

DESCRIPTION OF FIVE NEW SPECIES OF *CYRTODACTYLUS* (REPTILIA: GEKKONIDAE) FROM SRI LANKA

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ABSTRACT.— The genus *Cyrtodactylus* Gray, 1827 has been considered to be represented in Sri Lanka by a single widely distributed species, *C. fraenatus* (Günther, 1864). A survey of rainforest sites in the island's wet zone shows that at least six species are present, five of them new. *Cyrtodactylus cracens* and *C. subsolanus* were recorded from the western and eastern sides respectively, of the Sinharaja World Heritage Site; *C. edwardtaylori*, from a refuge at Namunukula; *C. ramboda*, from the north-western slopes of the central hills; and *C. soba* from the Knuckles mountains. *Cyrtodactylus fraenatus* sensu stricto, restricted to the hills around Kandy, is redefined based on one of its syntypes and fresh collections.

KEY WORDS.— Sauria, Gekkonidae, *Cyrtodactylus*, new species, conservation, Sri Lanka.

INTRODUCTION

Bent-toed geckos of the genus *Cyrtodactylus* Gray, 1827 are represented by some 70 species distributed through Sri Lanka, northern peninsular India and south-east Asia to the Solomon Islands (Bauer & Henle, 1994). A single species, *Cyrtodactylus fraenatus* (Günther, 1864), has been considered to be widely distributed in Sri Lanka (Annandale, 1906; Boulenger, 1890; De Silva, 1994; Deraniyagala, 1953; Smith, 1935; Taylor, 1953). Here, we show that these geckos in Sri Lanka comprise an endemic radiation of at least six species, morphologically separable from all south and south-east Asian congeners. Together with a redescription of *C. fraenatus* based on type material and fresh collections, we herein describe the new species so as to make names available for them and facilitate conservation.

MATERIALS AND METHODS

Measurements were made with KWB dial vernier callipers (to the nearest 0.1 mm), following the methodology described by Bauer (2003). Claw lengths of (ClawLM) and pes (ClawLP) was measured from the posterior margin of dorsal claw sheath to claw tip of fourth digit of manus and pes with the aid of a stage micrometer. Scale counts and observations of external anatomy were made using an Olympus SZ40 dissecting microscope. Sex was determined by the presence of hemipenial bulges. Unless otherwise stated, colour notes are based on freshly-preserved material. Comparisons were made with preserved material in the collection of the Wildlife Heritage Trust of Sri Lanka (WHT); Natural History Museum, London

(BMNH); Kansas University Museum Natural History (KU), and also with published descriptions (Bauer, 2002, 2003; Bauer et al., 2002, 2003; Darevsky & Szczerbak, 1997; Das, 1997; Das & Lim, 2000; Hikida, 1990; Smith, 1935; Ulber, 1993). The identification of sympatric geckos except for *Cyrtodactylus* is based on Deraniyagala (1953), Smith (1935) and Taylor (1953). Nomenclature follows Kluge (2001). Photographs were taken with a Cannon EOS-10D digital camera. Colour photographs are of living specimens unless otherwise stated. Altitudes are given in metres above mean sea level; geographic co-ordinates were taken using a Magellan 12-channel GPS (geodetic datum WGS-84: World Geodetic System of 1984), and in some instances, using topographic maps (Survey Department 1"=1 mile series). Specimens collected in the course of this study are deposited in WHT and National Museum of Sri Lanka (NMSL). All material is from Sri Lanka.

TAXONOMY

GEKKONIDAE

Cyrtodactylus fraenatus (Günther, 1864)

(Figs. 1–3, 4A, 5A, 6A, 7A, 8A, 9A, 10A, 13A, 14A, 15A; Table 1)

Gymnodactylus fraenatus Günther, 1864: 113, pl. 12 D, D'.

Material examined. – Lectotype (by present designation), male, 88.0 mm SVL (BMNH 53.2.12.6), from "Ceylon" (Günther, 1864: pl. 12 D').

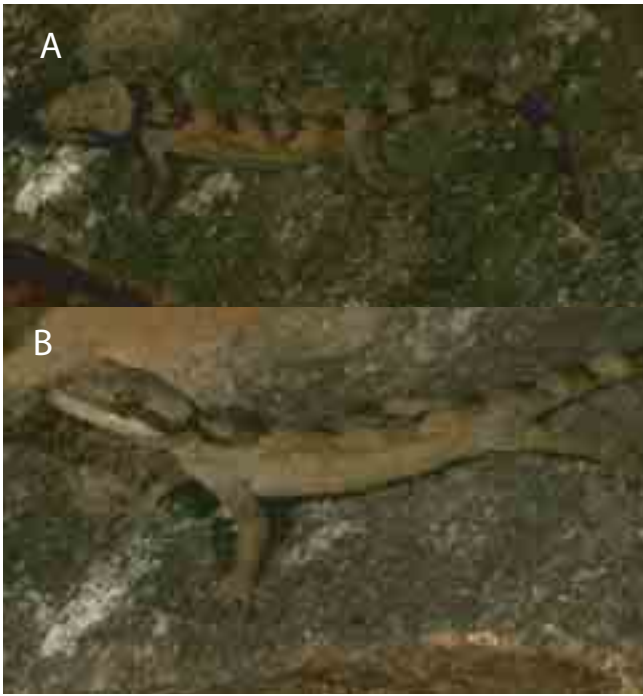


Fig. 1. Colour in life of *Cyrtodactylus fraenatus* (Günther 1864), toptype (WHT 6057). A, dorsal view; B, lateral view of left side.

Paralectotypes - subadult male, 53.4 mm (SVL BMNH53.7.19.10); female, 99.0 mm SVL (BMNH 53.3.30.13), from “Ceylon”; (Günther, 1864: pl. 12 D).

Recent material - 2 adult males (WHT 6053, WHT 6054), 5 adult females (WHT 6055–6058, WHT 6060), juvenile (WHT 6059), Gannoruwa Proposed Forest Reserve, near Peradeniya, Kandy District (07°17'10"N, 80°35'30"E, alt. 700 m); coll. M. M. Bahir and S. Batuwita, 5 Jan.2004. Adult female (WHT 6080), Pussellawa, Nuwara Eliya District, Sri Lanka (07°06'58"N, 80°37'21"E, alt. 980 m), coll. M. M. Bahir and S. Nanayakkara, 5 Jan.2004.

Diagnosis.— *Cyrtodactylus fraenatus* is distinguished from all other congeners by a combination of the following characters: subdigital lamellae beneath proximal portion of 4th digit of manus 7–9, beneath distal portion 11–15; basal lamellae under proximal portion as wide as digit width; subdigital lamellae beneath proximal portion of 4th digit of pes 8–11, beneath distal portion 13–16 (Figs. 3F, 14A); no precloacal groove; 4–6 precloacal pores in males; claws long (ClawLM/ForeaL ratio 0.07–0.14; ClawLP/ CrusL ratio 0.07–0.12) (Figs. 3G, 15A); mental subpentagonal, with concave postero-lateral borders (Figs. 3B, 7A); 27–35 scales across mid-body between ventrolateral folds; dorsal scales across mid-body between ventrolateral folds 70–74; 17–22 tubercles on paravertebral row; 5–9 rows of weakly convex dorsal tubercles at mid-body (Figs. 3C, 8A, 9A); ventral scales imbricate with rounded posterior edge (Figs. 2D, 3D, 10A). Original tail longer than body (TailL/SVL ratio range 1.08–1.16) (Fig. 2A).

Cyrtodactylus fraenatus resembles *C. ramboda* new species and *C. subsolanus* new species. It may be distinguished from the former by having 17–23 paravertebral tubercles (vs. 38–44 in *C. ramboda*), and from the latter by its distinct dorsal bands (vs. indistinct dorsal bands in *C. subsolanus*); (see Table 5).



Fig. 2. Colour in life of *Cyrtodactylus fraenatus* (Günther 1864), toptype female from Gannoruwa (not collected). A, dorsal view; B, lateral view of left side; C, lateral view right side of head; D, mid-ventral scales.

Description.— (Based on paralectotype, BMNH53.7.19.10, unless otherwise stated.) Subadult male, SVL 53.4 mm. Head moderately long (HeadL/SVL ratio 0.31), wide (HeadW/HeadL ratio 0.65), moderately depressed (HeadH/HeadL ratio 0.41), distinct from neck (Fig. 4A, lectotype). Lores and interorbital region weakly inflated; canthus rostralis not well developed. Snout moderately short (SnEye/HeadL ratio 0.38), longer than eye diameter (OrbD/SnEye ratio 0.62). Scales on snout and

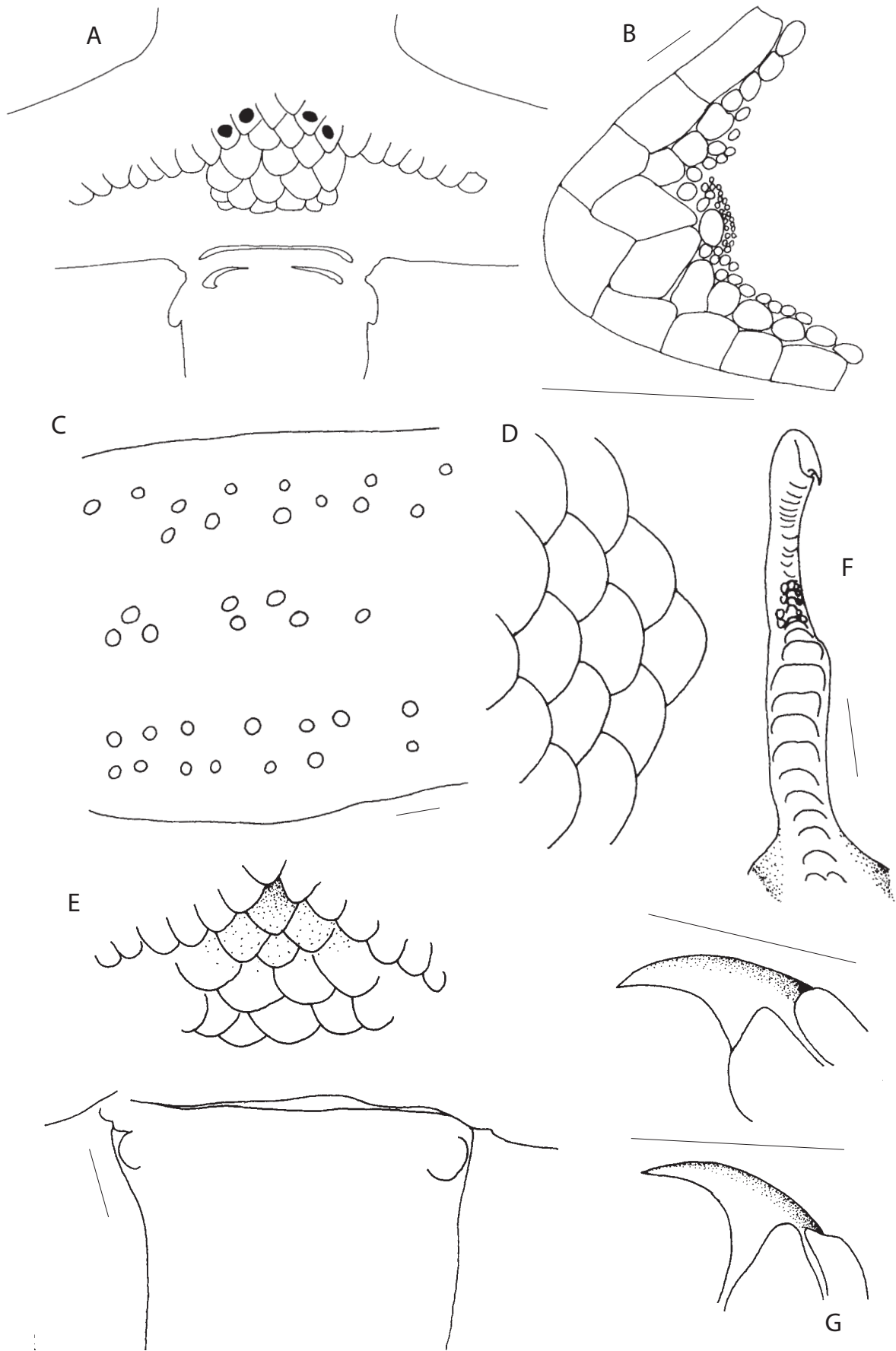


Fig. 3. Lectotype male *Cyrtodactylus fraenatus* (BMNH53.2.12.6): A. preloacal region, adapted from Günther (1864), showing preloacal pores. Paralectotype subadult (BMNH53.7.19.10): B. Ventral side of anterior part of head. C. Dorsum, showing large mid-dorsal tubercles. D. Mid-ventral scales. E. Preloacal region. F. Ventral side of fourth toe. G. Lateral aspects of claws of fourth finger and toe, respectively. Scale bar = 1 mm.

Table 1. Mensural data for paralectotype and topotypes of *Cyrtodactylus fraenatus* (Günther, 1864). Abbreviations as in Materials and Methods section; BM = BMNH; all measurements in mm.

	BM53.7.19.10 Paralectotype	WHT6053	WHT6055	WHT6056	WHT6054	WHT6057	WHT6058	WHT6060
Sex	male	male	female	female	male	female	female	female
SVL	53.4	91.2	94.3	78.2	92.4	82.0	93.4	87.8
FOL	7.0	12.9	12.8	10.0	12.3	11.0	12.5	11.0
Crus L	9.0	15.4	14.2	11.5	14.0	12.7	14.7	13.5
Tail L (entire)	57.0	48.3	109.0	74.6	107.3	92.7	100.0	100.9
Tail L (regenerated)			broken	broken				
Tail W	4.5	8.5	7.7	6.1	8.1	7.0	7.5	7.8
Trunk L	26.5	51.7	54.3	42.5	51.9	45.9	55.0	51.0
Head L	16.8	24.1	25.0	20.3	22.9	21.9	24.6	22.7
Head W	10.9	17.2	17.2	14.5	15.3	14.7	17.5	16.6
Head H	6.9	10.0	9.7	8.2	7.0	8.3	10.3	10.1
OrbD	4.4	6.0	6.9	5.0	5.9	5.2	6.2	5.2
EyeEar	4.7	6.1	6.1	5.2	5.1	6.5	7.4	7.2
SnEye	6.4	9.6	9.9	8.2	9.2	8.7	9.5	9.1
NarEye	4.6	7.0	7.0	6.0	7.0	6.7	7.2	7.0
Interorb	3.1	8.4	8.3	7.5	8.3	6.1	7.9	7.4
Ear L	1.0	1.8	1.8	1.3	1.7	1.2	1.5	1.3
Internarial	2.2	3.5	3.1	2.7	2.9	3.0	3.1	2.6

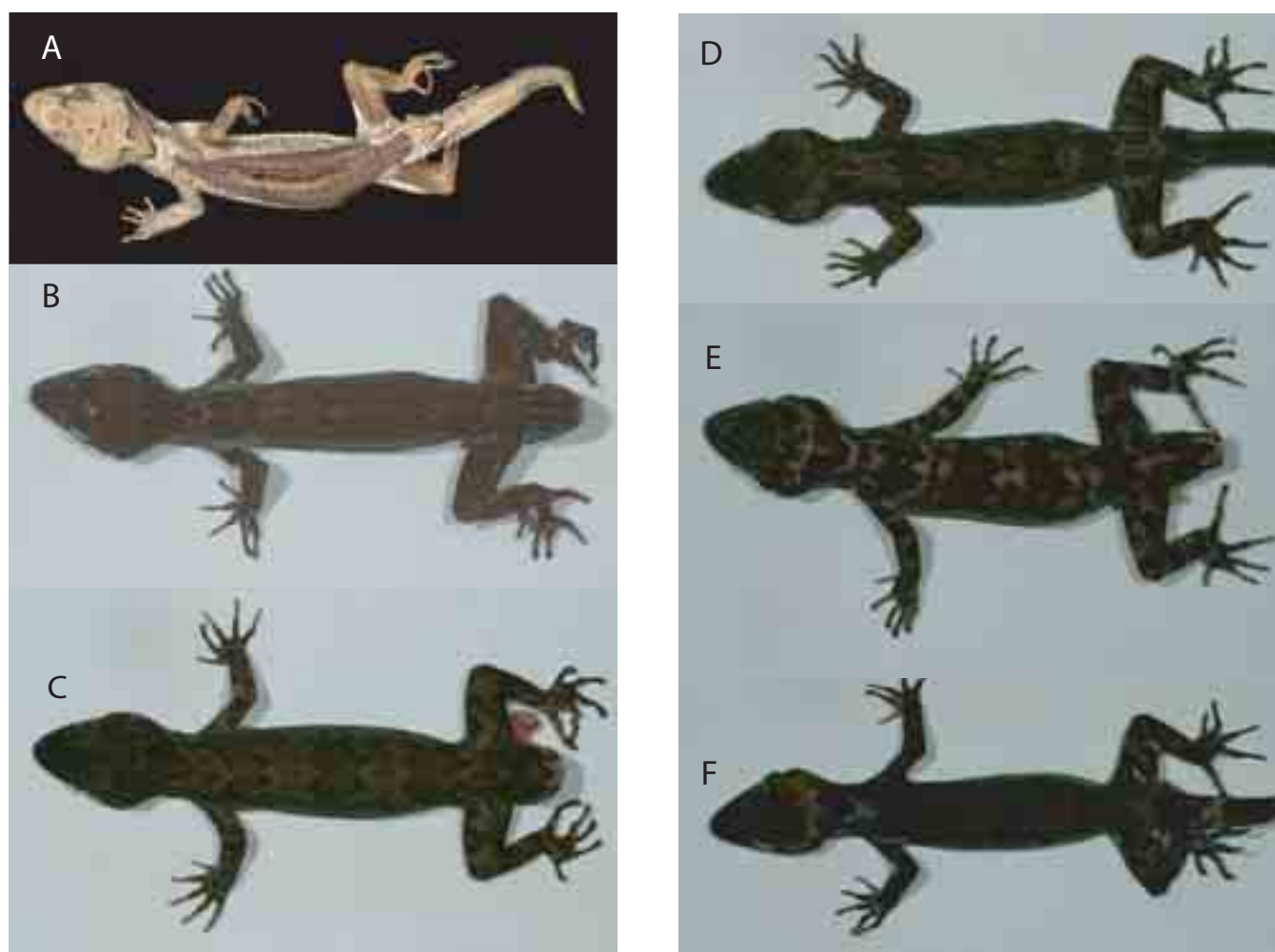


Fig. 4. Dorsal views of Sri Lankan *Cyrtodactylus* (holotypes, unless otherwise stated). A. Lectotype of *Cyrtodactylus fraenatus* (Günther, 1864) (BMNH53.2.12.6). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999).

