Original Article

CONTRIBUTION TO BEE FAUNA (HYMENOPTERA: APOIDEA: ANTHOPHILA) OF POLAND. VI. THE GENUS *ANDRENA* FABRICIUS, 1775. PART 2

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Abstract

The paper presents new records of the following six very rare or scarcely recorded species of short-tongued bees of the genus *Andrena* Fabricius, 1775 in Poland: *A.* (*Simandrena*) *congruens* Schmiedeknecht, 1883; *A.* (*Taeniandrena*) *lathyri* Alfken, 1899; *A.* (*Simandrena*) *lepida* Schenck, 1861; *A.* (*Poliandrena*) *polita* Smith, 1847; *A.* (*Suandrena*) *suerinensis* Friese, 1884 and *A.* (*Poliandrena*) *tarsata* Nylander, 1848. This is the second contribution concerning the rare species of the genus *Andrena* Fabricius, 1775 in Poland. The studies were based on museum collections as well as the author's own collections. During the research, approximately 21,000 specimens of mining bees of the genus *Andrena* from Poland were identified representing ninety-five taxa. The species discussed in the paper are known from just a few records in the country. The following information is provided for each species: short diagnosis, remarks on general distribution, bionomics, published records from Poland and confirmed Polish records based on studied collections. The text is accompanied by SEM micrographs showing diagnostic characters and distribution maps.

Keywords: *Andrena*, Andrenidae, Apoidea, bionomics, distribution, Poland

INTRODUCTION

The bees of the genus *Andrena* Fabricius, 1775 are distributed worldwide except Australia. In the Palaearctic 931 valid species belonging to sixty-seven subgenera in the genus *Andrena* are listed by Gusenleitner & Schwarz (2002). In Poland, ninety-five species representing twenty-six subgenera are known so far (Motyka et al., 2018).

The main morphological characteristics distinguishing the andrenid bees from other bees are two subantennal sutures below each antenna and the presence of facial foveae. Apart from that, the andrenid females have scopae on their hind legs and on trochanters which help in collecting pollen from flowers. Most *Andrena* species are solitary bees, although a few species are communal. Andrenids nest in sandy and sunny areas, on fields, paths, clearings as well as edges of forests (Osytshnjuk et al., 2005, 2008). The bees of the genus *Andrena* are effective pollinators of many fruit trees, bushes and crop plants (Ruszkowski et al., 1999a, 1999b, 2000a, 2000b, 2000c).

In Poland the bees of the genus *Andrena* were studied mainly by Dylewska (1987a, 1987b, 2000). In the key to identification of Polish

species she listed ninety-three species known to the fauna of Poland and also included forty-one other andrenid taxa, which were not confirmed in the country (Dylewska, 2000). In recent years, some new works related to this family have been published. Nevertheless, Dylewska's contribution to the development of research on the andrenid bees in the Central Europe was substantial. The aim of the paper is to provide data on the distribution of six rare species of the genus *Andrena* in Poland and summarize information about their bionomics and general distribution.

MATERIAL AND METHODS

The studies were carried out during the years 2010-2015 mostly as a part of the PhD thesis by E. Motyka, one of the authors, in the entomological collections of the following institutions:

- Museum and Institute of Zoology, Polish Academy of Sciences in Warszawa, Research Station Łomna-Las (specimens collected mostly by Marian Bielewicz, Paul Blüthgen, Robert Wilhelm Grünwaldt, Tomasz Huflejt, A. R. Paul and G. Schröder),
- Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Kraków (main collectors: Mirosława Dylewska, Waldemar Celary, Paweł Łoziński, Jan Zabłocki and Antoni Wierzejski),
- Natural History Museum of Wrocław University, Wrocław (collections of Rudolf Dittrich and Jan Noskiewicz),
- Upper Silesian Museum in Bytom (main collectors: Edmund Broczkowski, Roland Dobosz, Eberhard Drescher, Franz Kirsch, Jan Kowalewski, Hans Nowotny and Waldemar Żyła).

Specimens from some private collections were also studied, most of which were collected during the years 2000-2010. The bees were identified and the data from the labels were stored in a database. The information about distribution and bionomics of mining bees was also gathered from published papers e.g. Dylewska, 2000; Osytshnjuk et al., 2005, 2008; Falk, 2015 and the occurrence of the species in European countries may be found in Scheuchl & Willner, 2016. For each species, the information of known Polish localities is presented with the UTM coordinates. Distribution in Poland is also shown on maps, each with symbols representing various types of records:

- published ones – taken from available papers,
- confirmed published ones – when we could verify voucher specimens of published studies,
- unpublished records – based on studied material in various collections, apparently not published earlier.

The zoogeographical partitioning of the regions of Poland follows the one used in the Catalog of Polish Fauna (Burakowski et al., 1978). SEM images were taken at the Laboratory of Scanning Electron Microscopy, Museum and Institute of Zoology, Polish Academy of Sciences, Łomna (Hitachi S-3400N).

