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## A large new species of *Dardanus* (Crustacea, Decapoda, Diogenidae) from southwestern Australia

by Jacques FOREST and Gary J. MORGAN

**Abstract.** A new species of *Dardanus*, *D. australis* sp. nov., is described from southwestern Australian waters, from depths of 10-188 m. It is characterised by its pattern of spination, subequal chelipeds, proportions of the ocular peduncles, colour pattern and its large size (to at least 36.5 mm shield length).

**Key-words.** Decapoda, Diogenidae, *Dardanus*, southwestern Australia.

**Résumé.** Une nouvelle espèce de *Dardanus*, *D. australis* sp. nov., est décrite d'après des spécimens récoltés au large du sud-ouest de l'Australie, entre 10 et 188 m de profondeur. Elle est caractérisée par la disposition de ses épines, ses chélicères subégaux, les proportions de ses pédoncules oculaires, sa coloration et sa grande taille (jusqu'à 36,5 mm au moins de longueur de l'écusson céphalothoracique).

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### INTRODUCTION

Recent examination of a large collection of hermit crabs from northern and western Australian waters held by the Western Australian Museum, Perth, and the Muséum national d'Histoire naturelle, Paris, revealed at least seven new species (MORGAN and FOREST, 1991). An additional new and very large species of *Dardanus* was found but not described out of respect for an ongoing revision of the genus in Australian waters by Stephen COOK, Queensland Museum. It was discovered subsequently that this new species was not represented in COOK's collections and is therefore here described.

Sizes of specimens are cited as shield length (SL). Western Australia is abbreviated as WA. Type material is deposited in the Western Australian Museum (WAM), Muséum national d'Histoire naturelle (MNHN) and Queensland Museum, Brisbane (QM)

SYSTEMATICS

**Dardanus australis** sp. nov.

(Fig. 1)

*Dardanus* sp.; MORGAN, 1989 : 406.

HOLOTYPE : ♂, SL 35.8 mm, Lancelin Island, WA, 14.01.1958, WAM 339-65.

