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# On the systematics and distribution of *Cyrtodactylus semiadii*, Java - Indonesia

There are approximately 372 species of bent-toed geckos of the genus *Cyrtodactylus* Gray, 1827 distributed throughout most of tropical Asia from India to the Philippines and south through the Indo-Australian Archipelago, northern Australia, New Guinea, and the Solomon Islands (Uetz *et al*. 2024). *Cyrtodactylus semiadii* Riyanto, Bauer, Yudha, 2014 is a Javan endemic gecko listed as not threatened (of least concern, LC; Riyanto & Iskandar 2021). It was described based on specimens from two localities: (i) Paliyan, Jogjakarta (Central Java), and Tuban (East Java) separated by ~200 km. Since its description, there has been only one study on this species by Damayanti (2017) on its habitat preferences in Paliyan, Jogjakarta. That study showed that this gecko is mostly encountered in litter on the forest floor. All other 21 records were obtained from photographs in the iNaturalist citizen science platform from Central Java between 2016–2023. The molecular data on this species were first included in a phylogenetic tree by Riyanto *et al*. (2020) sampled from a single locality.

Here we present an updated molecular analysis with several new sequences (Fig. 1) from several other localities based on a final alignment of 1,009 bp of the ND2 mitochondrial gene using maximum likelihood on the IQ-TREE (Nguyen *et al*. 2015). This has revealed that all the *C. semiadii* samples are monophyletic and nested within the *C. marmoratus* group *sensu* Grismer *et al*. (2021). The infraspecific genetic divergence (*p*-distance) ranged from 0.6%–4.9%. Examination of 24 specimens, including additional specimens to type specimens, has shown that all the samples throughout Central and East Java represent a single species with only minor variation at the infraspecific level. Males have 8–10 precloacal pores (Riyanto *et al*. 2024). This character was overlooked by Riyanto *et al*. (2014), but with additional specimens in this study, we note that the precloacal pores range from 6 to 10. This character became visible once methylene blue was applied to the specimens (Harvey *et al*. (2015).

***Cyrtodactylus semiadii***

(Figs. 2, 3)

A small-sized bent-toed gecko reaching SVL 51.4 mm; head triangular in dorsal view, distinct from neck; tubercles present on the occiput and dorsolateral of head. Rostral rectangular; naris oval; orbit separated from supralabials by two rows of small lorilabial scales; 8–13 supralabials; 8–10 infralabials. Mental triangular, bordered laterally by first infralabials, posteriorly by a pair of enlarged first postmentals, which contact medially over about 43–70%; second postmentals elongated, about one-third of the first postmentals, and separated from each other by 4–6 scales; gular sales small, granular, grading to slightly smaller size posteriorly and then from base of neck become enlarged smooth scales which overlap.

Body elongated, dorsal scales small, granular, interspersed with large, conical, semiregularly arranged, keeled tubercles; ventrolateral body folds indistinct; 15–20 dorsal tubercle rows; 26–49 paravertebral tubercles rows. Ventral scales larger than dorsals, smooth, flat, imbricate, 34–45 ventral scale rows across the belly; enlarged scales immediately anterior to the cloacal opening absent.

Forelimbs short, dorsal scales on forelimbs granular; dorsal surface of upper and lower arms, with few tubercles close to elbow and many near to the axilla; palmar scales flat, smooth,

