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New record of the Epaulet Skimmer: *Orthetrum chrysostigma* (Burmeister) (Odonata:Libellulidae) from Iraq

Razzaq Shalan Augul[1*], Asmaa Hasan Al-Hashmi, H.H. Al-Saffar

[1]*Iraq Natural History Research Center and Museum, University of Baghdad, Iraq*

[2]*Department of biology, College of Sciences, Al Mustansiriyah University, Iraq*

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Abstract

In this study, the Epaulet Skimmer *Orthetrum chrysostigma* (Burmeister, 1839) belonging to the family of Libellulidae (Order: Odonata) is described as a first time to fauna of Iraq; the specimens were collected from Maysan province, south of Iraq, is described as a first time to fauna. The diagnostic characters and main morphological features were figured.

***Corresponding Author:** Razzaq Shalan Augul ✉ razzaqshalan@gmail.com

Introduction

Odonata are an aqueous insects with about 5500 defined species worldwide (von Ellenrieder, 2004). Every known species are hunters as adults and larvae; as such, they achieves an evaluate turn as biological control proxies for many noxious insects, notably those with aqueous larvae. They are unrated allies of human, certainly provident lives through their control of mosquitoes and other disease vectors. Through their wonts of eating a large diversity of flying herbivorous insects, they reduce the wastages of many marshland yields (Heckman, 2008).

Individuals of Odonata are disaggregated into three suborders: Anisoptera (dragonflies), Zygoptera (damselflies) and Anisozygoptera (a very small suborder) (von Ellenrieder, 2004). Anisoptera consist ten families among which the. Libellulidae, with 140 genera and about 962 species is the largest.

(Tennessen, 2003). This global family, regarded to be the family of more latter edified, incorporates about one quarter of well- known species of living Odonata (Cannings and Stuart, 1977). The Libellulidae (skimmers or perchers) is occasionally regarded to include the Corduliidae as the subfamily Corduliinae and the Macromiidae as the subfamily Macromiinae. Till if these are excepted, there still stays a family of over 1000 species. With approximately worldwide dispensation, these are nearly surely the more numerous often looked of all dragonflies (Silsby, 2001).

Libellulidae with wing venation and wing form in fore and hind wings disparate; eyes scarcely dabbing or dabbing only at a lone point; pterostigma with brace cross vein, well developed loop constituting a boot form in hind wing (Bybee, 2015). The genus of *Orthetrum* Newman, 1833 characterize by: Sectors of arculus in fore wings with a differentiated merger before encounter arculus; bases of hind wings without blackish-brown markings; ever any accessive cross-veins to the bridge (Fraser, 1956). This genus is already typified in the Iraq by the following five species: *O. brunneum* (Fonscolombe, 1837), *O. coerulescens* (Fabricius, 1798), *O. sabina* (Drury, 1773), *O. taeniolatum* (Schneider, 1845), *O. trinacria* (Selys, 1841) according to the list (Kalkman, 2006).
The species of *Orthetrum chrysostigma* (Burmeister, 1839) was recorded from Benin, Botswana, Algeria, Angola, Central African Republic, Chad, Burkina Faso, Cameroon, Crete , the Democratic Republic of the Congo, Dodecanese Islands, Cyprus, Canary Islands, Ivory Coast, Israel, Lebanon, Niger, Ethiopia, Jordan, Gambia, Egypt, Equatorial Guinea, Kenya, Liberia, Mali, Mauritania, Malawi, Mozambique, Namibia, Morocco, Libya, Ghana, Guinea, Nigeria, Portugal, South Africa, Spain, Tanzania, Tunisia, Turkey, Togo, Sudan, Yemen, Senegal, United Arab Emirates, Syria, Sierra Leone, Somalia, Saudi Arabia, Uganda, Zambia and Zimbabwe (Boudot, 2013), it was lately recorded in the Maltese Islands (Gauci and Sciberras, 2010).

The aim of the current study to provide additional information from these insects to Iraqi fauna.

Materials and methods

Many specimens of Odonata species were collected from Maysan Province at Hawizeh Marshes*, Umm An-Ni'aaj*, South of Iraq, by using air net during June 2015. The specimens were killed by freezing for few hours, and mounting by insect pins. The date and localities of sampling were recorded.

The samples of the species were diagnosed by using different taxonomic keys such as: Fraser (1934, 1936 and1956), Dumont (1991), de Fonesca (2000), Dijkstra and Lewington (2006), Kalkman (2006), Samways (2008), Theischinger (2009) and Skvorstov (2010).

