

Additions to the marine decapod (Crustacea: Decapoda) fauna of South Africa

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Abstract

This report adds five previously unreported species to the decapod crustacean fauna of South Africa, as well as removing one species previously listed in error. It also documents locality (and/or reference specimen) data for 12 other species, most of which had been depicted in regional field guides, but without reporting when and where they had been collected. Almost all the species added were already known from adjacent African countries and their ranges are here extended into South Africa. Although some of these records are based on photographs, rather than collected specimens, it is argued that such records should be accepted as adequate evidence for inclusion of at least visually-distinctive crustacean species into the regional fauna.

Keywords: fauna list, marine biodiversity, new records, photographic records, citizen science

Introduction

The last comprehensive monographic compilation of South African decapod Crustacea was that of Barnard (1950), although many of the more prominent regional species are depicted in Emmerson (2016), who also provides a comprehensive listing of the fauna of the wider southern African region. Reports of additional regional species are, however, continually coming to light, so that even Emmerson (2016) is now in need of revision. Maintaining accurate and up-to-date national species inventories and distribution records has a number of important functions. At the most basic level, species inventories are used to report on the taxonomic richness of the national fauna. For the South African marine fauna as a whole, for example, such compilations have been provided by Gibbons *et al.* (1999) and updated by Griffiths *et al.* (2010). These tabulations are also used to make international comparisons between species richness patterns between regions, such as that of Costello *et al.* (2010).

Recording the localities from which species have been reported is equally critical, as these data can then be used to plot geographical patterns of species richness, endemism, etc. Such broader analyses of the marine invertebrate fauna in South Africa have been carried out by Awad *et al.* (2002), Griffiths *et al.* (2010) and Scott *et al.* (2012). The uses of such data include the design and placement of appropriate Marine Protected Area (MPA) networks (Awad *et al.*, 2002).

The methods by which researchers collate and formalise species records have undergone significant historical changes in recent years. For centuries, the documentation of marine species and their distribution patterns were based almost entirely on traditional collection and curation techniques and were undertaken, or at least reported, almost exclusively by professional marine scientists who obtained samples by a variety of destructive techniques, including grabs,

trawls, dredges and cores, or in the case of coastal species, via manual collection. After preservation and identification, these specimens were then catalogued and lodged in museum collections and the results published in academic journals or monographs.

Recently, however, both methods of acquisition of species records and of publication, have changed radically. There has been a move towards non-destructive sampling, particularly photographic techniques, both remote (sledges, ROV's, BRUV's, etc.), and via proliferation of hand-held underwater cameras in the hands of both professional researchers and amateur SCUBA divers (Potts *et al.*, 2021). These methods often generate valuable species records, at least of those groups where external morphology and colour pattern are diagnostic, such as fishes, for which new photographic records have long been reported and accepted (e.g. Francis *et al.*, 1999). Amongst invertebrates, however, range expansions that are not supported by physical samples have seldom been reported on in formal taxonomic papers (but for a South African exception see Laird and Griffiths (2016) and Emmerson *et al.* (1990).

There has also been a trend towards publication of more popular photographic field guides, in place of technical taxonomic monographs, as well as a proliferation of 'virtual museums' to which the public can submit images. For example, many excellent images of South African decapod crustaceans (as well as many other groups) appear in recent photographic field guides by King and Fraser (2014), Branch *et al.* (2016) and Atkinson and Sink (2018). Many additional photographic records also appear on citizen science platforms, particularly iSpot (<https://www.ispotnature.org>), Echinomap (<http://vmus.adu.org.za>) and iNaturalist (<https://www.inaturalist.org>). Although all these sources provide valuable images, along with some descriptive text, they do not provide the full spectrum of information reported in formal taxonomic publications. Specifically, they generally do not explicitly state whether the organisms depicted are novel to the fauna, they often fail to provide precise collection data (date, location, depth, substratum, etc.), and such reports are hardly ever supported by reference specimens lodged in museum collections.

The objective of this paper is to add recent new records to the South African decapod fauna collected by the authors, as well as to formalise records that have already been reported in other media without providing adequate distributional and collection data.

Materials and methods

Some of the new records reported upon below derive from work done by the authors themselves, either through collection of physical specimens, using a variety of techniques, or through images taken with conventional underwater cameras. Other records were originally published in regional field guides, and original locality data has been obtained from authors or contributors linked to the images (indeed they often provided additional unpublished images and observations not mentioned in their books, or taken subsequent to their publication). In the case of records originating from virtual museums, locality data were collated for all images on the sites, thus establishing the known distributional ranges of each species. Where specimens were collected, these were deposited in the collections of the Iziko South African Museum and reference numbers were provided for these voucher specimens, thus making them accessible for future taxonomic research.

Results

Each of the species added to, or removed from, the South African decapod fauna is listed below and depicted in the plates, as indicated. The accompanying text gives relevant references, outlines the evidence upon which the species are included and provides locality records of their known distribution in South Africa.

Family Hymenoceridae

1. *Hymenocera picta* Dana, 1852

Fig 1a

Hymenocera picta King and Fraser, 2014: 280, Branch *et al.*, 2016:108; Emmerson, 2016, Vol 1: 212-215.

