Gnathia arabica, n.s. First Record of a Gnathiid from the Arabian Sea, and New Records of Isopods (Crustacea: Isopoda) from Pakistan in Collections of the Smithsonian Institution

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A new species of *Gnathia*, *G. arabica*, is described from Gujarat, India and from off Somalia, representing the first record of a gnathiid isopod from the Arabian Sea. It is distinguished from the other members of the genus (over 100 species) by details of the cephalon and mandible of the male. Three marine isopods (*Mothocya karobran* Bruce, *Aporobopyrus ryukyuensis* Shiino, *Aporobopyrina lamellata* Shiino) and a terrestrial oniscidean (*Hemilepistus klugii* [Brandt]) are reported as new records for Pakistan. The specimens are part of the Crustacea collection in the National Museum of Natural History (NMNH), Smithsonian Institution.

INTRODUCTION

Marine isopods of the family Gnathiidae number at present well over 100 species, having a world-wide distribution in tropical, temperate, Antarctic, and far northern latitudes. Habitats range from intertidal environments to abyssal depths over 3,700 meters. Since Monod's important monograph of 1926, in which he listed 66 known species in 6 genera, 58 more have been discovered during investigations of benthic ecosystems in the Caribbean, Australia, Indo-Pacific, Japan, eastern Pacific, Russia, South Africa, Antarctica, and both sides of the Atlantic (Camp 1988; Müller 1988; 1989a, b, c; 1991; 1993; Nunomura 1988).

Identification is based on morphology of the male since females are virtually indistinguishable. The sexual dimorphism in this family is perhaps the most extreme of all isopod taxa. The immature form or "praniza" is the only stage that swims and feeds, being an obligatory but temporary fish parasite. The effect of temporary attachment to a fish host is an

unknown factor in the distribution of species, although according to Wägele (1988), the natural hosts of at least Antarctic gnathiids are benthic, not pelagic fishes.

Seven species of *Gnathia* have been found thus far in the Indian Ocean region. These are *G. (Elaphognathia) insolita* Stebbing, 1904 (Sri Lanka); *G. africana* Barnard, 1914 (South Africa); *G. disjuncta* Barnard, 1920 (South Africa); *G. taprobanensis* Monod, 1926 (Sri Lanka); *G. piscivora* Paperna & Por, 1977 (Red Sea); *G. wolffi* Müller, 1989 (Kenya); *G. firingae* Müller 1991 (Réunion Island). The new species, the first *Gnathia* described from the Arabian Sea, was collected by benthic trawl during the 1964 International Indian Ocean Expedition from waters off Somalia and from the coast of northern India in Gujarat, implying that its range includes the coast of Pakistan.

GNATHIA ARABICA N. SP.

Material: HOLOTYPE USNM 252728, ♂, TL 2.2 mm, PARATYPES USNM 252729, 220 ♂, 55 ovig. ♀, 180 pranizae, off Somalia, IIOE RV *Anton Bruun*, cr. 9, sta 9–453, 11°11'N, 51°14'E, 47–49 m, 17 Dec 1964. Five ♂ and 5 ♀ are deposited as paratypes in the Marine Reference Collection and Resource Centre, University of Karachi, MRCC Cat. No. ISO. 3. Other material: 3 ♂, off Gujarat, northwestern India, IIOE RV *Anton Bruun* cr. 4B, 23'N, 70°00E to 20°20N', 69°55E, 71–79 m, 15 Nov 1963.

Description: Dorsum somewhat granular especially toward anterolateral edges of pereonites 2–4. Body mostly glabrous with few scattered setae. Cephalon broad, about 1.6 times wider than long, very granular and pitted, flat; tuberculate ridges running from eyes transversely to posterior margin; strong median carina (one-third length of cephalon) at posterior edge of head. Frontal margin with very shallow concavity flanked by pair of bifid, seta-bearing projections on each side. Pereonite 1 very short, lateral margins not visible dorsally. Pereonite 3 slightly longer than 2. Pereonite 4 subequal in length to 3; pereonite 5 appearing somewhat but not completely divided by sixth pereonite. Pereonite 7 minute, hidden by 6. Pleonites subequal in length. Telson triangular with two anterior setae and two pairs of setae posteriorly; two long setae on apical margin. Uropodal exopodite shorter than endopodite. Both uropodal rami bearing several long setae and both extending beyond tip of telson.

