

***Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda: Aloninae): the first record for Russia**

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ABSTRACT: This brief communication is dedicated to the first record of *Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda) in Russian Federation. This taxon was previously found in predominantly tropical and subtropical regions of eastern hemisphere. Now this species is recorded in the Republic of Kalmykia and Dagestan (Ciscaucasia, Russian Federation). The morphology of parthenogenetic females is studied and the species status of Ciscaucasian populations is confirmed based on the structure of the head pores and postabdomen. Our finding demonstrates the importance of temporary water studies for a full inventory of the cladoceran species composition in Ciscaucasia.

How to cite this article: Garibian P.G., Aksenova M.D. 2023. *Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda: Aloninae): the first record for Russia // Invert.Zool. Vol.20. No.4. P.411–416. doi: 10.15298/invertzool.20.4.06

KEY WORDS: *Ovalona*, Cladocera, Crustacea, first record, faunistic, Russia, North Caucasus.

***Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda: Aloninae): первая находка для России**

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РЕЗЮМЕ: Данное краткое сообщение посвящено первой находке *Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda) на территории Российской Федерации. Ранее этот вид был известен преимущественно из тропических и субтропических регионов восточного полушария. Сейчас этот вид отмечен в Республике Калмыкия и Дагестане (Предкавказье, Российская Федерация). Нами исследована морфология партеногенетических самок и подтверждён видовой статус популяций из Предкавказья по строению головных пор и постабдомена. Наша находка показывает важность исследований временных водоемов для полной инвентаризации видового состава ветвистоусых ракообразных Предкавказья.

Как цитировать эту статью: Garibian P.G., Aksenova M.D. 2023. *Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda: Aloninae): the first record for Russia // Invert.Zool. Vol.20. No.4. P.411–416. doi: 10.15298/invertzool.20.4.06

КЛЮЧЕВЫЕ СЛОВА: *Ovalona*, Cladocera, Crustacea, первая находка, фаунистика, Россия, Северный Кавказ.

Introduction

Cladocera (Crustacea: Branchiopoda) is a group of microcrustaceans undergoing a rapid progress in taxonomic and faunistic studies. It is a dominant group in planktonic, benthic and littoral communities (Dumont, 1994; Forró *et al.*, 2008; Kotov, 2013; Korovchinsky *et al.*, 2021). Europe is the best studied region, where investigations of Cladocera have a long history (Korovchinsky, 1996; Dumont, Negrea, 2002; Kotov 2015). To date, the cladoceran fauna of Europe can be considered well studied (Bledzki, Rybak, 2016). The Cladoceran faunas of the Far East of Russia (Kotov *et al.*, 2011a, b; Garibian *et al.*, 2020a, b) and Eastern Siberia, especially Central Yakutia, are relatively well studied (Klimovsky *et al.*, 2015a, b; Bekker *et al.*, 2018). The most complete information on species composition of the cladocerans in Northern Eurasia is presented in the keys of Rogers *et al.* (2019) and Korovchinsky *et al.* (2021), however, new faunistic and systematic studies are required for many regions.

During recent years, several new records of the cladocerans were made in different regions of Russia (Garibian, 2017; Garibian *et al.*, 2021, 2022). It is potentially possible to discover novel species, as in many regions, comprehensive faunistic and systematic studies have not yet been carried out recently. Examples of such regions are Caucasus and Ciscaucasia. Few comprehensive investigations were performed there since Benning (1941), only some small subregions were studied according to recent standards of the cladoceran faunistic studies (Aksenova *et al.*, 2020). Moreover, to date, previous data on the cladocerans of this region are strongly outdated due to a rapid development of the cladoceran taxonomy.

This brief communication is dedicated to the first record of *Ovalona cambouei* (Guerne et Richard, 1893) (Cladocera: Anomopoda) in the Russian Federation.

