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QUDDUSI BASHIR KAZMI

FEROZ AKHTAR SIDDIQUI

MUHAMMAD AFZAL KAZMI

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Range Extension of *Diogenes karwarensis* Nayak & Neelakantan, 1989 and a Report on *Dardanus tinctor* Forskål, 1775 (Crustacea: Decapoda: Anomura: Diogenidae) from the Persian Gulf

Quddusi Bashir KAZMI^{1*}, Feroz Akhtar SIDDIQUI¹, Muhammad Afzal KAZMI²

¹Marine Reference Collection and Resource Centre, University of Karachi, Karachi-75270, PAKISTAN

²Zoology Department, University of Karachi, Karachi-75270, PAKISTAN

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Abstract: The range extension of a diogenid species, *Diogenes karwarensis*, is reported up to the Persian Gulf, and another diogenid species, *Dardanus tinctor*, an important faunal component of the area, is described in detail.

Key Words: Records, *Diogenes karwarensis*, *Dardanus tinctor*, Persian Gulf

Introduction

The material on which the following report is based was obtained live in Qatar (Persian Gulf) (East Long. 50°45', 51°40', North Lat. 24°25', 26°10') during a programme in 2002 on the marine environment of Qatar.

The hermit crabs were collected by hand by hired divers from below 4-m depth and the material was preserved in 5% formalin and brought to the Marine Reference Collection and Resource Centre laboratories, University of Karachi, Pakistan. The hermit crabs represent 2 genera: 1 of *Diogenes* Dana and 1 of *Dardanus* Paulson. The *Dardanus* species has already been reported from the Persian Gulf but the *Diogenes* species *Diogenes karwarensis* Nayak & Neelakantan, 1989, is reported from Qatar for the first time.

The specimens are housed in the Marine Reference Collection and Resource Centre, University of Karachi.

The abbreviation SL is used for the shield length (mm), defined as the distance from the tip of the rostrum to the midpoint of the posterior margin of the shield.

Diogenes karwarensis Nayak & Neelakantan, 1989

Diogenes karwarensis Nayak & Neelakantan, 1989: 71, figs. 1,2; Rahayu & Komai, 2000: 30.

Diogenes karwarensis: Siddiqui & Kazmi, 2003: 89; Kazmi, 2003: 242.

Diogenes karwarensis: Siddiqui et al., 2004: 189.

Material examined

Qatar, 2002, 2 males SL 1.5-2 mm, 2.4 m; 1 male SL 2 mm (illustrated), 0.5 m; 30 specimens of both sexes (13 males and 17 females) SL = 1-2 mm. All from cerithids.

Diagnosis

Shield slightly longer than broad, with broadly rounded rostrum not exceeding level of lateral projections. Intercalary rostriform process acutely pointed, reaching nearly to tip of ocular acicles. Ocular peduncles short and stout, the ocular acicles subtriangular and with spines on distolateral margin. Antennular peduncles overreach ocular peduncles by quarter to half length of ultimate segment. Antennal peduncles slightly shorter to as long as antennular peduncles exceeding peduncles to entire length of fifth segment and fourth segment usually with dorsodistal spine. Antennal acicles simple, each terminating in strong simple or bifid spine, dorsal surface with 3 or 4 spines.

Left cheliped with median row of spinules on upper surface of dactylus; convex outer surface of palm with median ridge proximally and with irregular rows of acute spines on proximal half. Smaller right cheliped with a hiatus between dactylus and fixed finger; outer surface of dactylus and palm spinulose, tuberculate or granular. Dactyli of ambulatory legs longer than propodi, dorsal

