

Status of *Gehyra marginata* Boulenger, 1887 on New Guinea

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Gehyra is a genus of small to large geckos that contains 72 species and ranges across an extensive area from southeastern Asia to Australia and eastward throughout much of Oceania (Bauer and Henle, 1994; Kraus, 2024; Uetz et al., 2024). Most species are Australian, and only four are found east of Papua New Guinea. Taxonomic diversity of this genus in Melanesia has long been uncertain because of unresolved taxonomic problems, though some of this has been resolved with the recent description of four new species from that region (Kraus, 2024). One remaining problem in Melanesian *Gehyra* is whether *G. marginata* is present in the region, and that is the focus of this report.

Gehyra marginata was described by Boulenger (1887) from Morotai Island in the northern Moluccas, Indonesia, and is a very distinctive species for the genus. It is characterized by the unique combination of large size (SVL up to >130 mm), flattened tail, undivided toe lamellae, extensive toe webbing, and small subcaudals of subequal size (Kraus, 2024). Subsequent to its original description it has also been reported from Halmahera, Obi, Ternate, and the Kei Islands (de Rooij, 1915; Oliver et al., 2010). In his extensive taxonomic investigation of the larger *Gehyra* species of the Pacific, Beckon (1990, 1992) mentioned that he encountered two museum specimens from New Guinea that had been labelled as *G. marginata*. Beckon's main goal was to examine whether *G. vorax* Girard, 1858 was indeed a junior synonym of *G. oceanica* (Lesson, 1830), as many researchers had long held (Beckon, 1992). In doing so, Beckon (1992) included all giant *Gehyra* ranging from the Moluccas to Fiji in his concept of *G. vorax* and questioned the distinctiveness of *G. marginata* from that species.

Subsequent work on giant geckos of this region has clarified the taxonomy of these lizards and progressively divided Beckon's wide-ranging *G. vorax* into seven allopatric species. King and Horner (1989) described *G. membranacruralis* from the vicinity of Port Moresby, Papua New Guinea, and this species was subsequently interpreted as encompassing all giant *Gehyra* on New Guinea and nearby islands by Flecks et al. (2012), who also removed Vanuatuan populations of giant *Gehyra* from *G. vorax* and described them as *G. georgopotthasti*. Subsequently, Oliver et al. (2016) removed populations of giant *Gehyra* from the Admiralty Islands from *G. membranacruralis* and named those populations *G. rohan*. They also provided molecular evidence to show that the Moluccan *G. marginata* was clearly distinct and distantly related to the giant geckos of the Pacific, thus confirming the validity of that species. Finally, Kraus (2024) re-examined the status of giant *Gehyra* from the remainder of Papua New Guinea and recognized two additional species: *G. chrysopeleia* from Sudest Island, off the southeastern tip of New Guinea, and *G. aquilonia* from the northern versant of eastern New Guinea. Doing this also clarified that *G. membranacruralis* inhabits only the southern savannah regions and adjacent monsoon forests and rainforests of southern New Guinea. These progressive taxonomic actions leave *G. vorax* restricted to Fiji, confirm the Moluccan *G. marginata* as a valid species, and recognize five additional species of giant *Gehyra* occupying islands between these geographical extremes.

These taxonomic clarifications of giant Indo-Pacific *Gehyra*, however, have left unaddressed the question as to the status of the two New Guinean *Gehyra* that Beckon (1992) referred to as "*G. marginata*". He did not directly examine these specimens and therefore could not distinguish them from other New Guinean "*G. vorax*", as that species was understood by him. Beckon's remarks about these specimens led Bauer and Henle (1994) to tentatively include the species as part of the Pacific saurifauna, and The Reptile Database (Uetz et al., 2024) continues to note that this

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species is questionably present on New Guinea. In contrast, in a conservation assessment for the IUCN Stubbs et al. (2021) asserted that the distribution of *G. marginata* is restricted to the northern Moluccan islands of Halmahera, Morotai, Obi, and Ternate, citing P. Oliver (pers. comm.), but they did not identify the New Guinean specimens questionably assigned to that species, nor state whether they examined those specimens, nor mention what evidence led to their conclusion. Furthermore, Stubbs et al. (2021) did not address the earlier assignment of specimens from the Kei Islands (de Rooij, 1915; current MVZ catalogue) to this species, although Karin et al. (2018) suggested *G. marginata* was not present on those islands and that reports from there were likely misidentified *G. barea* or a close relative. Consequently, the taxonomic status of the two problematic New Guinean specimens identified by Beckon (1992) remains unaddressed in the literature.