PARATYPES : 2 ♂, SL 21.5 mm, 20.8 mm, Pelsaert Group, Houtman Abrolhos Islands, WA, 2-12.05.1963, MNHN Pg.4650; 3 ♂, SL 20.2 mm, 18.2 mm, 17.2 mm, ♀, SL 19.4 mm, Pidgeon Island, Wallabi Group, Houtman Abrolhos, WA, 05.1959, MNHN Pg.4651; ♂, SL 21.2 mm, 2 ♀, SL 20.9 mm, 19.9 mm, Rat Island, Houtman Abrolhos, 04.1972, WAM 85-72, 86-72; ♀, SL 8.4 mm, Good Friday Bay, Houtman Abrolhos, WA, 6.03.1963, MNHN Pg.4656; ♂, SL 16.5 mm, 4.4 mm, 2 ♀, SL 9.7 mm, 6.1 mm, northwest of Bluff Point, WA, 130 m, 10.10.1963, WAM 362-65, QM W15753; ♀, SL 12.5 mm (ovig.), southwest of Bluff Point, WA, 110 m, 4.02.1964, MNHN Pg.4664; ♀, SL 26.4 mm, Shark Bay or Houtman Abrolhos, WA, 1963, WAM 338-65; 16 ♂, SL 36.5-10.1 mm, 5 ♀, SL 21.0 mm, 15.5 mm, 14.5 mm (ovig.), 14.2 mm, 10.7 mm, Beagle Island, WA, 10-60 m, 1959-1964, WAM 310-65, 324-65, MNHN Pg.4644, Pg.4645, Pg.4646, Pg.4647; ♂, SL 8.9 mm, 2 ♀, 10.8 mm (ovig.), 5.6 mm, southwest of Jurien Bay, WA, 146 m, 9.12.1970, WAM 487-88; ♂, SL 7.6 mm, northwest of Green Head, WA, 146 m, 22.03.1972, WAM 1754-86; ♂, SL 14.5 mm, northwest of Green Islands, near Cervantes, WA, 139-146 m, 22.03.1972, WAM 1919-86; ♀ (ovig.), SL 11.7 mm, west of Lancelin, WA, 112-122 m, 5.02.1964, MNHN Pg.4654; ♀, SL 12.8 mm, northwest of Rottneest Island, WA, 183-183 m, with sponges, 14.08.1962, WAM 539-65; ♀, SL 15.5 mm, west of Rottneest Island, WA, 12.10.1963, WAM 387-65; ♀, SL 10.5 mm, west of Rottneest Island, WA, 146 m, 10.08.1962, MNHN Pg.4655; ♂, SL 30.4 mm, 11 km west of Rottneest Island, WA, 73 m, 12.01.1963, WAM 344-65; ♀, SL 9.5 mm, west of Rottneest Island, WA, 137 m, 28.08.1963, WAM 538-65; ♂, SL 17.5 mm, off West End, Rottneest Island, WA, 177-183 m, 16.09.1965, WAM 487-86; ♀ (ovig.), SL 9.2 mm, west of Rottneest Island, 23.03.1972, WAM 1700-86; ♂, SL 19.0 mm, North Fremantle, WA, 11.04.1972, WAM 76-72; ♂, SL 25.7 mm, west of Safety Bay, WA, 55 m, 01.1963, WAM 343-65; ♀, SL 7.7 mm, northwest of Bunbury, WA, 155 m, 17.03.1972, WAM 1752-86; ♂, SL 32.7 mm, 33°28'S, 115°04'E, 40 m, 6-7.12.1947, MNHN Pg.4648; ♂, SL 33.6 mm, off Hamelin Bay, WA, 12.1964, WAM 193-90; ♀, SL 18.2 mm, Chatham Island, WA, 16.07.1959, MNHN Pg.4652; ♂, SL 31.4 mm, near Rock Dunder, 24 km east of Albany, WA, 82 m, 27.01.1960, WAM 618-65.

DESCRIPTION

Shield (fig. 1a) 1/4 to 1/3 longer than broad. Rostrum very broadly triangular, blunt or rounded distally and not projecting as far as lateral projections; lateral projections strongly projecting, apex blunt or rounded. Shield with some small spines and tubercles anterolaterally and some protrusions at setal bases laterally, otherwise unarmed. Tufts of long simple setae laterally and anterolaterally.

Ocular peduncles moderately stout, shorter than front of shield and less than 1/2 as long as shield; peduncles weakly inflated distally and proximally and sparsely setose; corneal length about 1/4 total length of peduncles. Ocular acicles with 3-6 distal spinules; acicles about 1/3 length of ocular peduncles and as broad as long, separated basally by about 1/2 width of one acicle and converging distally; acicles bearing sparse clumps of long setae.

Antennular peduncles long and elongate, over-reaching ocular peduncles by 1/2 to 2/3 length of ultimate segment; unarmed except for 6-10 spinules on distolateral margin of

