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١ **A first report of *Canuellina insignis* Gurney, 1927 (Canuellidae: Copepoda)**
٢ **from The Persian Gulf and Gulf of Oman**

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١١ **Abstract**

١٢ In the study on biodiversity and systematics of meiobenthic copepods from northern coastline of
١٣ the Persian Gulf and Gulf of Oman, a canuelloid species, *Canuellina insignis* Gurney, 1927 was
١٤ found. This is the first report of the species in Iranian waters and also in the area.

١٥ **Key words:** Canuellidae, Copepods, meiobenthic, littoral zone, Iran.

١٦ **Introduction**

١٧ The following report deals with littoral copepods collected from the northern part of the Persian
١٨ Gulf and Gulf of Oman. Copepods taken from sediments and weed-washing, belonged to the
١٩ Canuellidae Lang, 1944. Currently, the family accommodated 19 genera and 59 species (Song *et*
٢٠ *al.*, 2018; Nazari *et al.*, 2018). In the prior study on meiobenthic copepods, three new species
٢١ belonging to the family Canuellidae were described from the region for the first time (Nazari *et*
٢٢ *al.*, 2018). The genus *Canuellina* Gurney, 1927, totally, distributed mostly in northwestern Indo-
٢٣ Pacific Ocean (Gurney, 1927; Por, 1967, 1969, 1983). Only one species, *C. nicobaris* (Wells &
٢٤ Rao, 1987), was reported from Andaman and Nicobar Islands. Previously, *Caniellina insignis*
٢٥ was reported from the Suez Canal (Gurney, 1927) and Inhaca Island of Mozambique (Wells,
٢٦ 1967). Recently, *C. insignis*, was found and reported here. Therefore, the number of Canuellid
٢٧ species in the area increase to four species.

٢٨ **Material and methods**

29 Copepod samples were collected from tide pools sediments and seaweeds during low tide.
30 Specimens were examined and identified at German Center for Marine Biodiversity Research
31 (DZMB) of senckenberg institute, using a Leica microscope equipped with Differential
32 Interference Contrast (DIC) at 1000×magnification and identification keys (Lang, 1948; Huys et
33 al., 1996; Boxshall & Halsey, 2004; Wells, 2007). Photographs were taken from one male and
34 one female by Confocal Laser Scanning Microscope Leica TCS SP5 equipped with a Leica
35 DM500 B. Abbreviations used in the text: exp, exopod; enp, endopod; P1-P4, first to fourth
36 swimming legs.

37 **Result**

38 A total of 68 individual were collected from five stations in the northern coast of the Persian
39 Gulf and Gulf of Oman.

40 **Material and habitat.** 1 ♀ 3 ♂ Dylam 30° 2'52.51"N 50° 8'43.97"E; 11♀ 4 ♂ Bandar Abbas
41 27°10'59.01"N 56°19'10.19"E; 12 ♀ 7 ♂ Koohestak 26°48'12.10"N 57° 1'22.33"E; 3 ♀ 2 ♂ Old Jask
42 25°43'48.16"N 57°45'48.99"E; 14 ♀ 11♂ Chabahar (Tis) 25°21'52.25"N 60°36'29.90"E; Detritus sand
43 and seaweeds.

44 **Taxonomy**

45 Order CANUELLOIDA Khodami *et al.*, 2017

46 Family CANUELLIDAE Lang, 1944

47 Genus *Canuellina* Gurney, 1927

48 *Canuellina insignis* Gurney, 1927

49

50 **Diagnosis.** P1-bearing somite fused to cephalosome. Body thin and long without demarcation
51 between prosome and urosome. Distal segment of P3 exopod and endopod with four setae/spine.
52 P4 exp-2 without inner seta.