Abbreviation used in the text are:

NP – National Park [e.g. Ojców NP = Ojców National Park]

LP – Landscape Park [e.g. Bolimów LP = Bolimów Landscape Park]

* – missing data, e.g. day, month or year.

IUCN categories of threat are given after Nieto et al. (2014).

RESULTS

Systematic part

During the research, about 21,000 specimens of mining bees of the genus *Andrena* from Poland were identified. Later in the paper, information about six either very rare or scarcely recorded species in the country is presented.

Subgenus: *Simandrena* Pérez, 1890

Andrena congruens Schmiedeknecht, 1883

Diagnosis

In females: hind tibiae in the lower part not broadened. In males: tergites sparsely punctated, delicately shagreened; gonostyles are pubescent and broadened (Fig. 1).

Distributed in Europe except its northern regions, as well as in Anatolia, Asia Minor, Ural Mts and the Caucasia (Amiet et al., 2010);

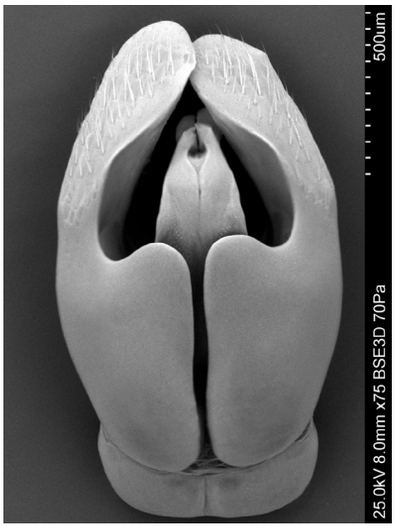


Fig. 1. *A. congruens*, male genitals (SEM)

recorded also from the UK (Falk, 2015; Scheuchl & Willner, 2016). Bivoltine: the first generation occurs in May and June, the second in July and August (Dylewska, 2000); in Western Europe the first generation is on wing in April (Amiet et al., 2010; Falk, 2015; Scheuchl & Willner, 2016). The bee prefers open habitats with flowering meadows of the order *Arrhenatheretalia elatioris* (Dylewska & Wiśniowski, 2003) but also inhabits other grassland areas and forest edges. Polylectic species; collects pollen from flowers of the following plants: *Cirsium* sp., *Eryngium campestre*, *Libanotis montana*, *Melilotus* sp., *Potentilla tabernaemontani*, *Prunus spinosa*, *Ribes uva-crispa*, *Salix* sp., *Stellaria media*, as well as flowers of the carrot family (Apiaceae), and *Rubus* sp. (Dylewska, 2000; Celary & Wiśniowski, 2003; Falk, 2015). Nests in sparsely vegetated ground, sometimes in large aggregations (Falk, 2015). The cuckoo bee *Nomada zonata* Panzer, 1798 is listed as the kleptoparasite in the nests of *A. congruens* (Celary, 1995).

Published records (Map 1): **Wielkopolska-Kujawy Lowland** (XU20 Poznań – Banaszak-Cibicka & Banaszak, 2011), **Kraków-Wieluń Upland** (DA16 Ojców NP – Dylewska, 1987b, 1988; Celary & Wiśniowski, 2003. DA14 Skołczanka reserve – Banaszak et al., 1998), **Świętokrzyskie Mts**. (EB03 Cząstków, Skały – Dylewska & Bąk, 2005), **Western Beskidy Mts**. (DV77 Młodów – Dylewska, 1987b), **Eastern Beskidy Mts**. (EV37-38 Magura NP – Wiśniowski & Werstak, 2009), **Bieszczady Mts**. (FV04, FV14 Bieszczady NP – Celary & Wiśniowski, 2003), and **Pieniny Mts**. (DV57 Gorge near Wysoka Mt., Nanowe, Pieniński Potok Valley, Sromowce Niżne – Dylewska, 1987b).

Verified published records (Map 1): **Kraków-Wieluń Upland** (DA16 Ojców NP: Ojców, 23.VI.2002 – 1♀; DA16 Grodzisko-Ciche Rocks, 5.VII.2002 – 2♀♀, leg. B. Wiśniowski), **Eastern Beskidy Mts**. (Magura NP: EV37 Ciechania, 14.V.2005 – 2♂♂; EV37 Żydowskie, 13.V.2005 – 2♂♂; EV38 Kolanin Mt, 14.V.2005 – 2♂♂; EV37 Ożenna, 3.VIII.2006 – 2♀♀ and 6♂♂, leg. B. Wiśniowski), and **Bieszczady Mts**. (FV04 Bieszczady NP: Wetlina, 17.VII.1999 – 2♀♀ and 20.VII.2000 – 1♀; FV14 Ustrzyki Górne, 7.VI.1999 – 1♀, leg. B. Wiśniowski).

