



A new species of *Cyrtodactylus* Gray, 1827 (Reptilia: Squamata: Gekkonidae) from Kokrajhar District, Assam, India

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Abstract

We herein describe a new species of *Cyrtodactylus* from Kachugaon, in the Kokrajhar District of Assam, India. Morphological characteristics combined with ND2 mitochondrial gene sequence data support its placement within the *Cyrtodactylus khasiensis* group, identifying *Cyrtodactylus raimonaensis* **sp. nov.** as the sister lineage to *Cyrtodactylus septentrionalis*. It is characterised by a moderate adult size (maximum SVL 71.1 mm), rounded, bluntly conical, and weakly keeled dorsal tubercles arranged in 20 or 21 longitudinal rows, and 36–38 paravertebral tubercles between the axilla and groin. Other diagnostic features include 32–38 mid-ventral scale rows, 13 precloacal pores in male, 13 precloacal pits in females, 17–20 subdigital lamellae beneath the fourth toe, absence of a single row of transversely enlarged subcaudal scales, 7 or 8 pairs of dark dorsal blotches between the axilla and groin, and a tail bearing alternating dark and light bands.

Key words: *Cyrtodactylus khasiensis*, gecko, Northeast India, Systematics, Taxonomy

Introduction

Cyrtodactylus Gray, commonly referred to as bent-toed geckos, represents one of the most taxonomically diverse groups of vertebrates and is currently recognised as the third most speciose vertebrate genus after *Pristimantis* Jiménez de la Espada and *Anolis* Daudin, with approximately 391 described species (Grismer *et al.* 2021; Uetz *et al.* 2025). These geckos are distributed across at least eight biogeographic regions extending from South Asia through Southeast Asia to Melanesia and are noted for their exceptional ecological adaptability and morphological variation (Grismer *et al.* 2021, 2022). A significant number of species exhibit narrow endemism, often associated with geographically and ecologically isolated habitats such as karst landscapes, montane forests, and riverine

systems (Grismer *et al.* 2021, 2022). Through extensive molecular and morphological analyses, Grismer *et al.* (2021) identified at least 31 monophyletic species assemblages within the genus, among which the *fasciolatus*, *khasiensis*, and *peguensis* clades represent major radiations restricted to South and Southeast Asia, particularly within the Indo-Burma region. Subsequent refinement within the *khasiensis* lineage has revealed clear highland and lowland sub-clades, as highlighted by Agarwal *et al.* (2018b) and Bhattarai *et al.* (2025), underscoring the role of historical mountain-building events, climatic fluctuations, and ecological gradients in driving diversification patterns.

Situated at the intersection of the Indo-Burma and Eastern Himalayan biodiversity hotspots, Northeast India has recently emerged as a prominent centre for *Cyrtodactylus* diversity. The taxonomic stabilisation of *Cyrtodactylus khasiensis* Jerdon *sensu stricto*, accompanied by the restriction of its distribution to the Khasi Hills of Meghalaya by Agarwal *et al.* (2018a), triggered a systematic re-evaluation of previously misassigned populations across the region. This reassessment, along with targeted herpetofaunal surveys and integrative taxonomic investigations, has resulted in a significant increase in the number of formally described species, expanding from only a few at the start of the century to nearly 30 at present (Agarwal *et al.* 2018a, b; Purkayastha *et al.* 2020, 2021, 2022; Kamei & Mahony 2021; Mahony & Kamei 2021; Bohra *et al.* 2022; Mirza *et al.* 2022; Lalremsanga *et al.* 2022, 2023; Boruah *et al.* 2024; Bharali *et al.* 2026). Within this context, the state of Assam currently harbours five recognised species: *Cyrtodactylus guwahatiensis* Agarwal, Mahony, Giri, Chaitanya & Bauer; *C. kazirangaensis* Agarwal, Mahony, Giri, Chaitanya & Bauer; *C. septentrionalis* Agarwal, Mahony, Giri, Chaitanya & Bauer; *C. urbanus* Purkayastha, Das, Bohra, Bauer & Agarwal and *C. vanarakshaka* Bharali, Thaosen, Vabeiryureilai, Lalremsanga, Purkayastha, Bhattacharjee, Das, Bohra & Hazarika.

In continuation of this growing inventory, we herein describe an additional new species of *Cyrtodactylus* from Kokrajhar District, Assam. Geographically, Kokrajhar lies along the north western boundary of Assam, sharing its northern border with Bhutan, flanked by West Bengal to the west, Chirang district to the east, and Brahmaputra river to the south. Positioned adjacent to the eastern Himalayan foothills, the district encompasses significant protected areas, including Raimona National Park (422 km², established in 2021), Sikhna Jwhlwao National Park (316.3 km², established in 2025), and Chakrashila Wildlife Sanctuary (45.57 km², established in 1994).

The present discovery was made in a non-protected forest fragment in proximity to Raimona National Park. The newly examined population, assignable to the *khasiensis* clade *sensu* Grismer *et al.* (2021), displays distinct morphological and genetic characteristics that clearly differentiate it from all known congeners in the region.

Materials and methods

Sampling: The study was carried out in the Kachugaon Forest Division of Assam, India. The collections were made after obtaining permission from the Chief Wildlife Warden of the Environment, Forests and Climate Change Department, Government of Assam, for non-scheduled saurian fauna within the non-protected areas of Assam (No. WL/FG.31/Research Project/Dr Madhurima Das). One adult male, one adult female and a juvenile female were collected from Kachugaon (26.608601, 90.025994; 102 m a.s.l). Post-collection, the specimens were euthanised using 2% Lignocaine, following institutionally approved protocols, and subsequently preserved in 95% ethanol (Bohra *et al.* 2025). All voucher specimens have been deposited in the National Zoological Collections (NZC) of the North Eastern Regional Centre (NERC), Shillong (with museum numbers VR/ERS/ZSI/961, VR/ERS/ZSI/962, and VR/ERS/ZSI/963). For molecular analysis, a small portion of liver tissue was extracted from the first two of these specimens before fixation and preserved in absolute (100%) ethanol.

Morphology: Morphometric data of the specimens were recorded to the nearest 0.1 mm using a Mitutoyo digital caliper. All measurements were taken on the right side of the body, unless otherwise specified. We recorded the following measurements (as defined by Agarwal *et al.* 2018b): SVL, snout to vent length; TRL, trunk length, between axilla and groin; BW, maximum body width; TL, tail length, from the cloaca to tail tip; TW, tail width taken at first tail segment; TD, tail depth taken at first tail segment; HL, head length from the snout tip to the retroarticular process of the jaw; HW, maximum head width; HD, maximum head depth; FL, forearm length taken from the elbow to the wrist; CL, crus length taken from the knee to the heel; OD, orbit diameter taken horizontally between the bony orbital borders; NO, distance between the posterior edge of the nostril and the anterior bony orbital border; SO, distance between the snout tip and the anterior bony orbital border; OE, distance between posterior bony orbital

border and the anterior border of the ear openings; EL, maximum ear length/diameter measured horizontally; ES, distance from the anterior border of the ear to the snout tip; IN, internarial distance, measured between two nasal openings; IO, minimum interorbital distance between left and right suprasciary rows; RL, maximum rostral length; RW, maximum rostral width; ML, Maximum mental length; MW, Maximum mental width; PMIL, maximum length of inner postmental; PMIIL, maximum length of outer postmental; PcP, precloacal pores, a continuous series of pore-bearing scales in the precloacal region which never extend onto the thighs; MVSR, mid-ventral scale rows (counted between ventrolateral folds); PVT1, paravertebral tubercles (counted from the most anterior tubercle on the occiput to the mid-sacrum); PVT2, paravertebral tubercles on the trunk only (counted between the level of the axilla and the level of the groin); DTR, dorsal tubercle rows (counted transversely across the trunk at the widest point); SL, total number of supralabials; IL, total number of infralabials; digits were measured from the site of insertion till the tip excluding the claw, and numbered from inner (1) to outer (5) as follows: on manus, F1, F2, F3, F4, F5; on pes, T1, T2, T3, T4, T5; three separate series for subdigital lamellae were counted on all digits of the right manus and right pes: (i) a basal series, which includes scales of a width at least twice the diameter of palmar scales up to and including a single large scale at the digital inflection; (ii) an apical series, including lamellae distal to the digital inflection and not including the ventral claw sheath and (iii) a series of nonlamellar scales between the basal and apical lamellae series (counted separately and given in parenthesis between digital and basal lamellae), abbreviated as follows: on manus, F1L, F2L, F3L, F4L, F5L; on pes, T1L, T2L, T3L, T4L, T5L.

