

Occurrence of *Ogkosoma cremieri* Romand (Ichneumonidae: Hybrizontinae) in the Czech Republic with notes on adult behaviour

KAMIL HOLÝ¹, KLÁRA BEZDĚČKOVÁ², PAVEL BEZDĚČKA²

¹*Crop Research Institute, Drnovská 507, CZ-161 06 Praha 6, Czech Republic; e-mail: holy@vurv.cz*

²*Methodical Centre for Myrmecology, Muzeum Vysočiny, Jihlava, Masarykovo náměstí 55,
CZ-586 01 Jihlava, Czech Republic; e-mail: bezdecka@muzeum.ji.cz*

HOLÝ K., BEZDĚČKOVÁ K. & BEZDĚČKA P. 2018: Occurrence of *Ogkosoma cremieri* Romand (Ichneumonidae: Hybrizontinae) in the Czech Republic with notes on adult behaviour. *Acta Musei Moraviae, Scientiae Biologicae* (Brno) (2017) **102(2)**: 139–143. – *Ogkosoma cremieri* (Romand, 1838) was previously known from only one locality in the Czech Republic. New specimens from the same locality and a new record for Moravia are presented. Notes on adult behaviour during the ant colony escape is reported.

Key words. Ichneumonidae, Hybrizontinae, *Ogkosoma cremieri*, *Eurypterna*, faunistics, new record, Czech Republic, adult behaviour

Introduction

Ogkosoma cremieri (Romand, 1838) is moderately-sized, brightly-coloured Palearctic ichneumonid parasitoid that develops in ants' nests. Its hosts are *Lasius fuliginosus* (Latreille, 1798) and *Lasius nipponensis* Forel, 1912 (Yu *et al.* 2016). Adults of *O. cremieri* were observed near nests of *Camponotus herculeanus* (Linnaeus, 1758), *Formica rufa* Linnaeus, 1761 and *Lasius brunneus* (Latreille, 1798) (RUDOW 1883, TOBIAS 1988, WASMANN 1898), although it is not certain if the ants were hosts or if adult of parasitoids were only attracted to the vicinity of the nests.

The female *Ogkosoma cremieri* lays its eggs in the ant larvae that are carried outside by workers during transport from the chambers in a tree trunk used in summer to the underground chambers of the nest that they take to in autumn (COBELLI 1906, KOMATSU & KONISHI 2010, KONISHI 2010).

Nothing is known of the development of the larvae (GÓMEZ DURÁN & van ACHTERBERG 2011, KOMATSU & KONISHI 2010, LACHAUD & PEREZ-LACHAUD 2012), or of the manner in which adults exit host nests after emergence (KOMATSU & KONISHI 2010).

Adults have been observed from late September to the end of October (KONISHI 2010), mostly in October (e.g. COBELLI 1906, KOMATSU & KONISHI 2010, WATANABE 1984).

Ogkosoma cremieri is known from Austria, the Czech Republic, France, Germany, Italy, Japan, The Netherlands, Poland (YU *et al.* 2016), Belarus (ARNOLD 1881) and Russia (TOBIAS 1988). MADL (2013) reported a new record for Austria. Occurrence in the Czech Republic was reported by HOLÝ & MACEK (2008) from Vůznice, Malaise trap, 6.ix.–9.x.1994, 1 ♂, 1 ♀ (as *Eurypterna cremieri*).

Material and methods

Localities selected for their high occurrence of *Lasius fuliginosus* nests were visited during the flight phase for *Ogkosoma cremieri* adults in 2010–2017. Tree trunks with *Lasius fuliginosus* nests were observed for few seconds or minutes and adults of *O. cremieri* were collected by netting or by hand. Sweeping of surrounding vegetation was also nearly always employed on visits to these localities. Window flight-intercept traps were used only in 2017 (20.ix.–13.x., 13.x.–19.x., 19.x.–9.xi. in Nižbor and 28.viii.–12.ix. in Čertoryje). The trap was made of a transparent 2-litre PET bottle with 4 holes (wings) in the upper part and 70% alcohol in the bottom (illustrated). A number of the faunistic grid follows PRUNER & MIKA (1996).

