

**Distribution and biology of *Coelioxys alata* (Hymenoptera: Megachilidae)
in the Czech Republic and Slovakia**

**Rozšíření a biologie druhu *Coelioxys alata* (Hymenoptera: Megachilidae)
v České republice a na Slovensku**

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Abstract. New findings and localities of a rare cleptoparasitic bee *Coelioxys alata* Förster, 1853 are presented. Up to now, this species has been known in the Czech Republic only from Moravia and only one record has been known from Slovakia. In 2003 and 2004, it was collected at three localities in Bohemia and one in Slovakia. Its host species, *Megachile ligniseca* (Kirby, 1802), is known from wet habitats and was collected together with *C. alata* in two cases. *Coelioxys alata* is probably not as rare as considered so far since it occurs in wetlands and is therefore overlooked by collectors.

INTRODUCTION

More than 400 species of the genus *Coelioxys* Latreille, 1809 live in all zoogeographical regions of the world. All species belong to the ecological group of cleptoparasitic (cuckoo) bees (Michener 2000). Females do not build nests but they lay eggs into nests of solitary bees, especially those of the related genus *Megachile* Latreille, 1802. The females have a characteristic, conical elongation of the abdomen, which is usually explained as an adaptation to laying eggs into the not fully closed brood cells of their hosts. Males have 4-8 spines on the last abdominal tergites, which are used as the main diagnostic characters (Westrich 1990, Warncke 1992). Thirteen species have been recorded from the Czech Republic and additional two from Slovakia (Přidal 2004).

Coelioxys alata Förster, 1853 is a Palearctic species with the distribution area reaching Belgium in the west. Banaszak & Romasenko (1998) state that the species is known from Central and Eastern Europe, Siberia and Russian Far East; Celary (1989) and Scheuchl (1996) mention that it occurs between 42° and 62°N in Europe. According to Warncke (1992), the distribution area reaches southern Finland in the north and Turkey in the south. However, in spite of its large distribution area this species has been considered very rare and its findings have been mostly exceptional and accidental. Check lists of bees in various European countries record only one (Celary 1989) or a few (Monsevičius 2004) specimens. The species is also considered as strongly endangered in Germany (Westrich 1997).

Records of *C. alata* from the Czech Republic and Slovakia have also been very scarce. Kocourek (1989) listed this species from Moravia without any further data; Přidal (2004) adopted this record and provided complete data of the first finding in Slovakia (see below). The species has not been collected in Bohemia so far.

As far as we know, *Coelioxys alata* is a cleptoparasite of two host species: *Megachile ligniseca* (Kirby, 1802) and *Anthophora furcata* (Panzer, 1798) (Celary 1989, Warncke 1992, Scheuchl 1996). Both host species nest in wood; the latter is the only wood-nesting species of that genus in Europe (Westrich 1990).

In this study, data on the distribution of *C. alata* in the Czech Republic and Slovakia with new records from both countries are presented, and the biology of *C. alata* is discussed.

MATERIAL AND METHODS

I have identified all specimens examined (using keys in Warncke (1992) and Scheuchl (1996)) and they are deposited in my private collection. The nomenclature follows Schwarz et al. (1997). The bracketed numbers following each locality represent the grid mapping square code used for the faunistic research in the Czech Republic (Pruner & Míka 1996) and Slovakia (Čepelák et al. 1989).

LIST OF RECORDS

Localities of *Coelioxys alata*

(Fig. 1)

1. Bohemia centr., Hradčany, Bář Nature Monument (5857), sunny slopes with shrubs on arenaceous marl, 30.vii.-12.viii.2003, 1 ♀, caught in Malaise trap, B. Mocek lgt., P. Bogusch det. et coll.
2. Bohemia centr., Dlouhopolsko, wet surroundings of Dlouhopolský rybník pond (5857), 4.viii.2004, 1 ♂, feeding on *Betonica officinalis* L., P. Bogusch lgt., det. et coll.
3. Bohemia or., Hradec Králové, Na Plachtě Nature Monument (5861), central marsh, 5.viii.2004, 1 ♀, feeding on *Lythrum hyssopifolia* L., P. Bogusch lgt., det. et coll.
4. Slovakia or., Remetské Hamre, Zaječí (7199), 20.vii.1966, 1 ♀, M. Kocourek lgt., J. Straka det., coll. M. Schwarz (see also Přidal 2004).
5. Slovakia centr., Muránska planina National Park, Suché Doly National Nature Reserve (7385), meadow in a beech wood, 9.viii.2003, 1 ♀, in Malaise trap, L. Vidlička lgt., P. Bogusch det. et coll.

