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# *Heterocypris reptans* (Kaufmann, 1900), a rare freshwater ostracod new to France (Crustacea, Ostracoda)

par

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**Résumé**: *Heterocypris reptans* (Kaufmann, 1900), un ostracode d'eau douce rare et peu connu, a été récolté dans un lavoir désaffecté alimenté par une source dans le Sud de la France (département du Gard). L'espèce, qui est répartie sur le pourtour de la Méditerranée et en Europe de l'Est, est nouvelle pour la faune française. La carapace et les valves sont illustrées par des images au microscope électronique à balayage. Des précisions sur la taxonomie, l'écologie et la répartition géographique de l'espèce sont données.

**Abstract**: *Heterocypris reptans* (Kaufmann, 1900), a rare and poorly known freshwater ostracod was collected in an abandoned wash-house in the department of Gard in the South of France. The species, the distribution area of which covers the mediterranean regions and eastern Europe, is first recorded in France. The carapace and valves are shown on scanning electron micrographs. Details on the taxonomy, ecology and geographic distribution of the species are given.

During a stay in the South of France in August 1992, I collected Ostracoda in various freshwater habitats. Examination of the material showed the presence of a rare and poorly known species, i.e. *Heterocypris reptans* (Kaufmann, 1900), which is new to the fauna of France.

In this paper, an additional description, based on scanning electron micrographs, of the carapace and valves of the species is given. Details on the ecology and geographic distribution of the species are provided.

The freshwater Ostracoda fauna of France at present remains poorly known, as only a few regions have been prospected somewhat extensively (see Meisch et al. 1990). The fauna of France comprises - the species recorded herein included - 113 species of freshwater Ostracoda.

Remark: When working on the taxonomic part of this paper, the Index and Bibliography of Non-Marine Ostracoda published by Kempf (1980, 1991) was extensively used.

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Abbreviations used in text and figures:

RV = right valve;
LV = left valve;
A2 = second antenna;
SEM = scanning electron microscope.

Phylum or subphylum CRUSTACEA Pennant, 1777

Class OSTRACODA Latreille, 1806

Subclass PODOCOPA Müller, 1894

Order PODOCOPIDA Sars, 1866

Superfamily CYPRIDOIDEA Baird, 1845

Family CYPRIDIDAE Baird, 1845

Subfamily CYPRINOTINAE Bronstein, 1947

## **Heterocypris reptans** (Kaufmann, 1900)

1900 *Microcypris reptans* Kaufmann: 301, pl. 16: 16-18 and 21: 14-16.
1905 *Cypris kaufmanni* nom. nov. *limbata* var. nov. Masi: 123.
1912 *Eucypris reptans* nov. comb. - G.W. Müller: 173.
1966 *Heterocypris brteki* Petkovski: 99, figs. 21-26.
1974 *Cyprinotus (Heterocypris) reptans* nov. comb. - Sywula: 68.
1981 *Heterocypris reptans limbata* nov. comb. - Rybecky: 69.

### Locality and material

The specimens of *Heterocypris reptans* have been collected in an abandoned wash-house at Bonnet-sur-Gard (department of Gard) in southern France, about 16 km northeast of Nîmes. The animals live on and in the thin layer of mud enriched in organic material which covers the bottom of the basins and their immediate neighbourhood. The wash-house is fed by the water of a spring.

27 specimens, all females (23 adults and 4 late juveniles), were collected on 21 and 25 August 1992. The population reproduces parthenogenetically, which is common in this species (see below) and not uncommon in Ostracoda in general.

### Additional description

The original description of the species by Kaufmann (1900) is fairly good and hence identification is not problematic. Redescriptions of the species have been provided by Masi (1905, 1909), Klie (1937, description of the male), Petkovski (1966, as *Heterocypris brteki* n. sp.) and Sywula (1974a,b). The lack of conspicuous tubercles on the antero- and/or postero-ventral margin of the RV (but see below) had prevented the correct ranking of the species in the genus *Heterocypris* until recently.

The following description of the carapace and valves is based on scanning electron micrographs (figs 1-4).