The specimens were compared morphologically with all known species from the ‘*khasiensis*’ group (Grismer *et al.* 2021). Comparisons were made through examination of type specimens (see Appendix I), literature containing original descriptions and literature reviewing a species based on type specimens (Jerdon 1870; Darevsky *et al.* 1998; Bauer 2002, 2003; Li 2007; Mahony 2009; Agarwal *et al.* 2018a, 2018b; Grismer *et al.* 2018, 2019; Purkayastha *et al.* 2020, 2021, 2022; Mirza *et al.* 2021, 2022; Kamei & Mahony 2021; Liu & Rao 2021; Bohra *et al.* 2022; Mahony & Kamei 2021; Lalremsanga *et al.* 2022, 2023; Boruah *et al.* 2024; Bhattarai *et al.* 2025; Bharali *et al.* 2026).

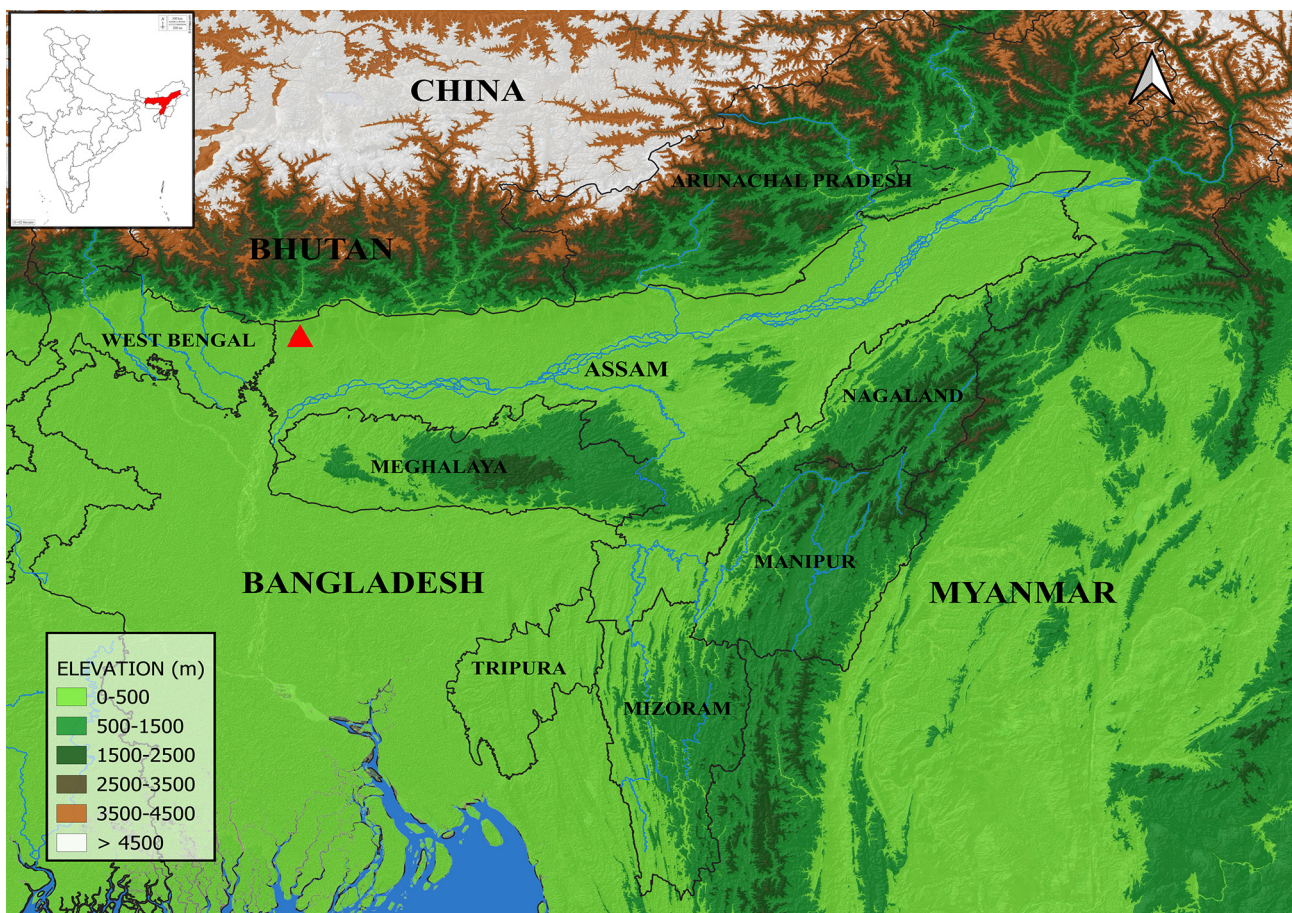


FIGURE 1. An elevational map showing the type locality (red triangle) of *Cyrtodactylus raimonaensis* sp. nov. at Kokrajhar district, Assam, India. Inset: Map of India showing Assam (in red).

