



Crustacea Stomatopoda and Decapoda collected by the MesoRun and HydMeR projects in Réunion Island, with 16 new records

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Abstract: A sampling of stomatopod and decapod crustaceans has been performed between 60-110 m off Réunion Island. Most of the specimens are very small, collected with hydrozoan or antipatharian hosts. Thirty-one species have been recognized, including 16 new records for Réunion Island. With these new observations, 598 species of Stomatopoda and Decapoda are now reported from Réunion Island.

Résumé : *Crustacés stomatopodes et décapodes récoltés par les projets MesoRun et HydMer à la Réunion, dont 16 nouveaux signalements.* Une récolte de crustacés stomatopodes et décapodes a été réalisée entre 60 et 110 m au large de la Réunion. La plupart des spécimens sont très petits, récoltés sur des hôtes hydrozoaires ou antipathaires. Trente et une espèces ont été identifiées, dont 16 nouveaux signalements pour l'île de la Réunion. Avec ces nouvelles observations, 598 espèces de Stomatopoda and Decapoda sont maintenant répertoriées à la Réunion.

Keywords: Réunion Island • New regional records • Stomatopoda • Decapoda • Mesophotic • Symbiotic

Introduction

The mesophotic zone, 50-150 m, is a marine realm still poorly known because it is difficult to access when diving. The improvement of diving techniques during the last decades, however, with rebreathers and special gas mixtures (Heliox, Trimix), has greatly expanded the depths accessible during scuba dives making thus observations more and more frequent in this so-called

twilight zone or Mesophotic Coral Ecosystems (MCEs). The investigations already conducted in MCEs have shown that: a) MCEs represent approximately 80% of potential coral reef habitat worldwide; b) they can serve as refugia for some shallow species; c) they constitute unique ecosystems, distinct from their shallow-water counterparts; and d) there exist community breaks for several benthic taxa around 60 m (Hinderstein et al., 2010; Rocha et al., 2018; Lesser et al., 2019; Pinheiro et al., 2019; Pyle & Copus, 2019). In this context, several scientific explorations have been recently initiated in the South Western Indian Ocean (SWIO), around

Mayotte and Réunion Island, to study these MCEs still pristine because out of reach of most anthropogenic nuisances (Barathieu et al., 2019; Pichon et al., 2020; Wickel et al., 2020; Boissin et al., 2021; Hoarau et al., 2021). The present study is a part of this new regional research program, focusing on crustacean specimens collected in 2020-21 around Réunion Island during the projects MesoRun and HydMeR.

Materials and Methods

The MesoRun (*Mésophotique Réunion*) and HydMeR (*Hydriales Mésophotiques Réunion*) programs were conducted in the mesophotic zone of Réunion Island on reefs slopes situated between 60-110 m, off Saint Leu and Sainte Rose, respectively west and east of the Island. Between August 2020 and February 2021, a total of 36 scuba dives have been realized by 'high tech' scuba divers of the association "*Poisson Lune*". During the limited time available at great depths, two divers, using closed circuit rebreather and Trimix gas, have collected sediment samples as well as several sessile organisms living on the coral slopes such as antipatharians, scleractinians, gorgonians, hydrozoans, sponges and algae. No effort was made to collect specifically the crustacean Stomatopoda or Decapoda. The specimens collected were mostly obtained as by-catch, often discovered accidentally in branches of the sessile organisms brought to the surface or mixed with sediment samples. As a result, the specimens examined herein are usually of small sizes, often juveniles, and sometimes crushed and in bad condition. The collection realized is, nevertheless, interesting because made by hand at rarely prospected depths. Consequently, species not usually sampled with more traditional techniques, such as trawl or dredges, were obtained. All collected specimens have been fixed in alcohol and examined in detail by using a Nikon SMZ stereomicroscope with transmitted light base, camera Lucida drawing tube and camera adapter for Canon EOS reflex camera. Identifications of the species were performed by J. Poupin, with contribution of A. Anker for the Alpheidae. They were made by using diverse taxonomic contributions that are cited under each species. '?' is used for determinations made with hesitation; aff. is used when the specimen(s) cannot be identified to species level but are close (affiliated) to the species indicated after "aff."; s.l. (*sensu lato*) is used when the species recognized is known to include distinct geographic populations that will likely be separated as distinct species in the future as taxonomic studies are refined, including the use of molecular sequencing.

Drawings and photographs have been made for some species with a few complementary photographs also posted in the database of Legall & Poupin (2022). Most of the specimens were not retained for Museum collections because of too poor condition and bad preservation. They are kept, however, at the École Navale (c/o J. Poupin). Measurements are carapace length (Lc, from post-ocular margin to posterior carapace) and, only for entire specimens of shrimps and anomurans, the maximum or total length (Lt, from tip of extended pereopods to posterior margin of telson). For the crabs the measurements are carapace length × carapace width (e.g. 5.5 × 4.4 mm). Abbreviations used are: FLMNH, Florida Museum of Natural History; IWP, Indo-west Pacific; Lc, carapace length; Lt, total length; MCEs, Mesophotic Corals Ecosystems; MNHN, Muséum national d'Histoire naturelle, Paris; NSW, New South Wales; NT, Northern Territories; pers. com., personal communication; P1-5, pereopods 1 (cheliped) to 5; SWIO, Southwest Indian Ocean; UF, University of Florida; WA, Western Australia.

Systematic section

Stomatopoda Latreille, 1817

Family Gonodactylidae Giesbrecht, 1910

Hoplosquilloides coronatus Manning, 1978

1 male, Lc 3.6 mm, Lt 16.7 mm, 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m, in hard bottom with coarse sediments.

This species is endemic of SWIO, described from Réunion Island (0-35 m) and Madagascar (21-33 m) (Manning, 1978), and reported herein for the first time since its description. Its maximum depth record is extended from 35 to 75 m. This is the single species of the genus, easily recognized by its crown-shaped telson with anus in dorsal position (Manning, 1978; Ahyong, 2001; Ahyong & Chan, 2008).

Decapoda Latreille, 1802

Caridea Dana, 1852

Family Disciidae Rathbun, 1902

Discias brownae Kensley, 1983

1 ovigerous female, Lc 1.4 mm, Lt 5.2 mm, 27 August 2020, Sainte Rose, 21.12070°S-55.78714°E, 70-80 m, on gorgonian.

This is a species from NSW (Port Jackson, 9-33 m; Kensley, 1983) and WA (Bald Island, 147-157 m; McEnulty et al., 2011), reported herein for the first time in SWIO. It is usually associated with sponges *Teichonopsis labyrinthica* (Carter, 1878) and perhaps

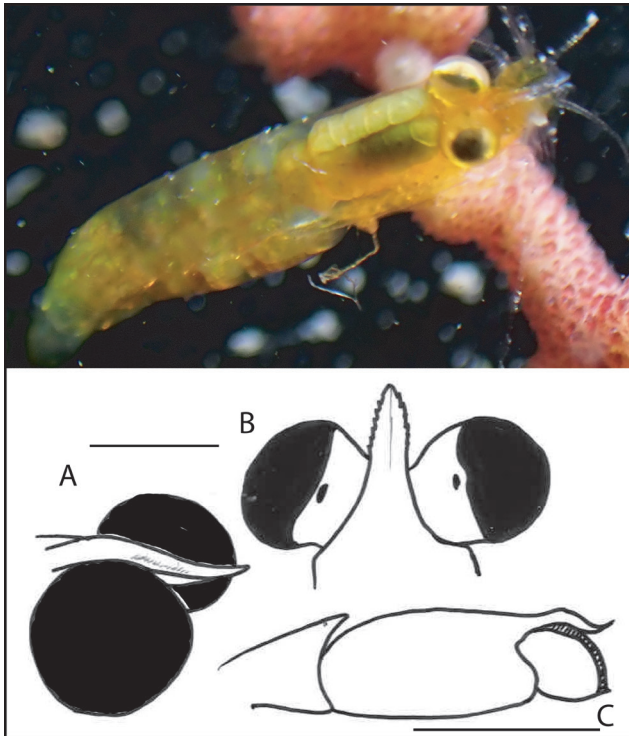


Figure 1. *Discias brownae*. Réunion, Sainte Rose, 70-80 m. Top, 1 ovigerous female, Lc 1.4 mm, Lt 5.2 mm (just after its collection, with? gorgonian; photo F. Trentin). Bottom, same, details of rostrum (A, lateral; B, dorsal) and chela of right P1 (C, lateral). Scales bars 0.5 mm.

also gorgonians (this study). The determination is made with Kensley (1983) key where *Discias* sp. is replaced by *Discias vernbergi* Boothe & Heard, 1987 (see Boothe & Heard, 1987). These characters were verified on the specimen examined: rostrum lanceolate, with sharp tip, feebly denticulate on distolateral edges (Fig. 1A-B); chela of P1 with dactyl disk-shaped (Fig. 1C); abdominal tergite 2 with small distomedian spine; telson armed with 3 pairs of distal spines; outer margin of uropodal exopod not denticulate. The mandible was not dissected. *Discias brownae* is related to *D. exul* Kemp, 1920 a species with large IWP distribution, redescribed by Pachelles & De Grave (2015), and distinct from other species by 4 pairs of distal spines on telson. It is also related to *Discias serratiostris* Lebour, 1949, an Atlantic species featuring a distinct rostrum, larger at its base, not lanceolate (compare Kensley, 1983: fig. 8j, 14a).