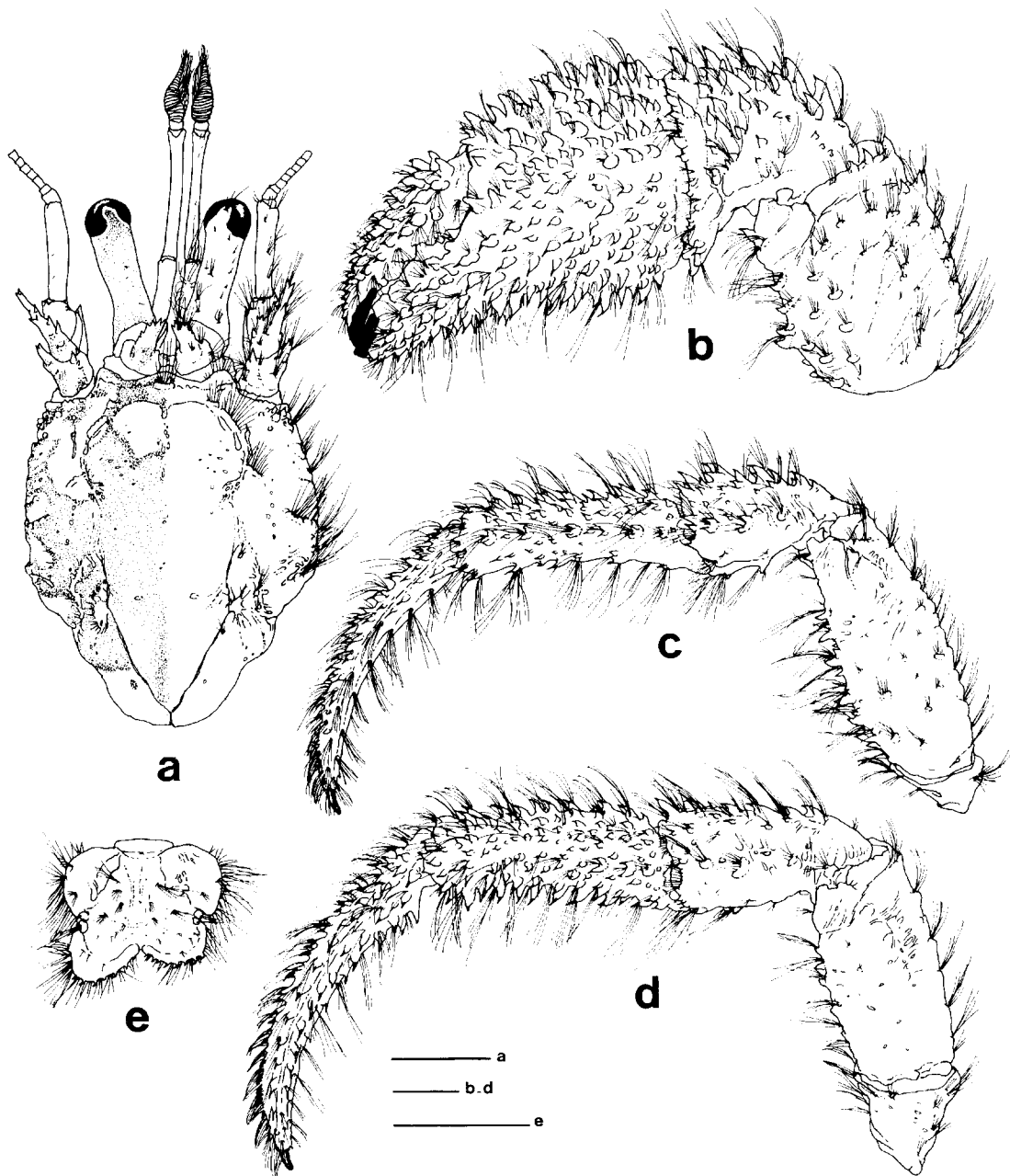


FIG. 1. — *Dardanus australis* sp. nov. Holotype ♂: a, shield and cephalic appendages, dorsal view (setae illustrated on right side, colour patterns on left); b, left cheliped, lateral view; c, left second pereiopod, lateral view; d, left third pereiopod, lateral view; e, telson, dorsal view. Scales = 10.0mm

proximal segment; ultimate segment with few very short setae, other segments bearing tufts of long setae. Antennal peduncles as long as or slightly longer than ocular peduncles; fifth segment unarmed; fourth with 1-2 spinules distolaterally; third with moderately strong distal spine; second with 1-2 distolateral and 1-2 distomesial spines; first segment with at least 1 distoventral spine. Antennal acicles reaching at most to 1/3 length of ultimate peduncular segment; acicles with 2 distal spines, 1 dorsal spine posterior to these and 3-4 mesial spines. All segments with tufts of long simple setae, especially dense on segments 2 and 3 and on acicles. Antennal flagella as long as or slightly longer than carapace; almost naked except for some scattered minute setae.

