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A new species of endemic day gecko (Reptilia: Gekkonidae: *Cnemaspis*) from a wet zone forest in the second peneplain of Southern Sri Lanka

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***Abstract.*—A new day gecko species of the genus *Cnemaspis* Strauch, 1887 is described from a geographically separated forested area in Ensalwatte, Matara district, Sri Lanka. This species is medium (34–35mm SVL) in size and can be differentiated from all other Sri Lankan congeners by a suite of distinct morphometric, meristic, and color characters. The species is recorded from rock outcrop habitats in wet, cool, and shady forest with minimal anthropogenic disturbance at low-elevations (below 860 m). Existing data suggest this gecko is a point endemic. Being a rupicolous microhabitat specialist with a scansorial mode of life, this species is susceptible to both localized and widespread threats. Therefore, isolated forest patches warrant special conservation action, including habitat protection, in-depth research, and species-specific hands-on management practices.**

Keywords. Conservation, critically endangered, microhabitat, natural history, point endemic, redlist, Sri Lankan warrior, threats

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Introduction

During the past decade, the number of day gecko species recognized in genus *Cnemaspis* has grown rapidly, reaching over 140 species (Uetz et al. 2019), and it is now considered the second most diverse gecko genus in the Old World (Grismer et al. 2014). *Cnemaspis* species are diminutive, slender-bodied geckos. They possess comparatively large, forward and upwardly-directed eyes with round pupils, and widely-splayed limbs bearing elongate slender digits that are bent at an angle with entire subdigital lamellae (Deraniyagala 1953; Manamendra-Arachchi et al. 2007; Wood et al. 2017). These crepuscular geckos are mostly rupicolous, though a few are arboreal or ground-dwelling, and most *Cnemaspis* have a cryptic morphology and coloration, both of which help with camouflage (Grismer et al. 2014; Wood et al. 2017). The genus *Cnemaspis* has been the subject of numerous taxonomic revisions and new species descriptions in recent years. Currently, there are 25 *Cnemaspis* species inhabiting Sri Lanka, all of which are endemic to the island (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; Karunarathna et al. 2019a). Herein, another species of *Cnemaspis* is reported from a lowland rainforest of southern Sri Lanka that could not be assigned to a known species and it is described as new.

Materials and Methods

Specimens: 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 caught by hand and were photographed in life. They were euthanized using halothane and fixed in 10% formaldehyde for two days, washed in water and transferred to 70% ethanol for long-term storage. Before fixation, tail tips were collected as tissue samples for future genetic analyses and stored in 95% ethanol under cool conditions (25 °C). For comparison, 394 *Cnemaspis* specimens (catalogued and uncatalogued) representing all

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recognized Sri Lankan species were eaxmined, including all type specimens housed at the National Museum, Sri Lanka (NMSL.NH), The Natural History Museum, London (BMNH), and Anslem de Silva's field series (ADS). 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. Specimens in this study were collected during a survey of the lizards of Sri Lanka under permit numbers WL/3/2/1/14/12 and WL/3/2/42/18 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 the 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. 2019a). 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. 2019a).

Morphometric characters: Forty morphometric measurements were taken using a Mitutoyo digital Vernier calliper (to the nearest 0.1 mm), and detailed observations of scales and other structures were made through a Leica Wild M3Z dissecting microscope. 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 anterior most 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 the 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 in-between the ears and the orbits; head depth (HD), maximum height of head at the level of the eye; jaw length (JL), distance between tip of snout and corner of mouth; internarial distance (IN), smallest distance between the 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 the axilla and the angle of the 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 claw; length of digits I–V of manus (DLM), distance between juncture of 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 vent and tail tip; tail base depth (TBD), maximum height of tail base; tail base width (TBW), widest point of tail base.