Remarkably, given the frequency with which regional divers have photographed this species, and the fact that both King and Fraser (2014) and Branch *et al.* (2016) indicate that it occurs in KwaZulu-Natal, there are no specific locality records for this species from within South Africa and its distribution is still listed by Emmerson (2016) as being from Maputo Bay, Mozambique, northwards. Here we document specific photographic locality records as follows:

Locality records: Sodwana Bay, Bikini Reef, 10 Jan 2007, S 27° 31.72', E 32° 41.31', 18-22 m, Kerry Sink; Sodwana Bay, Ribbon Reef, 2 Aug 2012, S 27° 29.40', E 32° 41.23', 15-20 m, also Aliwal Shoal off Scottburgh, photograph, Valda Fraser. iNaturalist records all Sodwana Bay: Stringer, 22 Apr 2016, S 27° 31.69', E 32°



Figure 1. a. *Hymenocera picta* Dana, 1852 Aliwal Shoal off Scottburgh; b. *Ancylocaris brevicarpalis* Schenkel, 1902, Sodwana Bay; c. *Cuapetes tenuipes* (Borradaile, 1898) and d. *Pontonides unciger* Calman, 1939), both Sodwana Bay, Bikini Reef; e. *Zenopontonia rex* (Kemp, 1922) and f. colour variant of *Z. rex*, both Sodwana Bay; photographs all Valda Fraser.

43.61', 14 m, UserID 'rosepalmer'; Rooneys, 10 Oct 2015, S 27° 32.12', E 32° 41.20', UserID 'jennyjj'; 7 Oct 2015, S 27° 31.44', E 32° 41.16', UserID 'Georgina Jones'; 6 Mile Reef, S 27° 31.91', E 32° 42.49', 4 Feb 2015, and 5 Mile Reef, S 27° 29.34', E 32° 41.37', 26 Apr 2012, UserID 'rowanwattpringle'.

Identification: Unmistakable and striking species, white with large red spots each fringed with blue. Legs banded with purple. Antennae leaf-like.

Distribution and habitat: Widespread Indo-Pacific, territorial and usually found in pairs; a specialist predator of echinoderms. In South Africa, regularly observed at Sodwana Bay, most southerly record Aliwal Shoal.

Family Palaemonidae

2. *Ancylocaris brevicarpalis* Schenkel, 1902

Fig 1b

Periclimenes brevicarpalis Gosliner *et al.*, 1996: 203; King and Fraser, 2014: 278; Emmerson, 2016, Vol 3: 432.

Emmerson (2016) lists this species in the checklist section of his book, but gives the distribution as Mozambique. King and Fraser (2014) previously reported the species as occurring in KwaZulu-Natal. The known locality records from South Africa are listed below.

Locality records: Sodwana Bay, 9 Mile Reef, S 27° 24.60', E 32° 43.80', 18 m, 13 Jan 2008, photograph, Valda Fraser; 5 Mile Reef, S 27° 36.91', E 32° 0.02', photograph, Kerry Sink. iNaturalist record: Sodwana Bay, S 27° 31.98', E 32° 40.98', 5 Feb 2013, User ID 'rowanwattpringle'.

Identification: Unmistakable species with large wart-like white patch on carapace, as series of white blotches on thorax and 5 large black spots with orange centres on uropods and telson.

Distribution and habitat: Widespread Indo-Pacific. Lives commensally on large sea anemones.

3. *Cuapetes tenuipes* (Borradaile, 1898)

Fig 1c

Cuapetes tenuipes King and Fraser, 2014: 278; Emmerson, 2016, Vol 3: 431.

Emmerson (2016) lists this species as a new record for KwaZulu-Natal in the checklist section of his book, but this record is based on the image and field-guide

entry given by King and Fraser (2014). Neither reference provided detailed locality records, so this information is provided below.

Locality records: Sodwana Bay, Bikini Reef, S 27° 31.72', E 32° 41.31', 18–22 m, 30 Jul 2012, photograph, Valda Fraser. iNaturalist records: Sodwana Bay, Elusive Reef (N of Sodwana) 10 May 2018, UserID 'robert-taylor'; two observations both 7 Mile Reef, S 27° 27.99', E 32° 42.60', 22 m, 5 Sep 2014, UserID 'rowanwattpringle'.

Identification: Very transparent species with a white line joining the eyes and red and white stripes along the abdomen, tips of chelae orange. Rostrum long with 8–10 dorsal and 6–9 ventral spines.

Distribution: Widespread Indo-Pacific, free-living, but sometimes on sea anemones. In South Africa distribution records not extending south of Sodwana Bay.

4. *Pontonides unciger* Calman, 1939

Fig 1d

Pontonides unciger Gosliner *et al.*, 1996: 207; King and Fraser, 2014: 280; Emmerson, 2016, Vol 3: 432.

Emmerson (2016) lists this species as a new record for KwaZulu-Natal in the checklist section of his book, but this record is based on the image and field-guide entry given by King and Fraser (2014). Neither reference provided specific locality records, so this information is provided below.

Locality records: Sodwana Bay, Bikini Reef, S 27° 31.72', E 32° 41.31', 18–22 m, 8 Feb 2013, photograph, Valda Fraser. iNaturalist records: Sodwana Bay, 2 Mile Reef (Antons), S 27° 31.80', E 32° 40.80', 16 m, 17 Feb 2013, photograph, UserID 'rowanwattpringle'.

Identification: Yellowish with dark and light transverse bands across the body, eyes white. Mimics whip corals, on which it is found.

Distribution: Widespread Indo-Pacific, on whip corals. In South Africa, distribution not recorded as extending southwards beyond Sodwana Bay.

5. *Zenopontonia rex* (Kemp, 1922)

Fig 1e–f

Periclimenes rex Barnard, 1955: 47

Periclimenes imperator Emmerson, 2016, Vol 1: 250–254

Zenopontonia imperator King and Fraser, 2014: 278.

