

# A replacement name for *Sphenomorphus keiensis* (Kopstein, 1926) from the southeastern Moluccas, Indonesia (Reptilia: Squamata: Scincidae) with a redescription of the species

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*Lygosoma keiensis* Kopstein, 1926 is demonstrated to be a junior primary homonym of *Lygosoma cyanogaster keiensis* Sternfeld, 1918. The junior homonym, now placed in *Sphenomorphus*, is given the replacement name *S. capitolythos*, and redescribed from the holotype, the only known specimen.

## Introduction

Many homonyms exist among nominal species-group taxa described in the scincid genus *Lygosoma*, the genus to which most skinks were referred during the second half of the 19th and first half of the 20th century (Duméril & Duméril, 1851; Boulenger, 1887; De Rooij, 1915). This is particularly the case among species from southeast Asia and the Australopapuan region. Many of these homonyms are secondary, arising from Boulenger's (1887) combination in *Lygosoma* of species originally described in a number of genera, and a variety of replacement species names were created at the time (Boulenger, 1887; Ahl, 1925). However, some are primary homonyms, reflecting the long period after Boulenger's monograph when most new skink species were referred to *Lygosoma*.

*Lygosoma* was subsequently split into numerous genera, most notably by Smith (1937), Mittleman (1952) and Greer (1974). For example, the 112 species referred to *Lygosoma* in the most recent monographic treatment of the skinks of the Indonesian/Papuan archipelago (De Rooij, 1915) are currently assigned to 16-17 genera (there is recent disagreement about the validity of the genus *Apterygodon*; Mausfeld & Schmitz, 2003).

The dismemberment of *Lygosoma*, and the lack of any complete checklist of names in the family since Boulenger (1887), has resulted in little attention being paid in recent years to the existence of primary homonyms among species originally described in *Lygosoma* but now in different genera. Most of these homonyms apply to names now considered synonymous with other taxa and not in present use. Therefore there is no need to provide them with a substitute name (Article 23.3.5; International Commission on Zoological Nomenclature, 1999). However, there still remain some problematic names.

One publication particularly rife with homonyms is Sternfeld (1918), often incorrectly cited as published in 1920 (e.g., Loveridge, 1948; Tyler, 1968; Zweifel, 1979; Mys, 1988; Brown, 1991). Sternfeld described 16 new species and subspecies of skinks in this paper. Eight of these are homonyms. Sternfeld twice proposed the same species or subspecies name for two taxa in the same paper: *Lygosoma (Hinulia) maindroni wolfi* (p. 395) and *Lygosoma (Otosaurus) wolfi* (p. 397), and *Lygosoma (Riopa) albofasciolatum boettgeri* (p. 418) and *Lygosoma (Emoa) boettgeri* (p. 406), possibly considering that either the differing subgeneric assignment, or the allocation of names to subspecies rather than species, avoided the homonymy. These primary homonyms were identified by Mertens (1924), who proposed the nomina nova *Otosaurus sternfeldi* (currently *Sphenomorphus concinnatus* (Boulenger, 1887)) for *L. wolfi*, and *Riopa albofasciolatum poehli* (currently *Eugongylus albofasciolatus* (Günther, 1872)) for *L. a. boettgeri*.