Family Chlorotocellidae Komai, Chan & De Grave, 2019

Anachlorocurtis occidentalis Horká, De Grave & Ďuriš, 2014

3 small specimens, largest Lc 1.7 mm, Lt 8.5 mm, 4 November 2020, Bay of Saint Leu, 21.17538°S-55.27256°E, 97 m, in antipatharians.

Before this study, this species was reported only from the Red Sea (Gulf of Aqaba), between 4-55 m (Horká et al., 2014). This is a first report in SWIO with new maximum depth at 97 m. *Anachlorocurtis* are thread-like mimetic shrimps living in antipatharians. Only three species are known: *A. occidentalis*; *A. commensalis* Hayashi, 1975, from Japan and Taiwan, 8-57 m (see Horká et al., 2014); and *A. australis* Ahyong, 2015, from Kermadec, 15-24 m. Réunion specimens are attributed to *A. occidentalis* based on the characters provided by Ahyong (2015). They are different from *A. commensalis* by: a) a distinctly humped abdominal tergite 3; b) a more elongate cornea with a small distal process (0.9 as long as stalk, versus about 0.5 as long as stalk in *A. commensalis*); and c) a more elongate abdominal somite 6 (dorsal length 2.9 times height, vs. 2.0 in *A. commensalis*). The differences indicated by Ahyong (2015) between *A. occidentalis* and *A. australis* are mostly based on differences in P3-5 proportions. In *A. occidentalis* P3-5 are slender than in *A. australis*, with propodi 10 times as long as high (vs. 8 times in *A. australis*) and dactyli 5.5 times as long as high (vs. 3.8-4.0 times in *A. australis*). The measurements for Réunion specimens are intermediate, but closer to *A. occidentalis*: propodi 8.7-8.8 times as long as high and dactyli 4.8-6.0 times as long as high. In the future it will be interesting to examine more specimens of both species to confirm their morphological differences. Only two specimens of *A. australis* were reported in the original description (Ahyong, 2015) and P3-P5 proportions could prove to be variable when more specimens are available, which would question the current distinction between the two species.

Family Palaemonidae Rafinesque, 1815
Cuapetes grandis (Stimpson, 1860)

1 male Lc 2.2 mm, 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m, with sediment (sand); 1 ovigerous female, Lc 1.8 mm, 27 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 80 m, coral rubbles.

This shrimp has a large IWP distribution, from the Red Sea and Eastern Africa to Japan and French Polynesia, 0-30 m (Li & Bruce, 2006: 644). In SWIO it has been reported from Kenya, Tanzania, Mozambique, Comoros (Mayotte), Madagascar, Seychelles and, herein, from Réunion for the first time, with a new maximum depth at 87 m. The two specimens examined have a broken rostrum. They were identified based on the key provided in Bruce key (2004; genus *Kemponia*). The carapace is armed with supraorbital, antennal and hepatic spines. The antennal peduncle, scaphocerite and P1-5 of the specimens examined are



Figure 2. *Anachlorocurtis occidentalis*. Réunion, Saint Leu, 97 m. Top, specimen in antipatharian, just after collection, Lt 8.5 mm; bottom, details of rostrum and dorsal carapace; photo F. Trentin. Scale bar 0.5 mm.

similar to the illustration given in Kemp (1922: 210, pl. VII, fig. 10). Carpus and merus of P2 are armed, each, with 1 distal spine.

***Cuapetes nilandensis* (Borradaile, 1915)**

1 male, 1 ovigerous female, Lc 2.5 mm, Lt 11 mm, 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m, in antipatharians; 1 ovigerous female, Lc 2.6 mm, Lt 11 mm [in bad condition], 1 September 2020, Le Port, 20.944233S-55.27755E, 65 m, in antipatharians; 1 sp. Lc 1.6 mm [missing most of pereopods], 27 August 2020, Sainte Rose, 21.12070S-55.78714E, 75-80 m, with sediments.

This is an IWP shrimp, reported from Eastern Africa to New-Caledonia and Eastern Australia, 1-133 m (Li & Bruce, 2006). In SWIO it has been already reported from Kenya, Zanzibar, Madagascar and Réunion (Li & Bruce, 2006: 647; including Réunion, coll. Marion Dufresne, MD32, station CP43, 73-77 m, 27 August 1982, MNHN Na-14918). The specimens examined were identified by using Bruce (2004) key and the re-description available in Bruce (1978: 22, figs 8-9). The rostrum formula is 1 (on carapace) + 8 (upper rostrum) / 4 (lower rostrum) spines; the carapace is armed with supraorbital, antennal and hepatic spines; P2 merus is unarmed, 1.33 times longer than carpus.

***Hamodactylus ? boschmai* Holthuis, 1952**

1 ovigerous female Lc 1.8 mm [all pereopods missing], 6 January 2021, Sainte Rose, 21.12070°S-55.78714°E, 75-80 m, in Gorgoniidae.

This is an IWP species, distributed from Kenya and Madagascar to Indonesia and New Caledonia. It is associated with Gorgoniidae, between 1-35 m (Li & Bruce, 2006). This is a first record for Réunion, at a new maximum depth of 75-80 m. The single specimen examined is missing all pereopods and is, therefore, determined with hesitation based on the key provided by Horká et al. (2016). Specific characters include: rostrum lamella unarmed ventrally, with 4 teeth on dorsal margin; hooked aspect of P2 dactyl not verified; carapace with supraocular and hepatic spines; proximal half of ocular peduncle inflated; basal antennular peduncle and telson similar to illustrations provided by Holthuis (1952) and Bruce (1970). The differences with typical *H. boschmai* are: a shorter rostrum, reaching only to the anterior margin of the penultimate antennular segment (instead of overreaching the distal antennular segment) and an indistinct antennal spine (instead of minute, but clearly present).

A second *Hamodactylus* specimen (male Lc 2.0 mm, Lt 10 mm) was collected at the same station. It is close to *H. noumeae* Bruce, 1970 but different. It has not been successfully determined to species level.

***Manipontonia paeneglabra* Bruce, 2012**

1 ovigerous female Lc 3.4 mm, Lt 19 mm [rostrum broken], 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m, with sediment.

This shrimp is associated with various species of Gorgoniidae, described from Northwest Australia, 95-105 m, and South China Sea, 82-84 m (Bruce, 2012), and also reported from Singapore, 6-75 m (Anker & De Grave, 2016). It is herein reported for the first time in the SWIO (Réunion). The specimen examined has an asymmetrical P2, left being very long, about 4 times Lc, with carpus being the longest segment. The carapace is armed with: 1 epigastric spine (hook shaped), 1 hepatic spine and 1 antennal spine. Similarly, long major P2 have been observed in species of *Rapimenes* (*R. laevimanus* (Đuriš, 2010) and *R. granulimanus* (Bruce, 1978); see Đuriš & Horká, 2017: fig. 3g-h) but in these two species the carpus is not the longest segment of major P2 and they also differ from many aspects (rostrum, pereopods, etc.) By using the key to species of *Manipontonia* in Bruce (2012) the specimen examined is attributed to *M. paeneglabra* (major P2 chela longer than half the carpus; palm covered with scarce and tiny spines). In *M. psamathe* (De Man, 1902), a morphologically close species, the major P2 chela is shorter than half of the carpus and the palm feature more spines (see Marin, 2010: fig. 2C-D). Anker & De Grave (2016), however,

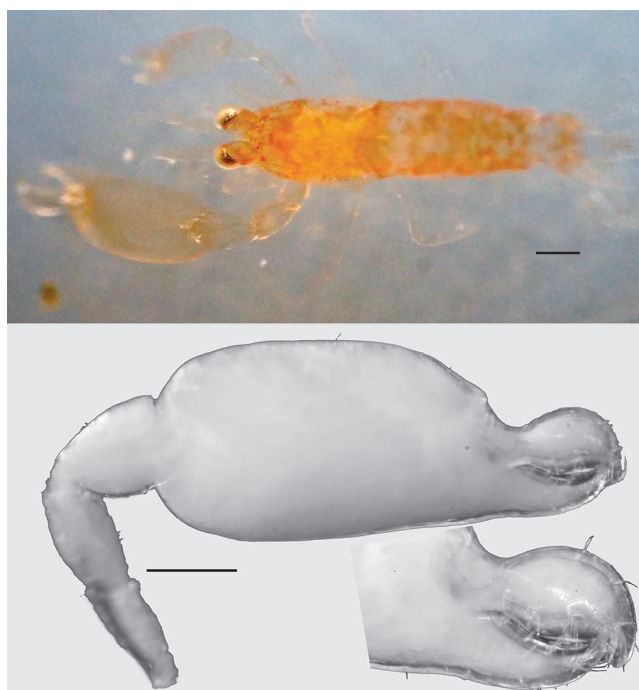


Figure 3. ?*Typton bawii*. Réunion, 'Coulée lave 1977', 93 m. Top, habitus of freshly collected specimen, Lc 1.4 mm, photo T. Mulochau; bottom, left major P2, inner face (fingers enlarged). Scales bars 0.5 mm.

have observed variations in the armature of the major P2 chela in *M. paeneglabra* and have suggested that *M. paeneglabra* and *M. psamathe* could perhaps be synonyms.

