Amara majuscula, a carabid beetle new for the Belgian fauna: overlooked or only a temporary visitor ?

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Introduction

Members of the carabid beetle subgenus *Bradytus* are, among other characters, separated from other subgenera of the speciose genus *Amara* (s.l.) by the prosternum, margined at the tip, the raised lateral bead on the pronotum and the absence of metallic coloration (as is present in many other species of the genus). Until now, no less than 37 *Amara* (s.l.) species have previously already been reported for Belgium (cfr. DESENDER, 1985, 1987). From the subgenus *Bradytus* these are *A. consularis, A. apricaria, A. fulva* and *A. crenata*, the last species only known from very few specimens taken during the previous century in the southern part of our country.

Already some years ago, my attention was drawn to another species of this subgenus, namely *Amara majuscula* CHAUDOIR, which seemed to be expanding its distribution area from eastern Europe and Siberia and had been signalled as far as The Netherlands already in the early sixties. No data were at that time known or published for our country, and this continued until today.

Amara majuscula was originally described in 1850 from eastern Siberia and only known during that century to occur in Siberia, Mongolia, China and Tibet (cfr. LINDROTH, 1945 and DEN BOER, 1962 for a review). Since the beginning of our century it expanded considerably its area to southern Scandinavia and Poland in the twenties, the eastern part of Germany, Czechoslovakia and Denmark in the fourties, the western part of Germany in the fifties and finally The Netherlands in the sixties (although very recently some older data seem to have been recovered for that country, TURIN, *in litt.*). Since the sixties data have accumulated rapidly for The Netherlands. At the moment no less than 100 records from about 39 UTM 10 km-squares have been gathered there (TURIN, *in litt.*)! Still, until now, no data have ever been mentioned for our country.

The (re?)discovery of *Amara majuscula* in Belgium

Recently, I identified or checked some carabid material, not yet catalogued, from the Derenne collection (which is now housed in the K.B.I.N., Brussels). To my surprise, some specimens were labelled '*Amara majuscula*'. The specimens were not in very good condition, so they were stored in alcohol for further study. Some more specimens of similar appearance, but labelled differently, were stored in the same batch. A quick survey of

the relevant literature and identification handbooks lead to the confirmation that six specimens (1 male, 5 females) indeed belonged to the species *Amara majuscula*. Apparently they had been taken at MtGauthier [UTM: FR56] on 3.VIII.1963 (1 male/2 females), on 15.VIII.1963 (1 female), on 28.VII.1964 (1 female) as well as at Gembloux [UTM: FS10] on 6.VIII. 1963 (1 female). The labels invariably mentioned 'piège' which means the specimens had most probably been taken in light traps, this also being indicated by the presence of lepidopteran scales on some of the beetles.

Further efforts to locate other material of the species from our country were until now unsuccessful: it just seemed as if the species had been wandering in low numbers into our country during 1963 and 1964 (with some specimens taken probably during flight), whereas the species more recently again had dissappeared from the stage. In addition, we surveyed some meteorological data (mean annual values of temperature and precipitation since 1920 at Ukkel) in a first attempt to explain these time-restricted data: whereas 1963 and 1964 were very near the overall mean annual precipitation, 1963 showed the lowest mean annual temperature in the complete series (Fig. 1) ! Although very speculative, this could suggest that the further expansion of the species has been limited by the more recent warmer climatic conditions in our region, superimposed on the suggested climatic limitation of its geographical distribution.