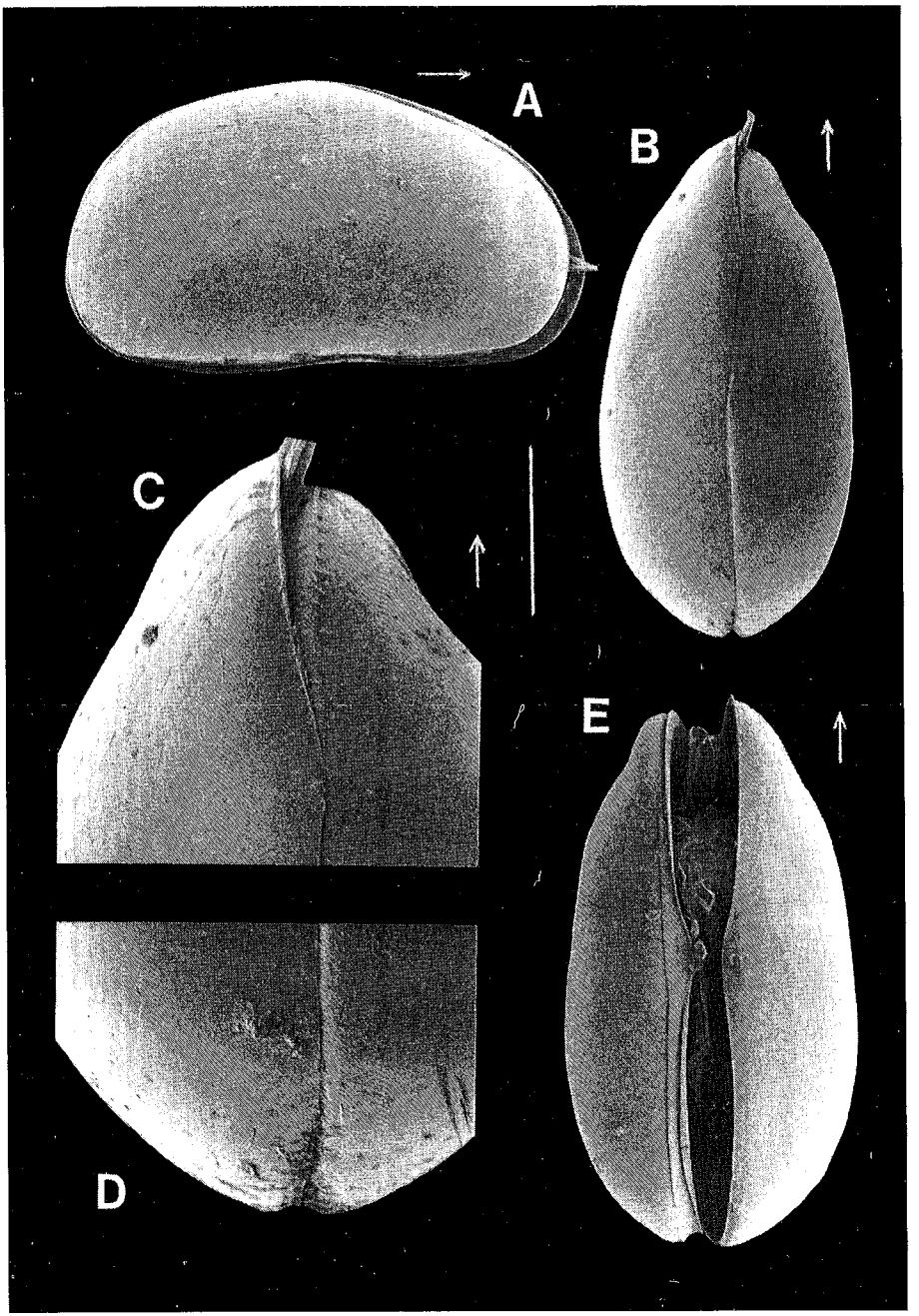



Fig. 1. - *Heterocypris reptans*. - A: Carapace in lateral view. B: Carapace in dorsal view. C: Anterior end of carapace in dorsal view, detail of B. D: Posterior end of carapace in dorsal view, detail of B. E: Carapace in ventral view (the pustules on the ventral outer list of the RV are not visible under this magnification). Scale bar: 0.40 mm for A, B and E.

