THE SYSTEMATIC STATUS OF CERTAIN AUSTRALIAN AND NEW GUINEAN GEKKONID LIZARDS

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The nomenclature of Australian and New Guinean reptiles can not reach the level of stability current in Europe and North America until the many type series extant in Australia are re-examined. Herpetologists have recognized this problem in the Australian region for some time (Loveridge, 1934, p. 248; 1948, p. 309) and yet it has only been relatively recent (Copland, 1946, 1947; Mack and Gunn, 1953) that there has been an attempt to restudy and evaluate the types of the large number of species so freely described by early Australian workers. A major part of the nomenclatorial confusion that remains today concerns the status of a large number of gekkonid lizards. This disorder in gekkonid nomenclature has in the most part been the result of inadequate original description and diagnosis, and in some cases spurious or totally absent locality data. The type series of the majority of the gekkonid species have never been re-examined and they have either been referred with some doubt to better known forms, treated as species inquirendae or ignored. A few species were originally incorrectly placed as to genus, thus presenting false zoogeographical patterns and greatly inhibiting understanding of the dispersal of this major group of lizards.

During 1961–62, under the auspices of a Fulbright Scholarship and Travel Award, I had the opportunity to visit all of the Australian university and museum herpetological collections. The gekkonid type material located in these depositories was examined and in part forms the basis for the present study. I have tried to conform to the new *International Code of Zoological Nomenclature* (1961); however, the preserved condition of the majority of the type series examined did not permit accurate measurements and determination of sex (Rec. 73c and 74c). Very little would have been gained by redescribing in detail and figuring the more or less dilapidated specimens, as the majority have been well described and figured elsewhere from fresh examples.

I wish to extend my gratitude to the curators of the following institutions for allowing me to examine the material under their care: Harold Cogger, Australian Museum (A.M.); Elizabeth Hahn, Macleay Museum (M.M.); Charles Brazenor (Director), National Museum of Victoria (N.M.); George Mack (Director), Queensland Museum (Q.M.); Glen Storr, Western Australian Museum (W.A.).

DIPLODACTYLUS ANNULATUS Macleay = [?] PHYLLODACTYLUS ANNULATUS (Macleay)

Diplodactylus annulatus Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 97. Type locality: Palm Island, north of Townsville, Queensland. Syntypes: M.M. R759–62.

The four specimens forming the type series of Diplodactylus annulatus are extremely desiccated and devoid of all color and pattern. The poor condition of this series precludes a more accurate interpretation of their status and it remains questionable until additional material can be collected. The only diagnostic characters that can be discerned in the type series with any degree of accuracy are the number of scleral ossicles and type of digits. The ossicle number appears to be fourteen per side in all specimens, and the digits are very similar to the Phyllodactylus-type (Underwood, 1954, p. 473). It is only on the basis of the low ossicle number that annulatus is removed from the Diplodactylinae (more than 18 ossicles) and referred to the Gekkoninae (less than 19 ossicles). Within the Gekkoninae, based solely on the similarity of the digits, annulatus is provisionally placed in the genus Phyllodactylus.

A comparison of Macleay's description of annulatus with other Australian Phyllodactylus (guentheri and marmoratus) reveals the following striking differences: (1) internasal shields (= supranasals) contiguous—almost never contiguous in guentheri and marmoratus; (2) dorsal body scalation heterogeneous, consisting of minute scales and flat, lightly carinate tubercles—homogeneous granular scales in guentheri and marmoratus; (3) dorsal surface of tail covered with strongly carinate scales forming raised annuli—homogeneous small scales in guentheri and marmoratus; (4) broad subcaudals—not greatly enlarged in guentheri and marmoratus; and (5) preanal pores present—absent in guentheri and marmoratus.