Meristic characters: Twenty-nine characters were observed on scales and other structures using a Leica Wild M3Z dissecting microscope on both left and right sides of the body (reported as L/R): number of supralabials (SUP) and infralabials (INF) between first labial scale and corner of mouth; number of interorbital scales (INOS), between left and right supraciliary scale rows; number of postmentals (PM) bounded by chin scales, 1st infralabial on the left and right, and mental; number of chin scales (CHS) touching medial 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 posterior-most point of orbit to anterior-most point of tympanum; number of canthal scales (CAS), number of scales from posterior-most point of naris to anterior most point of orbit; total lamellae on manus I–V (SLM) counted from first proximal enlarged scansor greater than twice the width of the largest palm scale, to most distal 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 towards the ventral scales; number of midventral scales (MVS) from first scale posterior to the mental to last scale anterior to the 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 postfemoral scales (PFS) counted from distal end of femoral pore row to knee; interfemoral scales (IFS), number of non-pored scales between innermost femoral pores

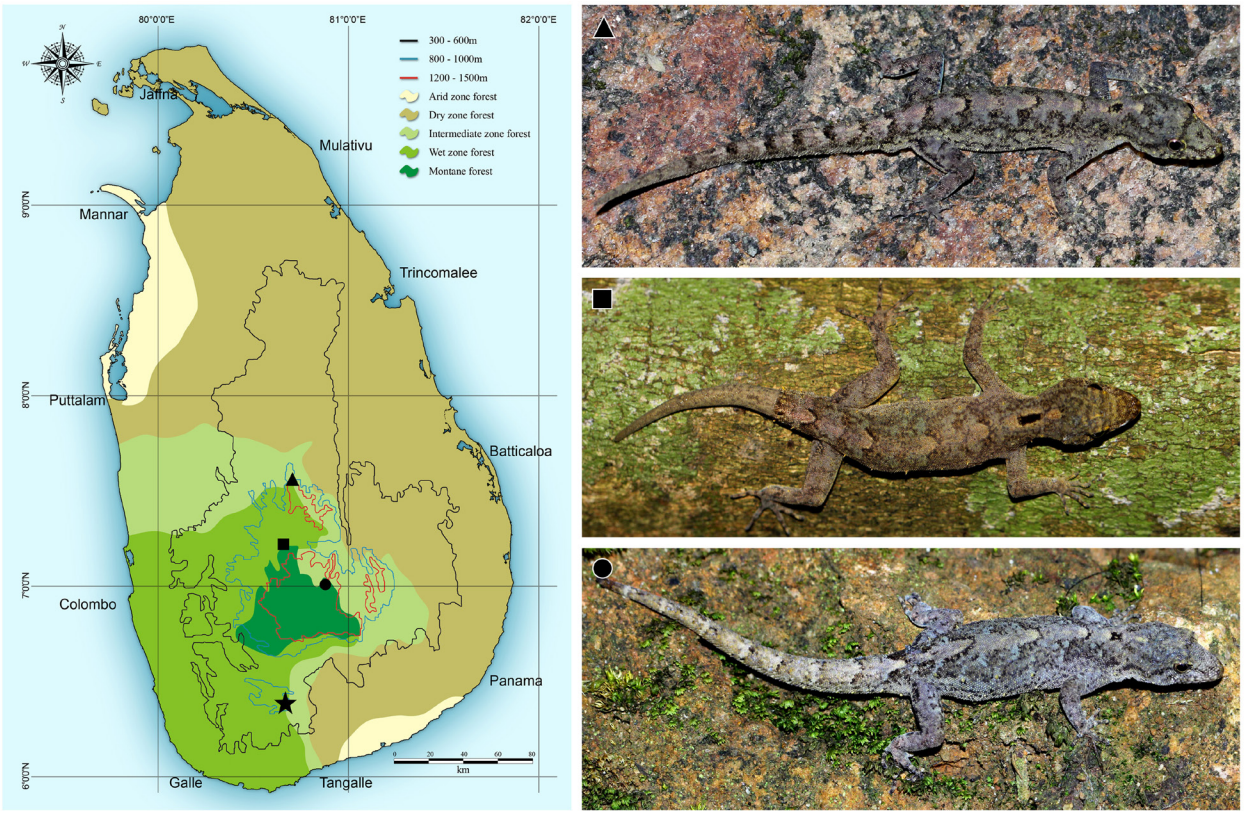

Fig. 1. Currently known distribution of *Cnemaspis godagedarai* sp. nov. (Ensalwatte, star), and related species: *C. gemunu* (Haggala, circle), *C. phillipsi* (Gammaduwa, triangle), and *C. scalpensis* (Gannoruwa, square) in Sri Lanka. *Photos: Suranjan Karunarathna.*

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 the flanks (FLSP), and characteristics such as appearance of the caudal scales (except in specimens with regenerated tails) were also evaluated. Coloration was determined from digital images of living specimens and from direct observations in the field.