The occurrence of this well-known tropical Indo-Pacific species within the boundaries of South Africa has not previously been adequately documented. Both Barnard (1955) and Emmerson (2016) cite specific locality records from southern Mozambique and the latter gives the distribution as ‘from Mozambique up though East Africa’ (and beyond), despite the fact that King and Fraser (2014) had earlier stated that ‘it occurs in southern KwaZulu-Natal’. Here the specific locality records are given based on observations by King and Fraser (2014) plus one additional independent observation.

Locality records: Sodwana Bay, Grants Beach, S 27° 32.20′, E 32° 42.04′, 54 m, Kerry Sink. Sodwana Bay, S 27° 31.98′, E 32° 40.98′; several occurrences on nudibranchs *Gymnodoris rubropapulosa*, *Chromodoris africana* and *Hexabranhus sanguineus*, off Pumula, KZN South Coast, S 30° 38.34′, E 30° 32.94′; occurrences on *Armina* sp. and *Miamina sinuata*, 2005–2014, photograph, Valda Fraser.

Identification: An attractive and familiar species; body red with numerous small white dots, broad sinuous white band extending from rostrum along back to cover uropods and telson; tips of chelae and legs purple.

Distribution and habitat: Widespread Indo-Pacific. Lives commensally on echinoderms and on various species of nudibranchs. In South Africa, fairly commonly seen at Sodwana Bay, extending southwards to Pumula on KZN South Coast.

6. *Zenopontonia soror* (Nobili, 1904) (removal from fauna list)

Periclimenes soror Gosliner *et al.*, 1996: 206
(Non) *Periclimenes soror* [misidentification] King and Fraser, 2014: 278; Emmerson, 2016, Vol 3: 432.

Emmerson (2016) lists this species as a new record for KwaZulu-Natal in the checklist section of his book, but that record is based on the image and field-guide entry given by King and Fraser (2014). However, it now appears that the images taken by King and Fraser (2014) represent a colour variant of *Zenopontonia rex* (above). Pending the collection of actual specimens that can be confirmed as *Z. soror* via examination of the rostral spines (which are fewer and larger than in *Z. rex*), it thus seems advisable to remove this species from the South African fauna list.

Family Alpheidae

7. *Alpheus bellulus* Miya and Miyake, 1969

Fig 2a

Alpheus bellulus Miya and Miyake, 1969: 307–314; Gosliner *et al.*, 1996: 208; King and Fraser, 2014: 282; Emmerson, 2016, Vol 3: 432.

This well-known and widespread Indo-Pacific species was reported as occurring in East Africa by Gosliner *et al.* (1996) and its range was extended into South Africa by King and Fraser (2014). It is thus listed from South Africa by Emmerson (2016), but specific locality records are not provided, so its range is still not documented. Observation details are provided for the first time below.

Locality records: 9 Mile Reef, Sodwana Bay, S 27° 31.98′, E 32° 40.98′, 18–23 m, 16 Nov 2010, photograph, Valda Fraser.

Identification: Body white with an attractive reticulated pattern of brown stripes and saddles. Legs banded in brown and white. Lives in association with goby species.

Distribution: Widespread Indo-Pacific, the above record appears to be the only one to date from South Africa, resulting in the recorded distribution not extending southwards beyond Sodwana Bay.

8. *Aretopsis amabilis* de Man, 1910, new record

Fig 2b

Aretopsis amabilis Marin, 2010: 1–4.

Exclusively found in association with large hermit crabs. Recorded while sampling for hermit crabs along the coasts of KwaZulu-Natal inside a *Conus* spp. shell inhabited by *Dardanus crassimanus*. Previously known from Somalia and Kenya (Vannini *et al.*, 1993), as well as Seychelles, Madagascar and Mozambique Channel (Poupin, 2016), but never as far south as South Africa.

Locality records: Off Pumula (KwaZulu-Natal), S 38° 20.40′, E 30° 32.93′, 20 m, 13 Oct 2015, SCUBA, SAMC–A066594, from sample SAMC–A066488, coll. Jannes Landschoff.

Identification: Left cheliped enlarged, colouration uniformly brown-orange to red with broad white or cream longitudinal dorsal stripe along the entire body. Photographs reported by Marin (2010) show

specimens with white dots and patches laterally.

Distribution: Red Sea, Somalia, Kenya, Madagascar, Seychelles and Maldives, Indonesia, Philippines, Vietnam, Japan, Australia and Marshall Islands. Reported from South Africa for the first time here.

Family Lysmatidae

9. *Lysmata debelius* Bruce, 1983, new record

Fig 2c

Lysmata debelius Bruce, 1983 [for 1982]: 115–120, Figs. 1–9; Burukovsky, 2000: 226, Fig. 4; Branch *et al.*, 2016:108; Emmerson, 2016: 434.

First described from the Philippines and popular in the aquarium trade. Appears to have a widespread Indo-Pacific distribution, but numerous locality records are from the ornamental pet industry (Baeza *et al.*, 2009). Here, a specimen photographed in South African waters in the wild is reported on that has the characteristic four large spots on the lateral carapace. It also has two additional small dots, one centrally between the four large ones, and another one posterior, but none on the pleon, like the most closely related species *Lysmata splendida* from the Maldives.

Locality records: Sodwana Bay, Bikini Reef, S 27° 31.72', E 32°41.31', 18–22 m, 28 Dec 2005, photograph Colin Odgen.

Identification: Identification by colour based on the uniformly bright red body with four large dots laterally on the carapace.

Distribution: Widespread Indo-Pacific, reported here for the first time from South African waters.

Family Enoplometopidae

10. *Enoplometopus crosnieri* Chan and Yu, 1998, new record

Fig 2d

Enoplometopus crosnieri Poupin, 2003: 645–646.

