

OCCURRENCE AND CONSERVATION STATUS OF SCOLIA WASPS (HYMENOPTERA: SCOLIIDAE) IN LITHUANIA

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Introduction

Scolia Fabricius, 1775 is a genus of parasitoid wasps, hunting and paralysing the ground-living larvae of beetles from the superfamily Scarabaeoidea.

At the northern border of its European distribution range, the genus is represented by two species, *S. hirta* (Schrank, 1781) and *S. sexmaculata* (O. F. Müller, 1766) (= *S. quadripunctata* Fabricius, 1775). The hosts of *S. hirta* are larvae of *Cetonia*, *Protaetia*, and possibly some other Cetoniidae; reports of Rutellidae hosts (*Anomala* and *Anisoplia*) must be verified (Steinberg, 1962). *S. sexmaculata* is parasitoid of smaller Cetoniidae (mostly *Tropinota*, but also *Oxythyrea*, *Cetonia*, *Protaetia*), occasionally also Rutellidae and Melolonthidae (*Anomala*, *Anisoplia*, *Anoxia*) (Steinberg, 1962).

Both *S. hirta* and *S. sexmaculata* are widespread in neighbouring Poland (Olszewski *et al.*, 2016) and Belarus (Shlyakhtenok, 2013). *S. hirta* is scarce and red-listed in Sweden (Artfakta ArtDatabanken, 2017); it has been recently recorded in Latvia (Piterāns, 2016).

On the base of the first records in 1978–1990 *S. hirta* was included in the Red data book of Lithuania (Budrys, 1992). The species was repeatedly observed in the very south of Lithuania in 1999–2007 (Budrys, 2007a; 2007b).

The objective of this publication is reporting of the new data on *Scolia* wasps obtained in Lithuania since 2007 and an assessment of their conservation status.

Material and Methods

The wasps were collected using entomological net or observed and identified in the field by V. Bačianskas (V.B.), E. Budrys (E.B.), S. Domarkaitė (S.D.), V. Inokaitis (V.I.), R. Kazlauskas (R.K.), E. Komar (E.K.), K. Martinaitis (K.M.), R. Meškys (R.M.), Virg. Monsevičius (V.M.), A. Petrašiūnas (A.P.), I. Savickaitė (I.S.), G. Švitra (G.Š.), V. Uselis (V.U.), T. Ūsaitis (T.Ū.) and E. Žigis (E.Ž.). The collected specimens are preserved in the Nature Research Centre, Vilnius, and Tadas Ivanauskas Zoological Museum, Kaunas.

The species recorded in Lithuania for the first time is marked with an asterisk (*).

List of localities

Locality	Administrative district	Coordinates (LAT, LONG)
Kuodžiai	Lazdijai distr.	53.9425N 23.5761E
Liškiava, 1 km W	Varėna distr.	54.0810N 24.0428E
Mardasavas, S	Varėna distr.	54.1425N 24.3239E
Merkinė	Varėna distr.	54.1579N 24.1847E
Musteika, 6 km SSE	Varėna distr.	53.9081N 24.4094E

Puvočiai	Varėna distr.	54.1140N 24.3049E
Puvočiai env. 1	Varėna distr.	54.1094N 24.3174E
Puvočiai env. 2	Varėna distr.	54.0869N 24.3328E
Senoji Varėna, 3.7 km NE	Varėna distr.	54.2747N 24.5867E
Skroblus river fall to Merkys river	Varėna distr.	54.1094N 24.2767E
Skirgiškės 1	Vilnius distr.	54.8397N 25.3705E
Slišišķiai	Molėtai distr.	55.2877N 25.4644E
Viečiūnai f.	Druskininkai mun.	54.0419N 24.0678E
Viešvilė	Jurbarkas distr.	55.0658N 22.3986E
Žiogeliai	Druskininkai mun.	54.0658N 24.1194E

List of species

SCOLIIDAE

Scolia hirta (Schrank, 1781)

Kuodžiai, 01 08 2017, 1♂ (G.Š.); Mardasavas, S, 07 07 2016, 1♂ (A.P.); Merkinė, 12 07 2008, 1♂ (R.K.); Musteika, 6 km SSE, 10–16 07 2006, 1♀, 07–13 08 2006, 1♀, yellow pan trap (V.M.); Puvočiai, 24 08 2016, 1♀ (E.Ž.); Puvočiai env. 1, 25 08 2017, 1♀ (K.M.); Puvočiai env. 2, 27 08 2016, 1♀ (E.B.); Senoji Varėna, 3.7 km NE, 22 07 2017, 1 spec., 28 07 2017, 3 spec., 05 08 2017, 10 spec. (T.Ū.); Skroblus fall to Merkys, 28 08 2016, 1♀ (I.S.); Slišišķiai, 22 05 2014, 1♂ (E.K.); Skirgiškės 1, 05 09 2010, 1♀ (R.M.); Viečiūnai f., 05 08 2019, 1 spec., 02 08 2017, 25 spec. (V.I.); Viešvilė, 30 07 2014, 1 spec. (V.U.); Žiogeliai, 04 08 2017, 10 spec. (V.B.).

