

BEE-SPECIES *COLLETES INEXPECTATUS* NOSKIEWICZ, 1936  
- SPECIES REVOCATA (*HYMENOPTERA: COLLETIDAE*)

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Abstract

PŘIDAL A.: *Bee-species Colletes inexpectatus Noskiewicz, 1936 - species revocata (Hymenoptera: Colletidae)*. Acta univ. agric. et silvic. Mendel. Brun. (Brno), 1999, XLVII, No. 1, pp.: 55-60

*Colletes inexpectatus* Noskiewicz, 1936 - species revocata and *Colletes daviesanus* Smith, 1846 are distinctive species. The revocation is based on the morphology, morphometric indices, faunistics and bionomics. Reliable distinguishing characters in the male sex and additional arguments for revocation are given and discussed.

*Colletes, C. inexpectatus*, species revocata, faunistics

Warncke (1978) regarded *Colletes inexpectatus* Noskiewicz, 1936 as synonymous with *C. daviesanus* Smith, 1846 on the basis of high variability in dotting of the 1st abdomen tergite in *C. daviesanus* between specimens from Central and northern Europe and from southern Europe. He mentioned progressive coarsening of the dotting at an increase of the latitude. That problem have been mentioned yet by Noskiewicz (1936) as well but he have described reliable distinguishing characters in males. However, he wrote that distinguishing of females of both species is difficult and it would be possible only in fresh specimens. He considered the colour of hairs on the head and the thorax as reliable character. The synonymy was accepted differently by the specialist (Lukáš, 1987; Beláková et Lukáš, 1991; Kocourek, 1989; Banaszak, 1991; Schwarz et al., 1996). The aim of this study is to submit direct proofs of necessary revocation of indicated synonymization on the base of morphology, morphometric arguments and the sympatry of both related species including distribution and foraging sources comparison.

MATERIAL AND METHODS

Comparative material has been obtained from following collections: Moravian Museum

Brno (MMB), Dalibor Všíanský (Adamov-CZ), Dr. Bořek Tkalců (Prag-CZ), Deutsches Entomologisches Institute Eberswalde (DEI-Eberswalde), collection of University of Mons-Hainaut in Belgium and the collection of the author (see below). The most material comes from territories of the Czech Republic and Slovakia - i.e. Bohemia, Moravia and Slovakia. Several specimens were collected on territory of Bulgaria, Belgium and Germany. Further, some records of *C. inexpectatus* published by Lukáš (1987), Beláková et Lukáš (1991) were considered. Likewise, records of *C. daviesanus* according to Pádr (1990, 1995) with remarks on its foraging plants were assumed.

*Colletes daviesanus* Smith, 1846

\* **Bohemia or.**, Opatov (6164), 19.vii.1956, 1 male, Svitavy (6264), 5.vii.1956, 4 males, 24.vi.1957, 1 male, Rozhraní (6365), 10.vii.1956, 2 male, E. Staněk lgt., MMB coll.; \* **Moravia occ.**, Sněžné (6362), 23.vii.1990, 5 males, D. Všíanský lgt. and coll.; \* **Moravia centr.**, Adamov-Josefov (6665), 13.vii.1990, 1 male, Blansko (6665), 28.vi.1992, 4 males, Olomučany (6666), 2.vii.1998, 2 males, D.Všíanský lgt. and coll.; 3 males, Olomučany (6666), 19.vii.1998, 5 males, A. Přidal lgt. and coll.; \*

**Moravia or.**, Nivnice (7071), 1 male, 11.viii.1958, Uherský Brod-Havříce (6971), 8.viii.1960, 1 male, Staněk E. lgt., MMB coll.; Svatý Štěpán (6974), 1 male and 2 females, Slavičín (6973), 17.viii.1997, 1 male and 1 female, A. Přidal lgt. and coll.; \* **Moravia mer.**, Břeclav-Pohansko (7267), vi.1990, 1 male, D.Všianský lgt. and coll., Brno-Černá Pole (6765), 3 males, A. Přidal lgt. and coll., Pouzdřany (7065), 17.vi.1966, 1 male, B. Tkalců lgt. and coll.; \* **Slovakia or.**, Kráľovský Chlmec (7598), 30.vi.1960, 2 males; \* **Slovakia mer.**, Fiľakovo (7784), 28.vii.1959, 1 male, Šahy (7979), 12.vii.1968, 6 males, E. Staněk lgt., MMB coll., Štúrovo-Hegyfarok (8178), 12.viii.1976, 1 male, B. Tkalců lgt. and coll.; \* **Germany**, Dachau - Bayern, 3.vii.1963, 1 male, lgt. K. Warncke lgt., Peetzig 2,2km NW, 22.7.1995, Ch. Pietsch lgt., DEI Eberswalde coll.; **Belgium**, Namur Treignes, „Ancienne carrière“ FR1951, 200 m, 22.vii.1991, 2 males, 2 females, *Matricaria maritima*, C. Claessens lgt., Univ. of Mons-Hainaut coll., J. Petit det.; all A. Přidal det.

