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New records of the tribe Osmiini from Northern Africa (Hymenoptera: Megachilidae)

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Abstract
This short note presents five newly recorded species of the tribe Osmiini from two Northern Africa countries: Egypt and Libya. The present article represents a first contribution of a series of more extensive studies on wild bees of Egypt and Libya, aimed to record further species not yet mentioned for these two countries, as well as to potentially discover even new species to Science.

Key words: Osmiine Bees, Diversity, Biogeography, *Hoplitis*, *Protosmia*, Egypt, Libya.

Introduction

The Mediterranean region is one of the most important ecozone in term of high wild bee diversity due to the high floral diversity and optimal weather conditions (Varnava et al. 2020). Despite considerable importance of these insects for ecosystems and food production, there is a very poor knowledge of the biodiversity, community structure, and ecology of the wild Apoidea of the eastern North Africa (Libya and Egypt). This is mainly due to the lack of research specifically dedicated to this group in the mentioned countries, chiefly across different and more promising natural and seminatural habitats of this southern Mediterranean region (Eradley et al. 2006; Shebl et al. 2021). Northern Mediterranean areas were, in fact, much more intensively and extensively studied than the southern ones, and because of this condition, we could expect in the latter the discovery of much more species than thus far officially recognized. The osmiine bees (within the family Megachilidae) count 20 genera and over a thousand described species worldwide (Michener 2007). This group has been found in all continents except Antarctica, Australia and South America, and it is mainly diversified across the Mediterranean areas and the surrounding eremic and suberemic biomes. Osmiine generally exhibit rather narrow host plant specializations, although some species are polylectic such as those in the genus *Protosmia* Ducke, 1900 (Müller 2015).

The Middle East is one of the richest regions in osmiine bee species diversity but it is not well studied taxonomically, with many expected undiscovered species (Ungricht et al. 2008). Twenty additional species of wild bees were recently recorded from Sardinia with one new record of osmiine (Nobile et al. 2021). The most extensively studied country of Northern Africa is Morocco, where 67 additional species have been recently recorded, indicating that the Moroccan osmiine bee diversity could be distinctly higher than the 148 species listed in a recent compilation (Lhomme et al. 2020). In fact, fourteen new species were described very recently from the same Morocco (Müller 2022a). Two preliminary surveys on wild bees' fauna of Egypt have been recently published (Shebl et al. 2013, 2015), including some data on Osmiini. In this short paper, we recorded two species of the genus *Hoplitis* Klug, 1807 new for Egypt, other two new for Libya, and one species of the genus *Protosmia* Ducke, 1900 new fror Libya.

Material collection and identification

Several bee species were collected by sweep net from two main areas, Al-Hawaria and Borg el Arab in the western part of Egypt, and Al-Jabal Al Akhdar, Northeastern Libya. Few individuals of bees were collected and killed in normal cyanide jars, pinned and stored in wooden boxes

at the Dep. of Plant Protection, Fac. of Agriculture, Suez Canal University and Alexandria University. Labels containing the collecting time and date, area of collection and scientific name of the host plant were attached to the specimens. Species have been sent for identification to Andreas Müller at ETH Zurich, Institute of Agricultural Sciences, Zurich, Switzerland.

The studied material is now preserved at the entomological collection of the Dep. of Applied Entomology and Zoology, Fac. of Agriculture, Alexandria University, Alexadria, Egypt.