Habitat and ecology: New species described herein were collected on field surveys conducted in various habitats of Sri Lanka (Fig. 1). During this survey, behavior and other aspects of natural history of the focal species were observed through opportunistic and non-systematic means. Such observations were done at a minimum distance of 1–2 m from the focal animals while taking precautions to avoid disturbance. The ambient and substrate temperatures were measured using a standard thermometer and a N19 Q1370 infrared thermometer (Dick Smith Electronics, Shanghai, China), respectively. The relative humidity and light intensity were measured with a QM 1594 multifunction environment meter (Digitek Instruments Co., Ltd., Hong Kong, China). Recording elevation and georeferencing species locations, used an eTrex® 10 GPS (Garmin, Johannesburg, South Africa). Sex was determined by the presence (male) or absence (female) of precloacal and femoral pores. The conservation status of the species was evaluated using the 2001 IUCN Red List Categories and Criteria version 3.1 (IUCN 2012).

Taxonomy

***Cnemaspis godagedarai* sp. nov.**

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Godagedaras' Day Gecko (English)
Godagedarage Diva-seri Hoona (Sinhala)
Godagedaravin Pahalpalli (Tamil)
Figs. 2–3; Table 1.

Holotype: NMSL 2019.09.01, adult male, 35.5 mm SVL (Fig. 2), collected from agranite wall in Ensalwatte, Deniyaya, Matara District, Southern Province, Sri Lanka (6.388767°N, 80.599781°E, WGS1984; elevation 858 m) on 6 October 2018 by Suranjan Karunarathna and Anslem de Silva.

Paratypes: ADS 232, adult female, 34.2 mm SVL, and ADS 233, adult female, 34.7 mm SVL, collected from agranite wall in Ensalwatte, Deniyaya, Matara District, Southern Province, Sri Lanka (6.389128°N, 80.605767°E, WGS1984; elevation 831 m) on 6 October 2018 by Suranjan Karunarathna and Anslem de Silva.

Fig. 2. Close-ups of *Cnemaspis godagedarai* sp. nov. male holotype (NMSL 2019.09.01.NH). **(A)** Dorsal head; **(B)** Lateral head; **(C)** Ventral head; **(D)** Homogeneous dorsal scales; **(E)** Scales on lateral surface of trunk; **(F)** Smooth ventral scales; **(G)** Cloacal characters with precloacal pores and femoral pores; **(H)** Subdigital lamellae on manus; **(I)** Subdigital lamellae on pes; **(J)** Dorsal scalation of tail; **(K)** Lateral side of tail; **(L)** Oval shaped subcaudals. *Photos: Suranjan Karunarathna.*

Diagnosis: *Cnemaspis godagedarai* sp. nov., can be readily distinguished from its Sri Lankan congeners by the following combination of morphological and meristic characteristics and color pattern: maximum SVL 35.5 mm; dorsum with homogeneous, smooth, granular scales; 2/2 supranasals; one internasal and 1/1 postnasal present; 26–28 interorbital scales present; 14–15 supraciliaries, 11–12 canthal scales, 24–26 eye to tympanum scales; three enlarged postmentals; postmentals bounded by 5–6 chin scales; chin and gular scales smooth, juxtaposed granules; pectoral and abdominal scales smooth, subimbricate; 21–23 belly scales across venter; 5–6 weakly developed tubercles on posterior flank; 101–106 paravertebral granules linearly arranged; precloacal pores absant in males, 12–13 femoral pores in males and 8–9 unpored interfemoral scales in males; 133–137 ventral scales; 98–102 midbody scales; subcaudals smooth, large subhexagonal, subequal in width, in a regular series forming a median row; 7–8

Fig. 3. *Cnemaspis godagedarai* sp. nov. male holotype (NMSL 2019.09.01.NH) in life *in situ*. **(A)** Dorsolateral view of the full body displaying color pattern. **(B)** Lateral view with temporal coloration. *Photos: Chen Lee.*

supralabials; 7–8 infralabials; 17–18 subdigital lamellae on digit IV of manus, and 20–21 subdigital lamellae on digit IV of pes.

