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# Interesting freshwater Ostracoda (Crustacea) from Macedonia

by

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**Abstract**: The finding of five interesting freshwater ostracod species in Macedonia (former Yugoslavia) is reported. The taxonomy, ecology and distribution of the species are discussed and illustrations of the valves and appendages are given. *Candonopsis scourfieldi* Brady, 1910 is new to Macedonia and the Balkans in general. The first finding of bisexual populations of *Psychrodromus peristericus* (Petkovski, 1959) and *Psychrodromus fontinalis* (Wolf, 1920) are reported. *Ilyodromus virudulus* (Brady, 1886), new to Macedonia, is recorded from rice-fields. *Potamocypris pallida* Alm, 1914 is recorded for the first time from Macedonia and Bulgaria.

## Introduction

Despite its relatively small surface, Macedonia (former Yugoslavia) harbours a rich and diverse freshwater fauna, amidst which the Ostracoda are most remarkable. The diversity is due to both the geographical situation in the central Balkans and the existence of ancient lakes, like Lake Ohrid, which are renowned for their endemic faunas. However, many other aquatic habitats of Macedonia appear faunistically highly interesting.

In the present paper we report on the finding of five remarkable species in the Perister and Dautica Mountains, the rice-fields of the valley of the river Babuna, and some other localities in Macedonia. The taxonomy of each species is discussed and data on the ecology and distribution are provided.

*Candonopsis scourfieldi* Brady, 1910 is reported from the Perister Mountains and several other localities in Macedonia. The species is new to Macedonia and the Balkans in general.

*Psychrodromus peristericus* (Petkovski, 1959) is only known from the Perister, where only parthenogenetic populations had so far been recorded. In the present paper we report on the finding of bisexual populations in two localities of the Perister. A description of the male is given. The taxonomic relations with *Ps. olivaceus* and *Ps. turcicus* are discussed.

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Parthenogenetic populations of *Psychrodromus fontinalis* (Wolf, 1920) are not uncommon in Macedonia. The males of this species were so far unknown. We report on the finding of one bisexual population in the Dautica Mountains.

*Ilyodromus viridulus* (Brady, 1886) is recorded from the rice-fields in the valley of the river Babuna. This species, which originates from Australia and eastern Asia, was introduced, a few decades ago, into Europe, where it was first reported from rice-fields in northern Italy. The species is new to the Balkans.

Finally, we report on the finding of *Potamocypris pallida* in the Perister and in Bulgaria.

Abbreviations used in text and figures: LV, left valve; RV, right valve; L, length of carapace; H, height of carapace; a.s.l., above sea level; SEM, scanning electron microscope.

Remark: When working on the taxonomic part of the present work, the 'Index and Bibliography of nonmarine Ostracoda' by Kempf (1980, 1991, and also subsequent working copies) was extensively used.

Classification (after Maddocks 1982 as rearranged for the Podocopida by Martens 1992):

Phylum or subphylum CRUSTACEA Pennant, 1777
Class OSTRACODA Latreille, 1806
Order PODOCOPIDA Sars, 1866
Infraorder CYPRIDOCOPINA Jones, 1901
Superfamily CYPRIDOIDEA Baird, 1845

## Family CANDONIDAE Kaufmann, 1900

### *Candonopsis scourfieldi* Brady, 1910

(Fig. 1)

1910 *Candonopsis scourfieldi* Brady, Proc. Zool. Soc. London, part 1: 209; pl. 26: 1-12.

1967 *Candonopsis parva* Sywula, Bull. Soc. Amis Sci. Lett. Poznan D, 88: 19-21; figs 2-3.

1969 *Candonopsis stammeri* Nüchterlein, Intern. Rev. hes. Hydrobiol 54 (1): 248-250; figs 23-29.

1988 *Candonopsis scourfieldi* - Henderson & Bamber, J. Nat. Hist 22 (2): 465-250; figs 1-4 (redescription).

This species is known in England since 1910. However, the original description appears insufficient, which explains why the species was later described twice as new. Sywula (1967) recorded it as *C. parva* from Bulgaria. Two years later, Nüchterlein (1969) described it as *C. stammeri* from southwestern Germany. More recently, Henderson & Bamber (1988) redescribed *C. scourfieldi* after both topotype