53 **Description of female** (figures 2A, 3A, 4A). Body linear, length measured from tip of rostrum to
54 posterior margin of furcal rami 937 µm. First pedigerous somite fused to cephalosome. Rostrum
55 rectangular and elongate, broad and defined at base with two sensilla at apex. Genital double-
56 somite larger than other segments, with lateral sub-cuticular rib. Genital field with paired
57 copulatory pores; gonopores paired; eggs arranged in a row in egg sacs. Furcal rami divergent

08 and rectangular, nearly four times as long as wide, with seven setae. Antennule 6-segmented.
 09 Antenna biramus; exopod 7-segmented; endopod with three segments. P1-P4 with three-
 10 segmented rami; P4 endopod with short segments. P5 incorporated into segment with four setae.
 11 Setal formula as follows:

	Exopod	Endopod
P1	0.0.2.2.3	1.1.2.2.2
P2	0.1.2.2.2	1.1.1.2.2
P3	0.1.0.2.2	1.1.0.2.2
P4	0.0.0.2.2	1.0.1.1.1

12

13 **Description of male** (figures 2B, 3B, 4B). As in female but smaller and genital double-somite
 14 separate. Total body length 782 μm . Antennule chirocerate with 7 segments. P4 enp-3 with
 15 finger-like process on inner side. Genital field occupied genital segment; with well-developed
 16 chitinous processes.

17 **Distribution.** *Canuellina insignis* was recorded from the Red Sea, Suez Canal and Inhaca Island.

18 Discussion

19 Gurney (1927) established the genus *Canuellina* to accommodate a single female found in Suze
 20 Canal. Later, both male and female were reported and described from Mozambique (Wells,
 21 1967). Wells (1967) recognized inner seta on the first and second segment of P2 endopod, not
 22 described and figured by Gurney (1927). He concluded that the seta might be overlooked by
 23 Gurney (1927). Moreover, Por (1984) summarized *Canuellina* synapomorphies as follows: 1)
 24 antenna with 7-8 segmented exopod, 2) P1-P4 exp-3 with 7, 6, 4, 4 and enp-3 with 6, 5, 4, 3
 25 seta/spine respectively, 3) P4 endopod segments very short, 4) female genital field reduced. In
 26 addition, he suggested to remove *Canuellina* from the rest of the family and place in a new
 27 family. However, only a comprehensive molecular analysis can clarify the genus position in the
 28 Canuelloida. This is the third report of *canuellina insignis* in the world and the first record for the
 29 Persian Gulf and Gulf of Oman.

٨٠ **Acknowledgments**

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٨٣ **References**

٨٤ Boxshall, G. A. & Halsey, S. H., 2004. An introduction to copepod diversity. The Ray Society,
٨٥ London, 966 pp.

٨٦ Gurney, R., 1927b. Zoological Results of the Cambridge Expedition to the Suez Canal, 1924.
٨٧ XXXIII. Report on the Crustacea: Copepoda (littoral and semi-parasitic). *Transactions of the*
٨٨ *Zoological Society of London*. (22): 451–577.

٨٩ Nazari, F., Mirshamsi, O., Sari, A., Aliabadian, M. & Martinez Arbizu, P., 2018. Three new
٩٠ Canuellidae (Copepoda: Canuelloida) from Iran. *Zootaxa*. 4446 (4): 401–441.

٩١ Por, F. D., 1967. Level bottom Harpacticoida (Crustacea, Copepoda) from Elat (Red Sea), part I.
٩٢ *Israel Journal of Zoology*. (16): 101–165.

٩٣ Por, F. D., 1969. The Canuellidae (Copepoda, Harpacticoida) in the waters around Sinai
٩٤ Peninsula and the problem of Lessepsian migration of the family. *Israel Journal of Zoology*.
٩٥ (18): 169–178.

٩٦ Por, F. D., 1983. A note on two new species of Canuellidae (Copepoda, Harpacticoida) from the
٩٧ Red Sea. *Crustaceana*. 44 (2): 187–197.

٩٨ Por, F. D., 1984. Canuellidae Lang (Harpacticoida, Polyarthra) and the Ancestry of the
٩٩ Copepoda. In Studies on Copepoda II. In: Proceedings of the First International Conference on
١٠٠ Copepoda, Amsterdam, the Netherlands, 24–28 August 1981. *Crustaceana*, 7 (Supplement) 1–
١٠١ 24.

١٠٢ Song, S. J., Kangtia, P., Khim, J. S. & Chullasorn, S., 2018. Two new Asian species of the genus
١٠٣ *Scottolana* Huys, 2009 (Copepoda: Canuelloida: Canuellidae). *Journal of Natural History*. (52):
١٠٤ 377–403.

