



Morphological study of the cotton seed bug, *Oxycarenus hyalinipennis* (Costa, 1847) (Hemiptera: Lygaeidae) in some localities of Kurdistan region– Iraq

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Abstract

This study introduces a morphological description of cotton seed bug, *Oxycarenus hyalinipennis*(Costa, 1847) (Hemiptera: Lygaeidae), which were collected in some localities of Kurdistan region- Iraq through the period of April till December of 2021. The species identified according to same diagnosed characters; mouthparts approximately dark brown. Piercing sucking type mouthpart with elongate proboscis extending in the middle of 3rd abdominal sternite. Maxilla needle shaped, slightly curved and the apical part. Labium four segmented, dark brown. Antennae nearly filamentous shaped with four antennomeres, 2nd antennomere tubular shaped, two times as long as the 1st, 4th antennomere elongated oval, 1.1 times as long as 3rd antennomere. Fore wings hemielytron type, the membranous part whitish color with four or five veins. Parameres nearly hook shaped. The important body parts antenna; rostrum; mouthparts, labrum, mandible, maxilla, labium; pronotum; fore wing; fore leg; eighth abdominal sternite and male genitalia were take pictures. Locations and date of collection were mentioned.

Keywords: Morphological study; *Oxycarenus hyalinipennis*; Lygaeidae; Kurdistan region; Iraq.

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Introduction

Seed bugs, Lygaeidae It is one of the most prominent families in the order Hemiptera and it is globally widespread, as the number of its species is estimated at about 972 species belonging to more than 100 genera [1]. The species of this family feed on plant juice, many of them feed on seeds, and some are predators of some types of insects [2]. The cotton seed bug, *Oxycarenus hyalinipennis* (Costa, 1847), is a significant cotton pest [3]. Costa is the first who described the species from Italy in 1847 [4]. It is generally known as the cotton seed insect [5], and specimens were identified as dusky cotton seed bugs [6,7]. It is a most serious pest of mature cotton, its attack continues until harvesting time [8,9]. Native to Africa, cotton seed bug is now widespread with distribution in Asia, Europe, Middle East, South America and the Caribbean [10,11]. The infestation of the species caused weight loss in cotton seed, decrease seed germination, and reduce oil seed [12]. Additionally, Cotton fibres gets discoloured throughout process when cotton seed bugs are found in sufficient number, resulting in a drop in values [3]. *O. hyalinipennis* feeds on numerous plants in the order Malvales, primarily in the Malvaceae family, but also in the Tiliaceae and Sterculiaceae families [5]. Adults via nymphs receive moisture by sucking the oil from seedlings and the fluids from the leaves of immature stem [13]. The species has become a severe pest of different malvaceous hosts, especially cotton and ornamentals. It is indigenous to Africa and has now spread to the Caribbean Basin and Pakistan [14,15,16]. [17,18] mentioned this species in Iraq.

The aim of this study is a morphological description of the cotton seed bug, *Oxycarenus hyalinipennis*, (Costa) in some localities of Kurdistan Region-Iraq.

Materials And Methods

Samplings were carried out during the period during April till December of 2021 for morphological study of cotton seed bug, *Oxycarenus hyalinipennis*(Costa, 1847) in different localities in Erbil (Qushtapa, Khabat, Ankawa, Shaqlawa, Barzan and Soran); Sulaimani (Qaladiza, Ranya, Dokan, Bakrajo and Darbandikhan) and Duhok (Akry, shekhan, Amedi, Semel, Zakho) governorates of Kurdistan region /Iraq.

The samples were collected by hand picking, sweeping net and traps. Some specimens collected from many species of plants, cotton, oleander and the weeds. The study depending on (50) specimens which placed in bottles and preserved in freeze till studied. A dissecting binocular microscope was used to examine the specimens. Compound microscopes and digital computerized microscopes are used to describe body parts, after that, the habit of photography with a digital camera (Ucma series microscope camera), and a linear micrometre is used to measure the length of the part. For preparation of slides for microscopic examination, the specimens placed in 10 percent KOH, followed by 10-15 minutes in the water bath for lipid body dissolves. The alkali is then neutralized by soaking the item in distilled water for two minutes, repeated two to three times, in order to remove the alkali. The specimens were dehydrated in ethyl alcohol at concentrations of 25%, 50%, 75%, and 100% for two minutes at each concentration. For clearing, the parts were placed in a dish with xylene for two minutes after which they were fixed on slides with DPX solution and were covered with coverslip for several research [19,20]. The samples were identified using a key of [4]. Also, the species was certified by Prof. Dr. Razzaq Shalan Augul, Assist. Prof. Dr. Hanna Hani Alsafar in Iraq Natural History Research

Centre and Museum, University of Baghdad, and Prof. Dr. Hayder Badri, Biological Department, College of Science, University of Baghdad, for their help to confirm the species.