# Plate 27

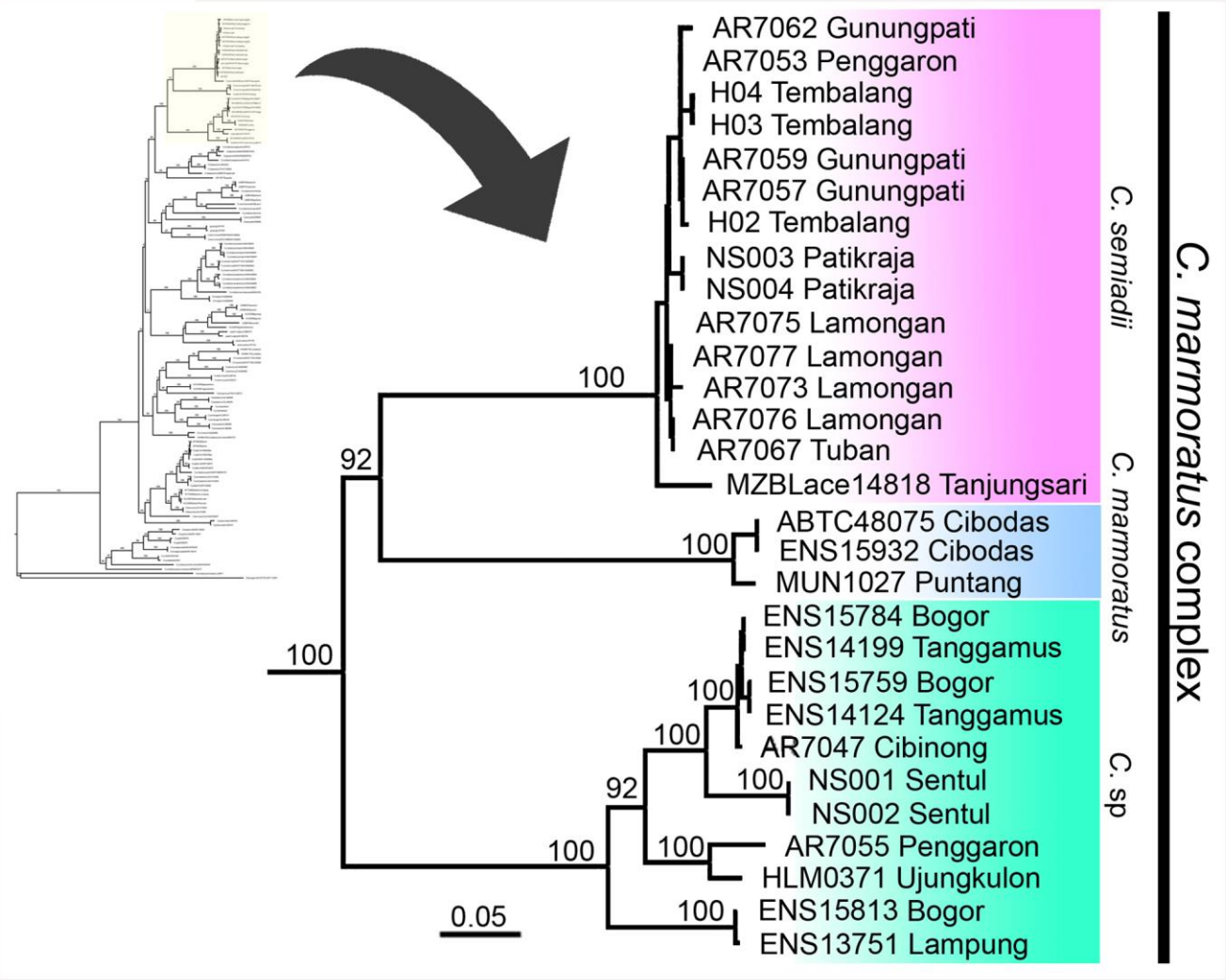


**Figure 1.** Maximum Likelihood (ML) phylogram showing *Cyrtodactylus semiadii* within the clade of *C. marmoratus* complex using ~1,009 bp fragment of ND2 mitochondrial gene and its flanking tRNAs