* E-mails: qbkazmi@yahoo.com

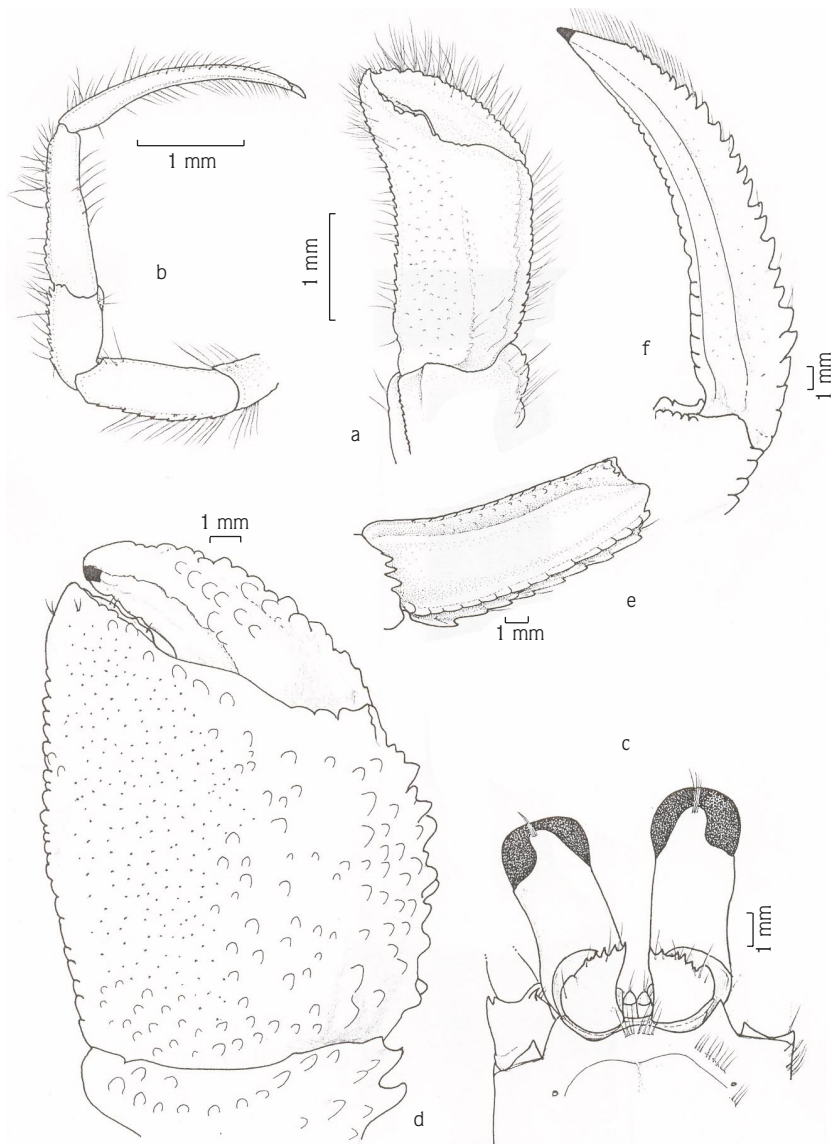


Figure 1. a, b. *Diogenes karwarensis* Nayak & Neelakantan 1989 (SL 2 mm). a. left chela, dorsal view; b. third left pereopod, lateral view; c-f. *Dardanus tinctor* Forskål 1775 (SL 14 mm); c. anterior portion of shield, ocular peduncles and acicles; d. left chela, dorsolateral view; e. propodus of left third pereopod, lateral view; f. dactylus of left third pereopod, lateral view.

surface of carpi of second pereopods with row of prominent spines.

Colour

Preserved specimens are light cream with prominent grey patches with a light red and brown tinge.

Distribution

Karwar and Ankola, India; Karachi, Pakistan; and now

from Qatar in the Persian Gulf.

Dardanus tinctor (Forskål, 1775)

Cancer tinctor Forskål, 1775: 93, 94. Herbst, 1796: 30.

Pagurus varipes Heller, 1861b: 244, pl. 1, fig. 1, pl. 2, figs. 2, 3; 1861a: 22. De Man, 1880: 184; 1881: 129. Kossmann, 1880: 75. Bouvier, 1892: 54. Alcock,

1905: 90, pl. 9, fig. 7. Fize & Serene, 1955, 213, text fig. 33C, D.

Pagurus pedunculatus Ortmann, 1894: 31. Barnard, 1950: 429, text fig. 79a. Not *Dardanus pedunculatus* (Herbst, 1804).