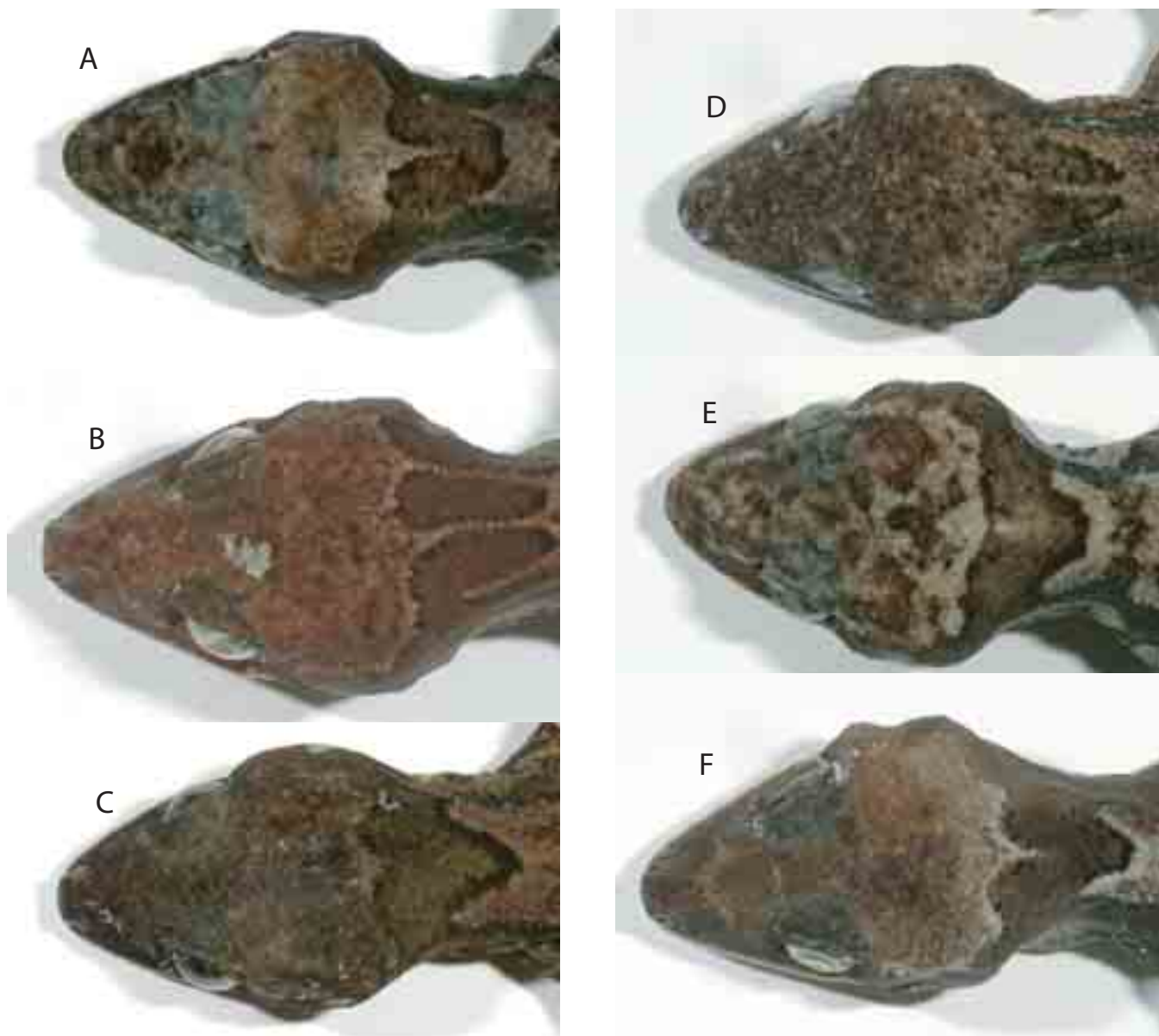


Fig. 5. Dorsal views of heads of Sri Lankan *Cyrtodactylus* (holotypes, unless otherwise stated). A. *Cyrtodactylus fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999).

forehead rounded, granular; scales on snout much larger than those on occipital region. Temporal and post-orbital region with convex and weakly conical tubercles. Eye relatively large (OrbD/ HeadL ratio 0.24); pupil vertical, its anterior margin with two blunt lobes, posterior margin with two roughly pointed lobes. Supraciliaries short, blunt (except for a few pointed scales at posterior border of orbit). Ear opening elliptical, obliquely orientated, small (EarL/ HeadL ratio 0.05). Eye to ear distance slightly greater than diameter of eyes (EyeEar/ OrbD ratio 1.06). Rostral approximately 60% as deep (1.5 mm) as wide (2.5 mm), incompletely divided dorsally by a weakly developed inverted Y-shaped rostral groove (about half rostral height). Two enlarged supranasals separated by two internasals, one roughly pentagonal, the other roughly triangular. Eleven scales border supranasal-internasal scale row. Rostral in contact with first supralabial, supranasals and internasals. Nostrils oval, laterally orientated, each in broad

contact with rostral and in narrow contact with first supralabial, also surrounded by supranasal and a narrow crescentic nasal rim bordered by two postnasals; lower postnasal about twice size of upper. A pigmented narial flap occludes posterior two-thirds of nostril. Four rows of scales separate orbit from supralabials. Mental subpentagonal, wider (2.5 mm) than deep (1.8 mm). One pair of enlarged postmentals approximately one-third of mental (Fig. 3B). Postmentals in broad medial contact with no intervening granules, bordered laterally by first infralabial and enlarged second postmentals, posteriorly by three small granular chin scales and a rather large medial chin scale (Fig. 3B). Infralabials bordered by a single row of enlarged scales, largest anteriorly. Throat scales minute, rounded, granular. Supralabials (to midorbital position), 8; enlarged supralabials to angle of jaws, 12; infralabials 10 (left) and 11 (right); interorbital scale rows across narrowest point of frontal bone, 18.

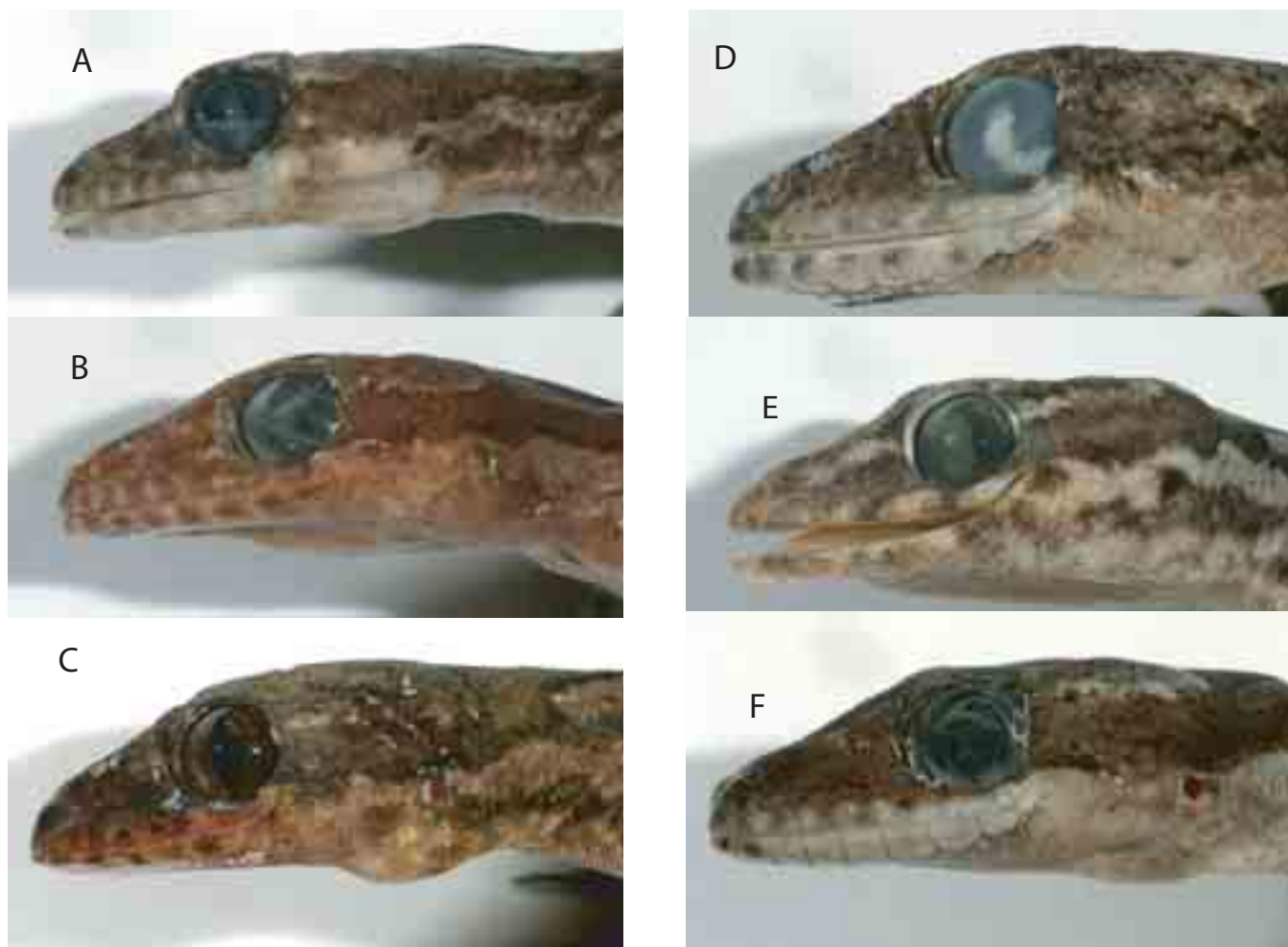


Fig. 6. Lateral views of heads of Sri Lankan *Cyrtodactylus* (holotypes, unless otherwise stated). A. *Cyrtodactylus fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999).

Body relatively robust (Fig. 4A, lectotype), short (TrunkL/SVL ratio 0.50) with well-developed, non-denticulate ventrolateral folds. Dorsal scales heterogeneous, with regularly arranged small, flattened or convex tubercles extending from occipital region along back to base of tail. Tubercles on paravertebral row small, raised, most prominent on dorsolateral surfaces, somewhat smaller and flattened on mid-dorsal line, absent on flanks. Weakly convex tubercles in eight longitudinal rows at mid-body (Fig. 3C). Scales dorsally on scale-row between ventrolateral folds, 71. Tubercles on paravertebral row from occipital region to midsacrum, 19. Ventral scales much larger than dorsals, cycloid, imbricate (Fig. 3D, see also Fig. 10A), 10 scales, somewhat larger between preloacal depression and vent; abdominal scales larger than those on chest. Mid-body scale rows across belly (between ventrolateral folds), 30. Scales on throat granular, grading into larger scales on chest. No preloacal pores (Fig. 3E). A single series of 4 preloacal pores separated by two scales. Femoral pores absent in adult male lectotype BMNH53.2.12.6 (see also Günther, 1864: pl. 12 D'). Preloacal depression present, preloacal groove absent (Fig. 13A, topotype). Scales on palm and sole smooth,

flattened to somewhat conical. Scales on dorsal aspects of proximal forelimbs smooth, imbricate, similar to ventrals, lacking tubercles. Distal forelimb and hindlimb scales similar to dorsal scales intermixed with larger convex tubercles interspersed among smaller scales.

Fore and hind limbs relatively stout (Fig. 4A, lectotype). Forearm short (ForeaL/SVL ratio 0.13). Tibia short (CrusL/SVL ratio 0.17). Digits long, strongly inflated at each joint, all bearing moderately long (ClawLM/ForeaL ratio 0.12; ClawLP/CrusL ratio 0.10), recurved claws (Fig. 3F, see also Fig. 15A). Subdigital lamellae smooth with scansorial surfaces on basal lamellae. Basal lamellae wider than long, as wide as digit width, rounded to emarginate posteriorly (Fig. 3F; 14A, topotype). Lamellae from first proximal scansor greater than twice largest palm scale to proximal portion of first interphalangeal joint: 7–10–8–9–8 in manus and 7–9–10–11–8 in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 10 (left)/ 11(right)–12 (left)/ 11(right)–14–13 (left)/ 15 (right)–13 in manus and 11(left)/ 12 (right)–12–15 (left)/ 16 (right)–14 (left)/ 16(right)–12 (left)/ 15 (right) in pes. Interdigital webbing weakly developed. Relative length of digits (measurements in mm in parentheses), manus:

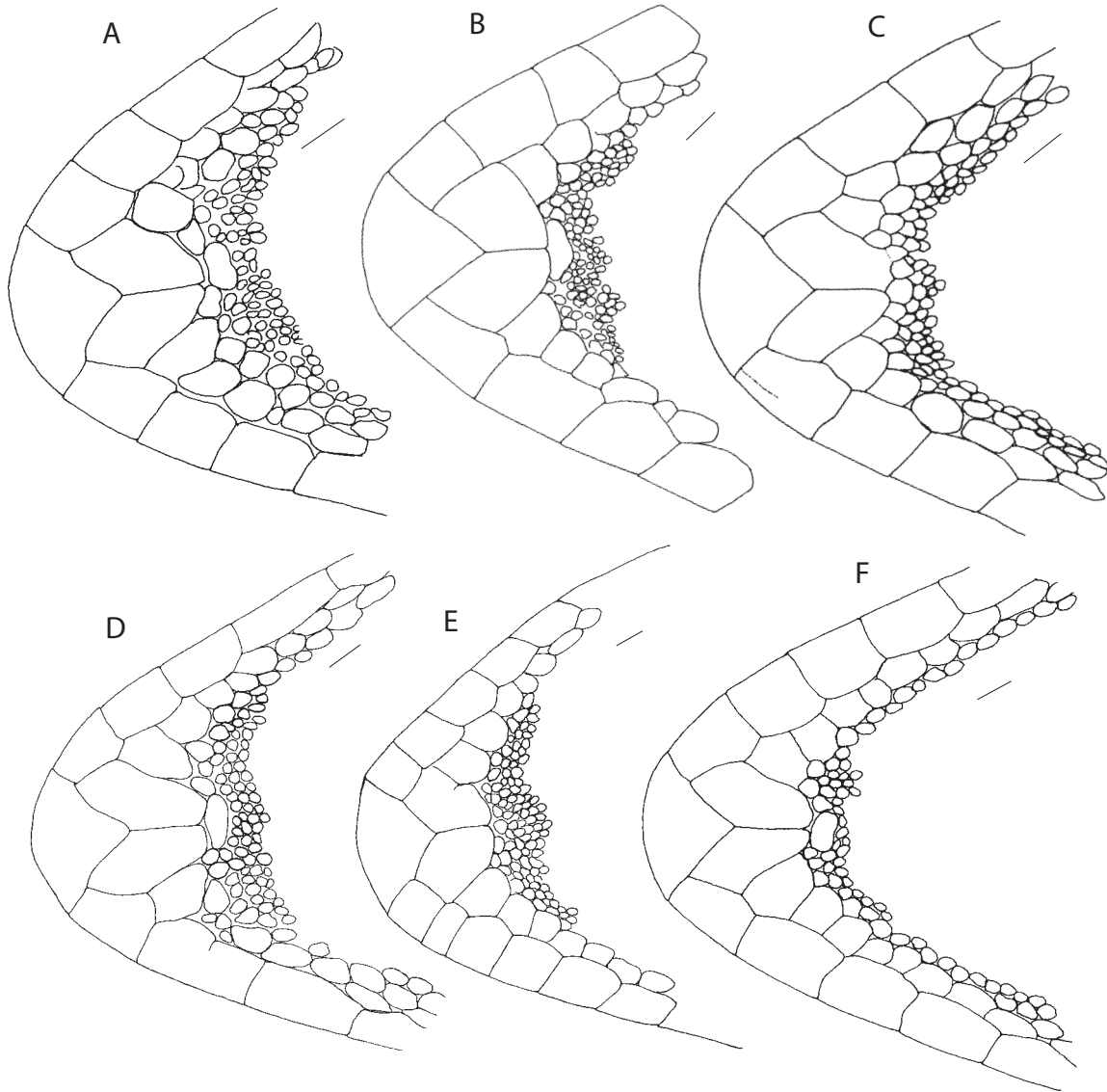


Fig. 7. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing ventral side of anterior part of head. A. *C. fraenatus* (Günther, 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

IV (4.9) > V (4.1) ~ III (4.1) > II (3.1) > I (2.6); pes: IV (5.8) > V (5.1) ~ III (5.1) > II (4.6) > I (3.5).

Original tail in subadult paralectotype BMNH 53.7.19.10 long (TailL/ SVL ratio 1.08). Subcaudal scales larger (half of tail width), with a single median series of enlarged plates; 2 enlarged scales on either side of tail base. Original tail in WHT 6055 long (TailL/ SVL ratio 1.16), moderately broad, slightly compressed dorso-ventrally. Dorsal scales rectangular. Tubercles arranged in 4 irregular whorls on base of tail, 4–6 tubercles in each whorl, becoming indistinct posteriorly. Subcaudal scales larger (~ half tail width), with a single median series of enlarged plates. Prominent cloacal spurs with 2 enlarged scales on each side of tail-base in WHT 6054.

Coloration.— (Based on WHT 6053: Figs. 5A, 6A, 8A; see also Fig. 4A, lectotype.) Base colour olive brown marked by

darker olive-brown bands, each with a dark-brown posterior border. Each marking bolder and better defined posteriorly, diffuse anteriorly. Head lighter with small dark dorsal markings in WHT 6056. Canthal region with a pale, narrow transverse bar (faded in some individuals). An olive-brown occipital band with a posteriomedial notch, continuous with temporal band, extending anteriorly to orbit and to loreal region, continuing indistinctly to rostral. Occipital band laterally confluent with band on nape. Four or five bands on dorsum between nape and sacrum. Band on nape continuous, others partially bifurcate posteriorly. Faint, more or less continuous, lighter longitudinal stripes on lateral surfaces. Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Tail-base with a dark band similar to that on sacrum. Remainder of tail with alternating elongate dark bands and shorter pale interspaces; 7–8 dark bands on original tail (including tail tip), each with a darker posterior border. Tail patterning continues on to venter, the bands more

clearly demarcated towards tail tip of WHT 6055. Venter pale, chin and gular areas darker. Palms and soles pale.

Colour in life similar to that in preservative but with a slightly yellowish cast on the lighter regions of the head and body (see Figs. 1, 2).

Variation.— Comparative mensural data for the paralectotype and recently collected series are presented in Table 1. The recently collected specimens vary from the paralectotype as follows: scale rows between ventrolateral folds, 27–35. Rows of dorsal tubercles at mid-body, 5–9; paravertebrals, 17–22; dorsal scales across mid-body, 58–68. A series of 5–6 preloacal pores in males (a single poreless scale dividing the series into 2 (left) and 3 (right) in WHT 6054). Preloacal pores 4 in male lectotype BMNH53.2.12.6 (two poreless scales dividing the series, 2 (left) and 2 (right)) (Fig. 3A). Preloacal pores small in female examples WHT 6055–8 and WHT 6060 (two poreless scales dividing the series, 2 (left) and 1 (right) in WHT 6058; three poreless scales dividing the series, one on each side in WHT 6060; preloacal pores absent, but with small depressions in these scales in adult WHT 6055 and subadult, WHT 6056). Two internasals in WHT 6055 and WHT 6058.

Supralabials to mid-orbital position, 7 on each side in WHT 6054 and WHT 6055; 7 on right side and 8 on left side in WHT 6056; 7 on left side and 8 on right side in WHT 6058; 8 on left side and 9 on right in WHT 6060. Supralabials to corner of mouth, 10 on right side and 11 on left side in WHT 6054; 12 on left side and 13 on right side in WHT 6055; 11 on left side and 12 on right side in WHT 6056; 13 on each side in WHT 6058; 13 on left side and 14 on right side in WHT 6060. Infralabials, 9 on each side in WHT 6054; 9 on right side and 10 on left side in WHT 6056; 10 on each side in WHT 6060; 10 on left side and 11 on right side in WHT 6058; 11 on each side in WHT 6055. Range of subdigital lamellae: 5–7, 7–9, 7–9, 7–9, 6–8 (proximal portion of 4th digit) and 10–12, 10–12, 12–15, 11–14, 11–13 (distal portion of 4th digit) of manus; and 5–8, 8–9, 8–9, 8–9, 6–8 (proximal portion of 4th digit) and 10–12, 11–14, 13–16, 13–16, 14–17 (distal portion of 4th digit) of pes. A single post-cloacal spur on right side in WHT 6060. Based on the material examined, *C. fraenatus* ranges in size range from 46.8 mm (WHT 6059, juvenile) to 94.3 mm (WHT 6055, adult female), SVL.

Remarks.— We here designate as lectotype of *Gymnodactylus fraenatus* Günther, 1864 the 88.0 mm SVL male (BMNH 53.2.12.6) figured by Günther (1864: pl. 12 D’).

Etymology.— Latin, fraenum = bridle or rein; possibly a reference to the band on the neck of this gecko.