Material and methods

Samples were collected using plankton nets with mesh size of about 30–100 µm and fixed by 96%

ethanol and then sorted under an Olympus SZ51 stereomicroscope. Selected specimens were placed on slides in a drop of glycerin. Detailed examination and drawing were carried out using an Olympus CX41 microscope with a camera lucida attached.

Abbreviation in illustration and text: PP — the postpore distance; IP — the interpore distance; ODL — the outer distal lobe of thoracic limb I; IDL — the inner distal lobe of the thoracic limb I; e1–3m — the endites of the thoracic limb I; epp — the epipodite of the thoracic limb I; ejh — the ejector hooks on the thoracic limb I; ext — the exopodite of the thoracic limb III.

Results

Class Branchiopoda Latreille, 1817
 Order Anomopoda Sars, 1865
 Family Chydoridae Dybowski et Grochowski, 1894 *emend.* Frey, 1967
 Subfamily Aloninae Dybowski et Grochowski, 1894 *emend.* Frey, 1967
 Genus *Ovalona* Van Damme et Dumont, 2008

Ovalona cambouei Guerne et Richard, 1893
 Figs 1–2.

Material examined here: six parthenogenetic females from a roadside ditch near village Idjil, Republic of Kalmykia (47.4114°N, 45.54131°E), collected on 2.05.2019 by P.G. Garibian, sample AAK M–5424; two parthenogenetic females from a roadside ditch near village Gubechayl, Republic of Dagestan (43.40293°N, 47.36602°E), collected on 17.10.2020 by A.A. Neplyukhina, sample AAK M–6441.

All samples are kept in the research collection of Prof. A.A. Kotov, laboratory of aquatic ecology and invasions, A.N. Severtsov Institute of Ecology and Evolution, Moscow, Russia.

PARTHENOGENETIC FEMALE. Body (Fig. 1A, B) ovoid in lateral view, compressed laterally, without a medial keel or lateral outgrowth. Maximum height in the middle of the body, height/length ratio in our material 0.64–0.66. Dorsal margin convex, posterior margin slightly convex, postero-dorsal angle present and slightly rounded, postero-ventral angle rounded. Ventral margin from slightly convex to almost straight and bearing c.a. 35 setae. Ventral margin of valves bearing numerous setae of different size (Fig. 2A, B), shortest one in the middle of valves, anterior portion of valves with relatively