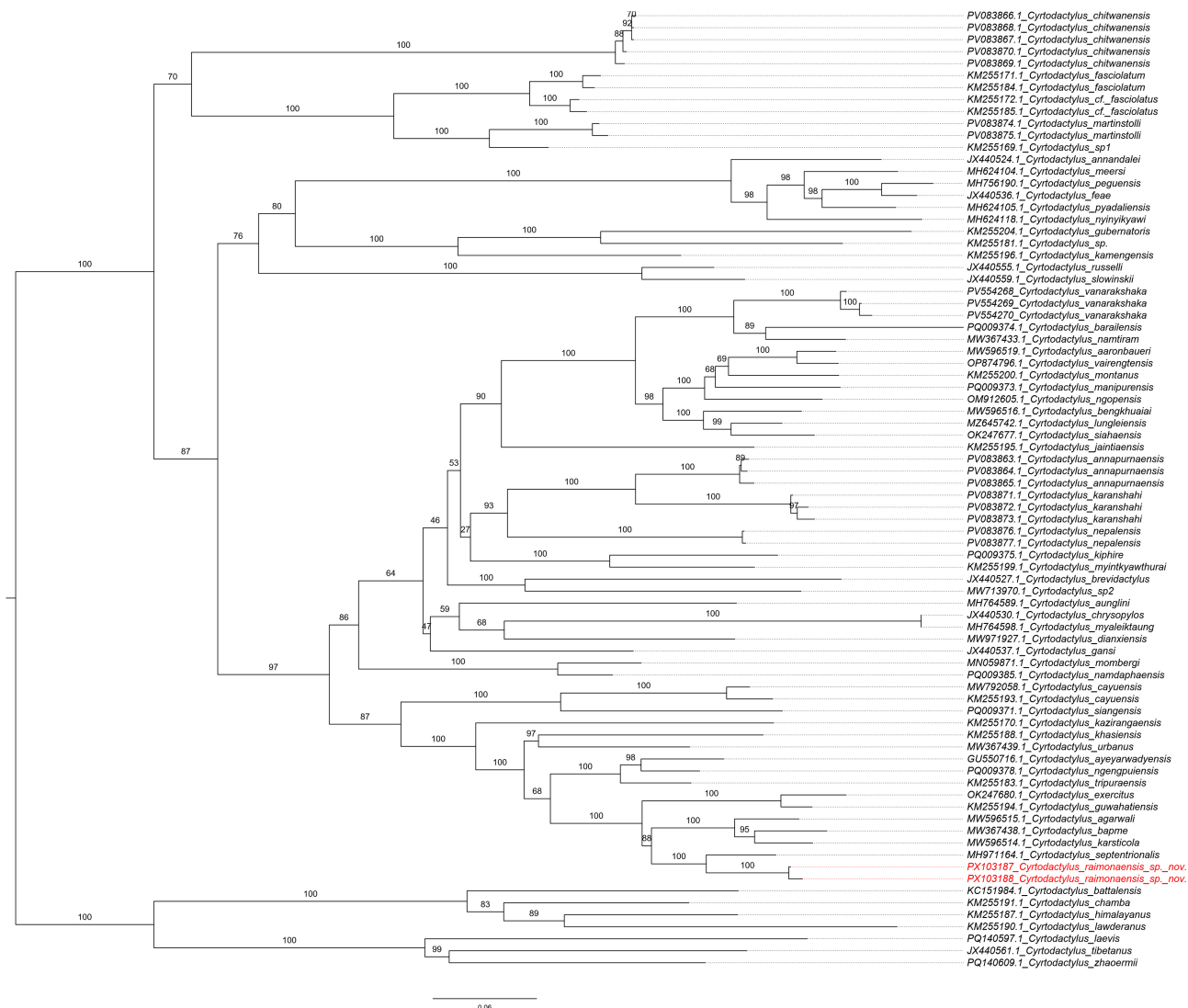


FIGURE 2. Maximum likelihood phylogeny showing the relationships among the Indo-Burmese *Cyrtodactylus* species using the mitochondrial NADH dehydrogenase subunit 2 gene. Numbers at each node are ultrafast bootstrap support values. Preceding each species name is the NCBI accession number.

Molecular Data. Genomic DNA was extracted from ethanol (100%) preserved liver tissue using a Qiagen Tissue Kit following the manufacturer’s instructions. A partial sequence of the mitochondrial nicotinamide adenine dinucleotide hydride (NADH) dehydrogenase subunit 2 (ND2) gene was generated, PX103187 (VR/ERS/ZSI/961) and PX103188 (VR/ERS/ZSI/962), using the primer pair MetF1 & H5934 (Macey *et al.* 1997). Sequence chromatograms were quality checked, edited and assembled into contigs using Sequence Scanner v1.0 (Applied Biosystems). Comparative ND2 sequences comprising Indo-Burma clade members of *Cyrtodactylus* were obtained from Bharali *et al.* (2026). Sequence alignment was done using MUSCLE (Edgar 2004) in MEGA7 (Tamura & Nei 1993; Kumar *et al.* 2016) with default parameter settings. The best partitioning schemes for the dataset were determined using PartitionFinder v2 (Lanfear *et al.* 2017). A Maximum Likelihood phylogenetic tree was reconstructed using an un-partitioned dataset in IQ-TREE (Nguyen *et al.* 2015) with the substitution model GTR+F+I+G4 selected based on BIC scores by ModelFinder (Kalyaanamoorthy *et al.* 2017) implemented in IQ-TREE (Nguyen *et al.* 2015) in the auto setting. Ultrafast bootstrap (1000 iterations) was used to assess clade support, with values $\geq 95\%$ considered to indicate strong node support (Minh *et al.* 2013). The uncorrected pairwise p-distance was calculated in MEGA11 (Tamura *et al.* 2021) with pairwise deletions of missing data and gaps.

Abbreviations for museum collections used are: Bombay Natural History Society, Mumbai, India (BNHS); California Academy of Sciences, San Francisco, USA (CAS); Centre for Ecological Sciences, Bangalore, India

(CES); Museum of Vertebrate Zoology, Berkeley, California, USA (MVZ); Departmental Museum of Zoology, Mizoram University, Aizawl (MZMU); La Sierra University Herpetological Collection, La Sierra University, Riverside, California, USA (LSUHC); Pakistan Museum of Natural History, Islamabad, Islamabad Capital Territory (PMNH); Natural History Museum, London, United Kingdom (NHM); Wildlife Institute of India, Animal DNA Repository (WII-ADR); Kunming Institute of Zoology, Chinese Academy of Sciences (KIZ); Brigham Young University, Provo, Utah, USA (BYU); United States National Museum of Natural History, Washington D.C., USA (USNM) and Chengdu Institute of Biology, Chinese Academy of Sciences, Chengdu, China (CIB).

Results

The present study identifies a previously unrecognized, genetically distinct lineage of *Cyrtodactylus* from Kachugaon in the Kokrajhar District of Assam, which we formally describe herein. Phylogenetic reconstruction resolves this taxon as deeply nested within the monophyletic *C. khasiensis* species group, forming a strongly supported sister species to *C. septentrionalis*. The new species is differentiated from all currently recognized congeners by a minimum uncorrected pairwise genetic distance of 7.2% (see Fig. 2, Table 1). The current phylogenetic inference aligns with tree topologies recovered in previous molecular studies (Bohra *et al.* 2022; Lalremsanga *et al.* 2023; Boruah *et al.* 2024). In addition to its molecular distinctiveness, the new species is morphologically diagnosable from its regional congeners.

Systematics

Cyrtodactylus raimonaensis sp. nov.

(Figures 3–5; Table 2)

Holotype: Adult male (VR/ERS/ZSI/961, SVL 62.3) from Kachugaon, Kokrajhar district, Assam, India (26.608601°N, 90.025994°E; 102 m elev.) collected by Bijay Basfore on 7 May 2025 at ca. 2040h.

Paratypes: A juvenile female (VR/ERS/ZSI/962, SVL 41.0 mm) collected on 9 May 2025 by Jayaditya Purkayastha & Bijay Basfore at ca. 1935h and one adult female (VR/ERS/ZSI/963, SVL 71.1 mm) collected on 12 July 2025 by Bijay Basfore at ca. 2030h. Other collection details are the same as the holotype.

Diagnosis: A moderate sized *Cyrtodactylus* with a maximum SVL of 71.1 mm; dorsal surface characterized by somewhat regularly arranged, bluntly conical, weakly keeled enlarged tubercles embedded within a matrix of smooth granular scales; dorsal tubercles approximately four or five times the size of the surrounding granular scales; mid-dorsum with 20 or 21 longitudinal rows of tubercles; 36–38 paravertebral tubercles (PVT2) between the level of the axilla and groin; 44–48 paravertebral tubercles (PVT1), extending from the most anterior tubercle on the occiput to the mid-sacral region; 32–38 mid-ventral scale rows between the weakly developed ventrolateral folds; adult male with a continuous series of 13 precloacal pores, females with 13 precloacal pits; 16–18 subdigital lamellae on finger IV (excluding non-lamellar scales between the proximal and apical lamellae) and 17–20 subdigital lamellae on toe IV (excluding non-lamellar scales between the proximal and apical lamellae); 7 or 8 paired dark brown transverse paravertebral blotches on the dorsum between axilla and groin; a continuous series of alternating dark and light transverse blotches on the dorsum of the tail and no single row of transversely enlarged subcaudal scales.

