



New Record of Soft-Winged Flower Beetles, *Malachius Scutellaris* Erichson, 1840 (Coleoptera: Melyridae: Malachiinae) From Erbil Governorate, Kurdistan, Iraq

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Abstract

A new record of soft-winged flower beetles, the *Malachius scutellaris* Erichson, 1840, is described for the first time in Erbil governorate, Kurdistan, Iraq. The specimens were collected from the *Silybum marianum* (L.) flowers, *Malva pusilla* Sm., and *Cardaria draba* (L.) using an air net. The main characteristics of the species include mandibles with bidentics of equal length. The dark-brown antennae consist of 10 antennomeres, of which the 1st - 4th antennomeres are cup-shaped, while the 5th - 10th are almost tubular. The 9th antennomere is 1.1 times as long as the 10th, elytra pale brown, with one-fourth of the basal part black. The protarsus is five-segmented, of which the 1st to 4th segments are nearly serrate-shaped, and the 5th tubular-shaped, 1.2 times longer than the 2nd, with the eighth abdominal sternite black and triangular-shaped; the posterior margin has profound medial margination. The eighth abdominal tergite is black and rectangular, with the posterior margin somewhat emarginate medially. The aedeagus is tubular-shaped, slightly curved, with a spear-like apical part. The habitus and the photos of essential parts were taken, and the sites, dates, and host plants of sample collections were reported.

Keywords: New record, Coleoptera, Melyridae, *Malachius scutellaris*, Iraq.

تسجيل نوع جديد من الخنافس الزهرية ناعمة الأجنحة، *Malachius scutellaris* Erichson, 1840 (Coleoptera: Melyridae: Malachiinae) في محافظة أربيل، العراق

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الخلاصة

تم تسجيل ووصف نوع جديد من خنافس الأزهار ذات الأجنحة الناعمة لأول مرة في محافظة أربيل كوردستان - العراق Erichson, 1840 *Malachius scutellaris*. تم جمع النماذج من أزهار النباتات، *Silybum marianum* (L.) و *Malva pusilla* Sm. و *Cardaria draba* (L.) وبأستخدام الشبكة الهوائية. تم ذكر الصفات الرئيسية للنوع وهي الفكوك العلوية ذات سنين متساويتا في الطول. اللامس بني داكن اللون يتكون من 10 عقل، العقل 1 - 4 فنجاني الشكل والعقل 5-10 أنبوبي الشكل تقريبا. طول العقلة 9 بقدر 1.1 طول العقلة 10. الأجنحة الغمدية بنية فاتح - بنية اللون، الربع القاعدي منها سوداء اللون. تحتوي رسع الأرجل الأمامية خمسة قطع والقطع 1 - 4 منشارية الشكل تقريبا، القطعة الخامسة أنبوبية الشكل طولها 1.2 بقدر طول العقلة الثانية. قص الحلقة البطنية الثامنة سوداء مثلثة الشكل، حافتها الخلفية منعجة كثير عند الوسط. ظهر الحلقة البطنية الثامنة سوداء مثلثة الشكل، حافتها الخلفية منعجة قليلاً عند الوسط. القضيب أنبوبي الشكل منحني قليلاً وجزءها القمي رمحي الشكل. تم تصوير الجسم والأجزاء المهمة منها.

كلمات مفتاحية: تسجيل جديد، غمدية الأجنحة، *Malachius scutellaris*; Melyridae، العراق.

Introduction

The soft-winged flower beetle belongs to the Melyridae family, which is considered the largest group of the Cleroidea superfamily. It involves approximately 300 genera and 5500 species and is found in all regions worldwide (10). In addition, Malachiinae is an important subfamily worldwide, with all the species distributed in the Palaearctic region, East Asia, Madagascar, Japan, and China, Baltic states, except for New Zealand (1, 7, 9, 13 and 14). The *Malachius* Fabricius, 1775, might be deemed a significant genus belonging to the Malachiinae subfamily (3). This researcher found insect fragments in the guts of adults belonging to several species. However, *Malachius scutellaris* Erichson, 1840 is considered the rarest species of this genus. Furthermore,