Mandible quite broad, width 0.75 times longest dimension; interior margin regularly toothed with short setules between teeth. Maxilliped of five articles, typical of genus. Antenna 1 flagellum with five articles, fifth bearing three aesthetascs; antenna 2 flagellum with seven articles and two aesthetascs apically.

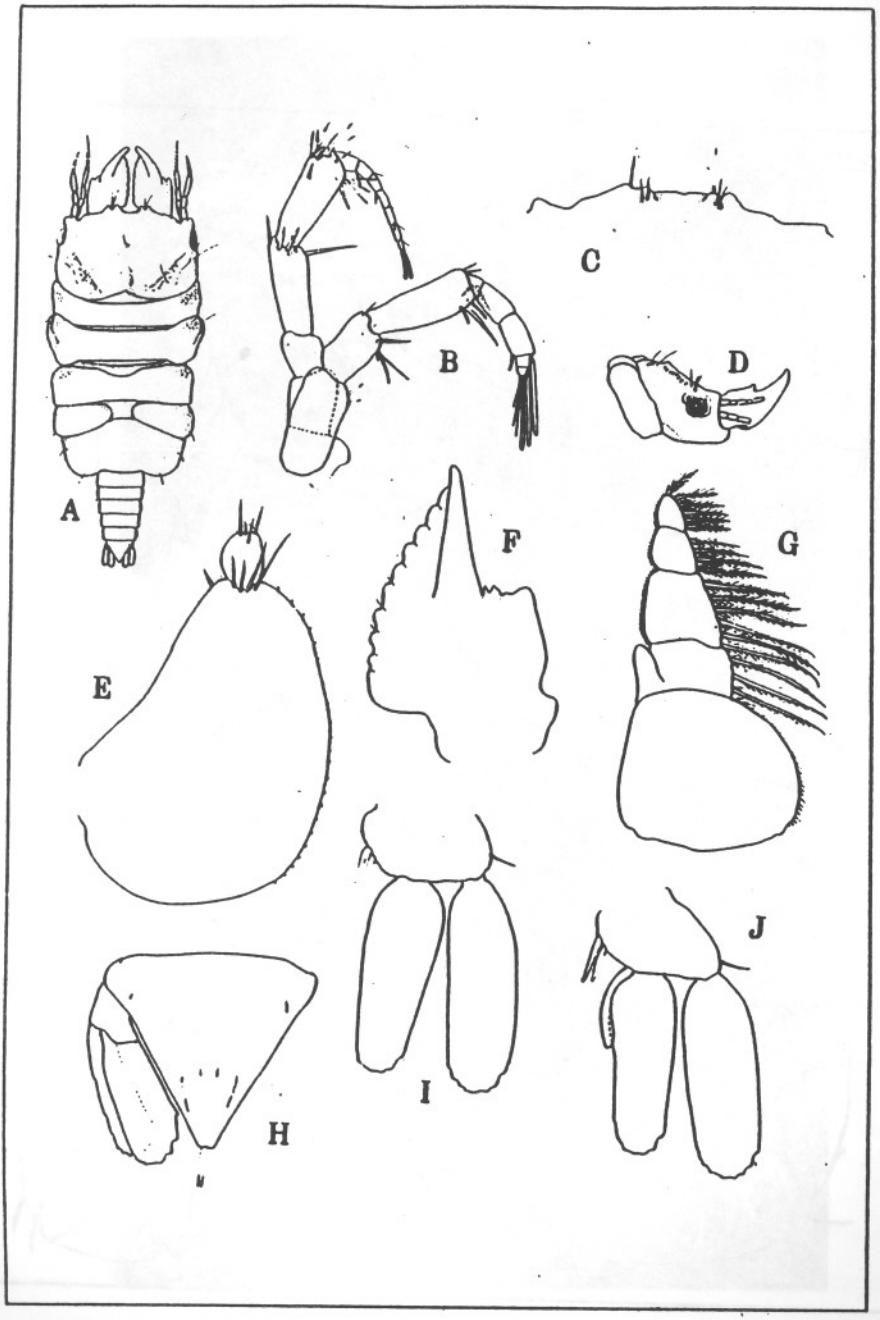

Figure 1. *Guathia arabica* male. **A** = dorsal habitus. **B** = antenna and antennule. **C** = frontal margin of cephalon. **D** = lateral view of cephalon. **E** = pylopod (pereopod 1). **F** = mandible, **G** = maxilliped. **H** = telson and uropods. **I** = pleopod 1. **J** = pleopod 2.