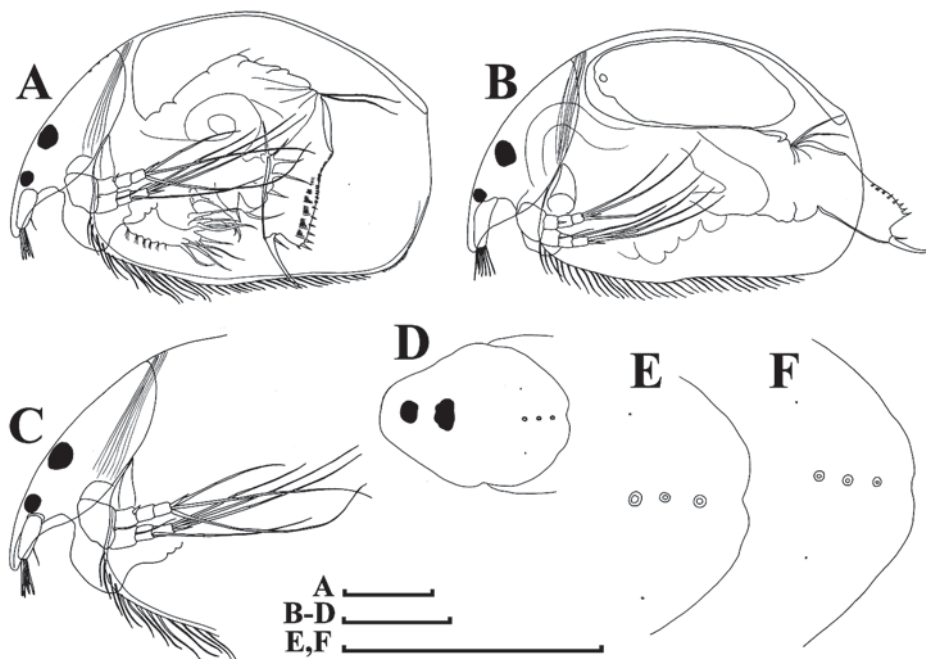


Fig. 1. *Ovalona cambouei* (Guerne et Richard, 1893), adult parthenogenetic female from a roadside ditch near village Idjil, Republic of Kalmykia, European Russia: A, B — lateral view, C — head, D — headshield in dorsal view, E, F — head pores. Scale bar 0.1 mm.

Рис. 1. *Ovalona cambouei* (Guerne et Richard, 1893), взрослая партеногенетическая самка из канавы в районе пос. Иджил, Республики Калмыкия, европейская часть РФ: А, В — вид сбоку, С — голова, D — головной щит вид сверху, E, F — головные поры. Масштаб 0,1 мм.

long setae, ventral portion of valves bearing relatively short setae. Postero-ventral angle of valves with a row of numerous small setulae of similar size, not forming any groups (Fig. 2C). Head (Fig. 1C) small, eye and ocellus well developed. Rostrum short, in dorsal view rounded (Fig. 2D). Headshield (Fig. 1D–F) bearing a three dorsal head pores without connections between them, middle pore smaller than two others, PP distance shorter than IP, small lateral head pore located at about IP distance from the middle, PP/IP ratio 0.57–0.76. Posterior margin of head shield with only a pair of lateral notches in contrast to populations from Uzbekistan (Sinev, 2001, 2015). Labrum (Fig. 1C) bearing a relatively large labral keel with a rounded tip. Antenna I (Figs 1C; 2D) shortened, not reaching the tip of rostrum, with nine aesthetascs and one sensory seta. Antenna II relatively short, with a robust basipodite, coxopodite bearing two short setae subequal in size. Antennal formula: setae 0-0-3/1-1-3, spines 1-0-1/0-0-1. Postabdomen (Fig. 2I, J) subrectangular, relatively short and broad. Distal part with strongly projected angle, ventral portion almost straight. Preanal and postanal margins almost straight, anal mar-

gin concave, preanal angle well developed, postanal angle absent. Postanal portion with well-developed denticles, distalmost denticle not longer than others. Several clusters of simple marginal setules medially to marginal denticles, in each cluster setules decreasing in length proximally. Anal portion with a several rows of small setules. Limb I (Fig. 2F, G) ODL with a one long seta, ratio IDL seta 3/ODL = 0.31. IDL of limb I bearing three setae of different size, seta 1 shortest and not setulated, seta 2 subequal in size with a seta 3, both seta setulated in distal part, ratio of IDL seta 2 and seta 3/IDL seta 1 = 0.33 and 0.31. Endite 1 of limb I with a two setulated setae, endite 2 with a three setulated setae of different size, endite 3 with a three relatively short setae sub equal in size and one anterior seta. Exopodite of limb III (Fig. 2H) bearing five distal setae of different size and two lateral setulated setae (1 and 2). Seta 3 of limb III exopodite longest one and seta 5 shortest, seta 7 with a fine setulation.

Size in our material: length 0.37–0.45 mm, height 0.24–0.30 mm.

EPHIPPIAL FEMALE, MALE. Not found in our material.

