

THE STATUS OF
CLEISTOSTOMA DOTILLIFORME ALCOCK, 1900
(CRUSTACEA: DECAPODA: OCYPODIDAE),
WITH THE DESCRIPTION OF A NEW GENUS

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ABSTRACT. - Material previously identified with *Cleistostoma dotilliforme* Alcock, 1900 from China is reidentified as *Paracleistostoma depressum* De Man, 1895, a common Malaysian and Indonesian species. *Cleistostoma dotilliforme* sensu stricto is assigned to a monotypic new genus, *Nasima*.

INTRODUCTION

In their revision of the Camptandriinae, Manning & Holthuis (1981: 201, 208) assigned *Cleistostoma dotilliforme* Alcock, 1900 to *Paracleistostoma* De Man, 1895, based on their examination of material identified with *C. dotilliforme* from southern China, the only specimens of that species then available to them. The species had been described from Karachi, Pakistan. In 1983, Jones and Clayton reported material of *C. dotilliforme* from several localities in the Persian Gulf as well as from Karachi, and their account and figures made it clear that the population from the Arabian Sea and that from China were not conspecific and probably not even congeneric. Subsequently, material of *C. dotilliforme* from Karachi became available for study, and a comparison of specimens from China with those from Pakistan confirmed that they represented different taxa.

The Chinese population is reidentified here as a species of *Paracleistostoma*, to which it had been assigned by Manning & Holthuis in 1981; it proved to belong to *P. depressum* De Man, 1895, which Gordon (1931) had reported from Xiamen (as Amoy). *Cleistostoma dotilliforme* Alcock, 1900 sensu stricto is assigned to a new genus here. Citations to *P. depressum* given below in the synonymy refer to the Chinese records for the species.

Jones & Clayton (1983) also described two other species of Camptandriinae from Kuwait, *Paracleistostoma arabicum* and *Cleistostoma kuwaitense*. Neither of these belong in *Cleistostoma* De Haan, 1833 as restricted by Manning & Holthuis (1981: 200) or in *Paracleistostoma*. Both of these key to the couplet containing *Paracleistostoma* and *Serenella* Manning & Holthuis, 1981 in the key to camptandriine genera in Manning & Holthuis (1981: 193-195). Both *P. arabicum* and *C. kuwaitense* have all somites of the male abdomen free and this distinguishes

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them from members of both *Paracleistostoma* and *Serenella*, in which the third to fifth somites of the male abdomen are fused. *Paracleistostoma arabicum* and *Cleistostoma kuwaitense* each should be referred to a new genus, which is however, beyond the scope of this study.

The following abbreviations are used in the descriptive accounts: cl, carapace length, measured on the midline; mm, millimeters; P1-P5, first to fifth pereopods.

All of the specimens reported below are in the collections of the National Museum of Natural History, Smithsonian Institution, Washington (USNM).

TAXONOMY

Family Ocypodidae Rafinesque, 1815

Subfamily Camptandriinae Stimpson, 1858

Genus *Paracleistostoma* De Man, 1895

Paracleistostoma depressum De Man, 1895

(Figs. 1, 2, 3c, d)

Paracleistostoma depressum De Man, 1895: 581; 1897: Pl. 14, Fig. 13; Gordon, 1931: 551, Fig. 26.

Cleistostoma dotilliforme - Rathbun, 1931: 101; Manning & Holthuis, 1981: 201. [Not *C. dotilliforme* Alcock, 1900]

Paracleistostoma dotilliforme - Manning & Holthuis, 1981: 208. [not *C. dotilliforme* Alcock, 1900]

Material examined. - Fujian Province, China: 1 ovigerous female, cl 7.8 mm (USNM 64947), Xiamen (= Amoy, 24°26'N, 118°07'E), leg. C. J. Shen, xi.1928. — 1 female, cl 4.1 mm (USNM 57824), Jimei (= Tsimei, 24°39'N, 118°06'E), tidal flats, leg. S. F. Light, vi.1923. — 2 males, cl 7.8-8.1 mm, 2 females, cl 7.2-7.3 mm (1 ovigerous, cl 7.3 mm) (USNM 61968) Santu (Santu Bay = 26°44'N, 119°59'E), leg. ix.1923.

