A new species of dwarf day gecko (Reptilia: Gekkonidae: Cnemaspis) from lower-elevations of Samanala Nature Reserve in Central massif, Sri Lanka

Article *in* Amphibian and Reptile Conservation · September 2019

CITATION
1

READS
879

2 authors:

D.M.S. Suranjan Karunarathna
Nature Explorations & Education Team (NEET)
146 PUBLICATIONS **339** CITATIONS
SEE PROFILE

Kanishka Ukuwela
Rajarata University of Sri Lanka
33 PUBLICATIONS **98** CITATIONS
SEE PROFILE

Official journal website:
amphibian-reptile-conservation.org

Amphibian & Reptile Conservation
13(2) [General Section]: 14–27 (e187).

urn:lsid:zoobank.org:pub:7F259D5F-3CBF-4421-BA54-5CECDB687340

A new species of dwarf day gecko (Reptilia: Gekkonidae: *Cnemaspis*) from lower-elevations of Samanala Nature Reserve in Central massif, Sri Lanka

[1,*]Suranjan Karunarathna and [2]Kanishka D.B. Ukuwela

[1]Nature Explorations and Education Team, No: B-1 / G-6, De Soysapura Flats, Moratuwa 10400, SRI LANKA [2]Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale 50300, SRI LANKA

***Abstract.*—A new day gecko species of genus *Cnemaspis* Strauch, 1887 is described from a midland forested area of Udamaliboda (north-western foothills of Samanala Nature Reserve) in Sri Lanka. This species is medium in size (30–35 mm SVL) and can be differentiated from all other Sri Lankan congeners by a suite of distinct morphometric, meristic, and color characters (dorsum with smooth and homogeneous granular scales; chin, gular, pectoral, and abdominal scales smooth; precloacal pores absent in males, 14–15 femoral pores separated by 9–11 unpored interfemoral scales in males; subcaudals smooth, subhexagonal, enlarged, subequal, forming a regular median row). It was recorded from tall trees with smooth bark in home gardens, and also on clay walls in very old tall houses in wet, cool, and shady forests, distributed across mid elevations (~450–650 m) with limited anthropogenic disturbance. They can climb to heights of 7 m on vertical surfaces of trees. The most noteworthy behavior of this species is that when "scared," it runs only upward to the canopy of the tree or along the wall to hide within crevices. The major threats for this species in Udamaliboda and other locations in lower Samanala Nature Reserve are habitat loss due to expansion of commercial-scale agriculture and monoculture plantations, and illicit forest encroachments. Therefore, these foothill forests warrant special conservation, habitat protection, further in-depth research, and specific hands-on management practices.**

Keywords. Arboreal, conservation, ecology, rainforest, redlist, taxonomy, Sripadha, threats

Citation: Karunarathna S, Ukuwela KDB. 2019. A new species of dwarf day gecko (Reptilia: Gekkonidae: *Cnemaspis*) from lower-elevations of Samanala Nature Reserve in Central massif, Sri Lanka. *Amphibian & Reptile Conservation* 13(2) [General Section]: 14–27 (e187).

Received: 16 May 2019; **Accepted:** 29 July 2019; **Published:** 9 September 2019.

Introduction

Sri Lanka's wet zone, home to unique assemblages of floral and faunal communities with high endemism, is one of the smallest biodiversity hotspots in the world (Meegaskumbura et al. 2002; Gunawardene et al. 2007). Within the diverse reptile community of the island (~225 species), the diversity of geckos (family Gekkonidae) is remarkable; 54 species (in eight genera) have been described so far, accounting for 24% of the overall reptilian species richness (Somaweera and Somaweera 2009; de Silva and Ukuwela 2017). Of these, 44 species (~81%) are endemic and 45 species (~83%) are threatened (MoE-SL 2012, Karunarathna et al. 2019a,b). The genus *Cnemaspis* comprises 32 species in Sri Lanka and all of them are endemic (Batuwita et al. 2019; Karunarathna et al. 2019a,b; de Silva et al. 2019). Sri Lankan *Cnemaspis* species represent two distinct evolutionary lineages, the *C. kandiana* and *C. podihuna* clades (Agarwal et al. 2017; Karunarathna et al. 2019b). The high species richness in Sri Lanka may be due to multiple possible colonization events from the Indian mainland with isolated *in situ* speciation (Agarwal et al. 2017).

During the past decade, the number of species recognized in the genus *Cnemaspis* globally has grown rapidly, reaching over 150 species (Grismer et al. 2014; Uetz et al. 2019; Karunarathna et al. 2019b), and *Cnemaspis* is now the second most speciose gecko genus in the Old World (Rösler et al. 2019). Though Sri Lanka is a small island, it harbors about 21% of the world's *Cnemaspis* species, of which 90% have been described in the last two decades, including many described only recently (Karunarathna et al. 2019b). However, most of the *Cnemaspis* species from the dry and intermediate climatic zones

Correspondence. * *suranjan.karu@gmail.com*

of Sri Lanka are restricted to small isolated hillocks scattered in the lowlands (Karunarathna et al. 2019b). Future studies on the biogeography of *Cnemaspis* in Sri Lanka are expected to highlight the importance of these isolated habitats in generating and maintaining the diversity of these unique groups of geckos on the island. During a field excursion to Udamaliboda (northwest Samanala Nature Reserve), an unidentified *Cnemaspis* species was discovered that closely resembles *C. gemunu*, *C. godagedarai*, *C. phillipsi,* and *C. scalpensis,* and it is described here as a new species.

Materials and Methods

Specimen collection. Museum acronyms follow Sabaj Pérez (2015). The type material discussed in this paper is deposited in the National Museum of Sri Lanka (NMSL), Colombo. Specimens were hand-caught and photographed in life. Three specimens were euthanized using halothane, fixed in 10% formaldehyde for two days, washed in water, and transferred to 70% ethanol for long-term storage. Tail tips were collected (as tissue samples) before fixation in formaldehyde for future genetic analyses and stored in 95% ethanol under relatively cool conditions (20–25 °C). For comparison, we examined 402 *Cnemaspis* specimens (catalogued and uncatalogued) representing all recognized Sri Lankan species, including all type specimens housed at the NMSL and The Natural History Museum, London (BMNH). Specimens that formerly belonged to the Wildlife Heritage Trust (WHT) collection and bear WHT numbers are currently deposited in the NMSL, catalogued under their original numbers. Original specimens in this study were collected during a survey on lizards of Sri Lanka under permit numbers WL/3/2/1/14/12 and WL/3/2/42/18 (A and B), issued by the Department of Wildlife Conservation, and permit numbers FRC/5 and FRC/6, issued by the Forest Department of Sri Lanka. Additional information on morphology and natural history of Sri Lankan *Cnemaspis* species was extracted from the relevant literature (Bauer et al. 2007; Manamendra-Arachchi et al. 2007; Wickramasinghe and Munindradasa 2007; Vidanapathirana et al. 2014; Amarasinghe and Campbell 2016; Wickramasinghe et al. 2016; Batuwita and Udugampala 2017; Agarwal et al. 2017; Batuwita et al. 2019; Karunarathna et al. 2019b). Assignment of unidentified specimens to species was based on the presence of shared morphometric and meristic characters (Wickramasinghe et al. 2016; Batuwita and Udugampala 2017; Agarwal et al. 2017; Batuwita et al. 2019; Karunarathna et al. 2019b; de Silva et al. 2019).

