

# A new *Mabuya* from Java, Indonesia

PATRICK MAUSFELD & WOLFGANG BÖHME

## Zusammenfassung

*Eine neue Mabuya aus Java, Indonesien.*

Im Rahmen einer aktuellen Revision der Gattung *Mabuya* (einschließlich der Anwendung molekulargenetischer Methoden) wurde eine neue Art anhand von zwei Exemplaren aus Java, Indonesien, entdeckt. Die neue Art erweist sich genetisch als klar in die asiatische Fraktion der Gattung gehörig und wird daher mit den asiatischen Gattungsvertretern verglichen. Sie kann durch die folgende Merkmalskombination diagnostiziert werden: Unteres Augenlid nicht mit transparentem Fenster sondern mit semitransparenter, aus mehreren Schuppen bestehender Scheibe; Supranasalia getrennt; Postnasalia vorhanden; Präfrontalia aneinanderstoßend; Parietalia getrennt; ein Paar Nuchalia; 27 Schuppen um die Körpermitte und dreikeilige Rückenschuppen. Charakteristisch ist auch ein schwarzes Lateralband, welches sich von der Schläfe bis zur Schulterregion erstreckt, von wo es caudalwärts verbläßt.

Schlagwörter: Reptilia: Squamata: Sauria: Scincidae: *Mabuya* sp. nov.; Indonesien: Java.

## Abstract

Within the framework of a current revision of the genus *Mabuya* (including the employment of molecular genetic methods), a new species is described from two specimens from Java, Indonesia. Genetically, it clusters clearly with the Asian section of the genus, and is therefore compared with the Asian representatives of the genus, but it is not assignable to any known species. The new species is characterized by the following character state combination: lower eyelid scaly; supranasals separated; postnasals present; prefrontals not separated; parietals separated; one pair of nuchals; 27 midbody scales; 3-keeled dorsals. A distinct black lateral band, extending from the eyes to the shoulder region, which posteriorly fades, is a further diagnostic character state of the new species.

Key words: Reptilia: Squamata: Sauria: Scincidae: *Mabuya* sp. nov.; Indonesia: Java.

## 1 Introduction

The knowledge of the herpetology of Java, Indonesia, is still rather poor and mainly based on publications dating from the first half of the last century. Most of these papers are based on the classical work by DE ROOIJ (1915) (e.g. BRONGERSMA 1930, 1934). Other examples for the importance of DE ROOIJ's work on the herpetology of this area include the comprehensive treatment of the zoogeography of Java by DAMMERMAN (1929). In this work, the author listed - next to 36 amphibians, seven freshwater and four marine turtles, three crocodiles and 68 snakes - 33 lizard species, among them eight scincids: *Tiliqua gigas*, *Lygosoma sanctum*, *L. olivaceum*, *L. temmincki*, *L. chalcides*, *Mabuya quinquecarinata* (with question mark), *M. rugifera*, and *M. multifasciata*. Only few herpetological surveys have been conducted on Java since then. In his work on reproductive modes of Javanese reptiles KOPSTEIN (1929) gives data for 10 lizard species, *Lygosoma temmincki* and *Mabuya multifasciata* being the only scincid lizards. In his paper on the reptiles of western Java KOPSTEIN (1930) listed 20 lizard species, among them five scincids, viz. *Lygosoma sanctum*, *L. temmincki*, *L. chalcides*, *Mabuya multifasciata*, and *Mabuya quinquecarinata*. MERTENS (1957), who listed for West Java (Ujung Kulon) nine lizard species, including four scincids (*Sphenomorphus s. sanctus*, *S. temmincki*, *Mabuya m. multifasciata*, and *Mabuya rugifera*), conducted the next herpetological survey.

