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**Description of a new and unusual species of *Sphaerodromia*
(Brachyura, Dromiidae) from the Seychelles Islands**

by Colin L. MCLAY and Alain CROSNIER

Description of a new and unusual species of *Sphaerodromia* (Brachyura, Dromiidae) from the Seychelles Islands

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Abstract. — A new species of dromiid crab, *Sphaerodromia brizops* sp. nov., is described from the Seychelles Islands, Indian Ocean. The unique feature of this crab is the presence of an enlarged, horizontally divided orbit in which the eye is restricted to the lower chamber. The characters of the genus *Sphaerodromia* which make it the most primitive genus of the Dromiidae are discussed.

Résumé. — Une nouvelle espèce de Dromiidae, *Sphaerodromia brizops*, récoltée dans l'océan Indien, aux îles Seychelles, est décrite. Elle se caractérise par une orbite de grande taille, divisée par une cloison horizontale s'étendant sur toute sa longueur, l'œil occupant uniquement la chambre inférieure. Les caractères du genre *Sphaerodromia*, qui en font le plus primitif des genres de la famille des Dromiidae, sont discutés.

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Currently *Sphaerodromia* Alcock, 1899a contains three species : *S. kendalli* (Alcock and Anderson, 1894), *S. nux* Alcock, 1899b, and *S. lethrinusae* Takeda and Kurata, 1976. These species belong to a genus of tropical sponge crabs which occur in the Indian and Western Pacific Ocean, as far north as Japan. The new species described herein was collected on the CEPROS Cruise to the slope of the Seychelles plateau which took place from October 20th to November 2nd, 1987 on the R.V. "Alis" belonging to ORSTOM, during which traps were set from 200 to 800 m deep.

The genus *Sphaerodromia* contains the most primitive species of Dromiidae as it is currently defined. The presence of podobranchs on the chelipeds, epipods on the first two pairs of legs (sometimes with podobranchs), an exopodite on the basis of the second male pleopod, and vestigial pleopods on the third to fifth segment of the male abdomen, all indicate that this is a primitive genus compared to other dromiid genera. A detailed knowledge of *Sphaerodromia* is essential for understanding the origin of the family Dromiidae and the discovery of a new species is therefore important.

Genus **SPHAERODROMIA** Alcock, 1899a

Sphaerodromia brizops sp. nov.

(Fig. 1 a-c, 2 a-g, 3 a-d; pl. I a-b)

MATERIAL — Seychelles Islands : CEPROS cruise, transect 13, trap 1-5, 4°59,8'S, 56°48,8'E, trap, 200-300 m, 01 Nov. 1987 : 1 ♂ holotype, CW = 36.4 mm, CL = 36.4 mm.

TYPE. — The unique specimen, holotype, is deposited in the Muséum national d'Histoire naturelle, Paris, under the registration number MNHN-B 24560.

DESCRIPTION

Carapace as wide as long, narrowed anteriorly, very convex; surface uniformly finely granulated with sparse setae; H-shaped cardiac groove carved, free of granules, with a pair of median pits anteriorly; branchial grooves hardly evident except near the carapace margins. Rostrum bilobed, very deflexed, frontal groove shallow, separating a narrow margin, free of granules, which extends unbroken from the rostrum around the entire supra-orbital and sub-orbital margins. Supra-orbital margin strongly concave, revealing the entire orbital area, eyestalk and eye and sub-orbital lobe in dorsal view. Sub-orbital margin a single broadly rounded lobe; orbit completed by basal segments of the antenna and antennule. First segment of antennae beak-like medially, gaping and twisted, second segment elongate (ratio of length/width = 1.9), distomedial corner not produced, small distal tubercle at point of insertion of third segment, antennal exopod extending beyond end of third segment, apex curved towards orbit. Ratio of length of exopod to length of second segment + exopod = 0.48. Carapace firmly joined to epistome but bearing a shallow groove. Ratio of length of antennal flagella to CW = 0.56. Orbit, very deep, divided horizontally by a curved, smooth shelf which extends from beneath the rostrum, leaving a narrow slot, curving over the antennule, across the orbit to the post-orbital corner just above a faint notch. Thus the orbit is divided into an upper, larger chamber and a lower, smaller chamber which contains the eye and the antennule when folded away. Cornea well-developed, dark brown. Eyestalk finely granulated externally with a bunch of thick setae near the cornea while the internal surface of the eyestalk has a dense fringe of long setae along its whole length. The eye can be totally hidden from dorsal view in this chamber. Internal surface of both the lower and upper chambers smooth, nacreous. Pterygostomial region convex, covered with larger rounded granules. Antero-lateral border of carapace begins at the post-orbital corner, beneath the level of the sub-orbital lobe, sharply convex anteriorly and bearing 13-15 closely-spaced small rounded granules amongst a fringe of short setae. A notch in the margin marks the branchial groove and posteriorly the carapace margin descends rapidly to the rounded postero-lateral corner. Posterior margin concave and paralleled by a distinct groove.