Although Beckon (1992) did not identify which problematic specimens from New Guinea were assigned to “*G. marginata*”, the information can be retrieved from his dissertation (Beckon, 1990). The relevant specimens are the only two from Dutch New Guinea listed under his “*G. vorax*” (CAS 64249 and CAS-SUR 11049; Beckon, 1990: 31), a jurisdiction later referred to in his published work under the new name “Irian Jaya” (Beckon, 1992). Although both were recorded as *G. marginata* by Beckon (1990, 1992), in the CAS catalogue they are currently referred to as *G. membranacuralis* and *G. vorax*, respectively, with the former identified by P. Oliver. Neither has precise locality data. To determine with certainty the status of *G. marginata* on New Guinea, I assessed the two western New Guinean CAS specimens for all relevant taxonomically useful characters so as to compare them against my recent taxonomic findings for New Guinean *Gehyra* and against the key to all Melanesian *Gehyra* with entire lamellae (Kraus, 2024), so as to provide a definitive answer to their taxonomic identity, and determine whether *G. marginata* should be considered a part of the Melanesian fauna or whether it is instead restricted to the Moluccas, as claimed by Stubbs et al. (2021).

Specimen CAS 64249 is a male with 128 mm SVL, 48 precloacal/femoral pores in an unbroken chevron across the pubic region and both thighs, 20/21 (R/L) undivided T4 lamellae, 13/13 undivided T1 lamellae, and extensive webbing between the toes. An antecubital skin fold is absent, the lateral skin fold is absent or weak (uncertain due to possible

preservation artifact), and the popliteal skin fold is extensive. The tail is rounded in cross-section without lateral serrations, and the subcaudals are expanded and in a single median row across the original tail, which is broken but with the anterior portion tied to the specimen. The postmentals are short, especially the lateral ones, which are less than half the length of the medial pair. Dorsal colouration is very pale grey (almost white), and the ventral colour is white.

Specimen CAS-SUR 11049 is also a male, with 109 mm SVL, 43 precloacal/femoral pores in an unbroken chevron across the pubic region and both thighs, 20 undivided T4 lamellae on both sides, 14 undivided T1 lamellae on both sides, and extensive webbing between the toes. The antecubital, lateral, and popliteal skin folds are all well developed. The tail is rounded in cross-section without lateral serrations, and the subcaudals are expanded and in a single median row across the original tail, which is broken but tied to the specimen. All postsupranasals are small, with none > 50% the size of the supranasal. There are four postnasals and one large internasal. The dorsal colouration is very pale brown (almost white), with scattered small brown flecks, densest on the head, neck, and forearms. The venter is uniformly white.

Direct comparison to specimens of *G. marginata* from Halmahera (UMMZ 225429, 227326) clearly shows that both CAS specimens cannot be confused with that species because they have round (vs. flattened) tails and enlarged subcaudals in a median row under the tail (vs. small subcaudals subequal in size). In all respects CAS 64249 keys to and clearly matches in direct side-by-side comparison *G. membranacuralis*. In all respects CAS-SUR 11049 keys to and clearly matches in direct side-by-side comparison *G. aquilonia*.

Although exact locality data were not retained with either specimen, CAS 64249 likely came from the savannah region or adjacent forest of South Papua Province, the only portion of Indonesian New Guinea containing habitat appropriate for this species. Similarly, CAS-SUR 11049 presumably came from somewhere along the north coast mountains or foothills of Papua Province. These two specimens represent the first country records for each of their respective species, so it is unfortunate that more precise locality data are available for neither. Robust identification of each specimen with the new data presented in Kraus (2024) also confirms the assertion of Stubbs et al. (2021) that *G. marginata* is not part of the New Guinean fauna and appears to be confirmed

only from the North Moluccan islands. Hence, that species can with certainty be removed from lists of the Melanesian herpetofauna.

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Appendix. Specimens examined.

- Gehyra aquilonia*. PAPUA NEW GUINEA: EAST SEPIK PROVINCE, Mindangua Stream, Prince Alexander Mts., BPBM 34745 (holotype).
- Gehyra marginata*. INDONESIA: MALUKU UTARA, Halmahera, UMMZ 225429, 227326.
- Gehyra membranacruralis*. PAPUA NEW GUINEA: CENTRAL PROVINCE, Varirata National Park, UMMZ 247752. NATIONAL CAPITAL DISTRICT, Port Moresby, University of Papua New Guinea, UMMZ 175393–94.