Three of Sternfeld's skinks, *Lygosoma (Keneuxia) smaragdinum nigrum* (p. 400), *Lygosoma (Emoa) cyanogaster aruensis* (p. 405) and *Lygosoma (Hinulia) jobiense elegans* (p. 397), were junior secondary homonyms at the time of description, respectively of *Eumeces niger* Jacquinot & Guichenot, 1853 (now *Emoia nigra*, see Brown, 1991), *Eumeces aruensis* Doria, 1874 (now *Sphenomorphus jobiensis* (Meyer, 1874), see Boulenger, 1887 and Zweifel, 1980), and *Hinulia elegans* Gray, 1838 (the current identity of which is unknown (Cogger et al., 1983), although from the illustration subsequently provided by Gray (1845), it may be a synonym of *Eulamprus tenuis* (Gray, 1831)). *Lygosoma jobiense elegans* is also a junior primary homonym of *Lygosoma elegans* Boulenger, 1897 (now *Lobulia elegantoides* (Ahl, 1925) and a junior secondary homonym of *Euprepes (Tiliqua) elegans* Fischer 1883 (now *Lygosoma fernandi* (Burton, 1836)) and itself a junior primary homonym of *Euprepes elegans* Peters, 1854, long considered to be part of the genus *Mabuya* Fitzinger, 1826, but more recently implicitly transferred to the resurrected genus *Euprepis* Wagler (see Mausfeld et al., 2002), and still more recently to *Trachylepis* Fitzinger, 1843 (see Bauer, 2003) with recognition that *Euprepis* was not available for the Afro-Malagasy lineage formerly in *Mabuya*; Fischer (1884) proposed the replacement name *Euprepes leoninus* for *Euprepes (Tiliqua) elegans*.

Mertens (1929) provided the substitute name *Dasia smaragdinum melas* (now in *Lamprolepis*) for the secondary homonym *L. smaragdinum nigrum* Sternfeld, 1918, although the recognition of subspecies within *Lamprolepis smaragdinum* has mostly been avoided for over half a century (Kinghorn, 1928; Burt and Burt, 1932; Hediger, 1933, 1934; Greer, 1970; McCoy, 1980; Mys, 1988; Crombie & Pregill, 1999), and neither Sternfeld's *nigrum* nor Mertens' substitute name has subsequently appeared in the literature. Should the Nissan Atoll *Lamprolepis* be accorded taxonomic recognition in the future, Sternfeld's *nigrum* is to be used as this name is no longer homonymous.

The homonymy of Sternfeld's *elegans* was noted by Loveridge (1948: 346), although as no author since Sternfeld has applied the name to a species or subspecies distinct from *Sphenomorphus jobiensis*, no substitute name is needed.

Sternfeld's *aruensis* is currently placed in the synonymy of *Emoia longicauda* (Macleay, 1877) (see Brown, 1991), and again no substitute name is needed.

An eighth skink taxon described by Sternfeld (1918) is also a homonym, though this time as a senior primary homonym, and this homonymy has not been previously recognised, nor is any subsequently published name available for the junior homonym. Sternfeld (1918) described *Lygosoma (Emoa) cyanogaster keiensis*, while Kopstein (1926)

described *Lygosoma (Homolepida) keiensis*, both from the Kei Islands (now Kai Islands, or Kepulauan Kai, Indonesia). The epithet is formed incorrectly in both instances, as the name *Lygosoma* is neutral in gender. The epithet *keiensis* is to be corrected to *keiense* according to Articles 31.2 and 34.2 of the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature, 1999). This mandatory action has no further implications for the primary homonymy observed. Sternfeld's subspecies is currently placed in the genus *Emoia*, while Kopstein's species is currently placed in *Sphenomorphus*.

The purpose of this paper is to provide a replacement name for Kopstein's junior homonym, and a more thorough description and diagnosis of the species, still known only from the holotype.

### Systematics

#### *Lygosoma (Emoa) cyanogaster keiense* Sternfeld, 1918

*L[ygossoma]*. [(*Emoa*)] *cyanogaster keiensis* Sternfeld, 1918: 405; Mertens, 1922: 175.

*Lygosoma* [(*Emoa*)] *cyanogaster*, Kopstein, 1926: 90.

*Emoia cyanogaster*, Loveridge, 1948: 366.

[*Emoia*] *keiensis*, Mittleman, 1952: 25.

*Emoia cyanogaster keiensis*, Brown, 1954: 264; Mertens, 1967: 74.

*Emoia longicauda*, Brown, 1991: 49; How et al., 1998: 134.

Holotype.— SMF 15334 (Mertens, 1967: 74).