New records from Egypt

Family Megachilidae is one of the most diverse family in Egypt, locally represented by several genera (Shebl et al. 2013; Shebl et al. 2015). Fourteen species of the genus *Hoplitis* are recorded and known for this country: *Hoplitis* (*Anthocopa*) *bidentata* (Morawitz 1876), *H.* (*Alcidamea*) *contracta* (Walker 1871), *H.* (*Hoplitis*) *fertoni* (Pérez 1890), *H.* (*Pentadentosmia*) *helouanensis* (Friese 1899), *H.* (*Hoplitis*) *jheringi* (Ducke 1898), *H.* (*Anthocopa*) *ligurica* (Morawitz 1876), *H.* (*Anthocopa*) *longispina* (Pérez, 1895), *H.* (*Anthocopa*) *nigrocolor* (Van der Zanden 1991), *H.* (*Annosmia*) *peralba* Van der Zanden 1992, *H.* (*Anthocopa*) *praestans* (Morawitz, 1893), *H.*(*Anthocopa*) *pulchella* (Pérez 1895), *H.* (*Annosmia*) *sordida* (Benoist 1929), *H.* (*Anthocopa*) *tergestensis* (Ducke 1897) and *H.* (*Alcidamea*) *tridentata* (Dufour & Perris 1840) (Grace 2010; Ascher & Pickering 2020). The present note is the first step towards a more extensive wild bee survey, addressed in particular to the least explored western areas of the country (Shebl et al. 2013, 2015), to refine the wild bee checklist of Egypt, and to improve available information on their local nesting biology and ecology. Probably also some undescribed species might be found in the country, taking into account that a series of new Egyptian species have for example been recently discovered and described within the genus *Megachile* Latreille, 1802 (Praz et al. 2021).

Hoplitis (*Pentadentosmia*) *moricei* (Friese, 1899)
Material examined: 2 ♀ and 2 ♂; **EGYPT:** Alexandria, Borg el Arab, Al-Hawaria, 30°57'13''N / 29°40'27''E, *Ocimum basilicum* (Labiatae),16/6/2021, Leg. F. Ramadan.
Distribution: Spain, Morocco, Algeria, Tunisia, Egypt (**new record**), Palestine, Jordan, United Arab Emirates, Pakistan, India. No available information about nesting biology (Müller 2022b).

Hoplitis (*Hoplitis*) *zonalis* (Pérez, 1895) ·
Material examined: 1 ♂; **EGYPT:** Alexandria, Borg el Arab, Al-Hawaria, 30°57'13''N / 29°40'27''E, *Enarthrocarpus lyratus* (Brassicaceae), 9/4/2021, Leg. F. Ramadan.
Distribution: Morocco, Algeria, Tunisia, Egypt (**new record**) and Palestine. Nest in sandy soil (Müller 2022b).

New records from Libya

Libyan bee fauna didn't receive much attention as neighboring countries, so only little information is known on local wild bee diversity and biology. Few studies were published recently on Libyan bees of genus *Xylocopa* (Almabrouk & Bataw 2019) and on some Megachilids (Almabrouk et al. 2022). Five species of the genus *Hoplitis* were known from this country: *H*. (*Hoplitis*) *adunca* (Panzer 1798), *H*. (*Anthocopa*) *bisulca* (Gerstaecker1869), *H*. (*Anthocopa*) *nigrocolor* (Van der Zanden 1991), *H*. (*Anthocopa*) *pulchella* (Pérez 1895) and *H*. (*Anthocopa*) *quadrispina* (Tkalcu 1992) (Grace 2010; Ascher & Pickering 2020). The genus *Protosmia* was not recorded so far from Libya.

Hoplitis (*Alcidamea*) *limassolica* (Mavromoustakis, 1937)
Material examined: 1 ♀; **LIBYA:** Al-Jabal Al Akhdar, El- Humry, 32°38'46''N / 21°47'36''E, 9/5/2019, Leg. E. Bufliga.
Distribution: Tunisia, Libya (**new record**), Jordan, Turkey, Cyprus. Nest in plant stem (Müller 2022b).

Hoplitis (*Hoplitis*) *insularis* (Schmiedeknecht, 1886)
Material examined: 1 ♂; **LIBYA:** Al-Jabal Al Akhdar, Susa, 32°49'28''N / 21°31'26''E, 12/3/2021, Leg. E. Bufliga.
Distribution: Mediterranean species; Italy, Spain, Morocco, Algeria, Tunisia, Libya (**new record**). No available information about nesting biology (Müller 2022b).

Protosmia (*Protosmia*) *exenterata* **(Pérez, 1895)**
Material examined: 1 ♀; **LIBYA:** Al-Jabal Al Akhdar, Salion, 32°45'90''N / 21°36'72''E, 2/5/2019, Leg. E. Bufliga.
Distribution: Mediterranean species; Italy, France, Spain, Portugal, Morocco, Algeria, Tunisia, Libya (**new record**). Nest in cavities (Müller 2022b).

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