Results And Discussion

Oxycarenum hyalinipennis (Costa, 1847) (Hemiptera: Lygaeidae)

Basionym: *Aphanus hyalinipennis* Costa, 1843

Description

Body (Figs.1 a): Dark brown, elongated oval shaped. Length 3.2- 4.3 mm and width 1.0-1.3mm.

Head: Dark brown, triangular shaped and opisthognathous type sloping forward, and cover with high density of short yellow setae with low density of punctures, the length is 0.8-1.1mm and the width is 0.5-0.7mm. Vertex dark brown slightly convex. Frons black - dark brown. Clypeus dark brown-black, slightly concave, longer than the head; juga are triangular in shape. Compound eyes light brown, spherical shaped, the distance between them is 0.3-0.4 mm. The pair of simple ocelli are red and spherical shaped, the distance between them is 0.2-0.3 mm. Mouthparts dark brown, piercing sucking type with elongate proboscis extending between 3rd abdominal sternite. Labrum (Fig.1 c) light brown-yellow, short, stylet shaped, 0.5-0.7 mm long. Mandible (Fig.1 d) needle shaped, 1.8 -2.4 mm long, apical part hook like; maxilla (Fig.1 e) pale brown- yellow, needle shaped, 2.0 -2.6 mm long, apical part slightly curved. Rostrum (Fig.1 f) tubular shaped, length 1.8-2.3 mm, four segmented, reaching into 3rd of abdominal sternite, 2nd segment 1.4 times as long as the 1st segment, 2nd and 3rd segment same length, 3rd segment 1.4 times as long as the 4th segment, apical part of 4th segment spear

like. Antennae (Fig.1 b) pale brown –dark brown, nearly filamentous shaped with four antennomeres, length 1.8-2.4 mm; 1st and antennomere 1st antennomere is the smallest, 2nd antennomere tubular partially yellow or pale yellow, 2 times as long as 1st antennomere, 4th antennomere elongated oval, as long as 3rd antennomere.

Thorax: Pronotum brown - dark brown, trapezoidal shaped (Fig.1 i), with black dots at the middle, its length 0.9-1.2 mm, surface covered with high density of short yellow setae and punctures. Posterior border partly overlaps the second thoracic segment. Scutellum black, triangular, with high density of short yellow setae and punctures. Fore leg (Fig.1 g) brown - dark brown, fore coxae, femur and $\frac{1}{4}$ basal of tibia are dark brown while $\frac{3}{4}$ of remain part of tibia and the tarsus are yellow; fore coxae nearly cone shaped; trochanter triangular; femur cylindrical, large, expanded at the middle, ventral surface with four small black spines at $\frac{1}{2}$ of apical part; fore tibiae tubular shaped, as long as the femur, ventral surface with a row of very short yellow spines, apical part with ring of very short yellow spines; fore tarsus three segmented, 1st segment 1.2 as long as the 2nd, lateral margins with a row of short yellow setae, 3rd segment 1.3 times as long as the 2nd and 1.1 as long as 1st. Claws sickle shaped with two distinct pulvilli. Middle legs resemble to the fore legs except, the femur smaller, not expanded at the middle and without spines; first tarsal segment is 1.3 times longer than the second segment. Hind legs resemble to the fore legs except, metafemur smaller not expanded at the middle and without spines; 1st tarsus piece 1.5 times loner than the 2nd. Fore wings (Fig.1 h) hemielytron type, glassy translucent and usually whitish color with four veins, the length is 2.2-2.6 mm, the clavus, base of corium and costal vein more opaque than the others, corium bright brown-silver, triangular shaped, with low

short yellow setae, clavus brown, rectangular with short yellow setae and punctures, subcostal vein unbranched, radius branched at the middle into radius 1 and radius sector, pterostigmata small and dark brown, medial veins united with radius nearly at the middle surface and formed cross-vein (r-m). The hind wings are membranous, triangular shaped and characterized by having an oblong discal cell and vannal fold.