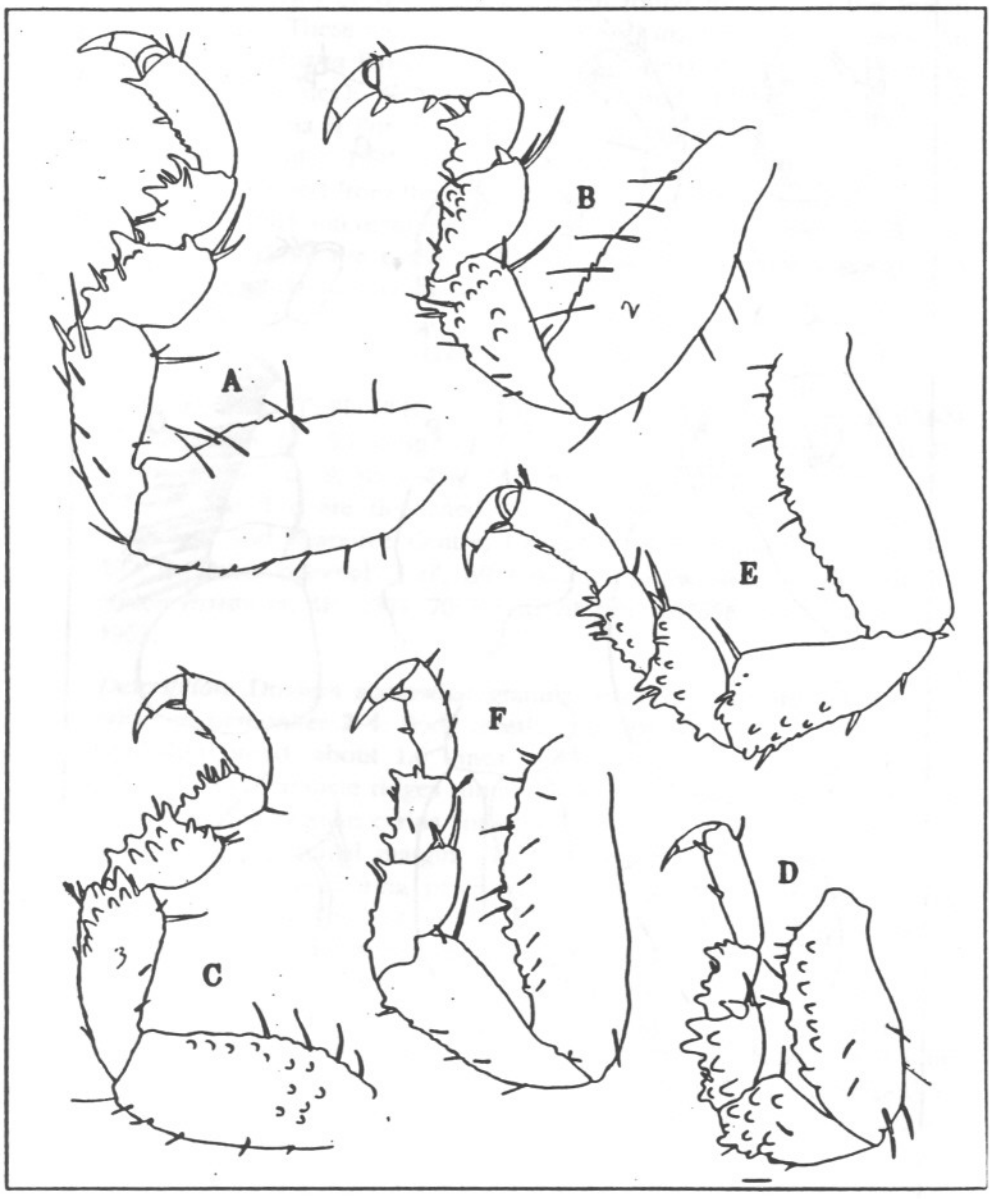

Figure 2. *Gnathia arabica* male. **A** = pereopod 2. **B** = pereopod 3. **C** = pereopod 4. **D** = perepod 5. **E** = pereopod 6. **F** = pereopod 7.