Map 1. Distribution map of *A. congruens* in Poland: □ – published records; ■ – verified published records; • – unpublished records.

Unpublished records (Map 1): **Wielkopolska-Kujawy Lowland** (XU20 Poznań, 4.*.* – 1♂, ex coll. R. Dittrich), **Małopolska Upland** (DA78 Gacki by Bogucice, 19.VI.2008 – 1♂, leg. B. Wiśniowski), **Lublin Upland** (EB68 Męćmierz, 7.VIII.2010 – 1♀, leg. W. Celary), and **Eastern Beskidy Mts**. (Magura NP: EV38 Świątkowa Wielka, 14.VII.2005 – 1♂, leg. B. Wiśniowski).

Remarks: The present status of threat in Europe is unknown. Category LC according to IUCN Red List (Europe). Scarce in UK with records confined to southern UK (Falk, 2015). Widely distributed in Germany but very rare and lacking in large

areas (Scheuchl & Willner, 2016). Polish records mainly in uplands and mountains in the south-eastern part of the country. In Polish mountains collected by one of the authors (BW) up to 700 m a.s.l. in Magura NP and in Bieszczady. Listed as VU [vulnerable] in the 'Red list of threatened animals in Poland' (Głowaciński, 2002).

Subgenus: *Taeniandrena* Hedicke, 1933
***Andrena lathyri* Alfken, 1899**

Diagnosis

In both sexes: clypeus flattened, concave in the middle. In females: pygidium with deep notch; basal area of labrum wide, merges with labrum. In males: gonocoxites elongate and sharpened; edeagus widened (Fig. 2).

This species is distributed in most of Europe,

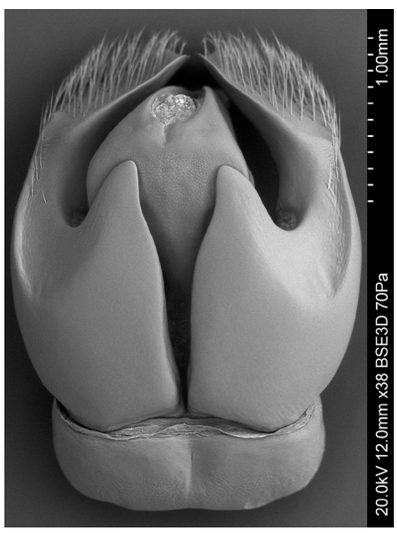


Fig. 2. *A. lathyri*, male genitals (SEM)

up to 61°N in Scandinavia but also reported from Turkey (Amiet et al., 2010) and the Far East (Scheuchl & Willner, 2016). Univoltine. The bees fly from May till the mid of June (Dylewska, 2000). The species prefers calcareous areas with Fabaceae plants, inhabits also forest edges. Nests are dug in light soils, usually solitarily or in small aggregations. Oligolectic species: collects pollen from flowers of the Fabaceae family, e.g. *Vicia* sp. and *Lathyrus* sp. Other plants may be visited for nectar, e.g. *Ajuga reptans*, *Geranium sylvaticum*, *Symphytum* sp., *Thymus* sp., *Trifolium* sp. (Dylewska, 1966; Falk, 2015; Scheuchl & Willner, 2016). The cuckoo bee *Nomada villosa* Thomson, 1870 is the kleptoparasite in the nests of *A. lathyri* (Amiet et al., 2010).

Published records (Map 2): **Pomeranian Lakeland** (XA81 Sulęczyno, XA82 Sierakowice – Alfken, 1909. WV58 Karlino – Blüthgen, 1919. XV52 upper part of the river Łobżonka valley – Torka, 1933), **Masurian Lakeland** (EF70 Puszcza Borecka – Krzysztofiak & Pawlikowski, 1995. FE38 Wigry NP – Banaszak & Krzysztofiak, 1996), **Wielkopolska-Kujawy Lowland** (WU46 Osiek – Torka, 1913. WU14 Gorzów Wielkopolski – Banaszak, 2006), **Lower Silesia** (WS87 Legnica – Dittrich, 1903), **Kraków-Wieluń Upland** (DA16 Ojców NP: Prądnik Valley – Dylewska, 1987b, 1988), **Małopolska Upland** (DC14 Wzniesienia Łódzkie LP – Szczepko & Bartos, 2007. DC04 Wzniesienia Łódzkie LP: Byszewy – Kowalczyk et al., 2009), **Świętokrzyskie Mts**. (DB93 Bieliny Poduchowne; EB03 Nowa Słupia – Dylewska & Bąk, 2005), **Sandomierz Lowland** (FA12 Węgierka, FA44 Nowa Grobla – Banaszak, 1973. FA12 Węgierka – Banaszak, 1984. DA95 Konary – Dylewska, 1987b), **Eastern Sudety Mts.** (XR87 Prudnik – Torka, 1925), **Western Sudety Mts**. (WS75 Myślibórz – Dittrich, 1903), **Western Beskidy Mts**. (CV99 Zawoja-Wilczna – Dylewska, 1966. DV19 Raba Wyżna – Dylewska, 1987b), and **Eastern Beskidy Mts**. (FA01 Babice, FA11 Krzywcza – Banaszak, 1984).