**Figure 2.** *Cyrtodactylus semiadii* in life (not collected) from Tuban, East Java, Indonesia

# Plate 28

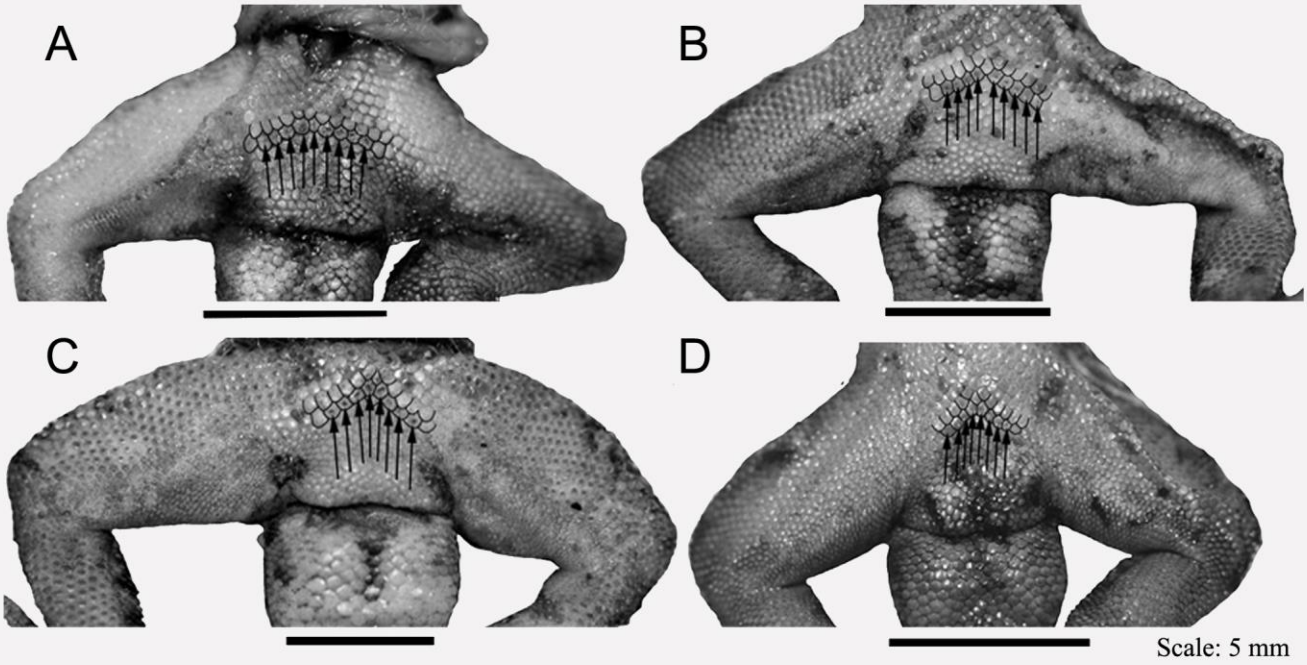


**Figure 3.** The variation of precloacal region of *Cyrtodactylus semiadii* from **(A)** Tanjungsari, Jogjakarta (Central Java); **(B)** Gunungpati (Central Java); **(C)** Lamongan (East Java); **(D)** Patikraja (Central Java)