All limbs fringed with short stout setae. Chelipeds well-developed; merus trigonal, armed with sparse, rounded granules, outer face and border of carpus and propodus similarly adorned. Fingers white, stout, down-curved, hollowed-out internally. Fixed finger armed with 10 teeth, smaller and more acute proximally, moveable finger with a single proximal tooth,

remainder of margin almost straight except for 2 distal teeth which engage the teeth of the fixed finger. Internal face of propodus densely pubescent. First two pairs of legs shorter than chelipeds, not knobbed, finely granulate, laterally compressed, dactyli long, but shorter than propodi, with brown curved terminal claws, inner margin armed with 7-8 short spines decreasing in size proximally. Inferior distal corner of propodi armed with a single stout spine which parallels the dactyl for a short distance. Last two pairs of legs, similar to first two pairs but shorter, each about the same length. Dactyl of third leg strongly curved, opposed by 3 short propodal spines (only 1 spine on right side), no spines on the superior propodal margin but there are 2-3 small accessory spines on the inferior margin of the dactyl. Dactyl of fourth leg opposed by 4-5 short propodal spines, no spines on superior propodal margin, but 3-4 accessory spines on the inferior margin of the dactyl itself.

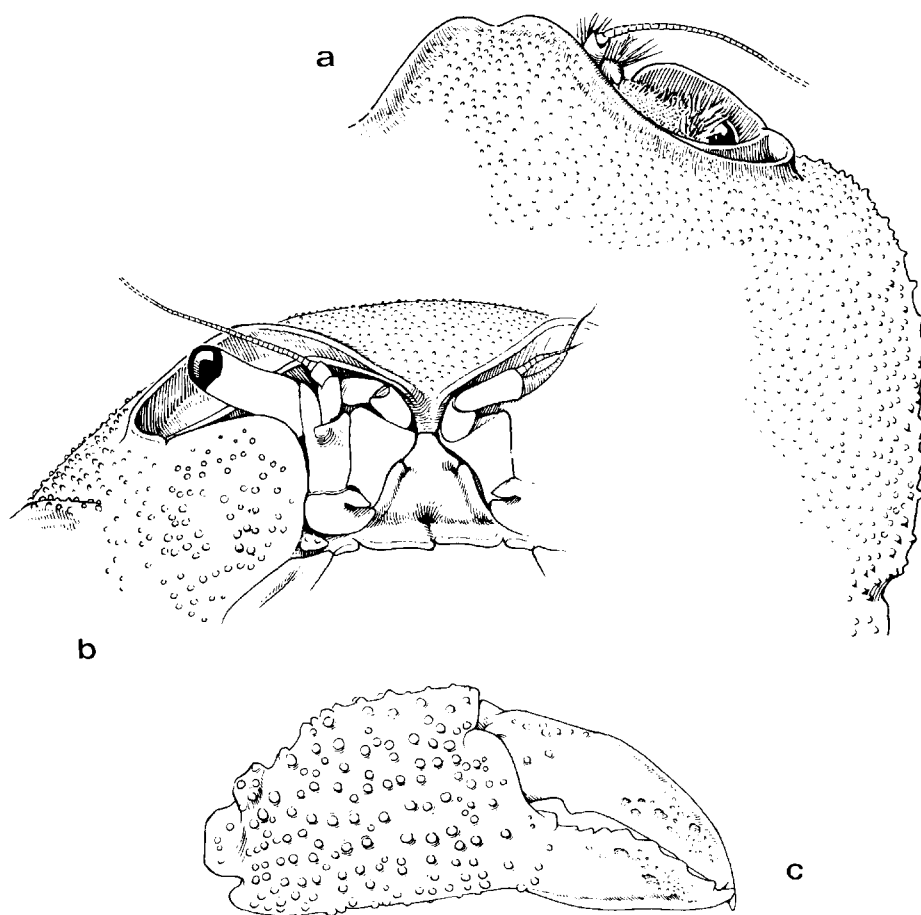


FIG. 1. — *Sphaerodromia brizops* sp. nov., ♂ holotype 36.4 × 36.4 mm, Seychelles Islands (MNHN-B 24560) : a. front and right anterolateral margin of carapace, dorsal view; b. details of right orbit, ventral view, setae omitted; c. right chela, setae omitted.

