandramouli

with the bands being distinct and dark in young individuals while broken with intermittent white spots in aged individuals. Upper lip, lower lateral body and venter cream coloured.

Distribution. During the present study, *E. andamanensis* was recorded from different localities throughout the Andaman Islands (Table 3).

Natural History. A diurnal species which has, at times, been seen active till 18:30 h at the dusk. Predominantly terrestrial and often seen on the ground in leaf-litter, but occasionally seen on low-lying tree trunks to a height of about 1.5 m above the ground. Based on personal observations, this skink feeds on insects, worms, small frogs and crustaceans.

Discussion

The information presented here on taxonomy, morphology, behaviour and natural history of *E. tytleri* and *E. andamanensis* adds significantly to

our existing knowledge on these species, which were described in the 1860s and 1930s respectively. Until now, only anecdotal notes have been available on these species based on older literature. Stoliczka (1870) mentions certain unusually large specimens of “*Tiliqua carinata*” collected from the Andaman Islands by Roepstorff with a long tail, which were referred to *E. tytleri* by Smith (1935).

These species still remain poorly known due to the lack of sufficient field records and data, and hence, their conservation status assessments remain yet to be assessed (IUCN 2020). Das (2002) erroneously illustrated *E. andamanensis* as *E. tytleri* in his species accounts. The identity of the individuals and specimens described and illustrated here were confirmed by comparing their respective type specimens (Fig. 6).

Both these species seem to be equally widespread within the Andaman archipelago (Fig. 7 & Table 3).

Table 1. Morphometric (in mm) and meristic character comparisons of *Scincus tytleri* Theobald, 1868 holotype and *Mabuya andamanensis* Smith, 1935 synype, and other specimens from Andamans; “—” = not measured.

Character	<i>E. tytleri</i>		<i>E. andamanensis</i>	
	Holotype (ZSI 2273)	Other preserved (n=4) & live (n=7)	Syntype (ZSI 15084)	Other live (n=6)
Sex	male	both	female	both
SVL	153.7	125.8–153.0	102.1	75.0–115.0
Head length (HL)	40.1	21.3–25.6	26.1	12.5–20.1
Head width (HW)	25.2	18.7–22.3	15.5	11.9–20.8
Axilla–groin distance (AG)	81.2	57.5–80.0	42.9	30.0–50.0
Eye–nostril length (EN)	9.2	9.2–11.2	5.7	6.1–8.5
Snout length (ES)	13.1	10.6–14.3	8.3	8.2–12.4
Tympanum–eye (TYE)	12.0	10.1–13.4	7.1	7.2–9.9
Orbit diameter (ED)	8.5	5.4–7.2	6.7	3.5–6.8
Thigh length (FEL)	21.9	18.2–23.9	17.4	12.2–22.3
Shank length (TBL)	24.6	19.8–22.4	18.1	12.5–23.5
Tail length (TAL)	—	220.0–290.0	—	120.0–175.0
Midbody scale rows	24	24–26	30	28–30
Nuchal pairs	1	1	1	1
Ventrals	51	48–53	56	48–55
Lamellae on 4 th toe	28	24–30	29	26–28
Paravertebral scales	40	40–45	37	36–40

Table 2. Diagnostic characters of *Eutropis tytleri* and *E. andamanensis* (live and preserved) in Andaman Islands

	<i>E. tytleri</i> (n=12)	<i>E. andamanensis</i> (n=7)
Dorsal scales	tricarinate	quinquecarinate
Temporal scales	smooth	keeled
Lateral band	invisible	visible
Supranasals	in contact	separated
Prefrontals	in broad contact	separated
Prefrontals in contact with	1 st & 2 nd supraocular	1 st supraocular only
Frontal in contact with	2 nd supraocular only	1 st & 2 nd supraocular
Parietals	completely separated	In contact behind interparietal
Midbody scale rows	24–26	28–30