Comparisons with other species: The new species is a member of the *C. podihuna* clade *sensu* Agarwal et al. (2017) based on the presence of large subhexagonal subcaudals scales. However, it differs from the all the other members of the clade as follows: from *C. kandambyi* Batuwita and Udugampala, 2017, *C. molligodai* Wickramasinghe and Munindradasa, 2007 and *C. podihuna* Deraniyagala, 1944 by the absence (versus presence) of precloacal pores; from *C. alwisi* Wickramasinghe and Munindradasa, 2007, *C. nilgala* Karunarathna et al., 2019, *C. punctata* Manamendra-Arachchi et al., 2007 and *C. rajakarunai* Wickramasinghe et al., 2016 by presence of more midbody scales (98–102 versus 71–78, 71–78, 71–78 and 69–74), respectively and by fewer femoro-precloacal scales (eight versus 18–19, 14–15, 25–27 and 20–22), respectively; from *C. gemunu* Bauer et al., 2007 and *C. phillipsi* Manamendra-Arachchi et al., 2007 by presence of more midbody scales (98–102 versus 74–87 and 76–91), respectively and more paravertebral granules (101–106 versus 79–93 and 86–93), respectively; from *C. rammalensis* Vidanapathirana et al., 2014 by fewer ventral scales (133–137 versus 186–207) and by fewer femoro-precloacal scales (eight versus 19–24); from *C. scalpensis* (Ferguson, 1877) by more belly scales (21–23 versus 17–19), by more midbody scales (98–102 versus 81–89) and by fewer flank spines (5–6 versus 9–11).

Among species of the *C. kandiana* clade *sensu* Agarwal et al. (2017) *C. godagedarai* sp. nov. differs in the presense (versus absence) of clearly enlarged, hexagonal or subhexagonal subcaudal scales, and absence of precloacal pores (versus presence) from the following species: *C. amith* Manamendra-Arachchi et al., 2007, *C. ingerorum* Batuwita et al., 2019, *C. kallima* Manamendra-Arachchi et al., 2007, *C. kandiana* (Kelaart, 1852), *C. kumarasinghei*

Table 1. Morphometric and meristic data of male holotype and two female paratypes of *Cnemaspis godagedarai* sp. nov. from Ensalwatte, Matara District, Sri Lanka. Abbreviations: L - left, R - right, M - male, F - female.

Measurement	NMSL 2019.09.01	ADS 232	ADS 233	Counts	NMSL 2019.09.01	ADS 232	ADS 233
	Holotype (M)	Paratype (F)	Paratype (F)		Holotype (M)	Paratype (F)	Paratype (F)
SVL	35.5	34.2	34.7	FLSP (L/R)	6/5	5/5	6/5
ED	2.0	2.0	1.9	SUP (L/R)	8/8	8/8	8/7
OD	3.4	3.4	3.3	INF (L/R)	7/8	8/8	7/7
EN	2.9	2.8	2.8	INOS	28	26	28
ES	3.9	3.7	3.6	PM	3	3	3
SN	1.6	1.6	1.4	CHS	6	6	5
NW	0.3	0.3	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	15.8	15.7	15.5	INT	1	1	1
EL	0.8	0.8	0.6	SUS (L/R)	15/14	15/15	14/14
IO	3.8	3.8	3.6	BET (L/R)	26/24	25/26	26/26
IE	3.9	3.8	3.7	CAS (L/R)	11/11	12/11	11/11
HL	9.7	9.6	9.6	TLM (i) (L/R)	10/10	11/10	10/10
HW	5.5	5.3	5.1	TLM (ii) (L/R)	14/15	14/14	14/14
HD	2.8	2.6	2.3	TLM (iii) (L/R)	16/16	15/16	16/16
JL	6.4	6.3	6.1	TLM (iv) (L/R)	18/18	17/18	18/18
IN	1.8	1.8	1.6	TLM (v) (L/R)	13/12	12/12	12/12
SED	8.8	8.7	8.6	PG	105	106	101
UAL	5.9	5.8	5.7	MBS	102	98	99
LAL	5.7	5.6	5.4	MVS	134	137	133
PAL	3.6	3.5	3.5	BLS	21	21	23
DLM (i)	1.6	1.5	1.4	TLP (i) (L/R)	11/10	10/10	11/10
DLM (ii)	1.8	1.7	1.7	TLP (ii) (L/R)	14/14	13/14	13/14
DLM (iii)	2.4	2.3	2.1	TLP (iii) (L/R)	16/16	15/15	16/15
DLM (iv)	3.1	3.1	2.9	TLP (iv) (L/R)	20/21	21/21	21/21
DLM (v)	2.5	2.4	2.2	TLP (v) (L/R)	16/16	15/16	16/16
TRL	12.8	12.6	12.2	FP (L/R)	12/13	-	-
TW	5.4	5.6	5.4	PFS	4/3	-	-
TD	3.4	3.4	3.3	IFS	8	-	-
FEL	6.0	5.9	5.8				
TBL	5.8	5.7	5.6				
HEL	5.5	5.4	5.3				
DLP (i)	1.6	1.5	1.4				
DLP (ii)	3.2	3.1	3.1				
DLP (iii)	3.7	3.6	3.4				
DLP (iv)	4.4	4.3	4.1				
DLP (v)	3.9	3.7	3.5				
TAL	38.9	37.5	37.6				
TBW	3.3	3.1	2.9				
TBD	2.9	2.7	2.7				