Morphometric characters. Forty morphometric measurements were taken (to the nearest 0.1 mm) using a Mitutoyo digital Vernier calliper, and detailed observations of scales and other structures were made through Leica Wild M3Z and Leica EZ4 dissecting microscopes. The following symmetrical morphometric characters were taken on the left side of the body: eye diameter (ED), horizontal diameter of eye ball; orbital diameter (OD), greatest diameter of orbit; eye to nostril length (EN), distance between anteriormost point of orbit and posterior border of nostril; snout length (ES), distance between anteriormost point of orbit and tip of snout; snout to nostril length (SN), distance between tip of snout and anteriormost point of nostril; nostril width (NW), maximum horizontal width of nostrils; eye to ear distance (EE), distance between posterior border of eye and anteriormost point of ear opening; snout to axilla distance (SA), distance between axilla and tip of snout; ear length (EL), maximum length of ear opening; interorbital width (IO), shortest distance between left and right supraciliary scale rows; inter-ear distance (IE) distance across head between the two ear openings; head length (HL), distance between posterior edge of mandible and tip of snout; head width (HW), maximum width of head between the ears and the orbits; head depth (HD), maximum height of head at level of eye; jaw length (JL), distance between tip of snout and corner of mouth; internarial distance (IN), smallest distance between inner margins of nostrils; snout to ear distance (SED), distance between tip of snout and anteriormost point of ear; upper-arm length (UAL), distance between axilla and angle of elbow; lower-arm length (LAL), distance from elbow to wrist with palm flexed; palm length (PAL), distance between wrist (carpus) and tip of longest finger excluding the claw; length of digits I–V of manus (DLM), distance between juncture of the basal phalanx with the adjacent digit and the tip of the digit, excluding the claw; snout-vent length (SVL), distance between tip of snout and anterior margin of vent; trunk length (TRL), distance between axilla and groin; trunk width (TW), maximum width of body; trunk depth (TD), maximum depth of body; femur length (FEL), distance between groin and knee; tibia length (TBL), distance from knee to ankle with heel flexed; heel length (HEL), distance between ankle (tarsus) and tip of longest toe (excluding the claw) with both foot and tibia flexed; length of pedal digits I–V (DLP), distance between juncture of basal phalanx with the adjacent digit and the digit tip, excluding the claw; tail length (TAL), distance between anterior margin of the vent and tail tip; tail base depth (TBD), maximum height of tail base; and tail base width (TBW), widest point of tail base.

Meristic characters. Twenty-nine discrete characters were observed and recorded using Leica Wild M3Z and Leica EZ4 dissecting microscopes on both left and right sides of the body (reported in the form L/R): numbers of supralabials (SUP) and infralabials (INF), between first labial scale and corner of the mouth; number of interorbital scales (INOS), between left and right supraciliary scale rows; number of postmentals (PM) bounded by chin scales, 1st infralabial on left and right and the mental; number of chin scales (CHS), scales touching medial

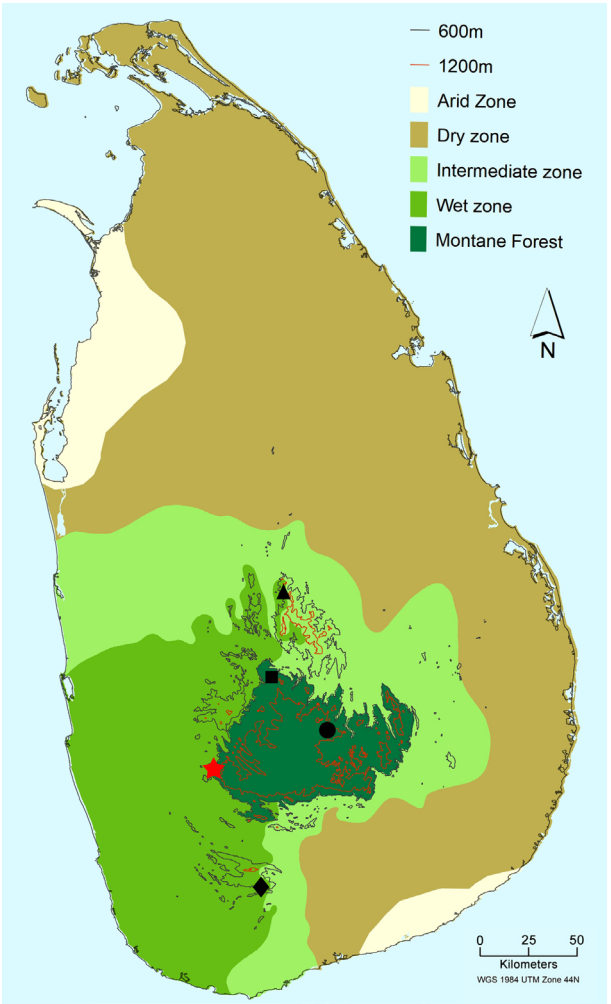

Fig. 1. Currently known distribution of *Cnemaspis anslemi* **sp. nov.** (Udamaliboda–star), and related species: *C. phillipsi* (Gammaduwa–traingle), *C. scalpensis* (Gannoruwa–square), *C. gemunu* (Haggala–circle), and *C. godagedarai* (Ensalwatte–diamond) in Sri Lanka.

edge of infralabials and mental between juncture of 1st and 2nd infralabials on left and right; number of supranasal (SUN), scales between nares; presence of postnasal (PON), scales posterior to naris; presence of internasal (INT), scale between supranasals; number of supraciliary scales (SUS), above eye; number of scales between eye and tympanum (BET), from posteriormost point of orbit to anteriormost point of tympanum; number of canthal scales (CAS), number of scales from posteriormost point of naris to anteriormost point of the orbit; total lamellae on manus I–V (SLM), counted from first proximal enlarged scansor greater than twice width of largest palm scale, to distalmost lamella at tip of digits; number of dorsal paravertebral granules (PG), between pelvic and pectoral limb insertion points along a straight line immediately left of vertebral column; number of midbody scales (MBS), from center of mid-dorsal row diagonally toward ventral scales; number of midventral scales (MVS), from first scale posterior to mental to last scale anterior to vent; number of belly scales (BLS), across venter between lowest rows of granular dorsal scales; total lamellae on pes I–V (SLP), counted from first proximal enlarged scansor greater than twice the width of largest heel scale, to distalmost lamella at tip of digits; number of femoral pores (FP), present on femur; number of non-pored posterior femoral scales (PFS), counted from distal end of femoral pore row to knee; and interfemoral scales (IFS), number of non-pored scales between first femoral pores on both femurs. In addition, the texture (smooth or keeled) of ventral scales, the texture (homogeneous or heterogeneous) of dorsal scales, the number of spinous scales on flanks (FLSP), and characteristics such as appearance of caudal scales (except in specimens with regenerated tails) were also recorded. Coloration was determined from digital images of living specimens and also from direct observations in the field.

Natural history. The new species described here was collected on a field survey conducted in Udamaliboda, Samanala Nature Reserve of Sri Lanka (Fig. 1). Behavioral and other aspects of the natural history of the focal species were observed through opportunistic and non-systematic means. Such observations were made at a minimum distance of 2–4 m from the focal animals while taking precautions to avoid disturbances. To record elevation and georeference species locations, an eTrex® 20 GPS (Garmin) was used. Sex was determined by the presence (male) or absence (female) of femoral pores. The conservation status of the species was evaluated using the 2001 IUCN Red List Categories and Criteria version 3.1 (IUCN 2012).

Systematics

***Cnemaspis anslemi* sp. nov.**

urn:lsid:zoobank.org:act:A5B58BCF-0BEE-4714-971B-B38218F74956

Anslems' Day Gecko (English)
Anslemge divaseri hoona (Sinhala)
Anslemvin pahalpalli (Tamil)
Figs. 2–5; Tables 1–2

Holotype. NMSL.2019.14.01, adult male, 34.4 mm SVL (Fig. 2), collected from a tall, straight tree with good canopy cover in a home garden (bordering forest) in Udamaliboda, Kegalle District, Sabaragamuwa Province, Sri Lanka (6.859728°N, 80.448736°E, WGS1984; elevation 485 m, around 16.00 hrs) on 25 March 2019 by Suranjan Karunarathna and Kanishka Ukuwela.

Paratypes. NMSL.2019.14.02, adult female, 32.5 mm SVL collected from an old clay house wall (bordering forest) in Udamaliboda, Kegalle District, Sabaragamuwa Province, Sri Lanka (6.869611°N, 80.457069°E, WGS1984; elevation 634 m, around 10.00 hrs) on 26 March 2019 by Suranjan Karunarathna and Kanishka Ukuwela, and NMSL.2019.14.03, adult female, 30.0 mm SVL (Fig. 3) collected from a tall, straight tree with good canopy cover in a home garden (bordering the forest) in