Habitat and distribution.— We recorded *C. fraenatus* from only two localities, separated by a distance of ~ 20 km: Gannoruwa Forest near Kandy, and Pussellawa (Fig. 21). At Gannoruwa, specimens were obtained from tree trunks (~ 2–9 m above ground) and rock outcrops in shaded areas, whereas at Pussellawa, these geckos were found on the wooden wall of a small house. In both cases, collections were

made between 1930–2130 hrs. The following gecko species were also observed in sympatry with *C. fraenatus* in Gannoruwa: *Cnemaspis kandiana* (Kelaart, 1852); *C. jerdoni scalpensis* (Ferguson, 1877); *Geckoella triedra* (Günther, 1864); *Hemidactylus depressus* Gray, 1842 and *H. frenatus* Duméril & Bibron, 1836; and in Pussellawa: *Cnemaspis* sp. and *Hemiphyllocladactylus typus* Bleeker, 1860. We also observed, but did not collect, *Cyrtodactylus fraenatus* on Hantana Mountain, near Kandy.

Cyrtodactylus cracens, new species

(Figs. 4B, 5B, 6B, 7B, 8B, 9B, 10B, 13B, 14B, 15B; Table 2)

Material examined.— Holotype, adult male (101.0 mm SVL) (WHT 6048) (partially regenerated tail broken at base), Sinharaja World Heritage site, Ratnapura District (06°26’N, 80°25’E, alt. 450 m), coll. D. Gabadage and M. M. Bahir, 24 Jan.2000.

Paratype - Adult male (102.3 mm SVL) (WHT 6049), same locality data as holotype, coll. M. M. Bahir and D. Gabadage, 23 May 1999.

Diagnosis.— *Cyrtodactylus cracens* is distinguished from all other *Cyrtodactylus* by a combination of the following characters: subdigital lamellae beneath proximal portion of 4th digit of manus, 7–9; beneath distal portion, 12–13; basal lamellae under proximal portion as wide as digit width. Subdigital lamellae beneath proximal portion of 4th digit of pes 8–9; beneath distal portion 12–14 (Fig. 14B); no preloacal groove; 5–6 preloacal pores in males; claws long (ClawLM/ForeaL ratio 0.10–0.12; ClawLP/ CrusL ratio 0.12–0.13) (Fig. 15B); mental subtriangular (Fig. 7B). Scales across mid-body between ventrolateral folds, 31. Dorsal scales across mid-body between ventrolateral folds, 63–67. Tubercles on paravertebral row, 26–27. Seven to eight rows flattened dorsal tubercles at mid-body (Fig. 8B, 9B). Ventral scales imbricate, with rounded posterior edges (Fig. 10B).

From among the other Sri Lankan *Cyrtodactylus*, *C. cracens* most closely resembles *C. subsolanus* new species, from which it may be distinguished as follows: head narrow (HeadW/HeadL ratio 0.65), dorsal tubercles flattened and claws comparatively longer, vs. head wide (HeadW/HeadL ratio 0.71–0.72), dorsal tubercles raised and claws short in *C. subsolanus* (see Table 5).

Description.— (Based on holotype, WHT 6048.) Adult male, SVL 101.0 mm. Head moderately long (HeadL/SVL ratio 0.27), relatively narrow (HeadW/HeadL ratio 0.65), not depressed (HeadH/HeadL ratio 0.40), distinct from neck (Figs. 4B, 5B, 6B). Lores and interorbital region weakly inflated; canthus rostralis well developed. Snout moderately short (SnEye/HeadL ratio 0.39) (Fig. 5B), longer than eye diameter (OrbD/SnEye ratio 0.61). Scales on snout hexagonal, flattened, and on forehead granular (Fig. 5B). Convex to weakly conical tubercles on temporal and post-orbital regions; a few enlarged scales on supraorbital area. Scales on snout much larger than those on occipital region (Fig. 5B). Eye relatively large (OrbD/HeadL ratio 0.24); pupil vertical, its anterior margin roughly

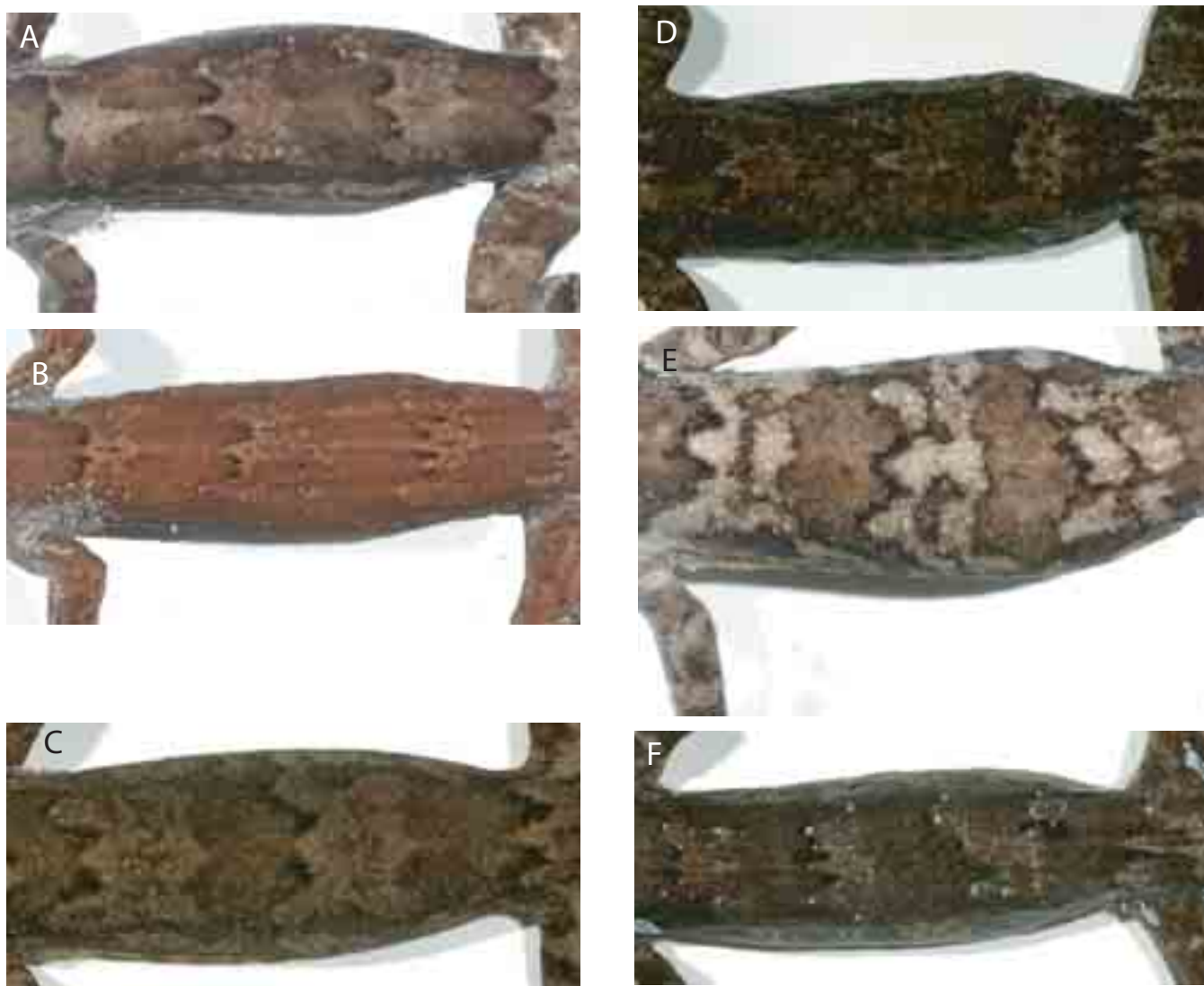


Fig. 8. Dorsal views of trunks of Sri Lankan *Cyrtodactylus* (holotypes, unless otherwise stated). A. *Cyrtodactylus fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

convex and posterior margin with two roughly pointed lobes; anterior supraciliaries short, bluntly pointed and pointed towards posterior eye rim. Ear opening elliptical, small (EarL/HeadL ratio 0.04), with supratympanic fold. Eye to ear distance greater than diameter of eye (EyeEar/OrbD ratio 1.14). Rostral approximately 50% as deep (2.2 mm) as wide (4.4 mm), incompletely divided dorsally by a weakly-developed, inverted Y-shaped rostral groove about half as deep as rostral. Two enlarged supranasals separated by a single, smaller, roughly hexagonal internasal. Nine regular rows of enlarged scales border supranasal-internasal row posteriorly. Rostral in contact with first supralabial, supranasals and internasal. Nostrils oval, laterally orientated, each in broad contact with rostral and narrow contact with first supralabial, also surrounded by supranasal and a narrow crescentic nasal rim bordered by two postnasals. Upper postnasal slightly smaller than lower. A pigmented narial flap occludes posterior half of nostrils. Two rows of scales separate orbit from supralabials. Mental subtriangular, wider (3.3 mm) than deep (2.4 mm) (Fig. 7B). One pair of enlarged postmentals, each approximately

two-thirds size of mental (Fig. 7B). Left and right postmentals in broad medial contact with no intervening granules, bordered laterally by first infralabial (right), first and (marginally) second infralabials (left), an enlarged lateral chinshield, and posteriorly by two granular chin scales and a somewhat large medial scale (Fig. 7B). Infralabials bordered by a single row of enlarged scales, the anterior of which are larger. Throat scales granular. Supralabials (to midorbital position), 7 (left), 8 (right): enlarged supralabials to angle of jaws 12 (left), 11 (right). Infralabials, 10. Interorbital scale rows across narrowest point of frontal bone, 21.

Body slender, relatively elongate (Fig. 4B) (TrunkL/SVL ratio 0.59), with well-developed, non-denticulate ventrolateral folds. Dorsal scales heterogeneous, flattened, pitted or rugose, with regularly arranged small (2–4 times size of dorsal scales) and flattened tubercles extending from occipital region on to back and base of tail. Tubercles most prominent on dorsolateral surfaces, somewhat smaller and weakly conical on nape, along mid-dorsal line, absent on flanks. Tubercles in eight flattened

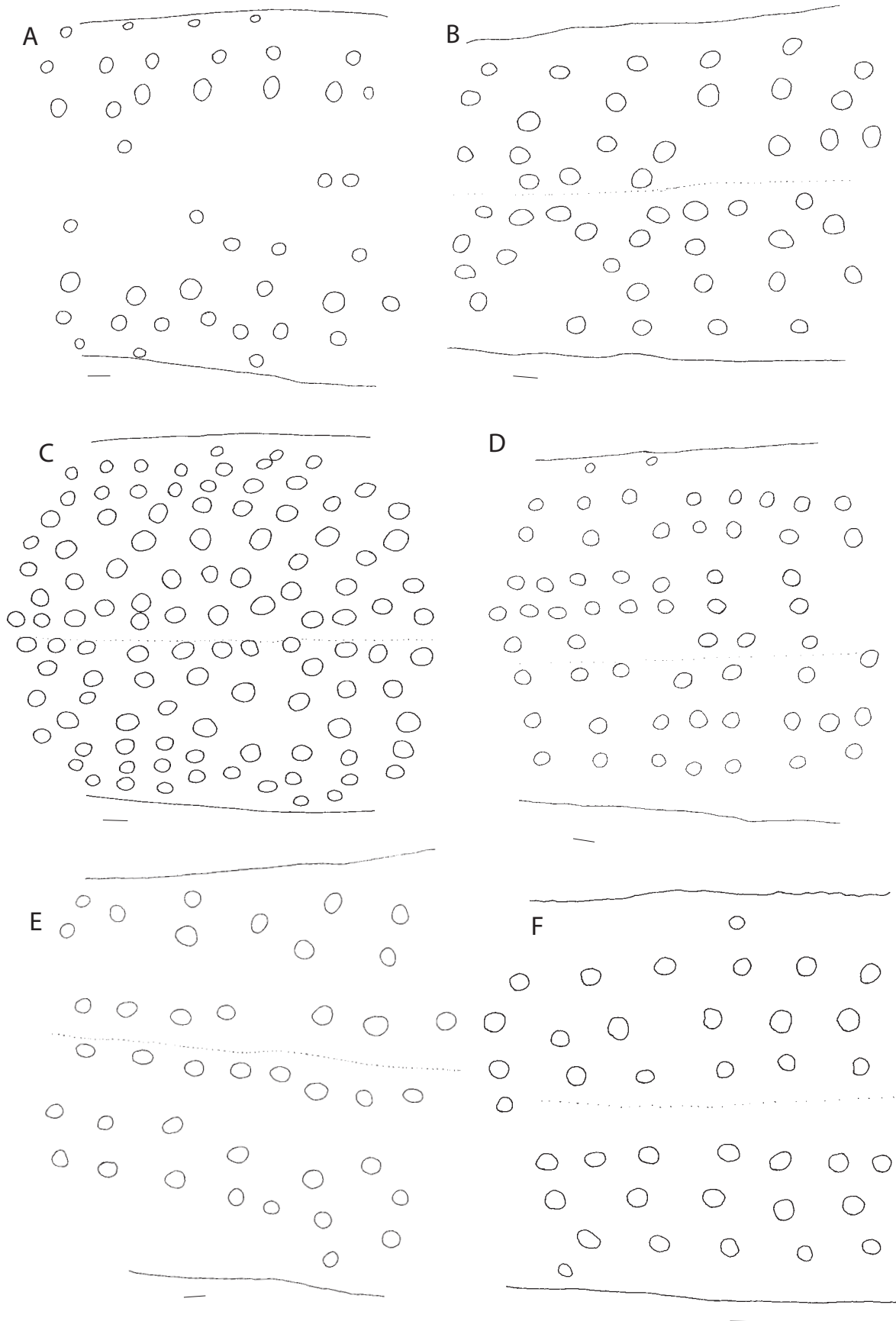


Fig. 9. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing large mid-dorsal tubercles, A. *C. fraenatus* (Günther, 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

Table 2. Mensural data for the types of *Cyrtodactylus cracens* and *C. edwardtaylori*. Abbreviations as in Materials and Methods section; all measurements in mm.

	<i>C. cracens</i> WHT6048 Holotype	<i>C. cracens</i> WHT6049 Paratype	<i>C. edwardtaylori</i> WHT6067 Holotype	<i>C. edwardtaylori</i> WHT6068 Paratype	<i>C. edwardtaylori</i> WHT6066 Paratype
Sex	male	male	male	female	female
SVL	101.0	102.3	92.7	93.4	95.5
FOL	14.5	15.2	12.6	12.0	12.4
Crus L	17.4	17.2	14.3	14.0	14.0
Tail L (entire)	99.9	91.7	86.3	71.6	17.3
Tail L (regenerated)	46.1	58.0	19.5	62.0	7.8
Tail W	9.5	8.6	9.6	8.3	8.0
Trunk L	59.1	57.8	54.4	53.5	54.6
Head L	27.2	28.0	23.0	23.5	24.6
Head W	17.8	18.8	17.5	17.5	17.2
Head H	11.0	10.6	10.5	10.4	10.2
OrbD	6.5	6.9	5.8	5.6	6.1
EyeEar	7.4	7.6	7.8	6.7	7.4
SnEye	10.7	11.4	9.2	9.0	9.5
NarEye	8.3	8.5	6.6	6.8	7.2
Interorb	8.3	9.2	8.2	8.1	8.5
Ear L	1.1	1.5	1.6	1.7	1.8
Internarial	2.9	2.5	3.3	3.0	3.5

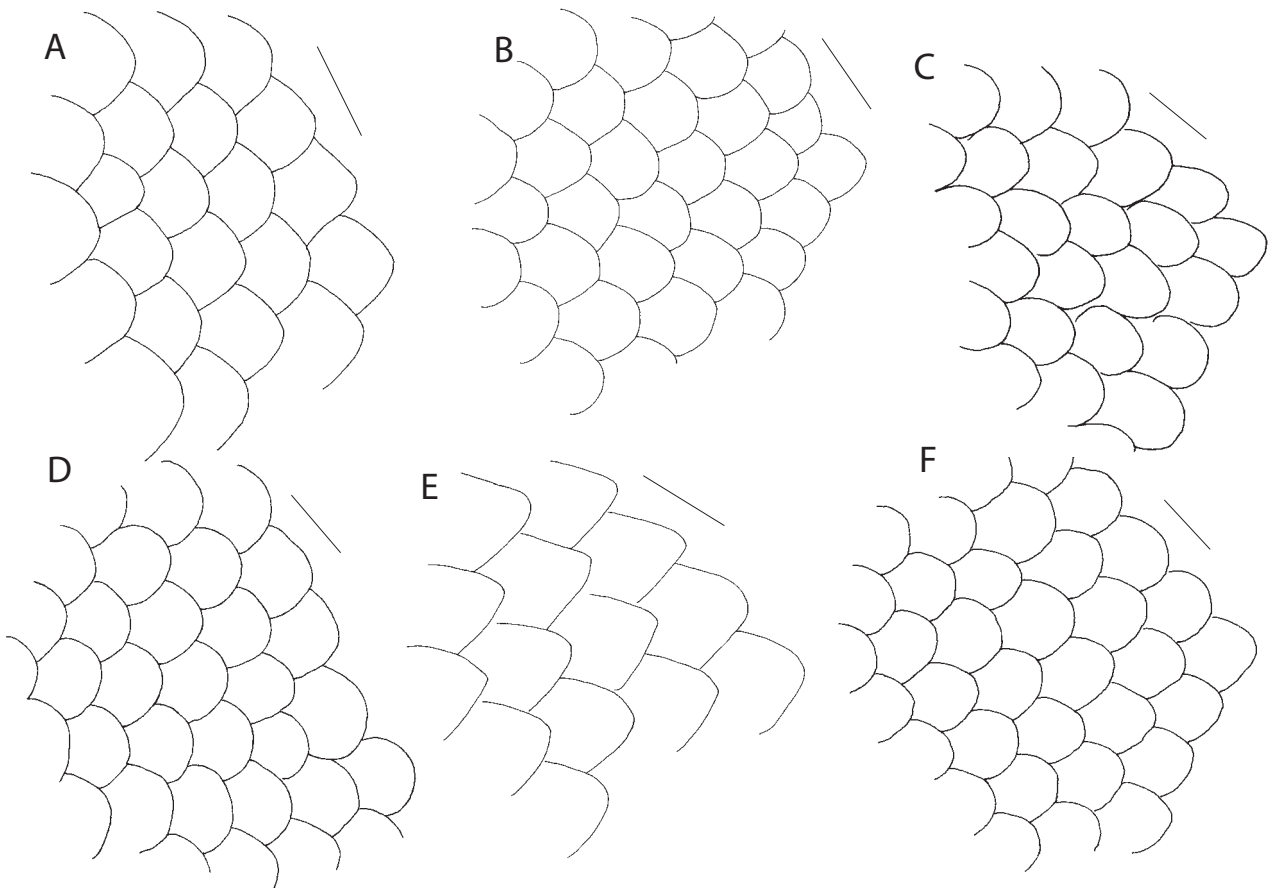


Fig. 10. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing mid-ventral scales. A. *C. fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

longitudinal rows at mid-body (Fig. 9B). Dorsal scales, 67. Tubercles in paravertebral row from occiput to midsacrum, 27. Ventral scales much larger than dorsal ones, cycloid, imbricate (Fig. 10B), nine enlarged scales between precloacal pores and vent, somewhat larger on abdomen than on chest. Mid-body scale rows across belly between ventrolateral folds, 31. Scales on throat small, granular, grading into larger ones on chest. A single series of 5 precloacal pores in a shallow precloacal depression, with a narrow, poreless, bluntly pointed scale partially separating two continuous rows of 3 (left) and 2 (right) pores (Fig. 13B). Femoral pores absent. A series of enlarged femoral scales present. Precloacal groove absent. Scales on palm and sole smooth, weakly convex. Scales on dorsal proximal forelimbs smooth, imbricate, similar to ventrals, without tubercles. Scales on distal forelimbs and hindlimbs similar to dorsal scales, intermixed with flattened tubercles.