Wickramasinghe and Munindradasa, 2007, *C. latha* Manamendra-Arachchi et al., 2007, *C. menikay* Manamendra-Arachchi et al., 2007, *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, 35.5 mm SVL. Body slender, relatively short (TRL 36.0% of SVL). Head relatively small (HL 27.3% of SVL, HL 75.8% of TRL), narrow (HW 15.4% of SVL, HW 56.4% of HL), depressed (HD 8.0% of SVL, HD 29.3% of HL) and distinct from neck. Snout relatively long (ES 72.1% of HW, ES 40.6% of HL), slightly less than twice eye diameter (ED 51.9% of ES), more than half length of jaw (ES 61.0% of JL), snout slightly concave in lateral view; eye relatively small (ED 21.1% of HL), larger than ear (EL 39.7% of ED), pupil rounded; orbit length more than eye to ear distance (OD 114.3% of EE) and greater than length of IV digit of manus (OD 109.8% of DLM IV); supraocular ridges not prominent; ear opening very small (EL 8.4% of HL), deep, taller than wide, larger than nostrils, smaller than eyes; one row of scales separate orbit from supralabials; interorbital distance is broad (IO 96.4% of ES), smaller than snout to nostril length (IO 39.2% of HL); eye to nostril distance subequal to eye to ear distance (EN 99.0% of EE).

Dorsal surface of trunk with smooth, small homogeneous granules; 105 paravertebral granules; 134 smooth midventral scales; 102 midbody scales; 6/5 weakly developed tubercles on flanks; ventrolateral scales not enlarged; granules on snout smooth and fairly raised, larger than those on interorbital and occipital regions; canthus rostralis nearly absent, 11/11 smoothly round scales from eye to nostril; scales of interorbital region oval and smooth; tubercles absent on sides of neck and around ear; ear opening vertically oval, slanting from anterodorsal to posteroventral, 26/24 scales between anterior margin of ear opening and posterior margin of the eye. Supralabials 8/8, infralabials 7/8, becoming smaller towards gape. Rostral scale wider than long, partially divided (75%) by median groove, in contact with first supralabial. Nostrils separated by 2/2 enlarged supranasals with one internasal; no enlarged scales behind supranasals. Nostrils oval, dorsolaterally orientated, not in contact with first supralabials; 1/1 postnasal, smooth, equal to nostrils in size, partially in contact with first supralabial.

Mental sub-triangular, as wide as long, posteriorly in contact with four enlarged postmentals (smaller than mental, and lager than posterior postmentals); postmentals in contact and bordered posteriorly with six smooth, posterior postmental scales (smaller than nostrils), in contact with the 1st infralabials; ventral scales slightly smaller than posterior postmentals. Smooth, rounded, juxtaposed scales present on chin and gular region; pectoral and abdominal scales smooth, subimbricate towards precloacal region, abdominal scales larger than dorsals; 21 belly scales across venter; scales around vent and base of tail smooth, subimbricate; precloacal pores absent in males, 12/13 femoral pores in males; original tail of holotype slightly longer than snout-vent length (TAL 109.6% of SVL); tail base greatly swollen (TBW 3.2 mm), homogeneous round scales on dorsal aspect of the tail, no spine-like tubercles at base of tail; tail with 4–5 enlarged, round and flattened obtuse scales forming whorls; no post-cloacal spur on tail base; subcaudals enlarged, hexagonal, smooth, arranged median series.

