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THE CASPIAN ENDEMIC GENUS *CRYPTOCYCLOPINA* (CRUSTACEA, COPEPODA) IN THE BLACK SEA

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Каспийский эндемичный род *Cryptocyclopina* (Crustacea, Copepoda) в Черном море. Мончен-ко В. И. — Вид *Cryptocyclopina inopinata* Monchenko, 1979, описанный ранее из Каспийского моря (окрестности Каякента и Новокаякента) как эндемик, впервые обнаружен (тоже в интерстициальном биотопе) в Черном море (окрестности Сухуми, Грузия). Представлено краткое иллюстрированное переописание. Показаны некоторые отличительные признаки описанных самок от каспийских особей. Обсуждаются проблемы происхождения и связи каспийских и черноморских популяций. В зоогеографических терминах ныне этот вид и род должен рассматриваться как понто-каспийский эндемик.

Ключевые слова: Copepoda, Cyclopinidae, *Cryptocyclopina inopinata*, Каспийское море, Черное море, фауна.

The Caspian Endemic Genus *Cryptocyclopina* (Crustacea, Copepoda) in the Black Sea. Monchen-ko V. I. — *Cryptocyclopina inopinata* Monchenko, 1979 described from the Caspian Sea (vicinity of Kayakent and Novokayakent) is recorded (also from an interstitial biotope) for the first time from the Black Sea (Georgia, vicinity of Sukhumi) and briefly redescribed. Certain differences of these females from the Caspian ones are shown. The problems of origin and relationships of the Caspian and Black Sea populations *C. inopinata* are discussed. This species is considered now as Ponto-Caspian endemic in the terms of zoogeography.

Key words: Copepoda, Cyclopinidae, *Cryptocyclopina inopinata*, Caspian Sea, Black Sea, fauna.

Cryptocyclopina inopinata Monchenko was described as endemic of the Caspian Sea based on materials collected by the author (Мончeнко, 1979) in two sites at the western coast of the Caspian Sea: in the vicinities of Kayakent and Novokayakent (Dagestan). Quite extensive material allows us to show the complete picture of its variability. Recently, this species was unexpectedly found by the author in the vicinity of Sukhumi (Georgia). Material is represented only by 6 mature females, but some morphological peculiarities are quite interesting to compare the populations from two different sea basins.

Cryptocyclopina inopinata Monchenko, 1979

Мончeнко, 1979: 1470—1477

Redescription. Female. Total length 358—380 mkm (in the Caspian specimens 356—430). Translucent animal with quite thickset cyclopiform outlines. Syncephalon with projecting frontal part and deflexed non-separated rostrum. Eye pigment poorly expressed. First pedigerous somite rather separated from syncephalon (fig. 1, *1*). Surface of somits non-ornamented, posterior edges smooth, only on abdomen with very thin notches. Genital double somite with cross suture, adjoining wide proximal third from narrower distal part; on the middle of dorsal surface with short cross-section (trace of former somite division). Anal plate semicircular, short, but rather wide (fig. 1, *2*).

Caudal rami pulled together, almost parallel, 1.98—2.14 (in Caspian specimens 2.1—2.25) times as long as wide and 1.45 times as long as anal somite. Dorsal seta well developed, attached above base of middle apical setae and almost as long as rami.