Third maxillipeds sometimes with distodorsal spine on carpus; merus with 1 distodorsal and 3-5 ventral spines; ischium with strong crista dentata and 1-3 ventral spines; basis with 1-2 distoventral spines.

Chelipeds (fig. 1b) subequal. Dactyl about 1/2 length of propodus, dactyl downcurved and covered with strong corneous-tipped spines on dorsal and lateral faces; several enlarged cutting teeth, cutting edge distally corneous for approximately 1/3 its length; mesial face with some spines dorsally. Propodus length twice or slightly less than twice maximum width (excluding spines); fixed finger deflexed ventrally resulting in concave ventral margin of chelae; several large cutting teeth, cutting edge distally corneous for 1/4 to 1/3 length; finger and palm covered on lateral, dorsal and ventral faces with strong mostly corneous-tipped spines; on large specimens, many of these spines, especially dorsally on palm, lacking corneous tips, being distally blunted; propodus less spinose mesially, with more scattered and usually blunter spines. Carpus slightly broader than long, bearing numerous corneous-tipped spines on lateral and dorsal faces, spines largest dorsally, mesial face almost smooth with some spines on distal edge and protrusions at bases of setal tufts. Merus weakly compressed laterally; dorsal edge with several large spines distally and on distolateral edge; spines and tubercles along ventrolateral and ventromesial edges, these spines especially large proximally on ventromesial edge; lateral and mesial faces with some protrusions and tubercles at setal bases. All segments with tufts of long simple setae.

Little allometric or sexual variation in morphology of chelipeds.

Second pereopods (fig. 1c) longer than chelipeds by length of dactyl of former. Dactyl long and recurved ventrally, bearing numerous corneous-tipped spines dorsally and laterally in irregular rows, mesial and ventral surfaces with few scattered spines; lateral longitudinal sulcus along most of length of dactyl. Propodus shorter and much stouter than dactyl, bearing numerous corneous-tipped spines, these largest and most numerous dorsally, mesial face with few spines dorsally. Carpus with large spines dorsally and some smaller more scattered spines laterally; 1-2 ventral spines; mesial surface almost smooth. Merus with non-corneous spines only along ventral margin, remainder smooth or with low tubercles at setal bases. All segments with tufts of long simple setae.

Third pereopods (fig. 1d) similar length to second. Dactyl longer than on second, spines more numerous ventrolaterally; longitudinal sulcus present. Propodus similar length to that of second but much broader and more spinose especially ventrolaterally. Carpus more compressed laterally than on second but ornamentation similar. Merus shorter than on second, ornamentation similar.

Tailfan very asymmetrical with left uropods much larger than right. Telson (fig. 1e) length similar to, or slightly greater or less than, width; left posterior lobe slightly larger than right,

both subtriangular and each bearing about 5-8 corneous spines along posterior margins. Telson with marginal long and short simple setae, some setae dorsally in tufts.

*Coloration* : No live specimens examined. Preserved material with shield predominantly red-brown with large semi-symmetrical patches of cream (fig. 1a). Ocular peduncles uniformly pale red-brown except for diffuse darker areas proximally and at base of corneas. Ocular acicles and antennal peduncles with patches of red-brown. Chelipeds and pereopods 2 and 3 with dactyl and propodus mostly deep red or red-brown, non-corneous spines tipped with cream or white; carpus and merus paler with darker red-brown band under corneous tips of most spines and areas of cream especially on tubercles and non-corneous spines; cream patches usually bordered by thin band of dark red-brown. Small specimens with chelae less uniformly coloured; red mostly on fingers, extending a variable distance laterally onto palm and usually along dorsal margin of palm.

