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SHORT COMMUNICATION

First record of *Manningis arabicum* (Jones and Clayton, 1983) (Decapoda, Brachyura, Camptandriidae) from India

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Abstract

The present paper confirms the occurrence of the brachyuran crab *Manningis arabicum* (Jones and Clayton, 1983) in India. The species has thus far been recorded from Kuwait, Iran, Iraq, Saudi Arabia, Qatar, and Pakistan and now also from the northwestern coast of India.

Keywords

Gulf of Kachchh, mangrove, new record, west coast of India

Introduction

Brachyuran crab species of the family Camptandriidae Stimpson, 1858 are commonly found in the estuarine, mangrove mudflat and open mudflat habitats in the Indo-West Pacific regions (Jones and Clayton, 1983). Camptandriidae is represented by around 40 species belonging to 22 genera worldwide (Ng *et al.*, 2008; 2009; De Grave *et al.*, 2009; Ahyong, 2014), out of which five species, *viz.*, *Baruna socialis* Stebbing, 1904, *Camptandrium sexdentatum* Stimpson, 1858, *Leptochryseus kuwaitense* (Jones and Clayton, 1983), *Nasima dotilliformis* (Alcock, 1900), and *Opusia indica* (Alcock, 1900) have been reported from India (Trivedi *et al.*, 2017; 2018). In the present study, we report the sixth species *Manningis arabicum* (Jones and Clayton, 1983) for the first time from the northwestern coast of India.

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Specimens were collected from the mangrove mudflat habitat of Jakhau village, located in Gulf of Kachchh region of Gujarat state, India. Specimens were washed properly to remove debris and photographed. They were preserved in 10 % formalin and deposited in the Zoological Reference collection (LFSc.ZRC), Department of Life Sciences, Hemchandracharya North Gujarat University, Patan, Gujarat, India. Abbreviations: CW, carapace width; CL, carapace length; P2–P5, first to fourth ambulatory leg respectively; coll., collector. Morphological terminology used in this article follows Ng *et al.* (2009).

Systematics

Order Decapoda Latreille, 1802

Family Camptandriidae Stimpson, 1858

Genus *Manningis* Al-Khayat and Jones, 1996

Manningis arabicum (Jones and Clayton, 1983) (Fig. 1)

Paracleistostoma arabicum Jones and Clayton, 1983: 190, fig. 4.

Paracleistostoma arabicum— Jones, 1986: 158, pl 46; Manning, 1991: 299, 300; Apel, 1994: 42–45, figs. 1, 2; Apel, 1996: 42–45, figs. 1, 2.

Manningis arabicum— Al-Khayat and Jones, 1996: 798, 809, fig. 7; Al-Khayat and Jones, 1999: 58, 61; Apel and Türkay, 1999: 135; Ng *et al.,* 2008: 233 (in list); Ng *et al.,* 2009: 10, 11, figs. 1b, 4; Naderloo and Türkay, 2012: 49; Naderloo *et al.,* 2013: 450, tab. 1, 456, tab. 2; Naderloo, 2017: 371, figs. 34.3, 34.4, 34.10b

Material examined. Ten females (CL: 2.77 mm–4.43 mm, CW: 4.21 mm–7.43 mm), LFSc. ZRC–156, Jakhau (23°13'58"N 68°36'42"E), Gujarat, India, mangrove muddy shore, coll. J. N. Trivedi, 7 July 2015.

Diagnosis (modified from Ng *et al.,* 2009). Carapace (Fig. 1a) smooth, much broader than long, glabrous, dorsal surface sloping downward from posterior to anterior portion; gastric region moderately convex; anterolateral margins acute, convex, produced into 2 lobes posterior to external orbital tooth; lateral margins with 2 feeble indentations and continuing posteriorly as granulate ridges over part of the branchial region; posterior carapace margin wide, thickened, straight; front (Fig. 1a, c) almost as wide as orbital, deflexed downward, concave and weakly bilobed from dorsal view; frontomedial margin distinctly bilobed; lateral angle of front touching inner infraorbital angle, then closing orbit; ex-orbital angle pointed, directed outward. Posteromedian tooth of epistome broadly triangular, lateral margins concave; posterior margin on either side concave. Third maxilliped (Fig. 1f) inner margin thick; merus slightly shorter than ischium, outer distal angle slightly broad, rounded; ischium with inner distal angle slightly produced, oblique line of setae present; basal segment of palp not excavated to form spatulate structure. Chelipeds (Fig. 1a, b) of female slender, setose, tips spatulate; fingers (Fig. 1d) longer than palm; P3 longest, P5 shortest, meri of P3 with anterior, dorsal surface granular, never spinulate or serrate; thoracic (Fig. 1b) sternum swollen. Pleon (Fig. 1b, e) subcircular, wider than long, visible dorsally, sutures visible, all somites free, telson triangular. Gonopore large, with outer margin almost straight, operculum small, directed forwards.

