

***Psithyrus flavidus* (EVERSMANN)
(Hymenoptera: Apoidea: Apidae) in Poland**

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Abstract. Information on morphology, distribution and bionomics of *Psithyrus flavidus* (EVERSMANN) are given. Its range and Polish stands are presented. The locality in the Bieszczady Mts. is the first record of the species from Carpathians and the second one from Poland.

Keywords: Hymenoptera, Apidae, *Psithyrus flavidus*, distribution, bionomics, Poland.

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I. INTRODUCTION

Psithyrus flavidus (EVERSMANN) belongs to the subgenus *Fernaldaepsithyrus* FRISON and is the only boreo-montane cuckoo bumblebee in the Polish fauna. It is one of the four species belonging to the subgenus, which occur in Europe (LØKEN 1984).

Female of the *P. flavidus* differs from other members of the subgenus *Fernaldaepsithyrus* by long but not reaching distal margin main keel of mandible, malar space as long as its width, dull scapus, hind tibia and basitarsus with longest hairs in posterior fringe markedly longer than their greatest width, fourth tergite yellow-haired and fifth one black-haired, callosities of sixth sternite without distinct and sharp triangular projection. Male of this species differs from others belonging to the same subgenus by indistinct genal furrow, densely haired scapus, first flagellomere almost as long as third one, fourth tergite with yellow hairs, and by a narrow rounded sixth sternite with an oval or truncate apex.

Data on the bionomics and distribution of the cuckoo bumblebee are scattered in various papers. The present paper summarizes all available information and gives new data on this species.

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II. BIONOMICS

Biology of the cuckoo bumblebee is still very poorly known. Activity of the adult females depends upon climate. In Poland warm spring weather usually wakes up overwintered females of *Psithyrus flavidus* at the end of the first half of May, but in subarctic regions or higher mountains (e.g. Swedish Lapland or Alps) fertilized females emerge from hibernation at the beginning of June (LØKEN 1984). They leave their winter quarters a little later than their hosts. Initially they spend much of their time on flowers, where they eat pollen and nectar. In this time their ovaries develop. Next, females begin to search for nests of hosts. *Psithyrus flavidus* attacks nests (colonies) of *Bombus cingulatus* WAHLBERG, *B. jonellus* (KIRBY), *B. lapponicus* (FABRICIUS) and *B. monticola* (SMITH) (LØKEN 1984). All the invaded species of bumblebees belong to the subgenus *Pyrobombus* DALLA TORRE. Behaviour of the cuckoo bumblebee is similar to the other members of *Psithyrus*. The female of *P. flavidus* enters the young nest of host stealthily. She hides between the cocoons or within the nest material and lies doggo. During this time the female absorbs the characteristic odour of the colony. Sometimes the female of *P. flavidus* seeks out the host queen and kills her. In this case she takes over the nest, lays its own eggs inside cells and let the workers of the host raise her offspring. When she does not sting the host queen right away, she oppresses her, eats the queen's eggs or prevents her from laying more. In the best situation the female of the invader and the queen of the nest get along side by side. Offspring of the cuckoo bumblebee hatch and abandon the nest since beginning or half of July (dependent on region). The males emerge a little earlier than females. Then they mate and the males die after the mating season, while the fertilized females of the cuckoo bumblebee search for a quiet and dry nook (so called hibernaculum) and go into hibernation. In the north and in the mountains the hibernating females live to the end of the first half of August, while the females progeny and males live to the end of the first half of September. In Poland activity of the hibernating females and their adult offspring disappear at the end of July and August respectively.

Psithyrus flavidus similar to other members of the genus is the polyphagous. In the north (Norway) it was observed on flowering willows (*Salix* spp.), buttercups (*Ranunculus* spp.), forest cranesbill (*Geranium sylvaticum* L.), thistles (*Cirsium* spp.), dandelions (*Taraxacum* spp.), and golden rod – *Solidago virgaurea* L. (LØKEN 1984, PITTIONI 1942), while in mountains (Alps) it was noticed on flowers of kidney vetch (*Anthyllis vulneraria* L.), *Leontodon montanus* LAM., some species of thistles (*Carduus personata* (L.) JACQ., *Cirsium spinosissimum* (L.) SCOP. and *C. appendiculatum*), heaths (*Erica* spp.), saxifrage – *Saxifraga aizoides* L. and wild thymes – *Thymus* spp. (BEAUMONT 1958, PITTIONI 1942). The specimen which was found in the Carpathians visited flowering ragwort – *Senecio fuchsii* GMEL.