All the drawings are at the same scale.

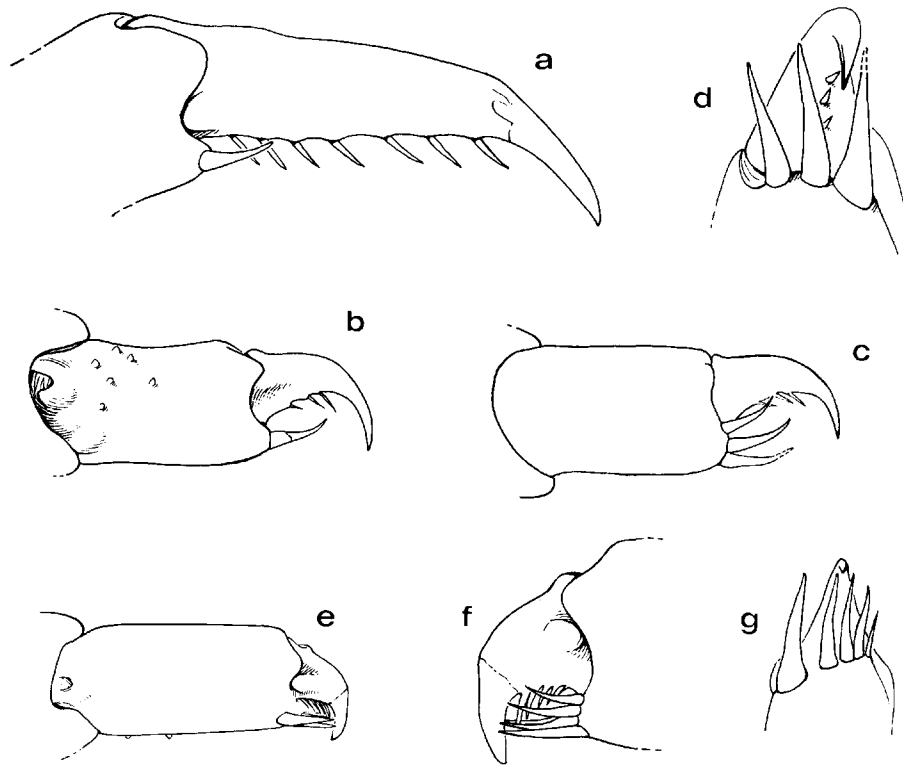


FIG. 2. — *Sphaerodromia brizops* sp. nov., ♂ holotype 36.4 × 36.4 mm, Seychelles Islands (MNHN-B 24560) : a, dactylus of 2nd right leg, posterior view; b, propodus and dactylus of 3rd right leg, posterior view; c, propodus and dactylus of the 3rd left leg, anterior view; d, *idem*, tip, ventral view; e, propodus and dactylus of 4th left leg, posterior view; f, *idem*, tip, anterior view; g, *idem*, tip, ventral view.
a, b, c and e at the same scale; d, f and g at a higher magnification.

Epipod on the cheliped, bearing a well-developed podobranch (all the gills are phyllobranchiate); epipod on first and second legs each with a small podobranch.

Abdomen of six free segments, surface finely granulated, telson longer than wide, tip broadly convex; uropod plates are well-developed and visible externally, lying between the bases of the first two pairs of legs when the abdomen is closed. The abdominal locking finely denticulate ridges on the coxae of the first two pairs of legs. The coxal ridge of the first leg engages with the margin of the proximal corner of the telson, while the coxal ridge of the second leg engages with the proximal corner of the penultimate abdominal segment. Uropods not involved in locking the abdomen. Abdominal segments 3-5 with vestigial pleopods. First pleopods openly grooved to carry the simple needle-like second pair; distal end of endopodite bears a blunt lateral knob and a semi-oval, flattened medial plate. Basis of second pleopod with a short, blunt exopodite. Female characters not known.