In the framework course of current phylogenetic studies on the genus *Mabuya* (MAUSFELD et al. 2000, MAUSFELD unpublished) we obtained two living specimens which were part of a shipment through the pet trade from Java, without precise locality data. On closer examination these specimens were neither assignable to any *Mabuya* species nor to any other scincid lizard currently known from Java. Further comparative morphological investigations led us to the conclusion that it is actually a *Mabuya*, but that it is not assignable to any known Asian species. Consequently, it is described here as a new taxon.

## 2 Material and Methods

Holotype and paratype of the new species are deposited in the collection of the Zoologisches Forschungsinstitut und Museum Alexander Koenig (ZFMK), Bonn, Germany. Snout-vent length (SVL) and tail length (TaL) of the preserved specimens were measured with a ruler to the nearest 1 mm. All other measurements provided throughout the text were taken by a dial caliper to the nearest 0.1 mm. In cases of measurements and/or scale counts on both sides of one individual, the left side follows the right side. To count the presacral vertebrae, a character considered to be of systematic significance in *Mabuya* (GREER et al. 2000), we x-rayed both type specimens.

## 3 Results

*Mabuya macrophthalma* sp. nov.

(Figs. 1-4)

Holotype: ZFMK 71717, adult female, Java, Indonesia, obtained by native collector, 1999.

Paratype: ZFMK 71716, adult female, same data as holotype.

Diagnosis: A big-growing, long-tailed species of *Mabuya*, distinguished from all other Asian members of the genus by the following combination of characters: head pointed; lower eyelid with a series of transversely enlarged opaque scales; supranasals separated; postnasals present; prefrontals in broad contact; parietals separated by interparietal; upper anterior temporal overlapping the parietal; two primary temporals followed by an upper and lower secondary temporal separated by a well established intervening tertiary temporal; one pair of multi-keeled nuchals; 27 scales around midbody; dorsal scales with three prominent longitudinal keels; coloration in life is greenish-brown with the neck colored brown fading posteriorly into the greenish-brown color of the rest of the dorsum. Dorsal scales are iridescent. A black lateral band, covering three scale rows, extends from just behind the eye to almost half of the body. After passing the shoulder it tapers off within the anterior half of the body. The flanks are grey to bluish-grey blending into the white of venter.

Description of holotype: Large, adult female with well developed pentadactyl limbs; snout pointed; head slightly narrower than neck. SVL 98 mm, TaL (tip of the tail regenerated: used as tissue sample) 177 mm; head length from tip of snout to anterior border of ear opening 21.2/21.0 mm; centre of nostril nearer to tip of snout (2.5/2.2 mm) than to anterior corner of eye (7.1/7.2 mm); internarial distance 3.5 mm; interocular distance at anterior corner of eyes 8.5 mm; head width at centre of eyes

12.6 mm; head height at centre of eyes 8.9 mm; limbs from inner base to claw tip of fourth finger and toe, respectively: forelimbs 34.3/34.5 mm, hindlimbs 60.7/57.3 mm; hindlimbs reach elbows when adpressed to body; lengths of fourth fingers 10.2/10.5 mm, and of fourth toes 15.9/15.3 mm; tail width at its base 14.0 mm.



Fig. 1. Dorsal view of holotype (left: ZFMK 71717) and paratype (ZFMK 71716) of *Mabuya macrophthalmia* sp. nov. Photo: J. KÖHLER.

Dorsalansichten von Holotypus (links: ZFMK 71717) und Paratypus (ZFMK 71716) von *Mabuya macrophthalmia* sp. nov. Foto: J. KÖHLER.

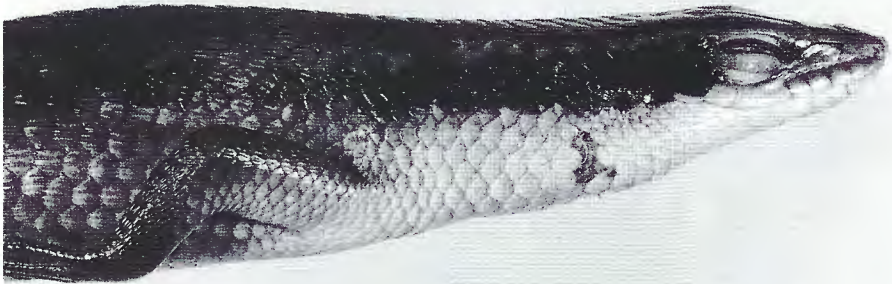


Fig. 2. Lateral view of the head of the paratype (ZFMK 71716) of *Mabuya macrophthalmia* sp. nov. Photo: J. KÖHLER.