Fore and hind limbs stout. Forearm short (ForeaL/ SVL ratio 0.14). Tibia short (CrusL/ SVL ratio 0.17). Digits long, strongly inflated at each joint, all bearing long (ClawLM/ ForeaL ratio 0.11; ClawLP/ CrusL ratio 0.15), recurved claws (Fig. 15B). Subdigital lamellae smooth, with scansorial surfaces on basal lamellae. Basal lamellae wider than long, almost as wide as digit width, rounded to emarginate posteriorly; 3–5 rows of fragmented lamellae on base of distal portion (Fig. 14B). Lamellae of first proximal scansor greater than twice largest palm scale to first interphalangeal joint (proximal portion): 6–8–8–8–7 in manus and 7–8–8 (left)/9 (right)–8 (left)/9 (right)–7 in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 10–11–12–12–11 (left)/ 12 (right) in manus and 11–11 (left)/ 12 (right)–14–15 (left)/ 13 (right)–14 in pes. Interdigital webbing present, weakly developed. Relative length of digits (measurements in mm in parentheses), manus: IV (9.5) > III (8.9) > V (8.6) ~ II (8.5) > I (6.5); pes: IV (12.0) > V (11.8) > III (10.6) > II (9.8) > I (6.0).

Original tail broken at base in holotype and partially regenerated. Regenerated tail short (TailL/ SVL ratio 0.99), slender, subcylindrical. Dorsal scales rectangular. Tubercles arranged in six irregular whorls on base of tail, 2–4 tubercles in each whorl, becoming indistinct posteriorly. Subcaudals widened in a single series, one-third width of tail; anterior subcaudals wider than long, becoming as long as wide posteriorly in the original portion of the tail. Prominent cloacal spurs with two enlarged scales on each side of tail base.

Coloration.— (Based on holotype, Figs. 4B, 5B, 6B.) Base colour light brown marked by darker brown bands, each with a dark posterior border. Anterior two bands distinct, remainder on body diffuse. Head light brown; small dark markings scattered on top of head. Canthal region with a pale narrow transverse bar. Brown occipital band separated medially and forming two blotches, blotch on the left side partially confluent with temporal band, other on right separated from temporal band. Temporal bands extend posterior to orbit (in paratype WHT 6049, occipital band continues with temporal bands in both sides). Occipital band laterally confluent with band on nape. Four bands on dorsum between nape and sacrum. Band on nape partially bifurcate anteriorly and posteriorly and with

dark borders. Small, elongate dark marking on interspace between occipital and nape band. Posterior bands between nape and sacrum indistinct with dark indistinct posterior borders, partially bifurcate posteriorly. A faint, interrupted longitudinal stripe on lateral surfaces. Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Tail-base with an indistinct dark band similar to that on sacrum. Remainder of tail with alternating elongate dark bands and shorter pale interspaces, each band with darker posterior border; three dark bands on regenerated tail of both holotype and paratype. Tail patterning continues on to venter, the bands more or less clearly demarcated on regenerated portion. Venter brown, slightly darker chin and gular areas. Palms and soles brown.

Colour in life unknown.

Etymology.— The specific epithet (Latin, *cracens* = slender) alludes to the relatively narrow head of this species.

Variation.— Comparative mensural data for the holotype and paratype are presented in Table 2. Adult male paratype (WHT 6049) resembles holotype in most respects except as follows: internasal pentagonal; supralabials to middle of eye, 8 (right), 9 (left), 12 to corner of mouth; infralabials, 9. Precloacal pores in a single continuous series, a single poreless scale dividing pores into continuous series of 3. Mid-dorsal tubercles, 7. Paravertebrals, 26. Dorsal scales across mid-body, 63. Subdigital lamellae: 6–8 (left)/ 7 (right)–7–9 (left)/ 7 (right)–8 (left)/ broken (right) (proximal portion of 4th digit) and 9–9 (right)/ 10 (left)–13 (right)/ 12 (left)–13 (right)/ 12 (left)–11 (left)/ broken (right) (distal portion of 4th digit) of manus; and 6–8 (left)/ broken (right)–8 (left)/ 9 (right)–8 (left)/ 9 (right)–7 (proximal portion of 4th digit) and 10–12 (left)/ (broken) (right)–13 (left)/ 12 (right)–13–14 (left)/ 13 (right) (distal portion of 4th digit) in pes. Regenerated tail short (TailL/ SVL ratio 0.89).

Habitat and distribution.— All specimens were obtained from Sinharaja World Heritage Site (Fig. 21) (to which the species is probably restricted), from small, cave-like rocky areas adjoining forest streams. Collections were made between 1930–2100 hours. The following gecko species were also observed in sympatry with *Cyrtodactylus cracens*: *Cnemaspis* sp., *Geckoella triedra* (Günther, 1864), *Hemidactylus depressus* Gray, 1842 and *H. frenatus* Duméril & Bibron, 1836.

Cyrtodactylus edwardtaylori, new species

(Figs. 4C, 5C, 6C, 7C, 8C, 9C, 10C, 11–13C, 14C, 15C; Table 2)

Material examined.— Holotype, adult male (92.7 mm SVL) (WHT 6067) (partially regenerated tail broken at base); Tonacombe Estate, Namunukula, Badulla District (06°52'N, 81°07'E, alt. 1320 m), coll. M. M. Bahir, S. Batuwita & M. Meegaskumbura, April 1999.

Paratypes - 2 adult females (93.4, 95.5 mm SVL) (WHT 6066, 6068); same collection data as holotype.

Others - 1 adult male KU 31258; Tonacombe Estate, Namunukula, coll. W. W. A. Philipps (not examined).

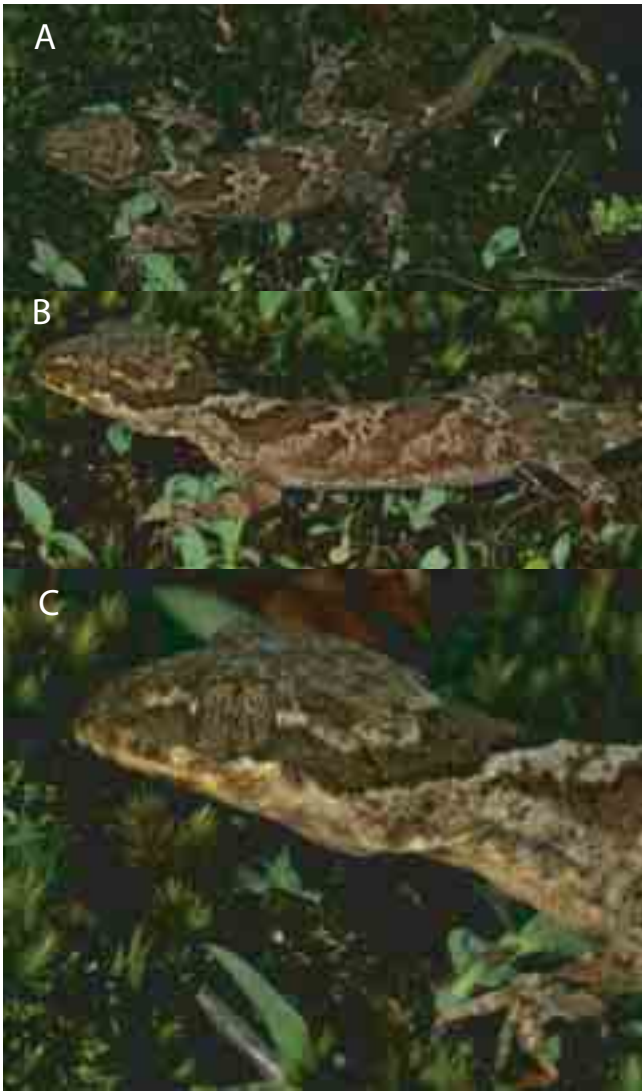


Fig. 11. Colour in life of *Cyrtodactylus edwardtaylori*, paratype (WHT 6068), A, dorsal view; B, lateral view of left side; C, lateral view right side of head.

Diagnosis.— *Cyrtodactylus edwardtaylori* is distinguished from all other congeners by the combination of following characters: subdigital lamellae beneath proximal portion of 4th digit of manus, 7–8; beneath distal portion, 10–11; basal lamellae under proximal portion as wide as digit width. Subdigital lamellae beneath proximal portion of 4th digit of pes, 7–10; beneath distal portion, 11–13 (Fig. 10C); precloacal groove absent; 6 precloacal pores in males; claws short (ClawLM/ForeaL ratio 0.10; ClawLP/ CrusL ratio 0.08–0.10) (Fig. 11C). Mental subpentagonal with concave posterior lateral borders (Fig. 5C). Scales across mid-body between ventrolateral folds, 29–30. Dorsal scales across mid-body between ventrolateral folds, 72–75. Tubercles on paravertebral row, 40–45; rows of keeled dorsal tubercles at mid-body, 14–15 (Fig. 8C, 9C). Ventral scales imbricate to subimbricate with rounded posterior edge (Figs. 8C, 14E). Regenerated tail longer than body (TailL/ SVL ratio 1.05 in holotype).

Among its Sri Lankan congeners, *Cyrtodactylus edwardtaylori* appears most closely to resemble *C. soba* new species,

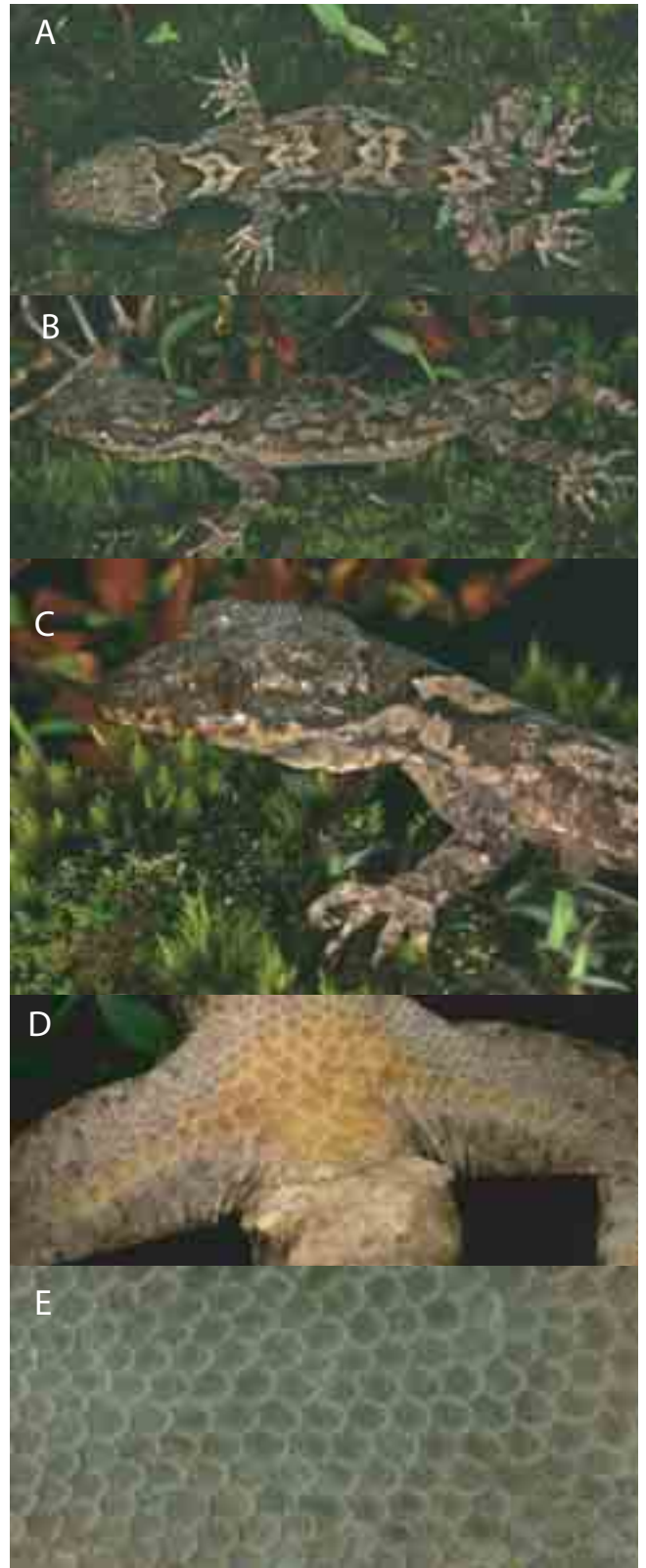


Fig. 12. Colour in life of *Cyrtodactylus edwardtaylori*, new species, holotype (WHT 6067). A, dorsal view; B, lateral view of left side; C, lateral view right side of head; D, cloacal region; E, mid-ventral scales.

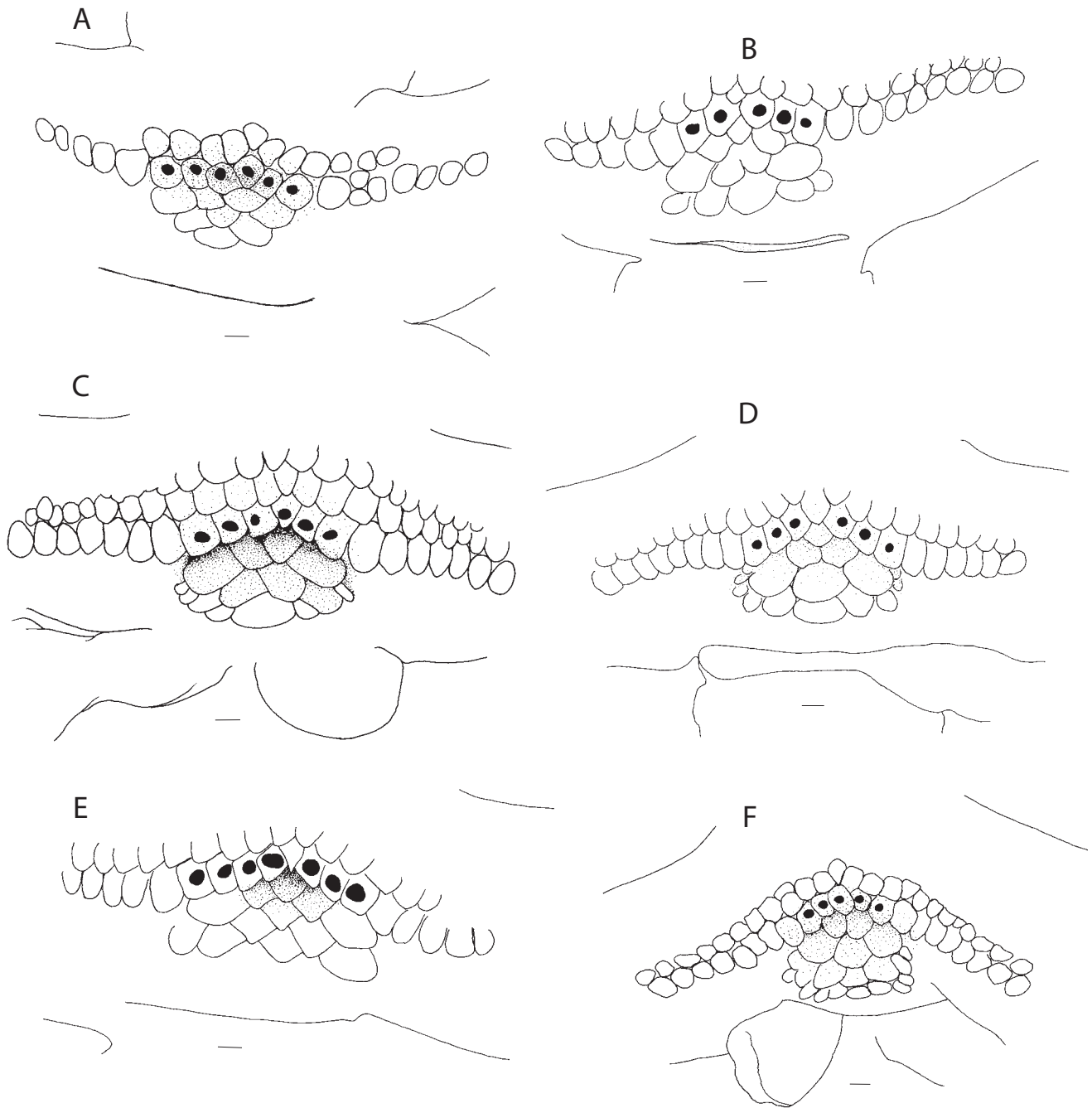


Fig. 13. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing preloacal region. A. *C. fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

from which it may be distinguished by having 4 dorsal bands, 14–15 mid-dorsal tubercles, 40–45 paravertebral tubercles and mid-ventral scales with rounded posterior edges, vs. 5 dorsal bands, 7–10 mid-dorsal tubercles, 25–31 paravertebral tubercles and mid-ventral scales with pointed posterior edges (see Table 5).

Description.— (Based on holotype, WHT 6067.) Adult male, SVL 92.7 mm. Head relatively short (HeadL/ SVL ratio 0.25), wide (HeadW/ HeadL ratio 0.76), not depressed (HeadH/ HeadL ratio 0.46), distinct from neck (Figs. 4C, 5C). Lores and interorbital region slightly inflated, canthus rostralis not particularly prominent. Snout moderately short (SnEye/ HeadL

ratio 0.40) (Figs. 5C, 6C), longer than eye diameter (OrbD/ SnEye ratio 0.63). Scales on snout and forehead convex, granular, intermixed with scattered small conical tubercles posterior to fronto-parietal suture (Fig. 5C), much larger than those on occipital region. Eye relatively large (OrbD/ HeadL ratio 0.25); pupil vertical, anterior margin roughly convex, posterior margin with two rather pointed lobes. Supraciliaries short, blunt. Ear opening elliptical, small (EarL/ HeadL ratio 0.06). Eye to ear distance greater than diameter of eyes (EyeEar/ OrbD ratio 1.34). Rostral approximately 65% as deep (2.4 mm) as wide (3.7 mm), incompletely divided dorsally by a weakly developed simple rostral groove (about one-third of rostral height). Two enlarged supranasals, separated by two

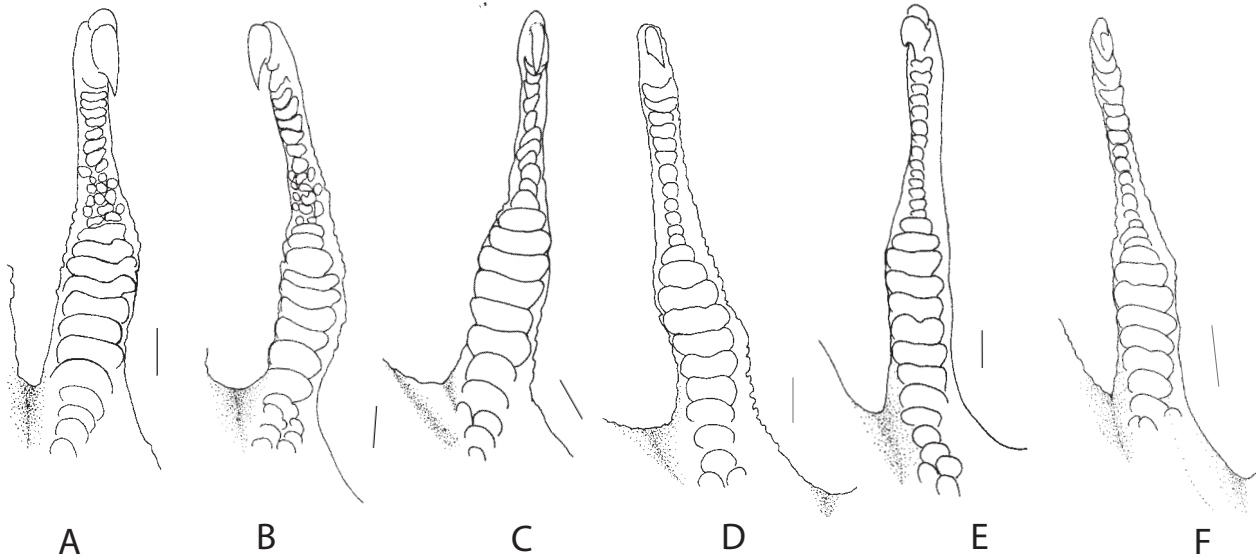


Fig. 14. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing ventral side of fourth toe. A. *C. fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.

longitudinally arranged, roughly pentagonal internasal scales. Rostral in contact with first supralabial, supranasals and anterior internasals. Nostrils oval, dorsolaterally orientated, each in broad contact with rostral and supranasal, and a crescentic nasal rim bordered by two subequal postnasals. Pigmented narial flap occludes posterior two-thirds of nostril; 2–3 rows of scales separate orbit from supralabials. Mental subpentagonal, wider (3.4 mm) than deep (2.7 mm). One pair of enlarged postmentals, each approximately two-thirds size of mental (Fig. 7C). Left and right postmentals in broad medial contact, with no intervening granules, bordered laterally by first infralabial and an enlarged lateral chin shield, and posteriorly by six granular chin scales (Fig. 7C). Infralabials bordered by a single row of enlarged scales, largest anteriorly. Throat scales minute, granular. Supralabials (to midorbital position), 7; enlarged supralabials to angle of jaws, 12. Infralabials 10 (left) and 9 (right). Interorbital scale rows across narrowest point of frontal bone, 17.