ETYMOLOGY. — The species name *brizops* is derived from the greek βριζω, to be sleepy, and ὤψ, eye, and recognizes the unusual construction of the orbit which gives to the crab the appearance of having "sleepy eyes".

HABITAT. — Because the specimen was taken in a trap, we have little idea of the habitat from which it comes except that it lived between 200-300 m. Other associated animals also taken in the trap were : *Plesionika edwardsi* (Brandt, 1851), *Heterocarpus ensifer* A. Milne Edwards, 1881, *Rochinia crosnieri* Griffin and Tranter, 1985, *Munida* sp. and several pagurids.

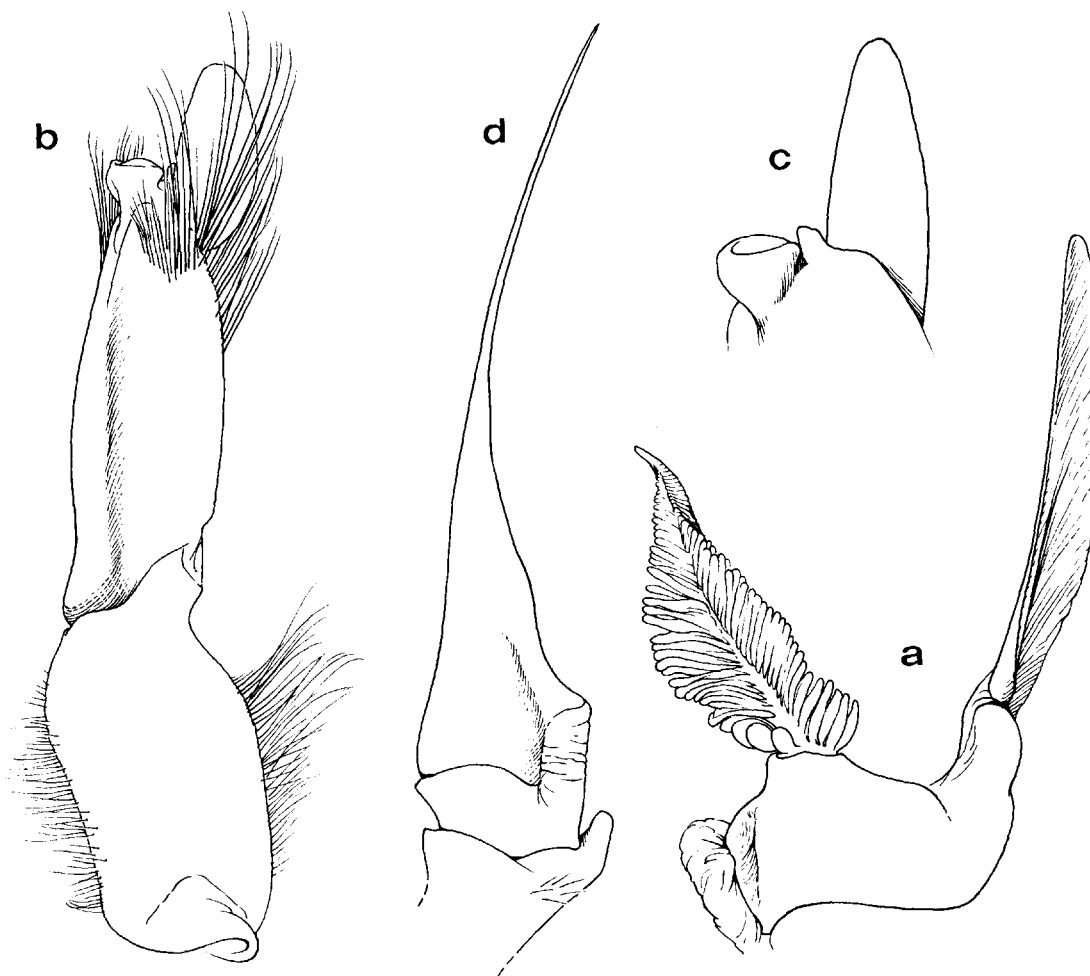


FIG. 3. — *Sphaerodromia brizops* sp. nov., ♂ holotype 36.4 × 36.4 mm, Seychelles Islands (MNHN-B 24560) : a, epipod and podobranch from right cheliped; b, left first pleopod, dorsal view; c, *idem*, tip enlarged, setae omitted; d, left second pleopod, ventral view.
a, b, d are the same scale.