Verified published records (Map 2): **Kraków-Wieluń Upland** (DA16 Ojców NP: Prądnik Valley,

Map 2. Distribution map of *A. lathyri* in Poland: □ – published records; ■ – verified published records; • – unpublished records.

11.V.1968 – 1♀, leg. M. Dylewska), **Świętokrzyskie Mts**. (DB93 Bieliny Poduchowne, 27.V.1983 – 1♂, leg. M. Dylewska), **Sandomierz Lowland** (DA95 Żabno-Konary: 10.VI.1966 – 1♀, leg. M. Dylewska), **Western Sudety Mts**. (WS75 Myślibórz: 28.V.1882 – 1♂, ex coll. R. Dittrich), and **Western Beskidy Mts**. (CV99 Zawoja-Wilczna: 29.V.1963 – 1♂, 1.VI.1964 – 1♂, leg. M. Dylewska. DV19 Raba Wyżna: 19.V.1921 – 1♂, coll. J. Noskiewicz).

Unpublished records (Map 2): **Pomeranian Lakeland** (VV71 Szczecin: Puszcza Bukowa, 10.V.1932 – 1♀, leg. A. R. Paul), **Upper Silesia** (CA48 Bytom-Dąbrowa Miejska, 13.VI.1932 – 1♂, leg. H. Nowotny. CA48 Segiet reserve, 7.VI.2011 – 1♂, leg. W. Żyła. CA57 Bytom: 10.VI.1932 – 1♀, 20.V.1937 – 1♀, 4.VI.1942 – 2♀♀, leg. F. Kirsch. CA57 Chorzów: open air museum, 25.V.2001 – 1♂, leg. W. Żyła), **Kraków-Wieluń Upland** (DA16 Ojców NP: Sąspów Valley, 18.V.2003 – 1♂, leg. B. Wiśniowski), **Małopolska Upland** (DA69 Polana Polichno reserve, 15.V.2008 – 1♀, leg. B. Wiśniowski), **Sandomierz Lowland** (EA85 Wola Mała by Łańcut: 8.V.2010 – 1♀, leg. T. Huflejt), and **Eastern Beskidy Mts**. (FA31 Skarpa Jaksmanicka reserve: 2.V.2014 – 1♀, leg. B. Wiśniowski).

Remarks: The present status of threat in most European countries unknown. Category DD according to IUCN Red List (Europe). In UK possibly extinct (Falk, 2015). In the Czech Republic occurs only locally, vulnerable species (Macek et al., 2010). In north-western Germany no current records (Scheuchl & Willner, 2016). *A. lathyri* was recorded in more than half of the zoogeographical regions in Poland, but quite much of the data is outdated. Current records come mainly from southern part of the country, and single localities are known from other areas. Listed as VU [vulnerable] in the 'Red list of threatened animals in Poland' (Głowaciński, 2002).

Subgenus: *Simandrena* Pérez, 1890
***Andrena lepida* Schenck, 1861**

Diagnosis

In females: punctures on tergites in comparison to *A. combinata* smaller; surface of clypeus without grooves. In males: face covered with black hair; genitals as figured on Fig. 3.

Distributed in Western Palearctic except its northern regions; recorded also from southern UK and Latvia (Scheuchl & Willner, 2016). Bivoltine: the first generation occurs from the end of April till the beginning of June, the second in July and August (Dylewska, 2000). Prefers sunny and dry areas and forest edges (Scheuchl & Willner, 2016). Probably polylectic species; collects pollen from flowers of the Brassicaceae and Rosaceae families; other plants may also be visited for nectar (Dylewska, 2000; Scheuchl & Willner, 2016). So far, no data on nesting and kleptoparasites is available.

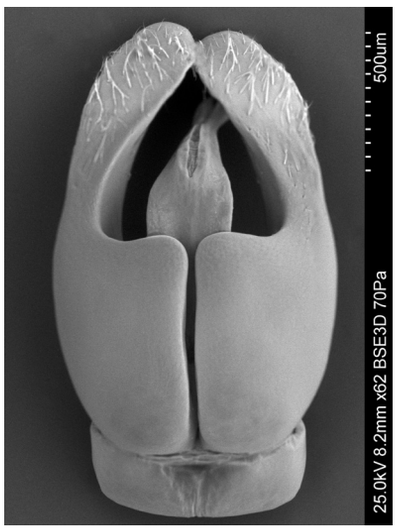


Fig. 3. *A. lepida*, male genitals (SEM)

Map 3. Distribution map of *A. lepida* in Poland:
□ – published records; ■ – verified published records;
• – unpublished records.