Description of the holotype (Fig. 3): Adult male (VR/ERS/ZSI/961), SVL 62.3 mm. Head length less than one-third of SVL (HL/SVL 0.27), longer than broad (HW/HL 0.57), distinct from neck and somewhat depressed (HD/HW 0.63); interorbital area slightly depressed, canthus rostralis somewhat oval; loreal region somewhat concave with homogenous granular scales; three rows of enlarged scales between loreal scales and supralabials; snout less than half of the head length (SO/HL 0.37); dorsal aspect of the head predominantly covered with blunt, juxtaposed scales that are generally oval in shape. The scales between the nape and the interorbital region are uniform, while those of the interorbital region gradually increase in size towards the internasal area. Few smooth and flattened tubercles are present near the postorbital region of the head, gradually increasing in size and becoming more pronounced and densely arranged towards the nape. Orbit less than a quarter of the head length (OD/HL 0.24); vertical pupil with crenulate margins; supraciliaries moderate in size, blunt and somewhat oval, those present on the anterior portion

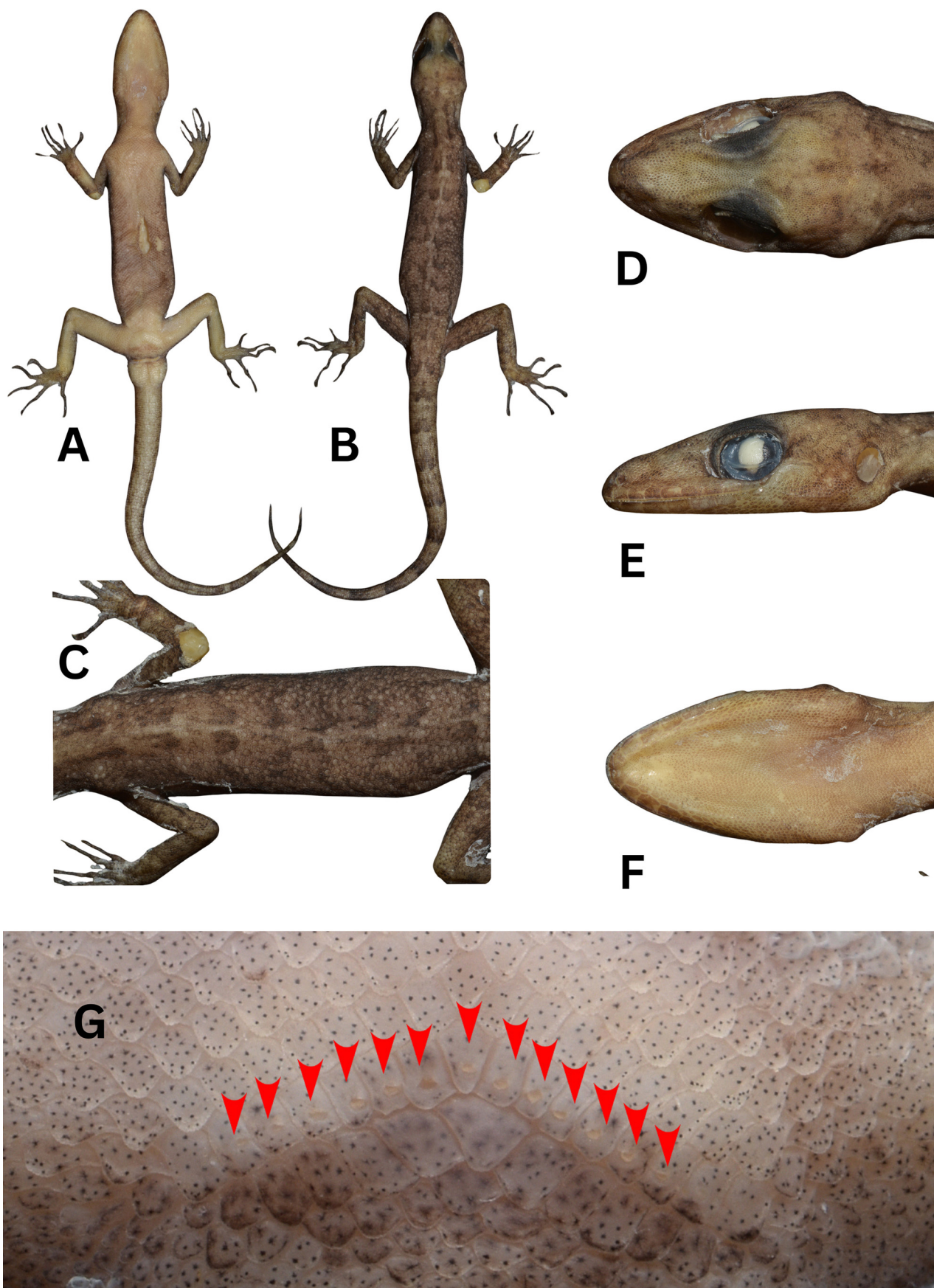


FIGURE 3. The holotype of *Cyrtodactylus raimonaensis* **sp. nov.** (VR/ERS/ZSI/961): (A) ventral view; (B) dorsal view; (C) details of dorsal pholidosis; (D) dorsal view of the head; (E) lateral view of the head; (F) ventral view of the head; (G) preloacal pores.

of the orbit largest and slightly more prominent; ear opening obliquely oriented and slightly oval, moderate in size (EL/HL 0.11); ear opening length less than half the orbit diameter (EL/OD 0.47); orbit to ear distance is less than the orbit diameter (OE/OD 0.88); rostral scale broader than long (RL/RW 0.66), with a shallow, poorly formed groove that partially divides the scale; a single elongated supranasal on either side, separated by three small heterogeneous granular internasals, with the median intranasal being comparatively larger and in broad contact with the rostral scale and two posteriorly situated smaller internasals. Rostral in contact with the first supralabials, nasals, two supranasals and the medially situated larger internasal; nostrils semicircular, opening anteriorly orientated with the posterior half being covered by the nasal pad, each nasal is in broad contact with the rostral and surrounded by the supranasal, five or six small post nasals, and the first supralabial on each side; two small rows of granular elongated scales separate the orbit from the supralabials; mental wider than long (ML/MW 0.88), triangular; two well-developed postmentals on either side; inner pair of postmentals longer than the outer pairs (PMIL/PMIL 0.63), inner pair bordered by the mental, infralabial I, the outer postmental and eight gular scales; outer pair bordered by inner postmental, infralabials I and II and five to six heterogeneous gular scales on either side; 12 supralabials present on either side of the head, bordered by a row of medium to large-sized scales that are somewhat flat, juxtaposed, and oval in shape. Nine infralabials are present on both left and right sides. A row of enlarged gular scales, situated posterior to infralabial II, somewhat hexagonal in shape, gradually becoming more elongate posteriorly and extending along the margin from infralabials II–VII; rest of the gular region with small and roughly homogeneous granular scales throughout.