III. DISTRIBUTION

Psithyrus flavidus (EVERSM.) is the only boreo-montane cuckoo bumblebee in Palaearctic fauna of bees. Range of the species has a very wide subarctic-subalpine disjunction. It inhabits exclusively northern regions of Palaearctic and higher mountains of Europe (Fig. 1). In Scandinavia the *Psithyrus flavidus* occurs from about 59°30'N to the sheltered habitats at the arctic coast (LØKEN 1984). Further range of the species is widespread to eastward throughout northern part of European Russia (Kola Peninsula and Karelia) (PEKKARINEN & TERÄS 1993), Urals and Siberia to the coasts of Pacific Ocean (POPOV 1931). In the Far East it reaches Kamchatka Peninsula, Magadan oblast and northern part of Sakhalin (KUPIANSKAYA 1995). Moreover the *Psithyrus flavidus* lives also in cold habitats of Lithuania and northern regions of Belorussia and Poland (PAWLIKOWSKI 1996). In the south the occurrence of the cuckoo bumblebee is restricted exclusively to mountainous regions of Europe. Till now it was found in the Cantabrian Mts. (Asturias province) in NW Spain (QUILIS 1932), in Piedmont (Ulzio near Susa) in Italy (PAGLIANO 1993), the Pyrenees (PÉREZ 1879,), Karst (Vremšica Mt.) in Slovenia (GOGALA 1999), and in the Alps (BEAUMONT 1958, SCHWARZ et al.

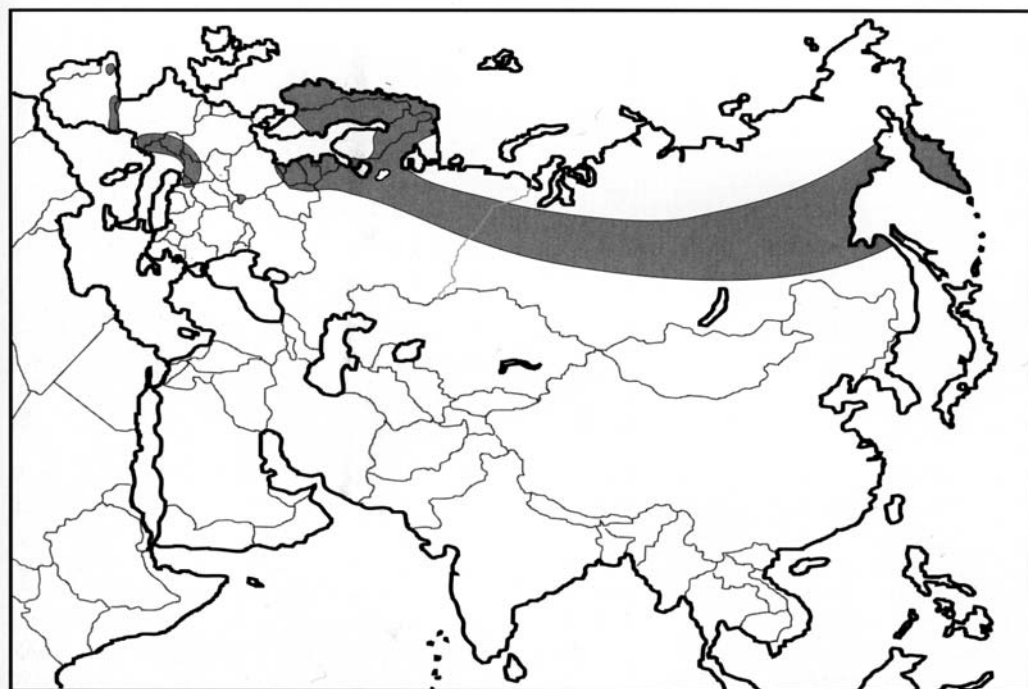


Fig. 1. World distribution of *Psithyrus flavidus* (EVERSMANN)

1996, WARNCKE 1986, WESTRICH 1989). Apart from, in the 40-ties of XX century *Psithyrus flavidus* was recorded from Ulu Dag Mt. in Turkey (PITTIONI 1942), but the stand seems to be doubtful. The cuckoo bumblebee has not been known from Carpathians, but recently it was discovered by the authors in the Bieszczady Mts. The locality is the first record from the whole Carpathians.

IV. STANDS IN POLAND

Until now *Psithyrus flavidus* was known in Poland only from the stand in Borecka Forest (PAWLIKOWSKI 1996). Recently the boreo-montane cuckoo bumblebee was discovered in the Bieszczady Mts. (Fig. 2). Data concerning Polish stands are presented below (each locality has the UTM coordinates).