The Dino-light microscope was used for taking photo of samples with scale of measurements; in addition, some photographs were taken with a Samsung galaxy S4, GT-19500 and used binocular dissecting microscope (MB. MARIOBROMA.SRL, Roma) to magnificent the morphological features.

The newly collected material is deposited in the insect collection of Iraq Natural History Research Center and Museum, University of Baghdad.

Results and discussion

In the current study, the species of *Orthetrum chrysostigma* (Burmeister, 1839) was registered as a new record to fauna of Iraq. This species can be recognized from closely species by: mesoepimerum with whitish and boarded blackish color; Pterostigma large and brown-yellowish; abdomen waisted, narrow towards front (Fig.1).

Fig. 1. male of *Orthetrum chrysostigma*.

The redescription of male and main characters is given below:

Measurements

It has an overall body length of 45 mm, a wingspan of forewing 32 mm, a hindwing length of 31 mm.

Head (Fig. 2): Face silvery, eyes blue or blue-greenish in a life specimens; vertex with depressed, frons and postclypeus covered by short and erect black hairs.

Thorax (Fig. 3): prothorax: in dorsal view the anterior lobe dark brown. Posterior lobe large; lateral parts of median lobe and posterior margin of posterior lobe covered by long, erect and pale hairs; Synthorax green brownish and with narrow black antehumeral and characterized by having a whitish streak on the mesoepimerum.

Wings (Fig. 4): Wing clear, venation black, membranula dark brown, basal amber on hind wing; Pterostigma brown-yellowish and boarded with black and covering about 2 cells.

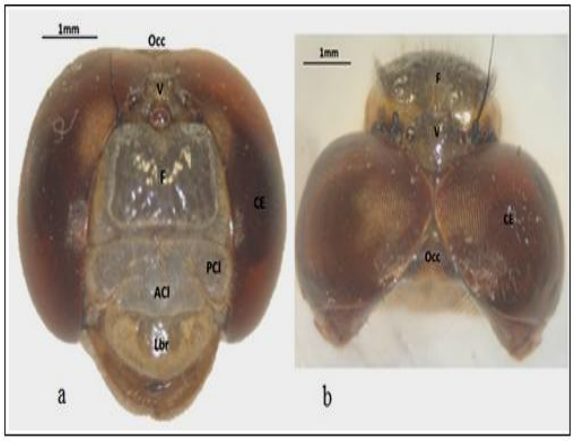

Fig. 2. Head of *Orthetrum chrysostigma*a:, anterior view; b: posterior view, Occ: occiput, V: vertex, F: frons; CE: compound eye, ACl: anteclypeus PCl: postclypeus, Lbr: labrum.

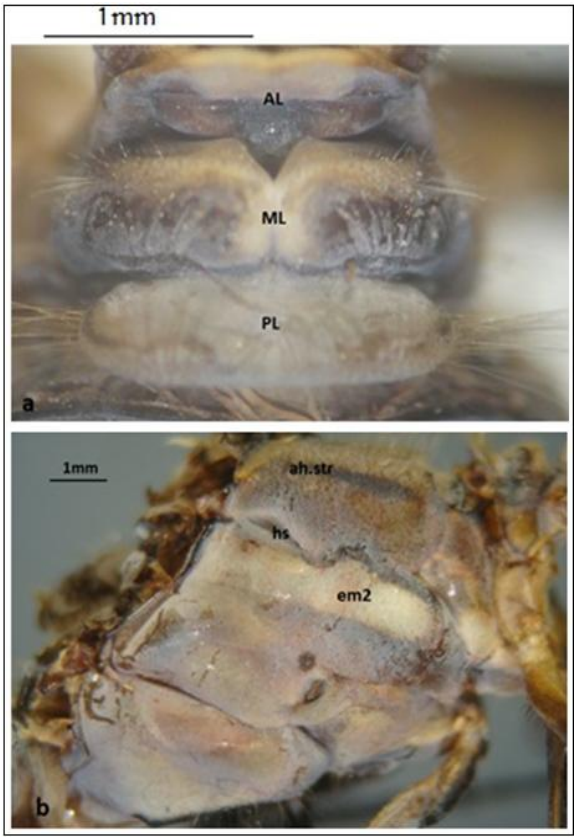

Fig. 3. Thorax of *Orthetrum chrysostigma,* a: dorsal view; b: lateral view AL: Anterior lobe, ML: Median lobe, PL: Posterior Lobe, h.s.: humeral suture, ah. str: antehumeral stripe, em2: mesoepimerum

Twelve antenodal crossveins in fore wing and last antenodal crossvein complete, subcostal crossveins yellow. Arculus integrated at origin and situated opposite the second antenodal nervure. Cubitous vein strongly arched in fore wing and arising from posterior angle of discoidal cell in hind wing. Discoidal field begins with three cells then two rows then branching at the rear edge of the fore wing. Triangular cell of the fore wing put vertical sloping slightly to the rear edge of wing, base equal to one–third of the length of each side. One or two rows of cell between IRiii and Rspl.