Forelimbs moderately short, slender (LAL 16.0% of SVL, UAL 16.8% of SVL); hind limbs long, tibia quite a bit shorter than femur (TBL 16.3% of SVL, FEL 17.0% of SVL). Dorsal, anterior, ventral and posterior surfaces of upper arm and lower arm with smooth scales. Scales on dorsal surface of femur smooth, granular, less imbricate scales on anterior, posterior and ventral surfaces, scales on the anterior surface twice the size of those on other surfaces. Dorsal, anterior, posterior and ventral surfaces of tibia with smooth scales, both anterior and posterior surfaces of tibia with smooth granules, scales of ventral surface twice as large as those of other parts. Dorsum and venter of manus and pes smooth, granular; dorsal surfaces of digits also with granular scales. Digits elongate and slender with inflected joints, all bearing slightly recurved claws. Subdigital lamellae entire (except divided at first interphalangial joint), unnotched; subdigital lamellae on manus (left/right): digit I, 10/10, digit II, 14/15, digit III, 16/16, digit IV, 18/18, digit V, 13/12; subdigital lamellae on pes (left/right): digit I, 11/10, digit II, 14/14, digit III, 16/16, digit IV, 20/21, digit V, 16/16; interdigital webbing absent; length of digits of manus (left): I (1.6 mm), II (1.8 mm), III (2.4 mm), V (2.5 mm), IV (3.1 mm); length of digits of pes (left): I (1.6 mm), II (3.2 mm), III (3.7 mm), V (3.9 mm), IV (4.4 mm).

Variation of the type series: SVL of adult specimens in type series (n = 3) ranges from 34.2–35.5 mm, TAL ranges from 37.5–38.9 mm, and TRL ranges from 12.2–12.8 mm; number of supralabials 7–8, and infralabials 7–8; spines on flank 5–6; interorbital scales 26–28; supraciliaries 14–15; canthal scales 11–12; scales from eye to tympanum 24–26; total lamellae on digits of manus (L/R): digit I (10–11), digit II (14–15), digit III (15–16), digit IV (17–18), digit V (12–13); total lamellae on digits of the pes (L/R): digit I (10–11), digit II (13–14), digit III (15–16), digit IV (20–21), digit V (15–16); ventral scales 133–137; midbody scales 98–102; paravertebral granules 101–106; belly scales 21–23; femoral pores 12–13, unpored interfemoral scales 8–9, and unpored postfemoral scales 3–4 respectively in males.

Color of living specimen: Dorsum of head, body and limbs generally grey brown; three large irregular cinnamon brown blotches along vertebral line; a distinct narrow,

