External Morphological Study of *Tabanus nemoralis* Meigen 1820 (Diptera: Tabanidae). In Baghdad/ Iraq

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Abstract

This work included external morphological study of horse fly *Tabanus nemoralis* Meig. 1820, which belongs to family Tabanidae order: Diptera. The study involved the most important taxonomic external characters of the: head, thorax, abdomen and their appendages which are: antenna, maxillary palp, wings, legs, spotting in coloring pattern of abdomen.

Key words: Horse fly, Diptera, Tabanidae, *Tabanus*, Description.

Introduction

The species *Tabanus nemoralis* Meig.1820 belongs to family Tabanidae Latreille 1802, subfamily Tabaninae Loew, 1860. This subfamily comprises about 275 species belong to 72 genera, worldwide distributed, from temperate to subtropical and tropical zones [1], it is known from many parts of the world from Asia including Saudi Arabia, Oman, Jordan, Syria, Kuwait and Turkey[2,3,4] to African including Egypt [5] to Europe including Hungary, Italy, Croatia and United Kingdom [6, 7] to North America including U. S. A. and Mexico [8] and to South America including Brazil, Chile and Colombia [9,10], the Tabaninae are poorly known in the Middle East [11], yet a comprehensive generic description is not available [12].
In Iraq, subfamily Tabaninae was studied by Leclercq (1963) describing 24 horse flies species within four genera and studied by Ahmed (2015) describing species within genera [13,14].
The females of most species feed regularly on nectar, which they need for energy, while blood meals are mainly utilized for Oogenesis by pierce skin and suck blood, while the males have lost their mandibles and feed on nectar and pollen alone [15,16].
The blood – feeding behavior of the females of horse flies make their veterinary and medical important, and includes many species important to human and animal health, either by acting as a disease vector such as surra, anthrax and Loaloa, or by debilitating the host [17, 18].
Members of family Tabanidae are medium – sized to larger specimens, usually densely haired on thorax and abdomen. Predominant specimens with brownish side markings on anterior abdominal segments, or mostly grayish – black to black, sometimes with paler dusted and pubescent posterior margins of abdominal segments [19,20].
Compound eyes in living specimens are mostly greenish with three purple bands, only very rarely unbanded or with one or two bands [20].
Eyes are always pubescent, usually rather long and very densely, or the hairs only indistinctly visible in the female sex. Males with longer and more densely haired eyes, facets on the upper parts of eyes either more or less enlarged or sharply separated from lower part with small facets, or all facets almost equal in size [21].
Ocellar tubercle is always present in both sexes, and vertex sometimes with three small vestigial ocelli. Frons usually narrower, frontal calli well developed; median callus usually liner and connected with a larger circular, square to rectangular shaped lower callus; only exceptionally calli reduced or missing. Wings are clear or slightly clouded especially interiorly, rarely with darker patches on cross veins and bifurcations; exceptionally a very short appendix to vein R4 [2,22].

Materials and Methods

Specimens of *Tabanus nemoralis* were collected from Al-Radwania 2014, west of the capital Baghdad, located at longitude 44.2680355 and latitude 33.1863567; and Al-Yousfia 2014, south of the capital Baghdad and away 25 km from Baghdad, located at longitude 44.251662 and latitude 33.07908 [23].
A total of two localities in the East of Iraq were visited during May, June, July and August 2014.
Horse flies were trapped with chemical trap and a regular insect net. Samples collected by the above traps were fixed on thick paper and kept in insect box. Date and place of collection and hosts were recorded.
A total of four female specimens were identified based on [20 and 22].
The study was made using a dissecting microscope (Olympus, Japan) and compound microscope (Olympus, Japan), using normal light. Image of insect by photomicroscope type **Ya Xun Microscope User Manual**, having enlargement power 200X max. Figures of different body insects have been improved with ocular micrometer [24].

The following table shows the solutions used in the preparation of the attractive substance of chemical trip and concentrations [14].