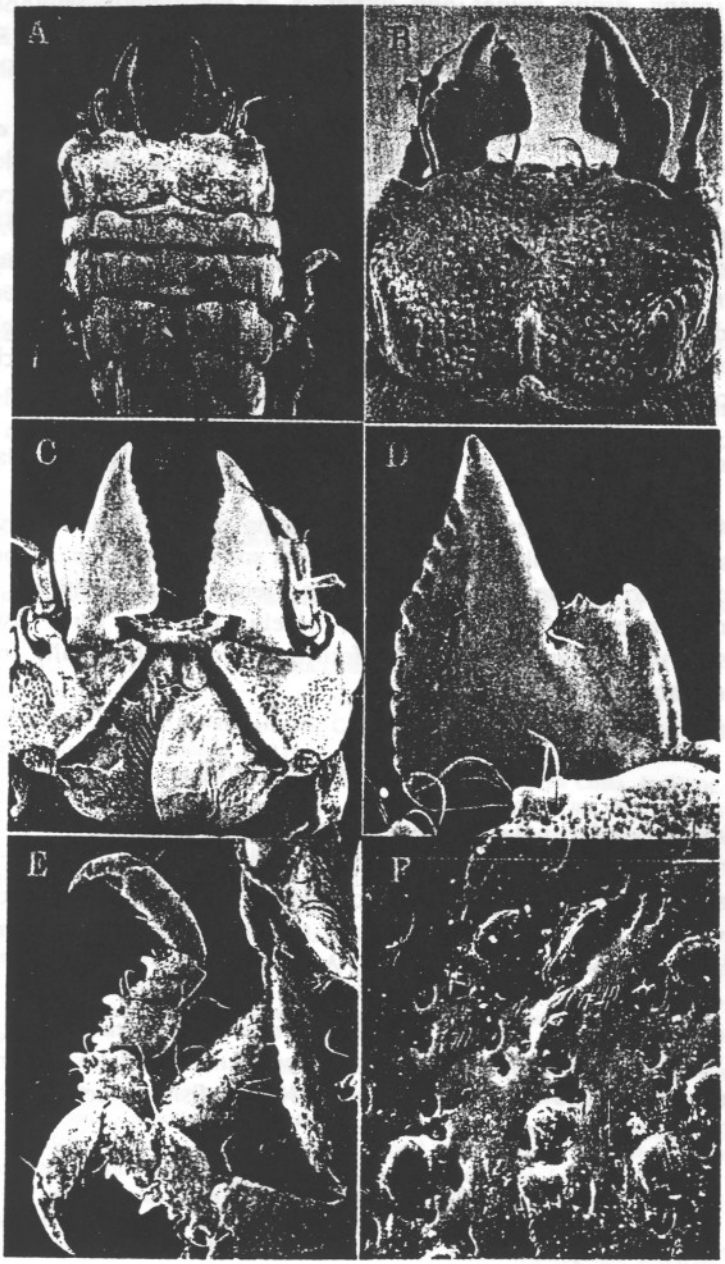

Figure 3. *Gnathia arabica* male. **A** = Dorsal habitus. **B** = cephalon. **C** = ventral view of cephalon and mandibles. **D** = right mandible. **E** = pereopods 2 and 3. **F** = detail of integument on cephalon.

Pylopod (pereopod 1) of three articles. Perepods 2–7 robust and with many strong spines and tubercles, as illustrated. Sympodites of pleopods 1 and 2 with two setae each; pleopod 2 bearing short, apically rounded appendix masculina, about 0.4 times length of endopodite.

Remarks: When compared to other Indian Ocean gnathiids, *G. arabica* differs in shape of the mandible and characters of the cephalon and fifth pereonite. *G. wolffi* and *G. insolita* belong to the *G. ferox* complex of species, having slender, antler-like mandibles (Müller 1989a). The broad mandible of the new species distinguishes it from *G. disjuncta*, *G. firingae* and *G. taprobanensis*; in the latter two the fifth pereonite is not divided. *G. arabica* somewhat resembles *G. africana*, which lacks the short cephalic medial carina, and also *G. spongicola*, which lacks the cephalic carina and bifid projections on the frontal margin.

Etymology: The species is named for its type locality, the Arabian Sea.

A forthcoming key to the isopod fauna of the Pakistan region by researchers at the University of Karachi lists some 40 species. A computer-aided search of the NMNH collections yielded four additional isopod records, reported for the first time herein. The first three listed are parasitic upon marine fishes, the fourth is terrestrial, usually found in desert habitats (Verhoeff 1923).

FAMILY CYMOTHOIDAE

Mothocya karobran Bruce, 1986: 1149–1152, figs. 34–36.