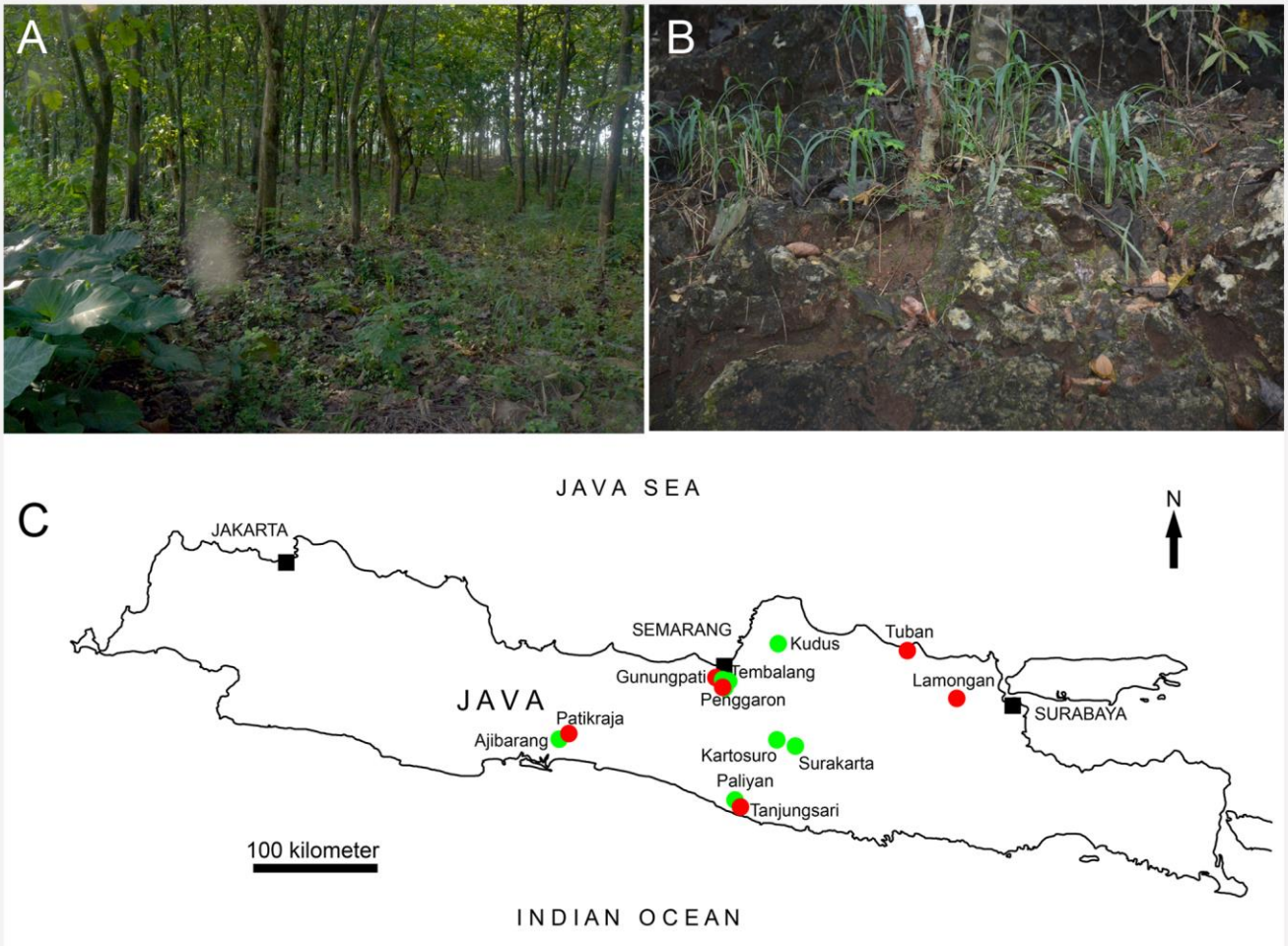


**Figure 4.** *Cyrtodactylus semiadii* habitat: **(A)** a Teak forest in Lamongan (East Java) and **(B)** a rocky embankment in Tanjungsari, Jogjakarta (Central Java); and **(C)** a map of Java showing the distribution of *C. semiadii* based on our field work (red circles) and iNaturalist database (green circles)

subimbricate; digits well developed, subdigital lamellae transversely expanded along the entire length of each digit, but slightly compressed in both length and width immediately distal to interphalangeal inflection; claws well developed. Hindlimbs longer than forelimbs; covered dorsally by granular scales interspersed with larger, conical tubercles; no femoral pores; males with 6–10 precloacal pore-bearing scales arranged in wide V-inverted obtuse angle. Subdigital lamellae transversely expanded along the entire length of each digit, but slightly compressed in both length and width immediately distal to interphalangeal inflection; claws well developed. Tail robust and short, with no enlarged median subcaudals.

Dorsal coloration varies from dark to light orangish brown, but mostly dark, dorsum with weak irregular narrow transverse darker brown markings between axilla and groin; a whitish light brown stripe extends from the upper postnasal region across the upper anterior eye; a dark brown stripe extends from lower postnasal past the lower anterior of eye and continues to the upper ear opening; ventral pale white. The dorsal tail is light brown patterned by irregular black blotches; ventral tail pale white patterned by irregular black blotches.

*Cyrtodactylus semiadii* occurs in various microhabitat types such as on the ground, on rocks, in dry rice fields, on grass and litter in gardens, pine, and teak forests (Fig. 4) and is distributed from the western parts of Central Java to the eastern parts of East Java at elevations from 50–300 m a.s.l.

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