Body moderately slender, with trunk length less than half of the snout-to-vent length (TRL/SVL 0.43); dorsum covered with small, rounded, homogeneous granular scales interspersed with somewhat irregularly arranged enlarged tubercles, oval to conical in shape, four to five times the size of granular scales. Tubercles originating near the occipital region become progressively larger toward the sacral region, terminating at the level of the second dark transverse blotch on the tail; degree of keeling increases gradually along the posterior aspect of the dorsum. Forty-eight paravertebral tubercles, from the most anterior tubercle on the occiput to the mid-sacrum; 38 paravertebral tubercles between the level of the axilla and the level of the groin; poorly developed ventrolateral folds, each bearing a single continuous row of smooth and elongated tubercle like scales; ventral surface covered with smooth, homogeneous cycloid scales, imbricate to sub-imbricate in arrangement and markedly larger than those on the dorsum; 38 mid-ventral scale rows between the ventrolateral folds; 13 distinct precloacal pores lacking pits on either side (Fig. 3G); scales bordering the posterior margin of the pore-bearing series are heterogeneous in shape and comparatively larger; two post-cloacal spurs or tubercles on either side of the tail base ventrally, particularly on the hemipenile bulge.

Forearm (FL/SVL 0.15) and crus (CL/SVL 0.19) short; digits narrow, without a scansorial pad, strongly inflected at each joint, all bearing robust, recurved claws; sub-digital lamellae transversely widened beneath the basal phalanx; basal lamellae 3–5–5–6–5 on the right manus, 4–5–5–7–5 on the right pes; distal lamellae (intervening rows of nonlamellar granular scales between the basal and distal lamellae series in parenthesis): 7(2)–10(1)–2(0)–2(0)–0(1) on the right manus, 9(2)–0(2)–4(0)–3(0)–4(0) on the right pes; interdigital webbing absent on both the manus and pes; relative length of digits $I < II < V < III < IV$ on the right manus, $I < II < V < III < IV$ on the right pes; smooth, imbricate and somewhat oval scales present on the palms and soles. Dorsal surface of the forelimbs covered with heterogeneous scales, comprising of somewhat raised, imbricate to sub imbricate scales; ventral surface of the forelimbs covered with homogeneous imbricate scales; dorsal surface of the hind limbs covered with mostly heterogeneous scales interspersed with irregularly arranged, feebly keeled conical tubercles that grow smaller towards the wrist; ventral surface of hind limbs covered with fairly homogeneous, smooth and imbricate scales.

Tail original and complete, oval in cross-section and dorsoventrally depressed. Dorsal tail tubercles, somewhat regularly arranged, oval in shape, and feebly keeled, extending up to the level of the second dark transverse blotch on the tail; dorsal caudal scales flat, imbricate, and mostly heterogeneous in shape and size; slightly raised to the second dark blotch, becoming completely flat towards the tail tip. Subcaudal scales smooth, imbricate, variable in size; no enlarged transverse or paired rows present.

Colouration in life (Fig. 4): The dorsal surface of the head is mottled brown with interspersed olive and tan-brown tones, featuring irregular dark markings extending from the snout to the parietal region. The dorsal surfaces of the limbs are similar in colouration to the trunk, exhibiting light brown hues with irregular dark blotches, which are particularly prominent on the digits. The dorsal trunk displays alternating light and dark brown blotches arranged in a somewhat reticulated, paired banded pattern, thus forming a series of nine paired, dark brown transverse paravertebral blotches between the axilla and groin, each bordered posteriorly by distinct, mostly paired whitish

markings, collectively giving rise to a faint mid-dorsal line. The tail is complete and bears 13 distinctly alternating dark and light brown bands extending to the tip. The ventral surface is uniformly light beige to pale brown, slightly translucent around the throat and abdominal regions, with no distinct markings or patterns; limbs and tail undersides are similarly coloured.

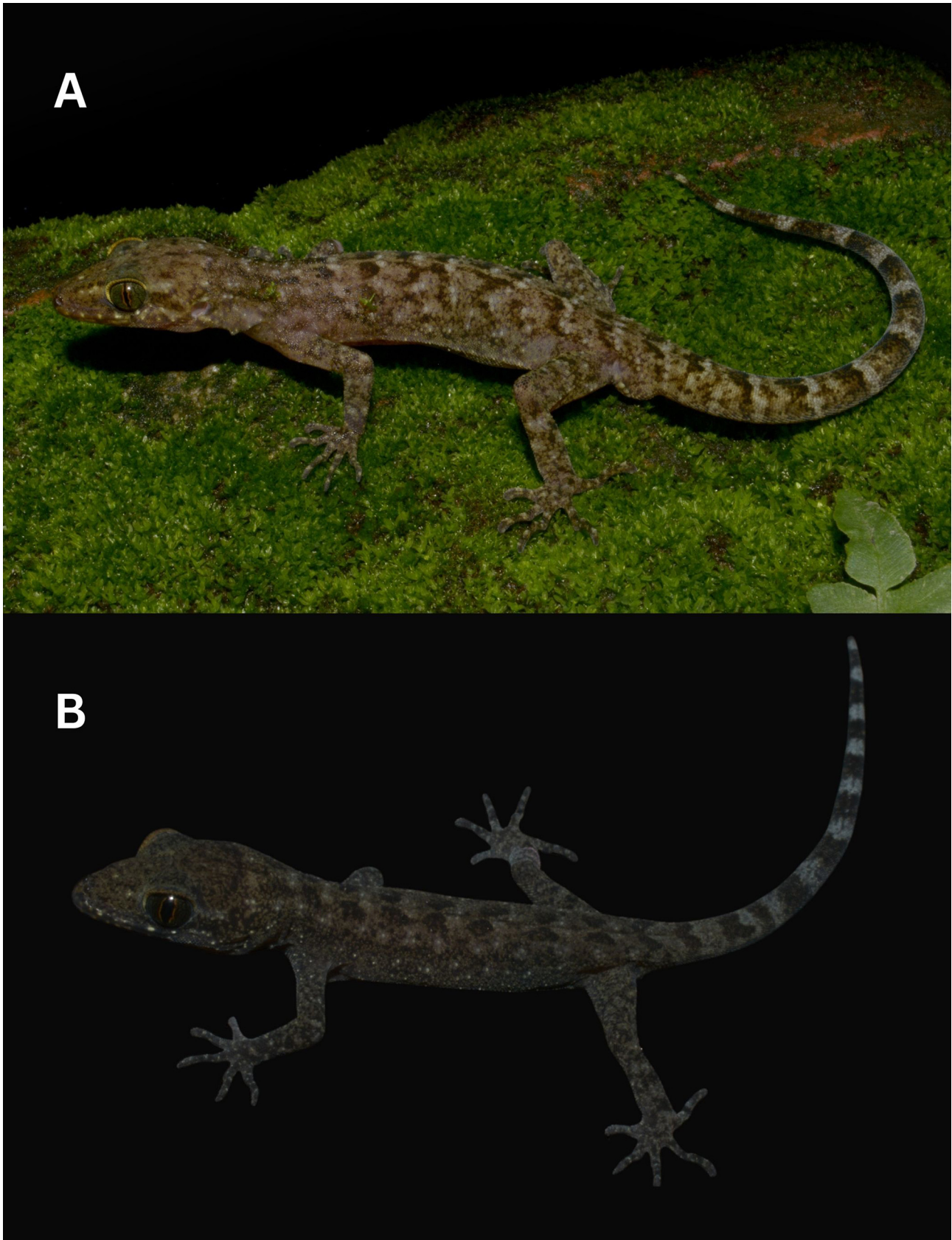


FIGURE 4. *Cyrtodactylus raimonaensis* sp. nov. in life (A) holotype; (B) paratype (VR/ERS/ZSI/962).