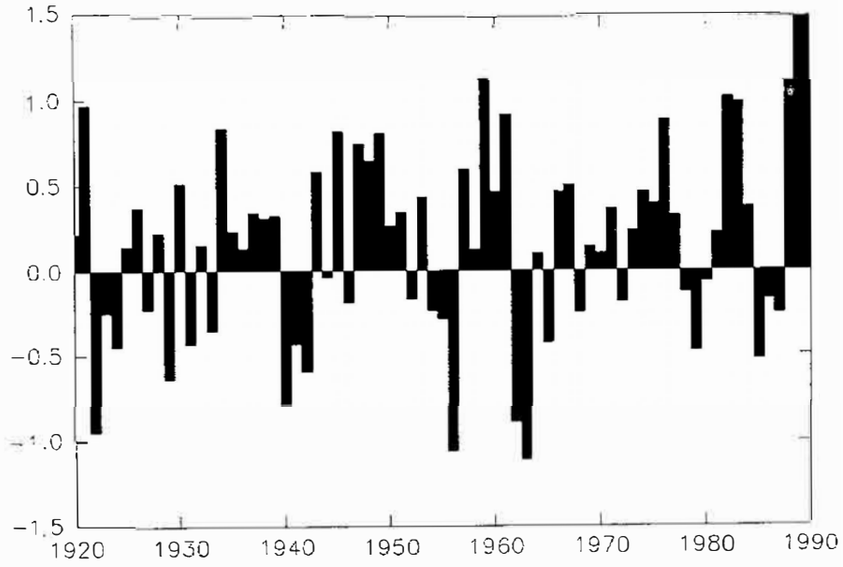

Fig. 1. Mean annual temperature since 1920 (at Ukkel, Belgium) expressed as deviation from the overall mean (derived from monthly mean values kindly provided by Ir. A. BODEUX, Klimatologie, K.M.I.)

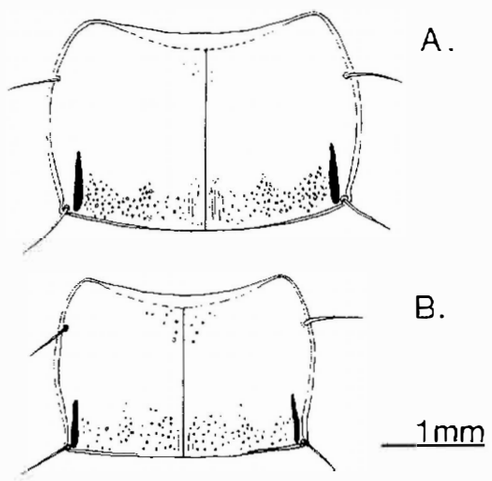

Fig. 2. Pronotum in (A) *Amara majuscula* as compared to (B) *Amara apricaria*.

Naturally, there is still another possibility, namely that recently the species has been overlooked or not even appropriately looked for in its natural or semi-natural habitat. It is of course necessary to explore this possibility first.

Identification of *Amara majuscula*

In a further attempt to resolve this intruiging but enigmatic situation, we have summarized hereafter the biology and most important morphological features of the species in order to enable interested coleopterists to check their collection and data of the most resembling other species from our country or even in order to stimulate anyone to go and look for the species.

Indeed, *Amara majuscula* is not that easy to identify, especially the females, as is equally the case for many other *Amara* species (s.l.).

Within the subgenus *Bradytus* the species *A. fulva* and *A. consularis* are relatively easily distinguished by their strongly oblique ridge-like convexity outside the outer pronotal fovea, this convexity being interrupted before the base by the basal pore-puncture. This character is nicely illustrated in LINDROTH (1986, fig. 350).

In the remaining species of the subgenus, including *A. majuscula*, the basal pronotal convexity is not or only slightly oblique and the basal pore-puncture thus is not situated in the same axis as the basal pronotal ridge (Fig. 2).

The species *A. crenata* shows parallel-sided elytra and distinctive male as well as female genitalia (illustrated by HIEKE (*in* FREUDE *et al.*, 1976)).

This reduces our identification problem to the separation of the species *A. apricaria* and *A. majuscula*. Males of both species do not pose many problems, because the meta-tibiae of males of *A. apricaria* are densely pubescent internally, which is not the case in *A. majuscula*. For females, to our opinion, the most reliable and easy character for identification is the shape of the pronotum, being absolutely, as well as relatively, narrower in *A. apricaria* (compare Fig. 2A and 2B), the sinuation of the lateral sides of the pronotum also being more pronounced in *A. apricaria*.

Ecology and biology of *Amara majuscula*

According to LINDROTH (1986), *A. majuscula* is almost exclusively confined to arable and ruderal land, although it would live both on sandy and clayey soil, often together with *A. apricaria* (which is also morphologically its closest relative, see higher!). Both species are excellent fliers and often come to light. They breed in summer-early autumn. In southern Scandinavia *A. majuscula* has also been reported in drift material on seashores in late July and August. It thus seems to be a highly mobile species of unstable habitats, and DEN BOER (1962) already suggested that the surprising expansion of *A. majuscula* during this century might well have been the result of an overall increase of such types of anthropogenic habitats. The first data of the species for Belgium are very well in agreement with these ecological data, but do not yet clarify why the species has not been found also more recently here.

Acknowledgements

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