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***STELIS ACULEATA* – A CLEPTOPARASITIC BEE SPECIES NEW
FOR THE FAUNA OF EUROPE AND NEW FINDINGS OF ITS
PRESUMABLE HOST, *HOPLITIS PRINCEPS* (HYMENOPTERA:
MEGACHILIDAE) IN THE CRIMEA**

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Stelis aculeata is reported from the Crimea as a new species for the fauna of Ukraine and Europe; 18 specimens of this bee species have been collected at the sand spit of Donuzlav Lake. Another rare bee species, *Hoplitis princeps* have been discovered (4 specimens) at the same habitat on the flowers of its forage plant – *Astragalus varius* subsp. *eupatoricus*. *Stelis aculeata* is regarded as a presumable cleptoparasite of *H. princeps*. The importance of psammophytic communities for the conservation of bee and wasp fauna in the Crimea and particularly for such rare species as *H. princeps* and *S. aculeata* is discussed.

Key words: bees, *Stelis aculeata*, *Hoplitis princeps*, Hymenoptera, Megachilidae, new findings, rare species, the Crimea, Ukraine.

INTRODUCTION

The cleptoparasitic bee genus *Stelis* Panzer, 1806 is known in the fauna of the Crimea by nine species which belong to four subgenera according to the system of C. D. Michener [1]: *Stelis (Heterostelis) annulata* (Lepeletier, 1841), *Stelis (Protostelis) signata flavescens* (Friese, 1925), *Stelis (Stelidomorpha) nasuta* (Latreille, 1809), *Stelis (Stelis) breviscula* (Nylander, 1848), *Stelis (Stelis) odontopyga* Noskiewicz, 1925, *Stelis (Stelis) ornatula* (Klug, 1807), *Stelis (Stelis) phaeoptera* (Kirby, 1802), *Stelis (Stelis) punctulatissima* (Kirby, 1802), and *Stelis (Stelis) simillima* Morawitz, 1876 [2]. Six species (*S. s. flavescens*, *S. nasuta*, *S. breviscula*, *S. odontopyga*, *S. phaeoptera*, and *S. punctulatissima*) are quite abundant while three other ones (*S. annulata*, *S. ornatula*, and *S. simillima*) are very rare and have been recorded in the Crimea only 2–3 times. All species of the genus are cleptoparasitic (“cuckoo”) bees which do not build their own nests but lay their eggs into nest cells of other bees in the family Megachilidae [1]. As far as several species of the genus parasitize on rare host species they are much vulnerable in comparison with other rare megachilids. In view of this feature one species of the genus (*S. annulata*) was included to the Red Book of Ukraine as the rare species [3].

The tenth species of the genus *Stelis* was found in the Crimea in June, 2013 and identified as *Stelis (Stelis) aculeata* Morawitz, 1880. This species was not previously known in Ukraine and Europe as a whole [4; 5]. Another rare species of megachilid bees, *Hoplitis (Megalosmia) princeps* (Morawitz, 1872) was found together with *S. aculeata*. This species which was previously known in the Crimea only by two specimens have been proposed to inclusion to the Red Book of the Crimea as endangered species [6].

MATERIAL AND METHODS

The bees of *S. aculeata* and *H. princeps* were discovered at the sand spit of Donuzlav Lake (45°19'01''N, 33°00'13''E). The habitat was covered with psammophytic vegetation with low coverage and predomination of *Artemisia* sp. (*Artemisia campestris* subsp. *inodora* Nyman or *Artemisia arenaria* DC., Asteraceae) and flowering *Astragalus varius* subsp. *eupatoricus* Sytin (Fabaceae) (fig. 1). The number of bee specimens collected here was 18 for *S. aculeata* and 4 for *H. princeps*.