DISCUSSION

Leaving aside the structure of the orbital area, *Sphaerodromia brizops* sp. nov. differs from *S. kendalli* in having 13-15 small granules on the antero-lateral margin (none in *S. kendalli*) and a distal spine on the inferior margins of the first two pairs of legs (none in *S. kendalli*).

S. nux differs from *S. brizops* in having epipods without podobranchs on the first two pairs of legs, a much longer exopodite on the basis of the second male pleopod and in the structure of the orbit.

The important characters which are probably shared by these 3 species include the overall shape of the carapace and the absence of a true rostrum, a similar shape of the tip of the first male pleopod, the presence of vestigial pleopods on male abdominal segments 3-5 (the male of *S. kendalli* is unknown), the presence of 6-8 small spines on the inferior margins of the dactyls of the first two pairs of legs, the presence of 3-4 spines opposing the dactyls of the last two pairs of legs, also the absence of spines on the superior propodal margins of these legs, and the female sternal grooves ending apart behind the genital openings (the female of *S. brizops* is unknown). Although the male or the female of two species are unknown, the overall similarity of the known material makes it likely that they will all share this suite of characters.

No comparisons need to be made with the other species described in this genus: *S. lethrinusae* Takeda and Kurata, 1976, a much smaller sponge crab known from Japan, which does not belong in this genus. The species was described using an immature female specimen and now that mature specimens are available, it will be placed in the correct genus in a later paper.

The most distinctive feature of *S. brizops* is the novel structure of the orbital region. The orbital area is large, extending more posteriorly and deeper into the body cavity than in the other species, and divided horizontally by a stout shelf. The eyestalk and cornea, although of similar length to that of *S. kendalli*, are less well developed. In *S. kendalli* the eyestalk fills the entire orbit when withdrawn while in *S. brizops* there remains ample space around the eyestalk. Thus the eyes can be more completely concealed. When the eyes are extended in *S. brizops* the field of vision is larger, both laterally and vertically. It is perhaps possible that the curved, smooth, nacreous surface of the upper chamber serves as a reflective background for the eye when it is extended. Therefore the unusual orbits of *S. brizops* may be an adaptation to enhance vision under conditions of low light intensity. The dense fringe of setae along the inner margin of the eyestalk is probably used to keep the orbital area clean.

The other species of *Sphaerodromia* (except for *S. lethrinusae*) also have orbits which differ from the other Dromiidae. ALCOCK and ANDERSON (1894) first noted the imperfect division of the orbit of *S. kendalli*. In this species, and also *S. nux*, the inner superior orbital surface carries a ridge which provides a pocket for the corneal region of the eyestalk, but the incipient division is vertical rather than horizontal as in *S. brizops*. This kind of orbital structure is also found among the Dynomenidae, e. g. *Dynomene filholi* Bouvier, 1894, *D. hispida* Desmarest, 1825 and *D. praedator* A. Milne Edwards, 1879. These species have a very similar shape and organization of the frontal region of the carapaces confirming the close relationship of the Dynomenidae and Dromiidae.

S. brizops is the third species of this genus found in the Indian Ocean. *S. kendalli* is known from the type locality in the Bay of Bengal (ALCOCK and ANDERSON, 1894) and *S. nux* is known from Burma (ALCOCK, 1899b), Madagascar and Seychelles (LEWINSOHN, 1984). Both of these species extend their distribution into the Pacific Ocean. It will not be surprising to find that *S. brizops* may have a similar, widespread distribution. At the Seychelles Islands both *S. brizops* and *S. nux* occurs but all the records for *S. nux* are from shallower water than for *S. brizops*.