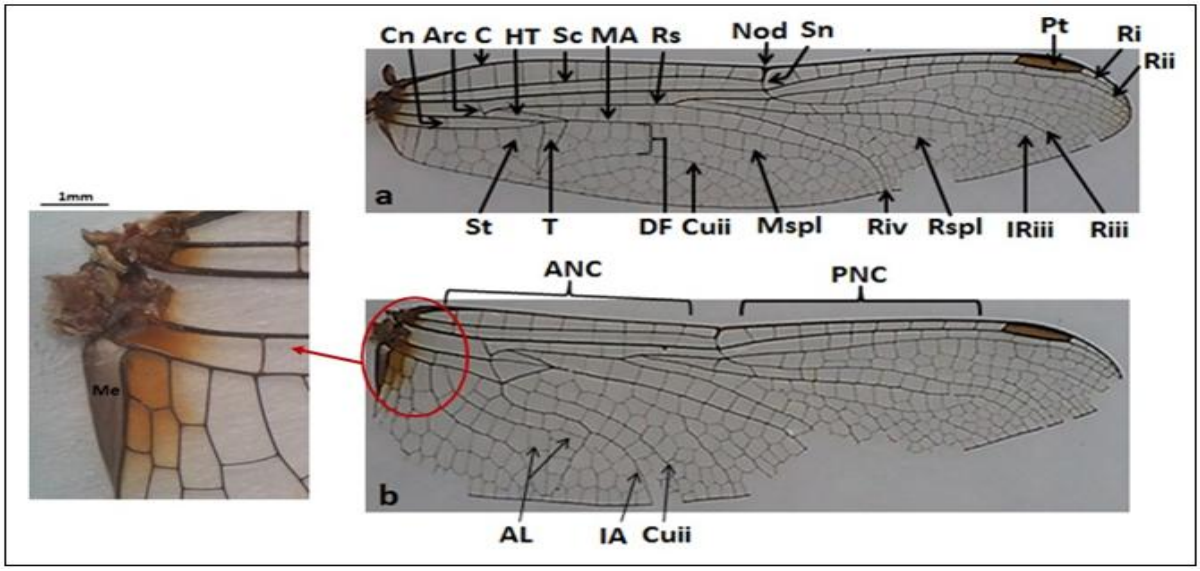

Fig. 4. Wings of *Orthetrum chrysostigma*, a: fore wing; b: hind wingHT: Humeral triangle, Ri: 1st Radius vein, Rii: 2nd Radius Vein, Riii : 3rd Radius vein, Riv: 4th Radius vein, IRiii: 1ST Radius vein branch, AL: Anal loop, MA: Median Arculus, Mspl: Nervulus between Cu &MA, IA:Anal vein ,Rs: Radius vein, Arc: Arculus, Nod: Nodus, Rspl: Nervulus between lRiii & Riv, C: Costal vein, ANC: Transverse antenodal nurvulus, PNC: Transverse post nodal nurvulus,Sc: Subcosta vein, Cn: Transverse Cubital nurvulus, Pt: Pterostigma,Sn: Subnodus, Cuii: Cubital vein, T: Triangular cell, St: Sub triangular cell ,DF: Discoidal field, Me: Membranula.