This ornamented reef lobster was originally described from Taiwan and has now been reported to have a more widespread distribution in the southwestern and central Pacific. This, however, is the first record for South Africa and to our knowledge also from the Indian Ocean. The image on which this new record is based was taken by Peter Timm, a nature enthusiast and one of the first SCUBA divers to see coelacanths in their natural environment in Sodwana Bay.

Locality records: Sodwana Bay, Triton 69, S 27° 30.91', E 32° 42.90', reef, 69 m, 16 Mar 2013, photograph, P. G. Timm.

Identification: Unmistakable by the white circle in distal half of lateral carapace.

Distribution: Central and southwestern Pacific. Range here extended to the Indian Ocean and into KwaZulu-Natal, South Africa.

Family Scyllaridae

11. *Scyllarides squammosus* (H. Milne Edwards, 1837), new record

Fig 2e

Scyllarides squammosus Emmerson, 2016, Vol 1: 296, Vol 3: 440.

A well-known Indo-Pacific species reported from Mozambique by Emmerson (2016), but range here extended into South Africa. Could be confused with the sympatric *E. elisabethae*, but that species has legs distinctively banded in red.

Locality records: South Coast KwaZulu-Natal, off Pumula, S 30° 38.52', E 30° 32.40', 35 m, 14 Apr 2014, photograph, Valda Fraser.

Identification: Mottled reddish-brown, body covered in small nodules. Terminal segment of antenna rounded, penultimate segment not strongly toothed. Carapace parallel-sided, anterior corners not acutely projecting.

Distribution: Widespread Indo-Pacific, here extended for the first time into South Africa.

Family Lithodidae

12. *Lithodes ferox* Filhol, 1885

Fig 2f

Lithodes ferox Emmerson, 2016, Vol 2: 85–89, Vol 3: 447; Griffiths *et al.*, 2018: 187.

Reported and illustrated from South Africa by Griffiths *et al.* (2018), but they fail to provide detailed station data or to point out that, as this species is listed by Emmerson (2016) as occurring only in Namibia and northwards, their records represent an addition to the South African fauna.

Locality records: West Coast Demersal Survey AFR291, sta A33086, S 31° 42.83', E 15° 59.81', 524 m, 15 Jan 2017, 1 female, SAMC–A066570, coll. Leila Nefdt.