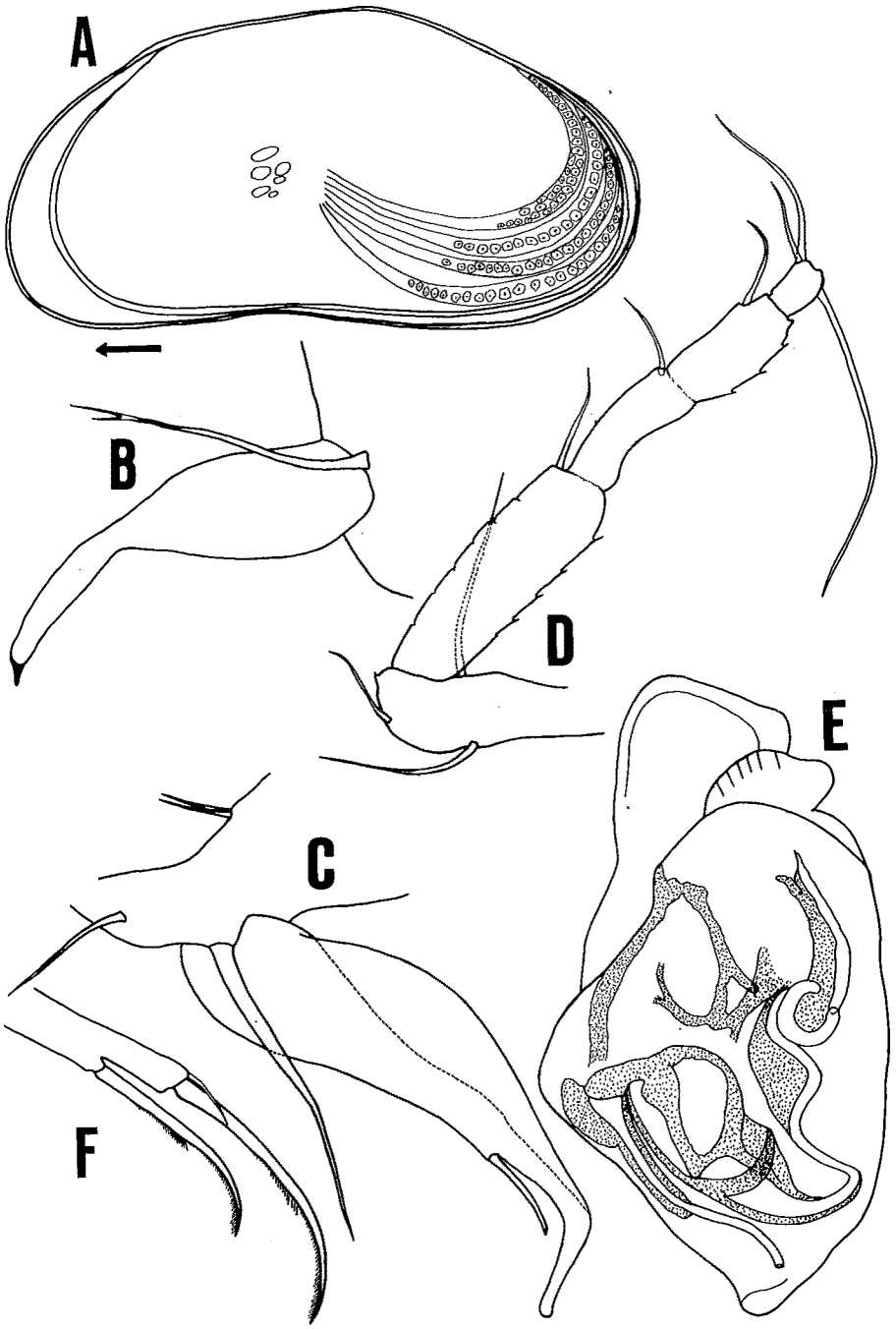



Fig. 1: *Candonopsis scourfieldi*, male. - A: RV, inner view. B and C: Left and right clasping organs. D: Cleaning leg. E: Hemipenis. F: Distal end of the furca.

and syntype specimens from England. It is now clear that this species is widely distributed throughout Europe, the Balkan peninsula included.

*C. scourfieldi* is much rarer than the closely related *C. kingsleii* (Brady & Robertson, 1870). *C. scourfieldi* differs from the latter in (a) the smaller size (0.66-0.68 mm, versus 0.85-1.06 mm; females); (b) the inner margin of both valves; (c) the structure of the male clasping organs; and (d) the distal processes of the hemipenis. According to Henderson & Bamber (1990) the two species should also differ in the length of the ventrodistal seta of the first endopodial segment of the antenna: In *C. scourfieldi* this seta should be relatively longer than in *C. kingsleii*. This statement, however, is erroneous. The authors apparently used Sars' (1925) figures of *C. kingsleii* for comparison, without checking dissected specimens of that species. When comparing *C. scourfieldi* from the Perister with *C. kingsleii* collected in a peaty swamp at the northeastern edge of Lake Ohrid and a pond in Alsatia (France), we could find out that in both species the above seta extends about to mid-length of the antennal claws. Thus this seta is of no diagnostic use.

In the Perister Mountains, *C. scourfieldi* has been captured in a temporary spring close to the stream Schemnitza, where it coexists with *Psychrodromus peristericus*. At mid-October of 1991 the spring had dried up, and the inhabitants of the spring survived in cushions of wet moss growing on the gravel. At that time, only a few males were collected. We would like to conclude that the species reproduces in the summer, and that the females disappear before the males. A similar development is found in other Crustacea, e.g. the copepods *Hemidiaptomus gurneyi* and *Branchinecta orientalis*.

Size of the males from Maloviste. LV: L = 0.80 mm; H = 0.38 mm. RV: L = 0.78 mm; H = 0.38 mm. Size of the males sampled in April in a temporary helocrenic spring in the Ovce-lowlands. LV: L = 0.72 mm, H = 0.36 mm. RV: L = 0.71 mm; H = 0.35 mm. The males of *C. kingsleii* collected in the swamp near Ohrid are 1.02 long, with H = 0.54 mm. The illustrations of fig. 1 are drawn after specimens from Maloviste.

*C. scourfieldi* was also found in bottom samples taken in Lake Dojran. However, the valves of those sanimals are decalcified and fragile, and hence of little taxonomic use. We rather expect the species to be found later in other localities in Macedonia and the neighbouring countries of the Balkans.

## Family CYPRIDIDAE Baird, 1845

### *Psychrodromus peristericus* (Petkovski, 1959)

(Figs 2 and 3)

1959 *Ilyodromus peristericus* Petkovski, Hidrobiologi Hydrobiol. Res. Inst. Fac. Sci. Univ. Istanbul B4 (4): 158-160; figs 1-3.

1977 *Psychrodromus peristericus* - Danielopol & McKenzie, Zool. Scripta, 6 (4): 319.