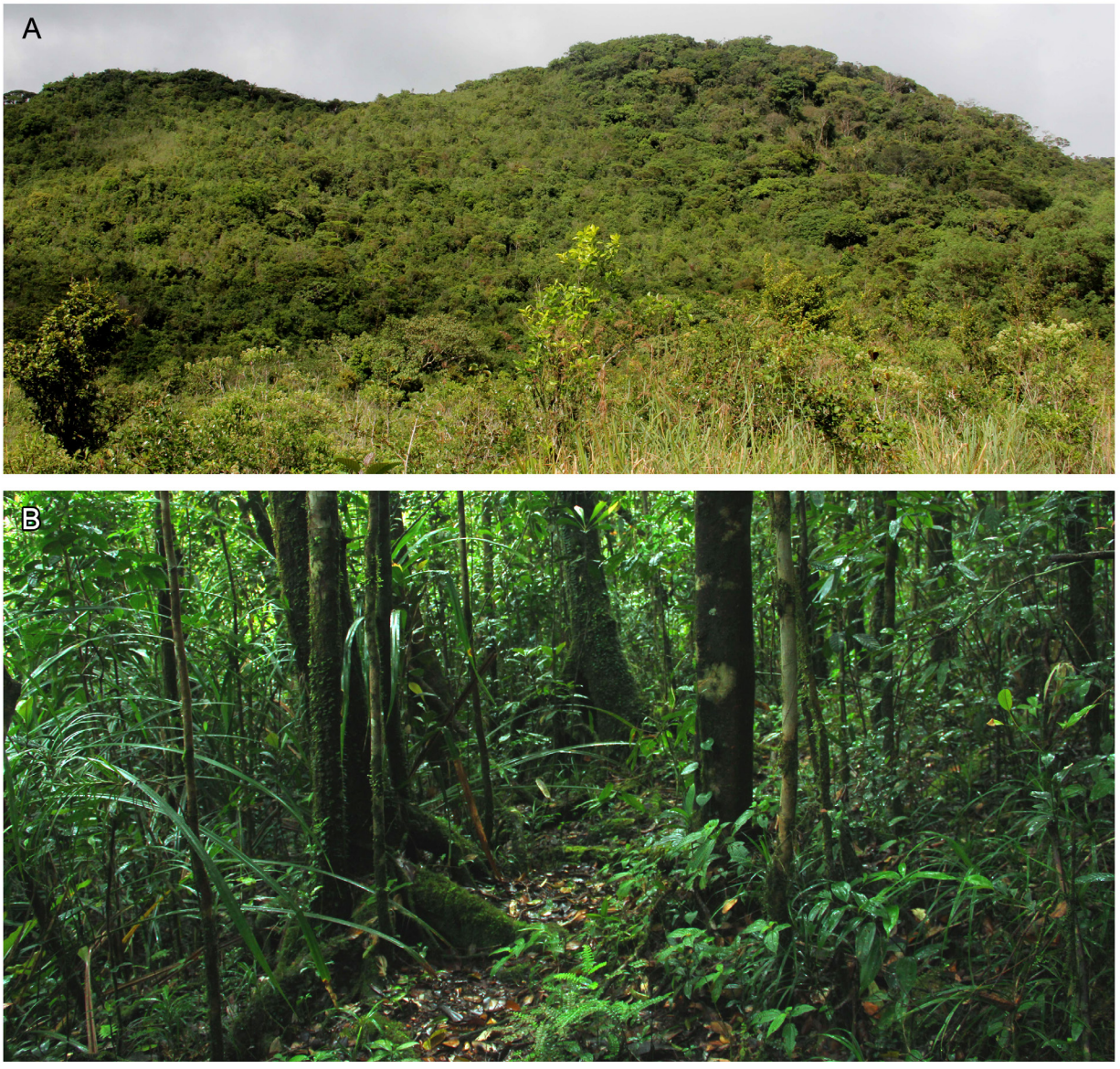

Fig. 4. General habitat of *Cnemaspis godagedarai* sp. nov. at Ensalwatte forest, Matara District, Sri Lanka. **(A)** Complete view of the forest hill. **(B)** Dense forest with cool and shady habitat. *Photos: Suranjan Karunarathna.*

short longitudinal black line on occipital area. Tail cinnamon brown dorsally, with 12 faded black cross-bands (Fig. 3); pupil is circular and black with surrounding yellow and light brown margins, supraciliaries being brownish; two postorbital stripes are present on each side, the upper white and the lower black; a light and dark interorbital stripe present; supralabials and infralabaials brown and with dirty white spots; chin and gular scales light yellow, without dark spots; pectoral, abdominal, cloacal and subcaudal scales immaculate cream; long transverse black line on posterior thigh; dorsum of limbs with faded brown patches; manus and pes with black and cream white crossed stripe arrangement.

Color of preserved specimen: Dorsally body is pale grey, colored with dark distinct irregular brown blotches; supralabials and infralabaials are brown, black and white in color; chin and gular scales becoming dirty white; ventral surface uniformly dirty white in color with some scales on thigh, tail base and arms with dark brown margins.

Etymology: The specific epithet is an eponym Latinized (*godagedarai*) in the masculine genitive singular, honoring Sri Lankan warrior Godagedara Rate Adhikaram for his valiant feats in the Great Rebellion of 1817–1818, which was initiated in Uva-Wellassa.