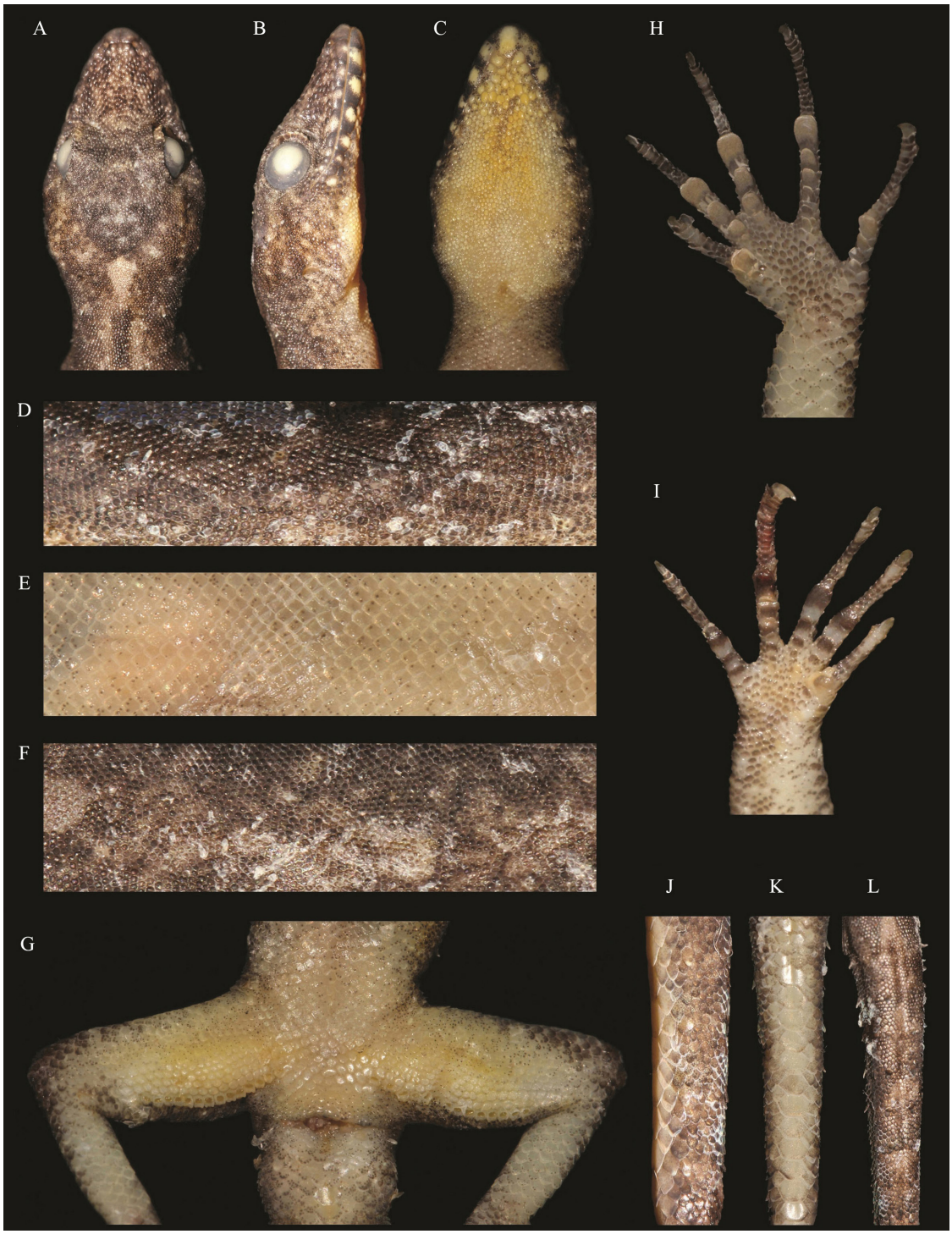

Fig. 2. Close-ups of *Cnemaspis anslemi* **sp. nov.** male holotype (NMSL.2019.14.01): (**A**) dorsal, (**B**) lateral, (**C**) ventral aspects of head, (**D**) scales on lateral surface of trunk, (**E**) smooth ventral scales, (**F**) homogeneous dorsal scales, (**G**) cloacal characters with femoral pores, **(H)** subdigital lamellae on pes, **(I)** subdigital lamellae on manus, (**J**) lateral side of tail, (**K**) oval shaped subcaudals, and (**L**) dorsal scalation of tail. *Photos: Suranjan Karunarathna*.

Udamaliboda, Kegalle District, Sabaragamuwa Province, Sri Lanka (6.859728°N, 80.448736°E, WGS1984; elevation 485 m, around 14.00 hrs), on 27 March 2019 by Suranjan Karunarathna and Kanishka Ukuwela.

Diagnosis. *Cnemaspis anslemi* **sp. nov.** can be readily distinguished from its Sri Lankan congeners by a combination of the following morphological and meristic characteristics, and also color pattern: maximum SVL 34.4 mm; dorsum with homogeneous, smooth granular scales; 2/2 supranasals, one internasal, and 1/1 postnasal present; three enlarged postmentals; postmentals bounded by five chin scales; chin and gular scales smooth, granular, juxtaposed; pectoral and abdominal scales smooth and subimbricate; 3–5 well developed tubercles on posterior flank; 118–122 paravertebral

Fig. 3. Dorsal and ventral aspects of the type series of *Cnemaspis anslemi* **sp. nov.** (**A**) Male holotype, NMSL.2019.14.01, (**B**) female paratype, NMSL.2019.14.02, and (**C**) female paratype, NMSL.2019.14.03 from Udamaliboda, Samanala Nature Reserve, Sri Lanka. *Photos: Suranjan Karunarathna*.

granules linearly arranged; 19–21 belly scales across venter; precloacal pores absent in males, 14–15 femoral pores on each side in males separated by 9–11 unpored interfemoral scales in males, and 2–3 unpored posterior femoral scales in males; 111–117 ventral scales; 87–91 midbody scales; subcaudals smooth, subhexagonal, enlarged, subequal, forming a regular median row; 8–9 supralabials; 8–9 infralabials; 16–17 total lamellae on digit IV of manus, and 20–21 total lamellae on digit IV of pes (Table 1). Dorsal body reticulated brown, black, and white; two large oval patches present on the neck; chin and gular with bright yellow, and femur dirty yellow.

Comparisons with other species. Based on the presence of enlarged hexagonal subcaudal scales *C. anslemi* **sp. nov.** can be assigned to the *C. podihuna* clade *sensu* Agarwal et al. (2017). However, the new species may be readily differentiated from congeners in this clade as follows: from *C. kandambyi* Batuwita and Udugampala, 2017, *C. molligodai* Wickramasinghe and Munindradasa, 2007, and *C. podihuna* Deraniyagala, 1944 by absence (*versus* presence) of precloacal pores; from *C. alwisi* Wickramasinghe and Munindradasa, 2007, *C. godagedarai* de Silva et al. 2019, *C. hitihami* Karunarathna et al. 2019, *C. kohukumburai* Karunarathna et al. 2019, *C. phillipsi* Manamendra-Arachchi et al. 2007, *C. punctata* Manamendra-Arachchi et al. 2007, *C. rajakarunai* Wickramasinghe et al. 2016, and *C. rammalensis* Vidanapathirana et al. 2014 by the presence of fewer ventral scales (111–117 *versus* 145–153, 133–137, 132–135, 131–134, 128–143, 129–137, 146–186, and 186–207, respectively); from *C. nilgala* Karunarathna et al. 2019 by the presence of more femoral pores (14–15 *versus* 7–9); from *C. gemunu* Bauer et al. 2007 by the presence of a greater number of belly scales (19–21 *versus* 13–16) and by presence of more paravertebral granules (118–122 *versus* 79–93); and from *C. scalpensis* (Ferguson, 1877) by the presence of fewer tubercles on posterior flank (3–5 *versus* 9–11) and a greater number of paravertebral granules (118–122 *versus* 102–112).

Among species of the *C. kandiana* clade *sensu* Agarwal et al. (2017), *C. anslemi* **sp. nov.** differs by the absence (*versus* presence) of precloacal pores and the presence (*versus* absence) of clearly enlarged, hexagonal, or subhexagonal subcaudal scales from the following species: *C. amith* Manamendra-Arachchi et al. 2007, *C. butewai* Karunarathna et al. 2019, *C. gotaimbarai* Karunarathna et al. 2019, *C. ingerorum* Batuwita et al. 2019, *C. kallima* Manamendra-Arachchi et al. 2007, *C. kandiana* (Kelaart, 1852), *C. kivulegedarai* Karunarathna et al. 2019, *C. kumarasinghei* Wickramasinghe and Munindradasa, 2007, *C. latha* Manamendra-Arachchi et al. 2007, *C. menikay* Manamendra-Arachchi et al. 2007, *C. nandimithrai* Karunarathna et al. 2019, *C. pava* Manamendra-Arachchi et al. 2007, *C. pulchra* Manamendra-Arachchi et al. 2007, *C. retigalensis* Wickramasinghe and Munindradasa, 2007, *C. samanalensis* Wickramasinghe and Munindradasa, 2007, *C. silvula* Manamendra-Arachchi et al. 2007, *C. tropidogaster* (Boulenger, 1885) and *C. upendrai* Manamendra-Arachchi et al. 2007.