many species of this family are elongate-oval and soft-bodied beetles, some are patterned in brown and black, red or yellow, and some melyrids possess an unusual orange structure along the sides of the abdomen (2 and 12). Adults are ordinarily observed on flowers, as they feed on pollen, which is reportedly herbivorous. At the same time, the larvae may be predacious or saprophagous (4, 7 and 11) and are mainly predators, occurring in different habitats but most generally in soil, under bark, or leaf litter. They may also be considered scavengers (5). Hatch (6) provides a key to the species in the Pacific Northwest. The study's primary purpose was to conduct a comprehensive survey of the beetle species in various areas in Erbil governorate, Kurdistan Region, Iraq, using specimen samples from flowers of different plants and then describing and photographing the most important parts, particularly the male genitalia.

Materials and Methods

The specimens were obtained from March to June 2021 on the flowers of *Silybum marianum* (L.), *Malva pusilla* Sm, and *Cardaria draba* (L.) in different areas of Erbil governorate, Kurdistan region, Iraq, using an air net. Eight specimens (5 males and three females) were placed in boiled water for 10-15 minutes to soften their parts. The head and abdomen were separated, placed in 10% potassium hydroxide solution, and put in a water bath for approximately 10-15 minutes. The samples were placed in distilled water for about 2-3 minutes to balance the alkali. The parts were put in ethyl alcohol 25% and prepared for the binocular microscope. The measured proportions of body parts were obtained by an eyepiece linear micrometer in a binocular microscope (8). while the species were identified using the keys provided by Hatch (6). The photos of important parts were taken with a digital camera (UCMOS series microscope camera).

The specimens were deposited at the Insect Museum in the Department of Plant Protection at the College of Agricultural Engineering Science, Salahaddin University, Erbil.

Results and Discussion

***Malachius scutellaris* Erichson, 1840**

Description (Male):

Body (Fig. 1a): Oval, brown-to-dark brown, 6.5-7.7 mm long and 2.6-2.9 mm wide.

Head: Oval, black. The length is 1.4 -1.7 mm, and the width is 1.5- -1.8 mm. Eyes prominent, rounded, and dark brown. Vertex black, slightly convex, deep black setose and fine punctate. Coronal suture exists, and Frons is black, somewhat concave, with fine punctate and deep black setose. Clypeus somewhat concave, rectangular, fine punctate, and sparsely black setose. Labrum (Fig.1b) is nearly globular, pale yellow, length 0.2-0.4 mm, sparsely pale yellow setose, posterior margin slightly concave with a row of short, pale brown setae. Mandible (Fig.1c) brown - dark brown, length 0.5-0.8 mm, bidentics equal in length, scrob sparsely long brown setose, molar area bare. Maxilla (Fig.1d) length 0.8-1.1 mm, brown - dark brown, cardo triangular, stipes rectangular, distal part of galea triangular, sparsely brown setose, low sclerotized, lacinia brown, apical part membranes densely yellow short setose, membranous, apical

part densely short dark yellow setose, galeas brown, apical part densely long dark yellow setose, four maxillary palps segmented, 1st – 3rd segments nearly cup-shaped, 2nd segment 2.3 times longer than the 1st; while 1.3 times longer than the 3rd ones, 4th segment elongated oval, 1.3 times longer than 3rd segment. Labium (Fig.1e) length 0.3-0.5 mm, dark brown, labial palp three-segmented, 1st and 2nd segments triangular, 2nd segment 1.3 times longer than 1st, 3rd segment cylindrical, 1.2 times longer than the 2nd. Antennae (Fig.1f) length 3.2-3.6 mm, dark brown, consist of 10 antennomers, 1st - 4th antennomeres are cup-shaped, 1st antennomere 3.2 times longer than the 2nd, 5th - 10th antennomers are nearly tubular shaped, 5th - 9th antennomeres are almost equal in length, 9th antennomere 1.1 times longer than the 10th.

Thorax: Pronotum (Fig.1g) black, rectangular, length 1.8-2.2 mm, and the width 2-2.4 mm; with two marginal reddish brown triangular spots at both sides from the middle down to the apical angles, anterior margin of pronotum straight, surface deep black setose; and the posterior margin somewhat concave; angles of both anterior and posterior are rounded, prosternum black, rectangular, sparsely black setose, procoxal cavity open, and anterior margin of prosternum straight; and prosternal process roughly trapezoidal; while, scutellum triangular, black and surface lightly fine punctate.