Results and discussion

***Ogkosoma cremieri* observation sites. Bohemia:** Nižbor, Vůznice (5949), GPS 50°1'14.797"N, 13°59'59.974"E, 8.x.2010, 1 ♀, 27.ix.2011, 1 ♀, 8.ix.2016, 1 ♂, lgt., 19.x.2017 1 ♀ observ., adults flying around *L. fuliginosus* nest in the trunk of *Tilia* sp., 13.–19.x.2017 24 ♀♀, 2 ♂♂, window flight-intercept trap. **Moravia:** Tvarožná Lhota, Čertoryje (7071), GPS 48°50.989'N, 17°25.238'E, 400 m a.s.l., 30.ix.2011, 3 ♂♂, 1 ♀ lgt., 1 ♂, 3 ♀♀ observ., all adults escaped from an *L. fuliginosus* nest in the trunk of *Pyrus communis* L.. Several other specimens flying around the nest were not collected, 27.x.2015 on the same tree 1 ♀, 1 ♂ lgt., 1 ♀ observ., 16.x.2017, 1 ♂ sweeping on grass a few hundred metres from a colony in *P. communis* tree. All K. Holý lgt., observ., det. et coll.

Based on known biology, ecology and photo documentation (e.g. COBELLI 1906, KONISHI 2010) the locality (the exact place where the Malaise trap had been placed in the past) with known occurrence of this species in the Czech Republic was explored (Vůznice 8.x.2010). Approximately 15 m from where the Malaise trap had been placed, one female flying around a large *L. fuliginosus* colony in the trunk of *Tilia* sp. was collected.

The colony was observed again 15.ix.2011, 27.ix.2011, 22.ix.2014, 21.x.2014, 31.viii.2015, 12.x.2015, 5.xi.2015, 10.xii.2015, 8.ix.2016, 20.ix.2017, 13.x.2017, 19.x.2017 and 9.xi.2017. Only on three of the visits were adults observed and collected (27.ix.2011, 8.ix.2016, 19.x.2017). Other small *Lasius fuliginosus* colonies in the surroundings were observed, but no *Ogkosoma cremieri* were found.

A further five localities (two in Bohemia and three in Moravia) with high occurrence of *L. fuliginosus* colonies were visited during autumn 2011. *O. cremieri* was found only in Čertoryje 30.ix.2011. There are hundreds of colonies of *L. fuliginosus* in this locality, but adult *O. cremieri* were observed and collected only on one old *Pyrus communis* tree with a large ant colony (the largest in the locality). The same situation held on 27.x.2015 in exactly the same locality. No adults were observed 28.viii.2017, 12.ix.2017 and 16.x.2017.

Successful observation and/or collection of *O. cremieri* only around huge colonies (thousands individuals) of *L. fuliginosus* suggests that these are more attractive than small or medium-sized colonies. Females are probably attracted by the high number of ant larvae transported, males by the higher numbers of emerging females per nest.

Escape from an ants' nest was observed only on 30.ix.2011 in Čertoryje (4 ♂♂, 2 ♀♀), when workers were transporting ant larvae and pupae from the nest chambers in the trunk to the chambers in the ground part of the nest. Each specimen of *O. cremieri* was surrounded by several ant workers (3–10) when leaving the nest entrance. The workers were grasping *O. cremieri* with their mandibles, mainly by the legs and wings. Even though 10 ants were holding one specimen, it proved stronger, being able to drag the ants along. After a few seconds or minutes, the specimens shrugged of all the ants, or simply walked too quickly for them, then flew away. No aggressive behaviour on the part of the ants was observed at all. The ant behaviour bore more resemblance to workers trying to keep young queens and males in the nest (at inappropriate, non-dispersal times), rather than to the transport of intruders reported by PEREZ-LACHAUD *et al.* (2015) for ant parasitoids of the family Eucharitidae (Hymenoptera: Chalcidoidea) that exploited the colony's hygiene routines to escape the colony. Further study, including chemical analyses of the cuticular hydrocarbons of both parasitoids and ants, is required.

The transport of one dead male *O. cremieri*, lacking its head, pronotum and forelegs, by three workers was also observed. The body of this specimen was fresh, so it had probably been decapitated in the course of transport within a nest corridor. This male was carried in the same way that ant larvae and pupae are moved between seasonal parts of the nest. Whether it was taken to the waste dump or somewhere else is not clear.

The behaviour of females during oviposition tallied with that described by COBELLI (1906), KOMATSU & KONISHI (2010) and KONISHI (2010). The extended, dangling hind legs, with their long coxa and enlarged tibia and first segment of the tarsus, provide weight for stabilization during hanging and oviposition. The leg modification, with the hind tibia drop-shaped, resembles that of the family Gasteruptiidae.