This species was described by Petkovski (1959) from habitats situated at high altitude in the Perister in Macedonia. Danielopol & McKenzie (1977)

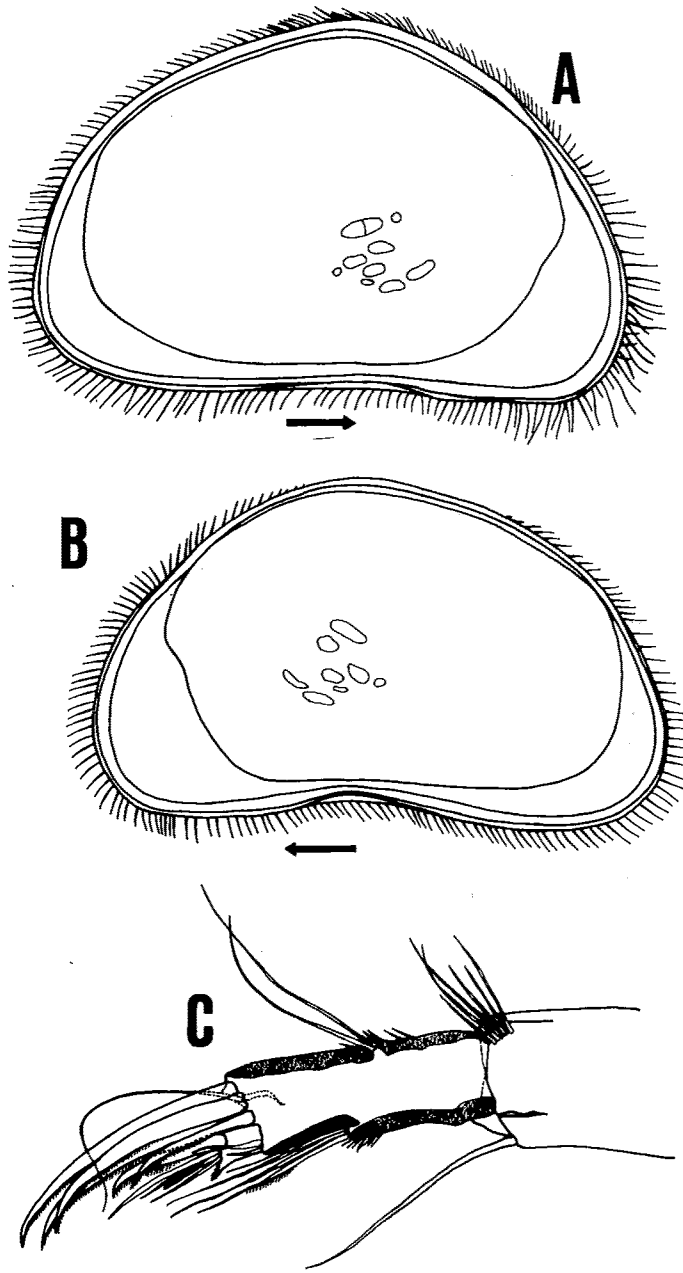



Fig. 2: *Psychrodromus peristericus*, male. - A: LV, inner view. B: RV, inner view. C: Distal end of the antenna.

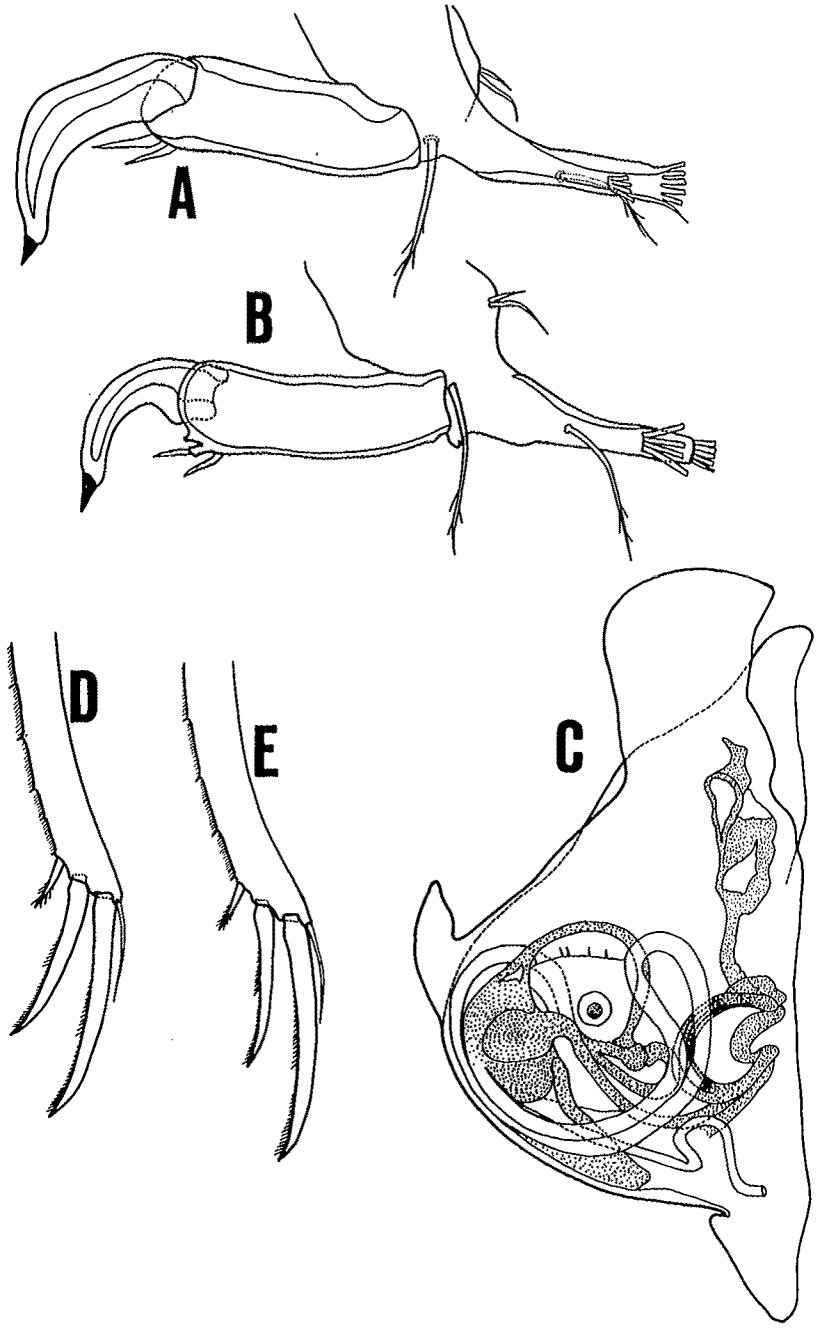



Fig. 3: *Psychrodromus peristericus*, male. - A and B: Left and right clasping organs. C: Hemipenis. D and E: Distal ends of the left and right furcal rami.

transferred the species from *Ilyodromus* into *Psychrodromus*. All known populations of the species reproduce parthenogenetically. Now, we are able to report on the finding of bisexual populations in two sites of the Perister.