Description of Holotype. An adult male, 34.4 mm SVL. Body slender and relatively long (TRL 42.3% of SVL). Head relatively large (HL 30.3% of SVL, HL 71.6% of TRL), narrow (HW 17.2% of SVL, HW 56.7% of HL), depressed (HD 10.0% of SVL, HD 33.1% of HL) and distinct from neck. Snout relatively long (ES 80.7% of HW, ES 45.8% of HL), more than twice the eye diameter (ED 38.4% of ES), more than half the length of jaw (ES 67.8% of JL), snout slightly concave in lateral view; eye relatively small (ED 17.6% of HL), twice as large as ear (EL 34.4% of ED), pupil rounded; orbit length greater than eye to ear distance (OD 115.6% of EE) and greater

Table 1. Morphometric and meristic data of holotype and paratypes of *Cnemaspis anslemi* **sp. nov.** from Udamaliboda, Sri Lanka. Abbreviations: Holo–holotype, Para–paratype, M–male, F–female, L–left, R–right.

Measurement	NMSL 2019.14.01	NMSL 2019.14.02	NMSL 2019.14.03	Counts	NMSL 2019.14.01	NMSL 2019.14.02	NMSL 2019.14.03
	Holo (M)	Para (F)	Para (F)		Holo (M)	Para (F)	Para (F)
SVL	34.4	32.5	30.3	FLSP (L/R)	5/5	3/3	4/3
ED	1.8	1.8	1.8	SUP (L/R)	8/8	9/8	8/8
OD	3.3	3.3	3.1	INF (L/R)	9/8	8/8	8/8
EN	2.9	2.7	2.7	INOS	27	29	26
ES	4.8	4.7	4.6	PM	3	3	3
SN	1.3	1.1	1.1	CHS	5	5	5
NW	0.2	0.2	0.2	SUN (L/R)	2/2	2/2	2/2
EE	2.9	2.7	2.7	PON (L/R)	1/1	1/1	1/1
SA	16.9	15.1	15.2	INT	1	1	1
EL	0.6	0.6	0.6	SUS (L/R)	9/10	11/11	10/9
IO	3.4	3.3	3.3	BET (L/R)	18/18	18/17	19/18
IE	4.8	4.7	4.7	CAS (L/R)	9/10	8/8	9/8
HL	10.4	9.9	9.9	TLM (i) (L/R)	11/11	10/11	10/10
HW	5.9	5.8	5.7	TLM (ii) (L/R)	12/12	12/13	12/11
HD	3.5	3.1	3.0	TLM (iii) (L/R)	14/13	14/14	13/13
JL	7.0	6.9	6.9	TLM (iv) (L/R)	17/17	17/16	17/17
IN	1.7	1.8	1.7	TLM (v) (L/R)	13/13	13/13	13/12
SED	9.5	9.4	9.4	PG	122	118	121
UAL	5.1	4.9	4.9	MBS	87	91	90
LAL	5.2	5.1	5.1	MVS	117	112	111
PAL	4.6	5.7	5.9	BLS	21	19	19
DLM (i)	1.4	1.3	1.4	TLP (i) (L/R)	9/9	9/9	9/9
DLM (ii)	2.8	2.7	2.7	TLP (ii) (L/R)	13/12	12/12	12/13
DLM (iii)	3.1	2.9	2.9	TLP (iii) (L/R)	18/18	19/18	17/18
DLM (iv)	3.3	3.1	3.2	TLP (iv) (L/R)	21/21	21/20	21/21
DLM (v)	2.5	2.4	2.4	TLP (v) (L/R)	16/16	15/16	15/15
TRL	14.6	12.3	12.0	FP (L/R)	15/14	-	-
TW	6.3	6.1	6.2	PFS (L/R)	3/2	-	-
TD	3.8	3.9	3.9	IFS	10	-	-
FEL	7.1	6.9	6.9				
TBL	6.2	6.1	6.1				
HEL	6.2	6.3	6.2				
DLP (i)	2.2	2.1	2.2				
DLP (ii)	3.4	3.2	3.4				
DLP (iii)	3.8	3.8	3.7				
DLP (iv)	4.2	4.1	4.2				
DLP (v)	3.6	3.5	3.6				
TAL	39.4	36.5	34.7				
TBW	3.8	3.5	3.4				
TBD	3.1	2.9	2.9				

than the length of digit IV of the manus (OD 100.3% of DLM IV); supraocular ridges not prominent; ear opening very small (EL 6.0% of HL), deep, taller than wide, larger than nostrils; single row of scales separates orbit from supralabials; interorbital distance is narrow (IO 72.1% of ES), shorter than head length (IO 33.0% of HL); eye to nostril distance slightly greater than eye to ear distance (EN 102.1% of EE).

Dorsal surface of the trunk with smooth, small homogeneous granules, 122 paravertebral granules; 117 smooth midventral scales; 87 midbody scales; 5/5 well developed tubercles on flanks; ventrolateral scales

slightly enlarged; granules on snout smooth and flattened, larger than those on interorbital and occipital regions; canthus rostralis not pronounced, 9/10 smooth oval scales from eye to nostril; scales of interorbital region oval and smooth; 2/2 weakly developed tubercles present on sides of neck and around ear; ear opening vertically oval, slanting from anterodorsal to posteroventral, 18/18 scales between anterior margin of the ear opening and posterior margin of eye. Supralabials 8/8 and infralabials 9/8, becoming smaller towards the gape. Rostral scale wider than long, partially divided (90%) by a median groove and in contact with first supralabial. Nostrils separated by 2/2 enlarged supranasals with one internasal and 1/1 postnasal; no enlarged scales behind supranasals. Nostrils oval, dorsolaterally oriented, not in contact with first supralabials.

Mental subrhomboidal, as wide as long, posteriorly in contact with three enlarged postmentals (smaller than mental, and larger than chin scales); postmentals in contact and bordered posteriorly by five smooth chin scales (larger than nostrils), contact with the 1st and 2nd infralabials; ventral scales smaller than chin scales, and larger than nostrils. Smooth, rounded, juxtaposed granule-like scales on chin and gular region; pectoral and abdominal scales smooth, subimbricate towards precloacal region, abdominal scales larger than dorsals; 21 belly scales across venter; smooth, subimbricate scales around vent and base of tail; 15/14 femoral pores; 10 unpored interfemoral scales; 3/2 small posterior femoral scales. Original tail of holotype longer than snout-vent length (TAL 114.5% of SVL); hemipenial bulge greatly swollen (TBW 3.8 mm), homogeneous scales on dorsal aspect of tail directed posteriorly, 1/1 spine-like tubercles present at base of tail, subcaudals very smooth; tail with 3–4 enlarged flattened obtuse scales forming whorls; absence of post-cloacal spur on each side; smooth subcaudals arranged into a median series of clearly enlarged, hexagonal or subhexagonal scales.

Forelimbs moderately short, slender (LAL 15.1% of SVL, UAL 14.8% of SVL) lower arm longer than upper arm; hind limbs moderately long, tibia shorter than femur (TBL 18.1% of SVL, FEL 20.5% of SVL). Dorsal, anterior, ventral, and posterior surfaces of upper arm with smooth scales, those on anterior surface twice as large as those on other faces of limb; dorsal, anterior, ventral, and posterior surfaces of lower arm with smooth scales, those on posterior surface twice as large as those of other parts; scales on dorsal surface of femur smooth and granular, less imbricate scales on anterior, posterior and ventral surfaces, scales on anterior surface are twice the size of those of other aspects. All surfaces of tibia with smooth scales; both anterior and posterior surfaces of limbs bearing smooth granules, scales of the ventral surface twice as large as those of other aspects. Dorsal and ventral scales on the manus and the pes smooth, granular; dorsal surfaces of digits with granular scales. Digits elongate and slender with inflected distal phalanges, all bearing slightly recurved claws. Subdigital lamellae entire (except divided at first interphalangial joint), unnotched; total lamellae on manus (left/right): digit I (11/11), digit II (12/12), digit III (14/13), digit IV (17/17), digit V (13/13); total lamellae on pes (left/right): digit I (9/9), digit II (13/12), digit III (18/18), digit IV (21/21), digit V (16/16); interdigital webbing absent; length order of digits of manus (left): I (1.4 mm), V (2.5 mm), II (2.8 mm), III (3.1 mm), IV (3.3 mm); length order of digits of pes (left): I (2.2 mm), II (3.4 mm), V (3.6 mm), III (3.8 mm), IV (4.2 mm).

