

UDC 595.34(262.5)

## TWO NEW SPECIES OF THE GENUS *CALANOPIA* (COPEPODA, CALANOIDA, PONTELLIDAE) FROM THE NORTHERN LEVANTINE BASIN (MEDITERRANEAN SEA)

Z. Uysal<sup>1</sup>, A. Shmeleva<sup>2</sup>

<sup>1</sup> Middle East Technical University, Institute of Marine Sciences.

P. O. Box 28, Erdemli, 33731 Turkey

E-mail: uysal@ims.metu.edu.tr

<sup>2</sup> Institute of Biology of the Southern Seas, National Academy of Sciences of Ukraine,

Nakhimov Avenue, 2, Sevastopol, 99011 Ukraine

Accepted 17 September 2003

**Two New Species of the Genus *Calanopia* (Copepoda, Calanoida, Pontellidae) from the Northern Levantine Basin (Mediterranean Sea).** Uysal Z., Shmeleva A. — Two new species, *Calanopia levantina* Uysal et Shmeleva, sp. n. and *Calanopia metu* Uysal et Shmeleva, sp. n. are described and figured. These species were found in the zooplankton collected by the Nansen net at 0–100 m depth along Turkish coastal waters in the northern Levantine Basin. *C. levantina* is closely related to *C. minor* A. Scott and *C. aurivillii* Cleve but differs from other species of this genus mainly by the structure and armature of the fifth leg, the structure of rostrum, etc. *C. metu* differs from other species of this genus by the robust form, body-wide-ovoid cephalosome with short thoracic spines and a short compressed urosome.

Key words: Copepoda, Calanoida, *Calanopia*, Levantine basin, Mediterranean Sea.

**Два новых вида рода *Calanopia* (Copepoda, Calanoida, Pontellidae) из северной части Левантийского бассейна (Средиземное море).** Уйсал З., Шмелева А. — Представлено иллюстрированное описание двух новых видов рода *Calanopia* — *Calanopia levantina* Uysal et Shmeleva, sp. n. и *Calanopia metu* Uysal et Shmeleva, sp. n., найденных в зоопланктонных пробах, взятых сетью Нансена в слое 0–100 м в прибрежных водах моря Леванта. *C. levantina* близка к *C. minor* A. Scott и *C. aurivillii* Cleve, но отличается от них строением и вооружением пятой пары плавательных ног, строением (структурой) рostrума и др. *C. metu* отличается от других видов этого рода грубой, ребристой широкояйцевидной формой тела с короткими торакальными шипами и короткой как бы спрессованной уросомой.

Ключевые слова: Copepoda, Calanoida, *Calanopia*, Левантийский бассейн, Средиземное море.

### Introduction

The genus *Calanopia* was described by J. D. Dana (1849), and 14 species were reported in my paper (Unal, Shmeleva, 2002). In 1966, L. Bayly and J. G. Greenwood recorded 10 species: *Calanopia elliptica* Dana, 1849; *C. americana* Dahl, 1894; *C. aurivillii* Cleve, 1901; *C. minor* Scott, 1902; *C. thompsoni* Scott, 1909; *C. herdmani* A. Scott, 1909; *C. media* Gurney, 1927; *C. sarsi* C. B. Wilson, 1950; *C. biloba* Bowman, 1957 and *C. australica* Bayly & Greenwood, 1966. In 1967, E. C. Jones and T. S. Park described *C. sewelli*; in 1969, two new species *C. parathompsoni* Gaudy and *C. seymouri* Pillai were described, and Mulyadi and H. Ueda (1996) described *C. asymmetrica*. Recently, a new species *C. kideysi* Unal & Shmeleva, 2002 was described from the Red Sea. Two additional species attributed to this genus are *C. brachiata* Dana, 1849, which has been synonymized as *Centropages brachiatus* Dana, 1852 and *C. herdmani mertoni* Fruchtl, 1924 from the Aru Ido, Indo, which was not properly described.

In addition to the above list, we describe two new species from the Mediterranean Sea, *Calanopia levantina* sp. n. and *Calanopia metu* sp. n. from Turkish coastal waters in the northern Levantine basin, off Erdemli. This brings the total number of species in *Calanopia* to seventeen. The genus, widely present in coastal waters, has been recorded mainly from the tropical regions of the Indian and Atlantic Oceans.

In general, the size of species of *Calanopia* ranges from an average of 1.0 mm (*Calanopia kideysi*) to 2.6 mm (*Calanopia thompsoni*). The body is oval or has an elongated shape. The cephalosome and first pedigerous somite are separate. The fourth and fifth pedigerous somites are fused. The female urosome is composed of two somites which are sometimes elongated. The rostrum is pointed, bifurcate ventrally. Five species, *C. parathompsoni*, *C. sewelli*, *C. australica*, *C. seymouri* and *C. thompsoni* have cephalic hooks along the lateral margins on each side of the cephalosome.

