

Varanus caerulivirens sp. n.,
a new monitor lizard of the *V. indicus* group
from Halmahera, Moluccas, Indonesia
(Squamata: Sauria: Varanidae)

Varanus caerulivirens sp. n., ein neuer Waran aus der *V. indicus*-Gruppe
von Halmahera, Molukken, Indonesien
(Squamata: Sauria: Varanidae)

THOMAS ZIEGLER & WOLFGANG BÖHME & KAI M. PHILIPP

KURZFASSUNG

Varanus caerulivirens sp. n. wird von der indonesischen Molukkeninsel Halmahera beschrieben. Die neue Art gehört der *V. indicus*-Artengruppe (sensu BÖHME & al. 1994) an und unterscheidet sich von deren übrigen Mitgliedern (*V. doreanus*, *V. finschi*, *V. indicus*, *V. jobiensis*, *V. melinus*, *V. spinulosus* und *V. yuwonoi*) durch die himmelblauen bis türkisfarbenen Färbungsanteile an Kopf, Nacken, Rücken, Extremitäten und Schwanz, in Kombination mit einer hohen Schuppenzahl rund um die Körpermitte, einer hellen, fleischfarbenen Zunge, die nur an den Spitzen bzw. an deren Gabelstelle etwas dunkel pigmentiert sein kann, und mit nur jeweils einseitig mit Paryphasmen besetzten Hemipenes bzw. Hemiclitores. Die artliche Eigenständigkeit von *Varanus caerulivirens* sp. n. wird weiter durch die Sympatrie mit *V. indicus* gestützt. Abgeleitete Genitalstrukturen verknüpfen die neue Art mit *V. indicus* und *V. melinus*, doch erscheint eine abschließende Bewertung der systematischen Beziehungen zu den übrigen Vertretern der Pazifikwaran-Gruppe verfrüht, zumal uns Hinweise auf die Existenz weiterer unbeschriebener Taxa aus dieser offenbar lebhaft evolvierenden Artengruppe vorliegen. Wir schlagen als deutschen Trivialnamen "Türkiswaran" für die neue Art vor.

ABSTRACT

Varanus caerulivirens sp. n. is described from Halmahera Island, Moluccas, Indonesia. The new species belongs to the *V. indicus* group (sensu BÖHME & al. 1994) and is distinguished from the other members of this group (*V. doreanus*, *V. finschi*, *V. indicus*, *V. jobiensis*, *V. melinus*, *V. spinulosus* and *V. yuwonoi*) by the following character combination: a light blue to turquoise tinge in the colouration of head, neck, parts of dorsum, limbs and tail; a high midbody scale count; a pink-coloured, light tongue which may have dark pigment only at the tips and/or their bifurcation point; and paryphasmata differentiated only at one side of the sperm groove of the hemipenis and hemiclitores, respectively. The specific status of *V. caerulivirens* sp. n. is further corroborated by its sympatry with *V. indicus*. The new species shares derived genital structures with *V. indicus* and *V. melinus*, but final conclusions on the systematic position within the *V. indicus* group seem to be premature since there is indication on the occurrence of some more still undescribed taxa in this intensively evolving species group. As a vernacular name for the new species we propose "Turquoise Monitor Lizard".

KEY WORDS

Squamata, Sauria, Varanidae, *Varanus indicus* group, *Varanus caerulivirens* sp. n. new taxon; Indonesia, Moluccas, Halmahera

INTRODUCTION

Among the Pacific monitors, the first taxon described was *Varanus indicus* (DAUDIN, 1802), thus, giving its name to the entire species group. Although its type (from Ambon, Moluccas) must be considered lost (BRYGOO 1987), *V. indicus* is defined today (see e. g., BÖHME & al. 1994; BÖHME & ZIEGLER 1997) as a dark-tongued species which is widely distributed from Sulawesi

in the west over the Moluccas, New Guinea including its offshore islands, the Bismarck Archipelago and the Solomon Islands, to the Carolines, Marianas and Marshall Islands in the northeast, reaching the northern tip of Australia in the south (but compare ZIEGLER & al. in press). Further species of the *V. indicus* group are *V. doreanus* (MEYER, 1874) from Australia, New Guinea

and several of its offshore islands, *V. finschi* BÖHME, HORN & ZIEGLER, 1994 from Australia, the Bismarck Archipelago and New Guinea, *V. jobiensis* AHL, 1932 from New Guinea and some offshore islands, and *V. spinulosus* MERTENS, 1941 from few Solomon Islands (BÖHME & al. 1994; ZIEGLER & al. in press). The taxonomic review by BÖHME & al. (1994) was, however, only a first step in reviewing this group of monitor lizards (compare also ZIEGLER & al. in press). This was impressively demonstrated by the recent discovery of two brightly coloured new species from the Moluccas: *V. melinus* BÖHME & ZIEGLER, 1997 from the Sula Islands (BÖHME & ZIEGLER 1997; ZIEGLER & BÖHME in press) and *V. yuwonoi* HARVEY & BARKER, 1998 from Halmahera (HARVEY & BARKER 1998). Moreover, two further possibly undescribed, new forms imported by the commercial pet trade from Indonesia and pre-

sumably originating also from the Moluccas, have already been figured by ZIEGLER & al. (1998) in a popular account on new, spectacular discoveries within the *V. indicus* group. Additional specimens that became available to us in the mean time allowed a closer examination. The dark form (figured in ZIEGLER & al. 1998: p. 15, below) in fact can be assigned to *V. doreanus* although being a bit darker than the neotype of the taxon. Specimen ZFMK 67177 is very typical in having a strongly marbled throat, a light yellowish tongue, 171 midbody scales and an arrangement of the paryphasmata on its hemiclitoris which is characteristic for *V. doreanus*. In contrast to this, the second form figured by ZIEGLER & al. (1998: p. 15, above, and p. 16) proved to be unassignable to any of the known species of the *V. indicus* group and to any synonym of *V. indicus* (see below). Thus, we describe it as a new species below:

Varanus caerulivirens sp. n.