Although the specimen which came to us was not accompanied by a sponge, we assume

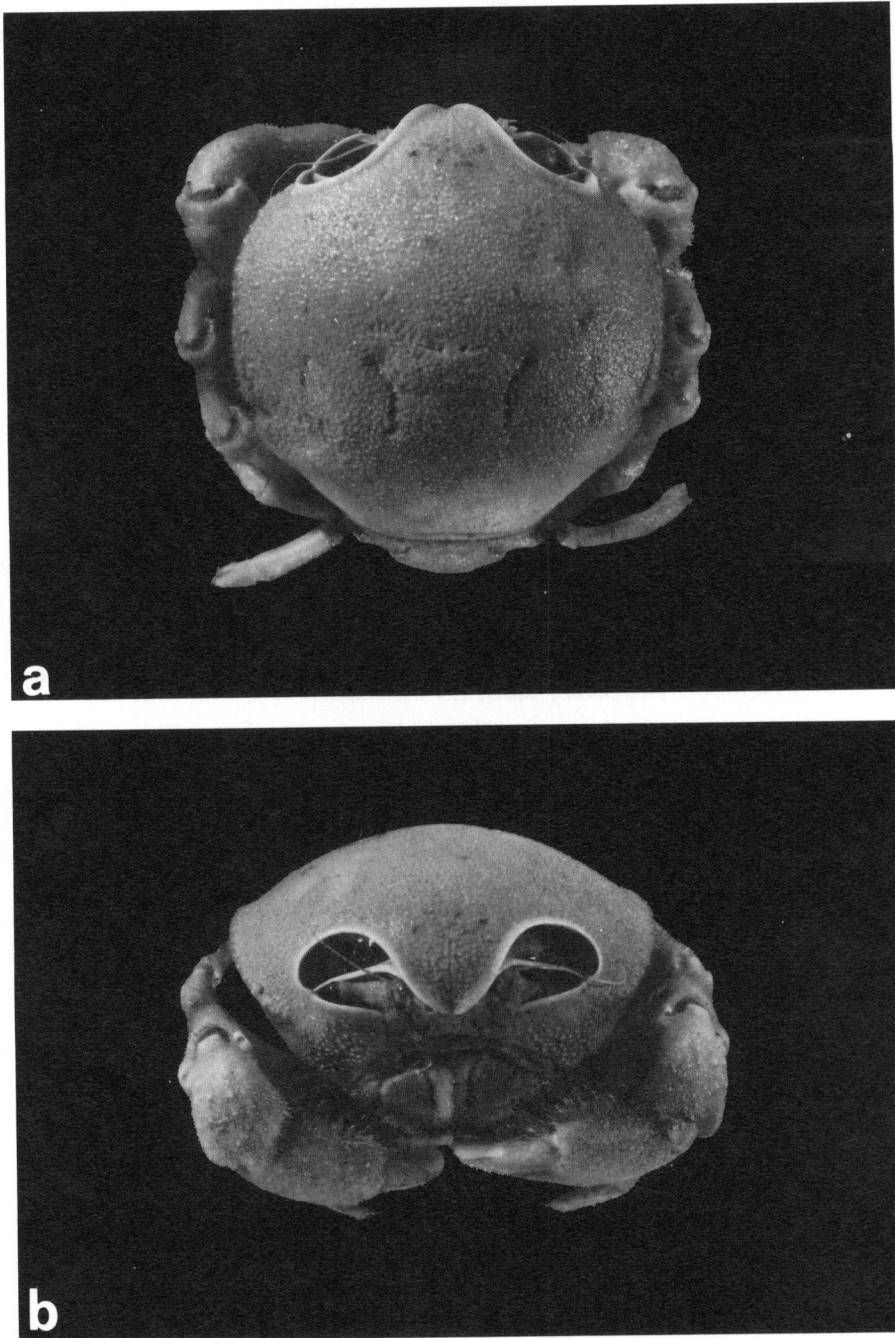
that it would, like the other species of *Sphaerodromia*, carry a sponge cap over its carapace. The last two pairs of legs and their terminal spines are developed in a similar manner to the other species which do carry large pieces of sponge for concealment.

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PL. 1. — *Sphaerodromia brizops* sp. nov., ♂ holotype 36.4 × 36.4 mm, Seychelles Islands (MNHN-B 24560) : a, dorsal view of whole crab, fourth legs not in natural position, b, frontal view of whole crab.