Material examined. **Masurian Lakeland:** EF70 Leśny Zakątek (Puszcza Borecka Forest), 21 July 1994 – ♂, leg. T. PAWLIKOWSKI. **Bieszczady Mts.:** FV23 Halicz-Krzemień Mt. (1270 m a.s.l.), 3rd August 2000 – ♂, leg. A. KOSIOR.

V. VERTICAL DISTRIBUTION

Depending on the place of occurrence, *Psithyrus flavidus* lives in various altitudes. According to BEAUMONT (1958) and PITTIONI (1942), in the Alps it occurs between 1200 and 2700 m a.s.l. In the Piedmont the cuckoo bumblebee was found on about 1200 m a.s.l. (PAGLIANO 1993), also in the

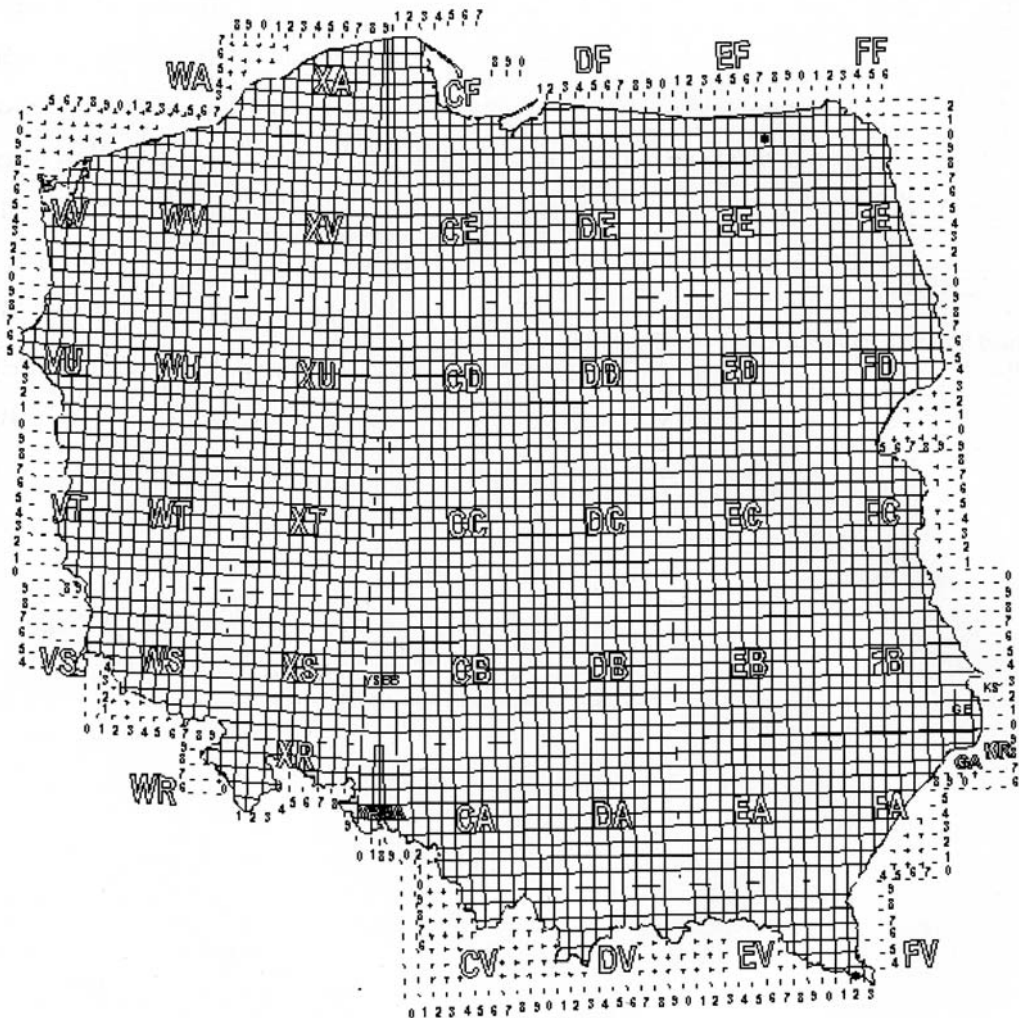


Fig. 2. Localities of *Psithyrus flavidus* (EVERSMANN) in Poland.

Slovenian Karst the species was caught on the similar altitude. In the southern Norway it was recorded up to 1100 m a.s.l. (LØKEN 1984).

In the Polish Carpathians (Bieszczady Mts.) *P. flavidus* was collected on about 1200-1300 m a.s.l.

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