It is quite possible that Macleay's specimens of annulatus were mislabelled and actually obtained outside the Australasian region. The original description of annulatus compares favorably with Phyllodactylus occurring on the Comoro Islands and Madagascar. The following osteological characters of annulatus also indicate this relationship: nasals paired; 26 presacral vertebrae; neural arches of atlas not fused on midline; clavicles thin, greatly dilated, pierced by single fenestra; interclavicle very large and diamond-shaped; three sternal and two mesosternal ribs; and cloacal bones and hypoischium present. There are Ethiopian reptiles deposited in the Macleay Museum collection, which adds further support to this thesis.

M.M. R762 is here designated the lectotype in view of the absence of an original designation or data accompanying the type series.

PERIPIA PAPUENSIS Macleay = **HEMIDACTYLUS FRENATUS** Duméril and Bibron

Hemidactylus frenatus Duméril and Bibron, 1836, Erpét. Gén., 3, p. 366.

Peripia papuensis Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 97. Type locality: Katau (Katow), near the Binaturi River, New Guinea. Holotype M.M. R800.

When Macleay described *Peripia papuensis* he specifically noted only a single specimen from Katow (= Katau). In the Macleay Museum reptile collection *papuensis* is represented by two specimens (R800–1) from Katau, one (R1117) from Hall Sound and six (R924–9) from Port Moresby, all New Guinea. It is assumed that Macleay overlooked the second specimen from Katau, in view of their continuous catalogue numbers which suggest a similar date of collection. The material from Hall Sound and Port Moresby doubtless came from the same expedition as the holotype. The reason for their exclusion from the type description is unknown, but is in accord with the many other inconsistencies of the describer.

All of the material labelled as papuensis is still moderately well preserved and agrees with typical Hemidactylus frenatus. Peripia papuensis was compared with series of frenatus from Port Moresby, Lae and Bubia, New Guinea and agrees in the following important diagnostic characters: Hemidactylus-type digits (not noticeably webbed, free distal joints long, less than eight subdigital lamellae under fourth toe, and inner digit very short with minute claw); dorsal body tubercles small, smooth, conical; tubercles not present on back of head; tail with annuli of enlarged tubercles.

From Macleay's original description of *papuensis* it is difficult to refer to either specimen from Katau as the holotype with any certainty, and, as there is no accompanying information with the series to suggest a designation, R800 is here regarded as the holotype.

PERIPIA ORNATA Macleay = LEPIDODACTYLUS LUGUBRIS (Duméril and Bibron)

Platydactylus lugubris Duméril and Bibron, 1836, Erpét. Gén., 3, p. 304.

Peripia ornata Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 98. Type locality: Port Moresby, New Guinea. Syntypes: Three specimens now lost.

In the original description of *Peripia ornata*, Macleay recorded the type locality as Port Moresby, New Guinea. A thorough search of the Macleay Museum reptile collection, where the type series was deposited, produced only two rather desiccated specimens of *ornata* (R915–6) from the Barnard Islands (North and South), south of Innisfail, north-east Queensland. In the main museum catalogue, the type series from Port Moresby is noted as having consisted of three specimens. Presumably, these specimens are now lost.

Both of the specimens from the Barnard Islands agree with Macleay's very limited description of the species and doubtless were collected on the same expedition as the type series. The remaining specimens of *ornata*, compared with typical Lepidodactylus lugubris from New Guinea and the Solomon Islands, are identical in the following important diagnostic characters and therefore considered conspecific: Lepidodactylus-type digits; digits with rudiment of web; well developed thumb; four transverse rows of small chin shields; tail moderately flat inferiorly, with relatively sharp lateral edge (sometimes serrate); 25–31 femoral pores in male; dark brown eye bar; and variable dorsal body color pattern—spotted on either side of the vertebral line or with indistinct wavy bands.

Apparently, the Barnard Island material was the first *lugubris* collected from Australia. Mertens (1958) has subsequently recorded the species from Green Island, north-east of Cairns (approximately 75 miles north of the Barnard Islands).

PERIPIA LONGICAUDIS Macleay = GEHYRA VARIEGATA (Duméril and Bibron)

Hemidactylus variegatus Duméril and Bibron, 1836, Erpét. Gén., 3, p. 353.