? *Typton bawii* Bruce, 1972
(Fig. 3)

1 specimen, Lc 1.4 mm, Lt 4.5 mm, 30 September 2020, 'Coulée lave de 1977', 21.15618°S-55.84092°E, 93 m, hard coral bottom with *Leptoseris*, *Stylaster* and ? sponges.

This IWP shrimp is usually associated with sponges (not formally observed herein), distributed from Tanzania and Kenya to Japan and Eastern Australia (Queensland), 18-25 m (Bruce, 2000). This is a new record for Réunion. The identification is tentative (even for genus) because the buccal appendages were not dissected, scaphocerites were not seen (broken), and the aspect of the left major P2 of *T. bawii* is not known: "Only the right second pereopod is present" (fide Bruce, 1972: 248). The specimen is tentatively identified based on description and figures of *T. bawii* provided in Bruce (1972) and on the key to species of the genus *Typton* (Bruce, 2000). In our specimen the rostrum is short, blunt, dorsally and ventrally unarmed,

as in *T. bawii*; the major left P2 is figured on figure 3; the minor right P2 of our specimen is as figured for *T. bawii* in Bruce (1972: fig. 5d-e).

Family Lysmatidae Dana, 1852
***Lysmata debelius* Bruce, 1983**
(Fig. 4A)

No specimen examined, only *in situ* photograph, 15 January 2021, Saint Leu, 21.17577°S-55.27213°E, 110 m, hard coral bottom with sponges, gorgonians and antipatharians.

This shrimp is emblematic for underwater photographs and aquarists because of its bright red coloration (Fig. 4A). It has been described from Polillo Island, East of Luzon, Philippines, 28 m (Bruce, 1983) and has since been episodically illustrated in underwater marine guides such as Gosliner et al. (1996: 213) or Debelius (2001: 128), between 10-30 m in various IWP localities: Sri Lanka, Maldives, Andaman, Indonesia, Philippines, Japan, Line and Society Islands. In India it has been reported by Madhavan et al. (2019). In Marquesas Islands it has been tentatively recognized on photographs (photo Yann Hubert, 2012, det. J. Poupin, unpublished until now). It is still unreported from Hawaiian Islands and Australia. It is herein reported for the first time in Réunion, at a new maximum depth of 110 m. The color of the specimen photographed is bright red with white spots on the carapace as illustrated in Debelius (2001: 127, 129). Our specimen differs slightly by the uniformly red tip of antennae and legs instead of white tips in Debelius' photographs (Debelius, 2001), but the latter author, however, indicates some color variations: "The coloration of the Scarlet cleaner shrimp shows some variation throughout the species wide range of distribution (Indian Ocean to central Pacific)".

Family Alpheidae Rafinesque, 1815
***Alpheus longecarinatus* Hilgendorf, 1879**
(Fig. 4B)

1 male Lc 3.3 mm, Lt 12 mm, 27 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 80 m, among coral debris, algae, and sponges.

This is a SWIO snapping shrimp, reported from Tanzania, Somalia, Kenya, Mozambique, Seychelles, Madagascar, South Africa, 36-86 m (Kensley, 1981; Banner & Banner, 1983) and, herein, a first report for Réunion (80 m). This new geographic record will be also integrated in a forthcoming list of SWIO alpheid shrimps (Anker & Corbari, in prep.). This alpheid has some resemblance with *A. paralcycione* Coutière, 1905, common in IWP, including Réunion between 58-70 m

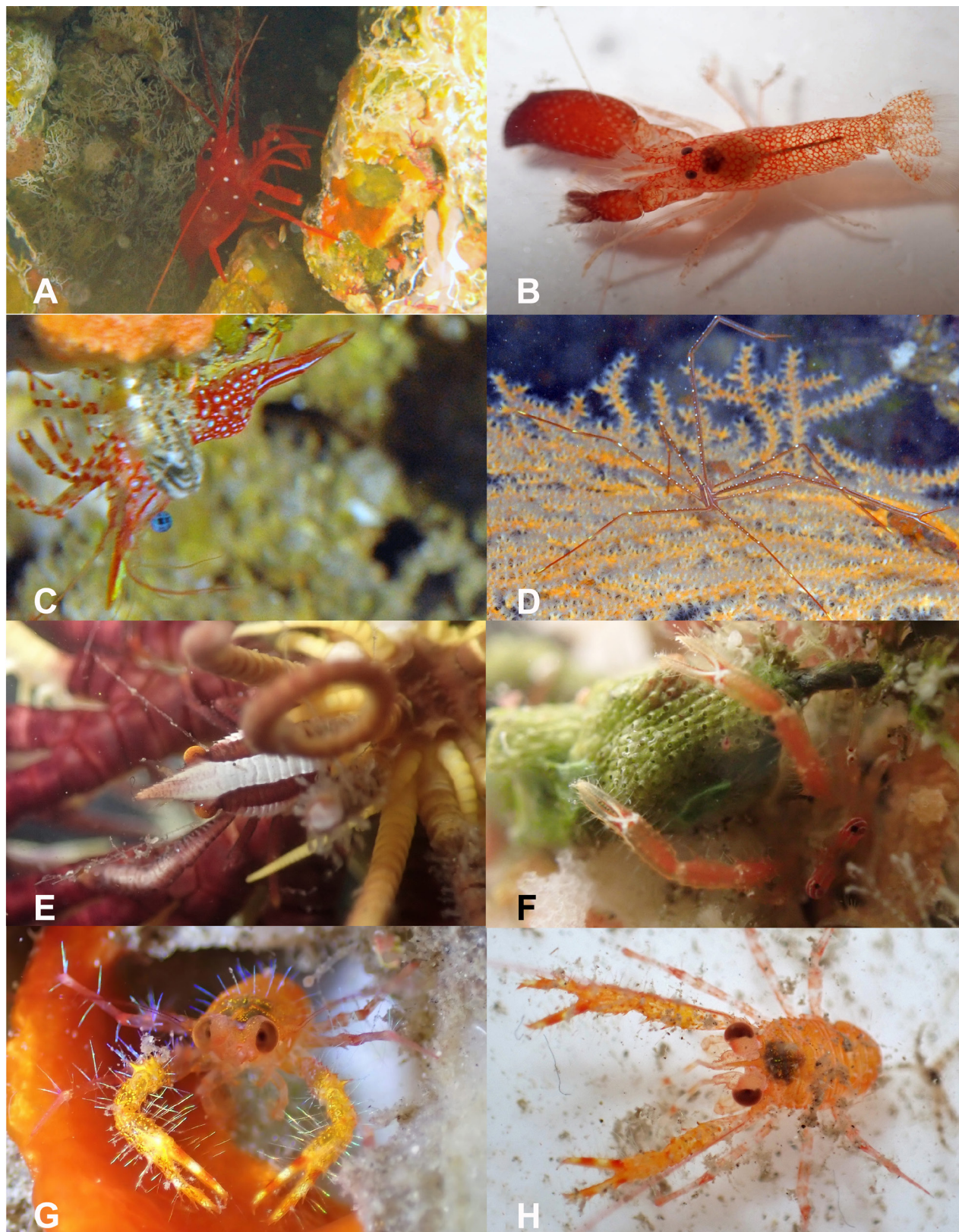


Figure 4. Crustacean Decapoda in Réunion mesophotic zone (75-110 m). **A.** *Lysmata debelius*, 110 m. **B.** *Alpheus longecarinatus*, 80 m. **C.** *Rhynchocinetes* sp. [1] aff. *serratus*, 95 m. **D.** *Chirostylus dolichopus* s.l., 93 m. **E.** *Allogalathea elegans*, 97 m. **F.** *Galathea tanegashimae*, 75 m. **G-H.** *Munida foresti*, 88 m. Photos P. Plantard (in situ, A, C & D), F. Trentin (B, E, G & H), T. Mulochau (F).

(Banner & Banner, 1983). Its color pattern is different, red orange with white spots (Fig. 4B), instead of overall yellow in *A. paralcycione*.

***Alpheus paradentipes* Coutière, 1905 s.l.**

1 male, Lc 4.8 mm, 1 ovigerous female, Lc 4.6 mm, 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m, hard bottom with rubbles; 1 male Lc 4.5 mm, 8 October 2020, Pointe au Sel, 21.20294S-55.27469E, 87 m [with doubt, no chelae and P3].