Published records (Map 3): **Pomeranian Lakeland** (CE21 Ostnicowe Parowy Gruczna reserve – Pawlikowski & Hirsch, 2002; Banaszak et al., 2006), **Wielkopolska-Kujawy Lowland** (CD63 Włocławek, XU79 Nakło nad Notecią – Torka, 1913. CD28 Rzęczkowo, CD29 Unisław Pomorski, CD56 Ciechocinek-Raciążek – Pawlikowski & Hirsch, 2002. CE10 Kozielec reserve – Banaszak et al., 2006), **Kraków-Wieluń Upland** (DA24 Kraków – Noskiewicz, 1924), **Małopolska Upland** (CC93 Łódź: Botanical Garden – Kowalczyk & Kurzac, 2005; Kowalczyk et al., 2008. DA68 Nadnidziański LP – Bąk-Badowska, 2012), **Świętokrzyskie Mts**. (EB22 Opatów – Drogoszewski, 1936. DB94 Bodzentyn – Dylewska & Bąk, 2005. DB73 Chęcińsko-Kielecki LP, DB92 Cisowsko-Orłowiński LP, DB93 Świętokrzyski NP – Bąk-Badowska, 2012), and **Lublin Upland** (FB71 Tomaszówka – Dylewska, 1987b).

Verified published records (Map 3): **Pomeranian Lakeland** (CE21 Gruczno: 27.V.2001 – 1♀, leg. J. Wendzonka).

Unpublished records (Map 3): **Lower Silesia** (BA89 Gogolin: 30.IV.1928 – 1♂, leg. H. Nowotny), **Upper Silesia** (CA57 Bytom-Szombierki: 9.VIII.2003 – 1♂, leg. W. Żyła), **Kraków-Wieluń Upland** (DA14 Sudół Dominikański: 30.V.1942 – 1♂, ex coll. J. Zabłocki. DA24 Kraków: 10.VIII.1940 – 1♂, leg. J. Zabłocki), and **Małopolska Upland** (DA69 Góry Pińczowskie Zachodnie: 9.VII.2007 – 1♀, leg. B. Wiśniowski. EB00 Szydłów, 19.VIII.2005 – 1♀, leg. W. Celary).

Remarks: The species is rare in most of Europe, and probably extinct in Germany (Scheuchl & Willner, 2016), the UK (Falk, 2015) and Switzerland (Amiet et al., 2010). Category DD according to IUCN Red List (Europe). In this context the present records of the species in Poland are of great value. Known localities of the species in Poland are distributed similarly to *Andrena potentillae* Panzer, 1809 (Motyka et al., 2018), and it seems that also *A. lepida* migrates mainly along valleys of big rivers, including the Vistula and Odra and their tributaries. Critically endangered species, although in the 'Red list of threatened animals in Poland' listed as VU [vulnerable] (Głowaciński, 2002). More observations are needed to assess the actual status of threat of the species.

Subgenus: *Poliandrena* Warncke, 1968
***Andrena polita* Smith, 1847**

Diagnosis

In both sexes: tergite II brown. In females: basal area of labrum trapezoidal. In males: clypeus black; genitals as figured on Fig. 4.

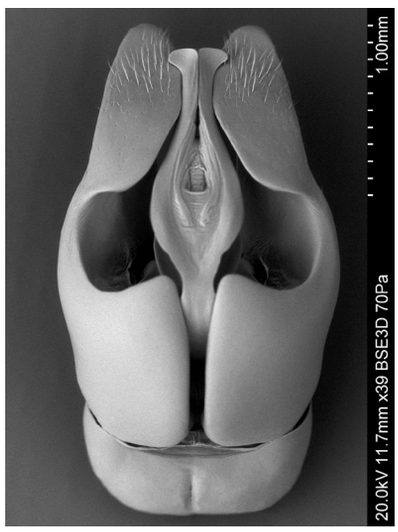


Fig. 4. *A. polita*, male genitals (SEM)

Map 4. Distribution map of *A. polita* in Poland: □ – published records; ■ – verified published records; • – unpublished records.

Distributed in most regions of Europe, except its northern parts; known also from Anatolia and the Caucasia (Amiet et al., 2010). Univoltine. Bees fly from the end of May till the end of August (Dylewska, 2000). The species occurs

in various types of meadows, grassland areas, sand pits, gravel pits and forest edges. Oligolectic species; collects pollen entirely from flowers of the family Asteraceae, e.g. *Cichorium intybus*, *Leontodon* sp., and *Hypochoeris* sp. (Dylewska, 2000). Nests in small aggregations on loessic slopes (Banaszak, 1979; Falk, 2015). The cuckoo bee *Nomada pleurosticta* Herrich-Schäffer, 1839 is known as the kleptoparasite of *A. polita*; probably also *N. mutabilis* Morawitz, 1870 (Amiet et al., 2010).