Body elongate, relatively robust (Fig. 4C) (TrunkL/ SVL ratio 0.59), well developed non-denticulate ventrolateral folds. Dorsal scales heterogeneous, mostly flattened, granules pitted or rugose, intermixed with mostly keeled small tubercles extending from parietal region on to back and base of tail. Tubercles absent on flanks, most prominent on dorsal and dorsolateral surfaces, somewhat smaller and more conical on nape, along mid-dorsal line; keeled tubercles in 14 longitudinal rows at mid-body (Fig. 9C); 40 tubercles on paravertebral row from occipital region to midsacrum. Ventral scales much larger than dorsal, cycloid, imbricate to subimbricate (Figs. 10C, 12E), largest under thighs and between precloacal pores and vent, somewhat larger on abdomen than on chest; 8 somewhat enlarged scales posterior to precloacal pores (Fig. 13C). Mid-body scale rows across belly between ventrolateral folds, 30. Scales on throat minute, granular, grading into larger scales on chest. Single series of six precloacal pores in a precloacal

depression (Fig. 13C). Femoral pores absent. A series of enlarged femoral scales present. Precloacal groove absent. Scales on palm and sole smooth, convex. Dorsal scales of forelimbs imbricate, similar to ventrals, without tubercles. Scales of forearms heterogeneous with scattered tubercles, some keeled. Scales on dorsal aspects of hindlimbs flattened, similar to dorsal scales, with larger, weakly-keeled tubercles interspersed among smaller scales.

Fore and hindlimbs relatively short, stout. Forearm short (ForeaL/ SVL ratio 0.14). Tibia short (CrusL/ SVL ratio 0.15). Digits long, strongly inflated at each joint, all bearing short (ClawLM/ ForeaL ratio 0.10; ClawLP/ CrusL ratio 0.10), recurved claws. Subdigital lamellae smooth with scansorial surfaces on basal lamellae. Basal lamellae wider than long, as wide as digit width, rounded to emarginate or roughly straight posteriorly (Fig. 14C). Lamellae on first proximal scansor greater than twice largest palm scale to first interphalangeal joint (proximal portion): 6–7 (left)/ 8 (right)–7 (left)/ 8 (right)–8–6 (left)/ 7 (right) in manus; 5–7–8–7 (left)/ 10 (right)–7 (left)/ 6 (right) in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 8 (left)/ 9 (right)–8 (left)/ 9 (right)–11–11 (left)/ 10 (right)–9 (left)/ 11 (right) in manus and 7 (left)/ 9 (right)–9 (left)/ 10 (right)–10 (left)/ 12 (right)–12 (left)/ 13 (right)–12 in pes. Interdigital webbing present, weakly developed. Relative length of digits (measurements in mm in parentheses), manus: V (8.1) ~ III (8.0) > IV (7.6) > II (7.0) > I (4.6); pes: IV (10.2) > V (9.7) > III (8.6) > II (7.7) > I (5.2).

Partially regenerated tail long (TailL/ SVL ratio 1.03), subcylindrical. Dorsal scales rectangular. Enlarged tubercles arranged in regular whorls; dorsal with seven enlarged whorls of scales arranged in six scales per whorl anteriorly, becoming indistinct posteriorly. Subcaudal scales half as wide as tail width, with a single median series of enlarged plates. Prominent cloacal spurs with two enlarged scales on either side of tail base.

Coloration.— (Based on holotype; see Figs. 4C, 5C, 6C, 8C.) Base colour light brown marked by dark-brown bands, each with a dark-brown posterior border and indistinct darker anterior border. Each marking bolder and better defined posteriorly. Interorbital region much darker. Canthal region with a pale, narrow transverse bar (faded in some individuals). Dark-brown occipital band extends anteriorly to orbit and under eye to loreal region, continuing indistinctly to rostral. Occipital band bluntly pointed posteriorly and laterally confluent with band on nape. Three bands on dorsum between nape and sacrum, each bifurcate posteriorly. Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Dark band on tail-base with a bluntly pointed posterior margin. Remainder of tail with alternating elongate dark bands and shorter pale interspaces; 3 dark bands on regenerated tail, each with a darker posterior border. Tail patterning continues on to venter, more clearly demarcated towards tail tip. Venter dusky, gular areas paler. Palms and soles pale.

Colour in life similar to that in preservative but with a slightly reddish cast to the lighter regions of the head and body (see Figs. 11, 12).

Etymology.— The species name is a patronym, applied in the genitive singular case, honouring Edward Harrison Taylor (1889–1978), who described this species (as *C. fraenatus*) in his “A review of the lizards of Ceylon” (1953).

Variation.— Comparative mensural data for the holotype and paratypes are presented in Table 2. Paratypes resemble holotype in most respects, except as noted: 40–45 paravertebrals; 72–75 dorsal scales across mid-body; 14–15 mid-dorsal tubercles; 29–30 mid-ventral scales between ventrolateral folds. Rostral groove absent in paratype WHT 6066. Supralabials to mid-orbital position, 6 on left and 7 on right in WHT 6066; supralabials to corner of mouth, 11 on left side and 12 on right side in WHT 6068; 11 on left and 13 on right in WHT 6066. Infralabials 10 on each side in WHT 6066; 11 on each side in WHT 6068. Subdigital lamellae 5–6, 7–9, 7–8, 7–8, 6–8 (proximal portion of 4th digit) and 7–9, 8–10, 10–12, 10–11, 9–11 (distal portion of 4th digit) in manus; and 5–6, 7–8, 8, 7–10, 6–7 (proximal portion of 4th digit) and 7–9, 9–10, 10–13, 11–13, 12–13 (distal portion of 4th digit) in pes.

Habitat and distribution.— *Cyrtodactylus edwardtaylori* was found to occur sympatrically with *Cnemaspis* sp. and *Geckoella triedra* at Tonacombe Estate, Namunukula (Fig. 21). All specimens in the type series were obtained from tree trunks (~ 2–4 m above ground) with heavy growth of moss and ferns. The species appears to be restricted to the type locality, a < 10 ha montane-forest remnant underplanted with cardamom and surrounded by tea plantations (a search for this gecko in nearby tea plantations, scrub and villages proved abortive). Collection was made between 2000–2230 hours.

Cyrtodactylus ramboda, new species

(Figs. 4D, 5D, 6D, 7D, 8D, 9D, 10D, 13D, 14D, 15D, 16; Table 4)

Material examined.— Holotype, adult male (99.1 mm SVL) (WHT 6050) (regenerated tail, bearing a mid-ventral incision), Ramboda near Gerandi Ella falls, Nuwara Eliya District (07°02'30"N, 80°41'20"E, alt. 780 m), coll. M. M. Bahir, S. Batuwita and S. Nanayakkara, 25 Mar.2004.

Paratypes - adult female (86.0 mm SVL) (WHT 6051) and subadult female (73.8 mm SVL) (WHT 6052), same locality as holotype, coll. M. M. Bahir and K. Wewelwala, 25 Mar.2004.

Diagnosis.— *Cyrtodactylus ramboda* is distinguished from all other congeners by the combination of following characters: subdigital lamellae beneath proximal portion of 4th digit of manus, 7–8; beneath distal portion, 11–13; basal lamellae under proximal portion as wide as digit width. Subdigital lamellae beneath proximal portion of 4th digit of pes, 8–10; beneath distal portion (Fig. 14D), 13–14; no precloacal groove; 6 precloacal pores in male holotype; claws moderately long (ClawLM/ForeaL ratio 0.10–0.11; ClawLP/ CrusL ratio 0.11–0.13) (Fig. 15D); mental subpentagonal, with concave posterior lateral borders (Fig. 7D). Scales across mid-body between ventrolateral folds, 28–32. Dorsal scales across mid-body between ventrolateral folds, 55–63. Tubercles on paravertebral row, 38–44. Rows of dorsal tubercles at mid-body, 9 (Fig. 8D, 9D). Ventral scales imbricate to sub imbricate with rounded posterior edges (Fig. 10D). Original tail subequal to body (TailL/ SVL ratio range 1.0).

Cyrtodactylus ramboda new species resembles *C. fraenatus*, from which it may be distinguished as follows: 38–44 paravertebral tubercles row vs. 17–23 in *C. fraenatus* (see Table 5).

Description.— (Based on holotype, WHT 6050.) Adult male, SVL 99.1 mm. Head moderately long (HeadL/ SVL ratio 0.27), wide (HeadW/ HeadL ratio 0.70), depressed (HeadH/ HeadL ratio 0.36), distinct from neck (Figs. 4D, 5D). Lores and interorbital region slightly inflated. Canthus rostralis not well developed. Snout short (SnEye/ HeadL ratio 0.39) (Fig. 6D), about twice eye diameter (OrbD/ SnEye ratio 0.57). Scales on snout and forehead granular, heterogenous, intermixed with enlarged convex tubercles (Fig. 5D). Four scales subequal to internasal scale border internasal-supranasal row posteriorly. Temporal and post-orbital regions with convex or weakly conical tubercles. Scales on snout much larger than those on occipital region. Eye relatively large (OrbD/ HeadL ratio 0.22); pupil vertical, its anterior margin with two slightly convex lobes and posterior margin with two weakly pointed lobes. Supraciliaries short, blunt, except for a few pointed scales at posterior border of orbit. Ear opening elliptical, obliquely orientated, small (EarL/ HeadL ratio 0.06); eye to ear distance greater than diameter of eyes (EyeEar/ OrbD ratio 1.44). Rostral approximately half as deep (2.2 mm) as wide (4.3 mm), incompletely divided dorsally by a weakly developed, simple rostral groove rather less than half the height of the rostral. Two enlarged supranasals separated by a single, smaller,

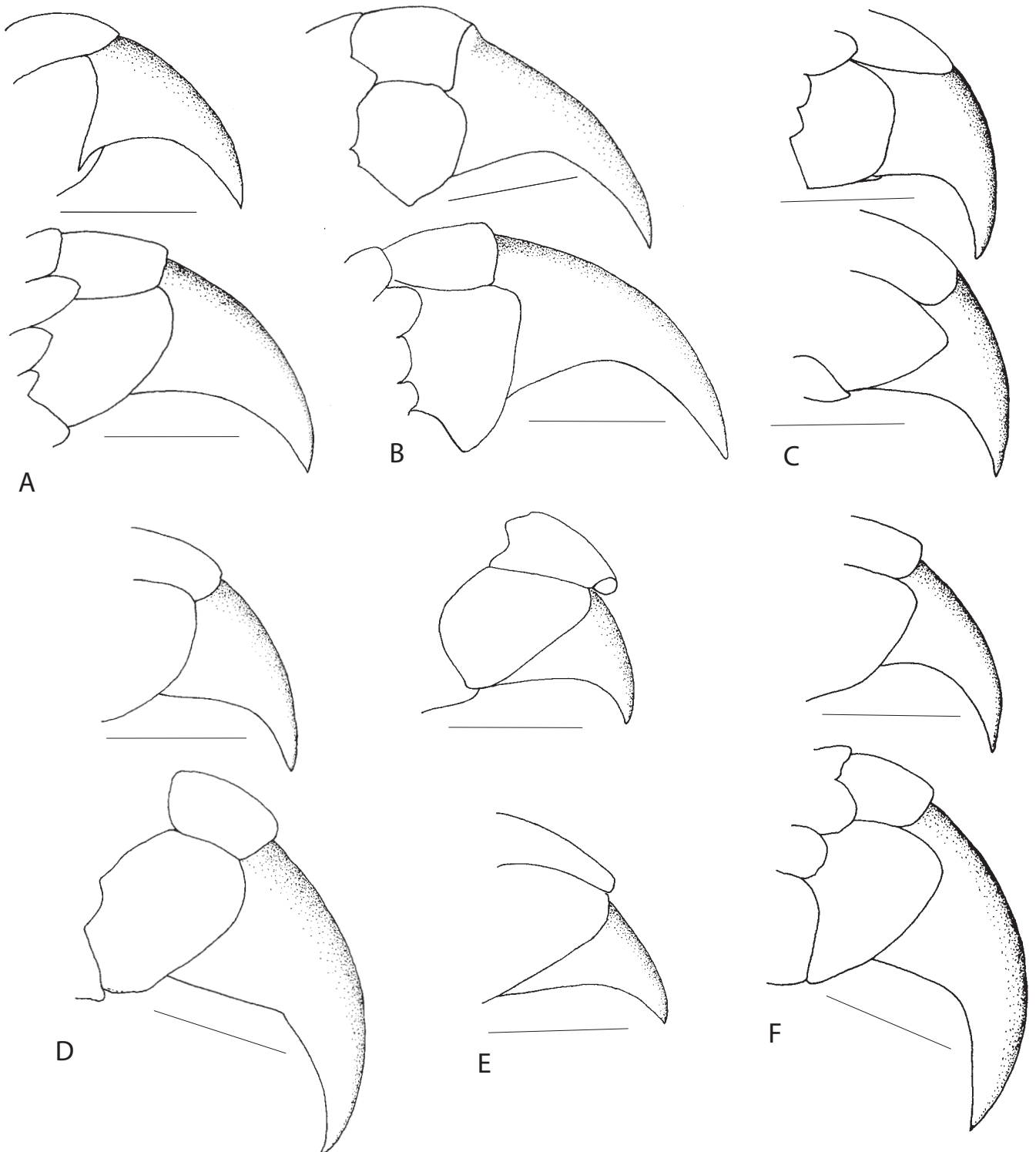


Fig. 15. Holotypes (unless otherwise stated) of Sri Lankan *Cyrtodactylus* showing lateral views of claws of fourth finger and toe respectively. A, *C. fraenatus* (Günther 1864) (WHT 6053, topotype). B. *C. cracens*, new species (WHT 6048). C. *C. edwardtaylori*, new species (WHT 6067). D. *C. ramboda*, new species (WHT 6050). E. *C. soba*, new species (WHT 6042). F. *C. subsolanus*, new species (WHT 5999). Scale bar = 1 mm.



Fig. 16. Colour in life of *Cyrtodactylus ramboda*, new species, paratype (WHT 6052). A, dorsal view; B, dorso-lateral view of right side.

roughly pentagonal internasal. Rostral in contact with first supralabial, supranasals and internasal. Nostrils oval, laterally orientated, each in broad contact with rostral and also surrounded by supranasal (narrowly), first supralabial (narrowly) and a crescentic nasal rim bordered by two subequal postnasals. Pigmented narial flap occludes posterior two-thirds of nostril. Three rows of scales separate orbit from supralabials. Mental sub-pentagonal, wider (3.8 mm) than deep (3.1 mm). One pair of enlarged postmentals, each approximately half size of mental; left and right postmentals in broad medial contact, with no intervening granules, bordered laterally by first infralabials and an enlarged lateral chin shield and posteriorly by 2 granular chin scales and an enlarged median scale (Fig. 7D). Infralabials bordered by a single row of enlarged scales, largest anteriorly. Throat scales small, rounded, granular. Supralabials (to midorbital position) 8 (left)/ 7 (right). Enlarged supralabials to angle of jaws, 11. Four enlarged scales border supralabials anteriorly. Infralabials, 8. Interorbital scale rows across narrowest point of frontal bone, 16.

Body relatively robust (Fig. 4D), short (TrunkL/ SVL ratio 0.56) with well-developed, weakly denticulate ventrolateral folds. Dorsal scales heterogeneous, mostly flattened, granules pitted or rugose, intermixed with small (2–4 times size of dorsal scales), flattened or slightly convex tubercles extending from occipital region on to back and base of tail. Tubercles prominent on dorso-lateral surfaces, on nape, along mid-dorsal line, absent on flanks (Fig. 8D). Tubercles in 9 weakly

convex longitudinal rows at mid-body (Fig. 9D). Dorsal scales across ventrolateral folds, 62. Tubercles on paravertebral row from occiput to midsacrum, 44. Ventral scales much larger than dorsal ones, cycloid, imbricate on chest and subimbricate to imbricate on abdomen (Fig. 10D); 9 enlarged scales between preloacal pores and vent, somewhat larger on abdomen than chest. Mid-body scale rows across belly between ventrolateral folds, 28. Scales on throat small, granular, grading into larger scales on chest. A single series of six preloacal pores in a preloacal depression, with a poreless scale separating two continuous rows of three pores on each side (Fig. 13D). Femoral pores and preloacal groove absent. Scales on palm and sole smooth, bluntly pointed, imbricate. Scales on dorsal aspects of forelimb smooth, imbricate, without tubercles. Dorsal scales on hind limbs with a few convex tubercles scattered among smaller, heterogeneous scales.

Fore and hindlimbs relatively stout. Forearm short (ForeaL/ SVL ratio 0.14). Tibia short (CrusL/ SVL ratio 0.16). Digits long, strongly inflated at each joint, bearing moderately long (ClawLM/ ForeaL ratio 0.10; ClawLP/ CrusL ratio 0.13), recurved claws. Subdigital lamellae smooth, with scansorial surfaces on basal lamellae. Basal lamellae wider than long, as wide as digit width, rounded to emerginate or roughly straight posteriorly (Fig. 14D). Lamellae from first proximal scansor greater than twice largest palm scale to first interphalangeal joint (proximal portion): 5–7–8–9–6 (broken) (left) / 8 (right) in manus and 5–8 (left) / 9 (right)–8–9 (left) / 10 (right)–7 in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 11–11–12–13–broken (left) / 12 (right) in manus, and 11–11 (left) / 12 (right)–13–13 (left) / 14 (right)–14 (left) / 13 (right) in pes; interdigital webbing present, weakly developed. Relative length of digits (measurements in mm in parentheses), manus: IV (9.1) > III (8.7) > V (8.0) > II (7.6) > I (5.5); pes: IV (12.3) > V (11.5) > III (10.8) > II (9.3) > I (5.5).

Original tail broken, regenerated (in holotype). Original tail subequal to body in paratype WHT 6052 (TailL/ SVL ratio 1.00), slender, subcylindrical. Dorsal tail scales rectangular. Enlarged tubercles arranged in 4 irregular whorls on base of tail, 2–4 tubercles in each whorl, becoming indistinct posteriorly. Subcaudal scales wider than long, larger (half of tail width) with a single median series of enlarged plates. Prominent cloacal spurs with a single enlarged scale on either side of tail base.