Type locality.— "Kei-Inseln, ? Molukken [...] Langgur (Kei)" (Sternfeld, 1918: 405).

Current status.— *Emoia longicauda* (Macleay, 1877).

Discussion of citation history.— Kopstein (1926) was the first to comment on Sternfeld's subspecies, stating that all of the Moluccan specimens he had collected agreed with Sternfeld's diagnosis of *L. c. aruense*. No material from the Kai or Aru Islands was available to him, but nevertheless he remarked that the purported differences in coloration and pattern were untenable in view of the great chromatic variation within *Lygosoma* species. Consequently, he referred his specimens to a monotypic *L. cyanogaster*. Loveridge (1948) rejected both *aruense* and *keiense* as well, but erroneously stated that Sternfeld had not provided any diagnosis. Mittleman (1952) listed the species-group taxon *keiense* in combination with *Emoia*, but this action did not reflect an intent to elevate it to species status for he noted "[I]n no sense does this list purport to be a checklist of the forms considered valid." Brown (1954) left the taxonomic status of the subspecies indeterminate, though restricting *E. c. cyanogaster* (Lesson, 1826) to the Solomon Islands, and recognising *E. c. longicauda* (Macleay, 1877) for populations in New Guinea. Mertens (1967) gave as current status *Emoia cyanogaster keiensis* without reference to a source, although presumably following Brown's listing. Brown (1991) in his monographic revision of the genus, placed Sternfeld's subspecies (misspelt twice as *E. c. keinensis*) in the synonymy of *E. longicauda* (Macleay, 1877), raising the latter to species status, although noting that further material was needed to resolve the status of the Aru and Kei Island populations. How et al. (1998), reporting on material from the Aru Islands, followed Brown's (1991) synonymy of Sternfeld's subspecies by not using trinomials in *E. longicauda*.

*Sphenomorphus capitolythos*, nomen novum for *Lygosoma keiense* Kopstein, 1926  
(figs 1-2)

*Lygosoma* [(*Homolepida*)] *keiense* Kopstein, 1926: 86.

*L*[*ygosoma*]. (*Sph*[*enomorphus*].) *keiense*, Brongersma, 1942b: 156.

[*Sphenomorphus*] *keiense*, Greer & Parker, 1967: 19.

*Sphenomorphus keiense*, Scott et al., 1977: 12; Whitaker et al., 1982: 47; Welch et al., 1990; Monk et al., 1997: 435.

Holotype. — RMNH 5088, an ethanol-preserved specimen of undetermined sex, collected March 1923, by Dr Felix Kopstein.