#### *Colletes inexpectatus* Noskiewicz, 1936

\* **Bohemia centr.**, Praha-Ruzyně (5951), 2.viii.1953, 2 males and 1 female, Z. Pádr lgt.; \* **Moravia mer.**, Čejč (7067), viii.1956, 2 males, M. Kocourek lgt., MMB coll., Pouzdřany (7065), 21.vii.1966, 4 male, B. Tkalců lgt. and coll.; \* **Slovakia mer.**, Hrkovce (7574), 24.vii.1958, 2 males, Fiľakovo (7784), 2.vii.1959, 1 male, 6.viii.1959, 1 male, 12.viii.1962, 3 males, Šahy (7979), 13.vii.1968, 2 males, 31.vii.1968, 1 male, Želiezovce (7977), 18.viii.1966, 8 males, Staněk E. lgt.; Štúrovo (8178), vii.1958, 1 male, vii.1962, 3 males, M. Kocourek lgt., MMB coll.; \* **Bulgaria bor. or.**, Varna-Vladislavovo, 13.vii.1977, 1 male, Varna-Galata, 21.vi.1977, 1 male, B. Tkalců lgt. and coll., all A. Přidal det.

All material was measured with a binocular microscope equipped with an ocular scale. The indices in the male sex were obtained for the 3rd metatarsus and the 2nd tarsalium of the 3rd tarsus such as that difference was described by Noskiewicz (1936). The sizes were measured with fortyfold extension according to Fig. 1b. The obtained data was statistically processed under T-test (Student's distribution) and figured in a chart. The shape of the 7th sternite appendage was compared in both species. The visited plants and distribution were discovered from existing written records.

#### RESULTS

*Colletes daviesanus* (50 males) and *C.inexpectatus* (32 males) were morphologically and morphometrically examined on the mentioned

characters. This characters are figured in Fig. 1a-d. The morphometrical characterizations were put into the chart (Fig. 2). Thereby the risen clusters are completely divided and very distant. Only in the case of the 2nd tarsalium of the 3rd metatarsus was recorded a simple one-pointed touch. However, T-test was highly significant (\*\*\*) for the difference among the measured files.

The appendage of the 7th sternite (a7S) in the both species was completely different without any changeability:

*Colletes inexpectatus* - (Fig. 1d) the lateral projection (A1) of the basal part (A) is significantly elongated up to lateral edge (B1) of the membraneous part (B) of a7S, in the end is broadly rounded. The proximal section of the basal part of (A) a7S is reduced.