Previous records. - Chinese records for this species are all from Fujian Province (as Fukien Province), southern China: Tsimei and Santu (Rathbun, 1931); Xiamen (as Amoy) (Gordon, 1931).

In addition to these records, the species is known from localities in peninsular Malaysia and Indonesia, including: Penang, Malaysia [5°24'N, 100°14'E] (De Man, 1895); Klang, Selangor [3°01'N, 101°25'E] (Pretzmann, 1977); Singapore [1°20'N, 103°50'E] (Tweedie, 1937; Serène, 1968); Pelabuhan Kelang [as Port Swettenham, 2°57'N, 101°24'E] and Muar [2°01'N, 102°35'E], Malaysia, all west coast of Malay Peninsula (Tweedie, 1937); and Pontianak, Borneo [0°0.5'S, 109°16'E] (De Man, 1895; Gordon, 1931).

Paracleistostoma depressum has been mentioned by Tesch (1918: 63), Guinot & Crosnier (1963: 608), and Serène (1974: 64, 55), none of whom reported on material.

Description. - Carapace 1.4 to 1.5 times broader than long, smooth, with at most few widely scattered hairs, convex from front to back and from side to side, lateral margins rounded,

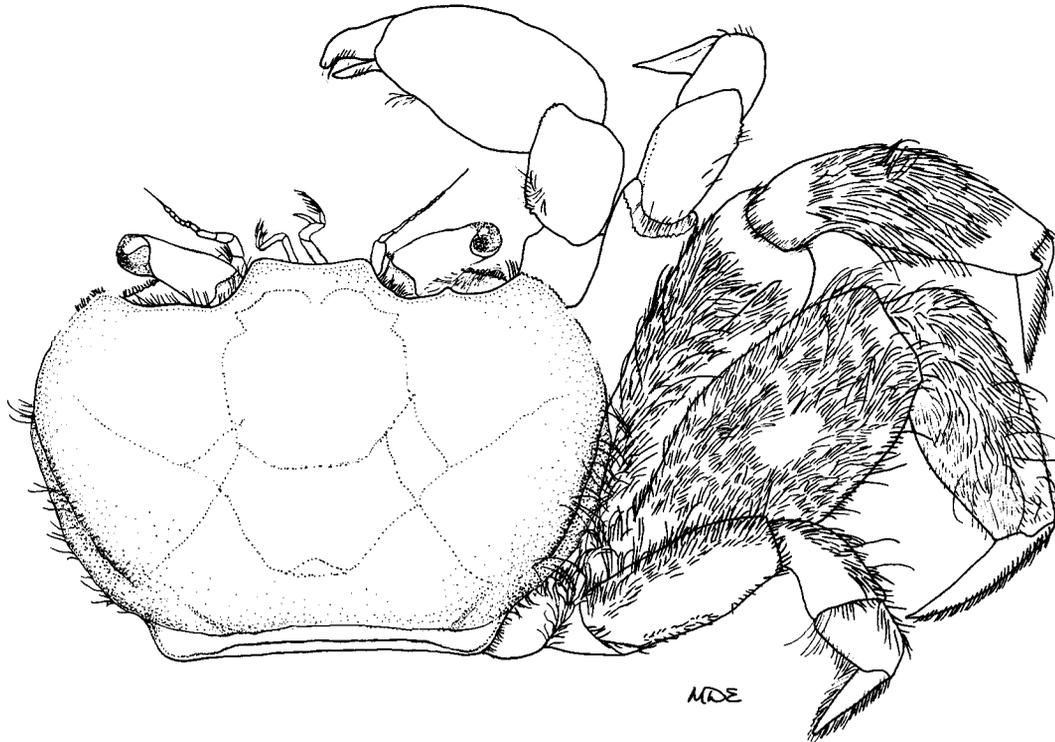


Fig. 1. *Paracleistostoma depressum* De Man, 1895. Male, cl 7.8 mm, Santu.