Seq.	Solution used	Concentration
1	Sec-butyl alcohol	11.4 ml
2	Iso-butyl alcohol	11.4 ml
3	n-butyric acid	11.4 ml
4	n-valeric acid	11.4 ml
5	Acetic acid	11.4 ml
6	Dimethyl disulphide	9.0 gm
7	Phenol	9.0 gm
8	P-cresol	9.0 gm
9	Indol	2.3 gm
10	Benzoic acid	2.3 gm
11	Acetone	11.4 ml

Results and Discussion

Describe of ***Tabanus nemoralis*** **Meig. 1820**

Body of ♀:- Fig -1-

Length: 13.2 mm and width 6.8 mm.

Head capsule:- Fig -2-

Compound eyes densely pale haired with three bands in a live pattern.

Frons:- Fig -2-

Pale grayish dusted, rather board, nearly parallel sided. Lower frontal callus has shining black, large and nearly square in shape, connected with subcallus and usually touching the eye margins. Median frontal callus large and very broad, rather dull black; larger than, and connected with the lower frontal callus. Frons at vertex has with another broad whitish patch. Postocular margin on vertex has border than usual, whitish-grey, and clothed with longer pale or grayish hairs. Subcallus grayish dusted, face and cheeks whitish-grey with long whitish hairs below. A distinct blackish has parafacial band on each side of antennae.

Maxillary palp:- Fig -2-

It's yellowish-grey, apical segment rather long and slender, about four times as long as deep and only indistinctly thickened at base, predominantly black palpalcalli.

Antennae:- Fig -2-

Stylate, entirely black, or segment 3 extensively reddish-brown with all intermediates to entirely black. Basal segments with fine black hairs; segment 3 rather slender with only slightly developed dorsal tooth near base.

Thorax: (Dorsal view) Fig -3- A

It's mostly blackish, pronotum dark and bear, meso and metanotum with distinct, paler longitudinal stripes and scattered pale hairing. Pleura paler grey dusted with denser pale hairing called pubescent, notopleural lobes always light color. Scutellum has oval, dark in color. A halter has dark brown, knobs paler at tip.

Abdomen: (Dorsal view) Fig -3- B

Rather shining black, clothed with densely set, short, adpressed black hairs; three rows of grayish pattern called patches rather distinct, consisting of a row of slender median triangles of patches which are broader on anterior tergites; of large, oval and distinctly oblique sublateral patches; and of narrow pale borders on posterior margins.

Wing: Fig -4- A

The wing is broader and more blunt-tipped. Clear with blackish-brown veins, exceptionally a very short appendix to vein R4. The anal cell closed. The setulae has presence on the basicosta.

Leg: Fig -4- B

Grayish on coxa, trochanter and femur, tibia are brownish, tarsus black. Femur and tibia cylindrical shape, tarsus consist of five segments with pair of two long and hard claws at the end, arolium is median size between the claws.

Fore leg: Fig -4- B\1

Coxa is elongate with medium size and pale haired, trochanter small size and bare, femur with median size of separate hairs, tibia with short separate hairs, basitarsus bare.

Mid leg: Fig -4- B\2

Coxa square shape and bare, trochanter median size with few short separate hairs, femur with tuft of long hairs on anterior part from ventral side, tibia with median size hairs on far half and has pair of black and long special spurs on far end near basitarsus, the last is bare and longer than basitarsus of fore leg.

Hind leg: Fig -4- B\3

Coxa nearly square with short pale hairs, trochanter with dense pale hairs, femur large size and inflate with long dense hairs along it, tibia with a long and median size hairs, basitarsus with short and median size hairs and it is larger than basitarsus of mid leg.

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Figure (1) Female of *Tabanus nemoralis* Meigen 20 X.

