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Research Article

External Morphological Study of the *Sympetrum fonscolombei* (Selys, 1840) (Odonata: Anisoptera: Libellulidae) in Baghdad

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Abstract
The specimens were collected from different region in Baghdad/Iraq, by using air net during April 2016. In this study, a morphological characters of *Sympetrum fonscolombei* (Selys, 1840) is include three region of body (head, thorax and abdomen); in addition, male and female genitalia. Such characters were supported by Figured

Keywords: Libellulidae, *Sympetrum fonscolombii*, Morphological study, Baghdad.

الخلاصة
العينات المدروسة جمعت من مناطق مختلفة من بغداد باستخدام الشبكة الهوائية خلال شهر نيسان 2016. في هذه الدراسة، الصفات المظهرية للنوع *Sympetrum fonscolombei* (Selys, 1840) تتضمن ثلاث مناطق من الجسم (الرأس والصدر والبطن) بالإضافة الى السوأتين التناسليتين الذكرية والانثوية، وهذه الصفات معززة بالصور.

Introduction

Odonata is one of the ancient groups of winged insects found now; with 5680 present species dragonflies are a comparatively small order of insects [1]. Every known species of Odonata are hunters as adults and larvae, and as such, they are very evaluate for premising biological control over many noxious insects, particularly those with water larvae [2]. This genus *Sympetrum* is already represented in the Iraq by following four species:

Sympetrum fonscolombei (Selys, 1840), *Sympetrum striolatum* (Charpentier, 1840), *Sympetrum depressiusculum* (Selys, 1841) and *S. arena color* Jodicke, 1994 according to list of Kalkman [3]. To Iraqi fauna, the species of *Sympetrum fonscolombei* (Selys, 1840) was recorded by Kalkman, Asahina, Derwesh, Morton and Sage [3] [4] [5] [6] [7]. The species of *S. fonscolombei* (Selys, 1840) was distribution South and East Europe, sometimes reaching Western Europe, the whole of Africa and spreading into Asia as far east as Kashmir. Very extensively distributed in levant the period from April to October [8]. The aim of this study was to make a detail description for the species *Sympetrum fonscolombei* (Selys, 1840) and afford additional information from these insects to Iraqi fauna.

Materials and Methods

Many specimens of O donate species were collected from different region in Baghdad/Iraq, by using air net during April 2016. The specimens were killed by freezing for 48 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: [3] [8] [9] [10] [11] [12] [13] [14].

The morphology of the adults were studied by using dissecting microscope, while the minute parts were studied by preparation of microscope slides, the adults dissected by using two fine pins, then the required parts (the abdomen) put in a beaker 100 ml contains 50 ml water with KOH 10% and placed on fire with shaking for about 10 minutes for dissolving of lipid maters of the body and destroying the muscles. After that it was placed in distilled water for 5 minutes in order to reduce the effect of the alkali. abdomen are

placed in ethyl alcohol 25% and dissected under microscope to obtain the male genitalia, 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 then placed in Canada balsam to prepare slides for examination under microscope [15].

The binocular dissecting microscope (MB. MARIOBROMA. SRL, Roma) was used to magnificent the morphological features and photographs were taken with a Sony Camera (capacity 12.1 MEGA PIXELS); in addition, some photographs (wing and abdomen) used Samsung galaxy mega, GT-19152.

Results and discussion

Body: Measurements (mm): Male body length of 42, fore wing 33, hind wing 32 (Figure 1); Female body length of 43, fore wing 34, hind wing 33.

Figure 1: body of the adult (male) of *Sympetrum fonscolombii*.

Head:

Labrum yellow, Clypeus silvary, frons yellow and coated with short and pale hairs; a broad black stripe at base of frons; verte convex yellow (Figure 2a).

Occiput pale olivaceous and overed by long and erect pale hairs (Figure 2b). Eyes brown above and pale olivaceous below. In mature specimens, the all face changes bright red (Figure 2c).