**Scolia sexmaculata* (O. F. Müller 1766)

Liškiava, 1 km W, 30 07 2015, 2♀ (E.B.); Slišišķiai, 26 05 2012, 1♀ (S.D.).

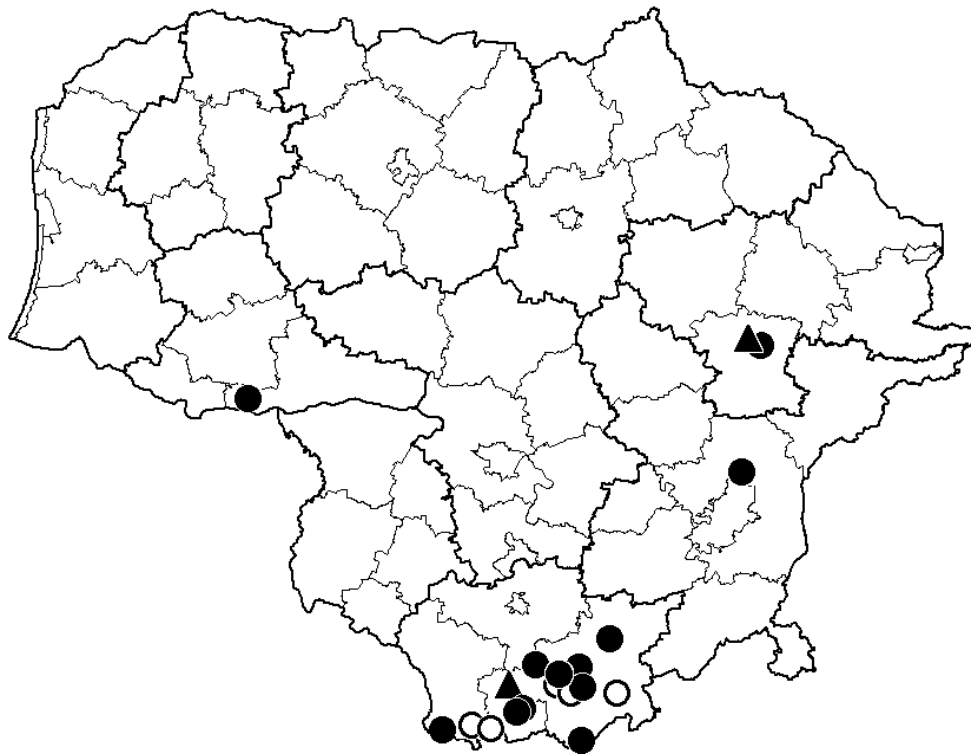


Figure 1. Distribution of *Scolia hirta* (circles) and *S. sexmaculata* (triangles) in Lithuania. Open circles: records of *S. hirta* before 2008; full circles: records of *S. hirta* in 2008–2017.

Discussion

At the northern limit of the distribution range, the populations of *Scolia hirta* survive in sandy xerothermic habitats, particularly in the inland dunes with open *Corynephorus* grasslands and pioneer xeric sand calcareous grasslands (EUNIS habitats E1.9 and E1.12; habitats 2330 and 6120 of the EU Habitat Directive, Annex I) (EEA, 2017). Such early successional habitats naturally occur in pine forest wildfire areas and eroded sandy slopes of continental dunes and river valleys; they are naturally substituted by pine forest or artificially afforested. Thus *S. hirta* is associated with transitional, deficient habitats, negatively affected by human activities. As an easily recognised insect species of a higher trophic level, this wasp is well suitable to serve as an umbrella species and possibly as an indicator of the quality of open xeric grasslands in assessments of conservation status of these habitats.

The available data on distribution of *S. hirta* and the state of the suitable habitats support the conservation status of it in Lithuania as an endangered species with national IUCN category EN B2ab(iii): the extent of occurrence (EOO) is estimated at 18800 km², though the area of occupancy (AOO) within the EOO is estimated at less than 75 km² based on the 2×2 km² grid overlay on the map of observation sites (IUCN, 2012; 2017); the occurrence habitats are severely fragmented and declining due to anthropogenic cessation or suppression of disturbance (pine forest wildfires) and afforestation.