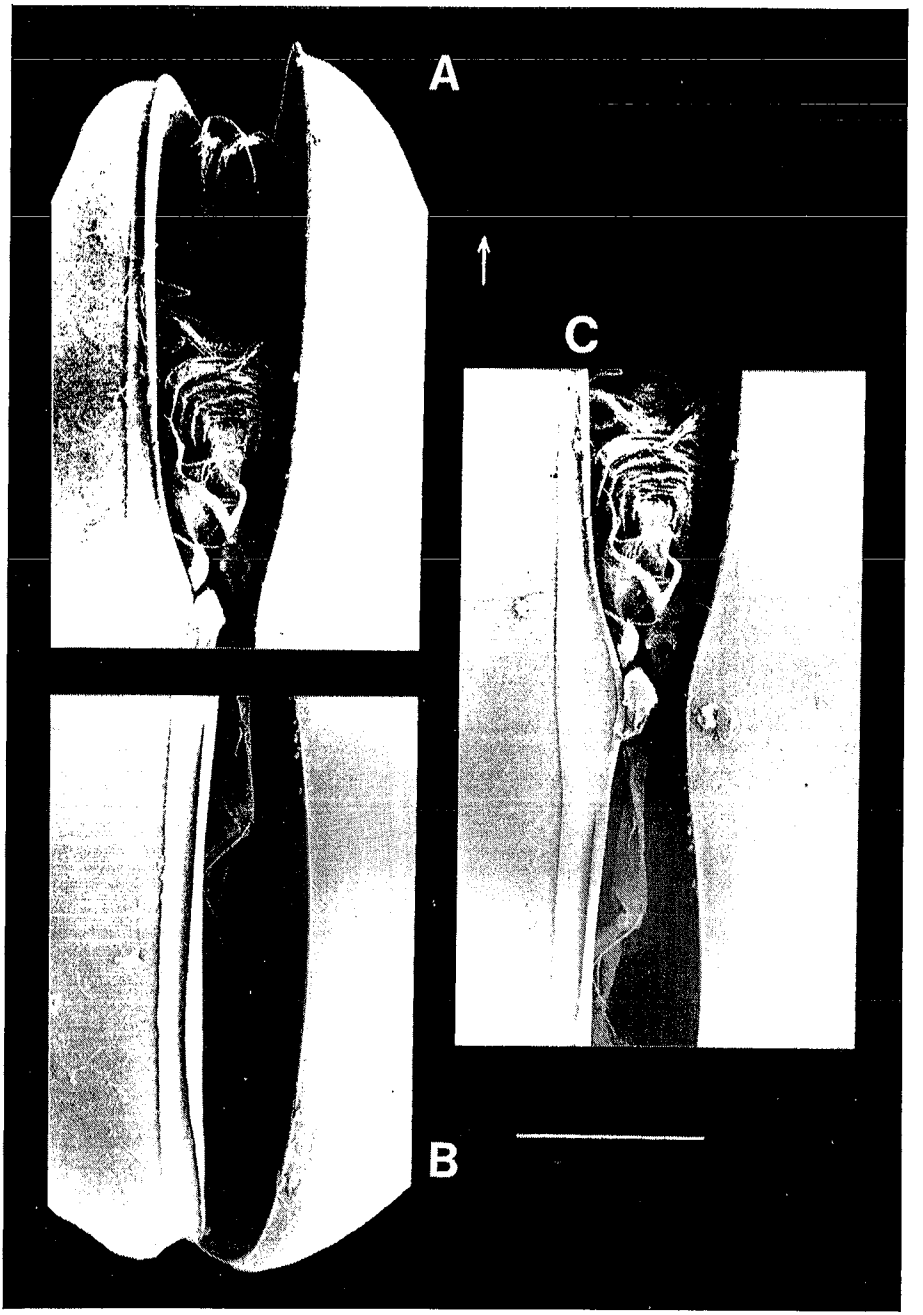



Fig. 2. - *Heterocypris reptans*. - A: Anterior end of carapace in ventral view. B: Posterior part of carapace in ventral view. C: Medial part of carapace in ventral view. A, B and C: details of fig. 1 E. Scale bar: 0.20 mm for all.

