

DESCRIPTION OF THE MINT LEAF BEETLE, *CHRYSOLINA HERBACEA*
(DUFTSCHMID, 1825) (COLEOPTERA: CHRYSOMELIDAE) FROM KURDISTAN
REGION– IRAQ

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ABSTRACT

The present work includes a detailed description of the mint leaf beetle, *Chrysolina herbacea* (Duftschmid) from Kurdistan Region– Iraq. The specimens were collected from the mint leaf during January to June of 2021. The taxon is easily distinguishable, where the labrum is dark green, and transverse oval shaped, slightly emarginated at the middle. Mandibles are asymmetrical, and apical part of left mandible is bidenticates. Fourth segment of maxillary palps cylindrical, as long as third segment. Antenna dark brown and filiform, reaching to the 1/3 of elytra base. Tegmen distinctly Y-shaped. Median lobe is sword shaped and acute at the apical part.

Keywords: Coleoptera, Description, *Chrysolina herbacea*, Chrysomelidae, Kurdistan Region, Iraq

INTRODUCTION

Chrysomelidae commonly is known as leaf beetles and are the second largest family of phytophagous Coleoptera, and it is widely distributed worldwide with over 55,000 species in 17 families and more than 2,500 genera (Cox, 1976; Booth *et al.*, 1990; Gruev, 1992). Adult and larval feed on all sorts of plant tissue, and all species are fully herbivorous. Many are serious pests to cultivated plants, and some of them are regarded as pests in agriculture and forestry (Warchałowski 2003; Özdikmen and Aslan, 2009). *Chrysolina* Motschulsky, 1860 is a very large and diverse genus of the family. Most species are distributed in Europe, Asia, with a small number of species inhabiting North America and were introduced to Australia and Africa (Bienkowski, 2001). Kippenberg (2001) reported that the genus consists of approximately 345 species in palearctic region. Bechyné (1952) explained a taxonomical review of the genus and described some new subgenera and species. The genus *Chrysolina* is a very diverse of leaf-beetles consist of nearly 450 species belonging to 65 subgenera that have been identified (Bieńkowski, 2001), and new species are still being described (Ge *et al.*, 2011; Bourdonné *et al.*, 2013; Lopatin, 2014). *Chrysolina herbacea* (Duftschmid) is one of very important species of the genus, as it is a monophagous insect feeding on various Lamiaceae (Mint, pennyroyal), with a preference for the mint plants (Çağrı *et al.*, 2015). Both larvae and adult of the beetles feed on mint

leaves (King, 2015). In Iraq, El-Haidari *et al.*, (1972) recorded three species of the family including *Chrysolina marginata*. Al-Ali (1977) reported 17 species of the family involving two species that belong to the genus; which are *Chrysolina chalcites* (Germ.) and *Chrysolina grata* (Falderman).

The aim of this paper is a detailed description of mint leaf beetle, *Chrysolina herbacea* (Duftschmid) which collected from mint leaf in different areas of Kurdistan Region– Iraq.

MATERIALS AND METHODS

The present paper is based on 50 specimens. The samples of leaf beetle, *Chrysolina herbacea* (Duftschmid) were collected during January to June in some areas of Erbil and Sulimani governorates including (Qushtapa and Benslaw) and (Kalar and Beckrajo); respectively, in Kurdistan region - Iraq.

The specimens were placed in boiling water for 10-15 minutes to soften their parts. Then the parts were separated under dissecting microscope to three parts; head, thorax and abdomen. The head and abdomen were soaked in a beaker contained 10% KOH and placed on fire with shaking for about (10-15) minutes for dissolving of lipids materials of the body and destroying the muscles. After that, the samples were placed in distilled water for 2-3 minutes in order to neutralize the alkali. The parts were placed in ethyl alcohol 25% and dissected under microscope then transferred to ethyl alcohol 50%, 75% and 100%, respectively for two minutes of each concentration for water dehydration. The samples were placed in xylol for two minutes, for translucency. Finally, the parts finely were placed on slides with a drop of DPX solution and covered by cover slides to be prepared slides for examination (Lane and Grosskey, 1993; Mawlood *et al.*, 2016; Abdulla *et al.*, 2020).

The specimens were deposited in the Insects Museum in the Department of Plant protection- College of Engineering Sciences- University Salahaddin-Erbil Governorate Kurdistan region- Iraq.

RESULTS and DISCUSSION

Chrysolina herbacea (Duftschmid, 1825)

Synonyms

Chrysomela herbacea (Duftschmidt, 1825)

Chrysomela menthastri (Suffrian, 1851)

Chrysomela fulminans (Suffrian, 1851)

DESCRIPTION

Body

Oval, strongly convex and shiny metallic green, bronze color with black legs and antennae. Length 6.1-7.5 mm, width 3.7-4.4 mm.