Megachile ligniseca in localities of *Coelioxys alata*

1. Bohemia centr., Dlouhopolsko, wet surroundings of Dlouhopolský pond (5857), 4.viii.2004, 1 ♂, feeding on *Betonica officinalis* L., P. Bogusch lgt., det. et coll.
2. Slovakia centr., Muránska planina National Park, Suché Doly National Nature Reserve (7385), meadow in a beech wood, 20.vi.2003, 1 ♂, 29.vi.2003, 1 ♂, 20.vii.2003, 2 ♀♀, 27.vi.2003, 2 ♂♂, 1 ♀, 9.viii.2003, 1 ♀, in Malaise trap, L. Vidlička lgt., P. Bogusch det. et coll.

DISCUSSION

I am aware of only three findings of *Coelioxys alata* in Bohemia and one in Slovakia in 2003 and 2004. This may suggest that it is a very rare species in the Czech Republic and Slovakia similar to elsewhere in Europe. However, a species may be marked "very rare" due to inappropriate monitoring methods. Entomological surveys can become biased if only a few

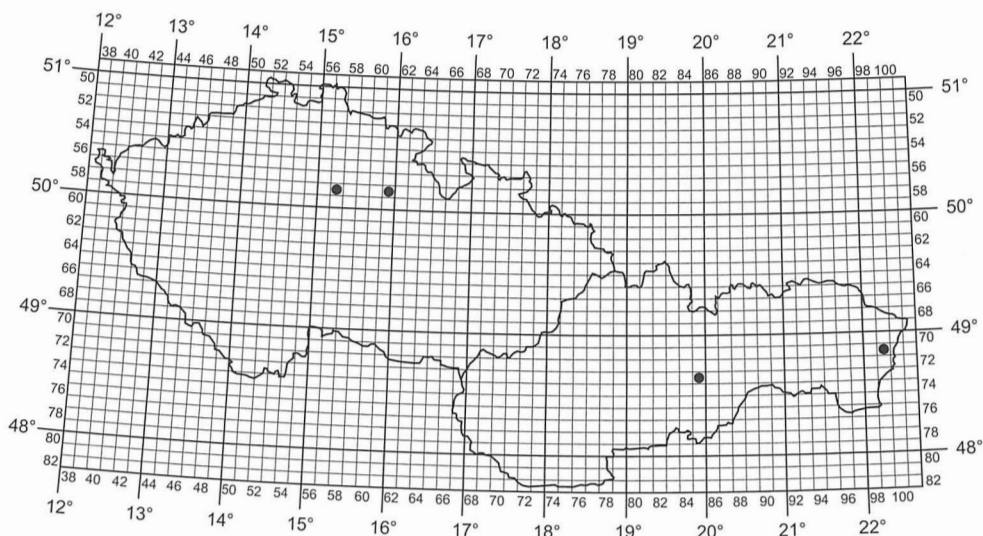


Fig. 1. Distribution of *Coelioxys alata* Förster, 1853 in the Czech Republic and Slovakia.
Obr. 1. Rozšíření druhu *Coelioxys alata* Förster, 1853 v České republice a na Slovensku.

habitat types are screened. The bees are regarded as thermophilous with the center of their diversity in tropical and subtropical regions; only several groups (e.g. the whole tribe Bombini) have the largest diversity in the temperate zone (Michener 2000). Most bee species live in warm, sunlit habitats such as sandy sides, rocky steppes and aeolian sands. Such localities have been thoroughly investigated and have the largest numbers of bee species recorded. However, not many apidologists have collected bees in mountains and mesophytical, submontane regions, and nearly no records come from wetlands and marshes. This inconsistency caused that some species were labelled as “very rare” and “accidentally collected”, e.g. *Hylaeus moricei* (Friese, 1898), *Melitta nigricans* Alfken, 1905, and both Czech species of the genus *Macropis* Panzer, 1809 (A. Přidal, pers. comm.). Another good example is the cuckoo bee *Epeoloides coecutiens* (Fabricius, 1775). In 1930s, this species was regarded as the rarest bee in Central Europe (Schmiedenknecht 1930); nevertheless, new data about its biology show that this species occurs regularly in wet localities (Bogusch 2005).