unarmed. Shallow, U-shaped groove present on mesogastric region, hepatic region and each side of intestinal region with shallow depression. Front subquadrate, deflexed, appearing transverse in dorsal view, concave medially in frontal view; indistinct epigastric ridges present at base of front. Orbits broad, sinuous, lacking incision dorsally; suborbital ridge forming lower margin of orbit, true suborbital margin present as line of granules in orbit. Lateral margin of carapace defined by raised, granulate ridge, ridge terminating posterolaterally above true margin at level of fifth pereiopods. Transverse ridge present posteriorly just ahead of posterior margin.

Third maxillipeds subquadrate, almost meeting in midline. Carpus with distinct curved crest on exterior surface, forming spatulate cup.

Chelipeds differing in males and females, inflated and equal in males, smaller and equal in females. In male, palm of chela almost as high as long, noticeably inflated; fingers shorter than palm, gaping; movable finger with piston-like tooth proximally, several low, irregular teeth distally, tips of fingers spatulate. Chelipeds of females much smaller, fingers longer than palm, tips spatulate, unarmed.

Walking legs (P2-5) broad stout. P2 naked, much of dorsal surface of P3-5 obscured by dense coat of hairs; P4 longest, P5 shortest. Meri of walking legs about twice as long as high, meri of P3 and P4 appearing stouter than meri of P2 and P5. P5 short, extending beyond merus of P4 with at most all of dactylus.



Fig. 2. *Paracleistostoma depressum* De Man, 1895. Male, cl 7.8 mm, Santu: a, third maxilliped; b, cheliped; c, P2; d, P3; e, P4; f, P5; g, abdomen; h,i, gonopods.

Abdomen of male not extending laterally to bases of walking legs, composed of 5 somites, third to fifth somites fused, lacking any sutures. Abdomen with two slight lateral constrictions, not exposing gonopods when closed. Abdomen of female with 7 free somites.

First gonopod strongly recurved, apex crossing major axis, distal appendage terminating in Y-shaped lobe.

Measurements. - Carapace lengths of males 7.8 and 8.1 mm, of non-ovigerous females 4.1 and 7.3 mm, of ovigerous females 7.2 and 7.8 mm.

Remarks. - With the transfer of *Cleistostoma dotilliforme* to a new genus, *Paracleistostoma* now contains three species, *P. depressum*, *P. wardi* (Rathbun, 1926), and *P. longimanum* Tweedie, 1937, all of which were assigned to the genus by Manning & Holthuis (1981). The other two species differ from *P. depressum* in having much slenderer walking legs, and *P. wardi* further differs in having the posterolateral surface of the carpace heavily tomentose. There are also differences in the gonopods, as shown in Fig. 3.

One species described in *Paracleistostoma*, *P. dentatum* Tesch, 1918, was excluded from the genus by Manning & Holthuis (1981: 209), and several other species subsequently assigned to the genus also were transferred to other genera by those authors.