Peripia longicaudis Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 98. Type locality: Endeavour River, near Cooktown, Queensland. Holotype: M.M. R974.

The holotype of *Peripia longicaudis* is rather desiccated and devoid of almost all color pattern. In spite of the poor condition of the holotype, it is possible to determine the important diagnostic characters of *Gehyra variegata*; *Gehyra-*type digits—distal subdigital lamellae divided by a median groove; absence of lateral body and hind limb skin folds; position of postmentals with regard to first and second infralabials; and presence of chromatophores on the venter. The holotype was compared in detail with series of *variegata* from numerous eastern coast and south-western interior localities of Queensland. All of the meristic and measurable characters of the holotype fall within the range of variation calculated from these series of known *variegata*.

PERIPIA DUBIA Macleay = GEHYRA VARIEGATA (Duméril and Bibron)

Hemidactylus variegatus Duméril and Bibron, 1836, Erpét, Gén., 3, p. 353.

Peripia dubia Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 98. Type locality: Cape Grenville, south of Shelburne Bay, east coast of Cape York Peninsula, Queensland. Holotype: Now lost.

A thorough search of the Macleay Museum reptile collection, where the holotype of *Peripia dubia* was deposited, did not reveal any material which could be associated with the original description or type locality. The main museum catalogue lists a single specimen of *dubia* from Cape Grenville. The Macleay collections have gone uncurated for considerable periods of time in the past and a large part of the material was allowed to dry up and either remains as an unintelligible mass of skin and bones or was discarded. It is possible that the holotype of *dubia* was discarded. To my knowledge no records were kept of the discarded specimens.

Although lacking in some important diagnostic characters, Macleay's limited description alone is enough to assign dubia to the synonomy of Gehyra variegata. Specimens of variegata from Queensland agree in all respects with the description of dubia. The diagnostic characters of variegata are listed under the preceding species discussion.

PERIPIA MARMORATA Macleay = **GEHYRA BALIOLA** (Duméril)

Hemidactylus baliolus Duméril, 1851, Cat. Méth. Rept., p. 38.

Peripia marmorata Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 99. Type locality: Katow (= Katau), near the Binaturi River, New Guinea. Holotype: M.M. R1201.

The holotype of *Peripia marmorata* is moderately well preserved and agrees in all respects with typical *Gehyra baliola* from New Guinea. The following diagnostic characters of *baliola* were used in the comparison with the holotype of *marmorata*: *Gehyra*-type digits, subdigital lamellae divided by a median groove; digits webbed at base; fold of skin bordering hind limb, absent along side of body; chin shields short; rostral U-shaped (deep mid-dorsal emargination); tail depressed, with sharp lateral edge; males with 18 to 21 preanal pores per side. Although the holotype of *marmorata* is an adult male the preanal pore number could not be accurately ascertained because of the badly damaged pelvic region.

PERIPIA BREVICAUDIS Macleay = GEHYRA BALIOLA (Duméril)

Hemidactylus baliolus Duméril, 1851, Cat. Méth. Rept., p. 38.

Peripia brevicaudis Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 99. Type locality: Darnley Island, Torres Strait, Queensland. Syntypes: M.M. R931-4 and R1006-8.

In the reptile collection of the Macleay Museum there are two lots of specimens (R931–4 and R1006–8), labelled as $Peripia\ brevicaudis$ from Darnley Island, which doubtless formed the type series. R931–4 (R931 = $Gehyra\ baliola$; R932–4 = $G.\ variegata$) are very well preserved and still retain their color pattern. R1006–8 (R1006–7 = $G.\ baliola$; R1008 = $G.\ variegata$) are extremely poorly preserved and their identification can only be considered tentative. The major diagnostic characters used in the identification of $baliola\ and\ variegata\ have\ previously\ been noted in the discussions of <math>Peripia\ marmorata\ and\ P.\ longicaudis\ respectively.$

There is no accompanying information with either series from Darnley Island to suggest a holotype and the designation of a lectotype can only be guided by the author's preference for a single specimen in the original description. R931 agrees most closely with Macleay's description, e.g. in the size and number of preanal pores, and is designated the lectotype. Some of the dorsal body and head scales of R931 are peculiarly arranged which represents either an early injury or general scutellational anomaly.

