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FIRST RECORD OF *MONOTOMA CONICICOLLIS* CHEVROLAT, 1837 (COLEOPTERA MONOTOMIDAE) IN THE APENNINES: INTRODUCTION OR SIMPLE OVERLOOKING?

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Corresponding Author: Fabio Cianferoni; fabio.cianferoni@unifi.it; cianferoni.fabio@gmail.comCianferoni F., Frizzi F., Santini G. – First record of *Monotoma conicicollis* Chevrolat, 1837 (Coleoptera Monotomidae) in the Apennines: introduction or simple overlooking?

The myrmecophilous beetle *Monotoma conicicollis* Chevrolat, 1837 (Cucujoidea: Monotomidae) is recorded for the first time in the Apennines in a nest of *Formica paralugubris* Seifert, 1996 (Formicidae).

Since nests of this ant species were translocated from Alps in the past, two possible scenarios about the occurrence of this beetle are discussed: a simple overlooking of *M. conicicollis*, already occurring (in association with other *Formica* spp.) in the Apennines prior the introduction of *F. paralugubris*, or its introduction together with the ant.

KEY WORDS: Cucujoidea, Monotominae, *Formica rufa* group, *Formica paralugubris*, introduction.

INTRODUCTION

The beetle genus *Monotoma* Herbst, 1793 (Cucujoidea: Monotomidae: Monotominae) includes 23 spp. in the Palaearctic Region (JELÍNEK, 2007) and 15 spp. in Italy (ANGELINI *et al.*, 2018), of which one, *M. americana* Aubé, 1837, is introduced (see JELÍNEK, 2007; ANGELINI *et al.*, 2018).

Monotoma conicicollis Chevrolat, 1837 is a species widespread from Europe to Far East (see JELÍNEK, 2007). In Italy this taxon was known so far only for Northern Italy, with generic records from Piedmont and Trentino-Alto Adige (LUIGIONI, 1929; PORTA, 1929).

Monotoma conicicollis is a myrmecophilous beetle associated with ants belonging to the *Formica rufa* group (subgenus *Formica* s.s.), e.g. *F. rufa* Linnaeus, 1761, *F. pratensis* Retzius, 1783, *F. lugubris* Zetterstedt, 1840, *F. polycтена* Förster, 1850, *F. uralensis* Ruzsky, 1895, *F. aquilonia* Yarrow, 1955, and to *F. exsecta* Nylander, 1846 belonging to the subgenus *Coptoformica* Müller, 1923 (PÄIVINEN *et al.*, 2002; SOLODOVNIKOV and PLISKEVICH, 2014). *Monotoma conicicollis* was detected sometimes as the most abundant beetle species in Finnish nest samples of mound-building wood ants (e.g. PÄIVINEN *et al.*, 2004 with *F. aquilonia*) or as a quite rare myrmecophilous (e.g. HÄRKÖNEN and SORVARI, 2014 with *F. polycтена*).

In Italy *M. conicicollis* was reported in association with *F. rufa* and *F. pratensis* (PORTA, 1929).

Together with *M. angusticollis* Gyllenhal, 1827, *M. conicicollis* has been included in the subgenus *Gyroceris* Thomson, 1863 because of the association of the two species with nests of *Formica* s.s. or *F. rufa* group (see THOMSON, 1863; OTERO, 1991 as *F. rufa* Linnaeus).

The species is listed in the IUCN Red List of the Italian saproxylic beetles (AUDISIO *et al.*, 2014) as Data Deficient (DD).

MATERIALS AND METHODS

The specimen of *M. conicicollis* was recently sampled in a nest of *F. paralugubris* Seifert, 1996 (Formicidae) in the northern Apennines, in the context of a project dealing with the comparative analysis of the symbiont communities inhabiting the nest mounds of this species between Alpine (native) and Apennine (imported) populations, headed by the Department of Biology, University of Florence (Italy).

Collecting information is ordered as follows: country, region, municipality and province (in brackets), locality, coordinates (geographical: degrees, minutes, seconds; datum: WGS84), elevation (a.s.l.), date, collectors (leg. = legerunt).

The specimen, dry mounted, is preserved in the collection of the first author (Florence, Italy).

Dorsal habitus and details of the front and middle legs, with the tibial spines indicated, are figured. The photos were taken by the first author with a Leica M205 C stereomicroscope at the Natural History Museum of the University of Florence.

Nomenclature follows JELÍNEK (2007).

RESULTS AND DISCUSSION

A single specimen of *Monotoma conicicollis* (Fig. 1) was recently sampled in a nest of *F. paralugubris*:

MATERIAL EXAMINED - Italy: Tuscany: Abetone Cutigliano (Pistoia), Abetone, 44°08'42.3" N 10°40'23.2" E, ab. 1320 m, 15.VII.2017, F. Frizzi & S. Giannotti leg.