*Size* (SL) : The 59 specimens examined include 36 males and 23 females. The sizes of males range from 4.4 mm to 36.5 mm; 7 of them measure more than 30 mm and 11 between 20 and 30 mm. The female range from 5.6 mm to 26.4 mm; they are on the whole much smaller than males, since only 3 exceed 20 mm. Five of them, from 9.2 mm to 14.5 mm, are ovigerous.

*ETYMOLOGY* : Named from the latin for 'southern', referring to the very southerly distribution of the species along the Western Australian coast.

*HABITAT* : *Dardanus australis* has been dredged or caught in rock lobster pots at recorded depths of 10-188 m. The 10 m record might be regarded with suspicion as the next shallowest report is from 40 m, with most specimens taken at depths exceeding 50 m, most frequently between 130-150 m. Shells utilised by the species are large and voluminous and include *Angaria delphimus* (Linnaeus, 1758), *Monodonta labio* (Linnaeus, 1758) and *Turbo jourdani* Kiener, 1839.

*DISTRIBUTION* : Known only from southwestern Australia. Most northern paratypes from Wallabi Group, Houtman Abrolhos Islands (28°26' S, 113°42' E) but an additional specimen examined from northwest of Dirk Hartog Island, Shark Bay (25°31' S, 112°29' E) ranging to just east of Albany (35°02' S, 117°53' E) in the south, a linear distance of 1200 km. There is one additional specimen, a male SL 35.0 mm, in the MNHN with a collection label of "Trawled 47 fathoms off Kingscliffe, June 1961". Kingscliffe is a town in northern New South Wales, eastern Australia. If this locality is correct, then it would imply that *D. australis* ranges around the entire southern coast of Australia. However there are no specimens from any other locality outside of southwestern Australia. We must regard the Kingscliffe record as most probably an error and conclude that the species occurs only in the southwest.

#### REMARKS

*D. australis* is a very large species with a maximum recorded shield length of 36.5 mm. Morphologically it closely resembles *D. hessii* (Miers, 1884), a similarly spinose species with subequal chelipeds, the latter being a rare trait for the genus. The true *D. hessii*, recorded from the Red Sea to Viet Nam and the Arafura Sea at depths of 15-73 m, also occurs in Australian waters with specimens examined from North West Cape and Point Cloates in Western Australia (WAM 528-65, 559-65) and New Year Island, far northern Australia, at depths to 133 m.

The new species can be distinguished by its feebly inflated corneas and longer ocular peduncles and by the shape and spination of the hand of chelipeds : the palm is much more

enlarged and the spines on the dorsal and lateral faces are a little shorter, more numerous and more closely set. Likewise, the spination on the lateral surfaces of the second and, especially, the third pereopod is more extensive. In addition, from our observations and those of earlier workers (e.g. FIZE and SERENE, 1955), *D. hessii* is a small species, possibly not exceeding 15.0 mm in shield length. Only preserved specimens of both species were available for comparison, but residual coloration showed dark lateral and mesial longitudinal bands on the ocular peduncles of *D. hessii* (also illustrated by FIZE and SERENE, 1955 : fig. 34) and on that species the deep red coloration appears confined to the fingers of the chelae.

*D. brachyops* Forest, 1962, known from Hawaii and Madagascar, is comparable in size to *D. australis* and similar in its spination. Comparison of a large specimen of *D. brachyops* (WAM 332-65) and FOREST's original description revealed several differences from *D. australis*. In the former, the right cheliped, although similar in form, is obviously smaller than the left. Also, the ocular peduncles are much shorter and stouter and bear 3 transverse dark red bands (FOREST, 1962 : fig. 1).

It is interesting that such a large species has not been described previously. This may be attributable to its close similarity to *D. hessii* and the apparent restriction of the species to the southwestern Australian coast where until recently very little pagurid research has been undertaken. In addition, like *D. brachyops*, *D. australis* does not occur intertidally and is found usually deeper than 50 m.

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