Both habitats are shallow pools located in the neighbourhood of temporary limnocrenic springs. The first locality, Bugar Cesma, is a catched spring in the environs of Palisnopje, situated at an altitude of ca 1500 m. The second spring flows freely at ca 1000 m a.s.l. in a meadow located in the valley of the stream Schemnitza below the locality of Maloviste. Both sites, above all the second one, are located close to the lower limit of the distribution area of the species in the Perister.

In mid-October of 1991, a large bisexual population was found at Bugar Cesma. The species coexists there with rare specimens of *Candona* cf. *peterseni* Caraion, *Candona* cf. *strumicae* Petkovski and *Pseudocandona sarsi* Hartwig. At the same time of the year, only a small number of males and females of *Ps. peristericus* were found in the spring near Maloviste, together with rare specimens of *Candona* cf. *peterseni* and *Candonopsis scourfieldi*.

The average size of the specimens of the two bisexual populations is inferior to that of the parthenogenetic populations which inhabit both the permanent springs and the waters flowing from those springs up to an altitude of 2300 m in the Perister.

Size:

LV of females: L = 1.35-1.54 mm; H = 0.80-0.90 mm; H/L = 0.59-0.60.
RV of females: L = 1.34-1.48 mm; H = 0.80-0.83 mm; H/L = 0.56-0.57.

The males are slightly smaller than the females.

LV of males: L = 1.41-1.47 mm; H = 0.83-0.85 mm; H/L = 0.56-0.60.
RV of males: L = 1.38-1.43 mm; H = 0.77-0.80 mm; H/L = 0.54-0.58.

**Description of the male**

Left valve in lateral view (fig. 2A): Greatest H situated at the angle located just in front of mid-length; anterior dorsal margin convex, relatively steeply and evenly (not angularly) sloping towards the anterior, broadly rounded end; posterior dorsal margin almost straight, joining the posterior end in a broad arch. Ventral margin weakly but broadly concave behind the mouth area; the latter protrudes very slightly. Inner margin distinctly displaced from both the anterior and posterior margins, but running close to the ventral valve margin. Anterior fused zone well developed, posterior fused zone narrow.

Right valve in lateral view (fig. 2B): Dorsal margin only weakly angular at the point of greatest H; dorsal margin anteriorly slightly concave in the eye region; dorsal margin posteriorly almost straight, evenly joining the narrowly rounded posterior margin. Inner margin conspicuously displaced inwards at the anterior end, less at the posterior end; ventrally, at the point where the marginal concavity is most developed, the inner margin comes very close to the valve margin.

Valves, above all in the anterior zone, covered with relatively long and stiff setae; the setae differ in length and rise from tiny warts. Valves surface additionally with numerous setae-lacking pores; the latter pores vary markedly in size, either equalling that of the warts or appearing much smaller.

Colour: dark bright green.

Appendages almost identical with those of *Psychrodromus olivaceus* as described by Danielopol & McKenzie (1977). Length ratios of the 5 distal segments of the antennule (A1; the measurements were taken at the ventral margin): 30:18:16:17:20. Length ratios of the terminal claw on the distal segment, the terminal aesthetasc, and the combined 4 distal A1-segments: 60:36:50. Length ratios of the endopodial segments of the antenna (A2; fig. 2C) similar to those of the female: 90:70:18. Length ratios of the longest terminal claw of the penultimate segment and the two claws on the distal segment: 64:48:20. All claws are serrate. The serration is most developed on the the main claw (GM), which thus appears comb-like, of the distal segment. Natatory setae short, the two longest extending to mid-length of the next segment.

Penultimate segment of the mandibular palp with a very characteristic brush-shaped seta (this seta was not correctly illustrated for *Ps. olivaceus* by Danielopol & McKenzie (1977; see fig. 6).

Maxillula: Terminal segment of the maxillular palp trapezoid (distally enlarged), with 6 distal points; 3rd masticatory process with two serrate teeth bristles ('Zahnborsten').

Maxilliped with 6 branchial filaments. Left and right clasping organs asymmetrical (figs 3A,B). Trunk of both organs cylindrical, distally with two spine-shaped sensory setae. Both fingers curved, each of them with a terminal sensory spine. The right finger is smaller and more strongly curved than the left one. Both fingers are very similar to those of *Ps. olivaceus* (see Petkovski 1959, 1966 and Järvekülg 1959).

Walking leg: Protopodite with two short 'd'-setae. Terminal claw longer than the 3 combined distal segments (length ratio 115:90; the ratio in the female is 125:100). Distal half of the terminal claw distinctly serrate.

Cleaning leg without any peculiar characters.

Hemipenis (fig. 3C) similar in structure to that of *Ps. olivaceus*, with two well developed distal processes, the inner one of which tapers distally; the longest process appears terminally enlarged. Additionally, there is a very short inner process.