This is a first record for Réunion that will be also integrated in Anker & Corbari (in prep.). The characters observed are those provided in the key by Banner (1953: 49; as *Crangon paradentipes*). As currently recognized *Alpheus paradentipes* s.l. is a complex of species widely distributed in the IWP that needs to be revised. Current distribution includes: Eastern Africa, Madagascar, Réunion (this study), Seychelles, Maldives, Indonesia, Philippines, Japan, Hawaii and French Polynesia, 10-170 m, often associated with sponges (Chace, 1988; Anker, 2001).

Family Rhynchocinetidae Smith, 1884

Rhynchocinetes* sp. [1] aff. *serratus

(H. Milne Edwards, 1837)

(Fig. 4C)

No specimen examined, only *in situ* photograph, 15 December 2020, Bay of Saint Leu, 21.17538°S-55.272256°E, 95 m, hard substrate with corals including antipatharians and gorgonians.

This is a new species close to *R. serratus*, also observed in the mesophotic zone of Mayotte (Poupin et al. in press) and probably endemic to SWIO. Collection of at least one specimen is necessary for a formal description. This is a new record for Réunion.

Anomura MacLeay, 1838

Family Chirostylidae Ortmann, 1892

***Chirostylus dolichopus* Ortmann, 1892 s.l.**

(Fig. 4D)

1 male Lc 3.1 mm, 13 January 2021, Saint Leu, 21.16904S-55.27030E, 97 m; photos only, no specimens, 12 August 2020, Saint Leu, 85 m, and 5 January 2021, Sainte Rose, 21.11783°S-55.78518°E, 93 m (Fig. 4D). On antipatharians.

As currently recognized *Chirostylus dolichopus* s.l. is an IWP species, distributed from Somalia, Mozambique Channel, and Mauritius, to Australia, Japan and Philippines, 35-238 m (Baba et al., 2008). This is a new record for Réunion. The characters observed on the Réunion specimen match those of *C. dolichopus* in the key of Osawa & Nishikiori (1998). The carapace

has the following spinulation: a minute rostral spine; a pair of epigastric spines (behind ocular peduncles); no gastric or cardiac spines; three branchial spines (in front of cervical groove, anterior spine separated from two posterior spines); a small anterolateral spine with a larger spine, just behind. Based on their coloration the specimens from Réunion are similar to those observed by Poupin et al. (2022:145, figs 8A, C, E, 14B)) from Mayotte and Glorieuses; these authors are reporting obvious differences in color pattern between the SWIO and the Japanese populations, indicating the presence of a cryptic species in SWIO. In a forthcoming checklist of SWIO Chirostylidae Baba et al. (in prep.) maintain the IWP status of *C. dolichopus* s.l. but conclude also that the SWIO population should be separated as a new species.

Family Galatheidae Samouelle, 1819

***Allogalthea elegans* (Adams & White, 1848)**

(Fig. 4E)

1 female Lc (with rostrum) 5.6 mm, 1 ovigerous female Lc 4.8 mm, 13 January 2021, Saint Leu, 21.16904°S-55.27030°E, 97 m, in feather star, Comatulidae.

Four species are currently included in this genus (Cabezas et al., 2011). *Allogalthea elegans* is distributed in the IWP, known with certainty from the Red Sea, Mozambique, Madagascar, Réunion (Marion Dufresne, 1982, MD32 station CP127, 90 m), Indonesia, Taiwan, Philippines, Vanuatu and New Caledonia (probably also in South Africa, Sri Lanka, Japan and Australia) (Cabezas et al., 2011). *Allogalthea elegans* is always associated with crinoid Comatulidae, between 10-183 m. The following characters were used to distinguish the two specimens examined from other species in the genus: P1, 1.4-1.5 times Lc; rostrum moderately elongated, 2.2-2.3 times longer than wide; dorsal surface of chela with spiny squamae (see Cabezas et al., 2011: fig. 6B); mesial and lateral margins of chelae almost straight; dorsal margins of P2-3 meri with spines; P2 merus 3.65 times longer than wide; color pattern much closer to *A. elegans* according to Cabezas et al. (2011) color plate of the four known *Allogalthea* species

***Galathea tanegashimae* Baba, 1969**

(Fig. 4F)

No specimen examined, only *in situ* photograph, 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m, coral ground with sponges and algae.

This species is remarkable by an X-shaped design at the base of the fingers of chelae, verified on specimens examined from Mayotte and Madagascar (see Macpherson & Cleve, 2010: 65, fig. 3G-H).

Distribution presented in Macpherson & Robainas-Barcia (2015) is IWP, from Mozambique, Mayotte, Scattered Islands, Madagascar, Seychelles and Maldives, Japan, Taiwan, Philippines, China Sea, New Caledonia, Australia, Vanuatu, Papua New Guinea, and Vanuatu, 1-153 m. This is a first record for Réunion Island.

Phylladorhynchus hylas Rodriguez-Flores,
Macpherson & Machordom, 2021

1 female, Lc 2.3 mm, 5 January 2021, Sainte Rose, 21.11783S-55.78518E, 93 m; 1 ovigerous female, Lc 1.7 mm, 1 male juvenile Lc 1.3 mm [bad condition], 1 October 2020, Anse Cascades, 21.19659°S-55.82976°E, 92 m; 1 male Lc 2.3 mm, 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m; 1 ovigerous female, Lc 2.0 mm, 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m. Hard bottoms with antipatharians, gorgonians, algae, sponges.

This is a SWIO species recently described from Réunion (Marion Dufresne, MD32, 1982, station CP43, 21.3450°S, 55.4483°E, 73-77 m), probably also present in the Red Sea. The material examined includes only small size specimens, some of them poorly preserved. They have been, however, determined confidently by using the key in Rodriguez-Flores et al. (2021). A slight extension of the maximum depth for *P. hylas*, from 77 to 93 m, is observed herein.

Phylladorhynchus janiqueae Rodriguez-Flores,
Macpherson & Machordom, 2021

2 ovigerous females, Lc 3.5 mm, collected before MesoRun campaign, 27 October 2019, La Pérouse seamount, 60-120 m.

This is a SWIO species reported by Rodriguez-Flores et al. (2021) from Madagascar, Walter Shoals (South of Madagascar) and Réunion (Marion Dufresne, 1982, MD32 station CP43, 21.3450°S-55.4483°E, 73-77 m), 18-98 m. The two specimens examined herein are from La Pérouse Seamount, 160 km northwest of Réunion, determined confidently with the key provided by Rodriguez-Flores et al. (2021). It must be noted that in unpublished scientific reports prepared before the present contribution, while the revision of *Phylladorhynchus* species by Rodriguez-Flores et al. (2021) was still not available, these specimens were determined erroneously as *Phylladorhynchus pusillus* (Henderson, 1885), from Australia and New Zealand, 10-274 m, and then as *Phylladorhynchus triginta* Schnabel & Ah Yong, 2019, from Tasman sea, Lord Howe Island, Middleton Reef, Norfolk Island, 10-84 m. These two species are not present in Réunion.

Family Munididae Ah Yong, Baba, Macpherson & Poore, 2010

Munida foresti Macpherson & de Saint Laurent,
2002
(Fig. 4G & H)

1 female, Lc 2.3 mm, 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m; 1 female Lc 2.6 mm, 3 November 2020, Bay of Saint Leu, 21.178469°S-55.27614°E, 88 m; 1 female Lc 2.8 mm, 13 January 2021, Saint Leu, 21.16904°S-55.27030°E, 97 m. Hard bottom with antipatharians, gorgonians, algae, sponges.

This is a SWIO species described from Réunion (Macpherson & De Saint Laurent, 2002: 468, Marion Dufresne, 1982, MD32, station DR85, 20°59.5'S-55°15.1'E, 58-70 m), reported by Macpherson et al. (2017) in the Mozambique Channel (Between Glorieuses and North Madagascar, BENTHEDI, 35-150 m). The live colour pattern of *M. foresti*, banded in red on the fingers of chelae, is illustrated herein for the first time (Figs 4G-H).

Sadayoshia edwardsii (Miers, 1884)
(Fig. 5A)

1 male Lc 4.3 mm, 1 female Lc 3.2 mm, 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m. Hard bottom with rubble.

This is an IWP species reported with certainty from Mayotte, Aldabra, Réunion, Mauritius, Seychelles (Amirante), New Caledonia, Loyalty, Vanuatu, Marianas, Palau, Line Islands and French Polynesia, 3-90 m (Macpherson & Baba, 2010). The specimen examined has the typical marbled pattern on its chelae (Fig. 5A), also illustrated in Macpherson & Cleva (2010, fig. 3L) for a specimen from Mayotte. The others characters provided in the key of *Sadayoshia* in Macpherson & Baba (2012) fit well with our specimens.