On the other hand, the observations of *S. hirta* during the last decade demonstrate an expansion of the distribution range that may be related either to a higher recording effort or to a recent spreading of the species northwards (Fig. 1). The possible widening or temporary fluctuation of the distribution area may be related to the climate change. Another possible reason is an adaptation to exploit the anthropogenic early successional xeric habitat fragments, such as forest roads, firebreak lines, artificially cleaned open habitats under power transmission lines, military training areas, etc. Some of the recent *S. hirta* observations (e.g. Senoji Varėna, 3.7 km NE; Skirgiškės) occurred in such sites.

The *Scolia* populations in Lithuania may benefit from the trend of climate change that may foster their spreading to the north and growth of their abundance. As a result, the national IUCN category of *S. hirta* may be downlisted in the future.

According to the current number of known occurrence sites, the national IUCN category of *S. sexmaculata* must be considered as vulnerable (VU D2).

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References

- Artfakta ArtDatabanken. 2017. Available from <https://artfakta.artdatabanken.se>. (Accessed November 10, 2017)
- Budrys E. 1992. Gauruotoji skolija. *Scolia hirta* Schrank. In: K. Balevičius (ed.) *Red Data Book of Lithuania. Rare and endangered species of animals, plants and fungi*.

Vilnius, 140.

- Budrys E. 2007a. Gauruotoji skolija. *Scolia hirta* (Schrank, 1781). In: V. Rašomavičius (ed.) *Red Data Book of Lithuania*. Vilnius, 154.
- Budrys E. 2007b. New records of *Scolia hirta* in Lithuania (Hymenoptera: Scoliidae). *New and rare for Lithuania insect species* 19: 67–68.
- EEA. 2017. EUNIS, the European Nature Information System. Habitat types search. Available from <https://eunis.eea.europa.eu/habitats.jsp> (Accessed November 10, 2017).
- IUCN. 2012. Guidelines for Application of IUCN Red List Criteria at Regional and National Levels: Version 4.0. Gland, Switzerland and Cambridge, UK: IUCN. Available from http://cmsdocs.s3.amazonaws.com/keydocuments/Reg_Guidelines_en_web%2Bcover%2Bbackcover.pdf (Accessed November 10, 2017)
- IUCN. 2017. Guidelines for using the IUCN RedList categories and criteria. Version 13. Prepared by the Standards and Petitions Subcommittee. Available from <http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf> (Accessed November 10, 2017).
- Olszewski P., Wiśniowski B., Bogusch P., Pawlikowski T., Krzyżiński M. 2016. Distributional history and present status of the species of the family Scoliidae (Hymenoptera) in Poland and the Czech Republic. *Acta Zoologica Bulgarica* 68 (1): 43–54.
- Piterāns U. 2016. *Scolia hirta* (Schrank, 1781) (Hymenoptera: Scoliidae) – a new family and species in the fauna of Latvia. *Latvijas Entomologs* 53: 129–131.
- Schedl W. 2006. Die Dolchwespen Südtirols (Insecta: Hymenoptera: Scoliidae). *Gredleriana* 6: 343–350.
- Shlyakhtenok A.S. 2013. Annotated catalogue of wasps (Hymenoptera, Apocrita, Aculeata) of Belarus. Minsk, Belaruskaya Navuka, 259 pp. Available from <http://docplayer.ru/45024734-a-s-shlyahtenok-annotirovannyi-katalog-os-hymenoptera-apocrita-aculeata-belarusi.html> (Accessed November 10, 2017) [in Russian]
- Steinberg D. M. 1962. *Fauna USSR, Hymenoptera, vol. XIII, Scoliidae*. Moscow-Leningrad, Acad. Sci. Publishers, 186 pp. [in Russian]

Skolijų (*Scolia*, Hymenoptera: Scoliidae) paplitimas ir apsaugos būklė Lietuvoje

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Santrauka

Pateikiami 2008–2017 m. duomenys apie gauruotosios skolijos (*Scolia hirta*) ir pirmą kart aptiktos dėmėtosios skolijos (*S. sexmaculata*) stebėjimus Lietuvoje. Abi šios rūšys paplitusios Lenkijoje ir Baltarusijoje; gauruotoji skolija 2014 m. pirmą kartą aptikta Latvijoje. Straipsnyje apžvelgta rūšių biologija. Nustatant Raudonosios knygos nacionalinę kategoriją, dėl prierašumo trumpaamžėms buveinėms, patiriančioms neigiamą antropogeninį poveikį, gauruotoji skolija įvertinta kaip nykstanti (EN B2ab(iii)); atsižvelgiant į mažą žinomų populiacijų skaičių, dėmėtoji skolija įvertinta kaip pažeidžiama (VU D2)

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