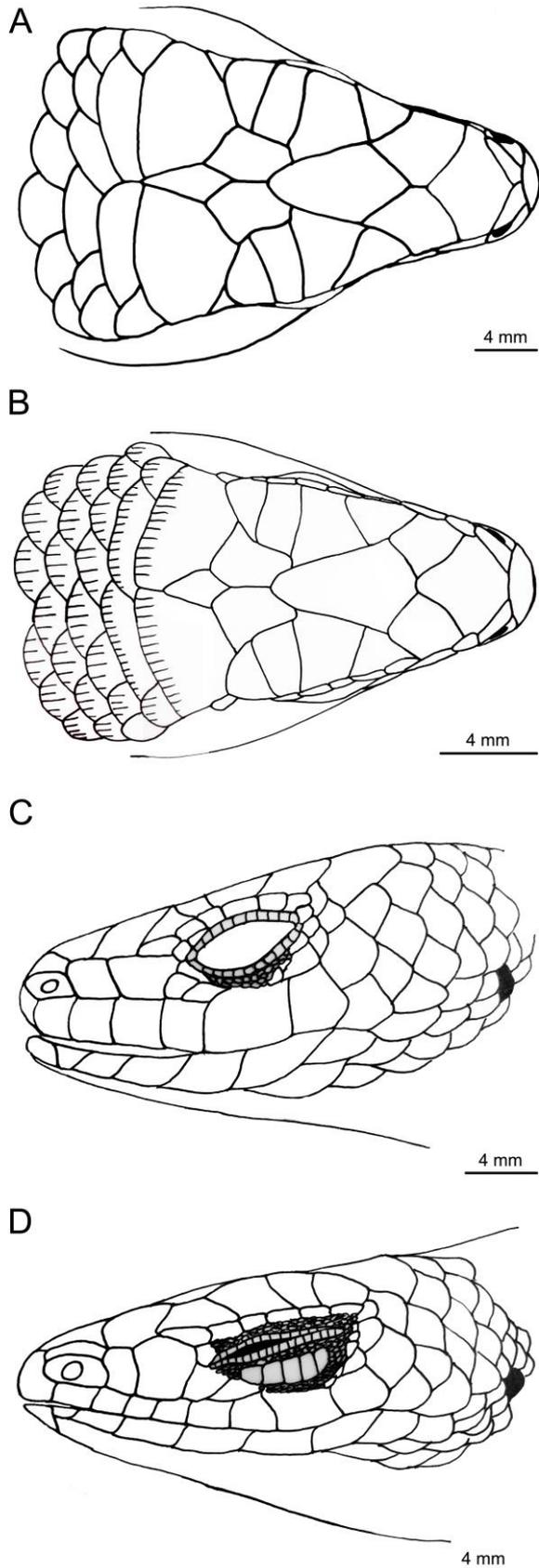


Figure 6. Head in dorsal and lateral views of (A, C) the holotype of *Eutropis tytleri* (ZSI 2273) and (B, D) syntype of *E. andamanensis* (ZSI 15084). Illustration © A.A.T. Amarasinghe

E. andamanensis is more common and can be seen abundantly whereas *E. tytleri* is relatively rare and less abundant. *E. andamanensis* is relatively more tolerant to human mediated habitat disturbances than *E. tytleri*, which is a more forest dependent species. There seems to be some degree of ecological niche partitioning between these two relatively large bodied skinks.

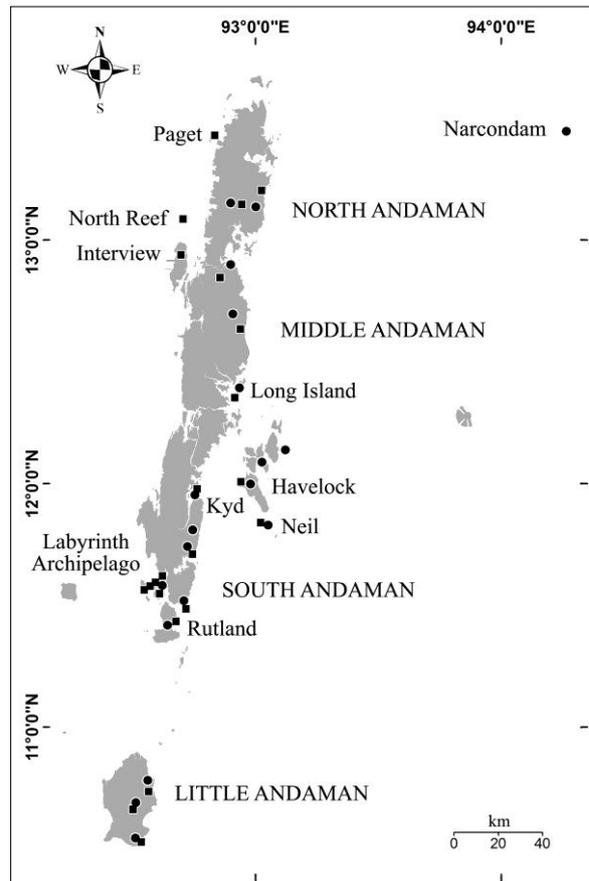


Figure 7. Current distribution of *Eutropis tytleri* (in circles) and *E. andamanensis* (in squares) in the Andaman Islands based on known locality records.

