A first report of Canuellina insignis Gurnney, 1927 (Canuellidae: Copepoda) from The Persian Gulf and Gulf of Oman

Nazari, F.1, 2, Mirshamsi, O.1, 3, Sari, A.4 and Aliabadian, M.1, 3

1Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran
2Department of Biology, Faculty of Science, University of Jiroft, Jiroft, 7867161167, Iran
3Department of Zoological Innovations (RDZI), Institute of Applied Zoology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran
4School of Biology and Centre of Excellence in Phylogeny of Living Organisms, College of Science, University of Tehran, Tehran, Iran

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

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

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

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

*Corresponding Author: fatemeh.nazari62@ujiroft.ac.ir

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

Material and habitat. 1 ♀ 3 ♂ Dylam 30°2'52.51"N 50°8'43.97"E; 11 ♀ 4 ♂ Bandar Abbas 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 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 and seaweeds.

Taxonomy
Order CANUELLOIDA Khodami et al., 2017
Family CANUELLIDAE Lang, 1944
Genus Canuellina Gurney, 1927
Canuellina insignis Gurney, 1927

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

Description of female (figures 2A, 3A, 4A). Body linear, length measured from tip of rostrum to posterior margin of furcal rami 937 µm. First pedigerous somite fused to cephalosome. Rostrum rectangular and elongate, broad and defined at base with two sensilla at apex. Genital double-somite larger than other segments, with lateral sub-cuticular rib. Genital field with paired copulatory pores; gonopores paired; eggs arranged in a row in egg sacs. Furcal rami divergent and rectangular, nearly
four times as long as wide, with seven setae. Antennule 6-segmented. Antenna biramus; exopod 7-segmented; endopod with three segments. P1-P4 with three-segmented rami; P4 endopod with short segments. P5 incorporated into segment with four setae. Setal formula as follows:

<table>
<thead>
<tr>
<th></th>
<th>Exopod</th>
<th>Endopod</th>
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<tbody>
<tr>
<td>P1</td>
<td>0.0.2.2.3</td>
<td>1.1.2.2.2</td>
</tr>
<tr>
<td>P2</td>
<td>0.1.2.2.2</td>
<td>1.1.1.2.2</td>
</tr>
<tr>
<td>P3</td>
<td>0.1.0.2.2</td>
<td>1.1.0.2.2</td>
</tr>
<tr>
<td>P4</td>
<td>0.0.0.2.2</td>
<td>1.0.1.1.1</td>
</tr>
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**Description of male** (figures 2B, 3B, 4B). As in female but smaller and genital double-somite separate. Total body length 782 µm. Antennule chirocerate with 7 segments. P4 endopod 3 with finger-like process on inner side. Genital field occupied genital segment; with well-developed chitinous processes.

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

![Figure 2](image-url) **Figure 2.** *Canuellina insignis*: Habitus, Dorsal (CLSM); (A) female; (B) male.
**Figure 3.** *Canuellina insignis*: Habitus, Lateral (CLSM); (A) female; (B) male.

**Figure 4.** *Canuellina insignis*: Habitus, Ventral (CLSM); (A) female; (B) male.
DISCUSSION
Gurney (1927) established the genus Canuellina to accommodate a single female found in Suez Canal. Later, both male and female were reported and described from Mozambique (Wells, 1967). Wells (1967) recognized inner seta on the first and second segment of P2 endopod, not described and figured by Gurney (1927). He concluded that the seta might be overlooked by Gurney (1927). Moreover, Por (1984) summarized Canuellina synapomorphies as follows: 1) antenna with 7–8 segmented exopod, 2) P1–P4 exop-3 with 7, 6, 4, 4 and endop-3 with 6, 5, 4, 3 seta/spine respectively, 3) P4 endopod segments very short, 4) female genital field reduced. In addition, he suggested to remove Canuellina from the rest of the family and place in a new family. However, only a comprehensive molecular analysis can clarify the genus position in the Canuelloida. This is the third report of C. insignis in the world and the first record for the Persian Gulf and Gulf of Oman.

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LITERATURE CITED