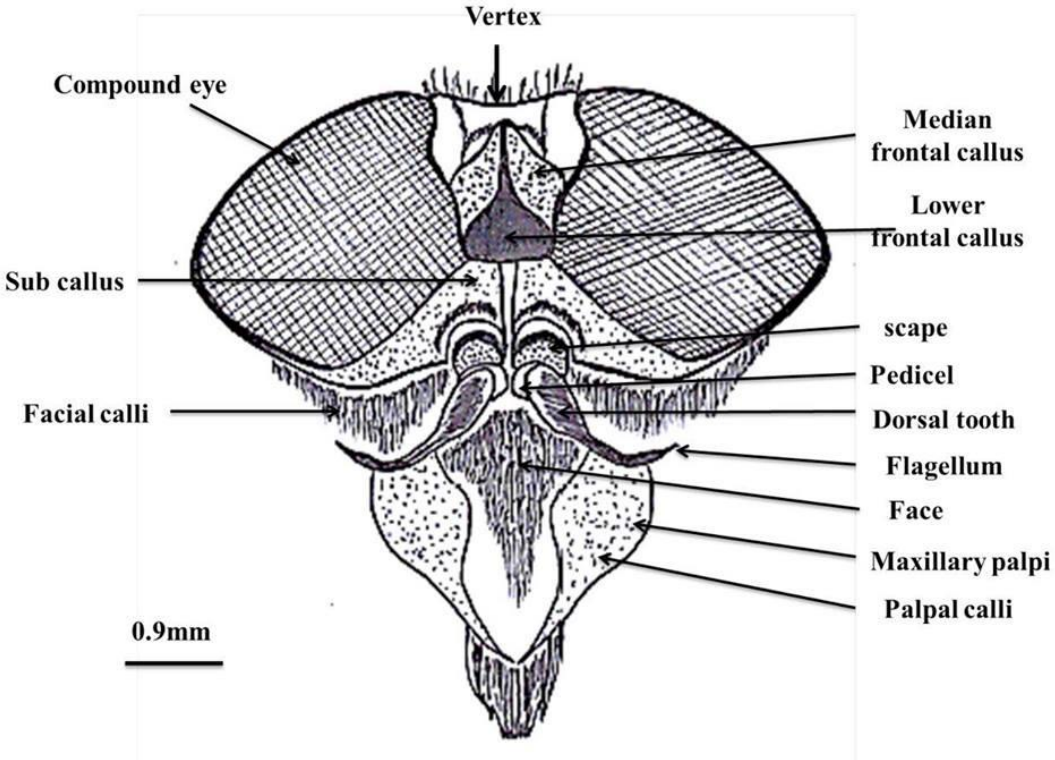

Figure (2) Head parts of *Tabanus nemoralis* Meigen