Among them, *E. tytleri* has a larger body size in comparison to *E. andamanensis* and is more arboreal in habit than the latter. Likewise, *E. tytleri* shows a crepuscular activity by being more active during twilight hours than during the day. On the other hand, *E. andamanensis* seldom ventures out after sunset.

E. andamanensis seems to undergo a gradual ontogenetic colour change as the intensity of the dark lateral bands seem to fade with age: young individuals have much darker and more legible bands than old ones, which have intermixed white spots on the dark bands along the lateral sides of the body. Such a phenomenon has not

been recorded in *E. tytleri*. Road traffic in forest reserves has been identified as a potential threat to these skinks (Fig. 3). A precise distribution map for these species presented here based on

current and confirmed past records will aid in their conservation status assessments. Locality details are listed in Table 3.

Table 3. Locality records of *Eutropis tytleri* and *E. andamanensis* in the Andaman Islands based on the present study and literature.

Species	Locality, Island	Lat.	Long.	Alt. (m)	Source
both species	Mt. Harriet NP, South Andaman	11.7207	92.7336	362	present study
both species	Chidiyatapu, South Andaman	11.4917	92.7088	77	present study
both species	Wandoor, South Andaman	11.6154	92.6194	3	present study
both species	Bada Khadi, Rutland	11.4291	92.6649	2	present study
both species	Kyd, Kyd Island	11.9663	92.7546	6	present study
both species	Sitapur, Neil Island	11.8302	93.0342	11	present study
both species	Radhanagar, Havelock	12.0085	92.9638	43	present study
both species	Harminder Bay, Little Andaman	10.5334	92.5353	24	present study
both species	Krishnanallah, Little Andaman	10.6776	92.5087	153	present study
both species	Dinghi Ghat, Little Andaman	10.7375	92.5673	16	present study
both species	Long Island	12.3693	92.9193	26	present study
both species	Cutbert Bay, Middle Andaman	12.6359	92.9560	22	present study
both species	Mayabunder, Middle Andaman	12.8474	92.8565	20	present study
both species	Kishori Nagar, North Andaman	13.1485	92.9427	99	present study
both species	Lamia Bay, North Andaman	13.1983	93.0367	6	present study
both species	Interview	12.9425	92.6978	64	present study
<i>E. andamanensis</i>	Tarmugli	11.5734	92.5519	29	present study
<i>E. andamanensis</i>	Alexandra	11.5785	92.6129	46	present study
<i>E. andamanensis</i>	Redskin	11.5709	92.5929	36	present study
<i>E. andamanensis</i>	Chester	11.5832	92.5782	0	present study
<i>E. andamanensis</i>	Grub	11.5894	92.5936	0	present study
<i>E. andamanensis</i>	Paget	13.4301	92.8324	34	present study
<i>E. andamanensis</i>	North Reef	13.0899	92.7013	18	present study
<i>E. tytleri</i>	Narcondam	13.4491	94.2638	13	Raman <i>et al.</i> (2013)
<i>E. tytleri</i>	Inglis	12.1399	93.0940	7	Sivaperuman (2014)
<i>E. tytleri</i>	John Lawrance	12.0975	93.0411	5	Sivaperuman (2014)

Acknowledgments

We thank the Department of Environment and Forests, Andaman and Nicobar Islands for permission to SRC (permit no: CWLW/WL/134/(J)/Folder/417) for conducting this study and for the infrastructure provided; K.V. Devi Prasad and the faculty of the Department of Ecology and Environmental Sciences and the Department of Ocean studies and Marine Biology, Pondicherry University for the support extended, the Mohamed bin Zayed Species Conservation fund for a grant (#14058387) which partly facilitated this study. We also thank the former Director, K. Venkataraman (Zoological Survey of India) for granting research permission to AATA. In particular we thank K. Chandra (Director) K. C. Gopi (officer-in-charge, FPS Building, ZSI, Kolkata), K. A. Subramanian (officer-in-charge, Technical Section, ZSI) for their help throughout the permitting application process. K. Deuti, S.

Raha, P.G.S. Sethy, P. Bag, and S. Debnath are also acknowledged for assisting us while examining collections in ZSI; Officers at the Chennai Snake Park Trust facilitated the study of preserved specimens under their care. We thank Jakob Hallermann (Universität Hamburg, Germany) and Philip Bowles (IUCN) for the review of the manuscript and critical comments. Finally, we thank J. Supriatna and the staff of the Research Center for Climate Change, University of Indonesia, for their support.

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