Variation of the type series. The SVL of adult specimens in the type series (n = 3) and others (n = 5) ranges from 30.3 to 34.4 mm, TAL ranges from 34.7–39.4 mm, and TRL ranges from 12.0–14.6 mm; number of supralabials 8–9, and infralabials 8–9 (Table 1); spines on flank 3–5; interorbital scales 26–29; supraciliaries 9–11; canthal scales 8–10; scales from eye to tympanum 17–19; total lamellae on digits of manus: digit I (10–11), digit II (11–13), digit III (13–14), digit IV (16–17), digit V (12–13); total lamellae on digits of pes: digit II (12–13), digit III (17–19), digit IV (20–21), digit V (15–16); ventral scales 111–117, midbody scales 87–91; paravertebral granules 118–122; belly scales 19–21; unpored interfemoral scales 9–11 in males; femoral pores in males 14–15, and unpored posterior femoral scales in males 2–3.

Color of living specimens. The body color on the dorsal side is reddish brown; the dorsal head is randomly scattered with black and white dots; a yellowish oval patch on occiput, and a straight black middorsal dash over midpoint of neck (Fig. 4); faded yellow patches along vertebral midline; indistinct dark canthal stripe extends through eye and above ear, terminating anterior to forelimb insertion; the pupil of eye is circular and black with the surrounding being golden brown; a series of 4–5 mottled, irregular, dark brown transverse bands with gray margins on dorsum of body; dorsum of tail with 13–15 cinnamon brown blotches separating 12–14 faded dark brown bands; lateral view of labials and neck consists of thin black dots in bright yellow background like a zigzag mark; small dark spots (like eyes) present on back side of femur; chin and gular with bright yellow, vent and femur completely dirty yellow color.

Color of preserved specimens. Dorsum is light brown; dorsum of head is randomly scattered with brown and cream dots; an oval cream color patch on occiput, and a straight dark brown middorsal dash over midpoint of neck; a white post-orbital stripe present; labials with black and cream spots; venter is completely dirty white; tail with scattered markings on dorsal side.

Etymology. The specific epithet is an eponym Latinized (*anslemi*) in the masculine genitive singular, honoring the veteran Sri Lankan herpetologist Kongahage Anslem

Fig. 4. *Cnemaspis anslemi* **sp. nov.** male holotype (NMSL.2019.14.01) in life *in-situ.* (**A**) Dorsal view of the full body displaying the typical color pattern and a straight black middorsal dash over midpoint of neck, (**B**) Ventral aspect showing gular and femoral colorations, (**C**) lateral view showing labial coloration and zigzag pattern, (**D**) dorsal view of the full body of female paratype (NMSL.2019.14.02) in life *in-situ* from Udamaliboda, Samanala Nature Reserve, Sri Lanka. *Photos: Kanishka Ukuwela and Suranjan Karunarathna*.

Fig. 5. General habitat of *Cnemaspis anslemi* **sp. nov.** at Udamaliboda, Samanala Nature Reserve, Kegalle District, Sri Lanka. (**A**) Complete view of the forest hill, (**B**) shady forest with thick leaf litter, (**C**) hundred years old house made using clay and bricks, also with wattle and daub, (**D**) communal egg laying site on a clay wall. *Photos: Madhava Botejue and Suranjan Karunarathna*.

Lawrence de Silva (the father of modern herpetology in Sri Lanka) for his valuable contributions to Sri Lankan herpetology and for inspiring the next generation of herpetologists, including the authors.

Natural history. The lower Samanala Nature Reserve area (along with Udamaliboda) comprises home gardens, and tropical evergreen rainforests (Gunatileke and Gunatileke 1990) mixed with tea and rubber plantations. The area comprises the Ratnapura and Kegalle districts and lies between 6.759172° and 6.889842°N and 80.436194° and 80.487717°E, at an elevation of 350–850 m. The mean annual rainfall varies between 3,500 and 4,500 mm, received mostly via the southwest monsoon (May–September). The mean annual temperature of the area is 26.4–27.9 ºC. *Cnemaspis anslemi* **sp. nov.** is a quite rare species as six (± 0.1) geckos per survey-hour were found after covering a total area of 20 ha. This species was restricted to tall straight trees with smooth bark and thick canopy cover, and houses with tall clay walls with crevices. These geckos could climb up to 7 m on vertical surfaces of trees (Fig. 5). They were active during the day time (08.00–17.00 h) and, when disturbed, sought refuge in tree tops with crevices. The new species was sympatric (at local habitat scale) with several other geckos (*Cnemaspis samanalensis*, *Cnemaspis* sp., *Cyrtodactylus triedrus*, *Cyrtodactylus* sp., *Gehyra mutilata*, *Hemidactylus depressus, H. pieresii*, *H. frenatus*, *H. parvimaculatus,* and *Hemiphyllodactylus typus*). The eggs were pure white in color and almost spherical in shape (~5 mm), with a slightly flattened side that attached to the clay-wall substrate. This species has also been recorded from the Lihinihela, Borangamuwa, and Warnagala areas in lower Samanala Nature Reserve.

Conservation status. Application of the IUCN Red List criteria indicates that *C. anslemi* **sp. nov.** is Critically Endangered (CR) due to having an area of occupancy (AOO) < 10 km^2 (six locations, 0.2 km^2 in total, assuming a 100 m radius around the georeferenced locations) and an extent of occurrence (EOO) < 100 km^2 (96.7 km^2) in the lower elevations of Central Province [Applicable criteria are B2-b (iii)].

Remarks. *Cnemaspis anslemi* **sp. nov.** most closely resembles *C. gemunu*, *C. godagedarai*, *C. phillipsi*, and *C. scalpensis*. The type localities of these species are

Table 2. Key characters and identification features of 12 species belonging to the *podihuna* clade (*scalpensis* group), Sri Lanka. For these species, the dorsal scales are homogeneous, ventral scales are smooth, and subcaudal scales are clearly enlarged, hexagonal, or subhexagonal. Abbreviations: SVL–maximum snout to vent length in mm; SUP–supralabials; INF–infralabials; VEN–ventral scales; BEL–belly scales; FSP–spines on the flank; MBO–midbody scales; PVT–paravertebral scales; UPF–unpored interfemoral scales; FEP–femoral pores; LF4–lamellae on 4th finger; and LT4–lamellae on 4th toe.

Species	SVL	SUP	INF	VEN	BEL	FSP	MBO	PVT	UPF	FEP	LF4	LT4
C. alwisi	40.4	8–10	7–9	145–153	27–31	4–5	71–78	89–97	18–19	7–9	15–17	17–21
C. anslemi	34.4	8–9	8–9	111–117	19–21	3–4	87–91	118–122	9–11	14–15	16–17	20–21
C. gemunu	34.0	8–10	7–8	112–118	13–16	7–8	74–87	79–93	10–12	11–14	15–17	18–19
C. godagedarai	35.5	7–8	7–8	133–137	21–23	5–6	98–102	101–106	8–9	12–13	17–18	20–21
C. hitihami	41.7	8–9	7–9	132–135	21–22	4–5	96–99	143–149	24–26	5–10	18–19	21–22
C. kohukumburai	34.5	8–9	7–8	131–134	22–23	7–8	81–88	150–159	24–25	6–9	21–22	23–25
C. nilgala	32.9	7–8	6–7	122–129	17–19	3–4	71–78	179–187	14–15	7–9	17–18	17–18
C. phillipsi	36.6	8–9	8–9	128–143	18–25	4–6	76–91	86–93	11–14	15–16	16–19	17–19
C. punctata	39.9	7–10	7–9	129–137	20–29	11–13	71–78	83–91	25–27	5–7	17–18	17–23
C. rajakarunai	40.2	8–9	9–11	146–186	26–29	5–6	69–74	81–85	20–22	7–8	16–20	19–22
C. rammalensis	53.8	8–10	8–9	186–207	25–28	4–5	119–131	94–96	19–24	14–16	22–23	22–23
C. scalpensis	36.6	7–9	7–8	120–131	17–19	9–11	81–89	102–112	8–12	13–15	17–18	19–21

separated by ~38 km (Haggala in Nuwara Eliya), ~55 km (Ensalwatte in Deniyaya), ~83 km (Gammaduwa in Matale), and ~47 km (Gannoruwa in Kandy) airline distances, respectively, from Udamaliboda in Kegalle (Fig. 1). Further, the new species can be distinguished from *C. gemunu*, *C. godagedarai*, *C. phillipsi*, and *C. scalpensis* by morphometric and meristic characters (Table 2). We believe *Cnemaspis* cf. *gemunu* (AMB 7507, now in NMSL) collected from Borangamuwa in Ratnapura District (6.742778°N, 80.707778°E; elevation about 800 m) would most likely represent *C. anslemi* **sp. nov.** according to the currently known distribution pattern (see Agarwal et al. 2017). The records of *Cnemaspis scalpensis* from Udamaliboda forest and vicinity by Peabotuwage et al. (2012) also represent *Cnemaspis anslemi* **sp. nov.**