Furcal rami (figs 3D,E) slightly more asymmetrical than in the female. Right ramus shorter than the left ramus, distally evenly curved; anterior margin exceeding 8x in length the width taken at the base of the posterior spine. Length ratios of the ramus (anterior margin), the anterior terminal seta, the anterior and posterior terminal claws: 136:28:65:50; the anterior claw is scarcely half as long as the ramus. Left ramus slightly more slender, ca 9x as long as broad, curved in the middle. Length ratios of the ramus (anterior margin) and the terminal seta and claws: 140:25:64:48:15. Posterior margin of both rami, as in the female, with 4 rows of setulae. In the female, the right furcal ramus is ca 9x longer than broad, the length ratios mentioned above are 140:36:75:56:16; the left ramus too is ca 9x as long as broad, and its length ratios are 145:34:75:56:16.

**Taxonomic discussion**

As already stated above, the distribution of *Ps. peristericus* is restricted to the high altitude areas of the Perister. *Ps. peristericus* differs from the remaining species of

the genus in the larger carapace, the outline of the dorsal margin, which is more distinctly arched, and the structure and colour of the carapace. *Ps. peristericus* appears dark bright green, not blueish or faintly green.

*Ps. peristericus* must be compared with *Ps. olivaceus* and *Ps. turcicus*.

Parthenogenetic populations of *Ps. olivaceus* are distributed throughout Europe. Bisexual populations have so far only been reported from mountainous regions in Macedonia (1300 and 2200 m a.s.l.; Petkovski 1959, 1966), the Caucase (1650 m a.s.l.; Järvekülg 1959) and Anatolia in Turkey (Gülen 1985; no indications on the altitude).

In Macedonia, *Ps. olivaceus* is represented by both parthenogenetic and bisexual populations. The latter populations only occur in the high areas, above 1300 m a.s.l.

The females of the Macedonian bisexual populations of *Ps. olivaceus* are 1.36-1.40 mm long, with H up to 0.80 mm (H/L= ca 60/100, as in *Ps. peristericus*). The largest males of *Ps. olivaceus* from Macedonian mountains are up to 1.42 mm long.

At medium altitude (up to about 1300 m) in the Perister and other mountains, *Ps. olivaceus* is represented by parthenogenetic populations only. These females are 1.20-1.40 mm long and their carapace is of medium height. In fact, these females appear very similar to those found in Central Europe. The valves hairs of both the bisexual and parthenogenetic populations are almost identical; it is noteworthy that the hairs show as dense but less stiff than in *Ps. peristericus*. The setae-bearing warts are distinctly larger than the more abundant pores of variable size located amongst them.

In the lower areas of Macedonia, above all in the small temporary springs and the waters connected with them, another parthenogenetic form of *Ps. olivaceus* is found, the carapace of which is still smaller and also less high. For instance, the animals of a population from the environs of Strumitza are 1.16 mm long, with H=0.50 mm (H/L = 51/100). The setae of the valves are very sparse and the scattered setae-bearing warts are conspicuously larger than the punctuate pores.

The animals of the relict bisexual populations of *Ps. olivaceus* reported from the Caucase are 1.34 mm long and 0.66 mm high. The animals of *Ps. turcicus* are of similar length: 1.30-1.40 mm, with H=0,62-0.68 mm. It can be seen that those two species are smaller and less high than *Ps. peristericus* and hence cannot be confused with the latter.

*Ilyodromus turcicus* was described by Hartmann (1964) from the mountains of the province of Gaziantep in southern Turkey. The species, which is represented by bisexual populations, was transferred into the genus *Psychrodromus* by Danielopol & McKenzie (1977). *Ps. turcicus*, which is distributed throughout Asia Minor, differs from *Ps. olivaceus* and *Ps. peristericus* above all in the structure of the male appendages. In *Ps. turcicus*, the penultimate segment of the male A2 is conspicuously stout; the sensory spines and also the fingers of the clasping organs are larger; the distal processes of the hemipenis appear markedly different; both furcal rami are more slender, more strongly curved, and the posterior spinules are very peculiar. It should be noticed, however, that the maxilliped of *Ps. turcicus*, like that of the remaining species of the genus, bears 6 branchial filaments (not two, as stated in the original description).

## *Psychrodromus fontinalis* (Wolf, 1920)

(Fig. 4)

1920 *Ilyodromus olivaceus* var. *fontinalis* Wolf, Arch. Naturgesch. 85 A (3): 37-38.

1937 *Ilyodromus fontinalis* nov. comb. - Holmes, Arch. Hydrobiol. 31 (3): 485; 489-492.

1977 *Psychrodromus fontinalis* nov. comb. - Danielopol & McKenzie, Zool. Scripta 6 (4): 319; figs 8: D-E; 10: E (taxonomy).

1993 *Psychrodromus fontinalis* - Baltanás, Danielopol, Roca & Marmonier, Zool. Anz. 231 (1/2): 39-57; figs 2D, 9C (the A2s are interchanged) (taxonomy, ecology and distribution).

At the present state of knowledge, the distribution of *Ps. fontinalis* is restricted to the regions north of the Alps (Germany Switzerland, Austria, Slovakia, Poland) and the Balkans, where it is known from Croatia (Baltanás & al. 1993) and Macedonia (Holmes 1937; Petkovski 1959, 1964). Baltanás & al. (1993) recently showed that the populations from Italy, the Pyrenees and Spain, which formerly had been assigned to *Ps. fontinalis*, actually belong to a closely allied but separate species, i.e. *Ps. betharrami* Baltanás & al., 1993. Both species colonize the epigean and hypogean habitats of cold mountain springs and brooks.

It should be noticed that all known populations of *Ps. fontinalis* reproduce parthenogenetically. (The males described by Fox (1965a) from northern Italy actually belong to *Ps. betharrami*; see above).

Parthenogenetic populations of *Ps. fontinalis* appear to be quite common in Macedonia (and probably also in the remaining countries of the Balkans), where they mainly occur in cold springs and brooks at higher altitudes. We are now able to report on the finding of one bisexual population in a small helocrenic mountain spring located at Bel Kamen, at ca 1600 m a.s.l., amidst sheep-run situated above the village of Cresnjevo within the beech-belt of the Dautica Mountains.