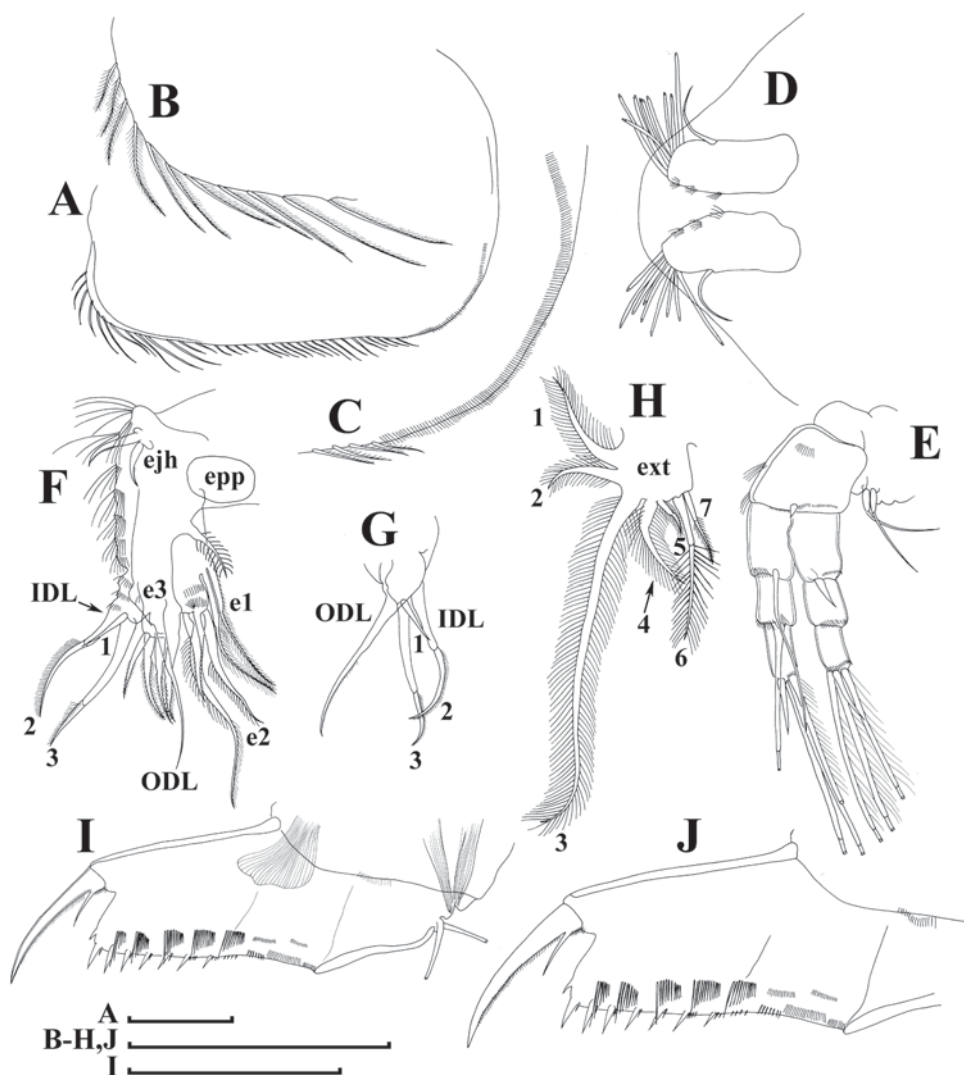


Fig. 2. *Ovalona cambouei* (Guerne et Richard, 1893) adult parthenogenetic female from a roadside ditch near village Idjil, Republic of Kalmykia, European Russia: A–C — armatures of valves, D — antenna I, E — antenna II, F, G — limb I, H — exopodite of limb III, I, J — postabdomen, Scale bar 0.1 mm.

Рис. 2. *Ovalona cambouei* (Guerne et Richard, 1893), взрослая партеногенетическая самка из канавы в районе пос. Иджил, Республики Калмыкия, европейская часть РФ: А–С — вооружение створок, D — антенна I, E — антенна II, F, G — торакопод I, H — экзоподит торакопода III, I, J — постабдомен. Масштаб 0,1 мм.