Discussion

The discovery and description of a novel species here adds yet another member to this speciose genus, increasing the known diversity of *Cnemaspis* in Sri Lanka to 33 species, all of which are endemic to the island. Several new descriptions during the last decade (e.g., Bauer et al. 2007; Manamendra-Arachchi et al. 2007; Wickramasinghe and Munindradasa 2007; Vidanapathirana et al. 2014; Wickramasinghe et al. 2016; Batuwita and Udugampala 2017; Batuwita et al. 2019; de Silva et al. 2019; Karunarathna et al. 2019a,b) have greatly advanced our knowledge on the diversity of these diminutive day geckos, increasing the total diversity from just four species. This trend most likely suggests that the diversity of Sri Lankan *Cnemaspis* is still underestimated, and further studies would most likely reveal more species from the varied natural and semi-natural habitats of Sri Lanka. Although Sri Lankan *Cnemaspis* are likely derived from the Indian radiation, the current diversity of this genus is probably the result of multiple colonization events (polyphyletic origin) as opposed to a single *in situ* radiation (monophyly); however, these phylogenetic and biogeographic affinities have yet to be confirmed (Agarwal et al. 2017; Bauer et al. 2007; Karunarathna et al. 2019b). We tentatively assign this species to the *podihuna* clade on the basis of clearly enlarged, hexagonal, or subhexagonal subcaudal scales (Fig. 6).

The preliminary studies reported here indicate that this novel species is frequently found in home garden habitats, as opposed to natural forest habitats, in the Udamaliboda region (Samanala Nature Reserve). During the survey from 2006 to 2019, only five specimens were found in the natural forest habitats of the Samanala Nature Reserve. The home gardens in which the new species was observed are heavily shaded and humid. The low encounter rates in natural forests could also be due to the low visibility conditions caused by the dense canopy, and this species may possibly occupy higher perches on the tree trunks, thus avoiding detection. However, further studies are necessary to ascertain this fact. Like most of the Sri Lankan *Cnemaspis* known so far (Bauer et al. 2007; Agarwal et al. 2017), the new species has a very small range, most likely due to the narrow ecological niche of this species (Slatyer et al. 2013). Its small size may reduce both dispersal ability as well as ecological tolerance levels. The Udamaliboda trail of Samanala Nature Reserve is inhabited by 11 species of geckos, including two undescribed species, two Critically Endangered, two Endangered, and two Vulnerable species (Peabotuwage et al. 2012). Overall, 65 reptile species have already being recorded from the type locality, indicating that the Udamaliboda is a local hotspot of reptile diversity.

The type locality of this species and the surrounding areas are currently subjected to encroachment via tea cultivation and mini-hydropower projects. Such activities will certainly reduce the crucial natural and semi-natural

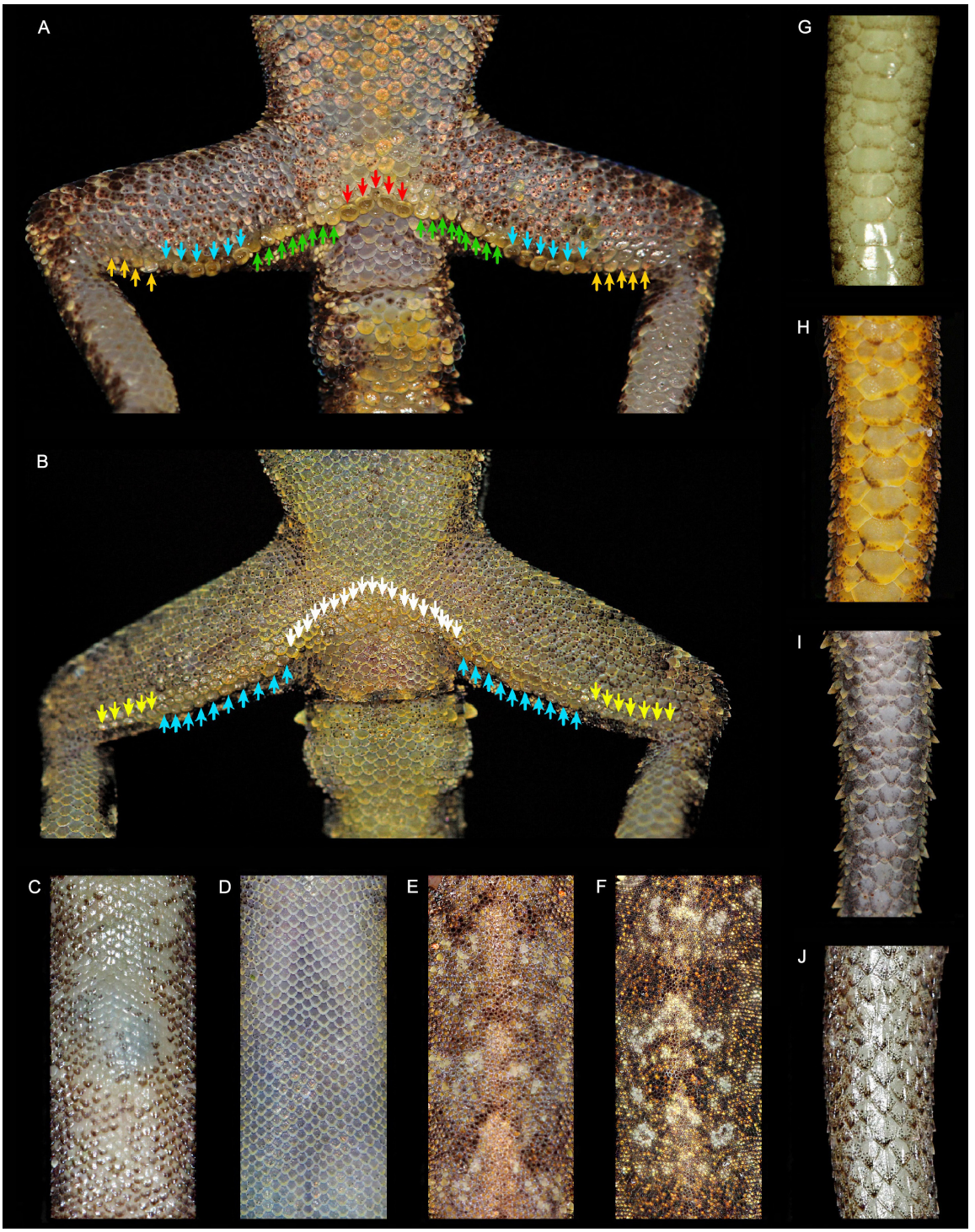

Fig. 6. Morphological characters that differentiate the species of *podihuna* and *kandiana* clades. (**A**) Scales and pores around vent in *podihuna* clade, (**B**) scales and pores around vent in *kandiana* clade, (**C**) keeled and imbricate belly scales, (**D**) smooth and imbricate belly scales, (**E**) heterogeneous keeled dorsal granules, (**F**) homogeneous smooth dorsal granules, (**G**) smooth sub-hexagonal subcaudals in *podihuna* clade, (**H**) smooth, solid hexagonal subcaudals in *podihuna* clade, (**I**) smooth, small, and irregular subcaudals in *kandiana* clade, (**J**) keeled, small, and irregular subcaudals in *kandiana* clade (yellow arrows: unpored posterior femoral scales in males; blue arrows: femoral pores in males; green arrows: unpored anterior femoral scales in males; red arrows: precloacal pores in males; white arrows: unpored interfemoral scales in males).

habitats of this range-restricted species. Thus, authorities should carefully consider new proposals for mini-hydropower plants near or within natural habitats like these, in order to ensure that loss of the habitats occupied by such rare or even undescribed species is minimized.

