

# Records of *Tracheliodes varus* (Panzer) and *T. curvitorsus* (Herrich-Schaeffer) from Central Italy (Hymenoptera, Crabronidae)

Maurizio Mei

Università di Roma "Sapienza", Dipartimento di Biologia e Biotecnologie "Charles Darwin". Entomologia | Piazzale Valerio Massimo 6 | 00162 Roma, Italy | [maurizio.mei@uniroma1.it](mailto:maurizio.mei@uniroma1.it)

## Zusammenfassung

Maurizio Mei: **Nachweise von *Tracheliodes varus* (Panzer) und *T. curvitorsus* (Herrich-Schaeffer) aus Mittel-Italien (Hymenoptera, Crabronidae).** Die ersten italienischen Nachweise von *Tracheliodes varus* werden vorgestellt, zusammen mit neuen Nachweisen von *T. curvitorsus* und einigen Beobachtungen über das Jagdverhalten beider Arten.

## Summary

The first Italian records of *Tracheliodes varus* are presented, together with new records of *T. curvitorsus* and some observations on the hunting behaviour of both species.

## Introduction

Wasps of the genus *Tracheliodes* A. Morawitz, 1866 are specialized in hunting workers of Dolichoderine ants. One of the three European species, the common and widespread *Tracheliodes quinquenotatus* (Jurine, 1807) hunts species of *Tapinoma* Förster, 1850 while the others, *T. varus* (Panzer, 1799) and *T. curvitorsus* (Herrich-Schaeffer, 1841), prey on *Liometopum microcephalum* (Panzer, 1798).

Only recently *T. varus* has been recognised as a valid species (Bitsch & Leclercq, 1993; Zettel et al., 2004). It is known from few localities in Southern Austria, Czech Republic, Slovakia, Bulgaria, Greece and by a single specimen from Corse (Dollfuss, 2004; Zettel et al., 2004; Pulawski, 2015).

*T. curvitorsus* has a very similar distribution throughout southeastern and central Europe (Zettel et al., 2004), but it is present also in Italy. There are only a few records of *T. curvitorsus* from Italy, however, and are all very old. It is known from several localities in Emilia Romagna (Baldini, 1894; Costa, 1864; Emery, 1891, 1893; Grandi, 1928), Campania (Emery, 1891, 1893) and Sicily regions (De Beaumont, 1959; Zettel et al., 2004). As far as it is known, the most recent finding of this wasp in Italy, i. e. the female specimen from Sicily reported by De Beaumont (1959) and preserved in the collections of the Museum of Zoology of the University of Rome (MZUR), dates back to 1935.

Both species are rarely collected, their occurrence being strictly dependent on that of *L. microcephalum* (there is, however, the single record of *T. varus* from Corse, where this ant is apparently absent: see Zettel et al., 2004). *L. microcephalum* is distributed throughout southern and Eastern Europe and from the Near East, Lebanon and Turkey, to the Caucasus and Ukraina

(Baroni Urbani, 1971; Del Toro et al., 2009; Martinez & Tinaut, 2001; Zettel et al., 2004). The westernmost populations in this range are found in Lower Austria and in Italy, where the species is known from many localities scattered through the peninsula, and Sicily (Baroni Urbani, 1971). This ant nests only in big, old trees, with a strong preference for oaks (*Quercus* spp.), and the colonies are very large and impressive. In Central Italy I found it mainly in Turkey oaks (*Quercus cerris*), but nests can be built also in Hungarian and Downy oaks (*Q. frainetto*, *Q. pubescens*). Its populations are very scattered and local, but in suitable places the ant could be quite abundant.

In the summer of 2013–2015, several sites in Central Italy were surveyed for the presence of *L. microcephalum*, in order to find the *Tracheliodes* wasps. Oak forests and groves, but also large isolated oak trees, were searched in Umbria (surroundings of Città di Castello), Latium (province of Rome: Macchia Grande di Manziana, Bosco Trentani, Macchia di Gattaceca, Tivoli, Poggio Cesi, Tenuta di Castelporziano, Bosco di Foglino,) and in the Abruzzi (Val de' Varri, Arsoli). Populations of *L. microcephalum* were found in three localities and both species of *Tracheliodes* were collected wherever the ant was present, *T. varus* being recorded from Italy for the first time.

## Examined material

*Tracheliodes curvitorsus* (Herrich-Schaeffer) (Fig. 1a; Fig. 2: a, b)

7 ♀♀, Umbria, Città di Castello (Perugia), S. Donino (43°25'07.94"N 12°15'49.73"E), 430 m a.s.l., 12.–14. VIII.2015, leg. M. Mei, preying on *Liometopum microcephalum*; 1 ♀, Latium, Manziana (Rome), Macchia Grande (42°07'19.75"N 12°07'18.42"E), 350 m a.s.l., 1.VIII.2013,

leg. M. Mei, preying on *Liometopum microcephalum*; 5 ♀♀, same data but 5.VIII.2013; 1 ♀ same data but 19.VIII.2013; 2 ♀♀ same data but 18.VIII.2014. 4 ♀♀, Latium, Nettuno (Rome), Bosco di Foglino (41°27'33.09"N 12°42'53.48"E), 31 m a.s.l., 12.VIII.2013, leg. M. Mei, preying on *Liometopum microcephalum*. In addition, a female of *T. curvitorsus* was observed hunting in Manziana on the twentieth of June 2013.

