



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(5): 134-137

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Received: 22-07-2018

Accepted: 24-08-2018

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A new record of Elm Leaf Beetles, *Xanthogaleruca luteola* (Muller, 1766) (Coleoptera: Chrysomelidae) in Iraq

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Abstract

A new recorded of elm leaf beetles, *Xanthoga lerucaluteola* Muller was collected from Elms (*Ulmus* spp.) in Sulaimani governorate –Iraq. A detailed description of the species and important characters especially mandible, maxillae, antennae, pronotum, fore leg and male genitalia have been photographed. The results showed that the mandibles tridenticles. Distalacinia triangular, dark yellow, apical part with row of pale yellow setae. 3rd -6th antennal segments same length. Pronotum dark yellow with three black spots, an hourglass at the middle and two oval spots laterally. 3rd tarsal segment bilobed. 1/5 apical part of paramer triangular and Tegmen Y- shaped.

Keywords: (Coleoptera; Chrysomelidae); New record; *Xanthogaleruca luteola*; Iraq

Introduction

Chrysomelidae is one of the largest and most diverse families of Coleoptera. This family includes about 37,000 species, which are categorized under 19 subfamilies ^[1]. Reports estimate that this family may include well over 50,000 species, as many species are not yet identified. At present, about 375 species (classified under 15 subfamilies) have been identified from the Korean peninsula ^[2]. *Xanthogaleruca* Laboissiere, is one of important genus of the family Chrysomelidae, subfamily Galeruinae which includes over nine species distributed in the Palearctic region ^[3-5]. In the Palearctic region, 13 species have been reported to date: however, four species were synonymized, and thus, there are a total of nine valid species ^[6]. Elms (*Ulmus* spp.), ornamental trees originally from Europe, Asia, and America, grow in Chile mainly in parks and avenues in the central and south-central zones ^[7, 8]. Elm trees attacked by the elm leaf beetle, *Xanthogaleruca luteola* Müller, amonophagous pest native to Europe that defoliates *Ulmus* spp., with preference for European species ; both larvae and adults of *X. luteola* Muller caused damage to elm tree by feeding on the leaves, they are not borer and don't damage the wood, adult beetles chew irregularly holes in the leaves while larvae skeletonise the leaves eating everything but the veins, which gives the foliage a net-like appearance the beetle don't transmit the disease ^[9]. The species induced elm leaf volatiles which attracted the egg parasitoid *Oomyzusga llerucae* a wasp specialized on elm leaf beetle eggs ^[10]. In Iran, the species reported for the first time by ^[11]. It is one the major defoliator pests of elm trees (*Ulmus* spp.), both larval and adult stages by feeding on the leaves. In addition to defoliation and morphological changes, this pest causes physiological stress which increases the elm susceptibility to secondary pest and Dutch elm diseases ^[12]. Elm leaf beetles are pests which considered the greatest defoliator of elms in plantations and ornamental trees in Europe, and has become the most important urban forestry pest in the USA, Argentina, Canada, and Australia ^[13]. The adults of *X. luteola* are 1/4 inch long, olive-green beetles with black, longitudinal stripes along the margin and center of the back (6). A new keys to identified the subfamily, genus and species of leaf beetles of the British Isles is formulated by ^[14, 15]. The main aim of this study was a detailed description of elm leaf beetle, *Xanthogaleruca luteola* Muller and provide habitus and the important parts photographs which guides to enable the non-specialist to identify the species.

Materials and Methods

The specimens examined in this study were collected from elm tree, *Ulmus* spp in different localities of Sulaemani Governorate, Kurdistan region- Iraq from April till July- 2015.

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The specimens were placed in boiling water for 10-15 minutes to soften their parts. Then the parts were separated and put in 10% KOH, placed on fire with shaking for about (4-5) minutes for dissolving of fats materials of the body and destroying the muscles. After that placed in distilled water for 2-3 minutes in order to neutralize the alkali. These parts placed in ethyl alcohol 25% and dissected under microscope, then transferred to ethyl alcohol 50%, 75% and 100% respectively for two minutes of each concentrations to dehydration of water, then placed in xylol for two minutes, for translucency, finely placed in Canada balsam to support slides for subsequent examination under microscope [16, 17]. Photographs of specimens and important parts were captured using a digital camera (Ucma series microscope camera). The examined specimens are deposited in Insect Museum of Plant Protection Dept. in College of Agriculture –Salahaddin Univrsity –Erbil- Iraq. The measured proportions of body parts are given in points of an eyepiece linear micrometer in a binocular microscope. The species identified by the help of available literature of [15] with the specialist in Natural History Research Center – University of Baghdad / Iraq and in German museum of technology.