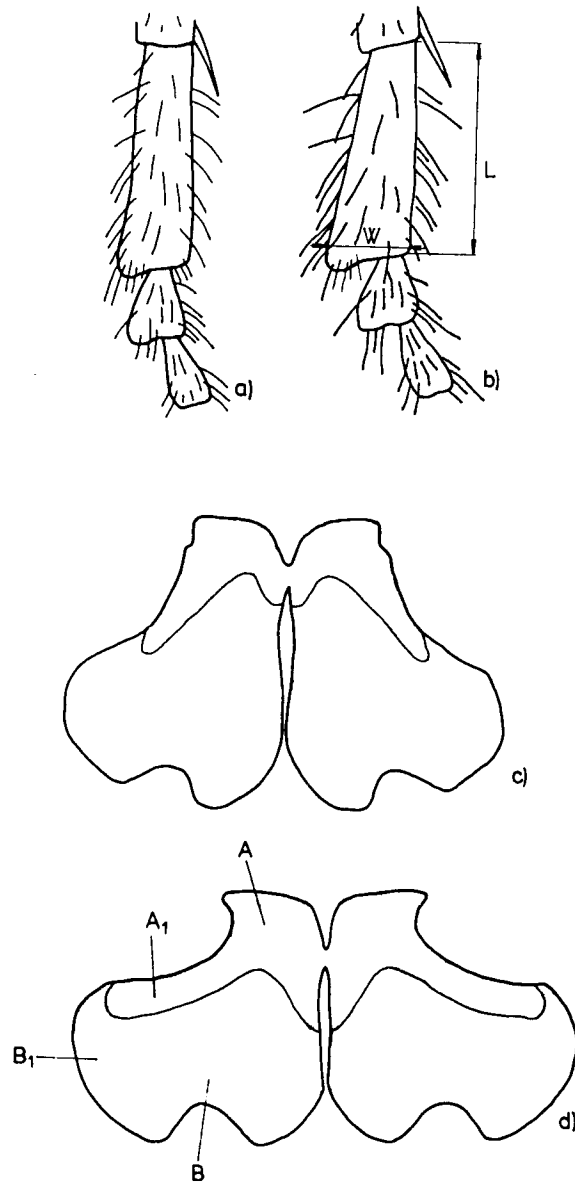
*Colletes daviesanus* - (Fig. 1c) the lateral projection of the basal part is reduced, and therefore does not reach the lateral projection of the membraneous part of a7S at all, at the end it is pointed. The proximal section of the basal part of a7S is strongly developed and is longer than the lateral projection of the membraneous part of a7S.

It is possible to distinguish fresh female specimens according to the colour of hairs. Another distinct character is the dotting in the 1st tergite. But it is rather variable and southern specimens of *C.daviesanus* are really much more coarsely spotted than specimens from the northern habitats.

On the basis of faunistical (in the collections) and literary data (Lukáš, 1987; Beláková et Lukáš, 1991; Pádr, 1990) the distribution of the both species in the Czech Republic and Slovakia was figured (Fig. 3). *C. inexpectatus* was also located in Bulgaria. It was ascertained that both species live in all observed territories (i. e. Bohemia, Moravia and Slovakia). Entirely the same habitat was found (black square) in three cases in the territory of Slovakia (faunistical square). Some inhabited localities neighbour together [for example Praha-Ruzyně (5951) and Praha-Charles University (5952)]. With respect to records of *C.inexpectatus* it must be stated that this species inhabits warm and dry habitats.

According to Noskiewicz (1936), the plants visited by *C.inexpectatus* belong to *Medicago* and *Trifolium* genera (Fabaceae). *C.daviesanus* flights on sources of the Asteraceae family according to Friese (1926), Pádr (1990), Westrich (1990) and coll. of Univ. of Mons-Hainaut as follows: *Achillea filipendulina*, *A. millefolium*, *A. ptarmica*,

*Anthemis arvensis*, *A. tinctoria*, *Erigeron annuus*, *Senecio jacobaea*, *Tanacetum parthenium*, *T. Helichrysum arenarium*, *Matricaria maritima*, *vulgare*, *Tripleurospermum inodorum*.