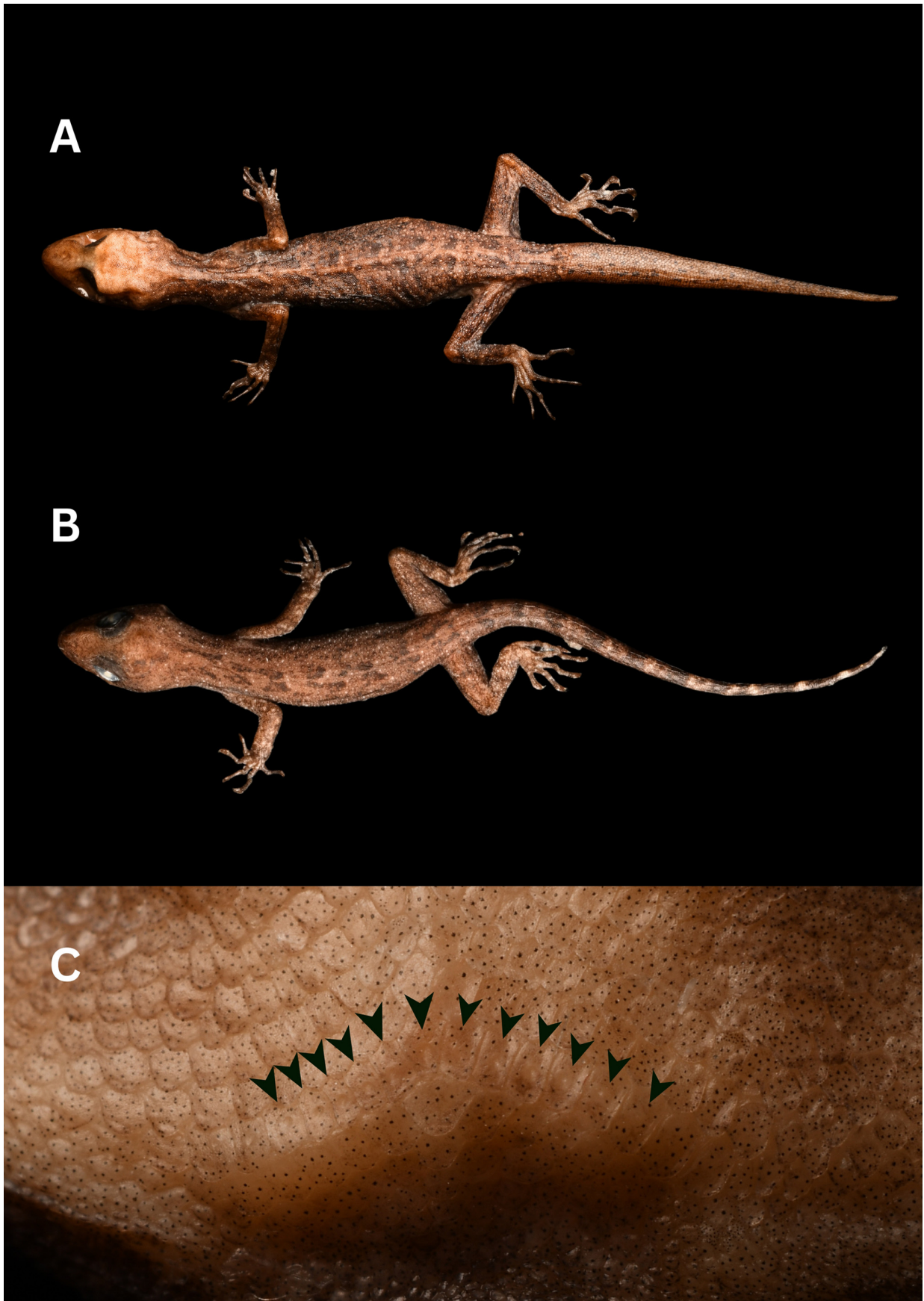


FIGURE 5. Paratypes of *C. raimonaensis* **sp. nov.** (A) Adult female (VR/ERS/ZSI/963); (B) Juvenile female (VR/ERS/ZSI/962); (C) Arrangement of precloacal pits in adult female (VR/ERS/ZSI/963).

Colouration in preservative: After preservation, the dorsum colouration has faded noticeably, appearing uniformly dark brown to greyish-brown with obscured paravertebral blotches; limbs and tail similarly exhibit reduced contrast with subdued pale markings.

Variation & Sexual Dimorphism (Fig. 4–5): The paratypes include an adult female and a juvenile female, which in general morphology and colouration agree with the holotype.

TABLE 2. Morphometric and meristic data for *Cyrtodactylus raimonaensis* **sp. nov.** (Numbers in parenthesis represent the number of broken lamellae).

Museum number	VR/ERS/ZSI/961	VR/ERS/ZSI/962	VR/ERS/ZSI/963
Locality	Kachugaon, Kokrajhar	Kachugaon, Kokrajhar	Kachugaon, Kokrajhar
Sex	Adult male	Juvenile female	Adult female
SVL	62.3	41.0	71.1
TRL	27.3	17.8	31.4
BW	10.9	6.5	13.2
TL	70.1	47.6	57.5
TW	4.9	2.6	5.6
HL	17.4	11.6	20.1
HW	10.0	8.2	11.4
HD	6.3	4.4	8.1
FL	9.6	5.7	10.7
CL	12.0	7.1	13.1
OD	4.2	3.0	5.7
NO	4.7	3.1	5.3
SO	6.5	4.2	7.6
OE	3.7	2.6	5.9
EL	2.0	0.9	2.7
IN	1.8	1.3	1.9
IO	4.2	3.8	4.4
F1	3.8	3.0	4.2
F2	5.5	3.9	5.7
F3	6.0	4.6	6.3
F4	6.5	4.9	7.5
F5	5.3	3.5	6.1
T1	4.3	3.3	4.7
T2	5.9	4.6	6.3
T3	7.8	5.3	8.2
T4	8.4	6.1	8.6
T5	7.5	4.4	7.7
RL	1.6	1.1	1.8
RW	2.4	1.4	2.8
ML	2.3	1.4	2.7
MW	2.6	1.6	2.6
PMIL	1.1	0.9	1.2
PMIIL	0.7	0.4	0.8
PcP	13	13	13
MVSR	38	32	33

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TABLE 2. (Continued)

Museum number	VR/ERS/ZSI/961	VR/ERS/ZSI/962	VR/ERS/ZSI/963
DTR	21	20	20
PVT1	48	44	48
PVT2	38	36	36
SL(L/R)	12/12	11/11	9/9
IL(L/R)	9/9	10/10	9/9
F1L	3(2)7	3(0)8	6(2)7
F2L	5(1)10	4(0)10	5(2)9
F3L	5(0)12	5(2)11	5(0)11
F4L	6(0)12	6(1)11	5(0)11
F5L	5(1)10	5(1)9	5(0)10
T1L	4(2)9	3(0)9	3(1)9
T2L	5(2)10	4(2)9	5(0)10
T3L	5(0)14	5(1)12	5(2)11
T4L	7(0)13	6(1)11	6(0)12
T5L	5(0)14	6(0)12	5(2)12
Dorsal spots	8	7	7