Results and Discussion

Xanthogaleruca luteola Muller, 1766

Description

Body: Yellow to olive green with a black spot with black stripes along the outer edges of the elytra. Length 5.3-7.8 mm.

Head: relatively small, nearly Oval, yellow with a dark spot in the female and transverse band in the male with narrow brown suture edge. Vertex dark yellow, slightly convex, with sparsely fine punctate. Coronal suture present. Eyes brown, oval. Frons dark yellow, sparsely fine punctate with oval black spot. Clypeus triangular, slightly concave, laterally densely fine punctate. Labrum (Fig. 2a) dark yellow, nearly cup shaped, anterior edge slightly concave, with a row of long yellow setae in middle surface. Mandibles (Fig. 2b) pale-dark brown, nearly triangular, tridenticles, apical part highly sclerotized, upper surface sparsely pale yellow setose. Maxilla (Fig. 2c) yellow, 1st segment of maxillary palp is the smallest, rectangular; 2nd -3rd segments cup shaped, same length, sparsely yellow setose; 4th segment elongated oval, bare, 1.3 times as long as 3rd segment, distalacinia dark yellow, triangular, apical part with row of pale yellow setae. Labium (Fig. 2c) pale yellow, prementum nearly spherical, 1-2 segments of labial palps cup shaped, sparsely yellow setose, 2nd segment 2.2 times as long as 1st; 3rd segment oval, bare, 1.1 times as long as 2nd. Antenna (Fig. 2d) dark yellow, filiform, densely microsetation, 3.2-3.8 mm long, 1st segment 1.2 as long as 3rd, 3rd -6th same length. 8th segment 1.1 as long as 9th, 9th segment 1.2 as long as 10th, 11th oval shaped, 1.2 times as long as 10th segment.

Thorax: Pronotum dark yellow with three black spots, an hourglass at the middle and two oval spots laterally, surface densely fine punctate, anterior edge slightly concave, posterior edge slightly emarginated at the middle; anterior and posterior angles rounded. Procoxal cavity open, anterior margin of prosternal slightly concave and prosternal process globular at the middle. Scutellum brown, triangular. Elytra dark yellow, sometimes yellow-brown, densely short pale yellow setose and fine punctate, with long dark longitudinal

band from the shoulder. Hind wing pale brown, veins brown, radial cell triangular, R5 arise at the middle and connected with radial cell at 1/3 of apical part, medial spur slightly curved, extending nearly to wing margin, oblongum cell elongated oval. Legs yellow, fore tibia 1.2 as long as fore femur; tarsus 5-5-5 densely yellow setose; 1st segment of fore-tarsus 1.2 as long as 2nd, 3rd tarsus bilobed, 4th segment is the smallest, hidden between the lobes of 3rd segment; and 5th segment as long as 5th. Middle legs resemble to the fore legs. Hind legs resemble to the fore legs excepts, coxa plate shaped; 1st segment of fore-tarsus 1.3 as long as 2nd.

Abdomen: Dark yellow, oval; 1-4th abdominal sternites same length; posterior edge of 5th abdominal sternite moderately emarginated. Spiculum gaster absent.

Male genitalia: Aedeagus (Fig. 2e) dark brown, moderate curved, 1/5 of apical part of paramer triangular. Basal hood brown color, slightly sclerotized, nearly rounded, pines tubular shaped, apical part triangular. Tegmen (Fig. 2f) brown, inverted Y- shaped, apical arm of 0.7-0.8 mm; lateral arms 0.3-0.4 mm.