Family Diogenidae Ortmann, 1892
Calcinus fuscus Malay, Komai & Chan, 2012
(Fig. 5B)

No specimen examined (probably retained by malacologists, with the shell), only colour photograph, 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m.

Calcinus fuscus is reported with from Western Pacific, Japan, Philippines, Papua New Guinea, and New Caledonia, 2-81 m (Malay et al., 2012). It is also present in the SWIO, at Mayotte and Réunion, 10-87 m (Poupin et al., 2022: 150, fig.10A; this study). At la Réunion it known since 2014 (program ZNIEF

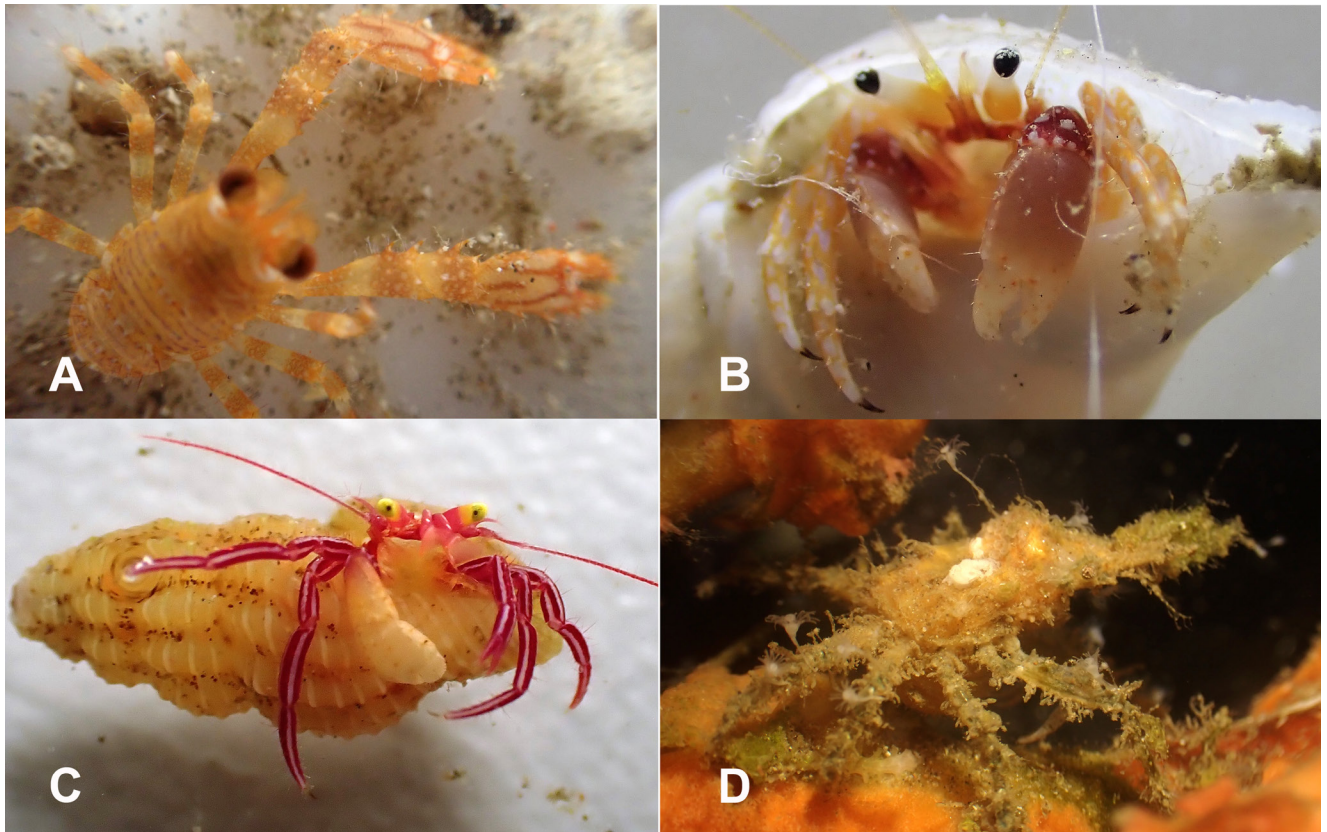


Figure 5. Crustacean Decapoda in Réunion mesophotic zone (83-97 m). **A.** *Sadayoshia edwardsii*, 75 m. **B.** *Calcinus fuscus*, 83 m. **C.** *Pylopaguropsis lewinsohni*, 87 m. **D.** *Hyastenus inermis*, 97 m. Photos T. Mulochau (A), F. Trentin (B-D).

2014, no specimens collected, color photographs only, det. J. Poupin in Legall & Poupin, 2022). The SWIO identifications have been made confidently based on color photographs because the coloration of this species is remarkable. In the future, it will be interesting to sample a few specimens to check also the morphological characters.

Pylopaguropsis lewinsohni McLaughlin & Haig,
1989
(Fig. 5C)

No specimen examined (probably retained by malacologists, with the shell), only colour photograph, 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m.

This is an IWP hermit crab known from the Red Sea and Réunion (Réunion in Poupin et al., 2013, BIOLAVE 2011, 10-30 m, fig. 2) to Indonesia, Japan and French Polynesia, between 10-252 m. The bright and typical live colouration of this species allows for a positive identification.

Brachyura Latreille, 1802

Family Inachidae MacLeay, 1838

Achaeus brevifalcatus Rathbun, 1911

(Fig. 6A-C)

1 ovigerous female 5.5 × 4.4 mm (Fig. 6A & C), 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m; 1 female 4.4 × 3.1 mm (Fig. 6B), 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m; 1 male 3.9 × 2.2 mm, 1 September 2020, Le Port, 20.944233°S-55.27755°E, 65 m; 1 male 3.2 × 1.9 mm, 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m. Coral reef slope, in antipatharians.

Achaeus brevifalcatus is usually associated with antipatharians and is distributed in the IWP from the Gulf of Suez, the Red Sea, Seychelles and Mauritius to Indonesia, Japan and Hawaii, 60-234 m (Sakai, 2022). This is a first record for Réunion. The genus *Achaeus* is one of the most diverse genera of the spider crabs in the Inachidae with 39 currently recognized species in WoRMS (2022). The specimens examined were identified based on the key in Griffin & Tranter (1986) and on the characters and illustrations in Rathbun

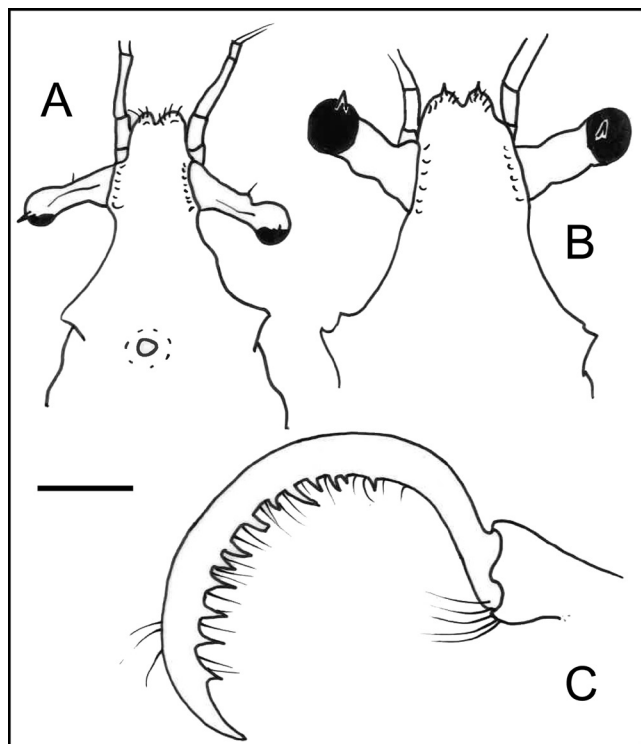


Figure 6. *Achaeus brevifalcatus*, Réunion 75-80 m. Variation of tip of rostrum, rounded (A) or with small sub-distal spines (B), and falciform dactyl of left P5 (ambulatory P4), outer view. A, C, ovigerous female 5.4 × 4.4 mm; B, female 4.4 × 3.1 mm. Scale bar 0.5 mm.

(1911), Miyake & Takeda (1969: fig. 1) and Griffin (1970: fig. 9, 10, 14b). Among others, the distal shape of the pleopod and the falciform aspect of P5 dactyl (Fig. 6C) have been verified, and these exclude related species such as *A. brevirostris* (Haswell, 1879), *A. serenei* Griffin & Tranter, 1986 and *A. podocheloides* Griffin, 1970. The specimens examined were covered with hydroids as it is often seen in the Atlantic related genera *Podocheila* (see Griffin & Tranter, 1986: 4; photo Yan Buske, in Poupin 2018: 91). Wicksten (1980) has reported that spider crabs that camouflage themselves can use various organisms, such as bryozoans, sponges, and algae.