Acknowledgements.—We thank Chandana Sooriyabandara (The Director General of DWC), Laxman Peiris

(Deputy Director – Research division of DWC), the research committee, and the field staff of the Department of Wildlife (WL/3/2/1/14/12 and WL/3/2/42/18 a and b) and Conservator General of Forest Department (FRC/5, and FRC/6) for granting permission and the field staff for assisting during the field surveys. Nanda Wickramasinghe, Sanuja Kasthuriarachchi, Lankani Somaratne, Chandrika Munasinghe, Rasika Dasanayake, Ravindra Wickramanayake, and P. Gunasiri at NMSL assisted while we were examining collections under their care. Anslem de Silva, Aaron Bauer, Thilina Surasinghe, Buddhika Madurapperuma, Chamara Amarasinghe, Tharaka Kusuminda, Indika Peabotuwage, Nirmala Perera, Madhava Botejue, Dinesh Gabadage, Hasantha Wijethunga, D.M. Karunarathna, Kawmini Karunarathna, Rashmini Karunarathna, Thesanya Karunarathna, and Niranjan Karunarathna provided valuable assistance in numerous stages of this study. This work was mainly supported by a Nagao Natural Environment Foundation (2018–20) grant to SK. Finally, we would like to thank the anonymous reviewers for constructive comments that helped to improve the manuscript.

Literature cited

Agarwal I, Biswas S, Bauer AM, Greenbaum E, Jackman TR, de Silva A, Batuwita S. 2017. Cryptic species, taxonomic inflation, or a bit of both? New species phenomenon in Sri Lanka as suggested by a phylogeny of dwarf geckos (Reptilia, Squamata, Gekkonidae, *Cnemaspis*). *Systematics and Biodiversity* 15: 1–13.

Amarasinghe AAT, Campbell PD. 2016. On the resolution of a long-standing issue surrounding the holotype of *Cnemaspis podihuna* Deraniyagala, 1944 (Reptilia: Gekkonidae). *Zootaxa* 4137: 296–300.

Batuwita S, Udugampala S. 2017. Description of a new species of *Cnemaspis* (Squamata: Gekkonidae) from Knuckles Range of Sri Lanka. *Zootaxa* 4254: 82–90.

Batuwita S, Agarwal I, Bauer AM. 2019. Description of a new diminutive, rupicolous species of day-gecko (Squamata: Gekkonidae: *Cnemaspis*) from southern Sri Lanka. *Zootaxa* 4565: 223–234.

Bauer AM, de Silva A, Greenbaum E, Jackman T. 2007. A new species of day gecko from high elevation in Sri Lanka, with a preliminary phylogeny of Sri Lankan *Cnemaspis* (Reptilia: Squamata: Gekkonidae). *Mitteilungen aus dem Museum für Naturkunde, Berlin, Zoologische Reihe* 83: 22–32.

Boulenger GA. 1885. *Catalogue of the Lizards in the British Museum (Natural History)*. British Museum of Natural History, London, United Kingdom. 436 p.

de Silva A, Bauer AM, Botejue M, Karunarathna S. 2019. A new species of endemic day gecko (Reptilia: Gekkonidae: *Cnemaspis*) from a wet zone forest in second peneplain of Southern Sri Lanka. *Amphibian & Reptile Conservation* 13(1) [General Section]: 198–208 (e177).

de Silva A, Ukuwela K. 2017. *A Naturalist's Guide to the Reptiles of Sri Lanka*. John Beaufoy Publishing, Oxford, United Kingdom. 144 p.

Deraniyagala PEP. 1944. A new *Cnemaspis* gecko from Ceylon. *Journal of Royal Asiatic Society Sri Lanka* 97: 226–227.

Ferguson WM. 1877. *Reptile Fauna of Ceylon. Letter on a Collection Sent to the Colombo Museum*. William Henry Herbert, Government Printer, Colombo, Ceylon (Sri Lanka). 42 p.

Grismer LL, Wood PL Jr, Anuar S, Riyanto A, Ahmad N, Muin MA, Sumontha M, Grismer JL, Onn CK, Quah ESH, et al. 2014. Systematics and natural history of Southeast Asian rock geckos (genus *Cnemaspis* Strauch, 1887) with descriptions of eight new species from Malaysia, Thailand, and Indonesia. *Zootaxa* 3880: 1–147.

Gunatileke IAUN, Gunatileke CVS. 1990. Distribution of floristic richness and its conservation in Sri Lanka. *Conservation Biology* 4: 21–31.

Gunawardene NR, Daniels DA, Gunatilleke I, Gunatilleke C, Karunakaran P, Nayak GK, Prasad S, Puyravaud P, Ramesh B, Subramanian K. 2007. A brief overview of the Western Ghats–Sri Lanka biodiversity hotspot. *Current Science* 93: 1,567–1,572.

IUCN. 2012. *IUCN Red List Categories and Criteria*. Version 3.1. 2nd edition. IUCN, Gland, Switzerland and Cambridge, United Kingdom. 32 p.

Karunarathna S, Bauer A, de Silva A, Surasinghe T, Somaratna T, Madawala M, Gabadage D, Botejue M, Henkanaththegedara S, Ukuwela K. 2019a. Description of a new species of the genus *Cnemaspis* Strauch, 1887 (Reptilia: Squamata: Gekkonidae) from the Nilgala Savannah forest, Uva Province of Sri Lanka. *Zootaxa* 4545: 389–407.

Karunarathna S, Poyarkov NA, de Silva A, Madawala M, Botejue M, Gorin VA, Surasinghe T, Gabadage D, Ukuwela, K, Bauer AM. 2019b. Integrative taxonomy reveals six new species of day geckos of the genus *Cnemaspis* Strauch, 1887 (Reptilia: Squamata: Gekkonidae) from geographically isolated hill forests in Sri Lanka. *Vertebrate Zoology* 64: 247–298.

Kelaart EF. 1852. *Prodromus Faunae Zeylanicae, being Contributions to the Zoology of Ceylon*. *Volume - 1*. Published by the author, Colombo, Sri Lanka. xxxiii + 197 + 54 + (3) p.

Manamendra-Arachchi K, Batuwita S, Pethiyagoda R. 2007. A taxonomic revision of the Sri Lankan day geckos (Reptilia: Gekkonidae: *Cnemaspis*), with description of new species from Sri Lanka and Southern India. *Zeylanica* 7: 9–122.

Meegaskumbura M, Bossuyt F, Pethiyagoda R, Manamendra-Arachchi K, Bahir M, Milinkovitch MC, Schneider CJ. 2002. Sri Lanka: an amphibian hotspot. *Science* 298: 379.

MoE-SL. 2012. *The National Red List 2012 of Sri Lanka: Conservation Status of the Fauna and Flora*. Biodi-

versity Secretariat, Ministry of Environment, Colombo, Sri Lanka. 476 p.

Peabotuwage I, Bandara N, Samarasinghe D, Perera N, Madawala M, Amarasinghe C, Kandambi D, Karunarathna S. 2012. Range extension for *Duttaphrynus kotagamai* (Amphibia: Bufonidae) and a preliminary checklist of herpetofauna from the Uda Mäliboda Trail in Samanala Nature Reserve, Sri Lanka. *Amphibian & Reptile Conservation* 5(2): 52–64 (e38).

Rösler H, Grismer LL, Ineich I, Kaiser H. 2019. The purportedly Indo-Australian gecko species *Cnemaspis timoriensis* (Duméril and Bibron, 1836) is actually the first named species of the neotropical genus *Gonatodes* Fitzinger, 1843 (Squamata: Gekkonidae). *Zootaxa* 4576: 483–509.

Sabaj Pérez MH. 2015. Standard symbolic codes for institutional resource collections in herpetology and ichthyology: an online reference, Version 5.0. American Society of Ichthyologists and Herpetologists, Lawrence, Kansas, USA. Available: https://asih.org/standard-symbolic-codes [Accessed: 22 June 2019].

Slatyer RA, Hirst M, Sexton JP. 2013. Niche breadth predicts geographical range size: a general ecological pattern. *Ecology Letters* 16: 1,104–1,114.

Somaweera R, Somaweera N. 2009. *Lizards of Sri Lanka: a Colour Guide with Field Keys*. Chimaira, Frankfurt am Main, Germany. 303 p.

Uetz P, Freed P, Hošek J. 2019. The Reptile Database. Available: http://reptile-database.reptarium.cz/ [Accessed: 20 July 2019].

Vidanapathirana DR, Rajeev MDG, Wickramasinghe N, Fernando SS, Wickramasinghe LJM. 2014. *Cnemaspis rammalensis* sp. nov., Sri Lanka's largest day-gecko (Sauria: Gekkonidae: *Cnemaspis*) from Rammalakanda Man and Biosphere Reserve in southern Sri Lanka. *Zootaxa* 3755: 273–286.