Material: USNM 216362, 1 ♂, 2 non-ovig. ♀, Pakistan, identified by N. Bruce; host *Strongylura strongylura*, the spot-tailed needlefish. Type locality: Moreton Bay, Queensland, Australia.

Remarks: A label in the vial lists *Strongylura strongylura* as host instead of *S. leiura* as reported by Bruce. *S. strongylura* was later confirmed as the correct host, a specimen from the NMNH fish collection. No other locality data are given.

FAMILY BOPYRIDAE

Aporobopyurus ryukyuensis Shiino, 1939: 81–84, figs. 3–4.

Material: USNM 170424, 1 ♂, 1 ♀, Karachi, Manora Islands, coll. by M. Ahmed, 11 Apr 1976; identified by J.C. Markham. 13 Oct 1977; host, the porcellanid crab *Petrolisthes boscii*. Type locality: Ryukyu Islands, Japan.

Aporobopyrina lamellata Shiino, 1934: 263–265, fig. 3.

Material: USNM 170423, 3 ♂, 4 ♀, Karachi, Manora Islands, coll. by M. Ahmed, 11 Apr 1976; identified by J.C. Markham, 13 Oct 1977; host, the porcellanid crab *Petrolisthes rufescens* Heller. Type locality: Seto, Japan.

FAMILY PORCELLIONIDAE

Hemilepistus klugii Brandt, 1833: 171.

Material: USNM 62944 1 ♀, "Baluchistan." No other locality data given. Type locality: Caucasus.

Remarks: The identifier of the specimen is not indicated. It is apparently part of a large collection purchased by the museum in 1930 from K.W. Verhoeff. Since Verhoeff had identified several *Hemilepistus* specimens in the collection to species level, it seems likely that he identified the present specimen at the same time.

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Brian Kensley kindly reviewed the manuscript and offered helpfull editorial comments.

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