H o l o t y p e: ZFMK (Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn) 68874, (sub)adult male, Halmahera, Moluccas, Indonesia, collected 1998 by native collectors.

P a r a t y p e s: ZFMK 68577, adult female, same data as holotype; SMF (Forschungsinstitut Senckenberg, Frankfurt am Main) 32805, juvenile, Patani, eastern coast of Halmahera, Moluccas, Indonesia, collected 1895 by W. KÜKENTHAL.

D i a g n o s i s: A representative of the *V. indicus* group which can be distinguished from *V. doreanus*, *V. finschi*, *V. indicus*, *V. jobiensis*, *V. melinus*, *V. spinulosus*, and *V. yuwonoi* by the following character combination: (1) a light blue to turquoise tinge of the head, neck, body, dorsum, limb and tail colouration; (2) a high midbody scale count (170-185), (3) a pink-coloured, light tongue which may have dark pigment only on its tips and/or at their bifurcation point; (4) differentiated paryphasmata only on one side of the sperm groove of the hemipenis and hemiclitoris, respectively.

Apart from the colouration differences, *V. caerulivirens* sp. n. can be distinguished from *V. indicus* mainly by the lack

of a broadly dark pigmented tongue, and by its particularly high scale counts (compare BÖHME & al. 1994), represented by an average S value (for explanation see table 1) of 177 (versus 129 in *V. indicus*), and an average XY value (cf. table 1) of 186 (versus 131 in *V. indicus*). These differences in colour pattern, tongue colouration and S and XY value are also valid in regard to the synonyms of *V. indicus* listed in BÖHME & al. (1994): *Monitor chlorostigma* GRAY, 1831: type locality Rawack, north of Waigeu; *Varanus tsukamotoi* KISHIDA, 1929: type locality Saipan, Carolines; and *V. indicus rouxi* MERTENS, 1926: type locality Durdjela, Wammer, Aru Islands. [Reinvestigation of the *rouxi* type series revealed that the third paratype - SMF 11593, from Dobo, Aru Islands, coll. H. MERTON 1908 - is actually a female of *V. doreanus* (marbled throat, mainly light tongue, high S value - according to MERTENS 1926: 168 -, paryphasman arrangement on the hemiclitoris)].

Varanus caerulivirens sp. n. can be distinguished - apart from its colour pattern - by scalation characters from *V. melinus* (e. g., S value: 124-133, BÖHME & ZIEGLER 1997; ZIEGLER & BÖHME in press) and

Table 1: Measurements (I: in mm), proportion indices (II) and scale counts (III) of the holotype and of both paratypes of *Varanus caerulivirens* sp. n. Parameters according to BRANDENBURG (1983) and BÖHME & al. (1994). Due to the small number of specimens (n = 3), we herein refrain from the calculation of standard deviations. Abbreviations are as follows (see BÖHME & al. 1994):

SVL - snout vent length; D - head neck length (from tip of snout to gular fold); E - body length (from gular fold to cloaca); F - tail length (from cloaca to tail tip); TL - total length; A - head length (from tip of snout to anterior margin of tympanum); B - head width (maximum width between eyes and ears); C - head height (above the eyes); G - distance from anterior margin of eye to centre of nostril; H - distance from centre of nostril to tip of snout; I - distance from anterior margin of tympanum to anterior margin of eye.

1 - relative tail length (F / [D + E]); 2 - position of nostril between tip of snout and eye (G / H); 9 - position of nostril to snout tip [(A - I) / G]; 10 - head length in relation to head width (A / B); 11 - head length in relation to head height (A / C).

P - scales from rictus to rictus; Q - scales around tail base; R - scales around tail behind first proximal third; S - scales around midbody; T - transverse rows of ventral scales from gular fold to beginning of hindlegs; X - transverse rows of dorsal scales from hind margin of tympanum to gular fold; XY - transverse rows of dorsal scales from hind margin of tympanum to beginning of hindlegs; c - supralabials; m - scales around neck in front of gular fold; n - ventrals from tip of snout to gular fold.

Tab. 1: Meßwerte (I: in mm), Proportionsindices (II) und Pholidosezählwerte (III) des Holotypus und der beiden Paratypen von *Varanus caerulivirens* sp. n. Parameter in Anlehnung an die Untersuchungen von BRANDENBURG (1983) und BÖHME & al. (1994). Aufgrund der geringen Individuenzahl (n = 3) wurde auf die Errechnung der Standardabweichung des Mittelwertes verzichtet. Abkürzungen (vgl. BÖHME & al. 1994) wie folgt:

SVL - Kopf-Rumpflänge; D - Kopf-Halslänge (von Schnauzenspitze zur Gularfalte); E - Körperlänge (von Gularfalte zur Kloake); F - Schwanzlänge (von Kloake zur Schwanzspitze); TL - Gesamtlänge; A - Kopflänge (Abstand Schnauzenspitze zum Vorderrand des Trommelfells); B - Kopfbreite (größte Breite zwischen Augen und Ohren); C - Kopfhöhe (über den Augen); G - Entfernung vorderer Augenrand zur Mitte des Nasenloches; H - Entfernung von Nasenlochmitte zur Schnauzenspitze; I - Entfernung vorderer Trommelfellrand zum Augenvorderrand.