Habitat and ecology: The Ensalwatte forest area is a Mesua-Doona-dominated tropical evergreen rainforest ~150 ha in size (Gunatileke and Gunatileke 1990), located in the lowland wet zone of southern Sri Lanka (near Deniyaya, Mathara District, Southern Province). The area lies between 6.381864–6.397750°N and 80.589167–80.617853°E, with an elevation range of 620–860 m (Fig. 4). The mean annual rainfall is 2,500–3,500 mm, received mostly during the southwest monsoon (May-September) season. The mean annual temperature is 22–25 ºC. Only six specimens (four females and two males) were found on scattered boulders. The new species was sympatric (at both local habitat and microsite scales) with several other

micro-endemic geckos (*Cnemaspis pulchra* and *Cyrtodactylus subsolanus*). No eggs were found in the same habitat. These microhabitats were well-shaded (light intensity 0–587 Lux), relatively moist (relative humidity 73–88%) and cool (rock-surface temperature 25.3–27.5 °C).

Conservation status: Application of the IUCN Red List criteria indicates that *C. godagedarai* sp. nov. is Critically Endangered, due to having an area of occupancy (AOO) <10 km^2 (three locations, 0.8 km^2 in total assuming a 500 m radius around the georeferenced location) and an extent of occurrence (EOO) <100 km^2 (3.9 km^2) in the second peneplain of Southern Province. The applicable criterion is B2-b (iii).

Remarks: Of its insular congeners, *Cnemaspis godagedarai* sp. nov. most closely resembles *C. gemunu*, *C. phillipsi*, and *C. scalpensis*. The type localities of these species are separated by ~60 km (Hakgala in Central highland), ~95 km (Kandy in Central highland), and ~100 km (Gammaduwa in Knuckles highland) airline distances, respectively, from Ensalwatte in Deniyaya (Fig. 1). See also Comparison with other species above.

Discussion

The addition of another endemic gecko species to the Sri Lankan reptile list further highlights the island's status as a key center of reptilian diversity (see Batuwita et al. 2019; Karunarathna et al. 2019). *Cnemaspis* now comprises 26 species in Sri Lanka, bringing the total number of geckos to 48. Among Sri Lankan gekkonids, 38 (~80%) species are endemic to the island, most of which are restricted to the wet zone (>2,000 mm of annual average precipitation). However, as this study demonstrates, Sri Lanka's *Cnemaspis* diversity is not limited to either the southwestern lowlands or the central massif, but is spread throughout the bio-climatic regions and floristic regions of Sri Lanka, which suggests intricate biogeographic patterns possibly due to multiple colonizations from the Indian mainland rather than a singular colonization event and an insular radiation (Agarwal et al. 2017). These findings suggest the possible speciation of *Cnemaspis* in geographically isolated mountains with granite caves, rock outcrops, and favorable environmental conditions, and the number of species is predicted to increase to more than 50 (e.g., Agarwal et al. 2017; Batuwita et al. 2019; Karunarathna et al. 2019b). Thus, continuation of faunal surveys and detailed examination of morphological diagnostic features, as well as genetic analyses, are critical for revealing the true *Cnemaspis* diversity in Sri Lanka. We strongly recommend that such studies focus on isolated hills, smaller forests, rock outcrops, and granite caves, including underground tunnel systems. Habitats of *Cnemaspis* species, including the type localities, are undergoing extensive habitat conversion, and are threatened by localized human disturbances such as encroachments for tea plantations and other crops, and human settlements. Habitat conservation of isolated mountains is absolutely crucial for the conservation of the unique fauna of the island.

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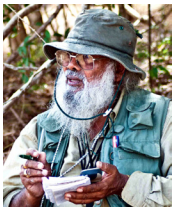

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Appendix 1

Comparative material:

***Cnemaspis alwisi*:** NMSL 2004.9.1 (holotype), NMSL 2004.9.2 (paratype), NMSL 2004.9.3 (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. 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. 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. kumarasinghei*:** NMSL 20061301 (holotype), NMSL 20061302 (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 2006.14.02-5 (paratype), NMSL 2006.14.03 (paratype), NMSL 2006.14.04 (paratype), NMSL 2006.14.05 (paratype).

***C. nilgala*:** 2018.07.01.NH (holotype), 2018.06.01.NH (paratype), 2018.06.02.NH (paratype), 2018.06.03.NH (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 20061002, NMSL 20061003, NMSL 20061004.

***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 20061201 (holotype), NMSL 20061202 (paratype), NMSL 20061203 (paratype), NMSL 20061204 (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 2004.1.1 (neotype), NMSL 2004.2.1, NMSL 2004.3.1, NMSL 2004.4.1, 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 72.