${\tt HETERONOTA}$ FASCIATA ${\tt Macleay} = {\tt CYRTODACTYLUS}$ PELAGICUS (Girard)

Heteronota pelagica Girard, 1857, Proc. Acad. Nat. Sci. Philadelphia, p. 197.

Heteronota fasciata Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 100. Type locality: Hall Sound, near Kairuku, New Guinea. Holotype: M.M. R802.

Gymnodactylus heteronotus Boulenger, 1885, Cat. Lizards Brit. Mus., 1, p. 41: nom. nov. for fasciata Macleay, preoccupied in Gymnodactylus.

The holotype of Heteronota fasciata is rather desiccated and little color or pattern persists. A comparison of the holotype with large series of New Guinea and Queensland Cyrtodactylus pelagicus reveals that the two forms are identical in all important diagnostic characters and thus confirms Loveridge's synonomy (1934, p. 300; 1948, p. 328). Loveridge has already discussed the variability of some of the characters of fasciata as stated in the original description; i.e. internasals (= supranasals) in contact, and the shape of the postmentals. I can confirm Loveridge's findings on both accounts.

The diagnostic characters of *pelagicus* are as follows: *Cyrtodactylus*-type digits (Underwood, 1954); a small species with lateral body fold absent; dorsum of body covered with 16–20 longitudinal rows of small conical striate tubercles; mental very large; postmentals small.

HETORONOTA MARMORATA Macleay = CYRTODACTYLUS PELAGICUS (Girard)

Heteronota pelagica Girard, 1857, Proc. Acad. Nat. Sci. Philadelphia, p. 197.

Hetoronota marmorata Macleay, 1877 Proc. Linn. Soc. N.S.W., 2, p. 100. Type localities: Fitzroy Island, south-east of Cairns, and Endeavour River, near Cooktown, Queensland. Syntypes: M.M. R632–4 and R905–13.

Gymnodactylus cheverti Boulenger, 1885, Cat. Lizards Brit. Mus., 1, p. 41: nom nov. for marmorata Macleay, preoccupied in Gymnodactylus.

Macleay's spelling of Heteronota is considered a lapsus calami in view of its correct presentation elsewhere in the paper. A type locality was not designated, however, Macleay referred to specimens from Fitzroy Island and Endeavour River as belonging to marmorata. These two series of marmorata are still extant in the Macleay Museum (R632–4, Fitzroy Island; R905–13, Endeavour River). Both series are very well preserved and are identical with large series of Cyrtodactylus pelagicus from New Guinea and Queensland (see diagnostic characters under discussion of Heteronota fasciata). Loveridge (1934, p. 300) has already reviewed the variability of some of the characters of marmorata as stated in the original description. The series of pelagicus from Queensland and New Guinea which I have used for comparison with the type series of marmorata does not support the validity of the characters considered in the description of the latter species.

Of the syntypes, R632 agrees most closely with Macleay's original description and is designated the lectotype. Fitzroy Island follows the lectotype as the restricted type locality.

HETERONOTA EBORACENSIS Macleay = CYRTODACTYLUS PELAGICUS (Girard)

Heteronota pelagica Girard, 1857, Proc. Acad. Nat. Sci. Philadelphia, p. 197.

Heteronota eboracensis Macleay, 1877, Proc. Linn. Soc. N.S.W., 2, p. 101. Type locality: Cape York, Queensland. Syntypes: M.M. R975–6.