Seitliche Kopfansicht des Paratypus (ZFMK 71716) von *Mabuya macrophthalmia* sp. nov. Foto: J. KÖHLER.

Rostral broader than high; supranasals separated from each other; frontonasal broader than long; prefrontals in broad contact; frontal much longer than broad; frontoparietals separated, longer than wide, reaching second supraoculars; interparietal longer than wide, not separating parietals, in contact posteriorly; one pair of weakly multi-keeled nuchals; nostrils in a single nasal; postnasals present, above first supralabial; two loreals, anterior slightly higher than long, posterior twice as long as high and more than twice as long as first loreal; first upper preocular large and in contact with third and fourth supralabials, posterior to second loreal; second lower preocular much smaller than first; four supraoculars, second largest, the first entirely separated from the frontal, the second extends forward to contact the prefrontal; six supraciliaries, third largest; two pretemporals; temporal scales smooth, two primary temporals followed by an upper and lower secondary temporal separated by a well established intervening tertiary temporal, the upper anterior temporal overlapping the parietal (Fig. 3); eyelids well developed, lower eyelids with a series of transversely enlarged opaque scales (in literature often described as scaly disk); seven supralabials, sixth enlarged; infralabials six; external ear opening on the left side slightly longer than high, on the right side round, with two or three short, pointed lobules at its anterior margin.

Dorsal, lateral and ventral scales subequal; preanals only slightly enlarged; subcaudals not enlarged; 33 dorsal scales (from nuchals to a line connecting posterior border of hindlimbs), dorsals with 3 keels; 27 scales around midbody; 49 ventrals (from behind chin shields to cloaca excluding row of slightly enlarged cloacal shields); 85 subcaudals from cloaca to tip of tail; scales on dorsal surface of forelimbs and hindlimbs tricarinate; subdigital lamellae spinose, 17 under the fourth finger, 22 under the fourth toe; 26 presacral vertebrae.

Coloration (after four months of preservation in 70 % ethanol): dorsal part of the body greenish olive-brown with the neck colored chestnut brown passing posteriorly of the shoulder into the olive-brown color of the rest of the dorsum. The olive-brown part is distinctly more iridescent than the brown neck. There are two dorsal rows with tiny black parts, each consisting of five black-spotted scales, each of which is separated through one or two not black-pigmented scales. A black lateral band, covering three scale rows, extends from just behind the eye to almost half of the body. After passing the shoulder it tapers off within the anterior half of the body. The flanks are grey to bluish-grey blending into the white of venter. Throat between ear opening and forelimb insertion whitish grey. Ventral surface of the hindlimbs and tail light brown to greyish. The color has only hardly faded from the living condition (Fig. 4).

Fig. 3. Lateral head scalation of the holotype (ZFMK 71717) of *Mabuya macrophthalma* sp. nov. Drawing: U. BOTT.

Seitliche Kopfbeschnuppung des Holotypus (ZFMK 71717) von *Mabuya macrophthalma* sp. nov. Zeichnung: U. BOTT.

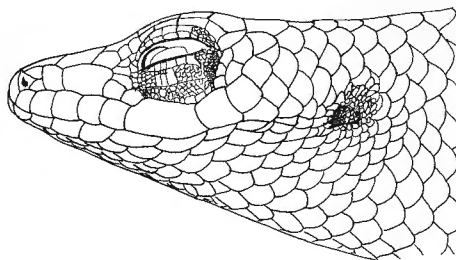




Fig. 4. Lateral view of head of the paratype of *Mabuya macrophthalmalma* sp. nov. (ZFMK 71716). Photo: W. BÖHME.