#### Materials and methods

In addition to physical and chemical parameters, plankton tows were collected from a station located about 10 km off the coast across the Turkish continental shelf, in the northern Levantine Basin, Mediterranean Sea. Sampling was conducted on a weekly basis over a period of one year starting from January 1998, on board R/V Erdemli, specifically designed for coastal studies. The coordinates of the station are 36°30'N, 34°22'E. Hauls were made from 100 m up to the surface using a Nansen closing net of 112 µm mesh size. The plankton collected in the net bucket was preserved with borax buffered formaldehyde to retain a final concentration of 10% formalin for further analysis in the lab. Qualitative and quantitative analyses of all zooplankton samples were performed in Institute of Marine Sciences' laboratories in Erdemli. Holotypes and paratypes of both species were gathered in the same station and are deposited in the collection of the Zoological Institute of the National Academy of Sciences, Ukraine (NASU). All allotypes are deposited in the Institute of Marine Sciences of Middle East Technical University in Erdemli, Turkey.

#### *Calanopia levantina* Uysal et Shmeleva, sp. n. (fig. 1)

**Material examined.** Holotype, adult female, body length 1.27 mm; (NASU No. 8/4 (3) # 3). Allotype, adult male, body length 1.12 mm; (NASU No. 8/4 (3) # 4). Paratypes, 5 females, (1.15–1.27 mm) and 5 males (1.10–1.15 mm).

**Female** (fig. 1, 1–15). Maximum length — 1.27 mm. Prosome is the widest at middle somite. Cephalosome is lacking cephalic hooks. Fourth and fifth pedigerous somites fused, posterolateral corners pointed and symmetrical, reaching about midway the genital complex. Rostrum swollen basally, bifurcate, pointed distally. Urosome symmetrical, 2-segmented, urosomites and caudal rami with proportions 37 : 48 : 15 = 100. Genital somite swollen laterally, 1.3 times shorter than anal somite. Anal somite is 3.3 times as long as wide. Caudal rami symmetrical and 3.5 times as long as wide. Antennule 17-segmented is extending posteriorly way to the genital segment. Antenna, mouthparts and swimming legs identical in arrangement of setae to those illustrated by W. Giesbrecht (1892) for *Calanopia elliptica*.

The fifth legs (fig. 1, 14) symmetrical, 3-segmented; second segment 1.5 times as long as wide with small seta. Third segment with one short lateral spine midway on lateral margin, apex terminating in long smooth spine.

**Male** (fig. 1, 16–21). Average length has 1.12 mm; prosome resembling female; prosome — urosome length ratio 2.1 : 1. Urosome 5-segmented with symmetrical caudal rami, length ratio of somites 18 : 17 : 19 : 16 : 14 : 16 = 100. First three urosomal somites approximately equal in length, fourth and fifth — slightly smaller. Ur<sub>2</sub> (uro-somite 2) 1.6 times as long as wide. Caudal rami 2.8 times as long as wide. Fifth pair of legs (fig. 1, 21) asymmetrical, left and right rami 3- and 4-segmented, respectively.

Left leg second segment longest, 4 times as long as wide, slightly swollen proximally, with large posterior seta. Left leg third segment shorter than second, swollen proximally and produced laterally into digitiform process with medial seta. Right leg second segment proximomedial margin swollen, seta on posterior surface of segment and distomedial seta produced into small tooth-like spine. Third segment 5 times as long as wide with proximomedial and distolateral spine. Fourth segment slender, medially directed, distally pointed with two apical spines.

**Remarks.** *Calanopia levantina* sp. n. most closely resembles *Calanopia aurivillii* from the IndoPacific in size, shape of prosome with acute processes, and in lateral corners of the fifth pedigerous somite. It differs in the structure of the fifth legs of both sexes, the longer apical spine on the distal segment of the female, and structural differences in the left leg of the male. E. G. Silas and P. P. Pillai (1976) recognized three species-groups in *Calanopia*. The first species-group includes *C. aurivillii*, *C. americana* and *C. minor*, and