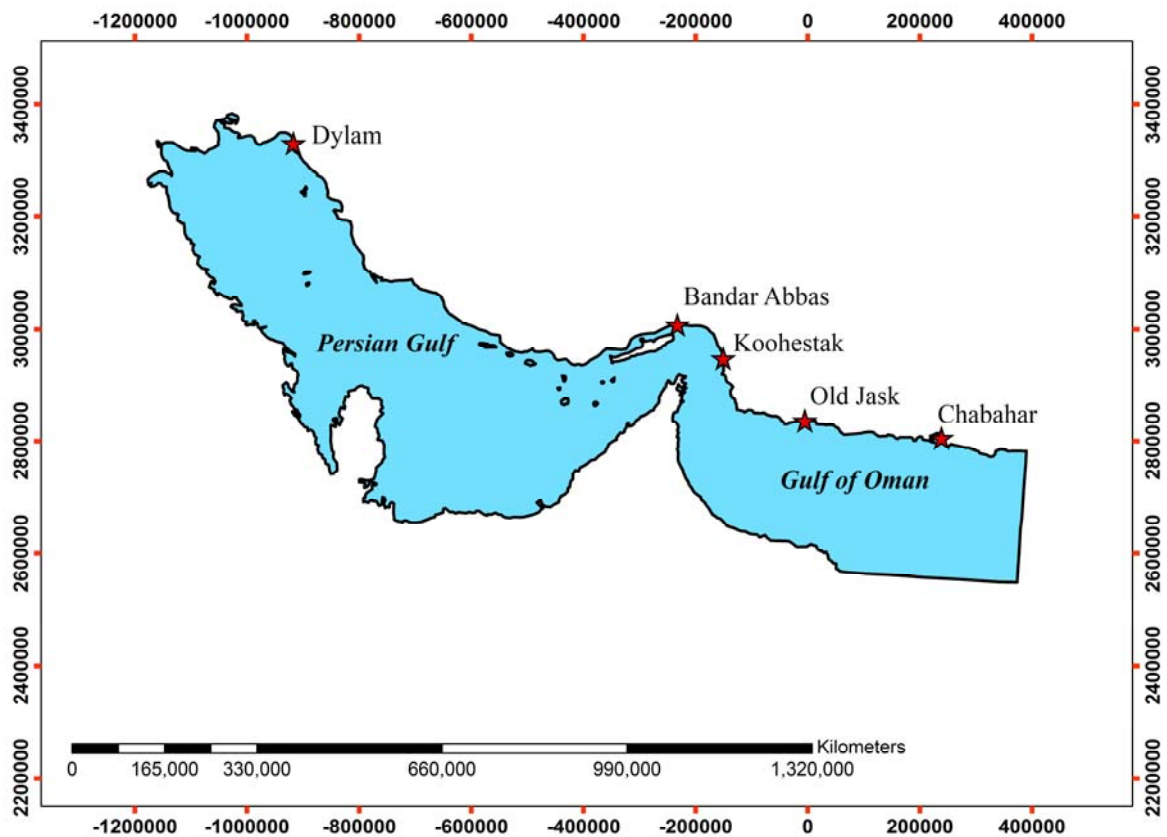
- 100 Wells, J. B. J. & Rao, G.C., 1987. Littoral Harpacticoida (Crustacea: Copepoda) from Andaman
 106 and Nicobar Islands. *Memoirs of the Zoological Survey of India*. 16 (4) pp 1–385.
- 107 Wells, J. B. J., 1967. The Littoral Copepoda (Crustacea) of Inhaca Island, Mozambique.
 108 *Transaction of the Royal Society of Edinburgh*. (7), pp 189-358.
- 109 Wells, J. B. J., 2007. An annotated checklist and keys to the species of Copepoda Harpacticoida
 110 (Crustacea). *Zootaxa*. (1568), pp 1-872.

111 Figure 1. Map of sampling sites of the species records in the Persian Gulf and Gulf of Oman.

112 Figure 2. *Canuellina insignis*: Habitus, Dorsal (CLSM); (A) female; (B) male.

113 Figure 3. *Canuellina insignis*: Habitus, Lateral (CLSM); (A) female; (B) male.

114 Figure 4. *Canuellina insignis*: Habitus, Ventral (CLSM); (A) female; (B) male.



115
 116 Figure 1.



117

118 Figure 2.



119

120. Figure 3.



121

122 Figure 4.