Published records (Map 4): **Kraków-Wieluń Upland** (DA16 Ojców NP: Grodzisko – Dylewska, 1988, 1991b), **Małopolska Upland** (DA79 Gacki – Banaszak, 1979. EB51 Góry Pieprzowe reserve by Sandomierz – Banaszak, 2003. DA68 Nadnidziański LP – Bąk-Badowska, 2012), **Świętokrzyskie Mts**. (EB22 Opatów – Drogoszewski, 1936), **Lublin Upland** (FB55 Krasnystaw – Kuntze & Noskiewicz, 1938), **Sandomierz Lowland** (FA24 Jarosław – Banaszak, 1979), and **Western Beskidy Mts**. (DV79 Podegrodzie near Stary Sącz, DV86 Żegiestów – Dylewska & Zabłocki, 1972).

Verified published records (Map 4): **Kraków-Wieluń Upland** (DA16 Ojców NP: Grodzisko, 21.VI.1967 – 1♂, leg. M. Dylewska).

Unpublished records (Map 4): **Małopolska Upland** (DA78 Gacki near Bogucice: 3.VII.2008 – 1♂; DA55 Hebdów near Nowe Brzesko: 18.VI.2008 – 2♂♂; DA68 Krzyżanowice reserve: 25.VII.2006 – 1♂, 13.VII.2007 – 3♂♂, 20.VII.2007 – 1♂, leg. B. Wiśniowski).

Remarks: The present status of threat in Europe is unknown. Category LC according to IUCN Red List (Europe). Last record in the UK from 1934 (Falk, 2015); in the Czech Republic only in the warmest regions, single records, vulnerable (Macek et al., 2010); known from southern Germany, northerly up to Mittelgebirge (Scheuchl & Willner, 2016). Known only from south-eastern Poland; recent findings limited to the Małopolska Upland. Listed as VU [vulnerable] in the 'Red list of threatened animals in Poland' (Głowaciński, 2002). As in *A. lepida* more observations are needed to assess the actual status of threat of the species as well as current distribution in the country.

Subgenus: *Suandrena* Warncke, 1968
***Andrena suerinensis* Friese, 1884**

Diagnosis

In both sexes: basal area of labrum triangular. In females: horizontal part of propodeal triangle granulated, with distinct folds. In males: gonocoxites elongate, edeagus wide almost on the entire length, gonostyles narrow (Fig. 5).

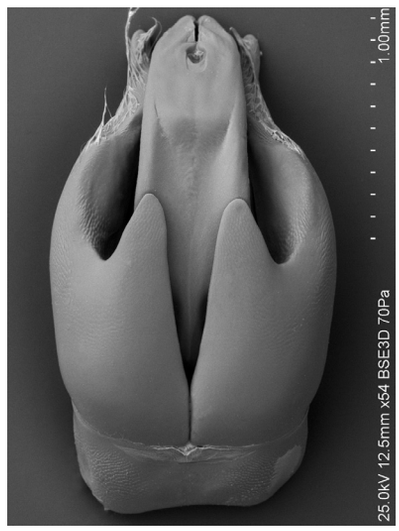


Fig. 5. *A. suerinensis*, male genitals (SEM)

Map 5. Distribution map of *A. suerinensis* in Poland: □ – published records; ■ – verified published records; • – unpublished records.

Distributed from north-west Africa through the temperate and southern zone of Europe to Ukraine, in the north to the Baltic coast in Germany and Poland (Scheuchl & Willner, 2016). Univoltine. Bees on wing from mid-May till mid-July (Dylewska, 2000). Occurs in sunny, sparsely vegetated sandy areas, ruderal

habitats, sand pits, abrupt loessic slopes etc. (Scheuchl & Willner, 2016). Oligolectic species on flowers of plants of the family Brassicaceae, e.g. *Raphanus raphanistrum*, *Sinapis arvensis*, *Sisymbrium* sp. (Dylewska, 2000). Nests in sandy areas and sparsely vegetated slopes (Dylewska, 2000). Kleptoparasites are *Nomada calimorpha* Schmiedeknecht, 1882 and probably *N. fulvicornis schmiedeknechti* Schmiedeknecht, 1882 (Amiet et al., 2010). Adults are sometimes stylopised (Scheuchl & Willner, 2016).