Comparisons: *Cyrtodactylus raimonaensis* **sp. nov.** can be differentiated from all other members of the *khasiensis* group based on the combination of the following characters: **(1)** a smaller maximum adult size, SVL 71.1 mm (*versus* *C. aunglini* Grismer, Wood, Thura, Win, Grismer, Trueblood & Quah max. 81.6 mm; *C. brevidactylus* Bauer max. 88.0 mm; *C. cayuensis* Li max. 83.5 mm; *C. chrysopylos* Bauer max. 83.8 mm; *C. dianxiensis* Liu & Rao max. 79.9 mm; *C. jaintiaensis* Agarwal, Mahony, Giri, Chaitanya & Bauer max. 96.2 mm; *C. kazirangaensis* max. 80.0 mm; *C. khasiensis* max. 81.1 mm; *C. martinistolii* Darevsky, Helfenberger, Orlov & Shah max. 80.4 mm; *C. tamaiensis* Smith max. 90.0 mm); **(2)** 20 or 21 rows of dorsal tubercles across the midbody (*versus* 22–28 in *C. aaronbaueri* Purkayastha, Lalremsanga, Bohra, Biakzuala, Decemson, Muansanga, Vabeiryureilai & Rathee; 22–24 in *C. ayeerwadyensis* Bauer; 17 in *C. barailensis* Boruah, Narayanan, Deepak & Das; 22–26 in *C. bengkhuaiai* Purkayastha, Lalremsanga, Bohra, Biakzuala, Decemson, Muansanga, Vabeiryureilai & Rathee; 27 in *C. brevidactylus*; 18–19 in *C. dianxiensis*; 18–19 in *C. karanshahi* Bhattarai, Gautam, Prasad, Neupane, Khandekar, Thackeray, Agarwal, Tillack, Olson, Hogan & Wright; 22–23 in *C. kazirangaensis*; 16 in *C. kiphire* Boruah, Narayanan, Deepak & Das; 24–28 in *C. lungleiensis* Lalremsanga, Chinliansiam, Bohra, Biakzuala, Vabeiryueilai, Muansanga, Malsawmdawngliana, Hmar, Decemson, Siammawii, Das & Purkayastha; 18 in *C. mandalayensis* Mahony; 23–27 in *C. mombergi* Grismer, Wood, Quah, Thura, Herr & Lin; 16–18 in *C. nagalandensis* Agarwal, Mahony, Giri, Chaitanya & Bauer; 17–19 in *C. namdaphaensis* Boruah, Narayanan, Deepak & Das; 23–24 in *C. septentrionalis*; 22–24 in *C. siahaensis* Purkayastha, Lalremsanga, Litho, Rathee, Bohra, Mathipi, Biakzuala & Muansanga; 15–16 in *C. siangensis* Boruah, Narayanan, Aravind, Deepak & Das; 22–24 in *C. urbanus*; 22–23 in *C. vairengtensis* Lalremsanga, Colney, Vabeiryureilai, Malsawmdawngliana, Bohra, Biakzuala, Muansanga, Das & Purkayastha); **(3)** 36–38 paravertebral tubercles (PVT2) between the levels of axilla and groin (*versus* 28–35 in *C. annapurnaensis* Bhattarai, Gautam, Neupane, Khandekar, Thackeray, Agarwal, Tillack, Olson, Hogan & Wright; 32 in *C. barailensis*; 30–35 in *C. chrysopylos*; 31–32 in *C. dianxiensis*, 32–34 in *C. exercitus* Purkayastha, Lalremsanga, Litho, Rathee, Bohra, Mathipi, Biakzuala & Muansanga; 30–34 in *C. jaintiaensis*; 26–29 in *C. kiphire*; 34–35 in *C. nagalandensis*; 33 in *C. namtiram* Mahony & Kamei; 29–34 in *C. ngengpuiensis* Boruah, Narayanan, Lalronunga, Deepak & Das; 26–32 in *C. siangensis*); **(4)** 44–48 paravertebral tubercles from the first tubercle on the occiput to the mid sacrum (PVT1) (*versus* 51 in *C. mandalayensis*; 52–55 in *C. vanarakshaka*); **(5)** 32–38 mid-ventral scale rows (MVSR) (*versus* 41–49 in *C. aunglini*; 45 in *C. brevidactylus*; 39–55 in *C. chrysopylos*; 40–42 in *C. jaintiaensis*; 39–42 in *C. karanshahi*; 57 in *C. myaleiktaung* Grismer, Wood, Thura, Win, Grismer, Trueblood & Quah; 40–45 in *C. siangensis*); **(6)** presence of 13 horizontally aligned precloacal pores (PcP) in male in a continuous series separates it from *C. aaronbaueri* (7–8), *C. annapurnaensis* (3–4), *C. bengkhuaiai* (5–7), *C.*

brevidactylus (8), *C. cayuensis* (6–10), *C. dianxiensis* (7–8), *C. gansi* Bauer (16–29), *C. guwahatiensis* (26–39), *C. jaintiaensis* (11–12), *C. karanshahi* (7–8), *C. karsticola* Purkayastha, Lalremsanga, Bohra, Biakzuala, Decemson, Muansanga, Vabeiryureilai & Rathee (34–38), *C. kazirangaensis* (10–11), *C. khasiensis* (10–12), *C. kiphire* (6–7), *C. lungleiensis* (3–5), *C. mandalayensis* (5), *C. manipurensis* Boruah, Narayanan, deepak & Das (7), *C. martinistolii* (7–8), *C. mombergi* (10–11), *C. montanus* Agarwal, Mahony, Giri, Chaitanya & Bauer (8–10), *C. namdaphaensis* (7–9), *C. namtiram* (12), *C. ngengpuiensis* (27), *C. ngopensis* Bohra, Zonunsanga, Das, Purkayastha, Biakzuala & Lalremsanga (6), *C. siahaensis* (7), *C. siangensis* (8–10), *C. tamaiensis* (40), *C. tripuraensis* Agarwal, Mahony, Giri, Chaitanya & Bauer (29–37), *C. urbanus* (9–12), *C. vairengtensis* (9–11) and *C. vanarakshaka* (10); (7) presence of 7 or 8 paired, dark brown transverse paravertebral blotches on the dorsum between the axilla and groin distinguishes the species from *C. exercitus* (irregular dark dorsal blotches); *C. karsticola* (dark brown irregular dorsal markings); *C. manipurensis* (six irregular dark brown dorsal blotches between the axilla and groin); *C. myaleiktaung* (five dark dorsal bands lacking paired paravertebral elements between the axilla and groin, see Fig. 4 in Grismer *et al.* 2018); *C. septentrionalis* (seven paired dark dorsal bands between the axilla and groin, see Fig. 9–10 in Agarwal *et al.* 2018b); (8) paravertebral aspect of the body covered by dark dorsal blotches that are posteriorly bordered by white markings vs absence of white margins posterior to the dark dorsal blotches in *C. agarwali* (see Fig. 5–6 in Purkayastha *et al.* 2021), *C. bapme* (see Fig. 3–5 in Kamei & Mahony 2021) and *C. septentrionalis* (see Fig. 9–10 in Agarwal *et al.* 2018b); (9) comparatively lower HW/HL ratio (0.56–0.70, mean = 0.61, N = 3), versus higher values in *C. bapme* (0.67–0.73, mean = 0.70, N = 5) and *C. guwahatiensis* (0.68–0.74, mean = 0.70, N = 8).

Distribution and natural history: *Cyrtodactylus raimonaensis* sp. nov. is currently known solely from its type locality, Kachugaon, situated in the Kokrajhar District in the westernmost part of Assam, India. Individuals were primarily observed on the basal trunk of large trees and on loose soil within forested areas. The species appears to be strictly nocturnal, with peak activity occurring approximately three to five hours after sunset. The holotype was collected from a fallen log, whereas paratype VR/ERS/ZSI/962 was observed moving actively on the forest floor, and paratype VR/ERS/ZSI/963 was taken from the basal trunk of a tree, just above a clear, shallow and slow-flowing stream. Both paratypes were collected within 50 m of the holotype locality. Within the Central Range of Raimona National Park, two uncollected individuals were observed on a steep, vertical rock wall composed of conglomerate and sedimentary rock, forming part of a shaded streambed characterized by clear, shallow, and slow-flowing water. The surrounding habitat consisted of broadleaf forest interspersed with scattered boulders and overhanging vegetation, suggesting a preference for moist, shaded, and structurally complex microhabitats. Other gecko species recorded in sympatry at the type locality include *Hemidactylus aquilonius* McMahan & Zug, *H. frenatus* Duméril & Bibron and *H. platyurus* (Schneider).