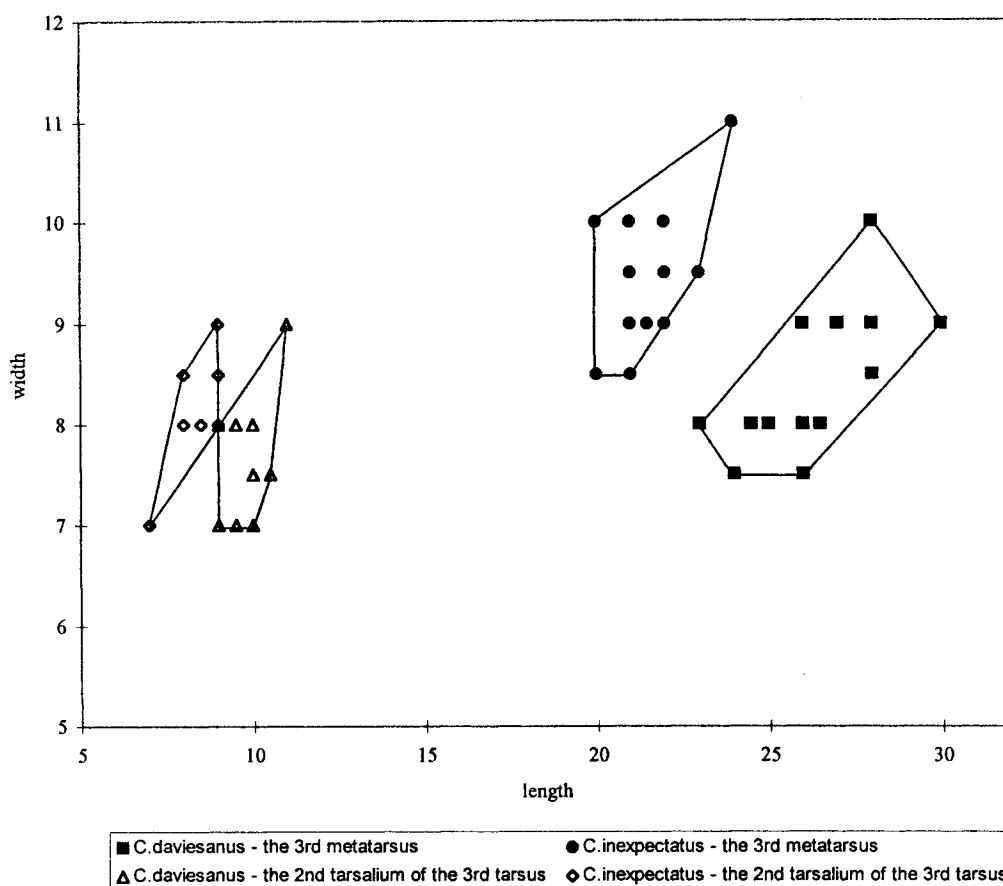
I: a) the 3rd metatarsus in *Colletes daviesanus*; b) the 3rd metatarsus in *C. inexpectatus* with figuration of measured parameters for morfometrical indices; c) the appendage of the 7th sternite in *C. daviesanus* male; d) the appendage of the 7th sternite in *C. inexpectatus* male with description of its parts: A - the basal part, A1 - the lateral projection of the basal part, B - the membraneous part, B1 - the lateral projection of the membraneous part.

#### DISCUSSION

Warncke (1978) confined oneself to only the character of the 1st tergite dotting but it was found as indetermined for synonymization in this study. It is suggested that the form of the 3rd metatarsus of males is reliable for distinguishing of both species (such as Noskiewicz, 1936). The form of the 2nd tarsalium of the 3rd tarsus was

not reliable for distinguishing as it requires "a practiced eye". Noskiewicz (1936) figured the 2nd tarsalium distinctly ampoule shaped but it has not been observed in this study. We imagine it could have been misunderstood in the past. It is possible to find certain differences in rippling of the 2nd-4th sternites but without the possibility of the circumscription of the character. The

character of the appendage of the 7th sternite (Noskiewicz, 1936; or see above for description). can be recommended as completely reliable



1: Dispersion of morphometric indices in *Colletes daviesanus* and *C. inexpectatus*.