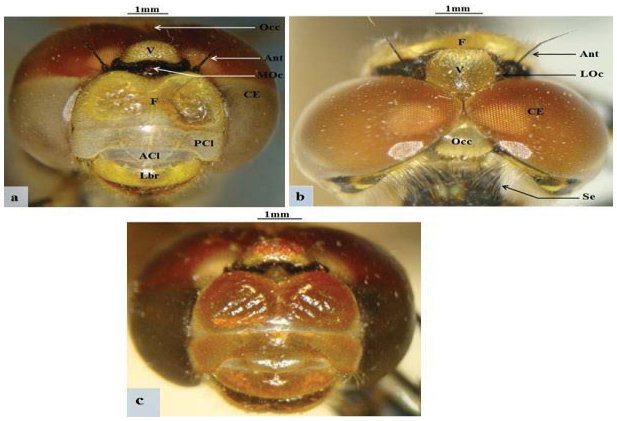

Figure 2: head of *Sympetrum fonscolombei* a: anterior view (teneral specimen); b: posterior view; c: anterior view(mature specimen).

Occ: occiput, Ant: Antenna V: vertex, F: frons; CE: compound eye, ACl: anteclypeus, PCl: postclypeus, Lbr: labrum, Se: Seta, LOc: Lateral Ocellus, MOc: Median Ocellus.

Thorax:

Prothorax: in dorsal view black. posterior lobe (PL) large, waisted in middle and posterior margin yellow and covered with long, erect and pale hairs(Figure 3a). Synthorax: in lateral veiw yellow-greenish, covered with long hairs, generally no antehumerals, Sutures marked with black, a long black line on humeral suture (Figure 3b).

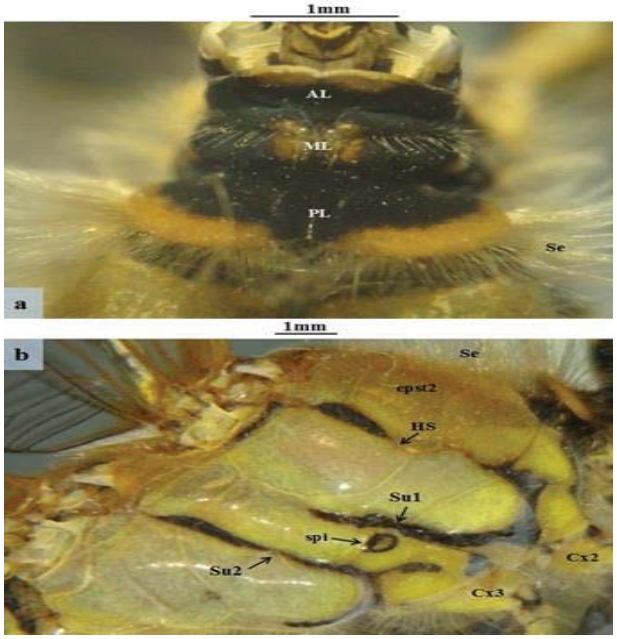

Figure 3: thorax of *Sympetrum fonscolombei.* a: Prothorax (dorsal view); b:Synthorax (lateral view).

AL: Anterior lobe, ML: Median lobe, PL: Posterior Lobe, HS: humeral suture, spi: Spiracle, epst2: mesoepisternum, Su1: Suture 1, Su2: Su-

ture 2, Cx2: Coxa of leg 2, Cx3: Coxa of leg 3, Se: Seta.

Wings:

Wing clear, venation (only main veins) yellow in tenerals or red in adults, membranula white, extreme bases of wings possessed with amber yellow; Pterostigma light yellow and boarded with black nervures. Fore wings with 6-½ antenodal crossveins, last antenodal crossvein incomplete. Arculus integrated at origin and situated between the first and second antenodal nervure. Discoidal cell divided to two cells, Discoidal field begins with three cells then parallel and lastly narrows. Triangular cell of the fore wing put vertical sloping to the rear edge of wing, base equal to one–third of the length of outer side. Only one row of cells between IRiii and Rspl. One Cubital crossvein (Cn) occur in each wing (Figure 4).