Head

Spherical shaped, metallic green with narrow sparsely setose and by punctate. Eyes black oval strongly prominent. Frons shine green, slightly convex, with moderately dense of punctures near clypeus. Clypeus triangular, shiny black green sparsely punctate. Fronto-clypeal suture smooth. Gena brown, sparsely punctate. Labrum (Fig.1A) dark green, posterior margin slightly emarginated at the middle, surface sparsely setose and punctate. Mandibles asymmetrical, high sclerotized, left mandible (Fig.1B) triangular, apical with two denticles, inner denticles shorter

than the outer, right mandible (Fig.1C) resembling to left mandible except, the apical part with single denticles. Maxilla (Fig.1D) dark brown, high sclerotized; basigalea elongated oval slightly longer than distigalea, apical part of each with dense of long yellow setae, 1st -3rd segments of maxillary palps cup shaped, sparsely dark brown setose, 2nd segment 1.2 as long as 3rd segment, 4th segment broadly oval, obliquely truncate, as long as third segment. Labium dark brown, 2nd segment of labial palp cup shaped, 1.2 times as long as 3rd segment, which are oval. Antenna (Fig.1E) dark brown consist of 11 antennomeres, 2nd antennomere elongated oval, 2.1 times as long as the pedicel and subequal to the 3rd antennomere, 3th -5th antennomeres nearly tubular shaped, 3th antennomere 1.1 times as long as the 4th once, 6th -10th segments cup shaped, 10th segment 1.1 times as long as 9th segment, 11th segment elongated oval 1.2 times as long as 9th.

Thorax

Prothorax shiny metallic green, nearly 1.75x longer than wide and narrower than the elytral base. pronotum convex, shiny black green, transverse, nearly twice longer than wide, anterior and posterior margins moderately curved. Pronotal disc sparsely and unevenly punctured with short pale yellow setae. Lateral margins of pronotum slightly curved, anterior and, posterior angles moderately produced, basal angles sharp. Scutellum triangular, anterior margin straight, apical part rounded, lateral margin curved, surface with high dense of granules. Anterior margin of prosternum slightly straight bear row of short brown setae, prosternal process nearly globular shaped, surface with moderate dense of fine punctures. Elytra (Fig.1F) oval, convex, metallic green, length 4.0-4.6 mm, covered, sparsely punctate; internal border of the lateral margin fringed with short, fine setae near the apex. Epipleura slightly straight, surface with low dense of punctures. Hind wing (Fig.1G) red color, veins yellow, costa short, less than half of subcostal, radius veins incomplete, radial cell triangular shaped, median spur extending to wing margin, cross veins r-m and cu-an absent, veins cu1 present but undivided; vein 2A slightly reduced. Fore legs (Fig.1H) metallic green, forecoxa conical shaped; femur cylindrical with low dense of punctures and short black setae; tibia tubular shaped, slightly longer than femur with short black setae, apical part without spurse; 1/6 of apical part with row of short brown erect spines; Protarsus black consist of five segments, 1st -2nd segments cup shaped, 2nd slightly smaller than the 1st segment, 3rd segment bilobed, 4th segment very small hidden beneath third segment, 5th segment is the longest, tubular shaped, 1.9 times as long as 2nd segment, outer surface of the segments 1st - 3rd covered with high dense of very short setae, claw hook shaped, brown color. Middle legs resemble to fore legs except the coxa nearly oval. Hind legs resemble to the forelegs, except the coxa nearly plate shaped.

Abdomen

Abdomen oval shaped, metallic green, consist of five visible sternites. The abdomen not grooved for reception of hind legs. 1st - 4th sternites rectangular, 1st sternite 1.2 times as long as the 2nd sternite, 5th sternite oval, 1.3 times as long as the 4th sternite, each sternites bear moderately dense of short pale yellow setae, with moderate dense of punctures. Tergites seven segmented, 1st - 6th tergites rectangular, anterior and posterior margin of 1st - 4th tergites are straight, posterior margin

of slightly emarginated at the middle and 2.6 times as long as 6th . pygidium(Fig.1I) nearly cup shaped low sclerotized at the middle.

Male genitalia

Aedeagus (Fig.1K) height sclerotized, dark brown, flattened in cross-section, strongly curved dorso-ventrally. Length 1.4- 2.0 mm. Phallobase dark yellow, oval. Tegmen (Fig. 1J) height sclerotized, inverted V-shaped and partially surrounds the aedeagus. Medial lob cylindrical shaped, moderately curved, its apex is lanceolate. Endophallus long and moderately sclerotized, joined to the parameres by simple temones. Ejaculatory duct long, tubular shaped. flagellum Invisible.



Fig.1 *Chrysolina herbacea* (Duftschmid)

A. Labrum B. Left mandible C. Right mandible D. Maxilla E. Antenna F. Elytra
G. Hind wing H. Fore leg I. Pygidium J. Tegmen K. Aedeagus (Lateral view)

Scale bar: a, b, c, d, e, i, j and k = 0.5mm ; f, g, and h = 2mm

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