Remarks. The specimens examined in the present study show close agreement with the original description given by Jones and Clayton (1983) and Ng *et al.* (2009). Manning (1991) while describing a new genus *Nasima* Manning, 1991 for *Cleistostoma dotilliformis* Alcock, 1900 commented that a new genus should be established for *Paracleistostoma arabicum* Jones and Clayton, 1983. Later, Al-Khayat and Jones (1996) established a new genus, *Manningis* for *P. arabicum*. The male and female of *M. arabicum* look similar in their overall morphology but show sexual dimorphism in relative cheliped size where males bear well developed and robust chelipeds and females bear slender chelipeds with a spatulate tip.

Manningis closely resembles *Nasima*, but can be distinguished from the latter on the basis of the following characters: robust chelipeds in the male, having a quadrangular palm, while the female has a slender cheliped with the palm longer than broad (*versus* chelipeds similar in the male and female of *Nasima*, Al-Khayat and Jones, 1996; Ng *et al.*, 2009, fig. 5a–c),

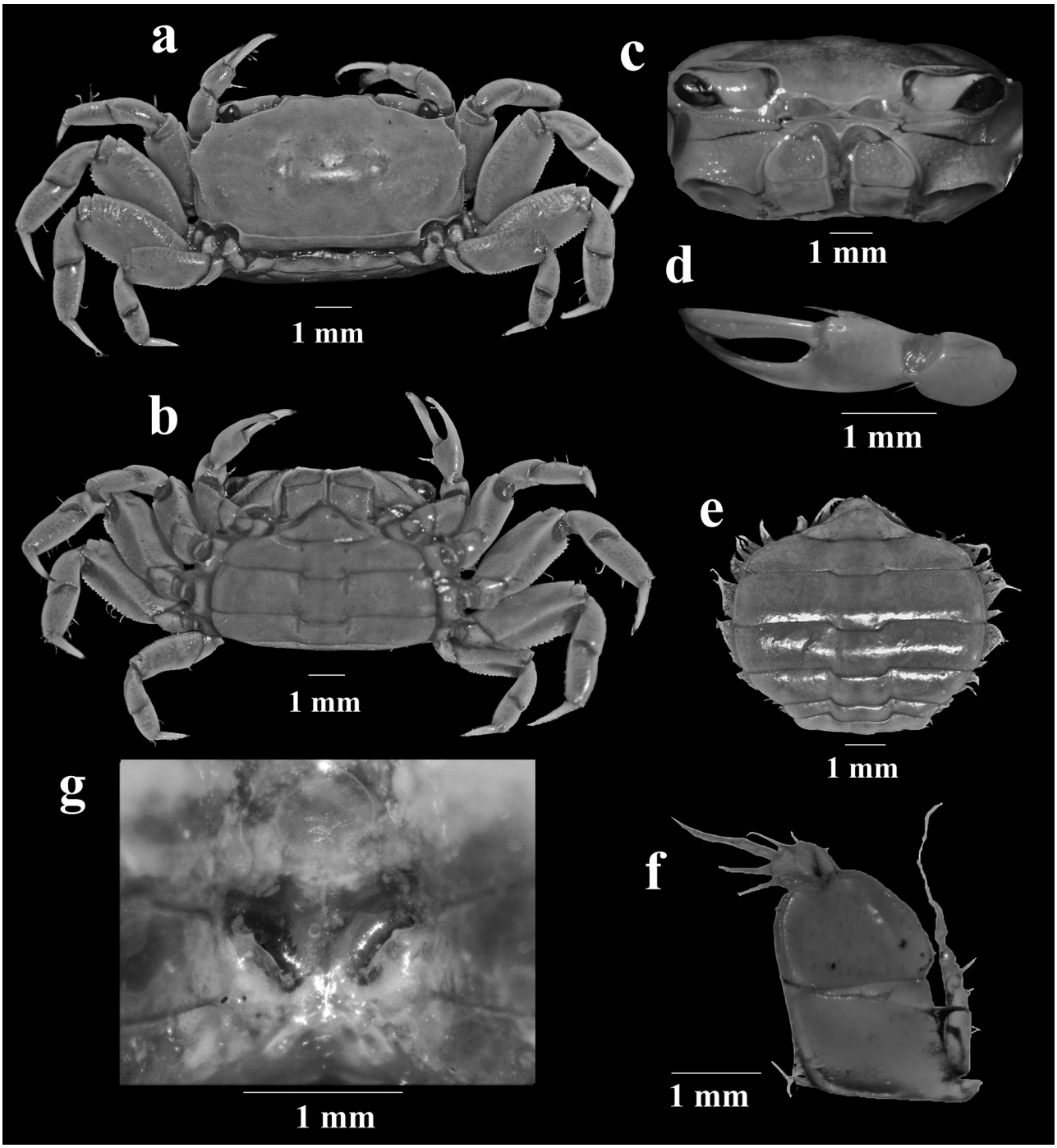

Figure 1. *Manningis arabicum* (Jones and Clayton, 1983), female (LFSc. ZRC–156), CL 4.43 mm; CW: 7.43 mm: **a**. dorsal view; **b**. ventral view; **c**. anterior view; **d**. right cheliped, outer view; **e**. pleon; **f**. third maxilliped; **g**. vulvae.

carapace average width to length ratio is 1.6–1.7 (Fig. 1a) (*versus* carapace average width to length ratio is 1.4 in *Nasima*, Ng *et al*., 2009, fig. 6A), carapace transversely oval in outline (Fig. 1a) (*versus* carapace subquadrate in outline in *Nasima*, Ng *et al*., 2009, fig. 6A), posterior carapace margin comparatively broad (Fig. 1a) (*versus* posterior carapace margin narrow in *Nasima*, Ng *et al*., 2009, fig. 6A).