Discussion

Taxonomic and faunistic studies on Cladocera has been constantly developing during recent decade, but still there are groups with a confusing taxonomy, for which new faunistic

studies are also required. Among these groups, the most renowned example is the artificial polyphyletic genus *Alona* s. lato, which during last two decades was subdivided into many genera (Sinev, Dumont, 2016; Sinev, 2015; Van Damme *et al.*, 2009; Van Damme, Dumont, 2008; Sinev, 2020). Only six species were kept

in the genus *Alona* (Sinev, 2002; Korovchinsky *et al.*, 2021). An example of such a recently created genus is *Ovalona* Van Damme et Dumont, 2008 which differs in several characters from other alonines (Sinev, 2015). The genus *Ovalona* is represented in Northern Eurasia by five species including *O. cambouei* (Guerne et Richard, 1893), three species are Mediterranean endemics, the only *O. karelica* (Stenroos, 1897) is known from Russia to date (Korovchinsky *et al.*, 2021). The species of the *cambouei*-group including *O. agascalientensis* (Sinev et Silva-Briano, 2012) known from Central Mexican Plateau, *O. glabra* (Sars, 1901) common in Neotropics, *O. karelica* (Stenroos, 1897) known from Germany, Slovakia, North-West Russia, Finland and Norway, *O. cambouei* (Guerne et Richard, 1893) and *O. pulchella* (King, 1983) from Australia and Tasmania, which are very close to each other in morphology and armatures of postabdomen (Sinev, 2015). Morphology of Ciscaucasian populations of *O. cambouei* fully agrees with that described in last taxonomic revisions (Sinev, 2001, 2015), except for two variable morphological features with a limited taxonomic value: posterior margin of the head shield has the only a pair of lateral notches and seta 7 of limb III exopodite is supplied with a minute setulation. The main differences between it and other species in Northern Eurasia are obvious: (1) it differs from *O. karelica* (Stenroos, 1897) by absence of a connection between main head pores and well developed basal spine of the postabdomen, (2) it differs from all Mediterranean endemics by a long postabdomen with almost parallel margins.

This thermophilic and eurybiotic species lives in the coastal zone of lakes, slow flowing rivers, temporary water bodies and rice paddies (Korovchinsky *et al.*, 2021). We can confirm that *O. cambouei* belongs to the “southern tropical” faunistic complex, according to Kotov (2016), see also Krolenko *et al.* (2023) and Chertoprud *et al.* (2023) for a further development of these ideas. Previously, the species was found in Africa, including Madagascar, the Iberian Peninsula, subtropical and tropical regions of Asia; vicinities of the city of Aksakan (Northwest Kazakhstan, 48°N) were regarded as its most northern distribution point (Sinev, 2015; Korovchinsky *et al.*, 2021). Most probably,

after our records, just Ciscaucasia must be regarded as its northernmost distribution region (up to 43°N). Therefore, we have demonstrated that Ciscaucasia is a region of penetration of the tropical fauna to European Russia similarly to the earlier studied Primorie in the Far East of Russia (Kotov, 2016; Chertoprud *et al.*, 2023; Krolenko *et al.*, 2023).

Note that our new record for Russian fauna originates from temporary waters. Our finding demonstrates the importance of temporary water studies for a full inventory of the species composition of the cladocerans in Ciscaucasia.

Compliance with ethical standards

CONFLICTS OF INTEREST: The authors declare that they have no conflicts of interest.

Acknowledgments. The authors are very grateful to the staff of the laboratory of Ecological functions of soil for their help in organization of expedition to Republic of Kalmykia and Dagestan Republic. Many thanks to A.A. Neplyukhina for a sample with *O. cambouei*. We are deeply grateful to G.A. Bazykin for linguistic corrections, A.Yu. Sinev, J.C. Paggi and F.D.R. Sousa for critical comments on earlier version of the manuscript. The study is supported by the by the Russian Science Foundation (grant 23-14-00128).

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Responsible editor A.A. Kotov