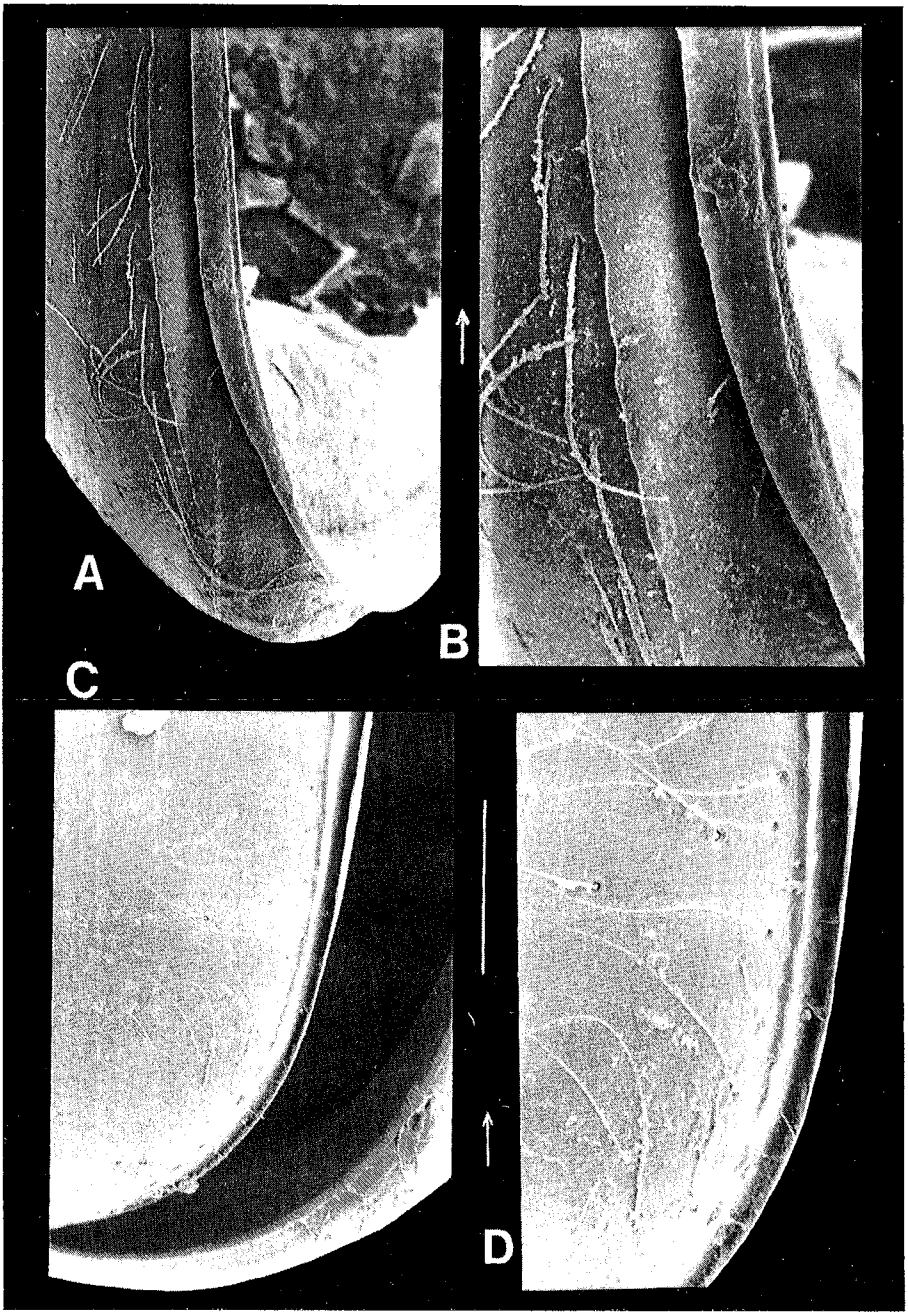



Fig. 3. - *Heterocypris reptans.* - A, B, C and D: Postero-ventral part of RV, B detail of A; D detail of C. See the weakly developed pustules, which are characteristic for the genus *Heterocypris.* Scale bar: 0.20 mm for A and C.