Seitliche Kopfansicht des Paratypus von *Mabuya macrophthalmalma* sp. nov. (ZFMK 71716). Foto: W. BÖHME.



Fig. 5. Lateral view of *Mabuya multifasciata* (ZFMK 71718) from Java, Indonesia. Photo: W. BÖHME.

Seitliche Ansicht von *Mabuya multifasciata* (ZFMK 71718) von Java, Indonesien. Foto: W. BÖHME.

Variation: The paratype is generally very similar to the holotype and has the following corresponding character states: SVL 108 mm, TaL (tail apparently not regenerated) 217 mm; head length from tip of snout to anterior border of ear opening 22.5/22.3 mm; center of nostril nearer to tip of snout (2.0/2.5 mm) than to anterior corner of eye (8.1/8.1 mm); internarial distance 3.9 mm; interocular distance at anterior corner of eyes 9.0 mm; head width at centre of eyes 12.4 mm; head height at centre of eyes 10.5 mm; limbs from inner base to claw tip of fourth finger and toe, respectively: forelimbs 36.9/35.5 mm, hindlimbs 54.3/51.9 mm; hindlimbs reach elbows when adpressed to body; lengths of fourth fingers 10.4/9.9 mm, and of fourth toes 16.9/17.6 mm; tail width at base 15.4 mm.

Headscales are almost identical to those of the holotype. ZFMK 71716 has the anterior loreal slightly longer than high, the posterior loreal almost twice as long as the first loreal. It has 26 scale rows around midbody, 34 dorsal scales, under fourth toe right 19, left 21 subdigital lamellae, and due to a not regenerated tail 103 instead of 85 subcaudals. Both specimens have 26 presacral vertebrae, thus fitting the general pattern of all Asian, nearly all African and some Cape Verdian species (see GREER et al. 2000).

Etymology: Latinized from Greek makros = large, and ophthalmos = eye, pointing on the remarkably large eyes of the new species.

Distribution: Presently known only from the type locality Java, Indonesia.

Comparisons: The new species is clearly assignable to the genus *Mabuya* FITZINGER, 1826, which is diagnosed by the following combination of characters (e. g. BOULENGER 1912, DE ROOIJ 1915, SMITH 1935, TAYLOR 1963, HORTON 1973, LEVITON et al. 1992, GREER & NUSSBAUM 2000): palatine bones in contact mesially; palatal notch entirely separating pterygoids, extending forward to midorbital position; pterygoid teeth minute or absent; maxillary teeth bicuspid or conical; limbs well developed, pentadactyle; digits subcylindrical or compressed, with transverse lamellae below; eyelids well developed and movable, lower eyelid with or without a more or less transparent disk; ear distinct, tympanum more or less deeply sunk; supranasals and prefrontals present; nostril pierced in a single nasal; usually two frontoparietals, rarely united in a single shield; interparietal distinct or rarely united with parietals; reduction in the contact between the first supraocular and the frontal.

As suggested already by the biogeographical pattern, Asian members of the genus *Mabuya* prove to be distinctly separated from both their Neotropical and Afrotropical congeners by molecular data (MAUSFELD unpublished.). Because *Mabuya macrophthalmia* clearly clusters with the Asian species of *Mabuya*, we compare it here exclusively with this clade of the genus. It differs from *Mabuya bibronii* (GRAY, 1839), *M. dissimilis* (HALLOWELL, 1857), *M. doriae* BOULENGER, 1887, *M. innotata* (BLANFORD, 1870), *M. quadratilobus* BAUER & GÜNTHER, 1992, in possessing a scaly lower eyelid (vs. a transparent disk in the lower eyelid of the species mentioned: BLANFORD 1870, BOULENGER 1887, WELCH et al. 1990, BAUER & GÜNTHER 1992, TIKADER & SHARMA 1992).