The two specimens forming the type series (R975–6) of Heteronota eboracensis are extremely desiccated and only small fragments of skin are left covering their skeletal frameworks. In spite of the poor condition of the syntypes, eboracensis can be referred to the synonomy of Cyrtodactylus pelagicus with some degree of certainty. All of the major diagnostic characters of pelagicus (see Heteronota fasciata discussion) are still visible on the syntypes. The number of supra- and infralabials, nine and eight, respectively, as given by Macleay in the type description, are slightly above the mean for pelagicus, however, still within the known range of variation.

It is quite obvious that Macleay's brief and somewhat confused description has led some workers to retain *eboracensis* as a distinct species (Boulenger, 1885; Zietz, 1920). The misleading portions of the original description appear to be "scales mostly tricarinate; tubercles on the back numerous and nearly smooth; scales on the tail all smooth".

There is no information accompanying the type series or in the original description to indicate a holotype. There is nothing in the characterization of the species to suggest that Macleay had a preference for a particular specimen and therefore R975 is arbitrarily designated the lectotype.

DIPLODACTYLUS HILLI Longman = DIPLODACTYLUS CONSPICILLATUS Lucas and Frost

Diplodactylus conspicillatus Lucas and Frost, 1897, Proc. Roy. Soc. Vic., (n.s.) 9, p. 55.

Diplodactylus hilli Longman, 1915, Mem. Qd. Mus., 3, p. 32. Type locality: Port Darwin, Northern Territory. Holotype: Q.M. J1994.

In describing Diplodactylus hilli, Longman stated that he compared his form with a "subtype" of D. conspicillatus from Charlotte Waters, Central Australia. He remarked that the only differences between the two species were in color and dorsal and caudal lepidosis. Kinghorn (1929), who examined the holotype of hilli, pointed out the extreme similarity in the body and tail scalation of the two forms, yet for an unknown reason retained both as distinct species.

The holotypes of hilli (Q.M. J1994) and conspicillatus (N.M. D7535) were compared and found to be identical in what are now considered to be the important diagnostic characters: relatively narrow digits, with moderately large subapical plates and subdigital granules; cloacal spur consisting of a cluster of spines; preanal pores absent; tail short and very depressed (beaver-like); rostral shield large, excluded from margin of nostril; rostral crease absent; first supralabial greatly enlarged, excluded from margin of nostril, remaining supralabials and infralabials

reduced to granules along border of lip; mental very large, oval; snout round. A detailed examination of all the material of *conspicillatus* (and supposed *hilli*) extant in Australian collections did not reveal any consistant morphological differences throughout the entire range of the species from Queensland to Western Australia.

DIPLODACTYLUS BILINEATUS Lucas and Frost = **DIPLODACTYLUS PULCHER** (Steindachner)

Stenodactylopsis pulcher Steindachner, 1870, Sitz. Akad. Wiss. Wein, 62, p. 343.

Diplodactylus bilineatus Lucas and Frost, 1903, Proc. Roy. Soc. Vic. (n.s.), 15, p. 146. Type locality: Carnarvon, Western Australia. Holotype: N.M. D7570.

 $Diplodactylus\ lucasi\ {\rm Fry,\,1914,\,Rec.\,\,W.\,\,Aust.\,\,Mus.,\,\,1,\,\,p.\,\,177:\,\,nom\,\,nov.\,\,for\,\,bilineatus}$ Lucas and Frost, preoccupied in Diplodactylus.

Lucas and Frost stated that the type locality of *Diplodactylus bilineatus* was Caernarvon (= Carnarvon), Western Australia. This locality appears to have been a generalization as data accompanying the holotype indicates that it was actually collected 80 miles inland from Carnarvon, at Minilya Station.

The holotype of bilineatus was compared with specimens of pulcher and the two forms are clearly conspecific. The lined color pattern of bilineatus is identical with the "variation" dorsalis described by Werner (1910). The color pattern of pulcher is extremely variable in a single population and the lined forms appear to have no significance. The major diagnostic characters of pulcher which the holotype of bilineatus exhibits are as follows: digits long, relatively narrow, with moderately large subapical plates; subdigital lamellae consists of two rows of enlarged flattened scales; cloacal spur consists of a cluster of spines; preanal pores absent; tail moderately long, round in cross-section; rostral shield large, excluded from margin of nostril; supralabials and infralabials moderately large (the first supralabial excluded from the margin of the nostril); mental large and triangular; snout sharply pointed.

