

## *Neotypus melanocephalus* (Hymenoptera: Ichneumonidae): the first record of a parasitoid wasp attacking *Maculinea teleius* (Lycaenidae)

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**Abstract.** A *Maculinea teleius* (Bergsträsser, 1779) pupa was found near Meszes (NE-Hungary) in a *Myrmica scabrinodis* Nylander, 1846 nest. Some hours later emerged a wasp that proved (det. K. Horstmann) to be *Neotypus melanocephalus* Gmelin, 1790 (Ichneumonidae). The wasp with the exuvium and specimens of the host ant are deposited in the Hymenoptera Collection of the Hungarian Natural History Museum (25.vii.2002; Meszes; leg. A. Tartally). It would be desirable to obtain more *Neotypus* specimens from *M. teleius* pupae to test if the wasp really is *N. melanocephalus*, or a form of *N. pusillus* Gregor, 1940, or even a new cryptic species of *Neotypus*.

**Key words.** *Neotypus*, *Maculinea*, *Myrmica*, Ichneumonidae, Lycaenidae, parasitoid, Hungary.

The larvae and pupae of four of the five European species of *Maculinea* van Eecke, 1915 butterflies are known hosts of parasitoids from the Ichneumonidae family. The two cuckoo *Maculinea* species for which the caterpillars are fed by worker ants (Thomas & Elmes 1998) have *Ichneumon* sp. parasitoids. *Ichneumon eumerus* Wesmael, 1857 was recorded as a parasitoid of *M. rebeli* (Hirschke, 1904) and the same or a sibling *Ichneumon* species attacks *M. alcon* ([Denis & Schiffermüller], 1775) as well (Thomas & Elmes 1993; Munguira & Martin 1999; Sielezniew & Stankiewicz 2004; Thomas, Fitton & Hilpert, pers. comm.). Two of the three *Maculinea* species, of which the caterpillars are predators of ant broods (Thomas & Elmes 1998), have *Neotypus* parasitoids: *N. pusillus* Gregor, 1940 was bred from *M. nausithous* (Bergsträsser, 1779) (Thomas & Elmes 1993) and another *Neotypus* sp. from *M. arion* (Linnaeus, 1758) (Thomas, Wardlaw & Fitton, pers. comm.). So far as known, each of these parasitoids is host-specific to a single *Maculinea* species, but until now no parasitoid wasp of the predatory *M. teleius* (Bergsträsser, 1779) was known.

*Maculinea* species and their parasitoids are of high interest to evolutionary and conservation ecology because of their extreme adaptations to a myrmecophilous lifestyle and because all are rare and globally endangered (IUCN 2004; Hochberg et al. 1996; Munguira & Martin 1999). The larvae of these butterflies feed briefly on specific foodplants before being adopted by *Myrmica* ants (Hymenoptera: Formicidae) in which colonies they live as social parasites for 11–23 months (Thomas & Elmes 1998). *Neotypus pusillus* oviposits on young *M. nausithous* larvae on the larval foodplant while *Ichneumon* spp., perhaps in response to the different population structure found in cuckoo species, penetrate *Myrmica* nests to seek *Maculinea* larvae (Thomas & Elmes 1993). These parasitoids both emerge from host pupae inside ant colonies and are presumed to have similar specialisations to those described for *I. eumerus* (Thomas et al. 2002) to escape unharmed from nests.

Between 2000 and 2003, hundreds of *Myrmica* nests at eight sites were examined for caterpillars, pupae, and exuvia of *M. teleius* to measure host specificity and to investigate whether parasitoids of this butterfly occur in the Carpathian Basin, Hungary.

Twenty-four caterpillars, one exuvium, and eight pupae of *M. teleius* were found at five sites. One of the pupae contained a parasitoid. This was collected on 25 July 2002 near the village of Meszes (NE-Hungary; Borsod-Abaúj-Zemplén County) in a marshy meadow with a profusion of *Sanguisorba officinalis* (I intentionally do not give the exact location as a precaution against collectors; only two more pupae were found there but these were not parasitized). The pupal cases of *M. teleius* and *M. nausithous* are hard to distinguish, but this pupa was found in a *Myrmica scabrinodis* Nylander, 1846 nest within one meter from a *S. officinalis* plant. *My. scabrinodis* is the main host ant of *M. teleius* in Europe (Thomas et al. 1989; Stankiewicz & Sielezniew 2002; Tartally & Csósz 2004) and no other species of *Maculinea* nor any other foodplant of *Maculinea*, occur at this site (Varga, pers. comm.). Moreover, *M. nausithous*, the only other *Maculinea* species that uses *S. officinalis*, is not known from NE-Hungary (Bálint 1996). Based on this evidence, this pupa was identified as *M. teleius*. Some hours after collection, a wasp hatched from this pupa. The wasp with the exuvium and specimens of the host ant (*My. scabrinodis*) were placed into a small vial with 75% ethanol. The full sample is deposited in the Hymenoptera Collection of the Hungarian Natural History Museum (25.vii.2002; Meszes; Tartally leg.). The wasp was sent to Dr. Klaus Horstmann (Theodor-Boveri-Institut für Biowissenschaften, Würzburg) for determination; it proved to be *Neotypus melanocephalus* Gmelin, 1790, a species that had not previously been recorded as a parasitoid of any *Maculinea* host (Thomas, pers. comm.).

There are several known *M. nausithous* populations infected by *N. pusillus* that co-occur with *M. teleius* in Europe, but in those studied in the Rhône valley (France), there is strong evidence that *N. pusillus* never parasitizes *M. teleius* (Thomas, pers. comm.). It would be worth checking more widely whether *N. pusillus* uses only *M. nausithous* as a host or whether it can infect *M. teleius* too. This is important because *N. melanocephalus* has, at times, been synonymised with *N. pusillus*; but current studies in the EU 'MacMan' programme suggest that *N. melanocephalus* is a cryptic sibling species (Thomas, pers. comm.), a phenomenon well known in parasitoid taxa (Godfray 1994). It would be desirable to obtain more *Neotypus* specimens from *M. teleius* pupae and to test whether this wasp really is *N. melanocephalus*, or a form of *N. pusillus*, or even a new cryptic species of *Neotypus*. If, as I suspect, it is both a good species and specific to *M. teleius*, then, like other parasitoids of *Maculinea*, it will by definition be rarer and more threatened than its host, and its populations will be in greater need of conservation (Hochberg et al. 1996; Thomas et al. 2002).

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