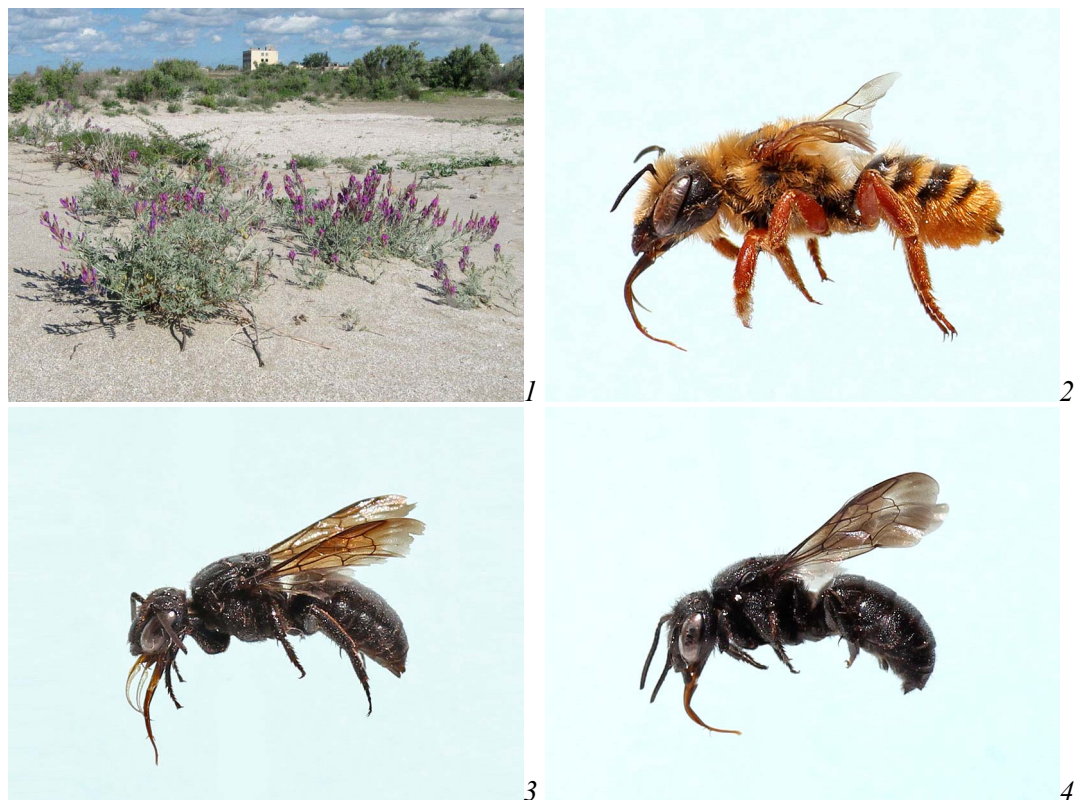


Fig. 1–4. The habitat and collected specimens of *Stelis aculeata* and *Hoplitis princeps*

1 – habitat of the bees at the sand spit of Donuzlav Lake with flowering plants of *Astragalus varius* subsp. *eupatoricus*; 2 – *Hoplitis princeps*, female; 3 – *Stelis aculeata*, female; 4 – *Stelis aculeata*, male.

Collected specimens are deposited in the collections of V. I. Vernadsky Taurida National University in Simferopol (VTNU) and Kharkov Entomological Society in Kharkov (KHES). The collection of I. I. Schmalhousen Institute of Zoology of the National Academy of Sciences of Ukraine in Kiev (IZAN) was also examined for studying old findings of *H. princeps* made in the Crimea.

RESULTS AND DISCUSSION

Stelis (Stelis) aculeata Morawitz, 1880 (fig. 3 and 4)

Material examined. 2♀, 1♂, the Crimea, sand spit of Donuzlav Lake, 01.VI.2013, A. Fateryga (VTNU); *ibid.*, 1♀, 2♂, 01.VI.2013, S. Ivanov (VTNU); 10♂, *ibid.*, 07.VI.2013, S. Ivanov & M. Filatov (5 at VTNU and 5 at KHES); *ibid.*, 1♀, 1♂, 13.VI.2013, S. Ivanov (VTNU).

General distribution. Patchy in central part of Northern Asia (Kazakhstan, Turkmenistan, Tajikistan, Mongolia, Tyva Republic); in the south to NW (37°N, 82°E) and NE China (44°N, 112°E) and in the north to Eastern Siberia (60°N, 100°E); Asia Minor (Turkey, 39°N, 35°E); type locality in NW Mongolia [4; 5; 7]. The new locality (the Crimea, 45°N, 33°E) is the first record of the species in Europe and the most western point in the range of its distribution.

Bionomics. The species is presumably confined to sandy habitats. Imagoes were registered feeding on flowers of *A. varius* subsp. *eupatoricus* (both females and males) and *Cakile euxina* Pobed. (Brassicaceae) (only males). The hosts are unknown. Two females were observed inspecting sand surface with antennae.

Hoplitis (Megalosmia) princeps (Morawitz, 1872) (fig. 2)

Material examined. 1♂, the Crimea, 1928 (IZAN); 1♀, the Crimea, Saki distr., Popovka vill., sea coast, 19.VII.1983, I. Pljushtch (IZAN); 4♀, the Crimea, sand spit of Donuzlav Lake, 07.VI.2013, S. Ivanov & M. Filatov (3 at VTNU and 1 at KHES).

General distribution. Central part of Northern Asia (SW Russia, Kazakhstan, Mongolia); in the south to NW (32°N, 90°E) and NE China (44°N, 112°E) and in the north to Eastern Siberia (60°N, 107°E); East Europe (Hungary, Romania, Ukraine); type locality in Astrakhan Area (Russia) [5; 8–11]. In Ukraine the species is known from the Crimea, vicinities of Kherson and Zaporozhye Area (Sea of Azov near the village of Kirillovka) [12]. All localities where *H. princeps* have been registered in Ukraine are sand spits or sandy sea/river coasts.

Bionomics. The species is strongly confined to sandy habitats. Females collect pollen from the flowers of the plants in the family Fabaceae [9], in the Crimea the specimens were collected also on *A. varius* subsp. *eupatoricus*. One record of the female collecting pollen from unidentified plant of the family Asteraceae is also known [12]. Nesting biology is unknown.