Elytra (Fig.1h) reddish brown, length 4.5-5.3mm, one-fourth of apical part black, surface deep black setose, also fine punctate. Epiplural black with short black setae. Also, hind wing brown and veins black - brown, radial cell dark brown, oval, wedge cell elongated oval, strongly curved, medium spur vein short, approaching near the posterior margin of the wings; and both Mp3 and Mp4-cu1 veins expanding to the wing posterior margin. Forelegs forecoxa elongated oval shaped, brown-black, fore trochanter oval, and fore femur cylindrical, protibia tubular, length 1.3-1.5 mm, and 1.2 times longer than the femur, surface sparsely black setose. Protarsus five-segmented, 1st – 4th segments serrate-shaped, 5th tubular, and 1st segment 1.1 times longer than 2nd, while 2nd segment 1.1 times longer than 3rd segment, 5th segment 1.2 times longer than first segment. Fore claw short and moderately curved; middle legs similar to fore legs, excluding coxa oval, trochanter elongated and oval, mesotibia 1.3 times longer than femur, 5th segment of mesotarsal 1.3 times longer than 1st segment. Hind legs similar to fore legs, except the metacoxa is triangular-shaped, the metatibia is 1.3 times longer than the femur, and the trochanter is elongated and oval.

Abdomen: Oval, consisting of six visible segments, length 5.1-5.7 mm, black, surface densely black setose. 1st - 4th abdominal sternites rectangular and approximately of the same length. 5th sternite cup-shaped and 1.2 times longer than the 4th one, anterior margin somewhat concave. 6th abdominal sternite oval and 1.2 longer than the 5th segment, anterior margin somewhat concave, posterior margin roughly straight. Eighth abdominal sternite (Fig.1i) length 0.4-0.6 mm, triangular shaped, black, posterior margin with a profound medial margination, and with the posterior edges forming almost a right angle, surface middling dense of yellow fine setae and finely punctate. 1st to 5th abdominal tergites transverse and 6th tergite cup-shaped. Eighth abdominal tergite (Fig.1j) black, length 0.5-0.7 mm, rectangular and 1.3 times wider than long, posterior margin somewhat emarginate medially, and its apodemes moderately long, surface with evenly dense yellow fine brown setae.

Male genitalia: In dorsal view (Figs 1, 1k), the aedeagus is simple, brown-dark brown, and shaped. In lateral view (Fig. 1l), slightly curved, length 1.2-1.5mm, apical part spear-like, basal hood nearly hook-shaped. Tegmen (Fig. 1m) pale yellow, square-shaped, 1.6 times wider than long, slightly emarginated in the middle, with long, thin-thick appendages.

Female: Similar to the male except it is longer, more robust, and between 6.7– 8.2 mm long.



Figure 1: *Malachius scutellaris* Erichson, 1840.

a. Habitus (6X), b. Labrum, c. Mandible, d. Maxilla, e. Labium f. Antenna, g. Pronotum, h. Elytra, i. 8th abdominal sternite, j. 8th abdominal tergite, k. Aedeagus with tegmen, l. Aedeagus, m. Tegmen.

Scale bar: b, c, e = 0.2; d, l, j, k, l, m = 0.5mm; f, g, h = 1mm.

Conclusions

A new record of soft-winged flower beetles, *Malachius scutellaris* Erichson, 1840, was defined for the first time in Erbil governorate, Kurdistan, Iraq. The antenna was dark brown and consisted of 10 antennomeres, the elytra were pale brown, and the protarsus was five-segmented, with the posterior margin having profound medial margination. The eighth abdominal tergite was black, rectangular, and the posterior margin somewhat emarginate medially. The aedeagus was tubular-shaped, slightly curved, and the apical part was spear-like.

Supplementary Materials:

No Supplementary Materials.

Author Contributions:

Author 1: methodology, writing—original draft preparation; Author 2: methodology (sample collections and measurements); and Author 3: writing—review and editing. All authors have read and agreed to the published version of the manuscript.

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Not applicable.

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Data available upon request.

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The authors declare no conflict of interest.

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