Family Epialtidae MacLeay, 1838

Xenocarcinus conicus (A. Milne-Edwards, 1865)

1 male (missing both cheliped), 6.2 (14 mm, with rostrum) × 4.3 mm, 4 November 2020 Bay of Saint Leu, 21.17538°S-55.27256°E, 97 m; 1 male 5.2 (10.0, with rostrum) × 3.5 mm, 8 September 2020, Cap La Houssaye, Saint Paul, 20.983520°S-55.182787°E, 92 m. In antipatharians, reef slope.

Xenocarcinus conicus is an IWP crab commonly reported from the Red Sea, Persian Gulf, Mayotte,

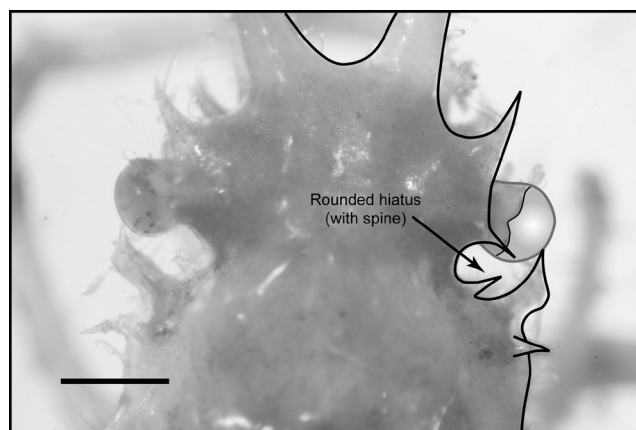


Figure 7. *Lahaina ovata*. Detail of ocular region, with indication of subcircular upper orbital hiatus with spine in the middle. Female juvenile 3.4 × 2.3 mm (soft shell, after molting), 75-80 m. Scale bar 0.5 mm.

Réunion, Seychelles, Chagos and Andaman, to Malaysia, Indonesia, Philippines and Japan, 3-80 m (Griffin & Tranter, 1986; Poupin et al., 2018; Sakai, 2022). The identification was made with the key in Griffin & Tranter (1986: 100, fig. 30 c; a specimen figured from Réunion, coll. Guézé, 1965, 70-80 m). This crab seems to be locally common, also reported at Réunion in 2011-12 during the BIOLAVE campaign, 60-80 m (Poupin et al., 2013). The maximum depth of the species is slightly extended herein, from 80 to 97 m.

Lahaina ovata Dana, 1851

(Fig. 7)

1 male juvenile 2.5 (3.5 with rostral spines) × 1.6 mm, 9 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 75 m; 1 female juvenile, 3.4 (6.3) × 2.3 mm (Fig. 7), 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m; 1 juvenile 3.1 (5.4) × 2 mm, 27 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 80 m. Hard substrate with rubbles, corals, algae, sponges.

Lahaina ovata is a widespread IWP spider crab, distributed from the Red Sea, Arabian Sea, Seychelles, Mayotte, India, Sri Lanka, Maldives, Chagos and Andaman, Indonesia, Japan, Hawaii and probably also French Polynesia (Marquesas, Ua Huka, 20 m, pre-determination J. Poupin, unpublished before present work, specimen in FLMNH, UF 30136), 1-120/400 m (Griffin & Tranter, 1986; Poupin et al., 2018; Sakai, 2022). This is a first record for Réunion. The specimens were determined with confidence by using the keys in Griffin & Tranter (1986). A few morphological variations (orientation and length of rostral spines; presence of

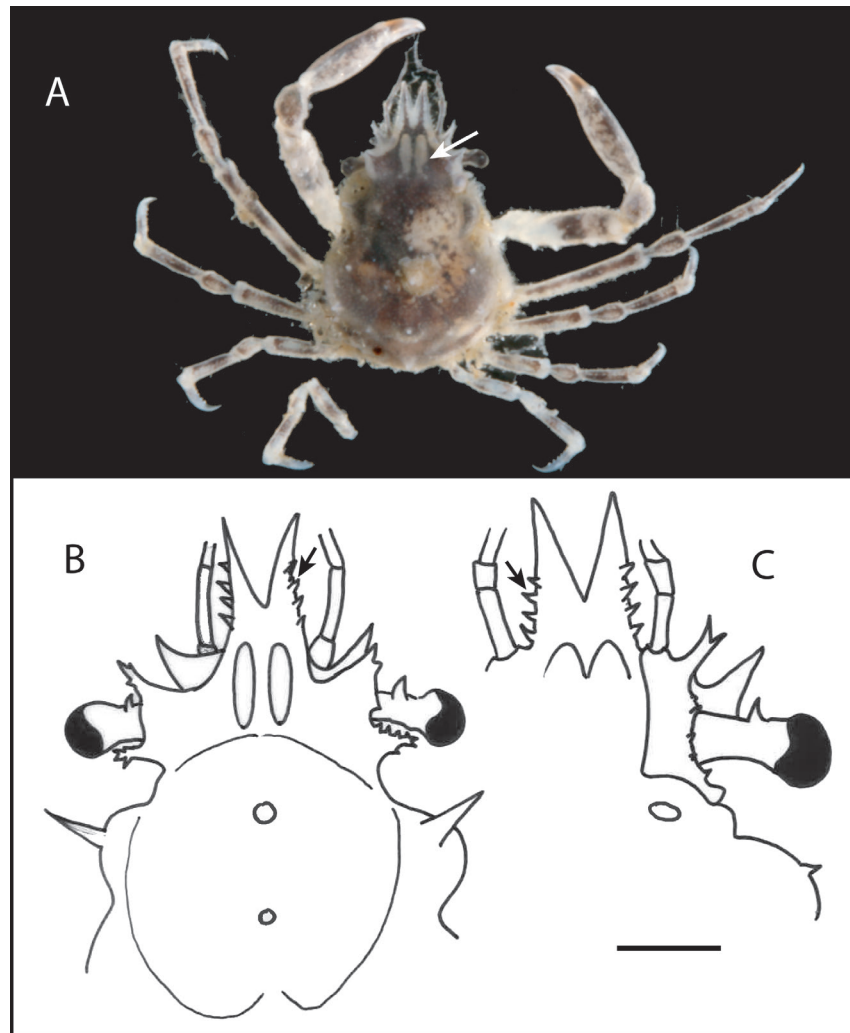


Figure 8. *Menaethiops* sp. [2] aff. *nodulosus*. Réunion. **A.** male juvenile Lc (with rostral horns) 4 mm, coll. BIOLAVE 2011, 10-30 m (white arrow indicates 2 oblong patches at base of rostral horns; photo J. Poupin, preserved specimen). **B-C.** Anterior carapace, dorsal (B) and ventral (C), post ovigerous female 3.4 (3.9 with rostrum) × 2.5 mm, MesoRun, 87 m (black arrows indicates spines at base of rostral horns). Scale bar 0.5 mm.

disto-dorsal spines on meri of P2-5) are attributed to juvenile condition. As indicated by Griffin (1974: 15), the hiatus between the eave and postorbital lobe is rounded and bears a minute spine in its middle (Fig. 7), not figured in the original description of the species (Dana, 1855: pl. 2, fig. 1).

Hyastenus inermis (Rathbun, 1911)
(Fig. 5D)

1 female juvenile, 5.2 (6.9 with rostrum) × 3.0 mm, 26 December 2020, Sainte Rose, 80 m; 1 ovigerous female 8.5 (11.0) × 5.3 mm (Fig. 5D), 13 January 2021, Saint Leu, 21.16904°S-55.27030°E, 97 m; 1 male 7.2 (9.9) × 4.5 mm, 1 September 2020, Le Port, 20.944233°S-55.27755°E, 65 m; 1 female juvenile 4.9 (6.2) × 2.9 mm, 17 September 2020, Sainte Rose,

21.12040°S-55.78695°E, 75-80 m. In antipatharians, on steep coral slope.

Hyastenus inermis is a SWIO species reported from Somalia (Cap Guardafui), Kenya (Mombassa), Seychelles (Amirante) and Mauritius (Cargados Carajos), 18-140 m (Griffin, 1974; Griffin & Tranter, 1974; Lee & Ng, 2019). Perhaps also in the Persian Gulf and Iran, but Lee & Ng (2019: 494) indicated that these regional records probably correspond to a new species closely related to *H. inermis*. This is a new record for Réunion. The specimens have been determined with the keys in Griffin & Tranter (1986) and the re-description, photos and figures in Lee & Ng (2019). A photo of this species is also available in Rathbun (1911: pl. 20, fig. 6). The male pleopod has been checked for the presence of a small apical lobe,

as figured by Lee & Ng (2019: 492, fig. 2A-D). Another species, *Hyastenus subinermis* Zehntner, 1984, has been reported from Réunion by Monod (1975: 1008; Y. Plessis coll., det. R. Serène). The illustrations of this species in Zehntner (1894: pl. XII, fig. 2) show that it differs by a spine on the branchial regions of the carapace, absent in our material of *H. inermis*.