PEROCHIRUS MESTONI De Vis = GEHYRA VARIEGATA (Duméril and Bibron)

Hemidactylus variegatus Duméril and Bibron, 1836, Erpét. Gén., 3, p. 353.

 $Perochirus\ mestoni\ De\ Vis,\ 1890,\ Proc.\ Linn.\ Soc.\ N.S.W.\ (n.s.)\ 4,\ p.\ 1035.\ \ Type\ locality:$ Bellenden Ker, Queensland. Holotype: Q.M. J236.

The holotype of *Perochirus mestoni* (Q.M. J236) is still moderately well preserved, with the color and pattern persisting. The holotype was compared with specimens of *Gehyra variegata* from the eastern coast and south-western interior of Queensland and the two forms are clearly conspecific. The diagnostic characters of *variegata* have already been noted under the discussion of *Peripia longicaudis*. Also available for study were two specimens of *Perochirus guentheri*, which substantiate the removal of *mestoni* from the genus *Perochirus*.

DIPLODACTYLUS WOODWARDI Fry= DIPLODACTYLUS STENODACTYLUS Boulenger

Diplodactylus stenodactylus Boulenger, 1896, Ann. Mag. Nat. Hist., ser. 6, 18, p. 232.

Diplodactylus woodwardi Fry, 1914, Rec. W. Aust. Mus., 1, p. 175. Type locality: Strelly River, Pilbara Division, Western Australia. Holotype: W.A.M. R14370.

The holotype of *Diplodactylus woodwardi* is extremely desiccated and devoid of all color and pattern. The holotype was compared with a large number of specimens of *Diplodactylus stenodactylus* ranging from Carnarvon to Derby, Western Australia. The two forms agree in the following diagnostic characters and are clearly conspecific: digits very long and narrow, with small subapical plates; subdigital lamellae consist of rows of small conical granules; cloacal spurs consist of one or two large spines; preanal pores two to four per side; tail long, round in cross-section; rostral excluded from nostril; supra- and infralabials moderately large (first supralabial borders nostril).

Although Fry did not indicate a specific type locality for *woodwardi*, information accompanying the holotype indicates that it was collected at the Strelly River, Western Australia.

HOPLODACTYLUS TUBERCULATUS Lucas and Frost = CYRTODACTYLUS LOUISIADENSIS (De Vis)

Gymnodactylus louisiadensis De Vis, 1892, Ann. Qd. Mus., 2, p. 11.

Hoplodactylus tuberculatus Lucas and Frost, 1900, Proc. Roy. Soc. Vic. (n.s.) 12, p. 145. Type locality: Endeavour River, near Cooktown, Queensland. Holotype: N.M. D7874.

The holotype of *Hoplodactylus tuberculatus* is a moderately well preserved adult female. It was compared with specimens of typical *Cyrtodactylus louisiadensis* from the eastern coast of Queensland and the two forms are identical in the following important diagnostic characters: *Cyrtodactylus*-type digits (Underwood, 1954); a large species, with faint lateral body fold between axilla and groin; dorsal body tubercles small and conical, in 25 to 26 longitudinal rows; 4 to 7 broad dark brown body bands. The holotype of *louisiadensis* was deposited in the Queensland Museum, however, it now appears to be lost and is therefore not available for comparison with *tuberculatus*.

The Queensland series of *louisiadensis* are slightly different from those of New Guinea and associated islands. The morphological differences exhibited by the Australian material suggest a moderately long period of isolation from the parental New Guinean stock.

Hoplodactylus tuberculatus was apparently overlooked by Chrapliwy et al. (1961) in their review of Gehyra, Peropus, Hoplodactylus, and Naultinus (Myers, 1961).

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