Coloration.— (Based on holotype; see Figs. 4D, 5D, 6D.) Base colour brown marked by dark-brown bands, each with a dark-brown posterior border. Each marking better defined posteriorly. Head with numerous dark markings in holotype (few markings in paratypes WHT 6051–52). Canthal region with a pale, narrow transverse bar (faded in some individuals). Dark-brown occipital band extends anteriorly to orbit and under eye. Bluntly pointed occipital band divided postero-medially and laterally confluent with band on nape. Four bands on dorsum between nape and sacrum each bifurcate posteriorly (bifurcate anteriorly and posteriorly in paratype WHT 6051). Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Tail-base with a dark band its posterior margin bluntly

pointed. Remainder of tail with alternating elongate dark bands and shorter pale interspaces; six dark bands in original tail of paratype WHT 6052, each with a darker posterior border. Tail patterning continues on to venter, the bands more or less clearly demarcated towards base of tail in paratype WHT 6052. Venter pale, chin and gular areas dusky. Palms and soles pale.

Colour in life similar to that in preservative but with a slightly reddish cast to the lighter regions of the head and body (see Fig. 16).

Variation.—Comparative mensural data for the holotype and paratypes are presented in Table 4. The paratypes resemble holotype in most respects, except as noted: ventral scales across mid-body, 28–32; paravertebrals, 38–40; dorsal scales across mid-body, 55–63. Three postnasals on each side in female paratype WHT 6051. Supralabials to middle of eye, 6 on left side and 8 on right side in WHT 6051; 7 on right side and 8 on left side of WHT 6052. Supralabials to corner of mouth, 10 on left side and 11 on right side of WHT 6051; 11 on right side and 12 on left side in WHT 6052. 9 infralabials on each side in WHT 6051 and WHT 6052. Small preloacal pores present in female paratype WHT 6051, a single poreless scale dividing 2 on each side; pores absent in subadult paratype WHT 6052. Range of subdigital lamellae 5–6, 7–9, 7–9, 7–8, 6–7 (proximal portion of 4th digit) and 9–10, 10–11, 11–14, 11–13, 11–12 (distal portion of 4th digit) of manus; 4–6, 8–9, 8–10, 8–10, 7 (proximal portion of 4th digit) and 10–11, 11–12, 12–14, 13–14, 13–15 (distal portion of 4th digit) of pes. Post-cloacal spurs 1 (right) and 2 (left) in WHT 6051.

Etymology.—The specific epithet, *ramboda*, is the name of the type locality, applied here as a noun in apposition.

Habitat and distribution.—Two of three specimens in the type series were obtained from tree trunks (1.5–2.5 m above ground), densely covered with epiphytic ferns, beside the Panna Oya [= stream] between 2000–2030 hours. A single specimen was on a thick (5 cm) moss covering on a boulder beside the same stream at 1530 hours. A species of *Cnemaspis* was found to be sympatric with *Cyrtodactylus ramboda*. The type locality (Fig. 21) is on the western slopes of Sri Lanka's central hills; the site enjoys no protection.

***Cyrtodactylus soba*, new species**

(Figs. 4E, 5E, 6E, 7E, 8E, 9E, 10E, 13E, 14E, 15E, 17, 18)

Material examined.—Holotype, adult male (99.9 mm SVL) (WHT 6042) (regenerated tail broken at base), Corbett's Gap, Knuckles Mountains, Matale District (07°22'N, 80°51'E, alt. 1100 m), coll. M. M. Bahir and S. Nanayakkara, 25 May 1999.

Paratypes - adult female (94.5 mm SVL) (WHT 0110), Corbett's Gap, near Rangala, Knuckles Mountains, Matale District, (07°22'N, 80°51'E, alt. 1100 m), coll. K. Manamendra-Arachchi, 25 May 1999; 3 adult males (97.7–102.6 mm SVL) (WHT 6043–45) and 3 adult females (97.1 mm SVL; NMSL RG) and (89.6, 105.7 mm SVL; WHT 6046, 6065).

Others - 3 adult females (100.1–103.2 mm SVL) (WHT 0704–0706); 5 adult males (84.1–104.0 mm SVL) (WHT 0702–3; WHT

0707–9); subadult female (68.6 mm SVL) (WHT 0710) and juvenile (46.2 mm SVL) (WHT 0711), Hare Park, near Rangala, Knuckles Mountains, Matale District, (07°21'N, 80°50'E, alt. 1370 m), coll. R. Pethiyagoda, 25 May 1999; adult male (93.0 mm SVL) (WHT 6134) and juvenile (42.9 mm SVL) (WHT 6047), same collection data as holotype.

Etymology.—The species epithet is Sinhala for “beautiful”, an allusion to the beauty of the habitat of this species, applied here as a noun in apposition.

Diagnosis.—*Cyrtodactylus soba*, new species, is distinguished from all other congeners by the combination of following characters: subdigital lamellae beneath proximal portion of 4th digit of manus, 6–7; beneath distal portion, 12–14; basal lamellae under proximal portion as wide as digit width. Subdigital lamellae beneath proximal portion of 4th digit of pes, 8; beneath distal portion (Fig. 14E), 12–16; absence of fragmented basal lamellae beneath distal phalanges (Fig. 14E); no preloacal groove; 5–8 preloacal pores in males; claws distinctly short (ClawLM/ForeaL ratio 0.05–0.09; ClawLP/CrusL ratio 0.06–0.10) (Fig. 15E); mental subpentagonal (Fig. 7E). Scales across mid-body between ventrolateral folds, 30–34. Dorsal scales across mid-body between ventrolateral folds, 61–72. Tubercles on paravertebral row, 25–31; 7–10 rows of weakly keeled dorsal tubercles at mid-body (Figs. 8E, 9E). Ventral scales imbricate, with pointed posterior edges (Figs. 8E, 17D). Original tail longer than body (TailL/SVL ratio range 1.11).

Among its Sri Lankan congeners, *Cyrtodactylus soba* resembles *C. edwardtaylori*, from which it may be distinguished by having 5 dorsal bands, 7–10 mid-dorsal tubercles, 25–31 paravertebral tubercles and mid-ventral scales with pointed posterior edge, vs. 4 dark bands, 14–15 mid-dorsal tubercles, 40–45 paravertebral tubercles and mid-ventral scales with rounded posterior edge (see Table 5).

Description.—(Based on holotype, WHT 6042.) Adult male, SVL 99.9 mm. Head relatively long (HeadL/SVL ratio 0.28), wide (HeadW/HeadL ratio 0.71), moderately depressed (HeadH/HeadL ratio 0.40), distinct from neck (Figs. 4E, 5E, 6E). Lores and interorbital region slightly inflated; canthus rostralis not well developed. Snout moderately short (SnEye/HeadL ratio 0.38) (Fig. 6E), longer than eye diameter (OrbD/SnEye ratio 0.63). Scales on snout large, convex, weakly conical. Forehead with small, smooth, convex scales (Fig. 5E). Scales on snout much larger than those on occipital region. Eye relatively large (OrbD/HeadL ratio 0.24), pupil vertical, its anterior margin roughly convex, posterior margin with two bluntly pointed lobes. Supraciliaries short, blunt, except for a few pointed scales at posterior border of orbit. A few conical tubercles on supraorbital area. Ear opening rounded, relatively small (EarL/HeadL ratio 0.06), with no fold. Eye to ear distance slightly greater than diameter of eyes (EyeEar/OrbD ratio 1.07). Rostral approximately 60% as deep (2.8 mm) as wide (4.6 mm), incompletely divided dorsally by a weakly-developed inverted Y-shaped groove about one-third height of rostral. Two enlarged supranasals, separated by two small, subequal pentagonal internasals. No enlarged scales posterior to

Table 3. Mensural data for the types of *Cyrtodactylus soba*. Abbreviations as in Materials and Methods section; all measurements in mm.

	WHT6042 Holotype	WHT6043 Paratype	WHT6044 Paratype	WHT0110 Paratype	NMSL RG Paratype	WHT6045 Paratype	WHT6046 Paratype	WHT6065 Paratype
Sex	male	male	male	female	female	male	female	female
SVL	99.9	97.7	100.1	94.5	97.1	102.6	89.6	105.7
FOL	14.8	14.6	14.3	13.8	14.1	15.2	13.4	15.5
Crus L	17.4	18.0	18.8	16.5	15.6	17.0	15.6	17.5
Tail L (entire)	86.7	90.7	108.0	72.3	10.5	80.8	87.7	36.1
Tail L (regenerated)	80.4	68.0	10.9	7.6	broken	66.4	76.5	29.1
Tail W	10.1	8.8	10.9	7.6	8.0	9.5	8.5	9.1
Trunk L	56.3	52.3	55.9	52.2	56.0	57.6	52.5	60.7
Head L	28.0	27.4	27.5	25.8	25.3	27.4	24.5	27.0
Head W	19.8	19.8	20.1	17.8	17.6	19.5	17.4	19.5
Head H	11.2	11.8	12.0	10.5	9.6	10.8	9.8	11.1
OrbD	6.7	6.6	7.0	6.3	5.9	6.5	5.7	6.5
EyeEar	7.2	7.8	8.0	6.4	7.2	8.5	7.0	8.7
SnEye	10.7	10.5	11.0	9.8	10.0	10.6	9.5	10.6
NarEye	7.3	7.8	7.8	7.3	7.5	7.7	6.5	7.9
Interorb	10.3	8.9	9.9	8.3	7.8	8.1	7.6	9.3
Ear L	1.6	1.6	1.2	1.1	1.5	1.8	2.0	1.4
Internar	2.9	3.2	3.2	2.9	3.0	3.3	3.3	3.2

internasal supranasal row. Rostral in contact with first supralabial, supranasals and internasals. Nostrils oval, dorso-laterally orientated, in broad contact with rostral and narrow contact with first supralabial and crescentic nasal rim bordered by two post-nasals; also surrounded by supranasal. Pigmented narial flap occludes posterior half of nostril. Three rows of scales separate orbit from supralabials. Mental subpentagonal, wider (3.9 mm) than deep (2.4 mm) (Fig. 7E). A single pair of enlarged postmentals (left post-mental partially divided), each approximately 52% size of mental; left and right postmentals in broad medial contact with no intervening granules, bordered laterally by first and second infralabials and an enlarged lateral chinshield, and posteriorly by 6 granular chin scales (Fig. 7E). Infralabials bordered by a single row of enlarged scales, largest anteriorly. Throat-scales small. Supralabials (to midorbital position), 8. Enlarged supralabials to angle of jaws, 13 (left)/14 (right); infralabials, 10 (left)/11 (right); interorbital scale rows across narrowest point of frontal bone, 20.

Body relatively robust (Fig. 4E) (TrunkL/ SVL ratio 0.56). A well developed, non-denticulate ventrolateral fold present. Dorsal scales heterogeneous, mostly flattened, with regularly arranged small, flattened, pitted or rugose, intermixed with feebly-keeled tubercles (2–4 times size of dorsal scales), extending from occipital region on to back and base of tail. Nine feebly keeled tubercle rows at mid-body, most prominent on dorsolateral surfaces, the tubercles somewhat smaller and conical on nape, along mid-dorsal line, absent on flanks (Fig. 9E). Tubercles in paravertebral row from occiput to midsacrum, 29. Ventral scales much larger than dorsal, cycloid, imbricate, their posterior edges roughly pointed (Figs. 10E, 17E), 12 largest between precloacal pores and vent, somewhat larger on abdomen than on chest. Mid-body scale rows across belly between ventrolateral folds, 34. Scales on throat smaller, granular, grading into larger scales on chest. Precloacal pores in a single series of 7, with a narrow poreless scale separating

two continuous rows of 3 (left) and 4 (right) pores (Figs. 13E, 17D). Femoral pores absent, but a series of somewhat enlarged 12 femoral scales present. Scales on palm and sole smooth and convex. Scales on dorsal aspect of proximal forelimbs imbricate, smooth, similar to ventral scales without tubercles. Scales on distal forelimbs and hindlimbs similar to those on dorsum, intermixed with weakly keeled tubercles.

Fore and hindlimbs stout, relatively short. Forearm short (ForeaL/ SVL ratio 0.15); tibia short (CrusL/ SVL ratio 0.17). Digits long, strongly inflated at each joint, all bearing short (ClawLM/ ForeaL ratio 0.05; ClawLP/ CrusL ratio 0.06) recurved claws (Fig. 15E). Subdigital lamellae smooth, with scansorial surfaces on basal lamellae. Basal lamellae wider than long, almost as wide as digit width, rounded to emarginate or roughly straight posteriorly. Lamellae from first proximal scensor greater than twice largest palm-scale to first interphalangeal joint: 6–7–7–7–6 (left)/ 7 (right) in manus, 5–7 (left)/ 8 (right)–8–8–6 in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 10 (left)/ 11 (right)–11–13–13 (left)/ 14 (right)–12 in manus and 10–12–14 (left)/ 15 (right)–15 (left)/ 16 (right)–15 in pes. Interdigital webbing present, weakly developed. Relative length of digits (measurements in mm in parentheses), manus: IV (10.2) > III (9.2) ~ V (9.2) > II (8.9) > I (5.2); pes: IV (12.8) > III (10.9) ~ V (10.8) > II (10.5) > I (6.2).

Original tail in holotype broken at base, regenerated. Original tail in WHT 6134 long (TailL/ SVL ratio 1.11), slender, subcylindrical, tapering to the tip. Dorsal scales rectangular. Enlarged tubercles arranged in 4 irregular whorls on base of tail, 2–4 tubercles in each whorl, becoming indistinct posteriorly. Subcaudal scales larger, with a single median series of enlarged plates, anteriorly wider than long, becoming as wide as long posteriorly. Prominent cloacal spurs with 2 (left) and 1 (right) enlarged scales on each side of tail base.

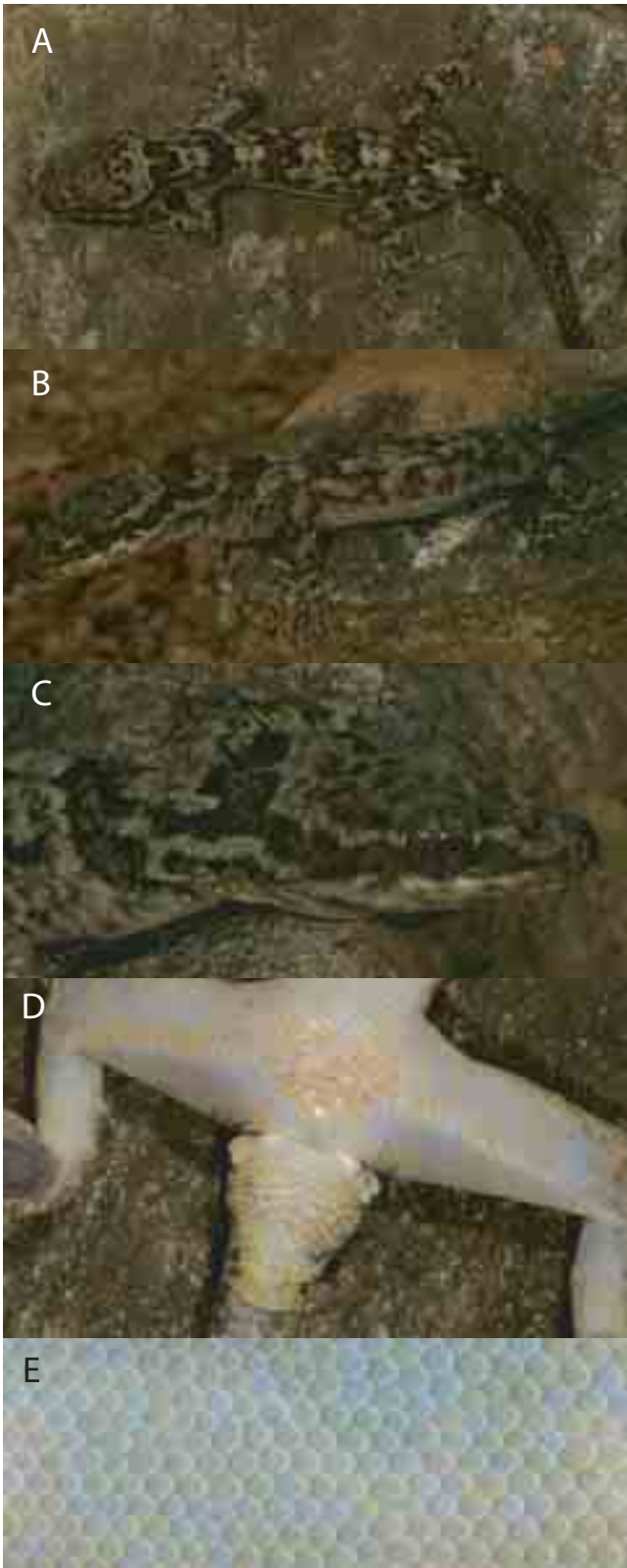


Fig. 17. Colour in life of *Cyrtodactylus soba*, new species, paratype (WHT 6045). A, dorsal view; B, lateral view of left side; C, lateral view right side of head; D, cloacal region; E, mid-ventral scales.

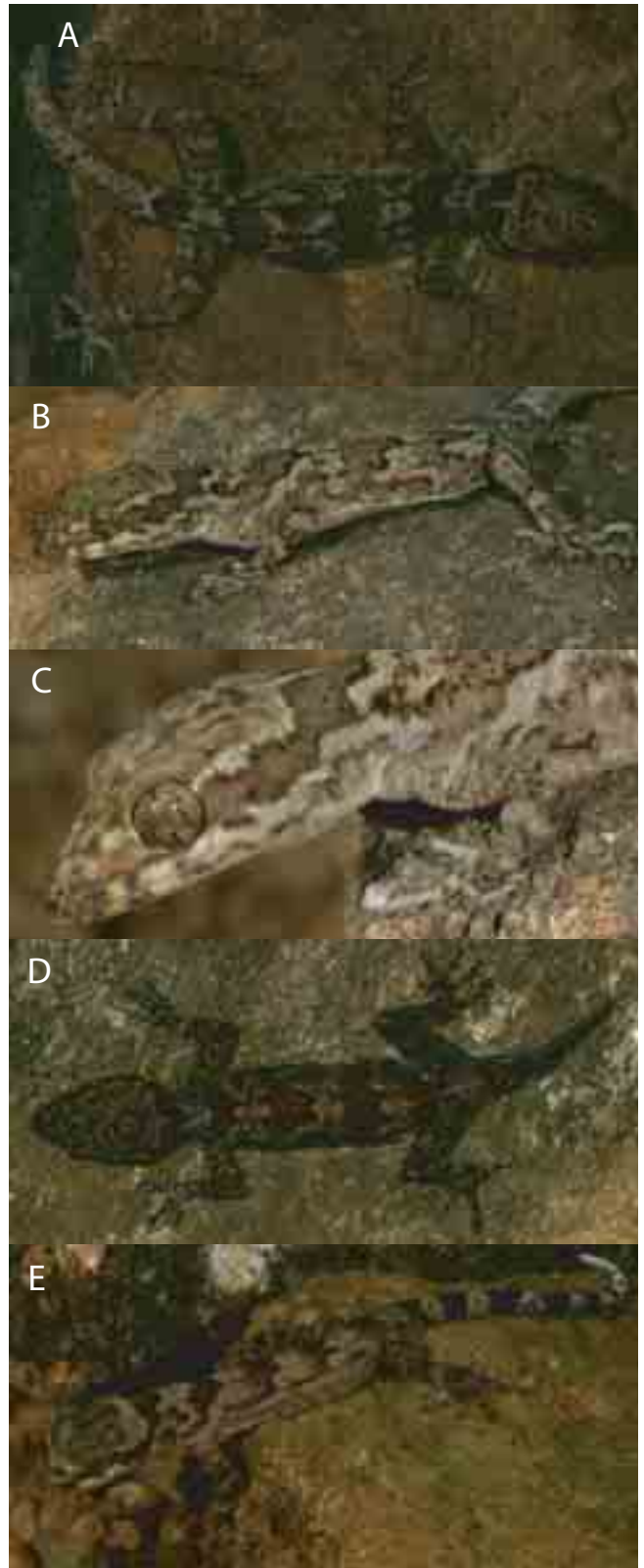


Fig. 18. Colour in life of *Cyrtodactylus soba*, new species, paratype (WHT 6046). A, dorsal view; B, lateral view of left side; C, lateral view left side of head; D, dorsal view of paratype (WHT 6065); E, lateral view of juvenile (WHT 6047).