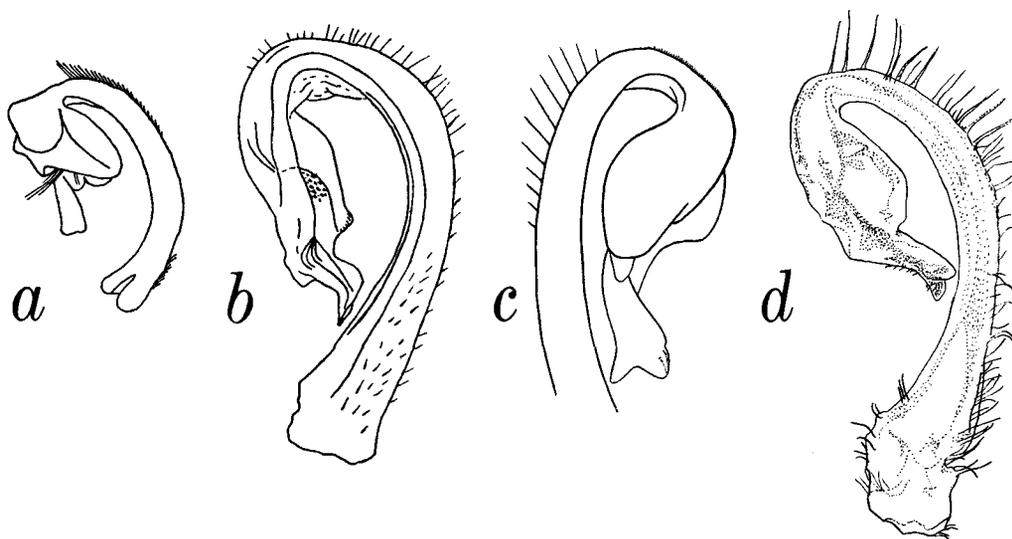


Fig. 3. First gonopods of species of *Paracleistostoma*: a, *P. wardi* Rathbun (from Barnes, 1967: fig. 15d); b, *P. longimanum* Tweedie (from Tweedie, 1937: fig. 5e); c, *P. depressum* De Man (from Gordon, 1931: fig. 26, right); d, *P. depressum* De Man, male, cl 8.1 mm, Santu.

Two other species, *Cleistostoma mcneilli* Ward, 1933 and *Paracleistostoma eriophorum* Nobili, 1903, have been doubtfully referred to the genus *Paracleistostoma* by Manning & Holthuis (1981: 208, 209) in their revision of the Camptandriinae. The first species differs from other members of the genus in having three anterolateral teeth on the carapace. Nobili's species differs from all other species assigned to the genus in having two carinae across the palm of the chela. The generic status of both of these species remains unclear.

The first gonopod of one of the specimens examined lacked the characteristic distal appendage (Fig. 2g,h), but it clearly is present in the other male (Fig. 3d). I can find no other differences between the two specimens.

According to Dr Peter K.L. Ng (*in litt.*), members of this species "prefer very fine soft mud, usually on almost flat ground, digging shallow oblique burrows with slit-like openings. It feeds on organic matter in the soft mud."

***Nasima*, new genus**

(Fig. 4)

Type species. - *Cleistostoma dotilliforme* Alcock, 1900: 373 (as *Clistostoma*). The gender is feminine.

Included species. - *Nasima dotilliformis* (Alcock, 1900). The genus is monotypic.

Diagnosis. - Carapace subquadrate, convex from front to back and from side to side, with depressed groove in center; greatest width anterior to midlength; surface sparsely hairy, with raised line of granules posterolaterally above true posterior margin; anterolateral margin with low, blunt lobe just behind anterolateral angle; epigastric ridges present as two lobes at base of quadrate front, latter concave medially, appearing transverse in dorsal view. Suborbital ridge forming lower margin of orbit, true lower margin visible as row of granules in side front. Third maxilliped with Y-shaped groove on surface, pterygostomial region also ornamented with grooves. Chelipeds small, equal, similar in both sexes. Meri of walking legs lacking spines. Male abdomen narrow, first somite not extending laterally to coxae of fifth pereopid; abdomen lacking constrictions, not exposing gonopods when closed; abdomens of male and female with 7 free somites. First gonopods recurved, bulbous, spiny apex crossing shaft, lacking protruding appendages.

Remarks. - *Nasima* keys out to the couplet containing *Paracelistostoma* and *Serenella* in the key in Manning & Holthuis (1981: 193-195). In both of those genera, the chelipeds of males are larger than and different from the chelipeds of females and the third to fifth somites of the male abdomen are fused. In *Nasima* the chelipeds of males and females are similar and all somites of the male abdomen are free.