Etymology: The specific epithet *raimonaensis* is derived from “Raimona,” the name of Raimona National Park, and the Latin suffix *-ensis*, meaning “from” or “belonging to.” Raimona National Park represents one of the most significant and recently designated protected areas in Assam. The name acknowledges the ecological importance of the park and its role in providing critical habitat for diverse flora and fauna. The epithet is treated as an adjective.

Suggested common name: Raimona bent-toed Gecko.

Discussion

The present study contributes to the expanding inventory of *Cyrtodactylus* diversity in Northeast India by documenting a morphologically and genetically distinct species from Kachugaon, Kokrajhar, Assam. Situated in a transitional zone between the high hills of Bhutan and the Brahmaputra floodplains, the landscape encompasses a range of habitat types. Combined with the absence of systematic herpetofaunal surveys, this region is likely to harbour several undocumented or unrecognised herpetofaunal taxa. The discovery of *C. raimonaensis* sp. nov. from a non-protected forest fragment near Raimona National Park reinforces this hypothesis and emphasises the need for systematic exploration in the western frontier of Assam. The presence of the species in a degraded habitat underscores the conservation significance of forest patches outside protected areas, particularly those adjacent to National parks including Manas, Raimona and Sikhna Jwhwla. As observed with several recently described congeners across the Indo-Burma region (such as Agarwal *et al.* 2018a; Purkayastha *et al.* 2020, 2021; Lalremsanga *et al.* 2022, 2023), members of the *khasiensis* clade often exhibit localised distributions and ecological specialisations, suggesting that current diversity estimates remain incomplete. Given the lack of detailed ecological

and distributional data, we recommend assigning *C. raimonaensis* **sp. nov.** a preliminary conservation status of Data Deficient (DD) under IUCN Red List criteria. Further surveys across Manas–Raimona–Sikhna Jwhwlaio landscapes and their adjacent areas are necessary to assess the species' range and habitat specificity, which would enable a more accurate evaluation of its conservation needs.

Historically, the Goalpara district of Assam consisted of the present-day districts of Goalpara, Dhubri, Kokrajhar, and Bongaigaon. This administrative restructuring has led to ambiguities in pinpointing the exact localities from which historical taxa were described, thereby complicating efforts to interpret and verify past records. A notable example is *Takydromus haughtonianus* Jerdon, a species described by Jerdon (1870) based on a single specimen, with no subsequent records reported to date. The lack of precise locality data, coupled with limited herpetological exploration in these areas, highlights the urgent need for targeted surveys. Such efforts are likely to contribute significantly to the taxonomic clarification and stabilisation of several cryptic or data-deficient taxa within this transitional biogeographic landscape. The current discovery reinforces the pattern of cryptic diversification in *Cyrtodactylus* and underscores the utility of integrative taxonomy in delineating species boundaries within morphologically conserved lineages. Improved taxonomic resolution, especially in under-explored regions of Northeast India, is likely to yield further narrow-ranged endemic species.

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APPENDIX I. Specimens examined

Cyrtodactylus aaronbaueri: holotype: adult male (MZMU2015); from Durtlang, Aizawl District, Mizoram state, India; referred material: adult males (MZMU2012, MZMU2021, MZMU2032) from Mizoram University Campus, Aizawl District, Mizoram state, India; adult female (MZMU2067), adult male (MZMU2020) from Tamdil National Wetland Saitual district, Mizoram state, India; adult male (MZMU2014) from Zawngtahlipui stream, Sihphir, Aizawl district, Mizoram state, India; adult females (MZMU2018, MZMU2056) from Durtlang, Aizawl District, Mizoram State, India.

Cyrtodactylus agarwali: holotype: adult male (MZMU2160); referred material: adult males (MZMU2157; MZMU2159; MZMU2161); sub-adult male (MZMU2158) from outskirts of Siju village, South Garo Hills District, Meghalaya state, India.

Cyrtodactylus bengkhuaiai: holotype: adult male (MZMU1989); referred material: adult males (MZMU1987, MZMU1990); adult females (MZMU1985, MZMU1986, MZMU1988) from Sailam Community Reserved Forest outskirts of Sailam village, Aizawl District, Mizoram State, India.

Cyrtodactylus karsticola: holotype: adult male (MZMU2155); referred material: adult males (MZMU2154, MZMU2156); adult female (MZMU2153) from outskirts of Siju village, South Garo Hills District, Meghalaya State, India.

Cyrtodactylus lungleiensis: holotype: adult male (MZMU2432) from outskirts of Lunglei town at Zobawk, Lunglei District, Mizoram state, India; referred material: adult males (MZMU2431, MZMU2426); adult females (MZMU2430, MZMU2427, MZMU2429) from Lunglei town, Lunglei District, Mizoram State, India.

Cyrtodactylus siahaensis: holotype: adult male (MZMU2445); referred material: adult males (MZMU2444, MZMU2446); adult female (MZMU2443); juvenile females (MZMU2448, MZMU2449) from Siaha town, Siaha District, Mizoram State, India.

Cyrtodactylus exercitus: holotype: adult male (MZMU2542); referred material: adult males (MZMU2544, MZMU2545); adult female (MZMU2543) from Umroi military cantonment area, Ri Bhoi District, Meghalaya State, India.

Cyrtodactylus guwahatiensis: referred material: adult males (VR/ERS/ZSI/690, VR/ERS/ZSI/691, VR/ERS/ZSI/693, VR/ERS/ZSI/694, VR/ERS/ZSI/696); adult females (VR/ERS/ZSI/692, VR/ERS/ZSI/695) from Guwahati, Assam State, India.

Cyrtodactylus himalayicus: holotype: male (ZSIK 15716), from 'Kurseong, Darjeeling dist. (5,000 ft)' [= Kurseong subdivision (ca. 1524 m asl), Darjeeling district, West Bengal state, India]; referred material: adult female (ZSIK 19546) 'Gopaldhara, Darjeeling dist' [= Gopaldhara Tea Estate, near Mirik town, Darjeeling district, West Bengal state, India].

Cyrtodactylus khasiensis: paralectotypes: adult female (ZSIK 6199), adult male (ZSIK 6197), collected along with lectotype; referred material: adult males (ZSIK 5831, ZSIK 5832), adult female (ZSIK 5828), from 'Cherrapunjee' [now Sohra town, East Khasi Hills District, Meghalaya state, India].

Cyrtodactylus urbanus: holotype: adult male (VR/ERS/ZSI/683); referred material: adult males (VR/ERS/ZSI/686, VR/ERS/ZSI/685, VR/ERS/ZSI/687); adult females (VR/ERS/ZSI/684, VR/ERS/ZSI/688, VR/ERS/ZSI/689) from Basistha, Guwahati, Assam State, India.

Cyrtodactylus ngopensis: holotype: adult male (MZMU2553) from Tuikhur veng, Chawngbawla section, Ngopa town, Champhai District, Mizoram state, Northeast India; referred material: adult male (MZMU2555); adult females (MZMU2552, MZMU2554, MZMU2556, MZMU2557, MZMU2558) from Ngopa town, Champhai District, Mizoram state, India.