Coloration.— (Based on holotype; see Figs. 4E, 5E, 6E, 8E.) Base colour brown to dark brown marked by several darker brown bands, each with a dark-brown posterior border and indistinct darker anterior border. Each marking bolder and better defined posteriorly. Numerous dark markings on head. Canthal region with a pale narrow transverse bar (faded in some individuals). A dark-brown occipital band extends anteriorly to orbit and under eye to loreal region and continues indistinctly to rostral. Occipital band bluntly pointed posteriomedially and laterally confluent with band on nape. Four bands on dorsum between nape and sacrum, more or less bifurcate posteriorly. Additional narrow bands on lighter interspaces between occipital band and sacral band. Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Dark band on tail-base with bluntly pointed posterior margin. Remainder of tail with alternating elongate dark bands and shorter pale interspaces; six dark bands on original tail of WHT 6134, each with a darker posterior border. Tail patterning continues on to venter, the bands more or less clearly demarcated towards tail tip of WHT 6134. Venter dusky, with paler gular areas. Palms and soles pale.

Colour in life similar to that in preservative but with a slightly reddish cast to the lighter regions of the head and body (see Figs. 17, 18).

Variation.— Comparative mensural data for the holotype and paratypes are presented in Table 3. The paratypes vary from the holotype as follows: scale rows between ventrolateral folds, 26–34; rows of dorsal tubercles at mid-body, 7–10; paravertebrals, 25–31; dorsal scales across mid-body, 61–72. Precloacal pores 5–8 in males in a continuous series, a single poreless scale dividing series into 2 (left) and 3 (right) in WHT 6043 and WHT 6044. Small pores present in adult females, WHT 0110, WHT 6065 and WHT 0705 (a single poreless scale dividing 1 pore on each side of WHT 0110 and WHT 6065, 2 on each side of WHT 0705). Pores absent in WHT 6046 and NMSL LG, but a small depression present on mid-scale of preano-femoral scale row. Supralabials to mid-point of orbit, 7 on right side and 8 on left side in WHT 6043; 7 on right side and 8 left side in WHT 6045; 7 on left side and 8 on left side in WHT 0110 and in WHT 6044; 8 on each side in WHT 6046 and WHT 6065; 7 on right side and 8 on left side in WHT 6043; 8 on right side and 9 on left side in NMSL LG. Supralabials to corner of mouth, 12 on each side in WHT 6045 and WHT 6065; 12 on right side and 13 on left side in NMSL LG and WHT 6043; 12 on left side and 14 on right side in WHT 0110; 13 on left side and 14 on right side in WHT 6046; 14 on each side in WHT 6044. Infralabials, 9 on right side and 10 on left side in WHT 0110; 10 on each side in WHT 6043; 11 on each side in WHT 6044. Three small scales separate supranasals of WHT 6045. Asymmetrical number of postnasals, 2 on left side and 3 on right side of WHT 6044. Except for the holotype, single internasal in all examined specimens. Materials referred to *C. soba* range in SVL from 42.9 mm (WHT 6047, juvenile) to 104.0 mm (WHT 0707, adult male). Range of subdigital lamellae 5–6,

7–8, 7, 6–7, 6–7 (proximal portion of 4th digit) and 10–12, 10–11, 12–14, 12–14, 11–13 (distal portion of 4th digit) of manus; 5–6, 7–8, 7–8, 8, 6 (proximal portion of 4th digit) and 9–11, 12, 12–15, 12–16, 12–16 (distal portion of 4th digit) of pes.

Habitat and distribution.— At Corbett's Gap, *C. soba* was collected from a neglected cardamom barn adjoining a disused house, 0.5–3 m above ground. At Hare Park, the geckos were found on the walls of tea plantation workers' dwellings (Fig. 21). All collections were made between 1930–2130 hrs. It appears that *C. soba* is endemic to the southern part of the Knuckles Mountains, in which the two collection localities lie. Diminutive, diurnal *Cnemaspis* geckos were observed in sympatry with this species.

Cyrtodactylus subsolanus, new species

(Figs. 4F, 5F, 6F, 7F, 8F, 9F, 10F, 13F, 14F, 15F, 19, 20; Table 4)

Material examined.— Holotype, adult male (99.5 mm SVL) (WHT 5999) (a 10 mm portion removed from tail tip and preserved in ethanol), in a cardamom plantation at Dolahena Estate, near Morningside Forest Reserve, adjacent to and east of the Sinharaja World Heritage Site, Ratnapura District (06°25'10"N, 80°36'30"E, alt. 850 m), coll. M. M. Bahir and M. Meegaskumbura, 2 Feb. 2004.

Paratypes - female (104.6 mm SVL) (WHT 6013); male (99.3 mm SVL) (WHT 6014), same collection data as holotype.

Diagnosis.— *Cyrtodactylus subsolanus* is distinguished from all other congeners by the combination of the following characters: subdigital lamellae beneath proximal portion of 4th digit of manus, 9–10; beneath distal portion, 12–13; basal lamellae under proximal portion as wide as digit width. Subdigital lamellae beneath proximal portion of 4th digit of pes, 8–10, beneath distal portion (Fig. 14F), 13–14; 1–4 fragmented basal lamellae beneath distal portion of each digit (Fig. 14F); no precloacal groove; 5 precloacal pores in males; claws long (ClawLM/ForeaL ratio 0.11–0.12; ClawLP/ CrusL ratio 0.12–0.15) (Fig. 15F); mental subtriangular (Fig. 7F). Scales across mid-body between ventrolateral folds, 30–32. Dorsal scales across mid-body between ventrolateral folds, 60–65. Tubercles on paravertebral row, 21–26 (tubercles absent on neck). Dorsal tubercles at mid-body in 6–8 rows (Figs. 8F, 9F). Ventral scales imbricate to subimbricate (Figs. 10F, 19D), imbricate on groin, with rounded posterior edges (Fig. 10F). Original tail shorter than body (TailL/ SVL ratio range 0.93–0.96).

Cyrtodactylus subsolanus resembles *C. cracens* new species and *C. fraenatus*. It may be distinguished from the latter by its indistinct dorsal pattern, vs. distinct dorsal pattern; and from former by having a broader head (HeadW/HeadL ratio 0.71–0.72) and raised dorsal tubercles, vs. narrower head (HeadW/HeadL ratio 0.65) and flattened dorsal tubercles; and also its comparatively short claws (see Figs. 15F vs. 15B; Table 5).

Description.— (Based on holotype, WHT 5999.) Adult male, SVL 99.5 mm. Head moderately long (HeadL/ SVL ratio 0.26),

Table 4. Mensural data for the types of two new species of *Cyrtodactylus ramboda* and *C. subsolanus*. Abbreviations as in Materials and Methods section; s.a. = subadult; all measurements in mm.

	<i>C. ramboda</i> WHT6050 Holotype	<i>C. ramboda</i> WHT6051 Paratype	<i>C. ramboda</i> WHT6052 Paratype	<i>C. subsolanus</i> WHT5999 Holotype	<i>C. subsolanus</i> WHT6013 Paratype	<i>C. subsolanus</i> WHT6014 Paratype
Sex	male	female	s.a. female	male	female	male
SVL	99.1	86.0	73.8	99.5	104.6	99.3
FOL	13.5	12.0	9.0	14.0	14.4	13.6
Crus L	15.5	14.2	11.0	15.5	15.8	15.5
Tail L (entire)	67.8	80.0	73.6	92.5	100.7	59.3
Tail L (regenerated)	58.8	62.0				broken
Tail W	10.2	8.4	6.0	9.5	9.6	9.5
Trunk L	55.2	47.2	40.0	55.7	58.0	55.0
Head L	26.4	23.2	19.2	26.1	27.6	24.9
Head W	18.6	16.0	13.5	18.5	19.5	18.0
Head H	9.6	8.5	7.0	10.8	11.2	9.9
OrbD	5.9	5.0	4.3	6.2	6.8	6.0
EyeEar	8.5	6.2	6.2	7.5	8.5	7.4
SnEye	10.3	8.8	7.8	10.4	11.0	10.2
NarEye	7.6	6.1	5.6	7.9	8.4	7.5
Interorb	9.0	7.9	6.6	8.3	8.8	8.1
Ear L	1.7	1.1	1.2	1.3	1.1	1.3
Internar	3.5	3.2	2.5	2.7	3.1	2.9

relatively narrow (HeadW/ HeadL ratio 0.71), not depressed (HeadH/ HeadL ratio 0.41), distinct from neck (Figs. 4F, 5F, 6F). Lores and interorbital region weakly inflated. Canthus rostralis not well developed. Snout moderately short (SnEye/ HeadL ratio 0.40) (Fig. 6F), longer than eye diameter (OrbD/ SnEye ratio 0.60). Scales on snout hexagonal, flattened; on forehead granular. Scales on snout much larger than those on occipital region. Convex tubercles present on temporal and post-orbital regions. Eye relatively large (OrbD/ HeadL ratio 0.24). Pupil vertical, lacking crenelated margins. Supraciliaries short, blunt without pointed scales. Ear opening elliptical, small (EarL/ HeadL ratio 0.05). Eye to ear distance greater than diameter of eyes (EyeEar/ OrbD ratio 1.21). Rostral approximately 50% as deep (2.5 mm) as wide (4.2 mm), incompletely divided dorsally by a weakly developed simple rostral groove about 60% of height of rostral. Two enlarged supranasals separated by a single, narrow internasal. Rostral in contact with first supralabial, supranasals, and internasal. Five enlarged scales (approx. one-fourth size of supranasals) border internasal-supranasals row posteriorly. Nostrils oval, laterally orientated, each in broad contact with rostral and also surrounded by supranasal and a narrow crescentic nasal rim bordered by two subequal postnasals. Pigmented narial flap occludes posterior two-thirds of nostril. Three rows of scales separate orbit from supralabials. Mental subtriangular, wider (3.3 mm) than deep (2.5 mm) (Fig. 7F). One pair of enlarged postmentals, the first approximately half size of mental (Fig. 7F); first pair (left and right) of postmentals in broad medial contact, with no intervening granules, bordered laterally by first infralabials and enlarged second postmentals, and posteriorly by 4 granular chin scales. Infralabials bordered

by a single row of enlarged scales, largest anteriorly. Throat scales small, granular. Supralabials (to midorbital position) 8 (left)–7 (right). Enlarged supralabials to angle of jaws, 12 (left)–11 (right). An enlarged series of 13–15 scales bordering supralabials largest scales on anteriorly. Infralabials, 10. Interorbital scale rows across narrowest point of frontal bone, 21.

Body slender relatively elongate (Fig. 4F) (TrunkL/ SVL ratio 0.56), with well-developed, non-denticulate ventrolateral folds. Dorsal scales heterogeneous, mostly flattened, granular, pitted or rugose, intermixed with small, weakly convex tubercles, 2–5 times size of dorsal scales, extending from margin of posterior nape on to back and base of tail. Tubercles most prominent on dorsolateral surfaces, along mid-dorsal line, absent on flanks. Tubercles in about 8 weakly regular longitudinal rows at mid-body (Figs. 8F, 9F). Tubercles on mid-dorsal row from posterior nape margin to mid sacrum, 29. Ventral scales much larger than dorsals, cycloid, imbricate on chest; imbricate to subimbricate on abdomen (Fig. 10F, 19D), and becoming imbricate again on groin, 9 largest between precloacal and pores and vent, somewhat larger on abdomen than on chest. Mid-body scale rows across belly, between ventrolateral folds, 32. Scales on throat smaller, granular, grading into larger scales on chest. A single continuous series of 5 pores in precloacal depression (Fig. 13F). Femoral pores absent. A series of 9 enlarged femoral scales present. Precloacal groove absent. Scales on palm and sole smooth, gently pointed, imbricate. Dorsal aspects of proximal forelimbs with smooth, imbricate scales, lacking tubercles. Scales on dorsal aspect of distal fore and hindlimbs heterogeneous, similar to dorsal scales, with large, convex tubercles interspersed among smaller scales.



Fig. 19. Colour in life of *Cyrtodactylus subsolanus*, new species, holotype (WHT 5999). A, dorsal view; B, lateral view of right side; C, cloacal region; E, mid-ventral scales.

Fore and hindlimbs relatively stout. Forearm short (ForeaL/SVL ratio 0.14). Tibia short (CrusL/SVL ratio 0.16). Digits long, strongly inflated at each joint, all bearing somewhat long (ClawLM/ForeaL ratio 0.11; ClawLP/CrusL ratio 0.15), recurved claws (Fig. 15F). Subdigital lamellae smooth with scansorial surfaces on basal lamellae. Basal lamellae wider than long, as wide as digit width, rounded to emarginate or roughly straight posteriorly (Fig. 14F). 1–4 rows of fragmented lamellae on base of distal portion of digits. Lamellae from first proximal scansor, greater than twice largest palm scale, to first interphalangeal joint (proximal portion): 6–9 (left)/8 (right)–

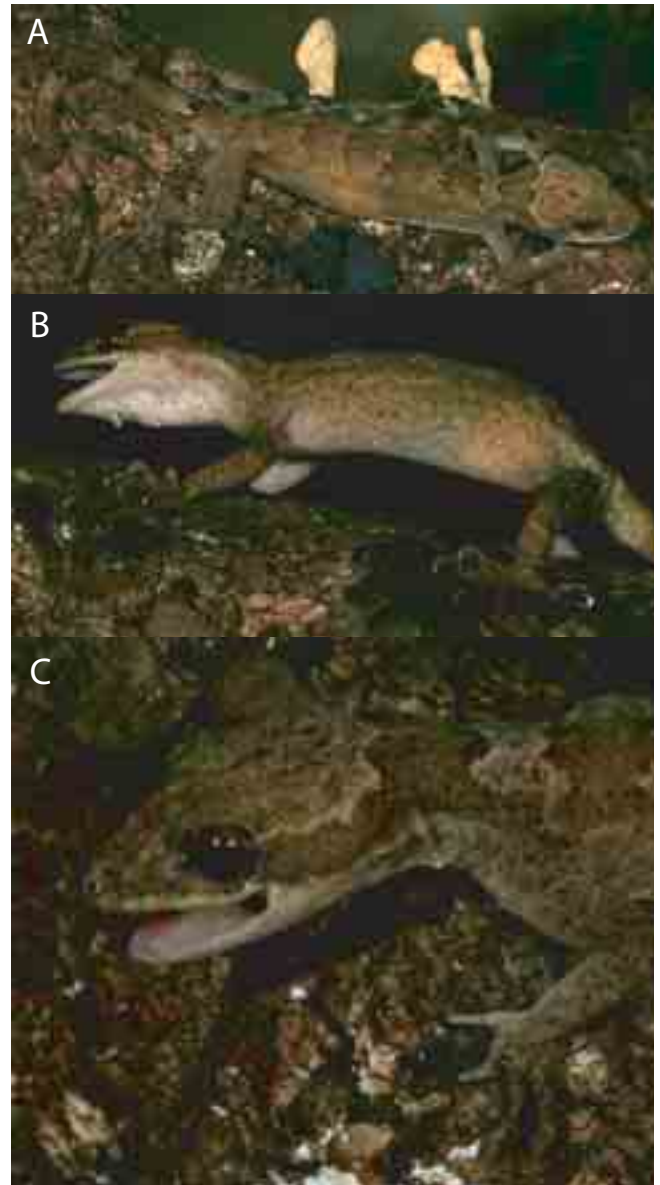


Fig. 20. Colour in life of *Cyrtodactylus subsolanus*, new species, paratype (WHT 6013). A, dorsal view; B, lateral view of left side; C, lateral view left side of head.

9–9 (left)/ 8 (right)–9 (left)/ 7 (right) in manus and 7 (left)/ 6 (right)–10 (left)/ 8 (right)–10 (left)/ 9 (right)–8–7 in pes. Lamellae from first interphalangeal joint to toe tip (distal portion), not including ventral claw sheath: 10 (left)/ 11 (right)–10–13 (left)/ 12 (right)–12–10 (left)/ 12 (right) in manus and 12–12–14–14 (left)/ 13 (right)–14 (left)/ 15 (right) in pes. Interdigital webbing present weakly developed. Relative length of digits (measurements in mm in parentheses), manus: IV (9.0) > III (8.5) > V (8.2) > II (7.3) > I (5.3); pes: IV (12.6) > V (11.0) > III (10.3) > II (9.4) > I (6.0).

Original tail short (TailL/SVL ratio 0.93), slender, subcylindrical. Dorsal scales rectangular. Enlarged tubercles arranged in four irregular whorls on base of tail, two tubercles in each whorl, becoming indistinct posteriorly. Subcaudals enlarged in a single series, one-third tail width. Prominent cloacal spurs with two enlarged scales on each side of tail base.

Coloration.— (Based on holotype; see Figs. 4F, 5F, 6F, 8F.) Base colour brown marked by dark brown bands, each with a darker brown posterior border. Dark markings on head. Canthal region with a pale, narrow transverse bar (faded in some individuals). A dark-brown occipital band with an antero-medial notch, extends anteriorly to orbit, bluntly pointed postero-medially, laterally confluent with band on nape. Four bands on dorsum between nape and sacrum, more or less bifurcate and better defined posteriorly. Faint, interrupted longitudinal stripes on lateral surfaces. Limbs more or less strongly barred, with alternating light and dark markings extending on to digits. Dark band on tail-base with bluntly pointed posterior margin. Remainder of tail with alternating elongate dark bands and shorter pale interspaces. Six dark bands on original tail, each band with a darker posterior border. Tail patterning continues on to venter, the bands more or less clearly demarcated towards tail tip. Venter dusky, gular areas paler. Palms and soles dusky.

Colour in life similar to that in preservative but with a whitish cast on the lighter regions of the head and body (see Figs. 19, 20).

Variation.— Comparative mensural data for the holotype and paratypes are presented in Table 4. The paratypes resembles holotype in most respects, except as noted: 30–32 scale rows between ventrolateral folds, 6–8 mid-dorsal tubercles, 21–26 paravertebrals, 60–65 dorsal scales across mid-body. 5 precloacal pores in males, (a single poreless scale dividing into 2 (right) and 3 (left) in WHT 6014). Precloacal pores small in females, a single poreless scale dividing into 3 (left) and one (right) in female paratype WHT 6013. Three postnasals on each side of WHT 6013 and WHT 6014. Supralabials to middle of eye, 7 on left side and 8 on right side in WHT 6013; 8 on each side in WHT 6014. Supralabials to corner of mouth, 11 on left side and 12 on right side in WHT 6013; 11 on right side and 12 on left side in WHT 6014. Infralabials 9 on each side in WHT 6013 and in WHT 6014. Range of subdigital lamellae 6–7, 8–9, 8–9, 9–10, 8–9 (proximal portion of 4th digit) and 9–10, 10–11, 11–14, 12–13, 10–12 (distal portion of 4th digit) of manus; 6–7, 8–11, 9–10, 8–10, 7–8 (proximal portion of 4th digit) and 10–12, 11–12, 12–14, 13–14, 13–15 (distal portion of 4th digit) of pes.

Etymology.— The specific epithet, *subsolanus*, is a Latin adjective for ‘eastern’, a reference to the restriction of this species to the eastern border of the Sinharaja World Heritage Site.

Habitat and distribution.— *Cyrtodactylus subsolanus* was found from tree trunks in a cardamom plantation adjoining a tea garden. One male was found in a tree hole about 2.5 m above ground at 1700 hours, another collected from a tree trunk about 1 m above ground at 1925 hours and a female from a dead tree trunk about 1.5 m above ground at 1940 hours. *Cnemaspis* geckos were observed in sympatry with *C. subsolanus* at Dolahena Estate. The species appears to be restricted to the type locality in the Rakwana Hills, an area that at present enjoys no protection (Fig. 21).