Etymology. - It seems appropriate to name this genus in honor of Professor Nasima M. Tirmizi of the University of Karachi, and Karachi is the type locality for the type species. More importantly, Professor Tirmizi has earned recognition for her untiring efforts to train students in the systematics and biology of Crustacea from Pakistan as well as to increase significantly our knowledge of the Crustacea of the Arabian Sea through her own research efforts, now spanning four decades.

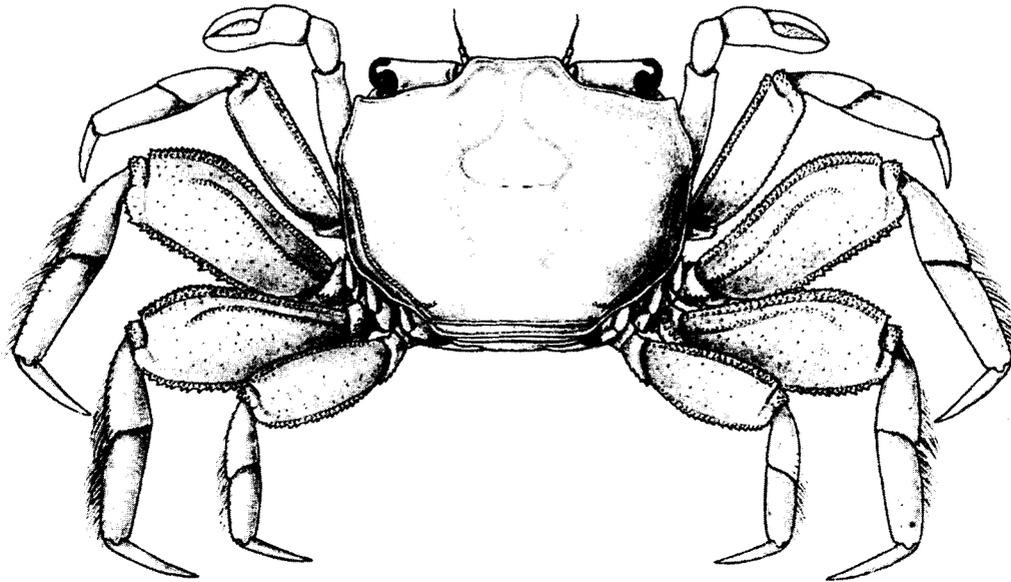


Fig. 4. *Nasima dotilliformis* (Alcock, 1900) (from Alcock and McArdle, 1902: Pl. 54, Fig. 1).

Acknowledgements. - I am indebted to Marion D. Erwin for donating her time to prepare the original illustrations and to Lilly King Manning for preparing the figures taken from the literature. I thank Dr Peter K.L. Ng, National University of Singapore, for his helpful comments on the manuscript and on the habits of *P. depressum*.

LITERATURE CITED

Alcock, A., 1900. The Brachyura Catametopa or Grapsoidea. Materials for a carcinological fauna of India, No. 6. *J. Asiatic Soc. Bengal*, **69**(II:3): 279-456.

Alcock, A. & A. F. McArdle, 1902. *Illustrations of the Zoology of the Royal Indian Marine Survey Ship Investigator, under the command of Commander T. H. Heming, R.N.*, Crustacea, Part 10: Pls. 56-67. Calcutta.

Barnes, R. S. K., 1967. The Macrophthalminae of Australasia; with a review of the evolution and morphological diversity of the type genus *Macrophthalmus* (Crustacea: Brachyura). *Trans. zool. Soc. Lond.*, **31**: 195-261.

Gordon, I., 1931. Brachyura from the coasts of China. *J. Linn. Soc. Zool.*, **37**: 525-558.