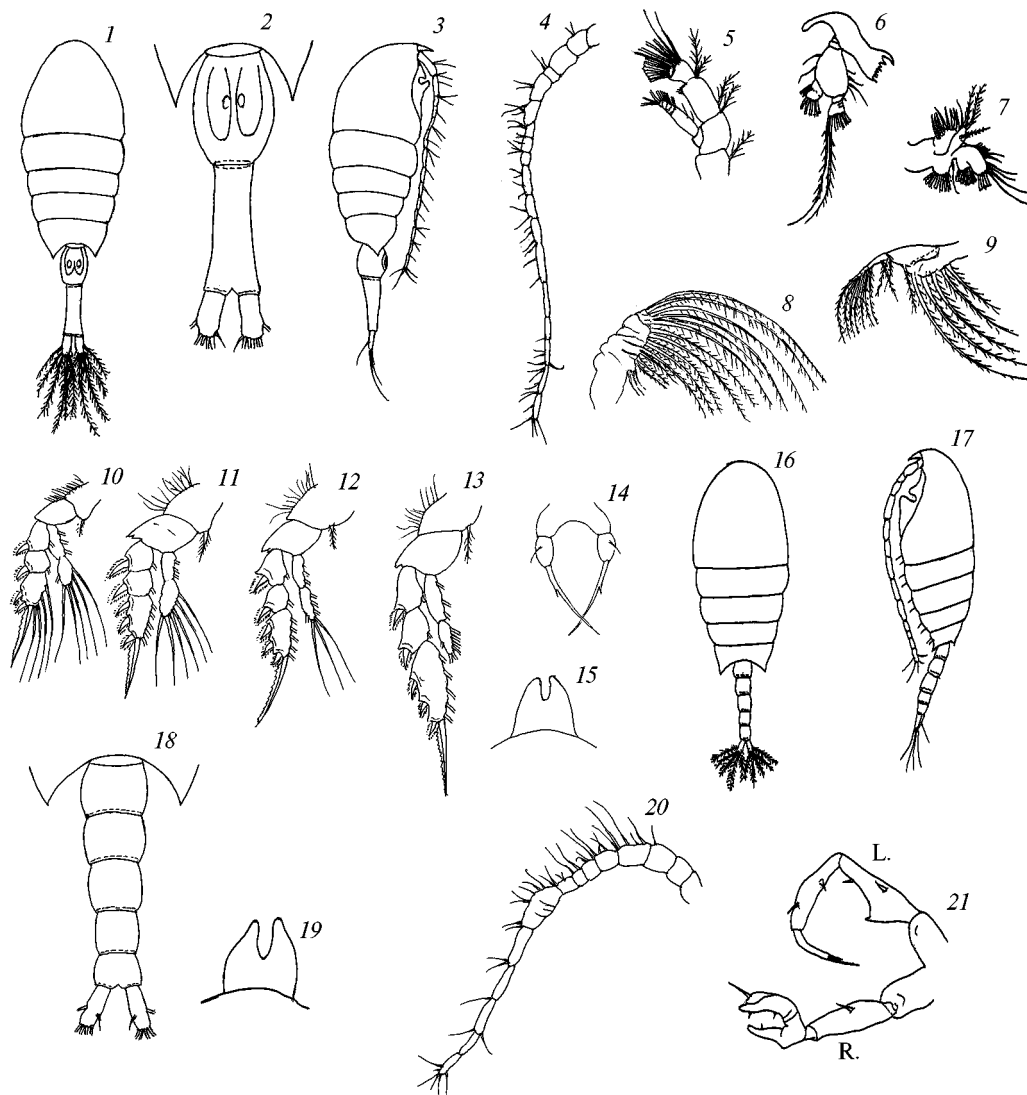


Fig. 1. *Calanopia levantina* (female 1–15, male 16–21): 1 – dorsal view of whole specimen; 2 – fifth pedigerous somite and urosome in dorsal view; 3 – lateral view of whole specimen; 4 – antenna; 5 – antennule; 6 – mandible; 7 – maxillule; 8 – maxilla; 9 – maxilliped; 10 – first swimming leg; 11 – second swimming leg; 12 – third swimming leg; 13 – fourth swimming leg; 14 – fifth legs; 15 – rostrum; 16 – dorsal view of whole specimen; 17 – lateral view of whole specimen; 18 – urosome, dorsal view; 19 – rostrum; 20 – right antennule; 21 – fifth leg.