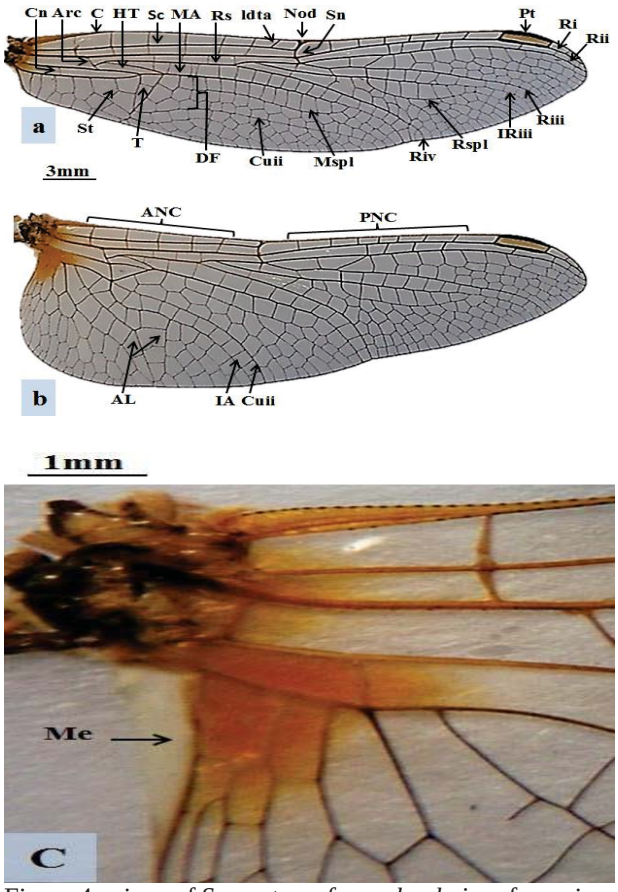

Figure 4: wings of *Sympetrum fonscolombei* , a: fore wing; b: hind wing , c: base of hind wing.

HT: Humeral triangle, Idta: Last discontinued transverse arculus, 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 and MA, IA:Anal vein ,Rs: Radius vein, Arc: Arculus, Nod: Nodus, Rspl: Nervulus between lRiii and Riv, C:Costal vein, ANC:Transverse antenodal nurvulus, PNC: Transverse post nodal nurvulus,Sc: Subcosta vein,Cn:Transverse Cubital nurvulus,Pt:Pterostigma, Sn:Sub nodus, Cuii: Cubital vein, T: Triangular cell, St: Sub triangular cell , DF: Discoidal field, Me: Membranula.

Legs:

Legs black, external surfaces of femora and tibia with bright yellow stripe (Figure 5).

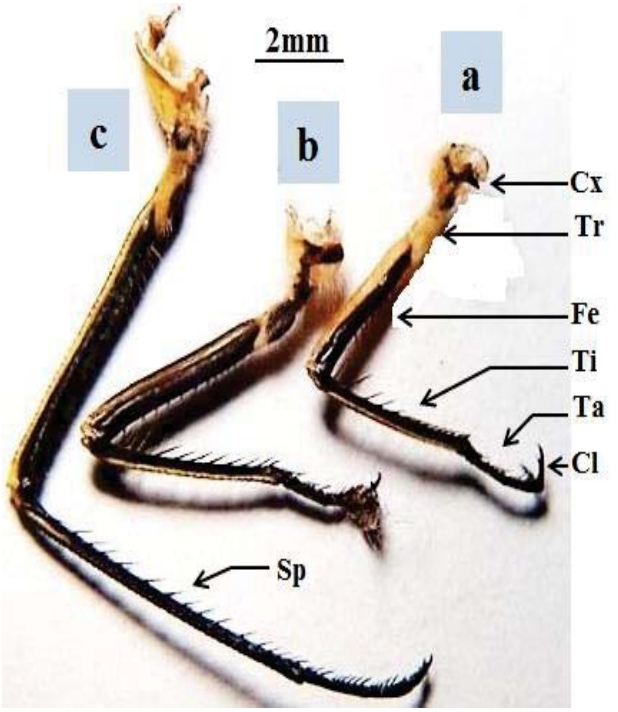

Figure 5: legs of *Sympetrum fonscolombe:* a: Fore-leg; b: Mid-leg; c:Hind-leg Cx: Coxa, Tr: Trochanter, Fe: Femur, Ti: Tibia, Ta:Tarsus, Cl: Claw, Sp: Spin.

Abdomen :

In male: Abdomen bright ochraceous in teneral then turning blood red at maturity (Figure 6a) ; a broad spot black on the dorsum of $S_1$and base and sides of S_2 (Figure 6b), also the S_{8-9} with carinal and lateral black straps (Figure 6c). In female: A carinal black spot extant on S_8-S_9 and a fine font on S_{10} (Figure 9a).)