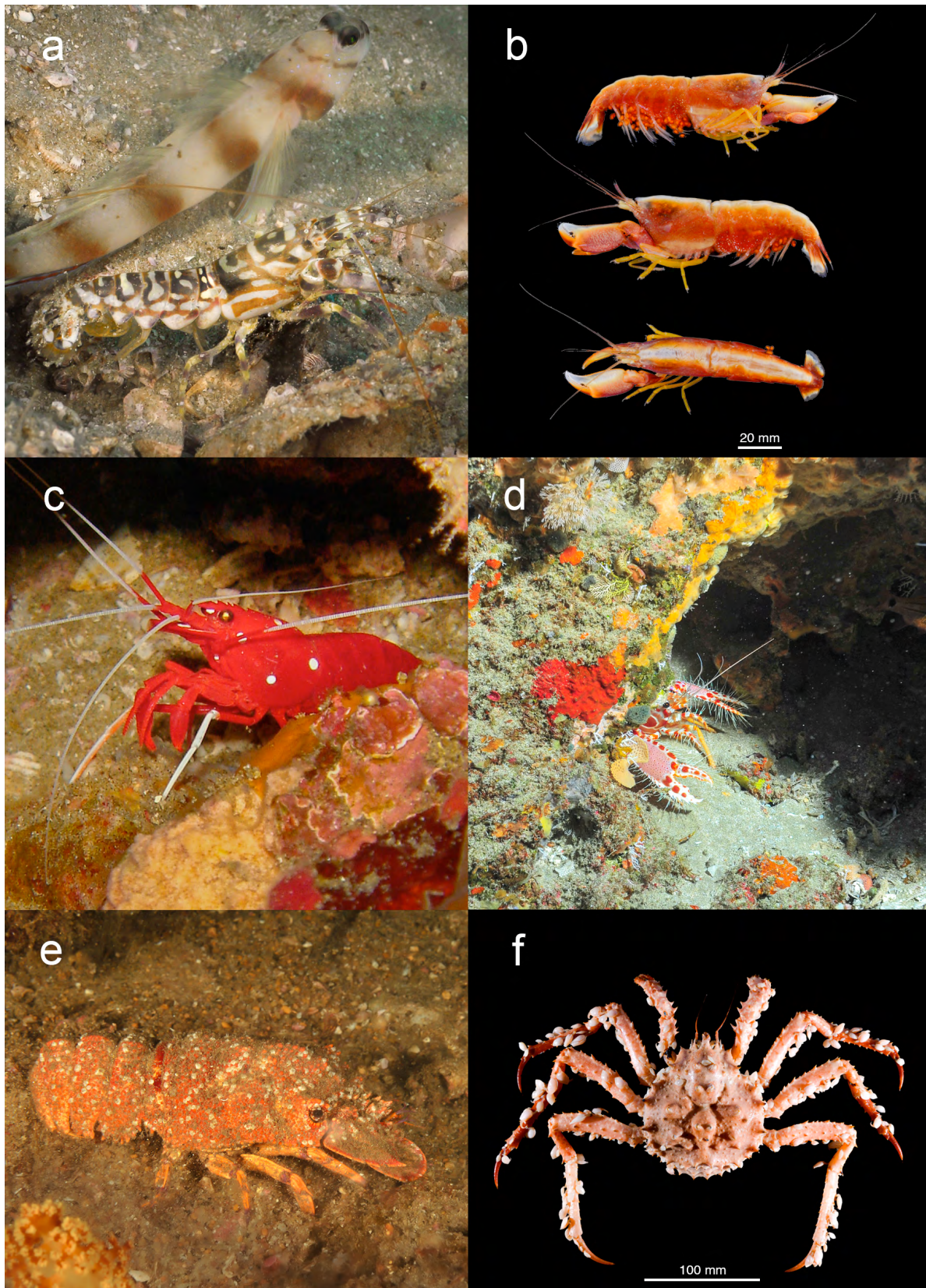


Figure 2. a. *Alpheus bellulus* Miya and Miyake, 1969, Sodwana Bay 9 Mile Reef, photograph Valda Fraser; b. *Aretopsis amabilis* de Man, 1910, off Pumula, left, right and dorsal aspect of same specimen, SAMC-A066594, photograph Jannes Landschoff; c. *Lysmata debelius* Bruce, 1983, Sodwana Bay, Bikini Reef, photograph Colin Odgen; d. *Enoplometopus crosnieri* Chan and Yu, 1998, Sodwana Bay, Triton 69, photograph Peter G. Timm; e. *Scyllarides squammosus* (H. Milne Edwards, 1837), off Pumula, photograph Valda Fraser; f. *Lithodes ferox* Filhol, 1885, West Coast offshore, SAMC-A066570, photograph Jannes Landschoff.

Identification: Distinguished from other regional stone crabs (*Neolithodes asperrimus* and *N. capensis*) by its smaller size, pattern and size of spines on the carapace and by shape of the rostrum, which is strongly produced and bifid with a branching pair of dorsal spines at corneal level and a downward-pointing ventral spine.

Distribution: Widely distributed across West Africa from Mauritania to Namibia at depths of 300–1000 m (Macpherson, 1988; Abello and Macpherson, 1991) and now extended into South Africa.

Family Lyreididae

13. *Lyreidus brevifrons* T. Sakai, 1937, new record

Fig 3a

Lyreidus brevifrons Emmerson, 2016, Vol 3: 454; Feldmann, 1992: 948; Griffin, 1970: 104.

Locality records: West Coast Demersal Survey, South of False Bay shelf edge, AFR300, sta A34550, S 35° 32.22', E 19° 01.20', 406 m, 2 March 2020, specimen damaged, SAMC–A066561, coll. Donia Wozniak.

Despite being damaged in the trawl the specimen collected here is well identifiable and also the only species of the genus known to extend into the western Indian Ocean. Genus new to the Southern African region, but it had been photographed before off the Mozambican coast by Tin-Yam Chan (Emmerson, 2016, page 455).

Identification: Rostrum acute, basal width equal to length. Anterolateral margin strongly granular, naked, concavo-convex from front backwards. One short, curved lateral carapace spine, with anterolaterally rounded sternum. Cheliped with one blunt merus dorsal spine a third from base and two long, sharp slender carpus dorsal spines. One small, blunt spine on third abdomen segment and one long, sharp spine on fourth abdomen segment.

Distribution: Known from Japan, South China Sea, west of the Philippines and Dar es Salaam. Here extended for the first time into South Africa.

Family Oziidae

14. *Lydia annulipes* (H. Milne Edwards, 1834)

Fig 3b

Euruppiella annulipes Barnard, 1950: 248; 1955: 4
Lydia annulipes Emmerson, 2016, Vol 2: 367–369.

There has been previous controversy as to whether this species occurs in South Africa (see detailed discussion in Emmerson, 2016). This is thus a confirmation, rather than a completely new record. Barnard (1950) documented earlier records of this species from 'the Cape' but expressed doubt about their authenticity, as he noted this as being a more tropical species. Although he then went on to confirm the species as occurring in Kosi Bay and St Lucia Bay, South Africa (Barnard, 1955), it was still not included in the regional fauna list of Kensley (1981). Moreover, Emmerson (2016) still listed the species as occurring from Inhaca Island, Mozambique northwards (thus not in South Africa), despite the fact that he reports on the records by Barnard (1955). The following records confirm its occurrence well into South Africa.

Locality records: Park Rynie, rock pool, S 30° 20.37', E 30° 44.11', intertidal, 2 Feb 2015, photograph, Alec Stansell.

Identification: Readily identified in the field by the red-orange body and cream legs with red bands at the joints. Carapace with marked anterior grooves medially and lumps laterally.

Distribution and habitat: Widespread Indo-Pacific. Intertidal, often under rocks. Distribution here confirmed to extend to South Coast of KwaZulu-Natal.

Family Leucosiidae

15. *Tanaoa pustulosus* (Wood-Mason, 1891)

Fig 3c

Tanaoa pustulosus Galil, 2003, 404–406, Figs. 1D, 3G–H; Emmerson, 2016, Vol 3: 460; Griffiths *et al.*, 2018: 226.

Although reported on and illustrated by Griffiths *et al.* (2018), they do not include detailed station data, which is given here. Emmerson (2016) lists this species from Mozambique so that the record reported here represents an important official range extension.

Locality records: South Coast Demersal Survey, South of Kenton-on-Sea, AND005 sta D00565, S 34°10.28', E 26° 46. 75, 425 m, 2 May 2015, SAMC–A091356, coll. Robin Leslie.

Identification: Carapace rounded, covered in fine granules, with distinctive long, pointed and upturned posterior spike and several smaller projections around posterior margin. Chelae elongate with narrow claws. Colour orange.