On June 13, 1985, a large number of adult males and females, which had just reached sexual maturity, were collected. Females and males are 1.20 mm long. Holmes' (1937) females from small springs situated above Lake Ohrid on the western slope of the Galicica Mountains have a size of 1.08-1.1 mm, similar to that of Wolf's (1920) type specimens from Switzerland. Petkovski's (1962a) female specimens from the Perister Mountains are 1.19 mm long.

The hairiness of the carapace is similar to that of the small lowland form of *Ps. olivaceus* (see above). The scattered setae-bearing warts are much larger than the setae-lacking punctiform pores. On both the anterior and posterior ends the setae are denser and longer than in the central area of the valves. Colour: yellowish to milky white.

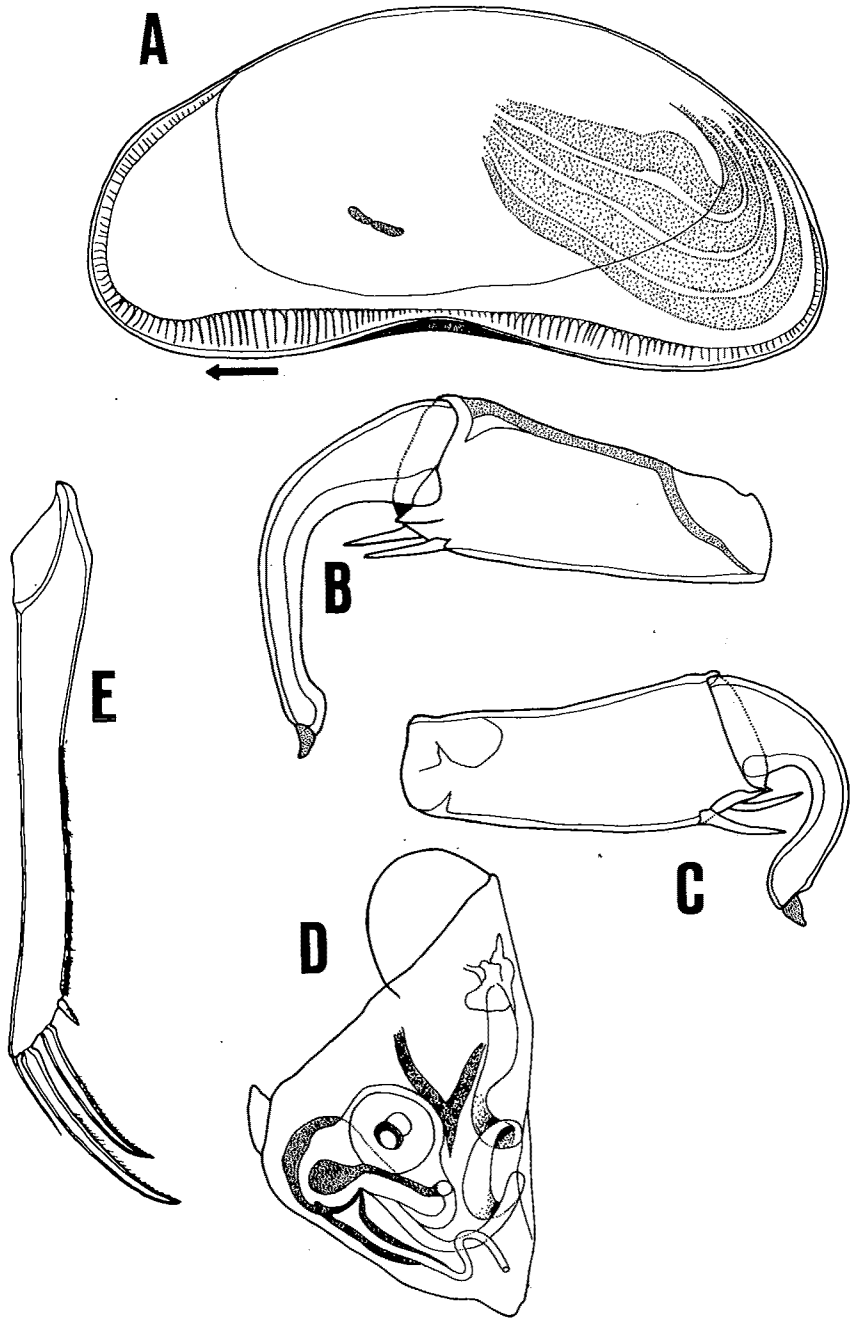



Fig. 4: *Psychrodromus fontinalis*, male. - A: RV, inner view. B and C: Left and right clasping organs. D: Hemipenis. E: Furca.

## *Ilyodromus viridulus* (Brady, 1886)

(Fig. 5)

1886 *Cypris viridula* Brady, Proc. Zool. Soc. London: 88; t.8: 1-2.

1889 *Herpetocypris viridula* nov. comb. - Sars, Christiana Vidensk. Selskabs Forhandl. 8: 41; t. 2: 3-4; t. 5: 8-11 (redescription).

1896 *Ilyodromus viridulus* nov. comb. - Sars, Arch. Naturv. Kristian. 18: 58.

1912 *Ilyodromus viridulus* - Müller, Das Tierreich, Königl, Preuß. Akad. Wiss. Berlin, Crustacea: 202 (key to the species of the genus).

1977 *Ilyodromus viridulus* - Danielopol & McKenzie, Zool. Scripta 6: 305; figs 3: G-J; 10: A-B, E; 11: B (taxonomy).

This species was originally described from Australia. Eggs of the species were most probably introduced with rice seed into Europe, where the species was first discovered in rice-fields in Italy (Moroni 1961; Fox 1965b; Ghetti 1973; Ghetti & McKenzie 1977). Now, we report on the finding of *I. viridulus* in rice-fields in the valley of the Babuna, a right tributary of the river Wardar, in the environs of the village Martolci, where a number of living females have repeatedly been collected in June of 1989-1991.