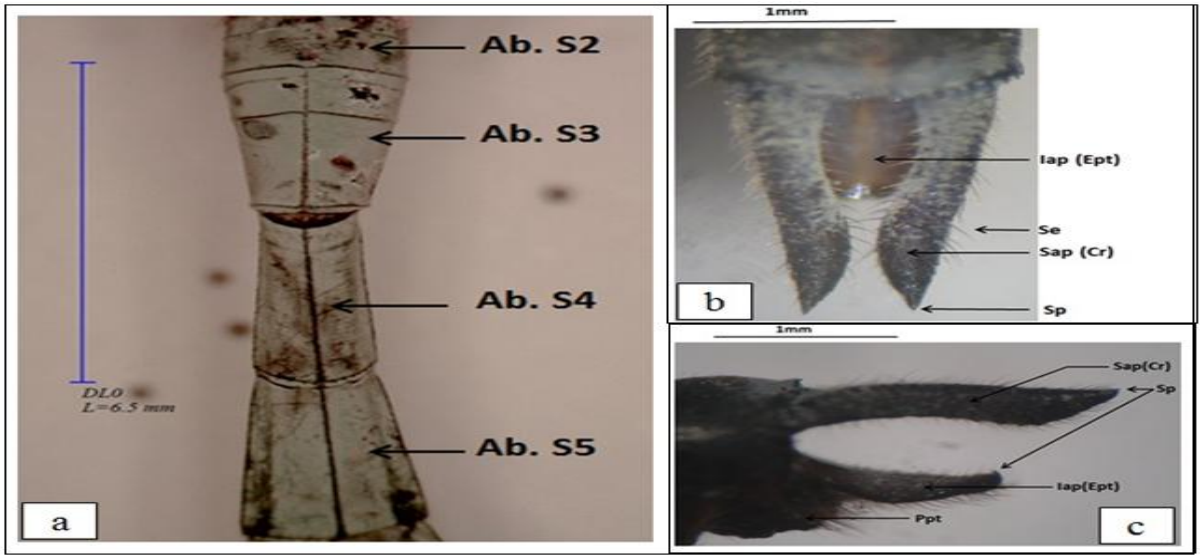

Fig. 5. Abdomen of *Orthetrum chrysostigma*, a: first segments of abdomen(dorsal view); b, c: anal appendages(dorsal and ventral view respectively) , Ab. S: abdominal segment, Iap- Ept: Inferior anal appendage, Sap-Cr: Superior anal appendage, Sp: Spine, Se: setae, Ppt: paraproct.

Abdomen (Fig. 5): gray bluish; the abdomen characterized by having waisted between abdominal segments 3 and 5; very fine and black line on along of the abdomen. End abdomen with anal appendages; superior and inferior anal appendages with moderately long, erect, densely and black setae; also both appendages ending with short and thick spines; last third of superior with some separated teeth on ventral side. Paraproct covered by long, erect, densely and black hairs.

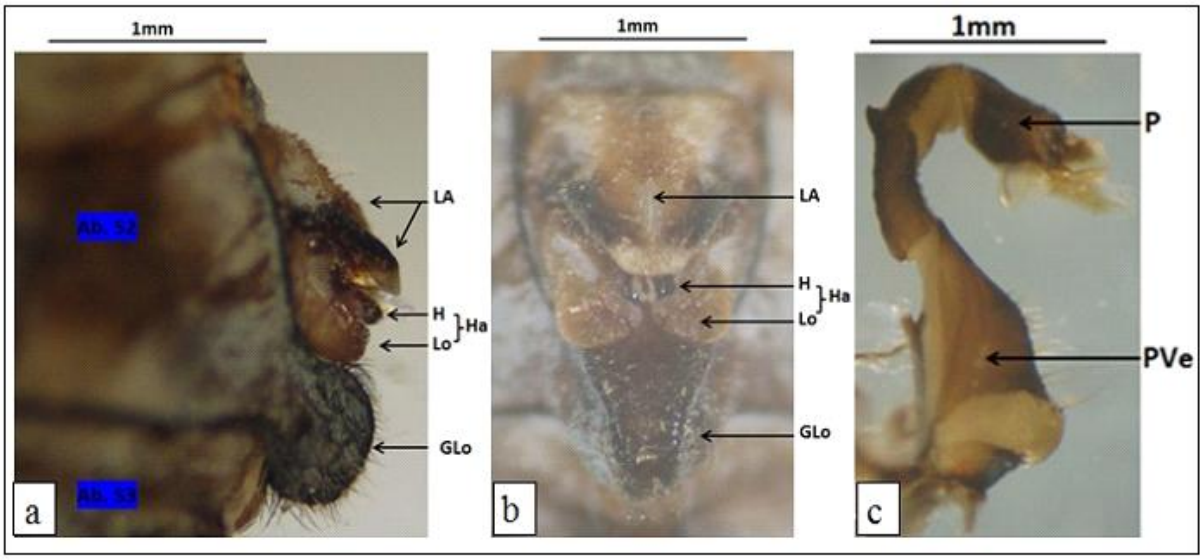

Fig. 6. Male genitalia of *Orthetrum chrysostigma*, a: lateral view b: ventral view c: penis, ALam: Anterior lamina, Lo: Lobe, H: hook, GLO: Genital lobe, P: Penis, Ha: Hamula, PVe: Penis Vesicle.

Male genitalia (Fig.6): Anterior lamina huge with short hairs and no spines, apex not bifid. Hamula with hook wide, erect and invert outwards. Lobe forms terminate apically in a hairy ridge down and external to the hook; genital lobe rounded, black and hairy.

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