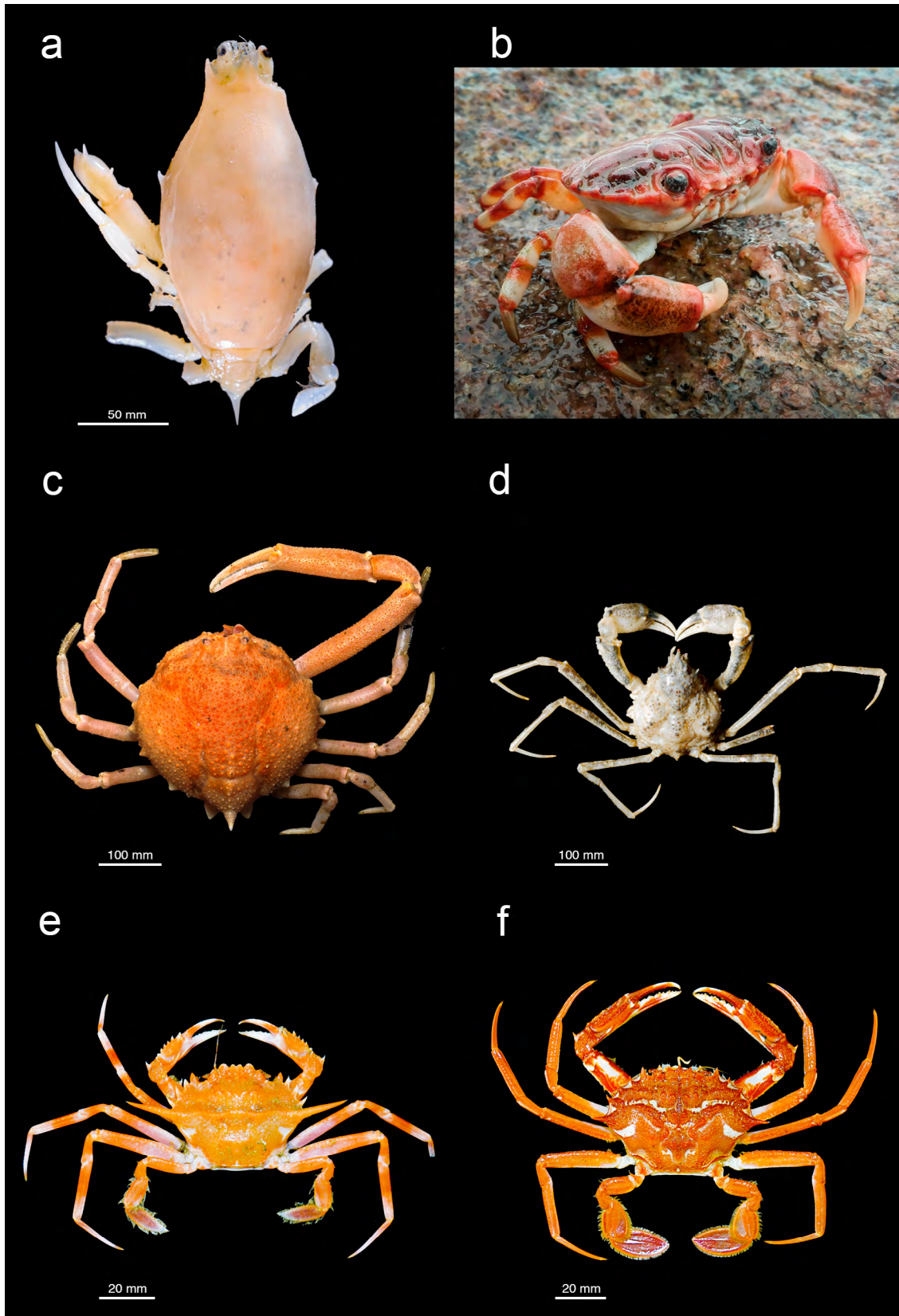


Figure 3. a. *Lyreidus brevifrons* T. Sakai, 1937, shelf edge south of False Bay, SAMC-A066561, photograph Janes Landschoff; b. *Lydia annulipes* (H. Milne Edwards, 1834), Park Rynie, photograph Alec Stansell; c. *Tanaoa pustulosus* (Wood-Mason, 1891), South Coast off south Kenton-on-Sea, SAMC-A091356 and d. *Pyromaia tuberculata* (Lockington, 1877), South Coast south of Gouritz River Mouth, SAMC-A091355, both photograph Robin Leslie; e. *Bathynectes piperitus* Manning and Holthius, 1981, West Coast offshore, SAM-A091359 and f. *Macropipus australis* Guinot, 1961, West Coast offshore, SAMC-A091357, both photograph Donia Wozniak.

Distribution: Widespread Indo-Pacific, now extending into South Africa.

Family Inachoididae

16. *Pyromaia tuberculata* (Lockington, 1877)

Fig 3d

Pyromaia tuberculata Ahyong, 2005: 460–461; Griffiths *et al.*, 2018: 198.

Reported on and illustrated by Griffiths *et al.* (2018), but they fail to point out that, as this species is not listed by Emmerson (2016), it represents an addition to the regional fauna. This species was also recently reported from Eastern Australia by Ahyong (2005) and may represent an introduction to both locations.

Locality records: South Coast Demersal Survey, South of Gouritz River Mouth, AND005 sta D00596, S 34° 23.23', E 21° 54.10', 43 m, 10 May 2015, SAMC–A091355 coll. Robin Leslie.

Identification: Carapace oval, bearing one anterior and three larger posterior tubercles, each covered on smaller knobs. Chelae inflated in males, but slender in females. Legs long and slender, with elongate dactyls.

Distribution and habitat: Native to Pacific North America. A suspected introduction.

Family Polybiidae

17. *Bathynectes piperitus* Manning and Holthius, 1981

Fig 3e

Bathynectes piperitus Manning and Holthius, 1981: 77–83; Emmerson, 2016, Vol 2: 563–568; Griffiths *et al.*, 2018: 218.