Anal appendages

End abdomen with anal appendages; long, skinny and yellow (later bright red), coverd by erect, densely and black hairs (Figure 7a,b).

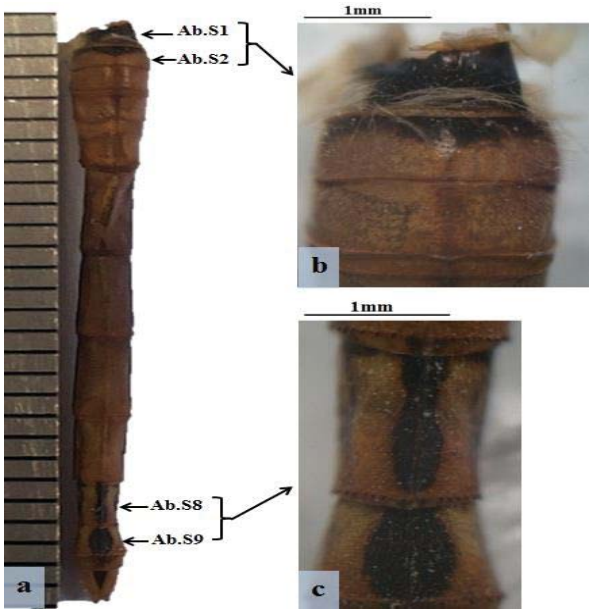

Figure 6: abdomen of *Sympetrum fonscolombei*
a: the abdomen(dorsal view), b:first segments abdomen(dorsal view); c: end segments of abdomen(dorsal view). Ab. S: abdominal segment.

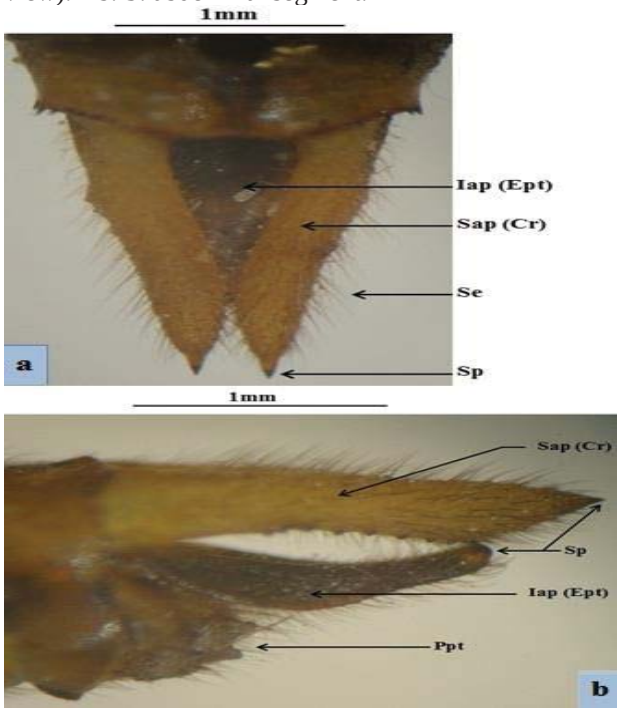

Figure 7: anal appendages (male) of *Sympetrum fonscolombe* a: (dorsal view) , b: (lateral view) Iap- Ept: Inferior anal appendage, Sap-Cr: Superior anal appendage, Sp: Spine, Se: setae, Ppt: paraproct.

Male genitalia:

Lamina anterior: very low in lateral veiw and black. Hamuli: small, with wide, short outer ramus (Lobe), and much shorter pointed inner ramus (Hook). Genital lobe: yellow, lengthen and hairy (Figure 8a,1b).

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Female genitalia:

Vulvar aperture with lips bulgy laterally and a profound U- shaped invagination is found in the mid (Figure 9b).