Manningis also resembles *Serenella* Manning and Holthuis, 1981 but differs from the latter in the following characters: carapace transversely oval in outline (Fig. 1a) (*versus* carapace quadrangular in outline in *Serenella,* Manning and Holthuis, 1981, fig. 55a), the lateral angle of front touching infraorbital tooth, thus effectively closing the orbit in *Manningis* (Fig. 1c) (*versus* the lateral angle of front

not touching inner infraorbital angle in *Serenella*); the posteromedial tooth of the epistome is broadly triangular in *Manningis* (Fig. 1c) (*versus* posteromedial tooth is acutely triangular in *Serenella*).

Manningis can also be differentiated from *Baruna* Stebbing, 1904 on the basis of the following characters: carapace transversely oval in outline (Fig. 1a) (*versus* carapace subquadrangular in outline in *Baruna,* Harminto and Ng, 1991, fig. 3e), anterolateral margin granular with two weak lobes (Fig. 1a) (*versus* anterolateral margin divided into three lobes, nearest the orbit being the largest with 6 or 7 marginal granules in *Baruna*, Harminto and Ng, 1991, fig. 3e), third maxilliped merus slightly shorter than ischium (Fig. 1f) (*versus* merus larger than ischium in *Baruna*, Harminto and Ng, 1991).

Manningis can be differentiated from *Camptandrium* Stimpson, 1858 on the basis of the following characters: carapace average width to length ratio is 1.6–1.7 (Fig. 1a) (*versus* carapace average width to length ratio is 1.3 in *Camptandrium*, Tan and Ng, 1999, fig. 1A, E), carapace transversely oval in outline (Fig. 1a) (*versus* carapace hexagonal in outline in *Camptandrium*, Tan and Ng, 1999, fig. 1A, E), anterolateral margin with two weak lobes (Fig. 1a) (*versus* anterolateral margin with 2 to 3 teeth in *Camptandrium*, Tan and Ng, 1999, fig. 1A, E)

Manningis can be differentiated from *Opusia* Ng, Rahayu and Naser, 2009 on the basis of the following characters: front weakly bilobed from dorsal view (Fig. 1a) (*versus* front entirely straight from dorsal view in *Opusia*, Ng *et al*., 2009, fig. 2A), frontomedial margin distinctly bilobed (Fig. 1a) (*versus* frontomedial margin broadly triangular ending in truncate tip in *Opusia*, Ng *et al*., 2009, fig. 2A), eyestalks without setae (Fig. 1a, c) (*versus* eyestalk with long, plumose setae in *Opusia*, Ng *et al*., 2009, fig. 2A, D), epistome with posteromedian tooth broadly triangular (Fig. 1c) (*versus* epistome with posteromedian tooth large, long and moderately narrow in *Opusia*, Ng *et al*., 2009, fig. 2D).

Manningis can be differentiated from *Leptochryseus* Al-Khayat and Jones, 1996 on the basis of the following characters: carapace average width to length ratio is 1.6–1.7 (Fig. 1a) (*versus* carapace average width to length ratio is 1.3 in *Leptochryseus*, Ng *et al*., 2009, fig. 11G), carapace transversely oval in outline (Fig. 1a) (*versus* carapace quadrangular in outline in *Leptochryseus*, Ng *et al*., 2009, fig. 11G), front weakly bilobed from dorsal view (Fig. 1a) (*versus* front gently concave from dorsal view in *Leptochryseus*, Ng *et al*., 2009, fig. 11G).

Manningis arabicum was originally described from specimens collected from Kuwait (Jones and Clayton, 1983), and later it was recorded from the Persian Gulf – Iran (Naderloo and Türkay, 2012; Naderloo *et al*., 2013), Iraq (Ng *et al*., 2009), Saudi Arabia (Apel, 1994), and Qatar (Al-Khayat and Jones, 1996, 1999). Outside the Persian Gulf, it has been recorded from Pakistan (Saher *et al*., 2017), and now it is also known from mangrove habitat of Jakhau port of Gujarat state, located on the northwestern coast of India. The species is found in the lower intertidal zone of mangrove habitat at Jakhau port where it shares habitat with *Nasima dotilliformis* (Alcock, 1900). *Manningis arabicum* is a deposit feeder and is found in small burrows present along the bank of creeks passing through the mangroves.

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