1 - Relative Schwanzlänge (F / [D + E]); 2 - Lage Nasenloch zwischen Schnauzenspitze und Auge (G / H); 9 - Lage Nasenloch zur Schnauzenspitze [(A - I) / G]; 10: Kopflänge im Verhältnis zur Kopfbreite (A / B); 11 - Kopflänge im Verhältnis zur Kopfhöhe (A / C).

P - Schuppenzahl zwischen den Mundwinkeln in gerader Linie über den Kopf; Q - Schuppenzahl um Schwanzbasis; R - Schuppenzahl um Schwanz nach erstem proximalen Drittel; S - Schuppen um Körpermitte; T - Ventralia-Querreihen von Gularfalte bis Ansatz Hinterbeine; X - Anzahl Dorsalia-Querreihen von Trommelfellende bis Gularfalte; XY - Anzahl Dorsalia-Querreihen von Trommelfellende bis Hinterbeinansatz; c - Supralabialia; m - Schuppen rund um den Hals vor der Gularfalte; n - Ventralschuppen von Schnauzenspitze bis Gularfalte.

Parameter	Holotype ZFMK 68874 Holotypus ZFMK 68874	Paratype ZFMK 68577 Paratypus ZFMK 68577	Paratype SMF 32805 Paratypus SMF 32805	Mean Mittel
I SVL (D + E)	295 (110 + 185)	375 (141 + 234)	169 (65 + 104)	-
I F	470 + few/einige mm	610	254	-
I TL (SVL + F)	765	985	423	-
I A	50	65	32	-
I B	27	35	17	-
I C	20	23	13	-
I G	15	20	9	-
I H	10	14	7	-
I I	26	32	16	-
II 1	1.59	1.63	1.5	1.57
II 2	1.5	1.43	1.29	1.41
II 9	1.6	1.65	1.78	1.68
II 10	1.85	1.86	1.88	1.86
II 11	2.5	2.83	2.46	2.6
III P	44	51	48	48
III Q	97	102	101	100
III R	55	53	56	55
III S	175	177	178	177
III T	97	91	93	94
III X	56	44	32	51
III XY	202	169	186	186
III c	24 (r) / 25 (l)	25 (r) / 25 (l)	26 (r) / 26 (l)	each/je 25
III m	131	134	128	131
III n	91	94	94	93

from *V. spinulosus* (e. g., S value: ca. 210, MERTENS 1942; SPRACKLAND 1994); by the pattern of paryphasmata arrangement on the hemipenis and hemiclitoris from *V. doreanus*, *V. finschi*, *V. jobiensis*, and *V. yuwonoi* which all have paryphasmata on both sides of the sulcal groove (ZIEGLER & BÖHME 1997, in press; ZIEGLER & al. in press).

Description of holotype (fig. 1; also figured in ZIEGLER & al. 1998 on page 15, above, and on page 16 the wrong way round): Habitat slender. Length of hindlimb 135 mm. Nostril closer to tip of snout than to eye. Canthal ridge expressed only in the preocular region. Nasal region swollen, with a median longitudinal shallow groove. Supraoculars on the right side: five, the first one oval, nearly as long as broad, the following four distinctly broader than long, the median being the largest, followed - when ranked by decreasing size - by the second, fourth, fifth, and first supraocular. Supraoculars on the left side: six, the median four markedly broader than long, the first and the last more oval and barely broader than long; supraoculars number two through four subequal, followed by the feebly smaller fifth one, the first and sixth being smallest. Pileus scales between the anterior supraoculars medially enlarged. Scale covering the pineal organ likewise enlarged, irregularly hexagonal, darkened at the margins only, with a turquoise centre, clearly different from the darker surrounding scales. Dorsal neck scales anteriorly broadened to oval-shaped, in the median and posterior neck area longish, narrow, high-domed, with a distinct keel, feebly broadened behind, surrounded by ca. 10 granules of markedly diminished size. Dorsal neck scales light (yellowish-greyish to turquoise), dark (grey-brownish to black) or anteriorly dark and posteriorly light-coloured; at their hindpart with (rarely) one to (more commonly) several distinct small grooves or pits. Dorsal scales similar to posterior neck scales, but shorter, partly broader, most of them with one darkened apical pit. Gular scales longish oval, mostly light, bearing one to several ill-defined pits at the hindpart and being surrounded (particularly in the posterior part of scale) by ca. 10 smaller granules. Chest scales similar to

the gulars, anteriorly with a dark margin, scales being largest in the anterior part of the chest region. Ventral scales hexagonal towards midventer, scales darkened anteriorly, slightly keeled, posteriorly mostly with one ill-defined pit. In that the ventrals are laterally juxtaposed, granules can be observed only at their hind margins. Dorsal side of limbs covered with dark, light, or two-coloured (anteriorly dark and posteriorly light) scales, which are longish, high-domed and keeled or oval and weakly keeled, with granules occurring mostly at their hindpart where in most cases also one pit is situated. Dorsal scales of tail weakly keeled, only at the tail base surrounded by distinct granules posteriorly. Here, the scales bear mostly several posterior pits, more distally only one or two pits. Ventral scales of tail similar to dorsal ones, but more strongly keeled, except at its basal part; the pits are disappearing towards the middle of tail. Tail dorsally with a continuous longitudinal double keel. For further measurements, proportion indices and scale counts see table 1.