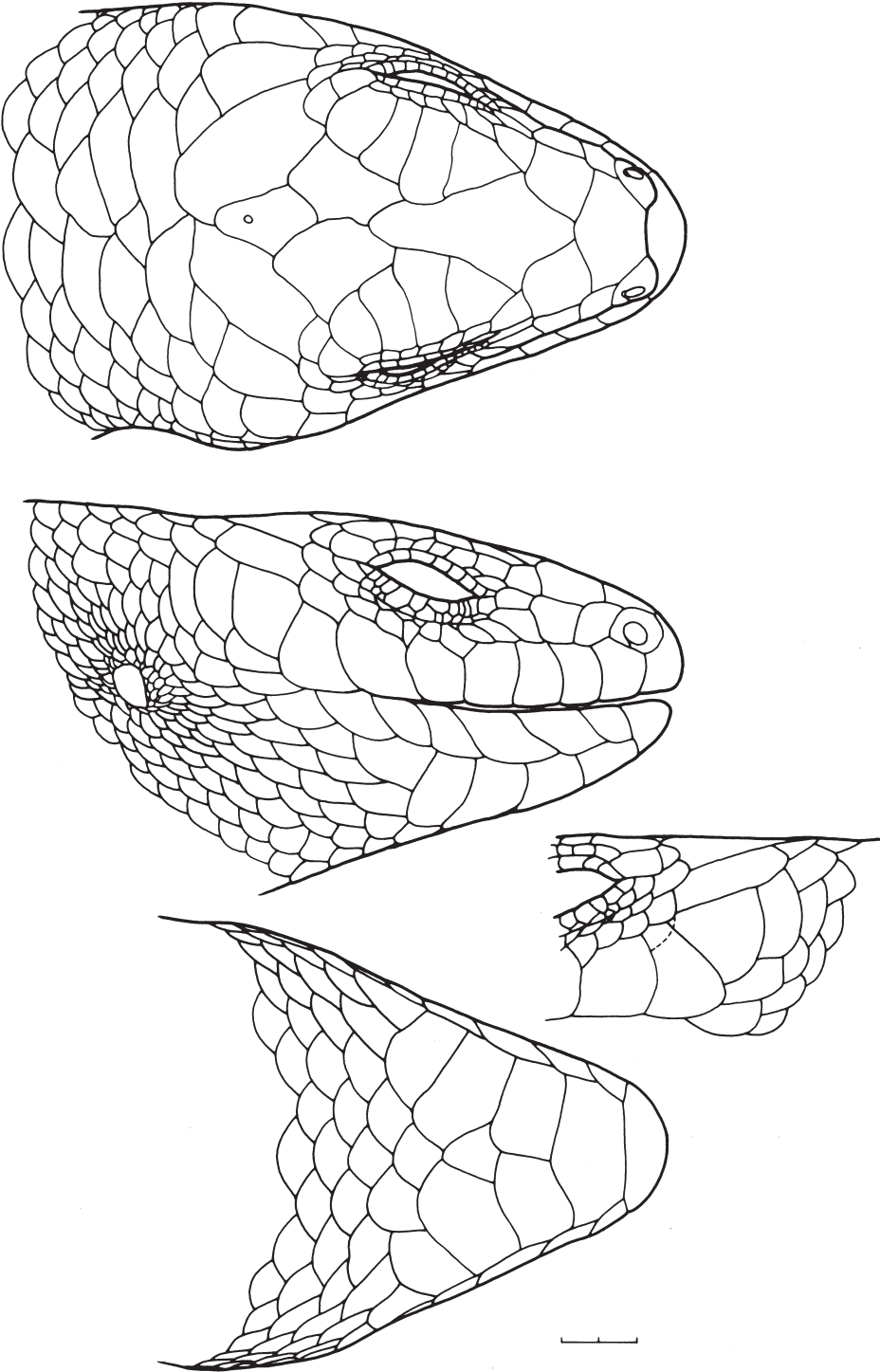
Type locality. — “Elat, Gross-Kei” (Kopstein 1926: 86). In contemporary geographical nomenclature, this locality is Elat (or Banda Elat) on Kai Besar, Kepulauan Kai, Maluku Tenggara Province, Indonesia (5°39’S 132°39’E).

Diagnosis. — A medium-sized species of *Sphenomorphus* (SVL 81 mm) with short limbs, widely separated when adpressed. The combination of grooved subdigital lamellae, a scaly lower eyelid lacking a central window, four supraoculars, third pair of chin shields medially separated by three scales but in lateral contact with the infralabials, no postsupraocular scale, and a temporal region with no fragmentation or division of the last two supralabial scales, single primary temporal scale or upper and lower secondary temporal scales, and with the upper secondary temporal overlapping the lower secondary temporal, will differentiate this species from all other members of the *Sphenomorphus* group of lygosomine skinks (Greer, 1979a) in Indonesia, the New Guinea region, and Australia.



Fig 1. Dorsal view of the holotype of *Sphenomorphus capitolythos*, *nom. nov.*

Fig 2. Dorsal, right lateral and ventral views of the head of the holotype of *Sphenomorphus capitolythos*, *nom. nov.* with (inset) detail of abnormal temporal region on left side of head (dashed line represents normal extent of primary temporal scale). Scale bar = 2 mm. ►



Description of holotype. — Nomenclature of head scales follows Taylor (1935), with exceptions as noted.

Head scalation. — Nasals moderately separated, nostril slightly posteroventrally located in nasal; supranasals and postnasals absent; prefrontals large, broadly separated medially; frontoparietals in broad contact; interparietal with parietal eye at junction of middle and posterior third; parietals in contact behind interparietal; nuchals 2/3; a single scale between upper secondary temporal and anterior nuchal on each side; supraoculars four, first two in contact with frontal; supraciliaries nine; posteriormost supraciliary (= anterior pretemporal of Greer, 1983) extends medially behind fourth supraocular, to contact frontoparietal on right side, but not on left side; posteriormost supraciliary not in contact with postocular, which instead wedges dorsally between penultimate supraciliary and uppermost postsubocular (= posterior pretemporal of Greer, 1983); single anterior and single posterior loreal, each with height and length similar, but posterior loreal dorsally a little longer than tall; presuboculars four; suboculars one; postsuboculars five; lower eyelid scaly, lacking a transparent window; supralabials seven, fifth below centre of eye, but separated from it by subocular series, sixth and seventh undivided; postsupralabials two; primary temporal single; secondary temporals two, lower overlapped by upper (on left side, the primary temporal is abnormally small, and the lack of its ventral part results in the last supralabial extending anteriorly to contact the postocular series; the arrangement of the scales of this region on the right side is typical of other sphenomorphine skinks with undivided temporal scales); external auditory meatus round, maximum diameter a little smaller than height of eye, tympanum deeply recessed; anterior margin of external auditory meatus lacking lobules; infralabials seven, first two in contact with postmental; three pairs of transversely enlarged chin shields, all laterally contacting the infralabial series; first pair of chin shields in medial contact; second pair separated by a median scale; third pair separated by three median scales.

Body and limb scalation. — Body scales in 31 rows at midbody (32 slightly anterior to this level); paravertebral scales not broader than adjacent dorsal scales, 59 from anteriormost nuchal to last scale anterior to level of hindlimbs (63 to level of posterior margin of hindlimbs); all scales polished and glossy; at high magnification, dorsal and lateral scales with many fine low longitudinal striations, but ventral scales smooth; median pair of preanals enlarged, overlapping more lateral preanals; lamellae below fourth toe 16, with a postaxial groove distinguishing a larger anterior and smaller posterior portion; scales above fourth toe six basally, three at middle of toe, reducing to two distally, with only terminal scale single; a sharp demarcation between rounded granular scales on sole and imbricate dorsal scales.

Measurements. — Snout-vent length 80.5 mm; axilla-groin interval 44 mm; tail distally regenerated; forelimb length 15 mm; hindlimb length 22 mm; head length 14.9 mm; head width 11.3 mm; head depth 8.8 mm.

Osteology (based on a radiograph of the type, and on direct examination of the dentition). — Presacral vertebrae 26, first three lacking ribs; sacral vertebrae two; tail regenerated from 17th postsacral vertebrae; ribs 6-8 sternal, 9-11 mesosternal, last four ribs short; phalangeal formula of manus and pes 2.3.4.5.3 and 2.3.4.5.4 respectively; premaxillary teeth nine (sum of left and right sides); maxillary teeth 18/17; postorbital bone possibly absent (the radiograph does not show a clearly distinct element in this region, although the postfrontal, jugal and squamosal are distinguishable).

Coloration.— Colour of the recently preserved specimen (after at most three years in preservative) was described by Kopstein (1926) as dorsally brown with irregularly arranged dark flecks, half a scale in size. Sides of the neck with faded grey reticulations. Lateral surfaces lighter brown. Ventral side uniform yellowish. The coloration in 2006, 80 years later, was similar, but paler. The dark flecks are located on both dorsal and lateral surfaces of body and tail, and are mostly located in the centre of scales, but occasionally obliquely oriented to cross scale rows. The upper and lower labial scales are dark-edged.

### Discussion

Kopstein remarked that his species was most closely related to *L. unilineatum* De Rooij, 1915. The latter taxon was recently reassigned to *Eugongylus* Fitzinger, 1843 by Greer and Shea (2000). However, *S. capitolythos* is not assignable to *Eugongylus*, based on supradigital scalation (multiple rows of scales in *S. capitolythos* vs. a single row in *Eugongylus*), nuchal scale orientation (obliquely to parietals vs. flush with parietals), preanal scales (median pair enlarged and overlapping adjacent lateral preanal scales vs all preanals more or less equal in size, with median pair overlapped by adjacent lateral preanal scales), number of presacral vertebrae (26 vs 28-30) and supranasals (absent vs usually present). In the first three of these character states, and in possessing nine premaxillary teeth, the species is clearly a member of the *Sphenomorphus* group of Greer (1979a). However, within this major lineage, the generic assignment of this species is less clear. In most scalational features, and in coloration, the species is similar to *Glaphyromorphus nigricaudis* (Macleay, 1877), from which it differs in having deeply grooved subdigital lamellae (vs smoothly rounded, ungrooved) and a greater number of paravertebral scales (63 vs 52-58, see Greer, 1979b). In the former feature, it is more similar to *Sphenomorphus* species occurring in New Guinea (Smith, 1937; Shea & Greer, 1999). However, it differs from the most speciose group in this region (the *S. maindroni* group, Greer & Shea, 2004) in lacking a postsupraocular scale, although in similarity with the postsupraocular of the *S. maindroni* group, the terminal supraciliary (or anterior pretemporal) extends to the frontoparietal (but on one side only).

There has been no rigorous morphological or biochemical analysis of relationships within the *Sphenomorphus* group of lygosomine skinks that has included both *Glaphyromorphus* and members of the *S. maindroni* group. The genus *Sphenomorphus* itself is currently undiagnosed in terms of derived character states within the *Sphenomorphus* group, and is likely to consist of more than one lineage on the basis of morphological variation. Similarly *Glaphyromorphus* is currently undiagnosed in terms of derived character states within the *Sphenomorphus* group, and represents a morphotype rather than a lineage (Greer, 1989, 1990). DNA sequence evidence for the polyphyly of *Glaphyromorphus* has been presented by Reeder (2003). Reeder also reported a major monophyletic lineage consisting of all Australian genera within the *Sphenomorphus* group, although his sampling of non-Australian representatives of the group was limited to just three species (representing *Prasinochaema*, *Scincella* and the *Sphenomorphus muelleri* species group). Hence, it is possible that his Australian lineage may include some non-Australian taxa, including some species currently assigned to *Sphenomorphus*. Given the present uncertainty about the limits and relationships of *Sphenomorphus* and *Glaphyromorphus*, we tentatively retain *S. capitolythos* in *Sphenomorphus*.

## Etymology

The specific epithet is a noun in apposition and honours Felix Kopstein (born 4 June 1893 in Vienna, Austria-Hungary [Adler stated Austria, but at that time Austria was part of the Habsburg Austro-Hungarian dual monarchy]; died 14 April 1939 in The Hague, the Netherlands), a physician and author of the last review of the Moluccan reptilian fauna (Adler, 1989). *Capitolythos* is derived from *caput* (Latin for 'head') and *lythos* (Greek for 'stone'), in reference to the two probable German compound words in the name Kopstein, German for head and stone respectively. This unconventional form of patronym was chosen because of the existence of *Lygosoma emigrans kopsteini* Brongersma (1942a). The species *emigrans* is presently assigned to the genus *Glaphyromorphus* (Greer, 1990) but the subspecies has not been re-evaluated in subsequent studies of the genus in the Lesser Sundas (Auffenberg, 1980; Greer, 1990; Aplin et al., 1993), and has only been mentioned in a listing of Brongersma's named taxa by Hoogmoed (1995).

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