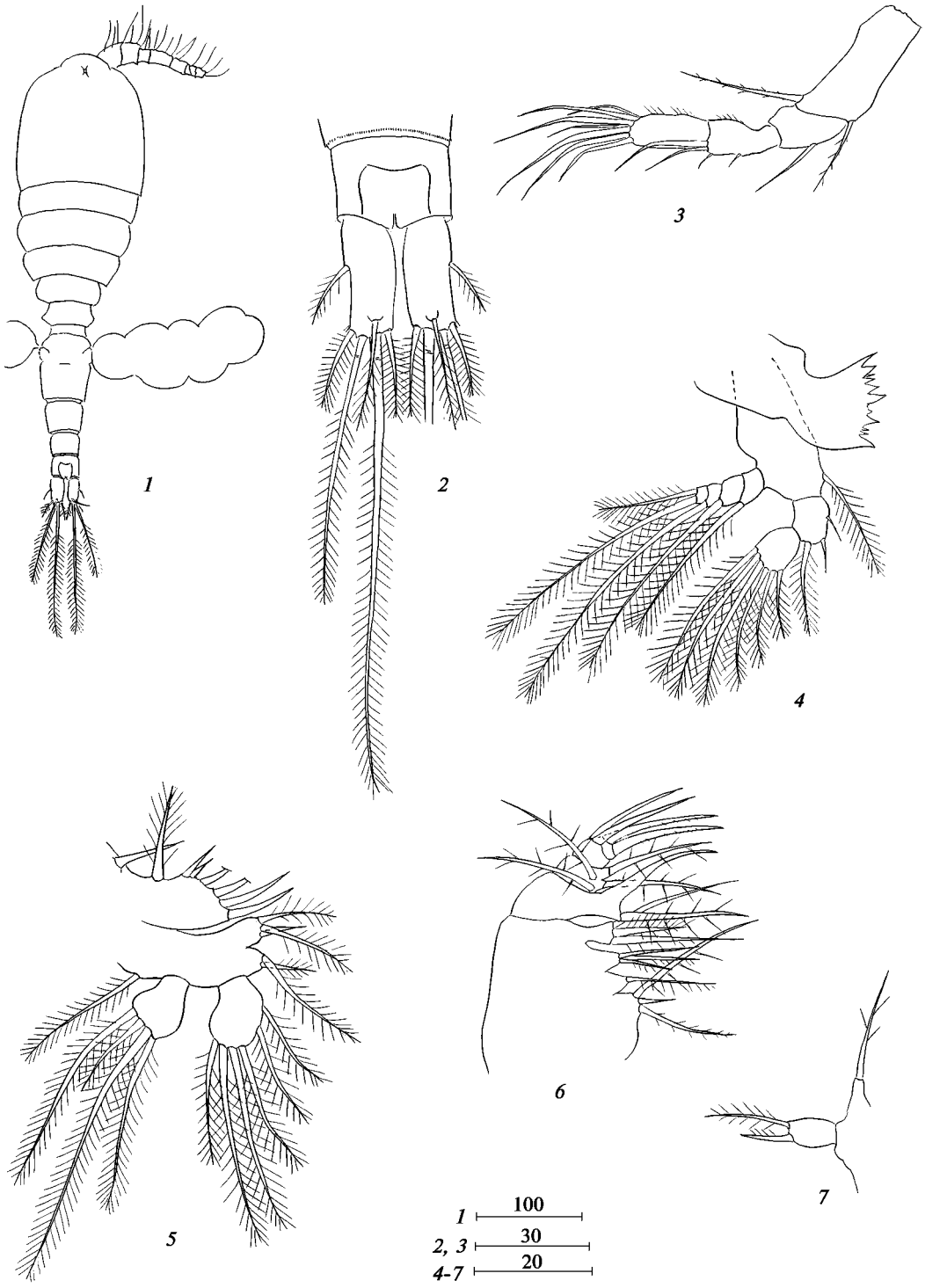

Fig. 1. *Cryptocyclopina inopinata*, ♀: *1* – habitus, dorsal; *2* – caudal rami, dorsal view; *3* – antenna 2; *4* – mandible with palp; *5* – maxilla 1 with palp; *6* – maxilla 2; *7* – P5. Scale bar in mkm.

Рис. 1. *Cryptocyclopina inopinata*, ♀; *1* – общий вид; *2* – каудальные ветви, дорсально; *3* – антенна 2; *4* – мандибула со щупиком; *5* – максилла 1 со щупиком; *6* – максилла 2; *7* – P5. Масштабная линейка в мкм.

Long lateral seta proximally of middle of outer edge of rami. Outermost and innermost setae of almost equal length, and 0.79—0.83 (in Caspian females 0.72—0.80) times as long as rami. Outer middle seta 2.33—2.59 (average 2.15 in compared group) as long as rami. Inner middle seta is 3.75—4.22 (average 3.50 in Caspian females) as long as rami. All setae are rigid plumose (fig. 1, *2*).

Antenna 1 moderately thickened, 8-segmented, with numerous well-downy setae. Antenna 2 4-segmented with outer seta on proximal segment (vestige of exopodite) and short apical armature (fig. 1, *3*). Mandible with wide masticator blade; coxobasopodite with one seta, 2-segmented endopodite and 4-segmented exopodite (fig. 1, *4*). Maxilla 1 with extended appendages on gnathobasis, and 1-segmented exo- and endopodite armed, correspondingly, with 4 and 6 setae; each of endites with 2 and 3 setae as shown on the figure 1, *5*. Maxilla 2 5-segmented, with 4 endites on proximal segment, big claw of basipodite, and 3-segmented endopodite bearing 8 appendages as figured (fig. 1, *6*). Maxillipede 6-segmented, characteristically curved in distal part, with 11 appendages.