Everted hemipenes (terminology after ZIEGLER & BÖHME 1997) ca. 4 to 4.5 cm long (fig. 3), pinkish in life with light (white-yellowish) hemibacula; cloacal lips partly with dark pigmentation. Shape of hemipenes longish, at the apical end asymmetrically extended. Sperm groove proximally oblique, straightly running to the exterior lobe after the truncal bend and ending at the base of the outer hemibaculum. Outer sulcal lip insignificantly stronger developed than the inner, leaving the whitish sulcus largely open. The elastic hemibacula are terminally projecting both asymmetrical apical lobes. The inner hemibacula are directed apically, slightly curved towards the sulcus and distally broadened; they bear ca. seven to eight indistinctly differentiated denticles at their (convexly bent) tips. The outer, smaller hemibacula are directed upwards laterally and are subdivided into three longish projections each; the two upper ones are ending in two or more ill-defined protuberances; the lower projection appears more distinctly divided into two parts and is more closely connected to the hemipenial tissue. Well differentiated, apically decreasing paryphasmata rows (a bit less than 20 rows each) are

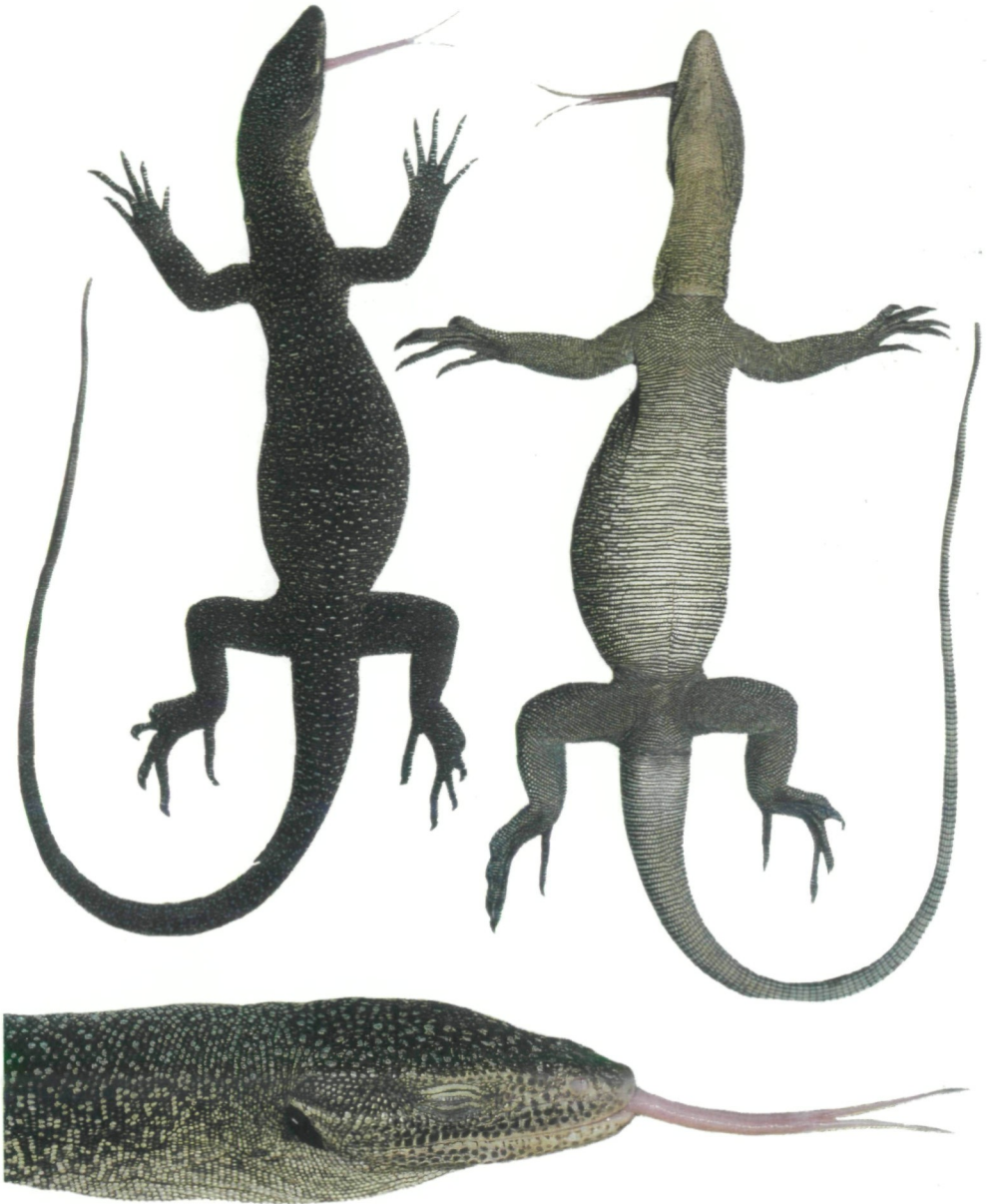


Fig. 1: Freshly dead holotype of *Varanus caerulivirens* sp. n. (ZFMK 68874).

Left: dorsal view; right: ventral view; below: lateral view of head.