Guinot, D. & A. Crosnier, 1963. Remarques sur les genres *Cleistostoma*, *Paracleistostoma* et *Tylodiplax*, et description de *Tylodiplax derijardi* sp. nov. (Crust. Decap. Brachyura). *Bull. Mus. Nat. Hist. Nat.*, Paris, (2) **35**(6): 606-619.

Manning : Notes on *Cleistostoma*, *Paracleistostoma* and *Nasima*, new genus

- Haan, W. de, 1833-1850. Crustacea. In: P.F. von Siebold, *Fauna Japonica sive Descriptio Animalium, quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summum in India Batava Imperium Tenent, Suscepto, Annis 1823-1830 Collegit, Notis, Observationibus et Adumbrationibus Illustravit*, pp. i-xvii, i-xxxii, ix-xvi, 1-243, Pls., A-J, L-Q, 1-55, circ. tab.2. Lugduni-Batavorum (Leiden).
- Jones, D. A. & D. Clayton, 1983. The systematics and ecology of crabs belonging to the genera *Cleistostoma* De Haan and *Paracleistostoma* De Man on Kuwait mudflats. *Crustaceana*, **45**(2): 183-199.
- Man, J. G. de, 1895. Bericht über die von Herrn Schiffscapitän Storm, zu Atjeh, an den westlichen Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Decapoden und Stomatopoden, Part 1. *Zool. Jahrb. (Syst. Geogr. Tiere)*, **8**: 485-609.
- Man, J. G. de, 1897. Bericht über die von Herrn Schiffscapitän Storm, zu Atjeh, an den westlichen Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Decapoden und Stomatopoden, Part 5. *Zool. Jahrb. (Syst. Geogr. Tiere)*, **9**: 725-790, Pls. 12-14.
- Manning, R. B. & L. B. Holthuis, 1981. West African brachyuran crabs. *Smithson. Contrib. Zool.*, **306**: xii+379 pp.
- Nobili, G., 1903. Contributo alla fauna carcinologica di Borneo. *Boll. Mus. Zool. Anat. comp. R. Univ. Torino*, **18**(447): 1-32.
- Pretzmann, G., 1977. Die Macrophthalminae des Zoologischen Instituts und Zoologischen Museums der Universität Hamburg. *Mitt. Hamburg. Zool. Mus. Inst.*, **74**: 65-67, Pl. 7.
- Rafinesque, C. S., 1815. *Analyse de la nature ou tableau de l'univers et de corps organisés*. 224 pp. Palermo.
- Rathbun, M. J., 1926. Brachyuran crabs from Australia and New Guinea. *Rec. Aust. Mus.*, **15**(2): 177-182, Pls. 14-16.
- Rathbun, M. J., 1931. New and rare Chinese crabs. *Lingnan Sci. Jour.*, **8**[for 1929]: 75-125.
- Serène, R., 1974. Note on the genera and species of the Camptandriinae Stimpson 1858 (Decapoda, Brachyura: Ocypodidae). *Treubia*, **28**(3): 59-68.
- Stimpson, W., 1858. Crustacea Ocypodoidea: Prodrômus descriptionis animalium evertibratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit, Pars VII. *Proc. Acad. Nat. Sci. Philad.*, **1858**: 225-252 [pp. 63-90 on separate].
- Tesch, J. J., 1918. Hymenosomidae, Retroplumidae, Ocypodidae, Grapsidae and Gecarcinidae. The Decapoda Brachyura of the Siboga Expedition, I. *Siboga Exped.*, **39**(c): 1-148, Pls. 1-6.
- Tweedie, M. W. F., 1937. On the crabs of the family Ocypodidae in the collection of the Raffles Museum. *Bull. Raffles Mus.*, **13**: 140-170.
- Ward, M., 1933. New genera and species of marine Decapoda Brachyura. From the coasts of New South Wales and Queensland. *Austral. Zool.*, **7**: 377-394, Pls. 21-23.