Wickramasinghe LJM, Munindradasa DAI. 2007. Review of the genus *Cnemaspis* Strauch, 1887 (Sauria: Gekkonidae) in Sri Lanka with the description of five new species. *Zootaxa* 1490: 1–63.

Wickramasinghe LJM, Vidanapathirana DR, Rathnayake RMGP. 2016. *Cnemaspis rajakarunai* sp. nov., a rock dwelling day-gecko (Sauria: Gekkonidae: *Cnemaspis*) from Salgala, an unprotected lowland rainforest in Sri Lanka. *Zootaxa* 4168: 92–108.

Suranjan Karunarathna obtained his Masters in Environmental Management at the University of Colombo, Sri Lanka. His scientific exploration of biodiversity began with the Young Zoologists' Association of Sri Lanka (YZA) in early 2000, and he served as president of YZA in 2007. As a wildlife researcher, Suranjan conducts research on herpetofaunal ecology and taxonomy, and he also promotes the scientific basis for raising awareness on the importance of biodiversity and its conservation among the Sri Lankan community. He is an active member of many specialist groups in the IUCN/SSC, and an expert committee member for herpetofauna in the National Red List development programs, Sri Lanka, since 2004. *Photo: Lark Hayes.*

Kanishka D.B. Ukuwela is currently a Senior Lecturer in Zoology at the Rajarata University of Sri Lanka. He holds a B.S. (Hons.) degree in Zoology from the University of Peradeniya, Sri Lanka and a Ph.D. in Evolutionary Biology from the University of Adelaide, Australia. His current research is focused on the origins, evolution, systematics, and conservation of the South Asian herpetofauna. *Photo: Isuri Jayawardena.*

Appendix 1.

Comparative material:

Cnemaspis alwisi: NMSL 2004.09.01 (holotype), NMSL 2004.09.02 (paratype), NMSL 2004.09.03 (paratype), WHT 5918, WHT 6518, WHT 6519, WHT 7336, WHT 7337, WHT 7338, WHT 7343, WHT 7344, WHT 7345, WHT 7346.

C. amith: BMNH 63.3.19.1066A (holotype), BMNH 63.3.19.1066B (paratype), BMNH 63.3.19.1066C (paratype).

C. butewai: NMSL 2019.07.01 (holotype), NMSL 2019.07.02 (paratype), NMSL 2019.07.03 (paratype).

C. gemunu: AMB 7495 (holotype), AMB 7507 (paratype?), WHT 7221, WHT 7347, WHT 7348, NMSL 2006.11.01, NMSL 2006.11.02, NMSL 2006.11.03, NMSL 2006.11.04.

C. godagedarai: NMSL 2019.09.01 (holotype), NMSL 2019.16.01 (paratype), NMSL 2019.16.02 (paratype).

C. gotaimbarai: NMSL 2019.04.01 (holotype), NMSL 2019.04.02 (paratype), NMSL 2019.04.03 (paratype).

C. hitihami: NMSL 2019.06.01 (holotype), NMSL 2019.06.02 (paratype), NMSL 2019.06.03 (paratype).

C. ingerorum: WHT 7332 (holotype), WHT 7330 (paratype), WHT 7331 (paratype).

C. kallima: WHT 7245 (holotype), WHT 7222 (paratype), WHT 7227 (paratype), WHT 7228 (paratype), WHT 7229 (paratype), WHT 7230(paratype), WHT 7239 (paratype), WHT 7249 (paratype), WHT 7251 (paratype), WHT 7252 (paratype), WHT 7253 (paratype), WHT 7254 (paratype), WHT 7255 (paratype).

C. kandambyi: WHT 9466 (holotype), WHT 9467 (paratype).

C. kandiana: BMNH 53.4.1.1 (lectotype), BMNH 80.2.2.119A (paralectotype), BMNH 80.2.2.119B (paralectotype), BMNH 80.2.2.119C (paralectotype), WHT 7212, WHT 7213, WHT 7267, WHT 7305, WHT 7307, WHT 7308, WHT 7310, WHT 7313, WHT 7319, WHT 7322.

C. kivulegedarai: NMSL 2019.08.01 (holotype), NMSL 2019.08.02 (paratype), NMSL 2019.08.03 (paratype).

C. kohukumburai: NMSL 2019.05.01 (holotype), NMSL 2019.05.02 (paratype), NMSL 2019.05.03 (paratype).

C. kumarasinghei: NMSL 2006.13.01 (holotype), NMSL 2006.13.02 (paratype).

C. latha: WHT 7214 (holotype).

C. menikay: WHT 7219 (holotype), WHT 7218 (paratype), WHT 7349 (paratype).

C. molligodai: NMSL 2006.14.01 (holotype), NMSL 2006.14.02 (paratype), NMSL 2006.14.03 (paratype), NMSL 2006.14.04 (paratype), NMSL 2006.14.05 (paratype).

C. nandimithrai: NMSL 2019.01.01 (holotype), NMSL 2019.01.02 (paratype), NMSL 2019.01.03 (paratype).

C. nilgala: NMSL 2018.07.01 (holotype), NMSL 2018.06.01 (paratype), NMSL 2018.06.02 (paratype), NMSL 2018.06.03 (paratype).

C. pava: WHT 7286 (holotype), WHT 7281 (paratype), WHT 7282 (paratype), WHT 7283 (paratype), WHT 7285 (paratype), WHT 7288 (paratype), WHT 7289 (paratype), WHT 7290 (paratype), WHT 7291 (paratype), WHT 7292 (paratype), WHT 7293 (paratype), WHT 7294 (paratype), WHT 7295 (paratype), WHT 7296 (paratype), WHT 7297 (paratype), WHT 7298 (paratype), WHT 7299 (paratype), WHT 7300 (paratype), WHT 7301 (paratype), WHT 7302 (paratype).

C. phillipsi: WHT 7248 (holotype), WHT 7236 (paratype), WHT 7237 (paratype), WHT 7238 (paratype).

C. podihuna: BMNH 1946.8.1.20 (holotype), NMSL 2006.10.02, NMSL 2006.10.03, NMSL 2006.10.04.

C. pulchra: WHT 7023 (holotype), WHT 1573a (paratype), WHT 7011 (paratype), WHT 7021 (paratype), WHT 7022 (paratype).

C. punctata: WHT 7256 (holotype), WHT 7223 (paratype), WHT 7226 (paratype), WHT 7243 (paratype), WHT 7244 (paratype).

C. rajakarunai: NMSL 2016.07.01 (holotype), DWC 2016.05.01 (paratype), DWC 2016.05.02 (paratype).

C. rammalensis: NMSL 2013.25.01 (holotype), DWC 2013.05.001.

C. retigalensis: NMSL 2006.12.01 (holotype), NMSL 2006.12.02 (paratype), NMSL 2006.12.03 (paratype), NMSL 2006.12.04 (paratype).

C. samanalensis: NMSL 2006.15.01 (holotype), NMSL 2006.15.02 (paratype), NMSL 2006.15.03 (paratype), NMSL 2006.15.04 (paratype), NMSL 2006.15.05 (paratype).

C. scalpensis: NMSL 2004.01.01 (neotype), NMSL 2004.02.01, NMSL 2004.03.01, NMSL 2004.04.01, WHT 7265, WHT 7268, WHT 7269, WHT 7274, WHT 7275, WHT 7276, WHT 7320.

C. silvula: WHT 7208 (holotype), WHT 7206 (paratype), WHT 7207 (paratype), WHT 7209 (paratype), WHT 7210 (paratype), WHT 7216 (paratype), WHT 7217 (paratype), WHT 7018, WHT 7027, WHT 7202, WHT 7203, WHT 7220, WHT 7354, WHT 7333.

C. tropidogater: BMNH 71.12.14.49 (lectotype), NMSL 5152, NMSL 5151, NMSL 5159, NMSL 5157, NMSL 5970, NMSL 5974.

C. upendrai: WHT 7189 (holotype), WHT 7184 (paratype), WHT 7187 (paratype), WHT 7188 (paratype), WHT 7181 (paratype), WHT 7182 (paratype), WHT 7183 (paratype), WHT 7185 (paratype), WHT 7190 (paratype), WHT 7191 (paratype), WHT 7192 (paratype), WHT 7193 (paratype), WHT 7194 (paratype), WHT 7195 (paratype), WHT 7196 (paratype), WHT 7197 (paratype), WHT 7260 (paratype).