Pagurus brevipes Bonnier & Perez, 1902: 117.

Pagurus tinctor: Nobili, 1905: 4, 1906a: 81, 1906b: 112. Riddell, 1911: 261. Balss, 1915: 10. Ramadan, 1936: 26.

Dardanus varipes: Gordan, 1956: 316 (lit.).

Dardanus tinctor: Gordan, 1956: 316 (lit.). Lewinsohn, 1969: 26, pl. 1, figs 1, 2. Hogarth, 1988: 1099.

Not *Pagurus varipes*: De Man, 1888b: 436. Henderson, 1893: 420 [= *Dardanus pedunculatus* (Herbst, 1804)].

Not *Dardanus varipes*: Boone, 1938 [= *Dardanus gemmatus* (H. Milne Edwards, 1848)].

Not *Dardanus tinctor*: Miyake, 1978: 55 (key) [= *Dardanus gemmatus* (H. Milne Edwards)].

Material examined

Qatar 2002, 1 male SL 14 mm, 3 m, from *Hexaplex kuesterianus* with 2 large sea anemones; 1 female SL 3 mm, 7.75 m, from *Cronia* sp.; 1 female SL 5 mm, 0.75 m from *Cronia* sp.

Diagnosis

Shield almost equal in length and breadth; anterior margin between rostrum and lateral projections shallowly concave; lateral margin with bunches of stiff setae; dorsal surface of shield slightly convex with scattered tufts of setae; post-frontal and Y-shaped posterior lines present. Ocular peduncles short, stout, slightly inflated distally; corneas dilated, but not broader than peduncles; ocular acicles broad with several acute spines on their distolateral margins. Interocular plate with a pair of protrusions, each with a tuft of setae. Antennular and antennal peduncles both overreaching distal margins of corneas. Antennal acicles terminating in stout spines, dorsolateral margin with 2 teeth.

Chelipeds grossly unequal. Ventral margin of palm of left, larger cheliped sinuous and serrate. Lower half of outer surface with few small tubercles proximally, rest

lower half surface pitted minutely, pubescence present in smaller specimens; longitudinal rows of larger tubercles alternating with longitudinal strips of smaller tubercles on upper half (3 strips of smaller and 3 rows of larger tubercles alternate); upper margin with strong spinulose tubercles. Upper margin and outer and inner faces of dactyl with rows of tubercles separated by shallow furrows; cutting edge and terminal tooth eroded. Carpus with 3 strong curved corneous tipped spines on upper margin, outer face with similar but smaller spines. Merus with ventromesial margin produced, armed with several large flattened projections; dorsolateral surface with several short, setose tuberculate ridges. Ischium with ventromesial margin armed with several flattened projections provided by long stiff setae. Right cheliped moderately slender without hiatus between dactylus and fixed finger. Dactylus and propodus spooned, corneous; cutting edges with several low, large teeth; dactyl's upper face bearing 1 row of short corneous-tipped spines and tufts of long setae; outer face with 1 upper row similar to that on upper face and 2 rows of tuft of setae, space between the tuft of rows cristiform. Palm with upper face bearing 2 irregular rows of strong, corneous-tipped spines; outer face separated from upper face by groove and with several bunches of setae.

Second pereopods and right third pereopods each with dactyli longer than propodi, terminating in strong corneous claw; lateral surfaces each with weak longitudinal sulcus flanked by setae. Propodus of left second pereopod weakly cristate on upper/outer surface. Left third pereopod with dorsal and ventral margins of dactylus cut into strong serrations or large curved spines; lateral face with strong longitudinal carina near lower margin. Propodus with dorsolateral margin rounded, lateral face with a serrated keel running parallel to setiferous serrated dorsolateral margin (upper outer surface), gap between the keel and dorsolateral margin provided with several (5) bunches of stiff setae; lateral face convex medially; ventral margin beaded. Dorsal margin of dactylus armed with curved spines, some with corneous tips.

Distribution

Red Sea, Mozambique, Persian Gulf, India, Sri Lanka, Malayan Peninsula, Tosa Bay, Ryukyu Islands.

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