Reported and illustrated by Griffiths *et al.* (2018), but they do not provide detailed station data and fail to point out that, as this species is listed by Emmerson (2016) as occurring only in Namibia, their records represent an addition to the South African fauna. A well-known and significant fisheries species (Abello and Macpherson, 1989).

Locality records: Caught by demersal trawl at several locations ranging from the border with Namibia (S 29° 47.30', E 14° 57.45') to just West of St Helena Bay (S 32° 45.162', E 17° 0.66'). Depth ranging from 353–415 m. *Reference specimens:* AFR296, sta A33877, S 29° 47.30' E 14° 57.45', 381 m, 3 March 2019, SAMC–A091359, coll. Donia Wozniak.

Identification: Carapace oval with four teeth between eyes and four on each side before strong long lateral spine; scalloped ridge runs horizontally across centre of carapace and surrounds a square depression centrally. Colour orange with distinctive red and white banded legs, tips of chelae white.

Distribution: West Africa from Cape Verde Islands southwards to Namibia and now extended to along the west coast of South Africa.

18. *Macropipus australis* Guinot, 1961

Fig 3f

Macropipus australis Manning and Holthius, 1981: 85; Emmerson, 2016, Vol 3: 466; Griffiths *et al.*, 2018: 215.

Reported on and illustrated by Griffiths *et al.* (2018), but they do not list detailed station data as provided below that prove an extension record into SA waters.

Locality records: Caught by demersal trawl at several locations ranging from the border with Namibia (S 28° 52.15', E 16° 26.92') to just South of Hondeklip Bay (S 31° 7.914', E 17° 26.754'). Depth ranging from 80–210 m. *Reference specimens:* AFR296, sta A33882, S 29° 14.09', E 15° 41.44', 175 m, 2 males SAMC–A091357, 4 March 2019; AFR296, sta A33884, S 29° 46.83', E 16° 31.14', 154 m, ovigerous female SAMC–A091358, 5 March 2019, 154 m, coll. Donia Wozniak.

Identification: Carapace with three frontal teeth, four sharp curved anterolateral spines on each side and a large lateral spike. Colour pattern distinctive, brick-red, with bright iridescent patches.

Distribution: Widespread between 90–240 m depth along the coasts of Angola and Namibia, here extended into South Africa.

Discussion

The aim of this paper is to update and correct the list of decapod crustaceans known from South African waters, subsequent to the recent regional monograph and listing by Emmerson (2016).

The additional records reported fall into two categories. The first of these are species added to the fauna in the conventional way – that is the species are newly collected and reported as completely novel to South Africa. Many of these were in fact included in the decapod fauna lists for the wider southern African region published by Emmerson (2016), but based

only on records from outside of the territory of South Africa. Additional locality records from within those borders are now reported, and these species can thus now be added to the South African national fauna list. The second group of species are those that have already been reported from South Africa in recent photographic field guides (King and Fraser, 2014; Griffiths *et al.*, 2018), and sometimes also by Emmerson (2016), but for which critical information, such as the date, location and/or depth (and museum catalogue number of specimen(s), where these exist) were not provided in the original source. By supplying these additional data, the usefulness of these reports is enhanced. A total of five species are reported from South Africa for the first time and formal locality records are provided to confirm the distributions of a further 12 species that were previously reported in field guides or as unconfirmed records. One other species is removed from the national species list as the previous field guide record appears to have been based on a misidentification.

The ease with which these numerous new records have been gathered illustrates how many decapods remain to be discovered in the region. Also, the majority of new records originate from the more tropical waters of the east coast, which have historically been more poorly sampled than the temperate South and West coasts, which support much larger commercial fisheries and have been subject to more intensive research and sampling to support their management (Griffiths *et al.*, 2010).

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References

- Abelló P, Macpherson E (1989) Distribution of *Bathynectes piperitus* (Brachyura: Portunidae) in the Benguela Upwelling Region and its relationship with some environmental parameters. *Journal of Crustacean Biology* 9 (3): 373-380
- Abelló P, Macpherson E (1991) Distribution patterns and migration of *Lithodes ferox* (Filhol) (Anomura: Lithodidae) off Namibia. *Journal of Crustacean Biology* 11 (2): 261-268
- Ahyong ST (2005) Range extension of two invasive crab species in Eastern Australia: *Carcinus meanas* (Linnaeus) and *Pyromaia tuberculata* (Lockington). *Marine Pollution Bulletin* 50: 460-462
- Atkinson LJ, Sink KJ (2018) Field guide to the offshore marine invertebrates of South Africa. Malachite Marketing and Media, Pretoria. 498 pp
- Awad A, Griffiths CL, Turpie JK (2002) Distribution and endemicity patterns of benthic marine invertebrates in South Africa applied to the selection of priority conservation areas. *Diversity and Distributions* 8: 129-145
- Barnard KH (1950) Descriptive catalogue of South African decapod Crustacea. *Annals of the South African Museum* 38: 1-837
- Barnard KH (1955) Additions to the fauna-list of South African Crustacea and Pycnogonida. *Annals of the South African Museum* 43: 1-107
- Baeza JA, Schubart CD, Zillner P, Fuentes S, Bauer RT (2009) Molecular phylogeny of shrimps from the genus *Lysmata* (Caridea: Hippolytidae): the evolutionary origins of protandric simultaneous hermaphroditism and social monogamy. *Biological Journal of the Linnean Society* 96 (2): 415-424
- Branch GM, Griffiths CL, Branch ML, Beckley LE (2016) Two oceans: A guide to the marine life of southern Africa. Fourth Edition. Struik Nature, Cape Town. 456 pp
- Bruce AJ (1983) *Lysmata debelius* new species, a new hippolytid shrimp from the Philippines. *Revue française d'Aquariologie* 9 (1982): 115-120
- Burukovsky RN (2000) *Lysmata splendida* sp. nov., a new species of shrimp from the Maldives (Crustacea: Decapoda: Hippolytidae). *Senckenbergiana maritima* 30 (3/6): 223-227
- Chan, T-Y, Yu H-P (1998) A new reef lobster of the genus *Enoplometopus* A. Milne Edwards, 1862 (Decapoda,