Published records (Map 5): **Pomeranian Lakeland** (CE21 Chełmno, XA81 Sulęczyno – Alfken, 1909. XU59 Radzicz – Torka, 1933. CE21 Gruczno reserve – Banaszak, 1975, 1980, 1982), **Masurian Lakeland** (FE38 Wigry NP – Banaszak & Krzysztofiak, 1996), **Wielkopolska-Kujawy Lowland** (WT39 Gościkowo, WU46 Osiek, XU79 Nakło nad Notecią – Torka, 1913. XT29 Wielkopolska NP: Góry Szwedzkie, Budzyńskie Lake; Puszczykowo – Szulczewski, 1948. CD37 Toruń-Bielany – Pawlikowski, 1985. XT29 Oz Budzyński – Ciercziak et al., 2005. XT26 Turew, XT26 Wyskoć, XU31 Mechowo, XU41 Wierzenica – Banaszak, 1982), **Mazovian Lowland** (DC27 Łowicz – Drogoszewski, 1933. EC09 Warszawa-Białołęka Dworska – Banaszak, 1994. DC36 Bolimów LP: Borowiny – Kowalczyk & Kurzac, 2009. DC79 Kampinos NP: ruderal sites on Kiełpińskie Lake (buffer zone of the Park) – Plewka, 2003; Szczepko & Wiśniowski, 2009.), **Lower Silesia** (XS37 Szewce, XS46 Wrocław-Karłowice – Dittrich, 1903. XS47 Pawłowice – Gabryś et al., 2003), **Małopolska Upland** (CC93 Łódź-Stoki – Banaszak & Kowalczyk, 2007. DC14 Wzniesienia Łódzkie LP – Szczepko & Bartos, 2007. CC93 Łódź – Kowalczyk et al., 2008. DC14 Wzniesienia Łódzkie LP: Brzeziny – Kowalczyk et al., 2009), **Sandomierz Lowland** (FA33 Piaski near Przemyśl – Noskiewicz, 1959b), **Eastern Sudety Mts.** (XR87 Prudnik – Torka, 1925), and **Western Beskidy Mts**. (DV78 Barcice – Dylewska & Zabłocki, 1972).

Verified published records (Map 5): **Lower Silesia** (XS37 Szewce: 25.V.1884 – 1♂; XS46 Wrocław-Karłowice: 19.V.1887 – 1♂, 21.V.1890 – 1♀, ex coll. R. Dittrich), and **Western Beskidy Mts**. (DV78 Barcice: 13.VI.1965 – 1♂, leg. M. Dylewska).

Unpublished records (Map 5): **Wielkopolska-Kujawy Lowland** (XU99 Mochełek: 23.V.1974 – 1♂, ex coll. ISEZ PAN Kraków), **Kraków-Wieluń Upland** (DA08 Ryczów, 19.V.2013 – 1♂, leg. W. Celary), **Małopolska Upland** (DB96 Majków Górki near Skarżysko Kamienna: 1.VI.2001 – 3♂♂, leg. B. Wiśniowski. EB08 Rożki near Radom: 23.V.2010 – 1♂, leg. T. Huflejt. EB41 Samborzec: 30.V.2008 – 3♂♂, leg. B. Wiśniowski), **Sandomierz Lowland** (EA46 Niwiska: 17.VI.2005 – 2♀♀; EA57 Mechowiec: 18.VI.2006 – 1♀, leg. T. Huflejt).

Remarks: The present status of threat in Europe is unknown. Category DD according to IUCN Red List (Europe). In some regions of Germany and Switzerland only historical data (Scheuchl & Willner, 2016). In Poland known from scattered localities in eleven zoogeographical regions, but much of the data is outdated; generally, the species is rarely recorded. Listed as VU [vulnerable] in the 'Red list of threatened animals in Poland' (Głowaciński, 2002). More observations are needed to assess the actual status of threat of the species as well as current distribution in the country.

Subgenus: *Poliandrena* Warncke, 1968
Andrena tarsata Nylander, 1848

Diagnosis

In both sexes: tergite II brown. In females: basal area of labrum curved and flattened (Fig. 6). In males: clypeus partly white, with two brownish maculae; genitals as shown in Fig. 7.

Distributed in temperate and boreal zone of Palearctic, up to 63,5°N in Scandinavia (Scheuchl & Willner, 2016). Univoltine. Bees are on wing from June till August (Dylewska, 2000). *A. tarsata* prefers sparsely forested areas, forest edges, forest clearings, and mountain glades (Dylewska, 2000; Scheuchl & Willner, 2016). Oligolectic species, collecting pollen from flowers of *Potentilla* sp., e.g. *Potentilla erecta* (Dylewska, 2000). Nests in aggregations in various soils. The cuckoo bees *Nomada obtusifrons* Nylander, 1848 and *N. roberjeotiana* Panzer, 1799 are listed as kleptoparasites (Celary, 1995).