The specimens examined are covered with hydroid zoanthid polyps. According to N. Gravier-Bonnet (pers. com.) these belong to the family Eudendriidae, genus *Eudendrium*. A similar camouflage is reported for the description of the related *H. tabolongi* Lee & Ng, 2019) with this comment of the diver (Lee & Ng, 2019: A. Podzorski, p. 496): “*The habitat of this crab is very specialized and to date, absolutely consistent. It is found exclusively on a sparsely branched species of black Epizoanthus illoricatus Tischbierek, 1930 [Hexacorallia: Epizoanthidae]. The crab places many polyps of Epizoanthus illoricatus all over its body, so much so it is almost impossible to distinguish the crab from the colony*”.

***Menaethiops* sp. [2] aff. *nodulosus* (Nobili, 1905)
(Fig. 8A-C)**

1 female, post ovigerous (abdomen dilated) 3.4 (3.9 with rostrum) × 2.5 mm (Fig. 8B-C), 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m, with rubble. Older collection at Réunion, 1 male juvenile, Lc with rostrum about 4 mm (Fig. 8A), BIOLAVE, 2 December 2011, 10-30 m.

The typical *Menaethiops nodulosus* is a SWIO species, reported from the Red Sea, Persian Gulf and Mayotte, 1-22 m (Poupin et al., 2018). The specimens examined from Réunion, 10-87 m, are affiliated to this species, but different. This form was already reported in Réunion by Poupin et al. (2013: 5, as *Menaethiops ?nodulosus*, specimen illustrated herein fig. 8A). In Griffin & Tranter (1986), they key out to *M. nodulosus* or *M. natalensis* Barnard, 1955, two affiliated species according to Guinot (1962: 42, group n°4). Guinot (1962) (see also Peyrot-Clausade & Serène, 1976: 1346) tentatively separate them based on the presence (*M. nodulosus*) or absence (*M. natalensis*) of a small spine on the infraorbital margin (see Barnard, 1955: fig. 3e). In the specimens examined herein this margin is intermediate, having 4-5 obsolescent spines (Fig. 8C). Others noticeable characters of the specimens examined are: two oblong patches situated at base of rostral horns (Fig. 8A, B); 4 triangular spines on proximal half of outer margins of rostral horns (Fig. 8B-C). These spines are easily overlooked and are clearly visible only from ventral view, and had so far been unreported for the genus (see Barnard, 1955;

Guinot, 1962; Kazmi & Tirmizi, 1999; Naderloo, 2015), suggesting that the specimens examined probably belong to a new undescribed species. An older record of *M. natalensis* from Réunion by Ribes (1978) could be of the same species.

Family Pilumnidae Samouelle, 1819

***Pilumnus longicornis* Hilgendorf, 1878**

1 female 7.5 × 9.4 mm (exuviae), 8 October 2020, Pointe au Sel, 21.20294°S-55.27469°E, 87 m; 1 female juvenile, 4.5 × 5.4 mm, 1 September 2020, Le Port, 20.944233°S-55.27755°E, 65 m; 1 female juvenile 3.9 × 4.6 mm, 17 September 2020, Sainte Rose, 21.12040°S-55.78695°E, 75-80 m. In rubble or antipatharians.

Pilumnus longicornis is common in IWP, between 10-85 m (Poupin et al., 2018; Legall & Poupin, 2022; Sakai, 2022). In SWIO it has been reported from Madagascar, Mayotte, Glorieuses, Europa, Réunion, Seychelles, Amirante, Saya de Malha Bank, Cargados Carajos and Mauritius. The specimen examined was identified based on the key in Takeda & Miyake (1968). The carapace has a tomentum with anterolateral margins armed with three hooked spines; the infraorbital margins have a few inconspicuous spicules; the ambulatory legs are armed only on the dorsal margins of meri. The species had already been doubtfully reported at Réunion, in 60-80 m, during the BIOLAVE campaign (Poupin et al., 2013). The new specimens examined herein confirm the presence of *Pilumnus longicornis* in Réunion.

Family Portunidae Rafinesque, 1815

***Thalamita spinifera* Borradaile, 1902
(Fig. 9A)**

1 female 8.6 × 11.7 mm, 20 January 2021, Saint Leu, 21.18784°S-55.27535°E, 85 m; 1 male juvenile 7.0 × 8.5 mm, 26 December 2020, Sainte Rose, 80 m. Hard bottom, with sponges, antipatharians, gorgonians.

Thalamita spinifera is a common IWP swimming crab previously reported from Mayotte, Madagascar, Réunion, Indonesia, Australia, New Caledonia, Japan, Hawaii and French Polynesia, 20-433 m (Castro, 2011; Poupin et al., 2018; Sakai, 2022). Crosnier (1985: 35; Marion Dufresne, MD32, 1982, 53-77 m) reported it in the mesophotic zone of Réunion. These new specimens were determined based on the keys in Crosnier (1962). In the female examined (8.6 × 11.7 mm) the fifth anterolateral tooth of carapace is abnormally smaller than the sixth tooth (usually of the same size in typical specimens), but this could be attributed to the small size of the specimen. The

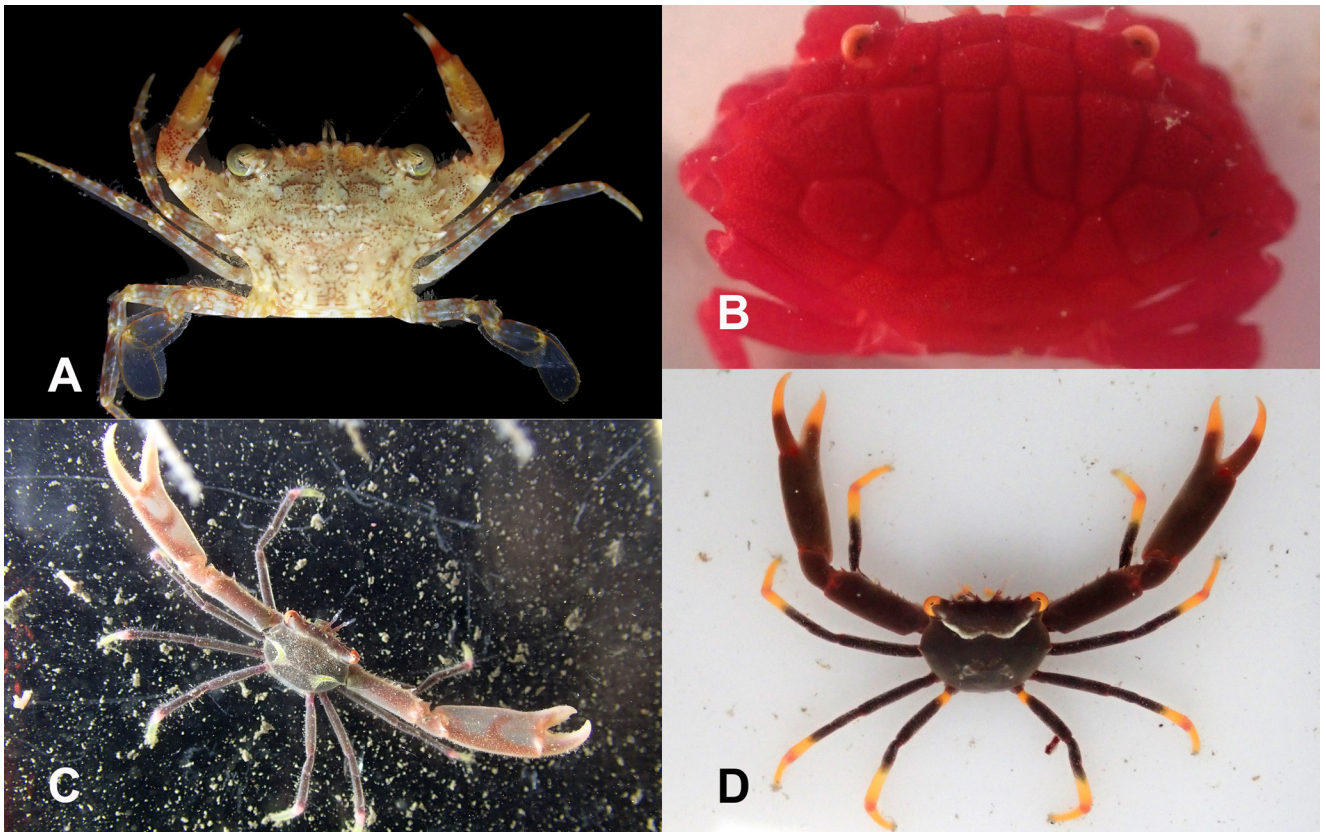


Figure 9. Crustacean Decapoda in Réunion mesophotic zone (70-85 m). **A.** *Thalamita spinifera*, 1 female 8.6 × 11.7 mm, 85 m. **B.** *Liomera rubra*, female juvenile 8.3 × 13.8 mm, 80 m. **C.** *Quadrella maculosa*, 1 ovigerous female 4.7 × 5.6 mm, 70-80 m. **D.** *Quadrella serenei*, 1 male 9.2 × 11.1 mm, 75 m. Photos F. Trentin (A-C), T. Mulochau (D).

colour pattern illustrated on Fig. 9A, with red rings at base of fingers of the chelae, green eyes, banded legs and marbled aspect of the carapace, can be used for a rapid determination of fresh specimens.