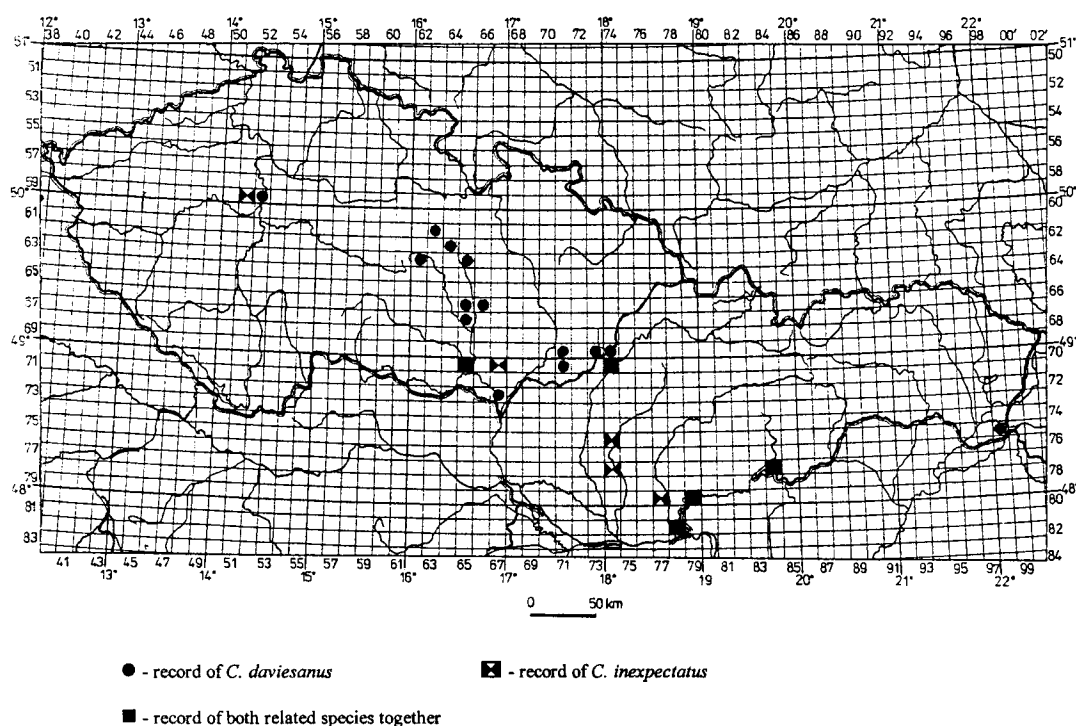
Although, we worked with females of both species we are not able to recommend any reliable characteristic for distinguishing. Noskiewicz (1936) stated as well: "Höchst ähnlich dem Weibchen von *C. daviesanus* Sm. und von diesem nur in ganz frischem Zustande sicher zu unterscheiden." It will be essential to entrap well defined bees directly from the nest when hatching. Probably only thus can be sufficient material gained for the irreversible proof of female origin. We suppose that the 1st tergite could be a hopeful characteristic.

It is evident these species are distinctive and they can't be considered as mere subspecies due to sympatry and different habitat and foraging requirements of both species. Similar results

were given by Schmidt et Westrich (1993). They divided the former species *Colletes succinctus* (auct.) into three taxons (i.e. *C. hederæ*, *C. halophilus* and *C. succinctus*) by explaining their trophic requirements. They showed all these species are valid ones in spite of their difficulties in distinguishing.

Noskiewicz (1936) recorded *C. inexpectatus* in the southern territory of Poland (Lwów - today the Ukraine). This area is very warm. Bouček et Šustera (1957) considered *C. inexpectatus* as very rare and warm liking species.

The presented facts call for subsequent observations to deepen the bionomics of *C. inexpectatus*.



2: The distribution of *Colletes daviesanus* and *C. inexpectatus* according to examined specimens and literary data in the Czech Republic and Slovakia (faunistic grid)

#### SUMMARY

*Colletes inexpectatus* Noskiewicz, 1936 - species revocata and *Colletes daviesanus* Smith, 1846 are distinctive species. Reliable distinguishing characters in male sex are as follows: the shape of the 7th sternite appendage and the 3rd metatarsus. Actual distinguishing characters of females are dubious. Both species *C. inexpectatus* and *C. daviesanus* live in close neighbourhood in the Czech Republic and Slovakia. *C. inexpectatus* was also located in Bulgaria. *C. inexpectatus* nests in warm and dry habitats and it visits plants of *Medicago* and *Trifolium* which *C. daviesanus* does not visit.

#### SOUHRN

Samotářská včela *Colletes inexpectatus* Noskiewicz, 1936 samostatný druh  
(Hymenoptera: Colletidae)

*Colletes inexpectatus* Noskiewicz, 1936 - species revocata a *Colletes daviesanus* Smith, 1846 jsou samostatné druhy, což je doloženo morfologicky, morfometricky, faunisticky a bionomicky. Za spolehlivé rozlišovací znaky samců je považován přívěsek 7. sterny a tvar 3. metatarzu. Rozlišení samic je za současného stavu znalostí nejisté. *C. inexpectatus* a *C. daviesanus* žijí na území České republiky a Slovenska v těsné blízkosti. *C. inexpectatus* byl zjištěn také v severovýchodním Bulharsku. *C. inexpectatus* obývá suchá a teplá stanoviště a navštěvuje rostliny rodu *Medicago* a *Trifolium*, na kterých *C. daviesanus* dosud nebyl zjištěn.

*Colletes*, *C. inexpectatus*, species revocata, faunistika

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## DEDICATED TO COMMEMORATION OF MY GRANDMOTHER

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