*Tracheliodes varus* (Panzer) (Fig. 1b; Fig. 2: c, d)

4 ♀♀, Umbria, Città di Castello (Perugia), S. Donino (43°25'07.94"N 12°15'49.73"E), 430 m a.s.l., 12.–14. VIII.2015, leg. M. Mei, preying on *Liometopum microcephalum*; 2 ♀♀, Latium, Manziana (Rome), Macchia Grande (42°07'19.75"N 12°07'18.42"E), 350 m a.s.l., 1.VIII.2013, leg. M. Mei, preying on *Liometopum microcephalum*; 3 ♀♀, same data but 5.VIII.2013; 8 ♀♀, same data but 19.VIII.2013; 1 ♀ same data but 18.VIII.2014; 3 ♀♀ same data but 6.VII.2015. 4 ♀♀, Latium, Nettuno (Rome), Bosco di Foglino (41°27'33.09"N 12°42'53.48"E), 31 m a.s.l., 12.VIII.2013, leg. M. Mei, preying on *Liometopum microcephalum*.

## Notes

The woods of Macchia Grande (Manziana) and Foglino (Nettuno), with an area of 580 and 550 ha respectively, are two of the largest remains of the ancient plain forest of Latium (Montelucci, 1977; Tedeschini Lalli, 1993; Gratani & Pasqua, 2004; Lattanzi et al., 2004) and are part, as Sites of Community Importance (SCI IT6030008, SCI IT6030047), of the "Natura 2000" european network of protected areas. The dominant tree species in both sites are *Quercus cerris* and *Q. frainetto*. A flourishing population of *L. microcephalum* has been found in Manziana, where many colonies are present in the eastern part of the forest, where the older and larger trees are located. In Foglino I found only three colonies of *Liometopum*, nesting in the large oaks of a quite disturbed picnic area, and other three large colony of this ant were found in a thin and quite small Downy oak (*Quercus pubescens*) grove, on a SE exposed slope in the countryside near Città di Castello. In all three localities, the ants were preyed upon by females of both *Tracheliodes* species.



Fig. 1: *Tracheliodes curvitorsus* (Herrich-Schaeffer) ♀ from Manziana (Rome, Italy) A: habitus dorsal; *Tracheliodes varus* (Panzer) ♀ from Manziana (Rome, Italy) B: habitus dorsal. (photos: Leonardo Forbicioni)



Fig. 2: *Tracheliodes curvitorsus* (Herrich-Schaeffer) ♀ from Manziana (Rome, Italy), a: head frontal view; b: head and mesosoma lateral view. *Tracheliodes varus* (Panzer) ♀ from Manziana (Rome, Italy), c: head frontal view; d: head and mesosoma lateral view. (photos by Leonardo Forbicioni)

*Tracheliodes* females hunt mostly in the shade, and are quite difficult to detect and to follow, in particular those of *T. varus* which are smaller and much darker of those of *T. curvitorsus* (when in flight, females of the latter species appear almost completely yellow). Both crabronids are exceedingly wary and are disturbed by even a small movement, but once they start hunting along the tree bark they become easier to observe or to catch. The female hovers a few millimeters from the whirling column of ants, often for many seconds, while choosing the more suitable worker prey, which is grabbed and carried away with its head under the gaster of the wasp. The capture of prey is lightning fast and the wasp disappears immediately, too fast to be traced. Females of both species were often observed hunting simultaneously on the same tree. My observations, carried out on a few tens of individuals in Città di Castello, as in Manziana and Foglino, seem to confirm those reported by Zettel et al. (2004): *T. curvitorsus* always hunts in the lower part of the tree, or even on the ground or along the roots, while *T. varus* was always observed rather higher, up to 2–3 m along the trunk. It would also seem that, on a given tree inhabited by *Liometo-*

*pum*, the wasps would prefer particular spots where to look for prey. In all the three sites several females, sometimes more than one at the same time, have been collected or observed hunting on particular portions of a trunk, not only in the same day but, in Manziana, also in subsequent years. In Città di Castello, five *T. curvitorsus* females were collected one after another in a few minutes from the very same smooth area at the base of an oak, though the ants were present and swarming all around the tree base and on another oak tree less than two metres away.

Any attempt to locate a nest and to collect the males of the two species was ineffective. The male and the nest of *T. varus* are still unknown. Only the nest of *T. curvitorsus* has been briefly described (Emery, 1893), the reproductive biology and the ecology of both species still remains to be studied.

My observations show that in suitable places the two species can be relatively abundant, and I guess that this could be true throughout the whole Italian Peninsula. However, both species are strictly dependent on populations of *L. microcephalum* and this ant species is, in turn, dependent on large and old trees, a resource ge-



nerally decreasing as pointed out by Schlick-Steiner et al. (2003), who accordingly list *L. microcephalum* as endangered in Austria. For these reasons, I think that both the ant and the two *Tracheliodes* should be best considered threatened in Italy, where their populations, moreover, are at the very edge of the ranges of the species.

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