Discussion. *Hoplitis princeps* belongs to the subgenus *Megalosmia* Schmiedeknecht, 1885 of the genus *Hoplitis* Klug, 1807 which is little studied bionomically due to the rarity of its representatives [8]. The range of distribution of the subgenus as a whole is quite similar with one of *H. princeps* [10]. Seven species are known in the subgenus but the nests were described only for *Hoplitis (Megalosmia) fulva* (Eversmann, 1852). According to T. P. Marikovskaja [13] the females of this species build their nests in preexisting cavities in sandy soil and use masticated leaves to construct their cells. It can be speculated that such mode of nesting is characteristic to the subgenus as a whole. Neither cuckoo bees nor other cleptoparasites are unknown for species in the subgenus. The bionomics of *S. aculeata* (i.e., its hosts) is not studied but it can be speculated that they are bees of the subgenus *Megalosmia* of the genus *Hoplitis*, arguing with following:

(i) The females of *S. aculeata* were observed inspecting sand surface in the area where *H. princeps* had been registered, and no other ground nesting bees of the family Megachilidae had been registered there.

(ii) Both *S. aculeata* and *H. princeps* are known in the Crimea only in single and very specific habitat where they are distributed quite locally.

(iii) The range of general distribution of *S. aculeata* can be found within both ones of *H. princeps* and the subgenus *Megalosmia* as a whole.

However, the bionomics of *S. aculeata* as well as the nesting habits of *H. princeps* requires further investigations. At the present it can be only asserted that these species inhabit the sand spit of Donuzlav Lake and adjacent areas (e.g., the village of Popovka) together. And it is also clear that both species can be regarded as vulnerable or endangered. All psammophilous bee and wasp species in the Crimea inhabit sea coasts because the areas with psammophytic vegetation can be found there only near the sea [14]. This means that such species of insects are vulnerable or endangered due to the high recreational load at the sea coasts.

The habitat of *S. aculeata* and *H. princeps* at Donuzlav Lake is also under high level of recreational load. It is important not only for these bees but also for other hymenopterans. Seven species of the wasps and bees included to the Red Book of Ukraine [3] have been also discovered there: *Megascolia maculata* (Drury, 1773) (Scoliidae), *Stizus fasciatus* (Fabricius, 1781), *Stizoides tridentatus* (Fabricius, 1775), *Larra anathema* (Rossi, 1790) (Crabronidae), *Andrena magna* Warncke, 1965 (Andrenidae), *Xylocopa iris* (Christ, 1791), and very rare species *Eucera armeniaca* (Morawitz, 1878) (Apidae). According to these data a reserved area should be created in the part of the sand spit of Donuzlav Lake but it is hardly probable taking into account the present situation with nature management at this territory.

CONCLUSIONS

1. *Stelis aculeata* is a new species for the fauna of the Crimea, Ukraine and Europe confined to psammophytic habitats. 2. The most probable host of *S. aculeata* is *H. princeps* or bees in the subgenus *Megalosmia* of the genus *Hoplitis* as a whole. 3. Both *S. aculeata* and *H. princeps* are vulnerable or endangered species due to their habitat which is important for conservation of psammophilous bee and wasp fauna but can be found under a high level of recreational load.

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Повідомляється про знахідку в Криму *Stelis aculeata* – нового виду для фауни України і Європи; 18 екземплярів цього виду бджіл було зібрано на піщаній косі озера Донузлав. Інший рідкісний вид бджіл, *Hoplitis princeps* був виявлений (4 екземпляри) у цьому ж місцезнаходженні на квітках його кормової рослини – *Astragalus varius* subsp. *eupatoricus*. *Stelis aculeata* розглядається як імовірний клептопаразит *H. princeps*. Обговорюється актуальність охорони псамофітних угруповань в Криму для збереження фауни бджіл та ос, зокрема таких рідкісних видів, як *H. princeps* і *S. aculeata*.

Ключові слова: бджоли, *Stelis aculeata*, *Hoplitis princeps*, Hymenoptera, Megachilidae, нові знахідки, рідкісні види, Крим, Україна.

Фатерыга А. В., Иванов С. П., Филатов М. А. *Stelis aculeata* – клептопаразитический вид пчел, новый для фауны Европы, и новые находки его предполагаемого хозяина, *Hoplitis princeps* (Hymenoptera: Megachilidae) в Криму // Экосистемы, их оптимизация и охрана. Симферополь: ТНУ, 2013. Вип. 8. С. 61–65.

Сообщается о находке в Криму *Stelis aculeata* – нового вида для фауны Украины и Европы; 18 экземпляров этого вида пчел было собрано на песчаной косе озера Донузлав. Другой редкий вид пчел, *Hoplitis princeps* был обнаружен (4 экземпляра) в этом же местообитании на цветках его кормового растения – *Astragalus varius* subsp. *eupatoricus*. *Stelis aculeata* рассматривается как предполагаемый клептопаразит *H. princeps*. Обсуждается актуальность охраны псамофитных сообществ в Криму для сохранения фауны пчел и ос, в частности таких редких видов, как *H. princeps* и *S. aculeata*.

Ключевые слова: пчелы, *Stelis aculeata*, *Hoplitis princeps*, Hymenoptera, Megachilidae, новые находки, редкие виды, Крим, Украина.

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