Рис. 1. *Calanopia levantina* (самка 1–15, самец 16–21): 1 – общий вид, дорсально; 2 – V торакальный сегмент и уросома, дорсально; 3 – общий вид, латерально; 4 – антеннула; 5 – антенна; 6 – мандибула; 7 – максиллула; 8 – максилла; 9 – максиллипеда; 10 – первая плавательная нога; 11 – вторая плавательная нога; 12 – третья плавательная нога; 13 – четвертая плавательная нога; 14 – пятая плавательная нога; 15 – рострум; 16 – общий вид, дорсально; 17 – общий вид, латерально; 18 – уросома, дорсально; 19 – рострум; 20 – антеннула правая; 21 – пятая нога.

was named the "*aurivillii*"-group, which corresponds to L. A. E. Bayly and J. G. Greenwood (1966) first group. *C. levantina* sp. n. is the fourth species of this group. The species name *levantina* refers to since it was found for the first time in the northern Levantine basin (eastern Mediterranean).

#### *Calanopia metu* Uysal et Shmeleva, sp. n. (fig. 2)

Material examined. Holotype, adult female, body length 1.6 mm; (NASU No. 8/4 (3) #). Allotype, male, copepodid V, body length 1.4 mm; (NASU No. 8/4 (3) # 2). Paratypes, adult females, 5 specimens; body length 1.37–1.5 mm.

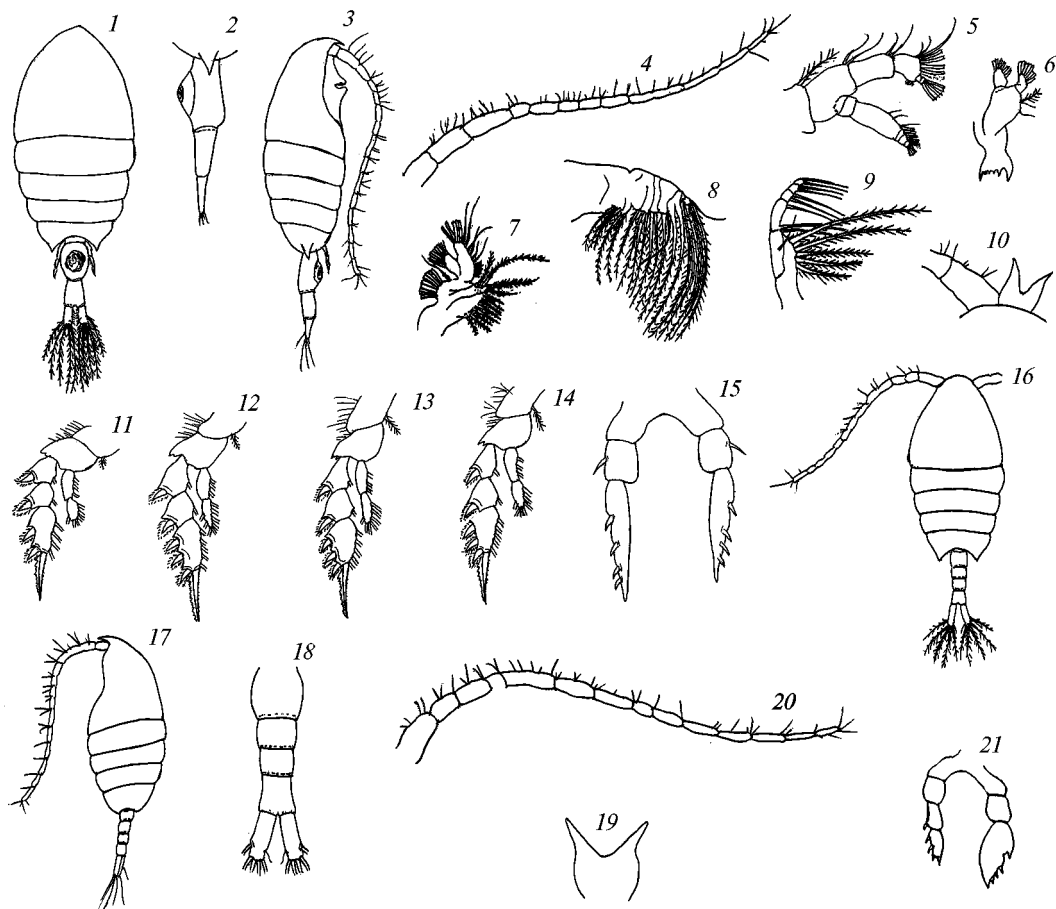


Fig. 2. *Calanopia metu* (female 1–15, male 16–21): 1 — dorsal view of whole specimen; 2 — fifth pedigerous somite and urosome in ventral view; 3 — lateral view of whole specimen; 4 — antennule; 5 — antenna; 6 — mandible; 7 — maxillule; 8 — maxilla; 9 — maxilliped; 10 — rostrum; 11 — first swimming leg; 12 — second swimming leg; 13 — third swimming leg; 14 — fourth swimming leg; 15 — fifth leg; 16 — dorsal view of whole specimen; 17 — lateral view of whole specimen; 18 — urosome, dorsal view; 19 — rostrum; 20 — antennule; 21 — fifth leg.