LV (fig. 5A) ca 1.20 mm long, with H=0.57 mm. RV (fig. 5B) 1.14 mm, H=0,54 mm. Moroni's (1962) specimens from northern Italy are 1.18-1.22 mm long. Fox' (1965b) animals are smaller (1.0 mm). According to Ghetti & McKenzie (1981) the size is 1.60-1.65 mm. The latter indication appears dubious, the more so as Sars (1989), when redescribing the species from Australia, reports on a carapace size of 1.20 mm, which is exactly the size of our specimens from Macedonia. The colour of the living animals appears conspicuously dark green.

Left valve: The calcareous inner lamella is very broad, above all at the anterior end. There is an inner chitinous list, which anteriorly runs close to the line of concrescence; posteriorly the list runs close to the inner margin. The fused zone is relatively broad at both the anterior and ventral margins; at the posterior end, it is distinctly less developed.

Right valve: The calcareous inner lamella is very broad at the anterior end, but distinctly less developed at the posterior end. At the posterior end, the selvage is displaced inwards, running close to the line of concrescence; ventrally and anteriorly the selvage forms the outer valve margin. The posterior fused zone is broader than the anterior one. At the posteroventral end there is a chitinous inner list which is displaced towards the inner margin.

The hairiness of the valves is most dense at the anterior end; at the posterior end, however, the hairs are stronger and stick out of tiny warts. The valve surface shows a dense longitudinal striation (fig. 5D), which is best seen in the SEM.

The very characteristic sensory seta of the 2nd segment of the antennule (A1) is shown in fig. 5E. The natatory setae of the antenna (A2) almost reach the tips of the terminal claws; the neighbouring sensory (=6th) seta extends about to the middle of the penultimate segment. Furcal rami as in fig. 5F.

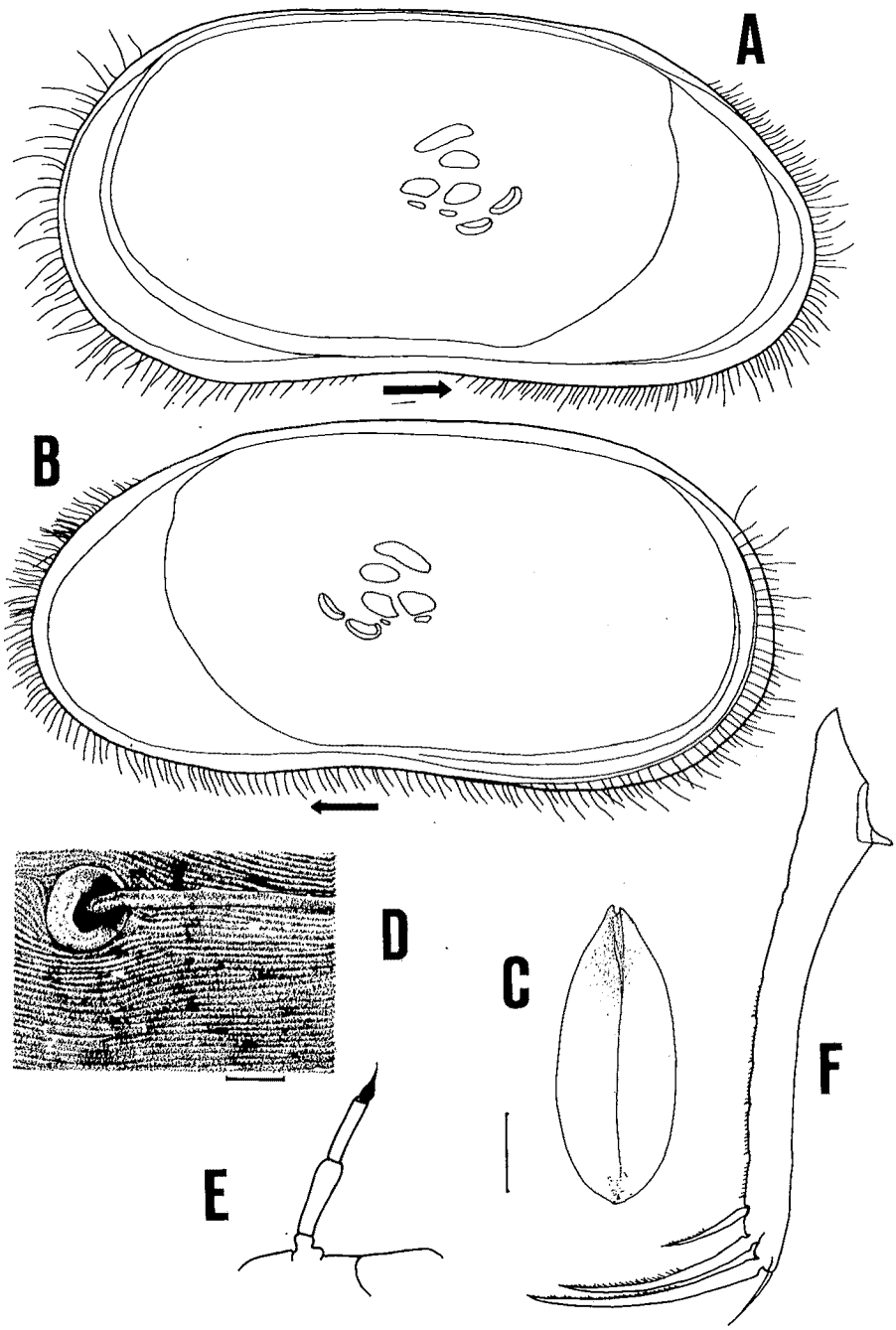



Fig. 5: *Ilyodromus viridulus*, female. - A: LV, inner view. B: RV, inner view. C: Carapace in dorsal view (scale bar: 0.3 mm). D: Surface of valves, see the longitudinal striation (scale bar: 300 um). E: Aesthetasc of the 2nd A1-segment. F: Furcal ramus.