Published records (Map 6): **Baltic Coast** (XA24

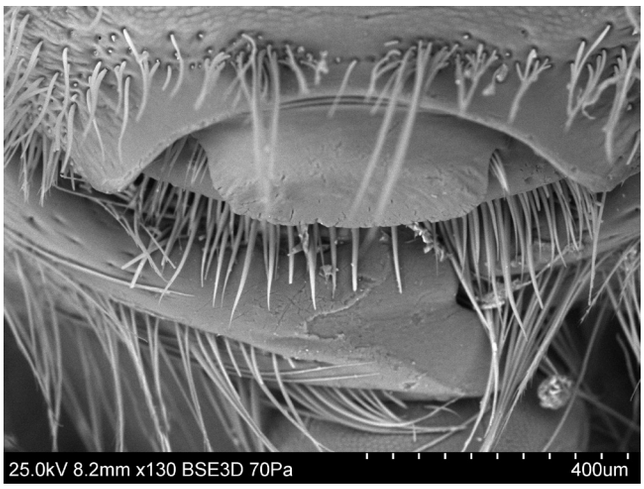


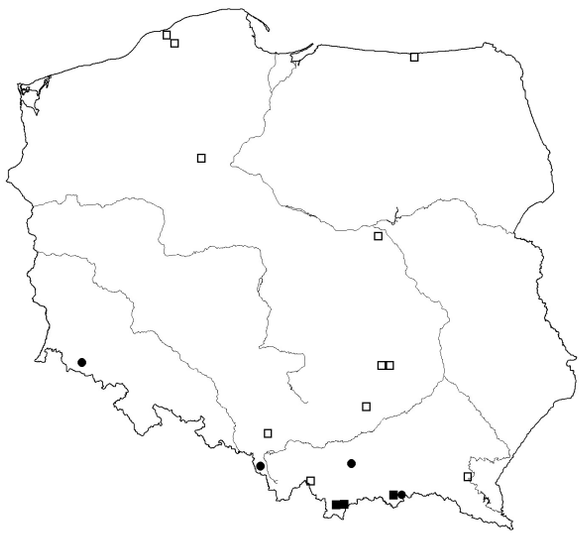
Fig. 6. *A. tarsata*, female: basal area of labrum (SEM)

Fig. 7. *A. tarsata*, male genitals (SEM)

Ustka – Blüthgen, 1919), **Pomeranian Lakeland** (XA33 Słupsk – Blüthgen, 1919), **Masurian Lakeland** (EF31 Mała Guja – Möschler, 1938), **Wielkopolska-Kujawy Lowland** (XU79 Nakło nad Notecią – Torka, 1933), **Mazovian Lowland** (DC89 Kampinos PN: Łąki Strzeleckie – Banaszak & Plewka, 1981; Plewka, 2003; Szczepko & Wiśniowski, 2009), **Upper Silesia** (CA45 Orzesze – Noskiewicz, 1959a), **Małopolska Upland** (DA68 Nadnidziański LP – Bąk-Badowska, 2012), **Świętokrzyskie Mts**. (DB83 Mąchocice, DB93 Święta Katarzyna – Dylewska & Bąk, 2005), **Western Beskidy Mts**. (DV97 Krynica-Zdrój: Krzyżowa Góra Mt – Noskiewicz, 1959a. CV99 Babia Góra: Gubernasówka – Celary, 1998), **Eastern Beskidy Mts**. (EV89 Słonny Wierch Mt near Sanok – Noskiewicz, 1959a), and **Nowy Targ Basin** (DV26 Zakopane – Śnieżek, 1910; Dylewska, 1991a. DV36 Bukowina Tatrzańska – Noskiewicz, 1959a; Dylewska, 1991a).

Verified published records (Map 6): **Western Beskidy Mts**. (DV97 Krynica-Zdrój: 13.VIII.1957 –1♀, ex coll. J. Noskiewicz), and **Nowy Targ Basin** (DV26 Zakopane: 27.VII.1868 – 1♀ and 1♂, ex coll. A. Wierzejski. DV36 Bukowina Tatrzańska: 12-16.VII.1939 – 1♀ and 3♂♂, 22.VII.1939 – 1♀, 23-24.VII.1939 – 1♂, 4.VIII.1939 – 1♂, 22-23. VIII.1939 – 1♀, leg. J. Zabłocki).

Unpublished records (Map 6): **Western Sudety Mts**. (WS43 Jelenia Góra-Sobieszów: 5.VIII.1887 – 1♀, ex coll. R. Dittrich), **Western Beskidy Mts**. (CA31 Goleszów, 23.VI.1997 – 1♂; DA41 Szczyrzyc, 18.VII.1998 – 1♀, leg. W. Celary. EV07 LZD Krynica: Jaworzyna Krynicka, 12.VIII.2006 – 1♀, leg. M. Łuszczak).



Map 6. Distribution map of *A. tarsata* in Poland:
□ – published records; ■ – verified published records;
• – unpublished records.

Remarks: The present status of threat in most European countries unknown. Category DD according to IUCN Red List (Europe). In the UK and Ireland widely recorded but scarce and much declined in many areas (Falk, 2015). Last record from northern Poland was published 80 years ago; information about the occurrence of the species in central Poland are based on specimens collected for about forty years ago. Since the last decade of the 20th century recorded at single localities in uplands and mountains in the southern part of the country.

Listed as VU [vulnerable] in the 'Red list of threatened animals in Poland' (Głowaciński, 2002). As with other species mentioned in the paper, more observations are needed to assess the actual status of threat of the species as well as current distribution in the country.

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