Abb. 1: Frischtoter Holotypus von *Varanus caerulivirens* sp. n. (ZFMK 68874).
Links: Dorsalansicht; rechts: Ventralansicht; unten: Kopfbereich in Lateralansicht.



Fig. 2: Tongue-flicking female paratype of *Varanus caerulivirens* sp. n. (ZFMK 68577).
Abb. 2: Züngelnder weiblicher Paratypus von *Varanus caerulivirens* sp. n. (ZFMK 68577).

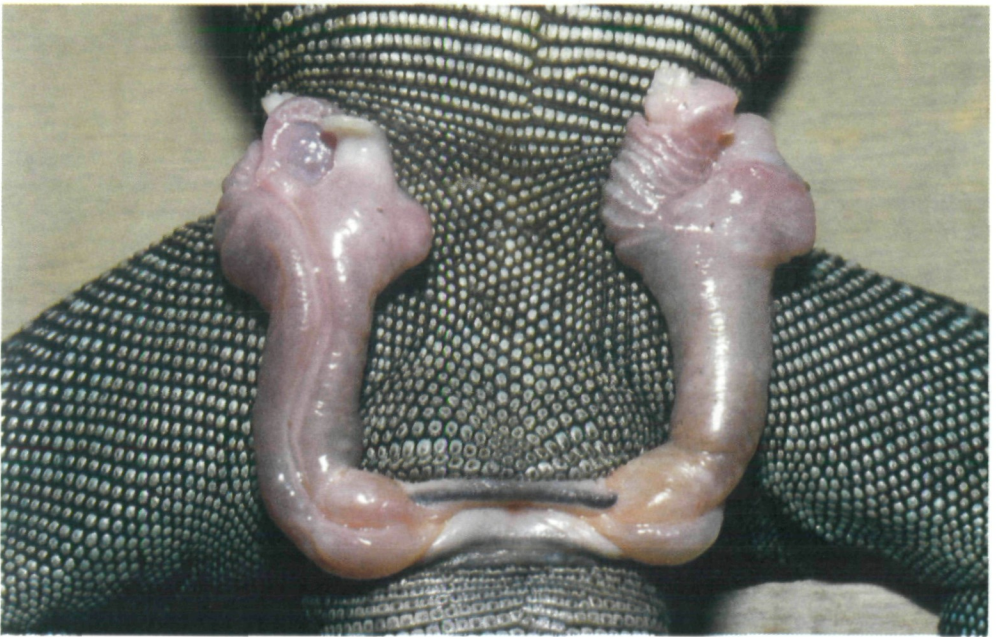


Fig. 3: Cloacal region of the holotype of *Varanus caerulivirens* sp. n. with everted hemipenes.
Left: right hemipenis in sulcal view; right: left hemipenis in asulcal view.
Abb. 3: Kloakenregion des Holotypus von *Varanus caerulivirens* sp. n. mit ausgestülpten Hemipenes.
Links: rechter Hemipenis in Sulcalansicht; rechts: linker Hemipenis in Asulcalansicht.

present only on the asulcal side of the outer lobe. These rows tend to become irregular towards the apex and surround the outer hemibaculum nearly completely. Asulcally, the inner lobe bears a few scattered, nearly indistinguishable traces of paryphasmata. Truncus and pedicellus are completely smooth on the entire sulcal side and on the proximal part of the asulcal side of the organ.

Although the size of the hemipenes seems to indicate adulthood, the elastic, hardly mineralized hemibacula could also mean that they are not finally differentiated, and that they would have become hardened with increased individual age of the specimen (see ZIEGLER & BÖHME 1997, in press).

Ground colour of the upper side of head, neck, dorsum, limbs and tail dark in life (greyish-brown to black) with lighter (beige to turquoise) patterning; ground colour of the underside of the respective parts light (yellowish-beige to turquoise) with grey-blackish patterning. The grey-blackish supralabials and the less dark infralabials are framed by a light yellowish to weak turquoise, as are the grey-brownish scales between nostril and eye and above the eyes. Ground colour of the eyelids brownish-black, with a horizontal, 2-scale-rows-wide yellowish stripe. Below the eyelids, there is another horizontal light stripe, being narrower and more whitish. Tongue pink-coloured, with whitish tips, the left tip being apically slightly dark pigmented. A dark temporal band consisting of greyish-turquoise scales is on both sides framed by yellowish to weakly turquoise scales. Tympanum with a light anterior margin. Upper side of head blackish with turquoise spots. Anterior neck region dorsally greyish-turquoise with black ocelli surrounding one to three turquoise scales each in their centers. These ocelli tend to become larger posteriorly, whereas the greyish-turquoise ground colour becomes less intensive. Upper side of dorsum similar to that of neck, the enlarged ocelli may enclose a central black scale. On dorsum between fore- and hindlimbs, approximately 20 transverse rows of ocelli which become more and more inconspicuous posteriorly. Depending on the angle of incidence of the light, several dark transverse bands are discernible on the

back. Ground colour of upper tail base and hindpart of dorsum black with several greyish-turquoise transversal markings, consisting of 1-6 scales each. At the end of the first third of the tail, greyish-turquoise ocelli surround a few black scales; more posteriorly, the tail colour pattern gets differentiated into greyish-turquoise and black crossbands, the latter enclosing again patches with greyish-turquoise scales. Upper side of limbs as well as upper neck region with marked, black ocelli surrounding one or more greyish to turquoise scales that correspond to the ground colour of these parts of the body. Towards the fore- and hindfeet, the turquoise and skyblue colouration becomes more intensive. Throat and lower part of neck yellowish, laterally with longish, weakly contrasting greyish spots. Anterior to the light gular fold they turn into a feeble marbling that extends medially on the ventral part of the neck. Chest with a weak greyish-beige marbling, similar to the lower parts of the limbs where, however, the hindlimbs exhibit an intensive turquoise colouration. Plantar and solar scales with black centres. Belly beige-coloured, the largely dark lateral scales giving rise to feeble black crossbands that extend to the median, light area of the belly. Underside of tail beige-coloured, interrupted by weakly contrasting dark crossbands in the last two thirds of the tail.