Рис. 2. *Calanopia metu* (самка 1–15, самец 16–21): 1 — общий вид, дорсально; 2 — V торкальный сегмент и уросома, латерально; 3 — общий вид, латерально; 4 — антеннула; 5 — антенна; 6 — мандибула; 7 — максиллула; 8 — максилла; 9 — максиллипеда; 10 — рострум; 11 — первая плавательная нога; 12 — вторая плавательная нога; 13 — третья плавательная нога; 14 — четвертая плавательная нога; 15 — пятая плавательная нога; 16 — общий вид, дорсально; 17 — общий вид, латерально; 18 — уросома, дорсально; 19 — рострум; 20 — антеннула; 21 — пятая нога.

Female (fig. 2, 1–15). Body darkly coloured and robust with maximum length of 1.6 mm. Cephalosome lacking cephalic hooks. Rostrum deeply forked. Prosome, in dorsal view, slightly less than twice as long as wide. The fifth segment with symmetrical acuminate spines, inclined a little outward. Urosome 2-segmented, symmetrical and unarmed, with urosomites caudal rami showing ratio of 50 : 29 : 21 = 100. 2<sup>nd</sup> urosomite 1.3 times as long as wide. Genital somite lacking ventral spine, distinctly evolved laterally, slightly protuberant ventrally and genital operculum rosette-shaped.

Caudal rami twice as long as wide and symmetrical. Antennule 17-segmented; extending about half way of urosome. Antenna, mandible and maxilliped (fig. 3, 5–9) with setae armature conforming to pattern described for other *Calanopia* species. Mandibular blade with sharp teeth.

Female fifth legs slightly asymmetrical and unlike any other species of *Calanopia*, 3-segmented with last segment having four short spines resembling well-developed finger-like projections.

Male (Copepodid Stage V) (fig. 2, 16–21). Maximum length 1.4 mm, cephalosome similar to female. Metasome 2.2 times longer than urosome. Thoracopod IV and V fused, latter produced posteriorly into symmetrical points. Urosome 4-segmented with symmetrical caudal rami showing ratio 19 : 16 : 19 : 19 : 27 = 100. Caudal rami longer than preceding somite. Rostrum similar to the female.

Antennule extending to first urosomite. Urosomite 1 1.6 times longer than urosomite 2. Ventral spine of urosomite 2 absent. Urosomite 2 1.3 times as long as wide; length of caudal rami 1.3 times shorter than urosomite 3 + urosomite 4.

Male copepodid V fifth legs (fig. 2, 21) asymmetrical with length of the third segment of right leg twice longer than the second segment and with smaller spines. Length of third segment of left leg 3 times as long as wide, with 4 small spines on ventro-lateral margin.

Remarks. The new species *Calanopia metu* is slightly similar to *C. elliptica* in size and shape of cephalosome, but differs by the structure of the lateral corners and shape of fifth pedigerous somite. The specific name *metu* is the abbreviation for the Middle East Technical University in Ankara, Turkey.

We are most grateful to V. N. Andronov (Institute of Oceanology, Kaliningrad) for critically reviewing this manuscript and help in providing relevant references. We wish to thank Lisa Weiss for improving the English.

Bayly L. A. E., Greenwood J. G. A new species of *Calanopia* (Copepoda: Calanoida) from Moreton Bay, Queensland // Proc. Royal Soc. Queensland. — 1966. — 77, p. 11. — P. 99–105.

Giesbrecht W. Systematik und Faunistik der pelagischen Copepoden des Golfes von Neapel und der angrenzenden Meerest Abschnitt // Fauna und Flora Golfes Neapel. — 1892. — 19. — 831 S.

Jones E. C., Park T. S. A new species of *Calanopia* (Copepoda, Calanoida) from neritic waters of French Oceania, Central Pacific // Crustaceana. — 1967. — 12, p. 3. — P. 243–248.

Mulyadi, Ueda H. A new species of *Calanopia* (Copepoda, Calanoida) from Sunda Strait, Indonesia, with remarks on species-groups in the genus // Crustaceana. — 1996. — 69, p.7. — P. 907–915.

Silas E. G., Pillai P. P. The calanoid copepod family Pontellidae from the Indian Ocean // J. Marine Biol. Associat. India. — 1976. — 15, p. 2. — P. 771–858.

Unal E., Shmeleva A. A. A new species of *Calanopia* (Copepoda, Calanoida) from the central Red Sea // Crustaceana. — 2002. — 75, p. 1. — P. 1–11.