Discussion

A briefly diagnostic characters of Elm Leaf Beetles, *Xanthogaleruca luteola* Muller have been mentioned by [6], 1/4 inch long, olive-green beetles with black, longitudinal stripes along the margin and center of the back. Pictorial keys formulated to the identification of British seed and leaf beetles, and give some important characters of *X. luteola*: Head yellow with a dark spot in the female and transverse band in the male. Antennae blackish above. Pronotum yellow with three dark marks (can be variable) or a dark triangular spot. Elytra orange-yellow (sometimes yellow-brown or yellow-grey) with long dark longitudinal band from the shoulder [15]. A note on the genus *Xanthogaleruca* have been given in Korea with reported *Xanthogaleruca aenescens* Fairmaire for the first time, this species can be distinguished by the following characters: Elytron greenish; pronotum yellowish with three black spots; antennomeres I–VII yellow and black stripes on the dorsal segment; rest of the segments black [18]. *Xanthogaleruca maculicollis* (Motschulsky) described and distinguished by the following characters: Elytron reddish brown; pronotum yellowish with three black spots; antenna black [19].

Conclusions

In highlighting of this study we conclude the following:

1. Elm leaf beetles, *Xanthogaleruca luteola* Muller from (the subfamily Galeruinae of family Chrysomelidae) are a widespread which attacks elm trees (*Ulmus* spp.) in Sulaimani governorate –Iraq.
2. A detailed description of *X. luteola* as a new record from Iraq.
3. Many diagnostic characters add to the description which help to identified the species; Mandibles tridenticles. 3rd -6th antennal segments same length. Pronotum dark yellow with three black spots, an hourglass at the middle and two oval spots laterally. 3rd tarsal segment bilobed. 1/5 apical part of paramer triangular and Tegmen Y- shaped. These characters add to the description which help to identified the species.
4. The important parts have been photographed which are helps in the identified of the species.

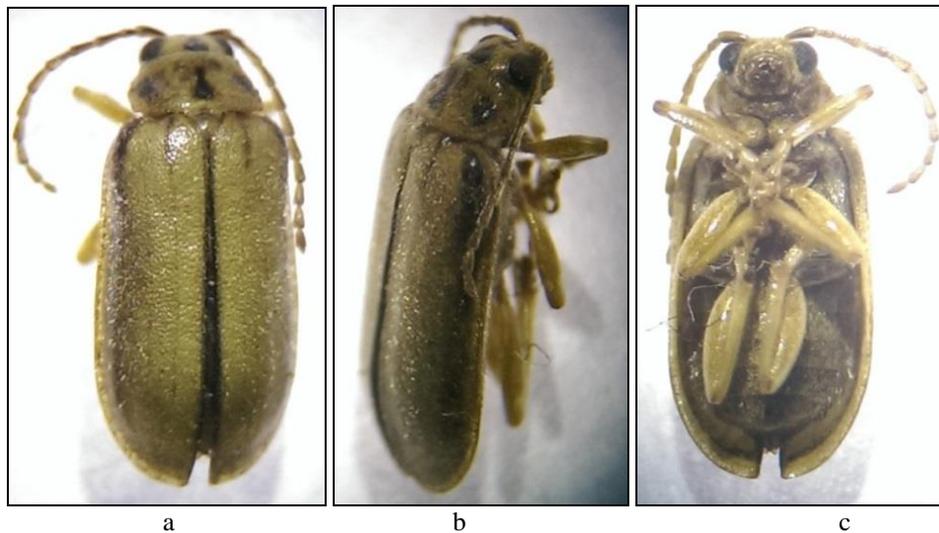
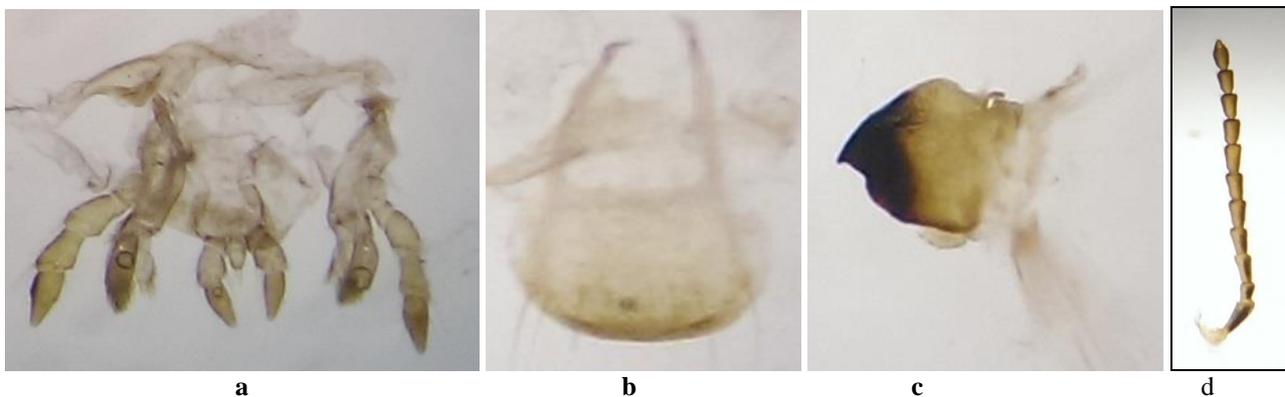