Variation of paratypes: The adult female paratype - the folded oviducts indicate that eggs have already been laid - ZFMK 68577 (fig. 2) as well as the juvenile paratype SMF 32805 (fig. 4) correspond largely to the description of the holotype. Hindleg length of ZFMK 68577: 167 mm; of SMF 32805: 69 mm. Supraoculars of ZFMK 68577: 5 right and 4 left; of SMF 32805: 5 left, 3 well differentiated ones right, a further, in front of the first well differentiated right supraocular, is subdivided into 2 smaller scales. Further measurements, proportion indices and scale counts can be found in table 1.

The hemiclitoros of ZFMK 68577 are nearly 3 cm long and slightly pigmented sulcally on the pedicellus, and asulcally on the lower truncus but otherwise correspond closely to the hemipenes of the holotype. Hemibaubella flexible. The inner, larger hemibaubella have terminally 8-10 tips

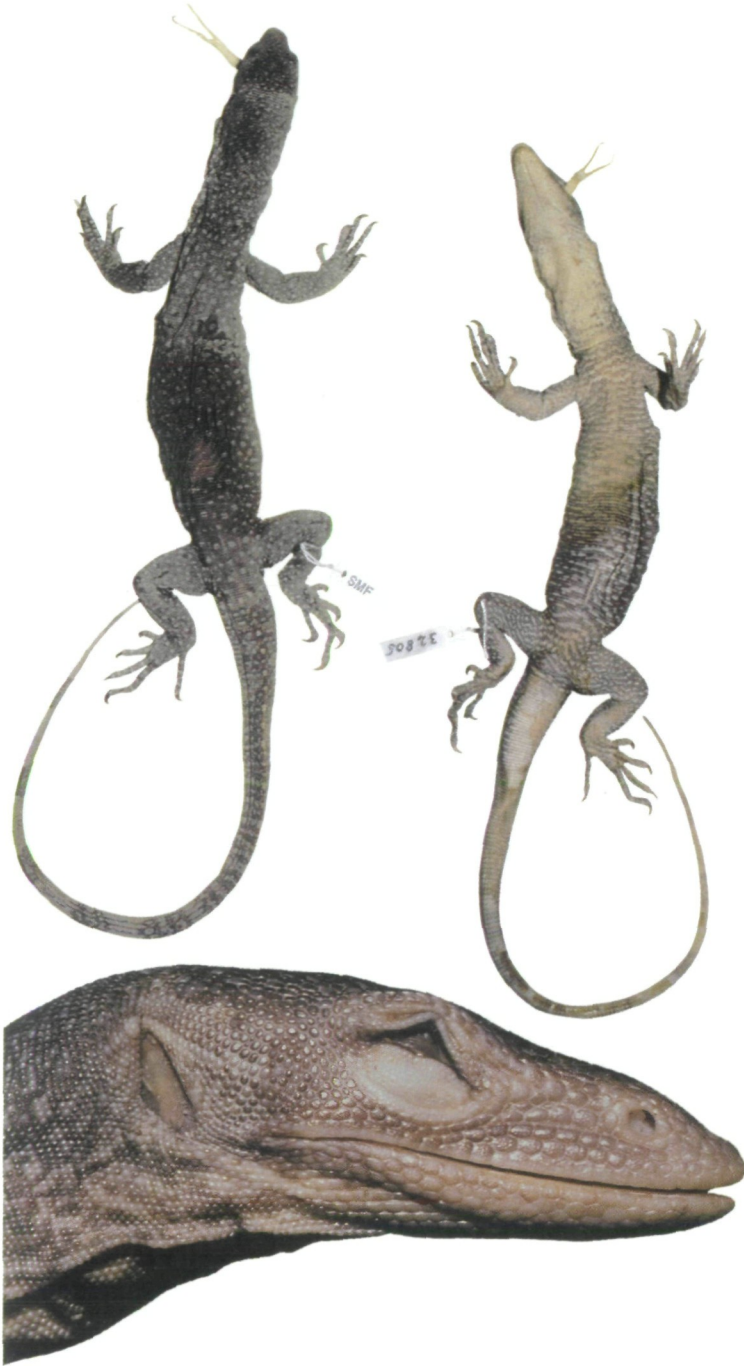


Fig. 4: Juvenile paratype of *Varanus caerulivirens* sp. n. (SMF 32805).

Left: dorsal view; right: ventral view; below: lateral view of head. Photos: T. ZIEGLER.

Abb. 4: Juveniler Paratypus von *Varanus caerulivirens* sp. n. (SMF 32805).

Links: Dorsalansicht; rechts: Ventralansicht; unten: Kopfbereich in Lateralansicht. Photos: T. ZIEGLER

each. The outer smaller hemibaubella are subdivided in 3 projections, the 2 upper terminating in only slightly indicated protuberances, the lower being distinctly forked and more closely connected with the hemiclitorial tissue. Distinct paryphasma rows, apically decreasing in size, are running only on the asulcal side of the outer lobe; they become more irregular apically and surround the outer hemibaubellum nearly completely.

The eyelids of ZFMK 68577 (alive) are dark only immediately above and below the eyes and in the eye-angles, otherwise light yellowish-brownish. Tongue pink-coloured except anterior tips and upper side of bifurcation area which are markedly pigmented with black. Dorsal colouration of the specimen generally darker. Ocellation on the upper side of the anterior neck and on the limbs less distinct, partly hardly discernible. The pattern of light and dark caudal crossbands begins already in the anterior third of the tail. Dark marbling of the throat, in front of the gular fold, is less distinct, rather forming a few dark transverse bands.

In the juvenile paratype (SMF 32805) the turquoise to skyblue colour tinge and the characteristic pattern are rather well preserved, in spite of more than 100 years of alcohol preservation. The dorsal ocellation is particularly distinct, otherwise there is not much difference from the colour pattern of the adults. As compared with the holotypes, the eyelids are apparently lighter, the colouration of the tongue is light-yellowish. The belly is predominantly dark.

FURTHER MATERIAL: Several additional specimens of the new species imported by the pet trade, could be inspected externally, three of them were photographed in some detail. Among them was a big male of 1040 mm total length (snout vent length 400 mm, tail length 640 mm). In one specimen we could count the midbody scales (S value: ca. 185). As far as tongue-flicking was observed, all tongues proved to be pink-coloured, partly with a dark fleck at their bifurcation point. Moreover, we had access to photographs of four further specimens: three from the Indonesian pet trade (courtesy of B. SOCTANTO, Jakarta), and one imported to Japan (courtesy of AOKI RIOSUKE, Yokosuka). All

these specimens corresponded quite well with the type material. Turquoise to skyblue colouration was - though to a varying extent - visible at the upper side of their heads, necks, limbs and tails. Ocellation of the back and neck was also well discernible or at least indicated. In one specimen, the light, dorsal ocellation was particularly distinct, though interrupted by dark transverse bands.

After having finished this study we had the opportunity to reinvestigate some monitor lizards deposited in the Natural History Museum (RMNH) in Leiden. The specimen RMNH 3149 from Halmahera, which was mentioned in BÖHME & al. (1994) as an "aberrant" *V. indicus* (their fig. 4), now turned out to be *V. caerulivirens* because of its (still recognizable) blue to turquoise colouration of head, neck, body, limbs, and tail, the high scale counts (S: 170, XY: 182) and the light tongue (however, somewhat darkened during preservation). Furthermore, distinct ocelli on parts of the neck and dorsum as well as broad greyish-turquoise and blackish crossbands at the last two thirds of the tail are clearly expressed.

Etymology: The specific epithet *caerulivirens* is derived from Latin: from the adjective "*caeruleus*", -a, -um (poetic "*caerulus*" = blue, and from the gerund "*virens*" = becoming green. It refers to the diagnostic skyblue to turquoise colouration of head, neck, limbs and distal parts of tail. Our proposal for the lizard's vernacular name is "Turquoise Monitor Lizard".

Distribution: According to the information given to us by the importers of the holotype, the adult female paratype and the additional specimens, *V. caerulivirens* sp. n. originates from Halmahera, Moluccan Islands (fig. 5). This information is corroborated by the juvenile paratype SMF 32805 and the additional specimen RMNH 3149. The juvenile paratype had been collected by W. KÜENTHAL in 1895 at Patani, Halmahera, and was mentioned already - as *V. indicus* - by BOETTGER (1900) and MERTENS (1942). Its high midbody scale count (see MERTENS 1942) had lead us to suspect that it might belong to our new species. In spite of its more precise locality data we preferred to designate it only as paratype, as it did not provide data on