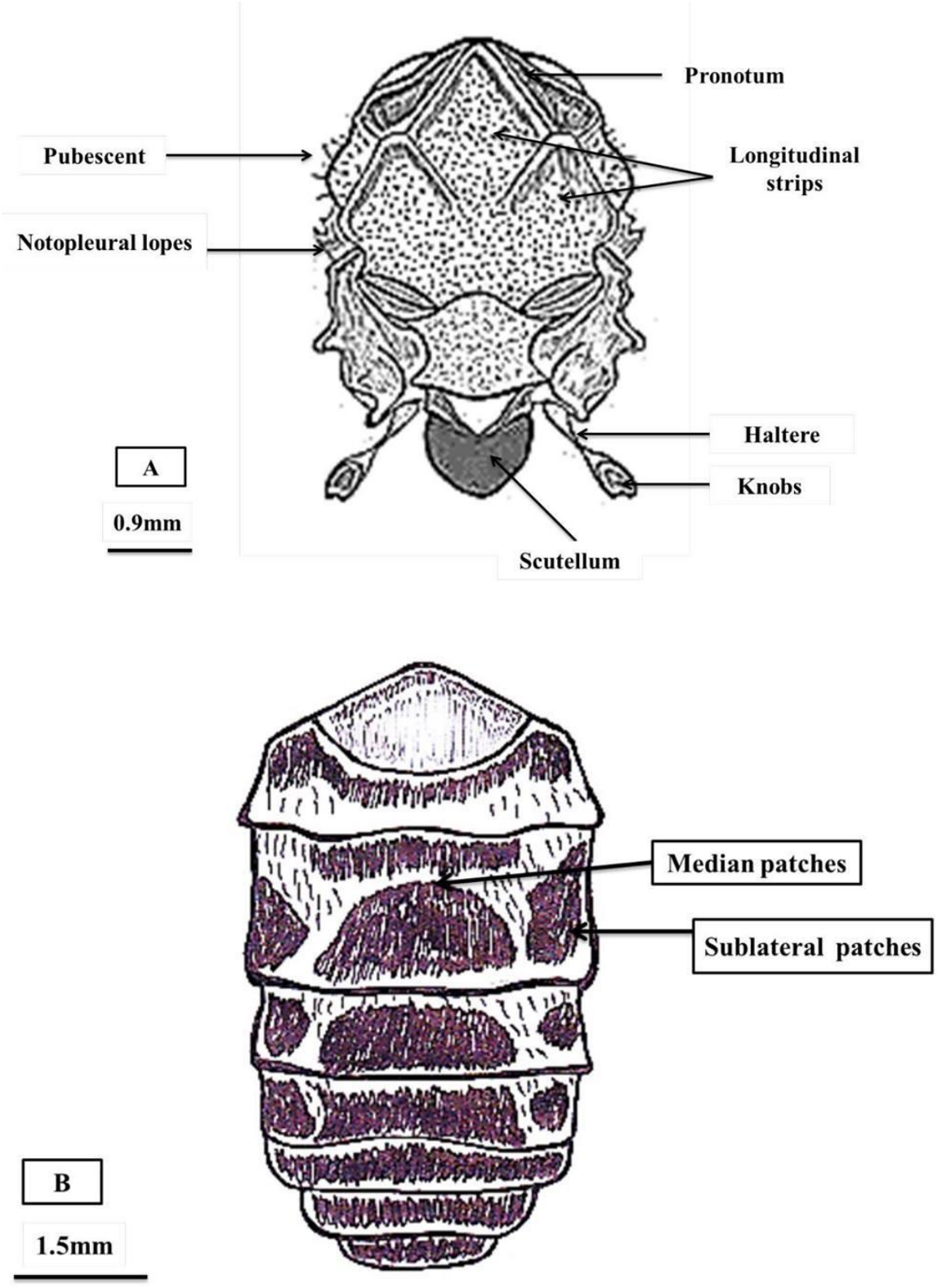

Figure (3) Body parts of *Tabanus nemoralis* Meigen (Dorsal view) A- Thorax, B-Abdomen