Three recent publications deal with some new characters which are said to be of systematic significance within the genus *Mabuya* (GREER & NUSSBAUM 2000, GREER & BROADLEY 2000, GREER et al. 2000). As far as helpful for differentiating our new species from its congeners they will be mentioned below.

For *M. novemcarinata* (ANDERSON, 1871) scaly eyelids are reported by ANDERSON (1871) and by BOULENGER (1887); however, both SMITH (1935) and TAYLOR (1963) characterize this species as having a transparent disk in the lower eyelid. In addition, *M. novemcarinata* is distinguishable from *M. macrophthalma* by lacking postnasals and by a higher midbody scale count (32-34). For the Philippine species *M. cumingi* BROWN & ALCALA, 1980 and *M. indeprensa* BROWN & ALCALA, 1980, no information on the condition of the lower eyelid is provided, but the two species differ, together with *M. bontocensis* TAYLOR, 1923, from our new species in having the prefrontals divided, a different coloration and a higher midbody scale count (BROWN & ALCALA 1980).

For *M. longicaudata* (HALLOWELL, 1857), scaly lower eyelids have been reported by e.g. STEJNEGER (1907), SMITH (1935), WANG (1962), and TAYLOR (1963), although BOULENGER (1887) recorded lower eyelids with transparent disks. Comparative material from the ZFMK collection (nine specimens from Thailand: ZFMK 43911-12, 43934-36, 45715, 47106, 55162-63; seven from Myanmar: ZFMK 45503-06, 45550-52; seven from Vietnam: 44207, 67178-79, 70456, 70457-58, 71273; one from China: ZFMK 61755; one from Myanmar: 47064) shows constantly the first named condition, i.e. a scaly eyelid. In any case, *M. longicaudata* differs from *M. macrophthalma* by having the supranasals in contact, prefrontals separated, loreals nearly equal in size, different parietal/temporal overlap pattern, only one primary temporal, and by a different coloration.

Taxon	Author	Midbody scales (range)
<i>Mabuya macrophthalma</i>	this paper	27
<i>M. multifasciata</i>	AUFFENBERG (1980)	29-33
<i>M. multifasciata</i>	BIWAS (1984)	33-34
<i>M. multifasciata</i>	BOULENGER (1887)	30-34
<i>M. multifasciata</i>	BOULENGER (1912)	30-34
<i>M. multifasciata</i>	BOURRET (1942-1947)	30-34
<i>M. multifasciata</i>	BROWN & ALCALA (1980)	30-34
<i>M. multifasciata</i>	HORTON (1973)	28-32
<i>M. multifasciata balinensis</i>	MERTENS (1927)	34
<i>M. multifasciata</i>	MERTENS (1930)	29-34
<i>M. multifasciata tjendikianensis</i>	MERTENS (1956)	33
<i>M. multifasciata</i>	MERTENS (1956)	33-34
<i>M. multifasciata</i>	MERTENS (1959)	32-36
<i>M. multifasciata</i>	OTA (1994)	30-34
<i>M. multifasciata</i>	DE ROOIJ (1915)	30-34
<i>M. multifasciata</i>	SMITH (1935)	30-34
<i>M. multifasciata</i>	TAYLOR (1958)	29-30
<i>M. multifasciata</i>	TAYLOR (1963)	34
<i>M. multifasciata</i>	TIKADER & SHARMA (1992)	30-34

Tab. 1. Midbody scale counts of *Mabuya macrophthalma* and *M. multifasciata*.

Anzahl der Schuppen um die Körpermitte bei *Mabuya macrophthalma* und *M. multifasciata*.