Abdomen: Consists of 10 segments, six of these are visible. The length is between 1.4 and 1.9mm while the breadth is between 0.7 and 1.2mm. 1st - 6th abdominal sternites transverse, brown-dark brown, broad and nearly oval shaped. 1st sternite 1.2 times as long as the 2nd, 2nd and 3rd abdominal sternites same long, 1.2 times as long as the third sternite in the fourth., 5th male abdomens terminate in a round lobe, while female abdomens are truncated. Apical margins of each sternite slightly convex, 7th abdominal sternite strongly sclerotized, hairy and developed into lobe, 8th sternite (Fig.1 j) strongly sclerotized and smaller than the 7th one, 0.2-0.4 mm long. 9th segment is capsular in shaped with height density of setae. Abdominal tergites low sclerotized, 1st -6th abdominal tergites transverse, nearly rectangular shaped. 1st and 6th segment low sclerotized, 3rd - 5th tergites membranous.

Male genitalia: Pygophore (Fig.1k) nearly circular shaped, height sclerotized, 0.4-0.6mm long. Aedeagus (Fig.1 l) brown- dark brown moderately sclerotized with fine short brown setae, 0.2-0.4 long. Subgenital plates brown, hook shaped, low sclerotized and bare. Parameres (Fig.1 m) brown, tubular, moderately sclerotized, nearly hook shaped, 0.2-0.4mm long.

Female: Resemble to the male, except larger, body 3.6- 4.6mm long and the width 1.1-1.4mm. Female abdomens terminate are truncated.

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Fig. 1 *Oxycarenus hyalinipennis* (Costa) a. Habitus (Dorsal view) (9x)
 b. Antenna c. Labrum d. Mandible e. Maxilla f. Rostrum g. Fore leg
 h. Fore wing i. Pronotum j. 8th male abdominal sternite k. Pygophore
 l. Aedeagus m. Paramere

Scale bar; b,c,d,e,f,g,h,k and l = 0.5mm ; i, j and m = 0.1mm

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دراسة مظهرية لبقة بذور القطن *Oxycarenus hyalinipennis* (Costa, 1847) (Hemiptera: Lygaeidae) في بعض مناطق إقليم كردستان – العراق

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المستخلص

تشمل هذه الدراسة وصف مظهري لبقة بذور القطن *Oxycarenus hyalinipennis* (Costa, 1847) (Hemiptera : Lygaeidae) والذي تم جمعه من بعض مناطق إقليم كردستان – العراق وللفترة من نيسان ولغاية كانون الأول / 2021، تم تشخيص النوع تبعاً لبعض الصفات التشخيصية وهي أجزاء الفم بني داكن ومن النوع اثاقب الماص ولها خرطوم طويل يمتد الى وسط الحلقة البطنية الثالثة . الفك السفلي أברי الشكل منحني قليلاً عند جزئه القمي . الفك السفلي يحتوي على أربعة عقل بنية داكنة . اللأمس خيطي الشكل تقريباً يحتوي على أربعة عقل ، العقلة الثانية أنبوبية الشكل طوله مرتين بقدر طول العقلة الأولى ، العقلة الرابعة بيضوية طويلة طوله 1.1 مرة بقدر طول العقلة الثالثة . الجناح الأمامي نصف عمدي الشكل، الجزء العشائي بيضاء اللون يحتوي على 4 – 5 عروق . القطعتين الجانبيتين كلابي الشكل تقريباً . تم تصوير أجزاء الجسم المهمة منها اللأمس ، الخرطوم ، أجزاء الفم ، الشفة العليا ، الفك العلوي ، الفك السفلي ، الشفة السفلى ، ظهر الصدر الأمامي ، الجناح الأمامي ، الرجل الأمامي ، القص البطني الثامن والسوءة الذكرية . تم ذكر مناطق وتاريخ جمع الحشرات

الكلمات المفتاحية: دراسة مظهرية ، *Oxycarenus hyalinipennis* ، لايجيدي، إقليم كردستان، العراق