COMPARISON

All *Cyrtodactylus* species from Sri Lanka lack a deep precloacal groove and can thus be distinguished from *C. anulatus* (Taylor, 1915), *C. cavernicolus* Inger & King, 1961, *C. fumosus* (Müller, 1895), *C. papuensis* (Brongersma, 1934), *C. philippinus* (Steindachner, 1867), *C. pubisulcus* Inger, 1957, *C. pulchellus* Gray, 1827, *C. rubidus* (Blyth, 1860) and *C. sadleiri* Wells & Wellington, 1984. Sri Lankan *Cyrtodactylus* spp. are distinguished by the absence of femoral pores from *C. biordinis* Brown & McCoy, 1980 (which has a double row of femoral pores), *C. aaroni* Günther & Rösler, 2002, *C. angularis* (Smith, 1921), *C. annandalei* Bauer, 2003, *C. darmandvillei* (Weber & van Lidth de Jeude, 1891), *C. feae* (Boulenger, 1893), *C. gubernatoris* (Annandale, 1913), *C. redimiculus* King, 1962, *C. tiomanensis*, Das & Lim, 2000, *C. wetariensis*, (Dunn, 1927), *C. russelli* Bauer, 2003, *C. slowinskii* Bauer, 2002, *C. tigroides* Bauer, Sumontha & Pauwels, 2003 and *C. chanhomeae* Bauer, Sumontha & Pauwels, 2003, *C. abrae* Wells, 2002, *C. jarujini* Ulber, 1993, *C. lorae* (Boulenger, 1898), *C. louisiadensis* (de Vis, 1892), *C. malcolmsmithi* (Constable, 1949), *C. novaeguinae* (Schlegel, 1837), *C. papilionoides* Ulber & Grossmann, 1991, *C. tuberculatus* (Lucas & Frost, 1900), *C. variegatus* (Blyth, 1859) (data from Bauer, 2002, 2003; Bauer et. al., 2002, 2003; Das, 1997; Das & Lim, 2000; Darevsky & Szczerbak, 1997; Hikida, 1990; Smith, 1935; Ulber, 1993). All *Cyrtodactylus* species from Sri Lanka possess precloacal pores and thus are immediately distinguished from the following species: *C. jellesmae* (Boulenger, 1897), *C. laevigatus* Darevsky, 1964, *C. paradoxus* (Darevsky & Szczerbak, 1997), *C. sermowaiensis* (de Rooij, 1915); they are also distinguished from *C. brevidactylus* Bauer, 2002 by having proportionately longer digits.

All Sri Lankan *Cyrtodactylus* are distinguished from the following by having a lower ventral-scale count (< 35): *C. adleri* Das, 1997, *C. annandalei* Bauer, 2003, *C. baluensis* (Mocquard, 1890), *C. condorensis* (Smith, 1920), *C. consobrinus* (Peters, 1871), *C. derongo* Brown & Parker, 1973, *C. elok* Dring, 1979, *C. ingeri* Hikida, 1990, *C. interdigitalis* Ulber, 1993, *C. intermedius* (Smith, 1917), *C. irregularis* (Smith, 1921), *C. lateralis* (Werner, 1896), *C. malayanus* (de Rooij, 1915), *C. matsui* Hikida, 1990, *C. mimikanus* (Boulenger, 1914), *C. peguensis* (Boulenger, 1893), *C. quadrivirgatus* Taylor, 1962, *C. sworderi* (Smith, 1925) and *C. yoshii* Hikida, 1990. Sri Lankan *Cyrtodactylus* also differ from *C. peguensis* and *C. khasiensis* by having smaller ear openings: EarL/OrD ratio range 0.16–0.29 vs. ~ 0.50 (Smith, 1935: 50, 53), with the latter also lacking enlarged femoral scales and having a greater number of precloacal pores (8–14, vs. 4–8). The Sri Lankan species also differ from *C. consobrinoides* by having a lesser number of dorsal crossbars (4–6, vs. 8–9) and from *C. oldhami* in lacking longitudinal stripes. All Sri Lankan *Cyrtodactylus* may be distinguished from the following species by having a lesser number of precloacal pores (<

9), larger adult size (up to 94–105.7 mm SVL) and single series of enlarged subcaudal scales: *C. ayeyarwadyensis* Bauer, 2003 (21 precloacal pores; < 79 mm), *C. gansi* Bauer, 2003 (17 precloacal pores; < 63 mm) and *C. wakeorum* Bauer, 2003 (12 precloacal pores; < 64 mm) (data from Bauer, 2002, 2003; Bauer et al., 2002, 2003; Das, 1997; Das & Lim, 2000; Hikida, 1990; Smith, 1935).

Sri Lankan *Cyrtodactylus* may be distinguished from members of the subgenus *Geckoella* sensu Bauer (2002) by possessing precloacal pores (precloacal pores absent in *G. albofasciatus* (Boulenger, 1885), *G. collegalensis* (Beddome, 1870), *G. deccanensis* (Günther, 1864), *G. jeyporensis* (Beddome, 1877), *G. nebulosus* (Beddome, 1870) and *G. yakhuna* (Deraniyagala, 1945)) and from *G. triedra* (Günther, 1864) by having longer digits (data from Bauer, 2002).

DISCUSSION

The present study is based on a recently collected series of 28 specimens from eight localities, all of them more or less disturbed rainforest. While the sample size in this study was restricted owing to ethical considerations and conservation implications, future collections may well show that species-richness within this genus is significantly higher. Indeed, given the exceedingly restricted and highly fragmented ranges of many of the species described herein, and the fact that Sri Lanka has lost ~ 95 percent of its rainforest cover, it is likely that many species have already been rendered extinct.

In addition to the original description, there are only three previous specimen-based descriptions of *C. fraenatus*: Smith (1935), Taylor (1953) and Deraniyagala (1953). It is clear from Smith’s account that he had only a single specimen, the locality for which was stated simply as “Ceylon” [= Sri Lanka]. Smith’s description is insufficient to allow his specimen to be allocated to any one of our species. The illustration of the ventral side of the 4th toe of this specimen, and his note, “with imbricate rounded scales...and 35 ventral scales” suggests, however, that it was either *C. fraenatus* sensu stricto or *C. cracens* (Smith, 1935: p. 8, Fig. 3A; p. 49 cf. our Fig. 14).

Deraniyagala (1953) recorded *C. fraenatus* from Kandy (06°18’N, 80°38’E, alt. 500 m), Peradeniya (07°15’N, 80°36’E, alt. 500 m), Gammaduwa (07°34’N, 80°42’E, alt. 900 m), Hapugastenna (06°35’N, 80°40’E, alt. 450 m) and Ratnapura (06°41’N, 80°24’E, alt. 50 m), which localities are broadly represented in our series. His specimen/s from Neerodhamunai (08°31’N, 81°11’E, alt. 1 m), a north-eastern dry-zone site well separated from the central and south-western localities in which our collections were made, could be represent yet another species. Unfortunately, Deraniyagala did not list the material he examined. Deraniyagala’s (1953) description, “mental triangular, or subpentagonal... ventral scales large, smooth; imbricate...”, together with his Plate IX 2 (cf. our Fig. 7),

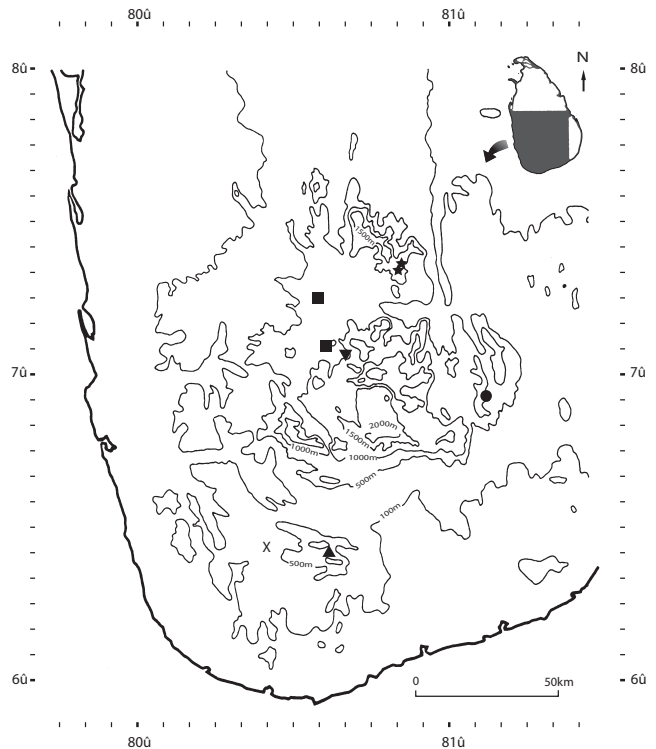


Fig. 21. Map of south-western Sri Lanka illustrating the distribution of the six species of *Cyrtodactylus* presently recognized from the island: *C. fraenatus* (Günther, 1864) (solid square); *C. cracens*, new species (×); *C. edwardtaylori*, new species (solid circle); *C. ramboda*, new species (inverted pyramid); *C. soba*, new species (solid star); *C. subsolanus*, new species (solid pyramid).

suggests that his description was in fact based on two of our species or another species unknown to us.

Taylor (1953) provided a detailed description of the *C. fraenatus* population in Tonacombe Estate, adding, “With about 14 irregular, longitudinal rows of larger rounded, flat, rarely slightly keeled tubercles... three brown W-shaped blotches on back of body...”. This makes it clear that his specimen was in fact a representative of the species we have here named in his honour, *Cyrtodactylus edwardtaylori*.

The gekkonid fauna of Sri Lanka has not been reviewed since Taylor (1953) and Deraniyagala (1953), both of whom considered there to be only a single species of *Cyrtodactylus*—*C. fraenatus*— on the island. Several reptile genera—e.g., *Aspidura*, *Ceratophora*, *Lankascincus* and *Nessia*—however, show endemic radiations in Sri Lanka, as does the rhacophorid frog genus *Philautus* (Bossuyt et al., 2004; Das, 1996; Macey et al., 1998; Meegaskumbura et al., 2002; Pethiyagoda & Manamendra-Arachchi, 1998). It is not surprising therefore to find hitherto cryptic diversity within *Cyrtodactylus*, a relatively little studied and superficially homogenous group of geckos. Despite being a continental island separated from India by the shallow and narrow (~ 10 m deep, 30 km wide) Palk Strait, and therefore connected to the mainland for much of the Pleistocene, when sea levels were ~ 120 m below present (Rohling et al., 1998), there has been little

Table 5. External morphological character variation in Sri Lankan *Cyrtodactylus*. Abbreviations: Convex = C; Flat = F; Rounded = R; Smooth = S; Keeled = K; Long = L; Moderate = M; Pointed = P; Short = Sh; Sub-pentagonal = Sp; Sub-triangular = St; Triangular = T.

	mid-ventral scale margin	mid-dorsal tubercles	mid-body tubercle rows	claw length	mental shape	bands on neck and body	paravertebral tubercles	lamellae under 4th toe basal and distal portions
<i>C. fraenatus</i>	R	S, C	5–9	M	Sp	5	17–22	8–9, 13–16
<i>C. cracens</i>	R	S, F	8	L	St	5	26–27	8–9, 12–14
<i>C. edwardtaylori</i>	R	K, C	14–15	Sh	Sp	4	40–45	7–10, 11–13
<i>C. ramboda</i>	R	S, C	9	M	Sp	5	38–44	8–10, 13–14
<i>C. soba</i>	P	K, C	7–10	Sh	Sp	5	25–31	8, 12–16
<i>C. subsolanus</i>	R	S, C	6–8	M	St	5	21–26	8–10, 13–14
Fig.	10		9	15	7	4		14

Key to the species of Sri Lankan *Cyrtodactylus*

1. Dorsal body (including occipital band) with 5–6 dark bands (Figs. 4A, B D–F); 5–10 longitudinal rows of tubercles across mid-body (Figs. 9A, B, D–F) 2
 - Dorsal body (including occipital band) with 4 dark bands (Fig. 4C); 14–15 longitudinal rows of tubercles across mid-body (Fig. 9C) *C. edwardtaylori*
2. 17–31 enlarged tubercles on paravertebral row 3
 - 38–44 enlarged tubercles on paravertebral row *C. ramboda*
3. 17–26 enlarged tubercles on paravertebral row; posterior margins of ventral scales rounded (Fig. 10A, B, F) 4
 - 25–31 enlarged tubercles on paravertebral row; posterior margins of ventral scales pointed (Fig. 10E) *C. soba*
4. Head wider (HeadW/ HeadL ratio 0.69–0.71) (Fig. 5A, F); claws comparatively short (ClawLM/ Foreal ratio 0.07–0.14; ClawLP/ CrusL ratio 0.07–0.15) (Fig. 15A, F) 5
 - Head narrow (HeadW/ HeadL ratio 0.65) (Fig. 5B); Claws longer (ClawLM/ Foreal ratio 0.10–0.12; ClawLP/ CrusL ratio 0.12–0.13) (Fig. 15B) *C. cracens*
5. Dorsal bands distinct and 8 dorsal tail bands (including band on base of tail); 17–23 enlarged paravertebral tubercles; Original tail long (TailL/ SVL ratio range 1.04–1.16) *C. fraenatus*
 - Dorsal bands indistinct and 6 dorsal tail bands (including band on base of tail); 21–26 enlarged paravertebral tubercles; Original tail short (TailL/ SVL ratio range 0.93–0.96) *C. subsolanus*

biotic exchange with India: the island is a remarkable centre of endemism (Bossuyt et al., 2004).

In this background, it is interesting that no species of *Cyrtodactylus* have been recorded from peninsular India, especially the Western Ghats mountains (which, together with Sri Lanka, are considered a Global Biodiversity Hotspot: Myers et al., 2000) and the southern states of Tamil Nadu, Kerala and Karnataka. Such a distribution however, is not unique, being shared also by the uropeltid snake genus *Cylindrophis*.

The Sri Lankan *Cyrtodactylus* appear to share their closest affinity with *C. khasiensis* (Jerdon, 1870) from the north-eastern states of India (Smith, 1935), with which they share a reduced number of ventral scales 26–35 (vs. 30–40) (Bauer, 2002). They differ from their Indian congeners, however, by having an equal or lower precloacal pore count of 4–8 (vs. 8–14).

Fresh exploration has recently brought to light a large number of new species of *Cyrtodactylus* in south-east Asia (Bauer, 2002, 2003; Das, 1997; Das & Lim, 2000; Ziegler et al., 2002). In a description of seven new species in this genus from Myanmar, Bauer (2003) suggested that different hill ranges and isolated peaks could be expected to harbour endemic species of geckos: this appears indeed to be the case in Sri Lanka.

CONSERVATION

Only one of the species of *Cyrtodactylus* described in this paper, *C. cracens*, occurs in a protected area (the lowland dipterocarp forest of the Sinharaja World Heritage Site). *Cyrtodactylus soba*, *C. edwardtaylori* and *C. subsolanus* were recorded only from privately-owned cardamom and tea plantations, which could be subject to arbitrary land-use change. The riparian anthropogenic habitat of *C. ramboda*, too, is subject to degradation, a clear threat to this species.

Cyrtodactylus fraenatus is found over a relatively wide range, in the Gannoruwa Proposed Forest (a mid-elevation rainforest heavily disturbed by mahogany forestry), the Hantana (secondary) forest and home gardens around Pussellawa. The former rain forests in these areas (450–1370 m a.s.l.) have largely been lost or severely degraded, and many of the sites in which these geckos occur are subject to continuing canopy loss. Given that all Sri Lankan *Cyrtodactylus* appear to be dependent on shaded habitats, there is clearly cause for concern.

Except *C. fraenatus*, it is of immediate concern that five of the island's six *Cyrtodactylus* species are known from areas of occupancy of about 10 km² or less. Several recent studies (e.g. Bierregaard et al., 2001; Brook et al., 2003; Ferraz et al., 2003) have shown that extreme rainforest fragmentation could lead to catastrophic declines and extinctions of species in decadal time-frames. Further, anthropic fires continue to devastate large tracts of forest in Sri Lanka each year (Fig. 22), and such stochastic events may pose significant threats to these ground-nesting, slow-moving geckos (Henry, 1928; Deraniyagala, 1953; De Silva, 1994; pers. obs.).

Recent data suggest the extinction of at least 17 species of *Philautus* shrub-frogs in the past century (Manamendra-Arachchi & Pethiyagoda, pers. comm.), most likely restricted-range species extirpated by loss of habitat. It is likely that *Cyrtodactylus* species too, have been lost in Sri Lanka, though the conjecture is difficult to prove in view of the dearth of preserved material in old museum collections.

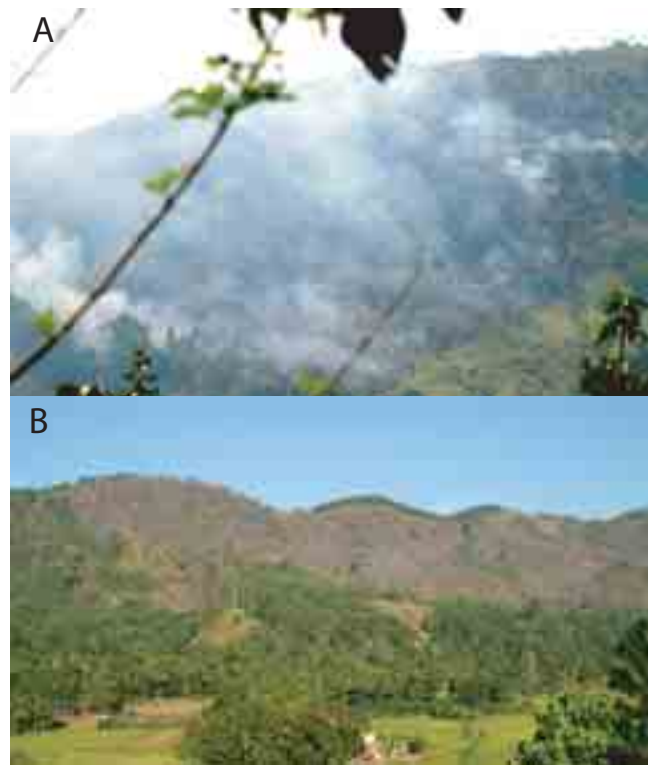


Fig. 22. Anthropic fires represent one of the greatest threats to many species in Sri Lanka, including the geckos. Before (A) and after (B) a forest fire near Gampola, central Sri Lanka: February, 2004.

ACKNOWLEDGEMENTS

R. Pethiyagoda (WHT) initiated this study in 1999, provided guidance, literature, financial support and helped improve the manuscript, which benefitted significantly also from the insightful comments of an anonymous reviewer. A. M. Bauer (Villanova University, USA) and I. Das (University Malaysia Sarawak) kindly provided us with much literature. We thank C. McCarthy (BMNH) for access to material. D. Gower (BMNH) and D. Yeo (Raffles Museum of Biodiversity Research, ZRC) for photographs of the syntypes of *C. fraenatus*. MMB thanks D. Yeo, D. Wowor, S. H. Tan and P. K. L. Ng for facilities at (ZRC), S. Nanayakkara (WHT) for hospitality and K. Lim (ZRC) for facilitating this work in many ways. We are grateful to M. Meegaskumbura (WHT) for colour photographs; and K. Manamendra-Arachchi (WHT), D. S. Kandamby (NMSL) and D. O'Connell (RSPCA, UK) for technical comments. SB is grateful to T. Devendra and J. Alahendra for assistance. We are grateful to H. Situge, K. Wewelwala, R. Wickramatilleke, A. Silva, K. Maduwage, D. Karunaratne and A. S. N. Batuwita for assisting this work. Finally, we thank the Director General of Wildlife Conservation, Sri Lanka, for initiating this study through the award of a grant through the GEF small grants programme awarded by him to Rohan Pethiyagoda (WHT) in 1999 and for permission to carry out the resulting survey; and the Conservator General of Forests for permission to survey the gecko fauna in lands under his care.

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