Among the Asian species of *Mabuya* possessing scaly lower eyelids, the following features differentiate *M. macrophthalma*: *M. andamanensis* SMITH, 1935, *M. clivicola* INGER, SHAFFER, KOSHY, & BAKDE, 1984, *M. darevskii* BOBROV, 1992, *M. englei* TAYLOR, 1925, *M. gansi* DAS, 1991, *M. macularia* (BLYTH, 1853), *M. madaraszi* MEHELY, 1897, *M. multicarinata* (GRAY, 1845), *M. nagarjuni* SHARMA, 1969, *M. quadricarinata* BOULENGER, 1887, *M. quinquecarinata* WERNER, 1896, *M. rugifera* (STOLICZKA, 1870), *M. trivittata* (HARDWICKE & GRAY, 1827) have more than three keels on their dorsal scales. *M. allapallensis* SCHMIDT, 1926, has distinctly separated prefrontals, no postnasals, and fused frontoparietals; *M. beddomii* (JERDON, 1870) has the supranasals in contact, no postnasal, and a higher midbody scale count; *M. carinata* (SCHNEIDER, 1801) has no postnasal, and a higher midbody scale count. *M. chapaensis* (BOURRET, 1837) has no supranasals and also a higher midbody scale count; *M. floweri* TAYLOR, 1950, has no postnasal, a higher midbody scale count, and separated prefrontals. *M. multifasciata* has higher midbody scale counts (Tab. 1) and a strikingly different color pattern (Fig. 5). *M. rudis* BOULENGER, 1887, next to its smaller size also differs by its distinct color pattern. *M. tytleri* (THEOBALD, 1868) has the supranasals in contact, and a different color pattern (BOULENGER 1887, DE ROOIJ 1915, SMITH 1935, BOURRET 1937, TAYLOR 1950, 1963, HORTON 1973, BROWN & ALCALA 1980, INGER et al. 1984, WELCH et al. 1990, DAS 1991, 1994, BOBROV 1992, TIKADER & SHARMA 1992).

SMITH (1916) transferred *Lygosoma praesigne* BOULENGER, 1900 to the genus *Mabuya* (see also BOURRET 1942-1947), but according to TAYLOR (1963) it belongs either to the genus *Sphenomorphus* or represents a monotypic genus. In any case, it differs from *Mabuya macrophthalma* in having no supranasals, three pairs of nuchals and five supraoculars (BOURRET 1942-1947).

MANTHEY & GROSSMANN (1997) reported eight species of *Mabuya* for the Sunda region, viz. *M. indepressa*, *M. longicaudata*, *M. macularia*, *M. multicarinata*, *M. multifasciata*, *M. novemcarinata*, *M. rudis*, and *M. rugifera*. Of these, only *M. multifasciata*, *M. rugifera*, and *M. rudis* are known to occur on Java. According to DE ROOIJ (1915) *M. quinquecarinata* occurs on Java, too. However, as stated already above, each of these Javanese species can easily be distinguished from *M. macrophthalma*: *M. rugifera* by its separated prefrontals, and middorsal scales with 5 (7) keels and 24-28 scales around midbody, and *M. quinquecarinata* by its 5 keeled middorsal scales and 28 scales around the midbody (DE ROOIJ 1915, SMITH 1935, MERTENS 1959, MANTHEY & GROSSMANN 1997). *M. rudis* differs by its distinct color pattern (with its two white lateral bands on each side), entirely separated parietals and its smaller size. However, a comprehensive molecular study of the phylogeny of Asian *Mabuya* revealed clear evidences *Mabuya macrophthalma* being the sister species of *Mabuya rudis*. Based on the combined analysis of 12S and 16S rRNA gene fragments, both maximum-parsimony and maximum-likelihood analyses strongly supported this result with a bootstrap value of 99 (MAUSFELD unpublished). Furthermore, apart from the differences in pholidosis and coloration, the genetic difference of 4.3 %, a difference typical to be found between full species, clearly proves the distinct species status of *Mabuya macrophthalma*.

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Authors: PATRICK MAUSFELD (e-mail: pmausfeld@t-online.de) and WOLFGANG BÖHME (e-mail: w.boehme.zfmk@uni-bonn.de), Zoologisches Forschungsinstitut und Museum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany.