TRANSLATIONS

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Papusaurus, a New Subgenus of *Varanus*

ROBERT MERTENS

Translated by PAUL GRITIS
P.O. Box 283
Coopersburg, PA 18036, USA

The Papua-monitor, *Varanus salvadorii* (Peters and Doria 1878) was previously placed in the subgenus *Varanus* Merrem 1820. However, on the basis of body form, scalation, and cranial characters, it seems that this splendid monitor, restricted to New Guinea, actually is not closely related to other monitors and occupies a special position (Mertens, 1950: 566). This special position is revealed most of all by the peculiar tail of this animal, which has a relative length of from 2.3 to 2.6 times as long as the head and body taken together. This relative length surpasses that of any other species of monitor. In addition, the shape of the tail is remarkable.

Peters and Doria noted in the original description (1878: 337) that the tail is not laterally compressed like a rudder, but is rounded at the base and even appears somewhat flattened so that it appears triangular in cross-section. On the other hand, Boulenger (1885: 314) noted: "tail rounded at the base, feebly compressed and keeled above in the rest of its length". Originally in my studies of the monitors I had access only to a single specimen, a young specimen at the Zoological Museum in Berlin (ZMB 24220). Unfortunately *Varanus salvadorii* is one of the great rarities at the Senckenberg Museum- there are only two mandibular rami (SMF 57877, 57878)- so it was a sensation for herpetologists when the first live Papua-monitor arrived in Germany in the summer of 1960. Thanks to the initiative of the director, Albert Schochle, *Varanus salvadorii* could then be exhibited at the "Wilhelma" Zoo in Stuttgart (Mertens 1960).

As I observed the animal, which was over 2 meters long and in flawless condition, it occurred to me that the tail could in no way be considered laterally compressed. Instead, it is very low or depressed and appears at first rounded in cross-section, but then somewhat triangular, and a low double keel runs along the dorsal surface. As previously mentioned, its unusual length is noteworthy. The scalation is unusual, since the scales beyond the base of the tail are not arranged in diagonal rows, and the scales of the underside of the tail are larger than those along the side of the tail. A row of subcaudal scales therefore corresponds to two or three of the lateral rows. This last observation does not seem to be as important as is the divergent tail form in recognizing that *V. salvadorii* may no longer be placed in the subgenus *Varanus*. This situation was known to Peters and Doria, the describers of *V. salvadorii*, when they wrote: "Questa forma assai rimarchevole e quasi un passaggio tra I sotto generi *Hydrosaurus* (=*Varanus*) ed *Odatria* perche non ha la coda remiforms dei primi, ne grandemente verticillata della seconde" (Translator's note: 'This very remarkable form is almost like an intermediate between the subgenera *Hydrosaurus* and *Odatria* because it does not have the oar-like tail of the first, nor the multi-whorled tail of the second'). Here is an early

indication that it is unfeasible to include *V. salvadorii* in either subgenus, *Varanus* or *Odatria*. *Varanus salvadorii* does not agree with the characters of the subgenus *Odatria*, as follows. In *Odatria* the caudal scales are regular, arranged in uniform rings to the end of the tail, in contrast to *V. salvadorii*. The skull characters are known to differ in *V. salvadorii* (for example the reduction of the parietal lamina in old individuals). The teeth in *V. salvadorii* are remarkably long and straight, becoming curved only at the tip, and then are only weakly curved. Finally, the total length of *V. salvadorii* distinguishes it from *Odatria*, some members of which are among the smallest monitors, not exceeding one meter in length, and most of the others are small, while *V. salvadorii* belongs among the giants of the genus, those species reaching at least 2.5 meters. Although the author is no advocate of monotypic genera or subgenera, in this case the only alternative is to erect such a new subgenus.

Papusaurus n. subgen.

Diagnosis – A subgenus of *Varanus* Merrem 1820. Very large, over 2 meters long. Head long, flat with long muzzle; nostril an elongated oval shape, situated along the side of the snout; tail very long, about 2.5 times as long as the head and body, very flat, not laterally compressed or rudder-shaped, rounded at base in cross-section, becoming triangular posteriorly, bearing a double keel dorsally; supraoculars not differentiated; caudal scales not arranged in whorls; skull with strongly vaulted nasal region when seen in lateral view; maxillae of the "hypsiprospisch" (Translator's note: "hysiprosopisch" =the excavatio nasalis of the maxilla does not extend beyond the posterior border of the septomaxilla, and the prefrontal process of the maxilla, which is rather long, rises gradually See Mertens, 1942, Part 2: 129); nasals paired or unpaired; parietal lamina well-developed in adult only anteriorly, reduced posteriorly; maxillary and mandibular teeth very long, pointed, almost straight, curved backwards only at the distal end and then only slightly; 10 maxillary and 10 mandibular teeth on either side and 8-9 premaxillary teeth.

Type species – *Monitor salvadorii* Peters and Doria 1878
= *Varanus salvadorii* (Peters and Doria 1878)

Papusaurus is the tenth subgenus of *Varanus*, and includes only the single species described here. The ancestors of *Varanus* (*Papusaurus*) *salvadorii* may be searched for among the members of the subgenus *Varanus*. The shape of the tail suggests that the Papua-monitor is not amphibious, but rather is arboreal. The live specimen in the "Wilhelma" Zoo appears to confirm this..

The Papua-monitor at Stuttgart unfortunately died on 27 August 1962 and may now be found in the collection of the Senckenberg Museum (SMF 58064). The total length of this male animal measured 244 cm.

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Mertens, R. 1971. Über eine Waransammlung aus dem östilichen Neu Guinea. Senckenbergiana Biologica 52: 1-5.

A Collection of Monitors from Eastern New Guinea

ROBERT MERTENS

Translated by PAUL GRITIS
P.O. Box 283
Coopersburg, PA 18036, USA

Among the monitors collected by Dr. Thomas Schultze-Westrum during his trips in 1959 and 1966 to New Guinea are specimens of all the forms of that family known until now to occur in New Guinea except for *Varanus timorensis similis*. This material, which except for a few specimens in the Senckenberg Museum is housed in the Zoologischen Staatssammlung in Munich, is especially valuable for two rarities: *Varanus salvadorii* and *V. karlschmidti*. Until now, the latter species was known only from four specimens- in the Museums of Chicago, Frankfurt, and Basel. Both animals in Schultze-Westrum's collection improve not only the diagnosis for the species (the color in life) but also increase our knowledge of its distribution. The collection also serves as an important enrichment to our rather meager knowledge of the varanid fauna of southeast New Guinea- I have earlier noted the debate on the subspecies problem in *V. indicus*.

Varanus (*Odatria*) *prasinus prasinus* (Schlegel)

Nos. 23, 318 (Now SMF 65963): 2 adults, Aird Hill, Gulf of Papua; October 1959.
Unnumbered specimens: 1 adult, 1 juvenile. Aird Hill, Gulf of Papua; March 1960.

In addition to these four specimens I also have available another two males, from the same locality, which I have received from Reverend Cribb on 24 September 1960. One of these animals is still alive, after more than 10 years.

Varanus (*Papusaurus*) *salvadorii* (Peters and Doria)

No. 71: 1 juvenile. Kopi Village near Kikori, Gulf of Papua: March 1966.
Unnumbered: 1 adult (tanned skin with skull), Kikoni River, Gulf of Papua, August 1960.
Unnumbered: 1 adult skull, Aird Hill, Gulf of Papua

The young specimen of this impressive arboreal monitor has a better marked color pattern than the older animal. These have a very long tail, as does no other *Varanus* species: in an animal of 242 mm SVL, the tail is 521 mm or more than twice as long as the SVL. The skull in the tanned hide in this collection has a gnathon-occipital condyle length of 134.8 mm, but this is smaller than the skull of the famous "Wilhelma" Zoo specimen (141.7 mm, SMF 58064). In Dr. Schultze-Westrum's opinion *Varanus salvadorii* is not the most massive monitor but is the longest, and may considerably exceed 3 meters.

Varanus (*Varanus*) *gouldii gouldii* (Gray)

No. 319: 1 subadult, Port Moresby; 5 November 1959

This Gould's monitor of 268 SVL + 415 mm tail came from the savannah and shows no differences between the nominate form from west, north and east Australia.

Varanus (*Varanus*) *indicus indicus* (Daudin)

No. 15 (now SMF 66915): 1 subadult, Aird Hill, Gulf of Papua; 12 Jan. 1966.
Nos. 43, 49, 195, 221-225, 288, 289 (now SMF 66916), 290, 295, 315: 13 adult and subadults, Aird Hill, Gulf of Papua; Oct. 1959 and Jan.-Feb. 1966.
No. 77: 1 adult, Pairupeni, edge (or rim) of hills on the Gulf delta; March 1966.
No. 78: 1 adult, Aird Hill, Gulf of Papua, March 1966.
No. 113: 1 subadult, Maeaera Plantation, St. Joseph River, Central District: 17 June 1966.
No. 129: 1 juvenile, Libano River, Mt. Bosavi region; August 1966.
No. 140: (now SMF 66917): 1 subadult, Moinamu village, Gulf of Papua; 8 October 1959.
No. 177 (now SMF 66918), 323, 328: 3 subadults, Kikori, Gulf of Papua; 14 October 1959.
No. 317: 1 subadult, Bulolo, Eastern Highlands District, Territory of New Guinea; October 1959.
No. 331: 1 adult, Didessa, around Mt. Bosavi, Southern Highlands District: 7 September 1966.

This series of 24 monitors gives a strong impression of uniformity, with a single exception (No. 317). These all have a grayish-black base color, dorsally sprinkled with yellow, the yellow spots have very little tendency to form rosettes. Therefore these are typical "*indicus*"- some individual variation in color, such as that of the tail or the intensity of the throat color, would only be recognized in living animals. More variable than the dorsal pattern is that of the venter: which from nearly patternless specimens goes through a complete range to sprinkled and even flecked patterns. As for the dorsal pattern, only No. 317, a half-grown specimen from Bulolo (SVL 228 mm), has no light spots, but only larger yellow flecks; except for one *V. karlschmidti*, no other small specimens are at hand from that locality. In life, these would appear as bright yellow on the black ground color (dorsally) and as green-yellow flecks on the nape of the neck. The tail was bluish green laterally, the throat was rosy-yellow on the side, the underside yellow, flecked with black. The tips of the tongue are yellow.

Earlier I stated that it is not possible at present to recognize these and other pattern variations of *Varanus indicus* as being distinct taxa. In many parts of the extensive geographic distribution of *V. indicus*, for example the Aru and Kei Islands, such variations seem to be geographically isolated, but elsewhere they are not.

The largest specimen in the collection, No. 77 from Pairupeni, has a total length of about 130 (50+80) cm. This is only slightly smaller than the size record for this species.

Varanus (*Varanus*) *karlschmidti* Mertens

No. 316: 1 subadult (now SMF 66919) Bulolo, Eastern Highlands District; October 1959.
No. 330: 1 adult, around Mt. Bosavi, Southern Highlands District, 7 September 1959.

This monitor was immediately recognized as a different taxon from *V. indicus* by the field collector on the basis of the color in life. It is distinguished from the species, which usually has a yellow throat, by its throat coloration which ranges from a rosy color to a bright flesh (reddish or pink) color, this is

documented in color photographs. It may also be noted that *V. karlschmidti* may be separated from *V. indicus* in life by the coloration of the tongue: which in *V. indicus* is yellow, in *V. karlschmidti* it is reddish with two small black tips.

Although both new specimens of *V. karlschmidti* agree in scalation pattern with the previously known four specimens, they are different in head coloration, which is not unimportant. I have already emphasized (1951: 468) as a distinctive character, the pronounced tendency towards a light yellow head and neck coloration in the types and both paratypes. But examination of the fourth specimen revealed (1959: 234) that the light coloration was not present on the dorsum of the head, and was only evident as a light brownish coloration on the sides of the head. In this regard, it is not generally recognized that both of the Schultze-Westrum's specimens have dark pigment dorsally and laterally on the head, and as mentioned previously only the underside are they a very noteworthy light red color. It is noteworthy that the first four specimens are from northern New Guinea (previously Kaiser Wilhelm's Land) but the new specimens are from the south part of the island (Bosavi) and the east part (Bulolo). It is not impossible that *V. karlschmidti* shows geographic variation in head coloration.

No. 316. SVL 290 mm. Tail 445 mm. Left 6, right 5 supraoculars, whose rows are separated from each other by seven scales. The number of scales from one corner of the mouth to the other is 61; there are 190 scales around the body; 106 transversely across the venter. Dorsally, the color in alcohol is blackish gray, some whitish scales, some are grouped and arranged in rosettes. Dorsally the head is a single color, dark gray, as is the side of the head. The underside of the head is patternless, light; belly is yellowish with small black flecks; dorsally the tail is dark with (a) yellow marbled design, in contrast the distal half is indistinctly banded, alternately light/dark. As to the color in life, it is noted: "Tongue reddish with two small black tips. Dorsum of head blackish gray. Throat with bright yellow on underside becoming bright fleshy-red anteriorly. Dorsum black with vivid greenish-yellow spots. This specimen resembles closely the one from Bosavi with rosy-colored throat (No. 330).

No. 330. SVL about 355 mm, tail about 500 mm. Left 8, right 9 supraoculars, whose rows are separated from each other by 9 scales. 59 scales from one corner of the mouth to the other. 197 scales around the body and 97 transverse scale rows ventrally. Coloration in alcohol: dorsally blackish gray with very sporadic light spots, which do not form rosettes. Dorsum of the head similar, light flecks scarcely noticeable; side of head is similar. Underside of head bright, patternless except for a few black flecks at the edge of the jaws; belly dark, clearly distinct from the bright underside of the head, dirty yellow with many small, black flecks. Dorsum of tail dark with light flecks, the second half (distal half of the tail) is darker and with bright transverse bands.

Varanus karlschmidti is extremely close (closely-related) to *V. indicus*. They agree in general body form, although the anterior part of the head is sometimes narrower in *V. karlschmidti* (Fig. 1). In addition, *V. karlschmidti*, whose total length exceeds 1 meter, does not have the same body mass (bulk) as does *V. indicus*.

As for the scalation, it appears that both species have the same type of enlarged scales, forming a ridge, on the basal portion of the fourth toe. In spite of this, it seems beyond doubt that *V. karlschmidti*, often living sympatrically with *V. indicus*, represents a valid species.

A very important distinguishing character between the two forms can be noted, that in *V. karlschmidti* the much smaller (and therefore more numerous) scales on the head and trunk are apparent without magnification (Figs. 1, 2). The scales on the neck are especially noteworthy, which are not only smaller but also more oblong and more strongly protruding. The scales are also finer in the temporal region, as shown by comparison of the number of scales from one corner of the mouth to the other (56-61 vs. 35-50). As for the color pattern, it is less distinct dorsally in *V. karlschmidti* than in *V. indicus*. On the contrary, the yellow color of the dorsum of the head and neck, emphasized in the original description, up to now has

only been known in specimens from the Sepik region of northeast New Guinea.

Summary

Five species of *Varanus* occur in east and southeastern New Guinea: *V. prasinus*, *V. salvadorii*, *V. gouldii*, *V. indicus*, and *V. karlschmidti*. The last species was previously known only from northeast New Guinea; its diagnosis is significantly expanded on the basis of coloration in life; in this regard a geographic gradient in variability does not seem unlikely.

Figure Caption

Figure 1. *Varanus karlschmidti* No. 316, Bulolo. The fine scalation is readily apparent, in contrast to that of the *V. indicus* in Fig. 2.