We would like to point out that despite repetitive investigations, *I. viridulus* was not found in the much older and larger rice-fields of the river Bregalnica (a left tributary of the Wardar), where several subtropic/tropic Ostracoda belonging to the genera *Stenocypris, Tanycypris, Cypris, Hemicypris, Strandesia, Cypretta, Cypridopsis* and *Potamocypris* were collected. Petkovski (1964) already reported on several of those species. The remaining species will be described later.

## *Potamocypris pallida* Alm, 1915

(Fig. 6)

1914 *Potamocypris pallida* Alm, Zool. Anz. 43 (10): 470; fig. 2.

1925 *Potamocypris thienemanni* Klie, Arch. Hydrobiol. 16: 270-271; figs 1-3.

1961 *Potamocypris pallida* - Löffler, Arch. Hydrobiol. Suppl. 25: 338-339 (synonymy with *P. thienemanni*).

1984 *Potamocypris pallida* - Meisch, Trav. sci. Mus. Hist. Nat. Luxemb. 3: 20-27; figs 4-7 (redescription).

Löffler (1961) introduced the synonymy of *Potamocypris thienemanni* and *P. pallida*. This synonymy was accepted by Petkovski (1962b, 1966, and Meisch 1984). Parthenogenetic populations of *P. pallida* are widely distributed throughout Europe, where the species mainly colonizes cold mountainous springs and brooks. Almost all records come from areas with siliceous rocks, the waters of which are poor in electrolytes. This is also true for the aquatic habitats of the Perister Mountains: at high altitude, volcanic rocks (melaphyres, diabases, gabbros) and granite are predominant; at low altitude, mostly cristalline schistes are found.

*P. pallida* is new to the fauna of Macedonia and the Balkan peninsula in general. It should be noticed that the closely related *P. fulva* is known from Greece (Stephanides 1948, Meisch 1984). The appendages of both species are very similar. They can, however, readily be distinguished by the serration of the terminal claw of the walking leg. In *P. pallida* the spinules come very close to the distal end of the claw (fig. 5B,C). In *P. fulva*, the serration stops at some distance from the tip of the claw, and the claw thus has a conspicuous smooth distal end. Our material of *P. pallida* comes mainly from a helocrenic spring located in the environs of the Small glacial (= cirque) lake (2280 m a.s.l.), also from a mountain brook at Schiroka slope (ca 1800 m a.s.l.), from two mountain springs near Jorgov Kamen (ca 1700 m a.s.l.), and from temporary springs near Malovista (ca 1000 m a.s.l.). All these localities are situated in the Perister. The animals inhabit the moss cushions on sandy and rocky bottom. They coexist with the above mentioned species of the Perister Mountains.

Only females have been found in the Perister Mountains (in fact, the males of *P. pallida* remain unknown). The carapace is 0.71 mm long and 0.40 mm high. In dorsal view, the RV overlaps the LV anteriorly; the opposite relation is found at the posterior end. The natatory setae of the antenna are reduced; the longest extend almost to the distal edge of the penultimate segment. Length of the aesthetasc Y: 42 µm. Maxillular palp with 5 distal spines, the 3rd being one the most delicate. The length of the single branchial filament of the maxilliped reaches ca 3/4 of the

length of the associated endopodial segment. Furcal rami proximally markedly curved.

Our material of *P. pallida* also comprises specimens collected in the Pirin Mountains in southwestern Bulgaria. A small number of adults and several juveniles were captured on 7 September 1972 in a small limnocrenic spring at ca 2230 m a.s.l. in the Banderitza-Glacial cirque at the edge of Lake Muratovo Ezero. We expect the species to be found later in other mountainous regions with siliceous rocks in the central Balkans.

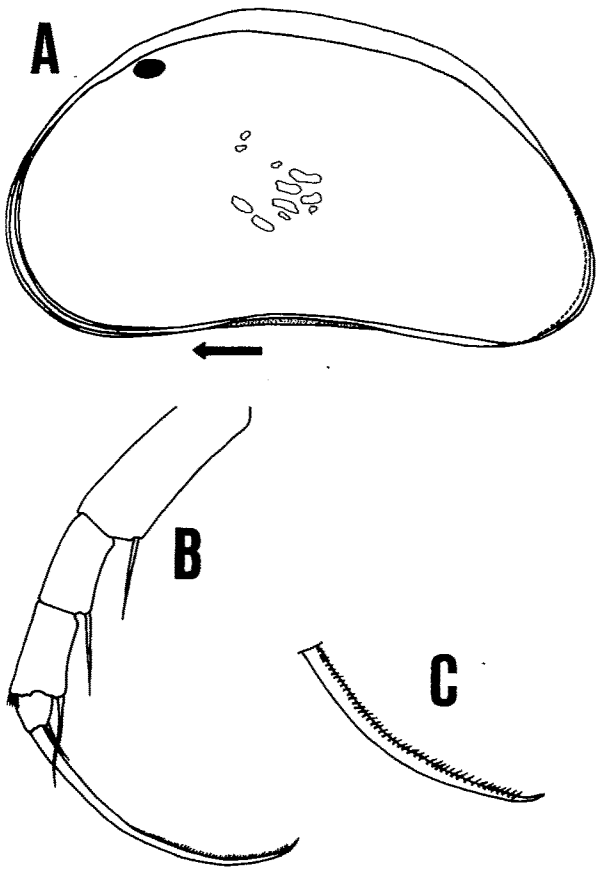



Fig. 6: *Potamocypris pallida*, female. - A: Carapace in lateral view. B: Walking leg. C: Walking leg, distal end of the terminal claw; see the spinules, which come very close to the tip of the claw.

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