Family Trapeziidae Miers, 1886
Quadrella maculosa Alcock, 1898
 (Fig. 9C)

1 ovigerous female 4.7 × 5.6 mm, 27 August 2020
 Sainte Rose, 21.12070°S-55.78714°E, 70-80 m, in
 antipatharian.

Quadrella maculosa is an IWP crab usually associated with antipatharians, distributed from the Red Sea, Kenya, Madagascar, Seychelles (Amirante), Mayotte, Réunion, Mauritius, Maldives, India, Ceylon, Moluccas to Indonesia, Australia, New Caledonia, Papua New Guinea, Philippines, Japan and French Polynesia, 27-37 m to 372-466 m (Poupin et al., 2018; Sakai, 2022); unreported from Hawaii (Castro, 2011). It is sometimes observed in association with *Q. serenei* Galil, 1986 on the same antipatharian host. Despite superficial resemblances the two species differ by their colourations (compare Fig. 9C-D) and

subtle morphological differences: aspect of frontal spines (a larger median 'V' in *Q. maculosa*); acute spines on flexor margin of meri of chelipeds in *Q. maculosa* (usually reduced to granules in *Q. serenei*, but sometimes sharper in juveniles); and (noticed during this study) the presence of a short tomentum on the chelae in *Q. maculosa* (absent in *Q. serenei*).

Quadrella serenei Galil, 1986
 (Fig. 9D)

1 male 9.2 × 11.1 mm, 1 female 6.6 × 7.6 mm,
 2 September 2020, Cap La Houssaye, Saint
 Paul, 21.002767°S-55.242483°E, 68 m; 1 male
 5.1 × 5.7 mm, 9 November 2020, Pointe au Sel,
 21.20383°S-55.27436°E, 75 m. In antipatharians.

Quadrella serenei features similar IWP distribution than *Q. maculosa*, between 10-466 m (Sakai, 2022); previously reported in Réunion mesophotic zone by Castro (1999: 97, Marion Dufresne, MD32, station CP43, 73-77 m). Its colour, illustrated in figure 9D and also in Castro (2002: fig. 2), is the best character to recognize it quickly (see others characters listed under *Q. maculosa*). A key to the six currently recognized

species of *Quadrella* is provided by Castro et al. (2004).

Family Xanthidae MacLeay, 1838

Liomera rubra (A. Milne-Edwards, 1865)
(Fig. 9B)

1 female juvenile, 8.3 × 13.8 mm, 27 November 2020, Pointe au Sel, 21.20383°S-55.27436°E, 80 m, in rubbles.

Liomera rubra occurs in the IWP from the Red Sea, Tanzania (Zanzibar), Madagascar, Mayotte, Glorieuses, Mauritius, to Hawaii and French Polynesia, subtidal-133 m (Poupin et al., 2018; Sakai, 2022), reported herein for the first time at Réunion. The specimen was identified using the contribution by Serène (1984), including the identification key, and by comparing our specimen with the photograph of the type specimen available online (MNHN-IU-2014-22612, <http://coldb.mnhn.fr/catalognumber/mnhn/iu/2014-22612>). Contrary to Serène (1984: plate 6f), the fingers of chelae are not black but almost totally white, a difference attributed to the juvenile condition of our specimen.

Conclusion

In total 31 species are listed here for the mesophotic zone of Réunion, 16 of them being new records for the Island: *Achaeus brevifalcatus*, *Alpheus longecarinatus*, *Alpheus paradentipess* s.l., *Anachlorocurtis occidentalis*, *Chirostylus dolichopus* s.l., *Cuapetes grandis*, *Discias brownae*, *Galathea tanegashimae*, *Hamodactylus boschmai*, *Hyastenus inermis*, *Lahaina ovata*, *Liomera rubra*, *Lysmata debelius*, *Manipontonia paeneglabra*, *Rhynchocinetes* sp. [1] aff. *serratus*, *Typton bawii*.

In the list of species five of them have been determined from photographs only. The flowchart provided by Horton et al. (2021: fig. 1) for naming correctly image-based identifications has been followed to name them. Four species are determined with confidence to species level because of their bright and typical coloration (*Calcinus fuscus*, *Galathea tanegashimae*, *Lysmata debelius*, and *Pylopaguropsis lewinsohni*). A shrimp is determined with confidence to the genus *Rhynchocinetes* but its color pattern cannot be related to any of the 15 valid species listed in WoRMS (2022). It has the same color pattern that the specimens recently reported in Mayotte mesophotic zone by Poupin et al. (in press; as *Rhynchocinetes* aff. *serratus*) and appear to be conspecific. The latter authors indicate that it is affiliated to *Rhynchocinetes serratus* (H. Milne Edwards, 1837), an Australian species perhaps also present in Hawaii and Japan,

but distinct and most probably belonging to a new species. To follow the recommendation of Horton et al. (2001: 9) it has been named *Rhynchocinetes* sp. [1] aff. *serratus*. To be consistent the same terminology has been used for the specimens examined of *Menaethiops* sp. [2] aff. *nodulosus*.

At least three species are recognized as probably new (*Rhynchocinetes* sp. [1] aff. *serratus*; *Chirostylus dolichopus* s.l.; *Menaethiops* sp. [2] aff. *nodulosus*) but additional, larger and better-preserved specimens are needed in order to propose formal descriptions. The relatively high proportion of new records in this work (16 species, 51.6%) can be explained by the special care during hand collecting process, targeting small species associated with antipatharians instead of more traditional sampling methods used previously in the Réunion mesophotic zone, with fishing boats operating traps, nets, dredges or trawls.

As already observed around Mayotte by Poupin et al., 2022, this work did not identify a typically mesophotic fauna. The crustaceans recognized in this zone are usually known from shallow waters (10-20 m) and sometimes reported far beyond a hundred meters. It is therefore logical to find them in the mesophotic zone. At most we can notice that for ten species the maximum depth reported herein is increased from several meters; these are (with indication of new maximum depth and the increase from previous works): *Pilumnus longicornis* (87 m, +2 m), *Calcinus fuscus* (87 m, +6 m), *Phylladiorhynchus hylas* (93 m, +16 m), *Xenocarcinus conicus* (97 m, +17 m), *Hoplosquilloides coronatus* (75 m, +40 m), *Anachlorocurtis occidentalis* (97 m, +42 m), *Hamodactylus ?boschmai* (80 m, +45 m), *Cuapetes grandis* (87 m, +57 m), *?Typton bawii* (93 m, +68 m), and *Lysmata debelius* (110 m, +80 m). However, more observations and sampling of the crustaceans living at mesophotic depths are needed to know if some of them are specifically living in this biotope. For the time being our results only suggest that several species from shallow waters can probably invade the MCEs and found there a refuge from the anthropic aggressions that are increasingly more common along the coasts.

In addition to list provided herein, four additional species have been recognized among the specimens examined (*Hamodactylus* sp., *Galathea* sp. 1 and sp. 2., *?Anapagrides* sp.) but were not included in the list because of limitation and doubts during the identification process. In addition to the specimens examined, a few additional macro-species have been also recognized on photographs made during the campaign but without specimens collected. These species are not included in the main list because common and already reported from Réunion. These are (with indication

Table 1. Updated number of Stomatopoda and Decapoda species recorded for Réunion, including results of this study. Source: database by Legall & Poupin (2022, January).

Stomatopoda	16
Decapoda	582
<i>Dendrobranchiata</i>	29
<i>Achelata</i>	11
<i>Polychelida</i>	1
<i>Astacidea</i>	4
<i>Axiidea</i>	7
<i>Gebiidea</i>	1
<i>Stenopodidea</i>	4
<i>Caridea</i>	173
<i>Anomura</i>	84
<i>Brachyura</i>	268
Total	598

of observation depths): *Justitia longimana* (H. Milne Edwards, 1837) (83-95 m); *Lysmataamboinensis* (De Man, 1888) (87-110 m); *Munida barbeti* Galil, 1999 (95-102 m); *Plesionika narval* (Fabricius, 1787) (83-102 m); *Stenopus hispidus* (Olivier, 1811) (75-102 m); *Stenopus pyronotus* Goy & Devaney, 1980 (75-102 m); and *Urocaridella antonbruunii* (Bruce, 1967) (95-102 m).

Previous list of Réunion Stomatopoda and Decapoda included 488 species (Poupin, 2009; Annexe 2 and Addendum). This new contribution, plus recent taxonomic revisions (e.g. *Phylladorhynchus* species, in Rodriguez-Flores et al., 2021) and/or new field observations during the last decade (e.g. BIOLAVE campaign in 2011-12, in Poupin et al., 2013), brings now the total to 598 species (Table 1).

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