- Nephropoidea) from the western and southern Pacific. *Zoosystema* 20 (2): 183-192
- Costello MJ, Coll M, Danovaro R, Halpin P, Ojaveer H, Miloslavich P (2010) A census of marine biodiversity knowledge, resources, and future challenges. *PloS One* 5 (8): e12110
- Emmerson WD, Goy JW, Koslowski S (1990) On the occurrence of *Stenopus tenuirostris* De Man, 1988 in Natal waters. *South African Journal of Zoology* 25 (4): 260-261
- Emmerson WD (2016) A guide to, and checklist for, the decapoda of Namibia, South Africa and Mozambique. Cambridge Scholars Publishing, Newcastle upon Tyne. Vols 1–3 526, 645, 711 pp
- Feldmann RM (1992) The genus *Lyreidus* De Haan, 1839 (Crustacea, Decapoda, Raninidae): systematics and biogeography. *Journal of Paleontology* 66 (6): 943-957
- Francis MP, Worthington CJ, Saul P, Clements KD (1999) New and rare tropical and subtropical fishes from northern New Zealand. *New Zealand Journal of Marine and Freshwater Research* 33: 571-586
- Galil BS (2003) Four new genera of leucosiid crabs (Crustacea: Brachyura: Leucosiidae) for three new species and nice species previously described in the genus *Randallia* Stimpson, 1857, with a redescription of the type-species, *R. ornata* (Randell, 1939). *Proceedings of the Biological Society of Washington* 116: 395-422
- Gibbons MJ *et al.* (63 others) (1999) The taxonomic richness of South Africa's marine fauna - a crisis at hand. *South African Journal of Science* 95: 8-12
- Gosliner TM, Behrens DW, Williams GC (1996) Coral reef animals of the Indo-Pacific. *Sea Challengers*, Monterey, California. 288 pp
- Griffin DJ (1970) A revision of the recent Indo-West Pacific species of the genus *Lyreidus* de Haan. *Transactions of the Royal Society of New Zealand Biological Sciences* 12 (1): 89-112
- Griffiths CL, Robinson TB, Lange L, Mead A (2010) Marine biodiversity in South Africa – an evaluation of current states of knowledge. *PloS ONE* 5 (8): e123008
- Griffiths CL, Landschoff J, Atkinson LJ (2018) Phylum: Arthropoda. In: Atkinson LJ, Sink KJ (eds) *Field guide to the offshore marine invertebrates of South Africa*. Malachite Marketing and Media, Pretoria. pp 133-226
- Kensley B (1981) On the zoogeography of southern African decapod Crustacea, with a distributional checklist of the species. *Smithsonian Contributions to Zoology*. 338: 1-64
- King D, Fraser V (2014) *The reef guide*. Struik Nature, Cape Town. 360 pp
- Laird MC, Griffiths CL (2016) Additions to the South African sea anemone (Cnidaria, Actiniaria) fauna, with expanded distributional ranges for known species. *African Invertebrates* 57: 15-37
- Macpherson E (1988) Revision of the family Lithodidae Samouelle, 1819 (Crustacea, Decapoda, Anomura) in the Atlantic Ocean. *Monografias de Zoologia Marina* 2: 9-153
- Manning RB, Holthuis LB (1981) West African Brachyuran crabs (Crustacea: Decapoda). *Smithsonian Contributions to Zoology* 306: 1-379
- Marin I (2010) On the presence of the symbiotic alpheid shrimp *Aretopsis amabilis* in the coastal waters of Nhatrang Bay, Vietnam. *Marine Biodiversity Records* 3: 1-4
- Miya Y, Miyake S (1969) Description of *Alpheus bellulus* sp. nov. associated with gobies from Japan (Crustacea, Decapoda, Alpheidae). *Publications of the Seto Marine Biological Laboratory* 16: 307-314
- Potts W, Mann-Lang JB, Mann BQ, Griffiths C, Attwood GC, de Blocq AD, Elwen SD, Nel R, Sink K, Thornycroft R (2021) South African marine citizen science – benefits, challenges and future directions. *African Journal of Marine Science* 43 (3): 1-14
- Poupin J (2003) Reef lobsters *Enoplometopus* from French Polynesia (Decapoda, Enoplometopidae). *Zoosystema* 25 (4): 643-664
- Poupin J (2016) First inventory of the Crustacea (Decapoda, Stomatopoda) of Juan de Nova Island with ecological observations and comparison with nearby islands in the Mozambique channel (Europa, Glorieuses, Mayotte). *Acta Oecologica* 72: 41-52
- Sakai T (1937) Studies on the crabs of Japan II. *Oxystomata*. *Science Reports of the Tokyo Bunrika Daigaku, Section B* 3 (Suppl. 2): 67-192
- Scott RJ, Griffiths CL, Robinson TB (2012) Patterns of endemism and range-restriction among southern African coastal marine invertebrates. *African Journal of Marine Science* 34: 341-348
- Vannini M, Innocenti G, Ruwa RK (1993) Family group structure in mysids, commensals of hermit crabs (Crustacea). *Tropical Zoology* 6 (1): 189-205