Ogkosoma cremieri is only rarely collected (KONISHI 2010, MADL 2013), a trend reflected by its representation in the collections of Czech museums and research institutions consisting of only two specimens. This may be due to low population density, its occurrence in the autumn when collectors are less active, not to mention the low numbers of specialists who collect Ichneumonoidea. Nevertheless, extended knowledge of its biology and ecology will facilitate the acquisition of more of this species more often in suitable localities. Thus, the best chances for discovery of *O. cremieri* may lie in finding a huge colony of *L. fuliginosus* (numbering in the thousands) and observing the nest for 30–60 minutes on a warm day, when ant larvae and pupae are transported. The Malaise or window trap placed near to the tree-trunk with the ant colony, sometime between the end of August and the beginning of November, should could provide the best results.

Acknowledgements

We would like to thank Jan Macek for providing information about the location of the previous Malaise trap in the Vůznice. This work was partly supported by grant MZe RO 0417. Tony Long (Svinošice) helped work up the English.



Figs 1–5. 1 – *Ogosoma cremieri* ♂ with coloured thorax; 2, *Lasius fuliginosus* nest in a trunk of *Pyrus communis*; 3, window flight-intercept trap; 4, *O. cremieri* ♀ surrounded by workers; 5, ants holding specimens by the legs and wings.

References

- ARNOLD N. 1881: *Paxylloma cremieri*, Brébisson. *Horae Societatis Entomologicae Rossicae* **16**: 146–149.
- COBELLI R. 1906: Il *Pachylomma cremieri* de Romand ed il *Lasius fuliginosus*, Latr. *Verhandlungen der kaiserlich-königlichen Zoologisch-botanischen Gesellschaft in Wien* **56**: 475–477.
- GÓMEZ DURÁN J.M. & ACHTERBERG C. van 2011: Oviposition behaviour of four ant parasitoids (Hymenoptera, Braconidae, Euphorinae, Neoneurini and Ichneumonidae, Hybrizontinae), with the description of three new European species. *ZooKeys* **125**: 59–106.
- HOLÝ K. & MACEK J. 2008: Faunistic records from the Czech Republic – 240. Hymenoptera: Ichneumonidae. *Klapalekiana* **44**: 20.
- KOMATSU T. & KONISHI K. 2010: Parasitic behaviors of two ant parasitoid wasps (Ichneumonidae: Hybrizontinae). *Sociobiology* **56**(3): 575–584.
- KONISHI K. 2010: Taxonomy of the genus *Eurypterna* with biological notes on *E. cremieri* (Ichneumonidae, Hybrizontinae). Pp. 92–93. In: MELIKA G. (ed.): *Seventh International Congress of Hymenopterists. Programme and Abstracts. List of Participants* 20–26 June 2010, Kőszeg.
- LACHAUD J.P. & PEREZ-LACHAUD G. 2012: Diversity of Species and Behavior of Hymenopteran Parasitoids of Ants: A Review. *Psyche* **2012**: 1–24.
- MADL M. 2013: Zur Kenntnis der Hybrizontinae (Hymenoptera, Ichneumonidae) Österreichs. *Linzer biologische Beiträge* **45**(1): 789–792.
- PEREZ-LACHAUD G., BARTOLO-REYES J.C., QUIROA-MONTALVAN C.M., CRUZ-LOPEZ L., LENOIR A., LACHAUD J.P., 2015: How to escape from the host nest: Imperfect chemical mimicry in eucharitid parasitoids and exploitation of the ants' hygienic behavior. *Journal of Insect Physiology* **75**: 63–72.
- PRUNER L. & MÍKA P. 1996: Seznam obcí a jejich částí v České republice s čísly mapových polí pro síťové mapování fauny. [List of settlements in the Czech Republic with associated map field codes for faunistic grid mapping system.] *Klapalekiana* **32** (Suppl.): 1–115 (in Czech, English summary).
- RUDOW F. 1883: Neue Ichneumoniden. *Entomologische Nachrichten* **9**(19/20): 232–247.
- TOBIAS V.I. 1988: Family Paxylommatidae (Hymenoptera) of the fauna of the USSR. *Trudy Vsesoyuznogo Entomologicheskogo Obshchestva* **70**: 131–143.
- WASMANN E. 1898: Erster Nachtrag zu den Ameisengästen von Holländisch Limburg mit biologischen Notizen. *Tijdschrift voor entomologie* **41**: 1–18.
- WATANABE C. 1984: Notes on Paxylommatinae with review of Japanese species (Hymenoptera, Braconidae). *Kontyu* **52**(4): 553–556.
- YU D.S.K., ACHTERBERG C. van & HORSTMANN K. 2016: *Taxapad 2016. Ichneumonoidea 2015. (Biological and taxonomical information). Taxapad Interactive Catalogue Database on flash-drive*. Nepean, Ottawa.