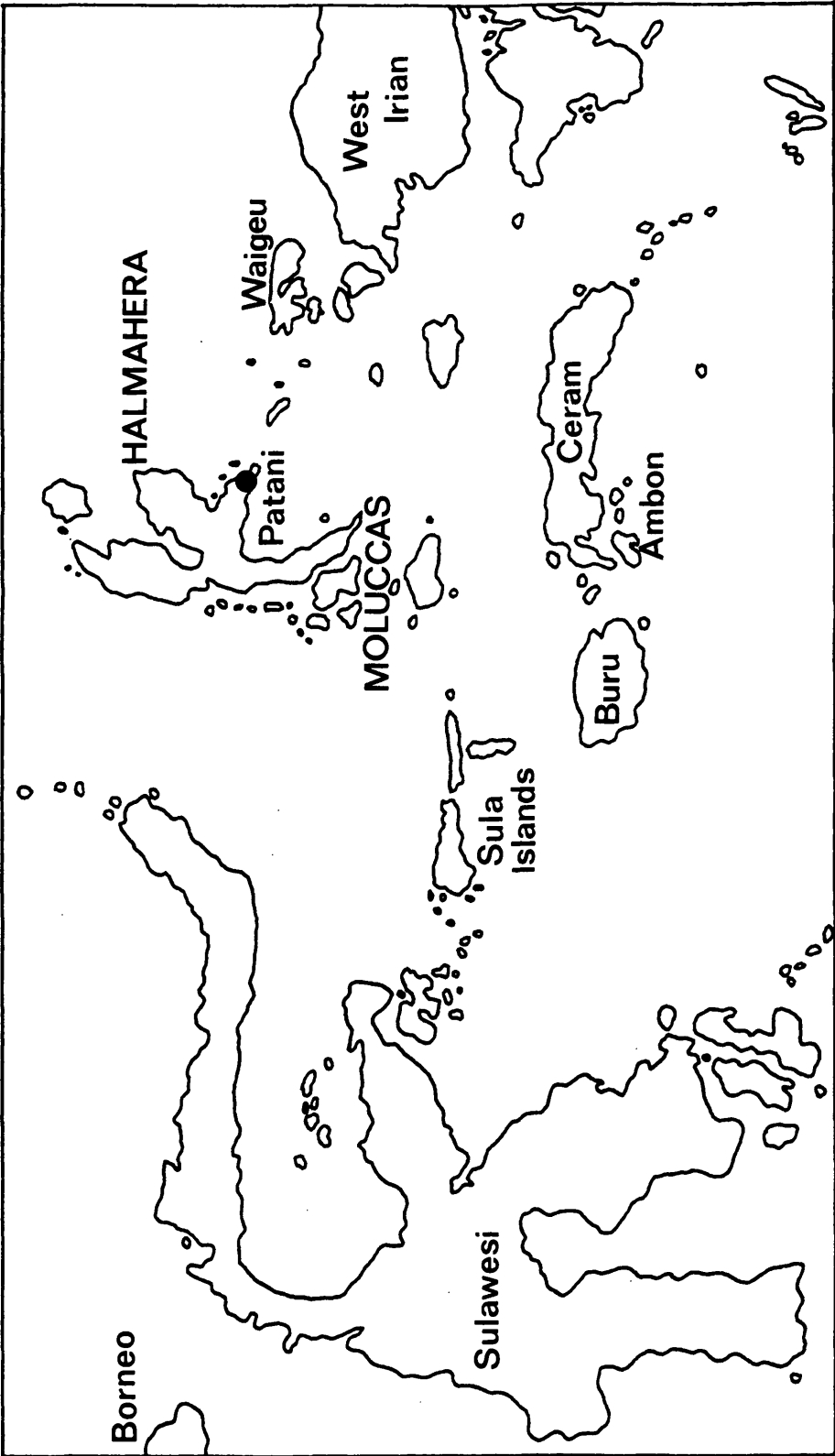


Fig. 5: At present, *Varanus caerulivirens* sp. n. is only known from Halmahera, Moluccas, Indonesia.
Abb. 5: Derzeit ist *Varanus caerulivirens* sp. n. lediglich von der indonesischen Molukkeninsel Halmahera bekannt.

genital morphology and on colour pattern in life. According to BÖHME & al. (1994) and BENNETT (1998), also the "true" *V. indicus* occurs on Halmahera and neighbouring islands. The sympatric occurrence of both *V. caerulivirens* sp. n. and *V. indicus* on Halmahera is supported by a "true" *indicus* specimen (ZFMK 68578, female, S value: 147, upper side of tongue completely dark). This specimen that belonged to the same batch of imported monitors as the two adult members of the type series most likely originates from the same collecting area - together with *V. yuwonoi*. This raises the interesting question of niche segregation among the members of the *V. indicus* group (see PHILIPP in press).

Much future work is necessary to evaluate not only the actual distribution of *V. caerulivirens* sp. n., but also its habitat requirements, life habits and population densities.

Systematic relationships: On the basis of its genital morphological characters, *V. caerulivirens* sp. n. is clearly assignable to the subgenus *Euprepiosaurus*, above all by the asymmetrical sperm groove which is highly autapomorphic for this taxon. Within *Euprepiosaurus*, it is assignable to the *V. indicus* species group by the autapomorphy of reduced paryphasmata, which are, however, much more differentiated than in the *V. prasinus* group (see ZIEGLER & BÖHME 1997). As a distinct species, *V. caerulivirens* sp. n. is character-

ized by its unmistakable diagnostic characters and by its sympatric occurrence with *V. indicus* on Halmahera as described above. The unilateral development of the paryphasma rows on the hemipenes and hemiclitores of *V. caerulivirens* sp. n. suggest a closer relationship to *V. indicus* and *V. melinus*. This unilateral development of paryphasmata is clearly a reduced, and therefore derived condition, as opposed to a bilateral occurrence, i. e. the primitive condition as it is found in *V. doreanus*, *V. finschi*, *V. jobiensis*, and *V. yuwonoi* (ZIEGLER & BÖHME 1997, in press; ZIEGLER & al. in press).

However, the high midbody scale counts of *V. caerulivirens* sp. n. (mean S value 177) as compared with those of *V. indicus* and *V. melinus* (mean S values of 129 each) have to be interpreted as the primitive condition (BÖHME & ZIEGLER 1997; ZIEGLER & BÖHME in press). The same seems to be true for the light, pink-coloured tongue of *V. caerulivirens* sp. n. (which only sometimes has small pigmented areas) as compared with the derived dark tongue of *V. indicus* (regardless of possible adaptive influences). We feel, however, that the time is not yet ripe for definite conclusions on the systematics of the *V. indicus* group, because we have evidence that several more undescribed taxa of this intensively evolving group of monitor lizards will emerge soon.

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AUTHORS: THOMAS ZIEGLER, Prof. Dr. WOLFGANG BÖHME, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany; KAI M. PHILIPP, Zoologische Staatssammlung, Münchhausenstraße 21, D-81247 München, Germany.

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