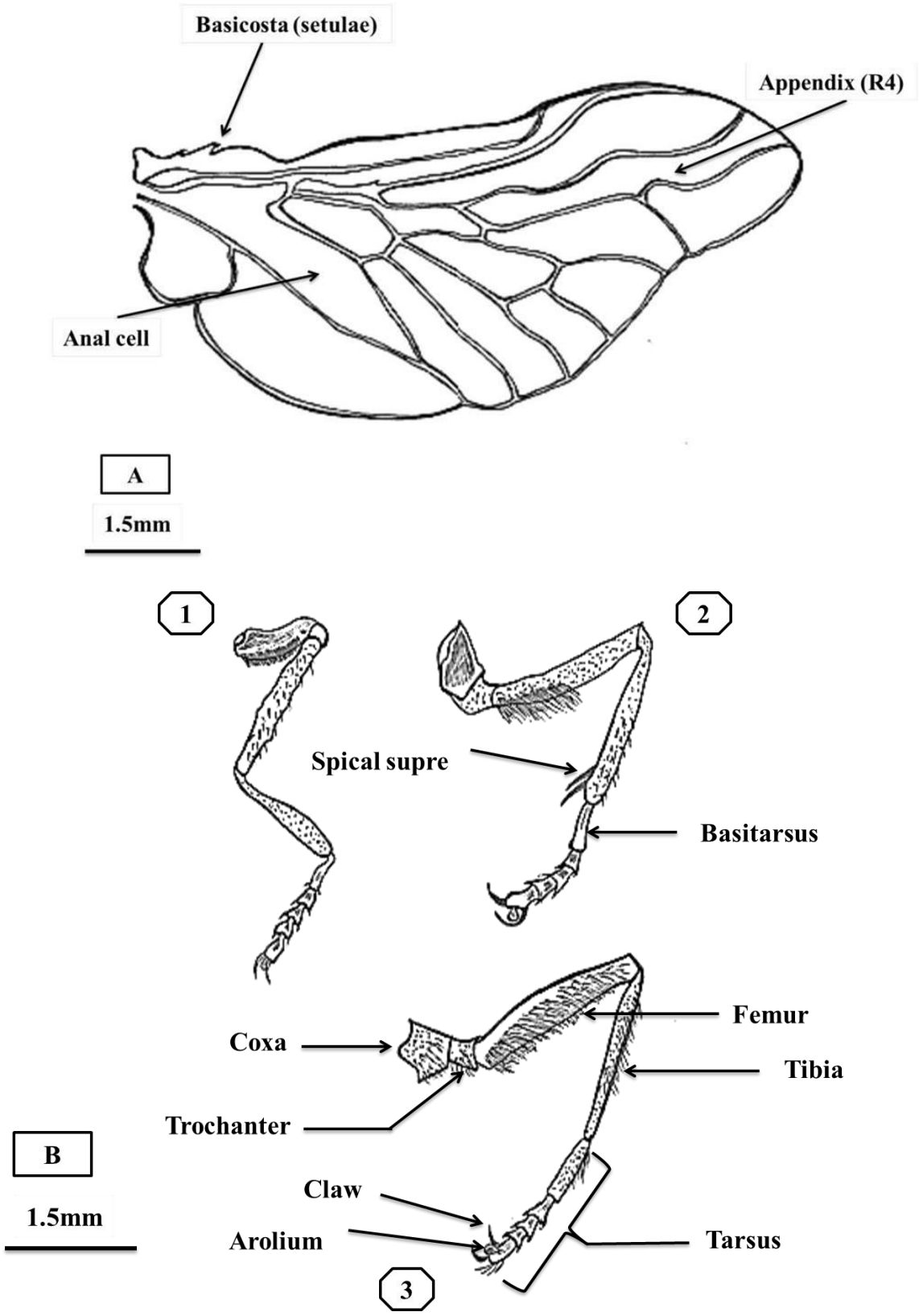

Figure (4) Body parts of *Tabanus nemoralis* Meigen A- Wing, B- Legs (1. Fore leg, 2, Mid leg, 3. Hind leg).

دراسة المظهر الخارجي للنوع *Tabanus nemoralis* Meigen,1820 (Diptera: Tabanidae) في بغداد/ العراق

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قسم علوم الحياة /كلية التربية للعلوم الصرفة (أبن الهيثم)/ جامعة بغداد

استلم في: 6/ ايلول/2016 ، قبل في: 8 /اذار/2017

الخلاصة

تضمن البحث دراسة المظهر الخارجي لذبابة الخيل *Tabanus nemoralis* Meig. 1820، والتي تعود لعائلة Tabanidae من رتبة ثنائية الأجنحة Diptera.
شملت الدراسة صفات المظهر الخارجي ذات الأهمية التصنيفية للرأس والصدر والبطن ولواحقها التي تتمثل بقرن الأستشعار والملمس الفكي والأجنحة والأرجل ونموذج التلون والتبقع للبطن.

الكلمات المفتاحية:- ذباب الخيل، ثنائية الأجنحة، Tabanidae، *Tabanus*، وصف.