NOMENCLATURAL NOTES - The name "*Monotoma conicicollis*" has been published for the first time by

Fig. I – *Monotoma conicicollis* Chevrolat, 1837. 1) Habitus, dorsal view. Scale bar = 1 mm. 2) Detail of a front leg. 3) Detail of a middle leg. The arrows indicate the tibial spines. Scale bar = 200 µm (photo by F. Cianferoni).

CHEVROLAT (1835: 264) but without giving a description; as such it must be treated as a *nomen nudum*.

The name “*Monotoma Conicicolle*”, attributed to L.A.A. Chevrolat, was then used by DEJEAN (1835: 312) in his catalogue but still not associated to any description (*nomen nudum*).

GUÉRIN-MÈNEVILLE (1837: 190, pl. 41, fig. 2 a) briefly described and figured some features of the species and attributed it, as “*Monotoma conicicollis*”, to Chevrolat who communicated the information to him (see COWAN, 1971 for datation).

In the same year, AUBÉ (1837: 455, pl. 17, fig. 1) gave a complete description and a figure of the same taxon. However he mistyped the genus, “*Monomotoma* [sic!] *Conicicollis*”, but correctly including it in the context of the genus *Monotoma* Herbst, 1793 and quoted it as “*Monotoma Conicicollis*” in the plate.

The authorship attribution has had also a troubled history: currently the species is listed as “Chevrolat, 1837” (e.g., JELÍNEK, 2007; ANGELINI *et al.*, 2018) but in the past it was attributed also to Guérin-Mèneville (e.g., REITTER, 1911; PORTA, 1929; OTERO, 1991; BOUSQUET and LAPLANTE S., 1999). The attribution to AUBÉ (1837) it is instead incorrect, since the work of GUÉRIN-MÈNEVILLE (1837) has priority. Thus, the correct authorship attribution is “Che-

vrolat in Guérin-Mèneville, 1837” or more briefly “Chevrolat, 1837”.

Nests of *F. paralugubris*, a native Alpine species (see SEIFERT, 1996; 2016), were translocated from the 50s of the XX century mainly from the Alps (particularly from Brescia and Bergamo provinces) to the Apennines for “biological control” of some native phytophagous species considered “harmful for the forest” (PAVAN, 1959; ADLUNG, 1966; see BARONI URBANI, 1971; EICHORN, 1981; RONCHETTI *et al.*, 1987; FRIZZI *et al.*, 2018; MASONI *et al.*, 2018) (Fig. II).

The only species of the *Formica rufa* group (subgenus *Formica* s.s.) native of Tuscan Apennines is *F. pratensis*, where however it seems to be very rare and scattered (see BARONI URBANI, 1971; PAVAN *et al.*, 1971). Another species of *Formica* (subgenus *Coptoformica*) also occurring in the Tuscan Apennines and associated to *M. conicicollis* (see SOLODOVNIKOV and PLISKEVICH, 2014) is *F. exsecta* (see BARONI URBANI, 1971).

The record of *M. conicicollis* is the first one for the Apennines and Tuscany, since this species was known so far only for the Alps (Piedmont and Trentino-Alto Adige).

Monotoma conicicollis shows a Sibero-European distribution (see JELÍNEK, 2007) and in the southern parts of its range it seems limited to mountains areas. According

Fig. II – Nest of *Formica paralugubris* Seifert, 1996 in the Apennines (photo by F. Frizzi)

to the current knowledge, it represents the southernmost record for the whole range of the species (see JELÍNEK, 2007).

Monotoma conicicollis has not been formally reported in association with *F. paralugubris*; however the Italian records of the beetle with *F. lugubris* (PORTA, 1929, without exact localities) could be possible misidentifications with this sibling species (see SEIFERT, 1996; 2016).

Essentially two scenarios seem possible concerning the Apennine record: 1) *Monotoma conicicollis* already occurred in the Apennines prior the introduction of *F. paralugubris*, in association with other native species belonging to the genus *Formica*, like *F. pratensis* or *F. exsecta* (see PORTA, 1929; BARONI URBANI, 1971; SEIFERT, 1992; SOLODOVNIKOV and PLISKEVICH, 2014); 2) *M. conicicollis* was not native from the Apennines and has been moved there from the Alps, following the introductions programs of *F. paralugubris* (see PAVAN, 1959).

Both hypotheses seem possible. Several species of insects, previously known only for the Alps, were often overlooked and their populations only recently recorded also in the northern Apennines and surrounding areas (e.g. CIANFERONI and TERZANI, 2013; CIANFERONI *et al.*, 2015). However, the second scenario could be also plausible since the translocations of *F. paralugubris* were made by transferring the whole nests, possibly including also specimens of myrmecophilous taxa (presumably together with several other organisms occurring in soil). Big trucks delivered their load with ant-filled barrels all over Italy (SEIFERT, 2016).

Further research involving molecular tools could shed light on the origin of the Apennine specimens of *M. conicicollis* and establishing which of the two hypotheses is the correct one. This could lead to very different managing options, which could range from conservation (in case the species is native) up to containment together with *F. paralugubris* (in case of a proven introduction).

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