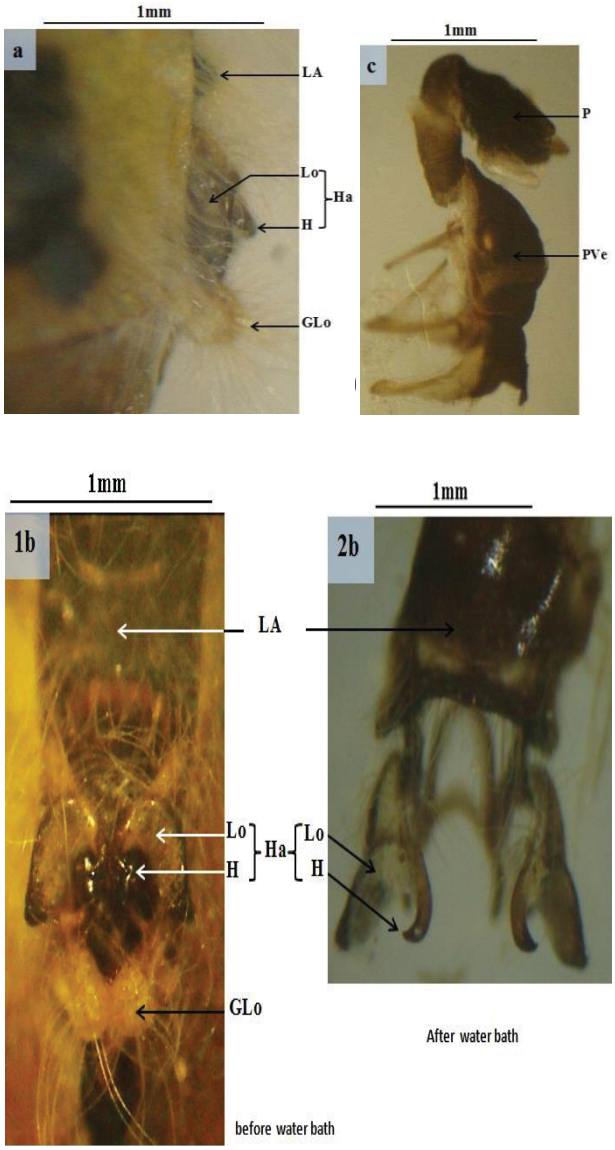

Figure 8: male genitalia of *Sympetrum fonscolombei*, a: lateral view b: ventral view c: penis LA: Lamina anterior, Lo: Lobe, H: hook, GLO: Genital lobe, P: Penis, Ha: Hamula, PVe: Penis Vesicle.

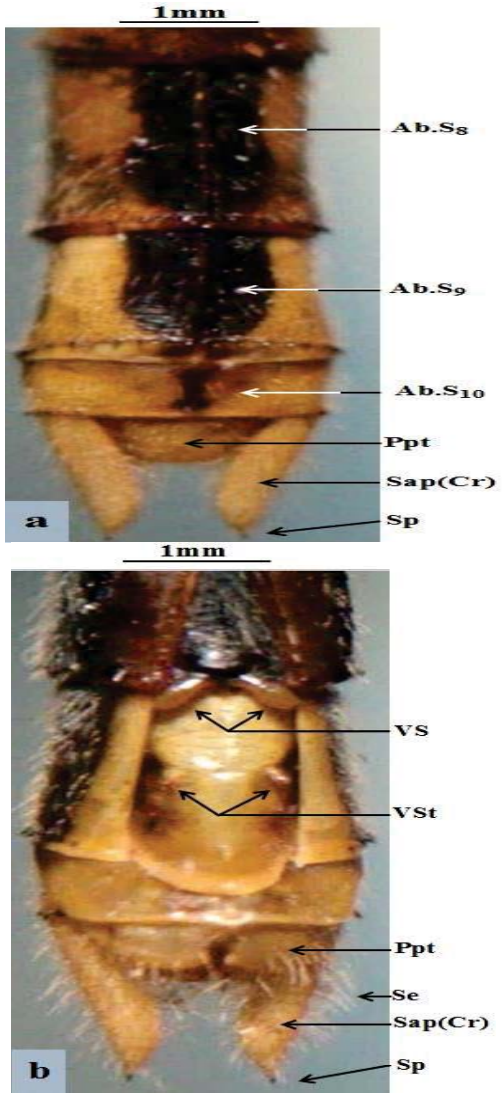

Figure 9: female abdomen and genitalia of *Sympetrum fonscolombii*: a: Abdomen (Dorsal view); b: genitalia(Ventral view) Ab. S: Abdominal Segment, Ppt: Paraproct, Sp: Spine, VS: Vulvar Scale, Sap (cr): Superior appendages, VSt: Vestigial stylet.

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