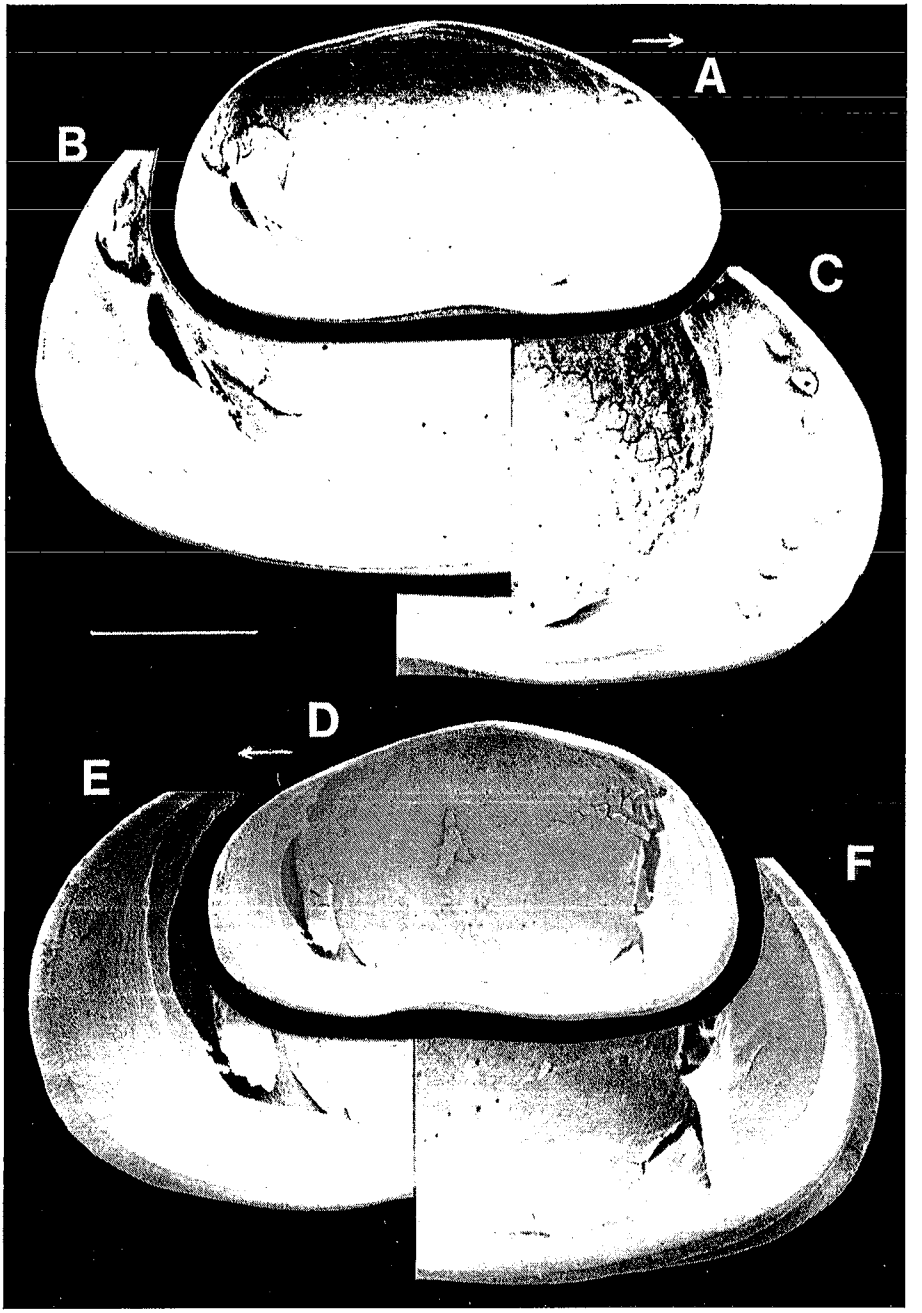



Fig. 4. - *Heterocypris reptans*. - A: LV, inner view. B: Posterior end of LV, detail of A. C: Anterior end of LV, detail of A. D: RV, inner view. E: anterior end of RV, detail of D. F: Posterior end of RV, detail of D. Scale bar: 0.40 mm for A and D.

Carapace in lateral view (fig. 1 A): the highest point is situated in the middle. The LV overlaps the RV in the anterior half of the dorsal margin, in the superior and inferior (but not the medial) part of the posterior margin and on the anterior margin. Ventrally, the marginal zone of the LV overlaps the marginal zone of the RV when the carapace closes.

Dorsal view of carapace (fig. 1 B-D): The anterior end is beak-shaped. The LV distinctly overlaps the RV in front, only slightly behind.

Ventral view of carapace (fig. 1 E, 2 A-C): At some distance from the selvage (which separates the inner and outer lamella of the valve), the RV bears an outer list which starts in the anterior part of the valve and runs nearly in a straight line towards the posterior end of the valve. This list bears the characteristic tubercles in most of the species of the genus *Heterocypris*. In *H. reptans*, this list appears smooth in the steromicroscope, even under high magnification (about 80 x). In the SEM, however, the postero-ventral part of this list shows small tubercles. The antero-ventral part of the list shows smooth or only slightly undulated. The existence of these small tubercles confirms the belonging of the species to the genus *Heterocypris*.

Surface of valves smooth. Setae are rare, except in the anterior and posterior regions of the valves. The inner view of each of the valves (fig. 4 A-F) shows several dozens of perforations.

Inner marginal zones of valves: Posterior marginal zone of LV with a well developed inner list (fig. 4 A-C). A similar but only weakly developed list is found on the anterior marginal zone of the LV. Marginal zones of RV smooth, without inner lists (fig. 4 D-F). Selvage peripheral on both valves.