The same is apparently true to *Coelioxys alata*. In the locality of Na Plachtě Nature Monument, it was collected in a marsh on *Lythrum hyssopifolia*, which is typical for marshes and wetlands. The habitat at Dlouhopolský rybník pond looks very similar and the male collected there was feeding on *Betonica officinalis*, which is also typical for wet meadows and marshes. The major host species of *C. alata*, *Megachile ligniseca*, has been marked as rare as well (Westrich 1990). I have collected it only in wet localities: in the surrounding of the salt marsh near Kamenín in southern Slovakia (Slovakia mer., Kamenín, surrounding of the salt marsh (8177), 1 ♀, 1.vii.2003, P. Bogusch lgt., det. et coll.) and in a sandy side above a floodplain forest near Závěšín in southwestern Bohemia (Bohemia mer., Závěšín (6549), 27.viii.2000, 1 ♀, P. Bogusch lgt., det. et coll.). I suppose that both the solitary bee *M. ligniseca* and its cleptoparasite *C. alata* have been considered as “very rare” because of their occurrence

in marshes and similar wet localities, which are rarely visited by apidologists. I assume that further research in wet localities will bring new data on the distribution of these species.

I could not locate the specimens mentioned by Kocourek (1989) or any material that could have been mentioned by Friese (1895) from Moravia. No other specimens or data from Moravia are apparently known.

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SOUHRN

Druh *Coelioxys alata* Förster, 1853 je jedním z asi 400 druhů tohoto kosmopolitně zastoupeného rodu, na území České republiky se vyskytuje 13 druhů, na Slovensku ještě dva další. Jedná se o kleptoparazitické včely, jejichž samice mají typicky kuželovitě zašpičatělý zadeček, samci mají zadeček na konci otněný. *C. alata* má palearktické rozšíření, vyskytuje

se ve střední a východní Evropě, znám je i ze Sibiře a Dálného Východu. V rámci svého areálu rozšíření je velmi vzácný a nálezy jsou ojedinělé a náhodné. Stejná je situace v České republice, odkud Kocourek (1989) uvádí bohužel bez upřesnění nález z Moravy; Přidal (2004) přináší první údaj pro Slovensko. V Čechách nebyl druh dosud sbírán.

Hostiteli druhu jsou samotářské včely *Megachile ligniseca* (Kirby, 1802) a *Anthophora fuscata* (Panzer, 1798). Oba dva druhy hnízdí ve dřevě.

Druh byl nalezen na třech lokalitách v Čechách: v roce 2003 byla chycena samice do Malaiseho pasti na Přírodní památce (dále: PP) Báň u obce Hradčany ve středních Čechách a v roce 2004 byl nalezen samec 4 km odtud na mokřadu u Dlouhopolského rybníka a samice na PP Na Plachtě v Hradci Králové. Na Slovensku byla v roce 2003 chycena do Malaiseho pasti jedna samice v Národní přírodní rezervaci Suché Doly (NP Muránska planina). Jedná se o druhý nález tohoto druhu ze Slovenska. Ve stejném sběru byl početný hostitel *Megachile ligniseca* (4 samci a 4 samice).

Vysvětlení malého počtu nalezených jedinců druhu *Coelioxys alata* v České republice a na Slovensku může spočívat v preferenci odlišných lokalit než u majoritního počtu našich druhů včel. Většina včel se vyskytuje zejména na teplých lokalitách typu písků nebo skalních stepí, a takovéto lokality jsou také hojně navštěvovány apidology. Zjištěné lokality druhu *C. alata* a jeho hostitele *M. ligniseca* mohou být řazeny spíše do kategorie mokřadů, na kterých nebyly včely nikdy tak intenzivně studovány. Byla pozorována imaga na živných rostlinách: samice *C. alata* na *Lythrum hyssopifolia* L. a samec kleptoparazita i hostitele na *Betonica officinalis* L. Oba druhy živných rostlin jsou typickými druhy vlhkých luk a mokřadů; nálezy včel na jejich květech svědčí o vlhkomilnosti obou druhů včel.