Coxo- and basopodites of swimming legs poorly ornamented. Inner setae of coxopodites and outer of basipodites shortened from P1 to P4. Inner spine of basipodite P1 rather short. All rami of P1—P4 3-segmented. Each first segment of all exopodites with short inner seta and short outer spine; analogous appendages on second segments much longer. Third (distal) segments armed with lanceolate spines (formula 4—4—3—3) and setae (4—4—4—4). First and second segments of endopodites P1—P4 each with single seta; third (distal) with 5 (P1 and P4) or 6 setae (P2 and P3). Distal segment of endopodite P4 slightly oval, 1.23—1.32 (average 1.2 in Caspian specimens) times as long as wide, both apical setae (almost equal in length) 1.13—1.30 (average 1.4 in Caspian specimens) times as long as endopodite. P5 consisting of seta, sitting on ledge of V thoracal segment, and single free oval outlined segment, armed with thin apical seta 1.65 times as long as segment, and with shorter subapical spines 0.5 times as long as apical seta (fig. 1, *7*).

Spermatophores bean-shaped, attached on middle line of genital double somite, on border of first and second third of its length. Egg bags attached to abdomen almost at direct or only a few smaller angle. Number of eggs in each bag 5—6.

The data on salinity in the interstitial biotope near Sukhumi fit well previous data (Мончeнко, 1979): in all the three sites this species was found at the salinity: 10.0‰, 11.5‰ (Caspian Sea) and 7.9‰ (Sukhumi). This species is therefore classified as pleiomeiohaline.

Remarks. Judging from available material, the Black Sea animals do no differ essentially from the Caspian ones. The qualitative characters are absent at all. There is no statistically significant differences among measured plastic characters. However, the length/width ratio of caudal rami is notably lower (2.0) than in Caspian specimens (ca. 2.2). There are some additional differences connected with this peculiarity in the ratio of the length of setae of caudal rami to the length of caudal rami itself. In the Black Sea specimens, these indices are higher than in the Caspian ones. On the contrary, the length/width ratio of distal segment of endopodite P4 is notably higher in the Black Sea specimens (1.23—1.32) than in the Caspian ones (average 1.2). In this connection, the ratio of two apical setae length to endopodite P4 length is less in the Black Sea specimens (1.13—1.30) than in the Caspian ones (1.4). In my opinion, these differences have not enough significance to describe a new subspecies.

Weak morphological differences between the Black Sea and Caspian Sea populations show that the period of their separation (in evolutional notion) is quite short. That event might take place in the times of one of the latest connections between these basins, the Old Euxine Lake Sea and the Khazar Lake Sea, remote from our time by ca. 250 thousand years (Мордухай-Болтовской, 1960).

The genus *Cryptocyclopina* represents the specifically marine family Cyclopinidae, which was not known from the Caspian Sea before our studies, and whose representatives rarely live in brackish waters. In this case, *Cryptocyclopina* undoubtedly is of the

marine origin (Мончeнко, 1979). Of the two basins, where the genus *Cryptocyclopina* now is known from, the Black Sea probably was not its native basin, where this genus evolved, because of the often changes of connection and isolation from the western Mediterranean and sharp salinity fluctuations.

Deep morphological peculiarities of this genus show its long formation. Immigration of ancestors of *C. inopinata* into the Caspian basin is believed to take place up to the to Akchagyl period in the history of Caspian Sea, on the boundary of the Middle and Upper Pliocene. At this time the endemic Caspian fauna started to be formed from its non-numerous initial forms, immigrated from the western Mediterranean either through the predecessors of the Black Sea basin or through lakes of the Near Asia as Ya. I. Starobogatov assumed (Старобогатов, 1970) for malacofauna of the Akchagyl Lake Sea. The geological time gone from those periods is believed to be quite enough for the initial forms to evolve, and to form new, endemic species and genera. Any changes of salinity and ionic composition of water in the Caspian basin are believed to have rather unfavorable influence on these sea immigrants. In the terms of zoogeography, now this species must be regarded as Ponto-Caspian endemic and the relict of the Akchagyl Lake Sea.

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