Fig 1: *Xanthogaleruca luteola* Muller Male: **a.** dorsal habitus **b.** lateral habitus **c.** ventral habitus Scale :10 X

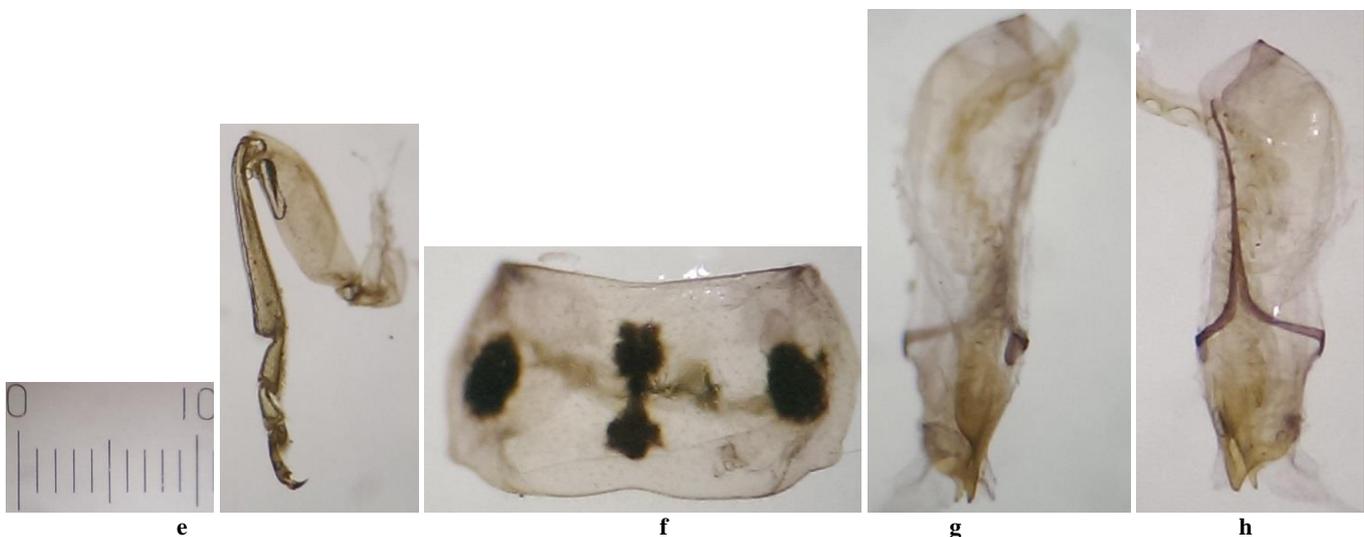


a

b

c

d



e

f

g

h

Fig 2: *Xanthogaleruca luteola* Muller **a.** Labrum **b.** Mandible **c.** Maxillae & Labial palps **d.** Antennae **e.** Fore leg **f.** Fore leg **g.** Male genitalia (lateral view) **h.** Male genitalia (dorsal view) Scale1- 10 = 1mm

Acknowledgments

Authors sincerely thank the specialist in German museum of technology who confirmed the identification. We deeply express my gratitude to Pro. Dr. Mohammed S. Abdul Rassoul in Division of Entomology, Natural History Research Center – University of Baghdad / Iraq for his confirm of the species and continuous encouragement to this work.

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