Natatory setae of the antenna (A2): in the specimens from Bonnet-sur-Gard, the longest of the setae extend to the distal end of the penultimate joint.

Carapace size of the adult females examined: 1.14-1.28 mm (1.00-1.30 mm in literature), of the juv. females: 0.90-0.91 mm. Colour of carapace: orange to light red.

## Taxonomy

*H. reptans* comes close to *H. incongruens*, a nearly cosmopolitan species, and above all to *H. rotundata* and *H. barbara*. *H. rotundata* is distributed throughout Eastern Europe, the Middle East and Asia. *H. barbara* is wide-spread in the circum-mediterranean regions from where it extends its area towards Eastern Europe (Rumania, Hungary, Poland...). *H. reptans* shares with *H. rotundata* and *H. barbara* the beak-like anterior end of the carapace (dorsal view). However, the valves of *H. reptans* do not show the tiny 'spikes' found in the anterior and posterior regions of the valves of the two related species. The length of the A2 natatory setae allows easy distinction of *H. reptans*: the natatory setae are strongly reduced and the species is devoid of any swimming ability. *H. rotundata* and *H. barbara* have long natatory setae and hence are good swimmers.

Masi (1905, 1909) ranked his specimens from Italy in a separate variety (var. *limbata*), which should differ from the nominal form above all by a well developed selvage on the anterior margin of both valves and slightly longer A2 natatory setae, which extend to the distal end of the penultimate joint of the antenna.

The specimens from southern France, as well as those from Slovakia (Petkovski 1966, fig. 23) and Poland (Sywula 1974b, fig. 81a) show a well developed selvage on the anterior margin of the LV and RV. Most probably this character was simply overlooked by Kaufmann (1900).

The tips of the longest A2 natatory setae reach from about the middle of the penultimate joint (Kaufmann 1900, Petkovski 1966) to the distal end of the penultimate joint (Masi 1909, Sywula 1974b, and the specimens from southern France). Such a variability-range is not exceptional in Cyprididae and is even expected, if one is aware that the species, as a result of the adaptation to a digging mode of life, is engaged in an evolutionary process leading to progressive reduction of the natatory setae.

I would like to point out that in my opinion the distinction of the variety *limbata* is no more justified.

## Parthenogenetic and bisexual reproduction

The specimens collected at Bonnet-sur-Gard all belong to the female sex and hence reproduce parthenogenetically. This shows true for all the populations hitherto recorded, except for one or several populations sampled near Split in Croatia (Klie 1937; the author writes that the material includes males, but he does not specify if the bisexually reproducing specimens were found in one or several localities). The species thus shows an interesting case of geographic parthenogenesis. The finding of other bisexual populations in the mediterranean regions is expected in future. It should be noticed that the valves of the specimens are opaque and that distinction of sexes is uneasy on non dissected specimens.

## Ecology and life-history

*H. reptans* has been collected in springs, in streams flowing from springs, in (roadside) ditches and in a pond fed by a spring. The species seems to show preference for slow flowing, shallow and cold waters, although it tolerates an increase of temperature (see the occurrence in ditches). The population sampled at Bonnet-sur-Gard confirms this ecologic preference.

Almost nothing is known about the life-history of the species. Masi (1909) collected adult specimens in April near Rome in Italy. The late juveniles found in August at Bonnet-sur-Gard most probably hatched from eggs laid in spring and probably will reproduce in autumn. If this shows true, the species produces two generations in a year.

## Geographic distribution

*H. reptans* is known from Switzerland (north of Lugano, Kaufmann 1900), Italy (environs of Rome, Abruzzi, basin of the Timavo stream, Masi 1905, 1909, Stammer 1932), Algeria (Gauthier 1928, fide Klie 1937), Macedonia (former Yugoslavia) and Croatia (Klie 1937), Slovakia (Petkovski 1966, Rybecky 1981), Poland (Beskidian Mountains, Sywula 1974a,b) and southern France.

The species appears to be widely distributed in the circum-mediterranean regions, from where it most probably extended its area towards Eastern Europe. This

hypothesis will be reinforced if later it can be shown that bisexual populations only occur in the mediterranean regions.

The northernmost localities known at present are situated in southern Poland (Beskidian Mountains) and in Slovakia. The species seems to be very rare or absent in Western Europe. Indeed, it has never been collected in Germany, Austria, Belgium, the Netherlands, Luxembourg, the ostracod fauna of which countries is relatively well known at present.

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