



## IV-RESULTS

### 1- Collection of materials:

Survey of tipulid flies was carried out from March 1993 to January 1996 in fifteen localities belonging to fifteen governorates representing Coastal Strip, Western desert, Lower Nile valley, Upper Nile valley, Eastern desert and Sinai (Table A)

Sweeping net and ultra violet light trap were the methods of collection; fields of wheat, barley, clover, maize, pastures and meadows were the places of collection.

**Table (A): Places of collection**

<b>Zones</b>	<b>Governorates</b>	<b>Localities</b>
Coastal Strip	Alexandria	Abise
Western desert	Bahria Oasis	Bawiti
	El Kharga Oasis	El Wadi El Gedeed
	Beheira	El Nubareia
Lower Nile Valley	Sharqiya	Bilbies
	Daqahliya	Aga
	Kafr El Sheikh	Sidi Salem
	Qalyubiya	El Marg
	Minufiya	Minuf
Upper Nile Valley	Cairo	Ain Shams
	Giza	El Orman
	El Faiyum	Kom Oshim
	Asyut	Ezbet Khalaf
Eastern desert	Ismailiya	Kassasin
Sinai	North Sinai	El Arish

\*The obtained results are as follows:

A total of 372 tipulid specimens of 10 species under 9 genera belonging to two subfamilies (Tipulinae and Limoniinae) from which 5 species and 3 genera were collected for the first time from Egypt.

Table (B1-B10) number of specimens collected during the period of investigation.

#### A- Subfamily Limoniinae:

Table (B1): *Conosia irrorata* (Wiedemann)

Months	No. of specimens		Hosts	Locality	Methods of coll.	
	Males	Females			Net.	L.t.
May	5	6	Meadows	El Orman	0	11
June	1	3	Maize, Clover	Asyut	0	4
July	1	1	Clover	El Nubareia	0	2
August	0	2	Barley, Clover	Kassasin	2	0
September	9	24	Rice, Maize	Bilbies	12	21
October	2	13	Rice, Clover	Sidi Salem	6	9
November	3	8	Maize, Clover	Aga	11	0
Total no. of specimens	21	57			31	47
	78					

Table (B2): *Dicranomyia ventralis* (Schummel)

Months	No. of specimens		Hosts	Locality	Methods of coll.	
	Males	Females			Net.	L.t.
May	1	2	Meadows	Ain Shams	0	3
June	4	4	Meadows	El Orman	0	8
Total no. of specimens	5	6			11	
	11					

Net. = sweeping net

L.t. = ultra violet light trap.

Table (B3): *Erioptera septemtrionis* Osten Sacken

Months	No. of specimens		Host	Locality	Methods of coll.	
	Males	Females			Net .	L.t.
June	19	34	Rice, Clover	El Wadi El Gedeed	0	53
Total no. of specimens	53					

Table (B4): *Gonomyia sexguttata* (Dale)

Months	No. of specimens		Host	Locality	Methods of coll.	
	Male	Female			Net .	L.t.
August	1	1	Forested area	El Wadi El Gedeed	2	0
Total no. of specimens	2					

Table (B5): *Gonomyia spuria* Bergroth

Months	No. of Specimens		Host	Locality	Methods of Coll.	
	Male	Female			Net .	L.t.
July	1	0	Clover	Kassasin	1	0
Total No. of Specimens	1					

Table (B6): *Helius longirostris* (Wiedemann)

Months	No. of specimens		Host	Locality	Methods of coll.	
	Males	Females			Net.	L.t.
June	3	4	Pastures	Kom Oshim	7	0
Total no. of specimens	7					

Table (B7): *Limnobia marginata* (Macquart)

Months	No. of specimens		Hosts	Locality	Methods of coll.	
	Males	Females			Net.	L.t.
February	5	8	Meadows	Ain Shams	0	13
October	3	5	Meadows	El Orman	0	8
Total no. of specimens	8	13				
	21					

Table (B8): *Symplecta stictica* Meigen

Months	No. of specimens		Host	Locality	Methods of coll.	
	Male	Female			Net.	L.t.
May	1	0	Wheat, Clover	El Nubareia	1	0
Total no. of specimens	1					

Table (B9): *Trimicra inconspicua* (Loew)

Months	No. of specimens		Hosts	Locality	Methods of coll.	
	Males	Females			Net .	L.t.
April	9	13	Clover	Kom Oshim	22	0
May	2	4	Meadows	El Orman	0	6
September	3	5	Fruit trees	El Arish	0	8
October	7	12	Clover, Wheat	Aga	19	0
Total no. of specimens	21	34			41	14
	55					

\*Nine species under eight genera were collected.

*Conosia irrorata* (Wiedemann) represented by 78 individuals (21 males & 57 females) from which 47 specimens collected by light trap and 31 by sweeping net, the largest number of specimens was collected during September and October on rice, maize and clover in Sharqiya (Bilbies) and Kafr EL Sheikh (Sidi Salem) (Table B1)

*Dicronomyia ventralis* (Schummel) represented by 11 individuals (5 males & 6 females) collected in May and June from Cairo (Ain Shams), Giza (El-Orman) on meadows by ultra violet light trap. (Table B2)

*Erioptera septemtrionis* Osten Sacken represented by 53 individuals (19 males & 34 females), collected by ultra violet light trap in June on rice and clover from El Kharga Oasis (El Wadi El Gedeed) (TableB3)

*Gonomyia sexguttata* (Dale) only 2 specimens (1 male & 1 female) were collected by sweeping net in August on forested area from El Kharga Oasis (El Wadi El Gedeed) (Table B4)

*Gonomyia spuria* Bergroth only one specimen (1 male) was collected by sweeping net in July on clover from Ismailiya (Kassasin) (Table B5)

*Helius longirostris* (Wiedemann) 7 individuals (3 males & 4 females) were collected by sweeping net in June on pastures from El Faiyum (Kom Oshim) (Table B6)

*Limnobia marginata* (Macquart) 21 individuals (8 males & 13 females) were collected by sweeping net in February and October on meadows from Cairo (Ain Shams) and Giza (El Orman) (Table B7)

*Symplecta stictica* Meigen only one specimen (1 male) was collected by sweeping net on clover from Beheira (El Nubareia) (Table B8)

*Trimicra inconspicua* (Loew) represented by 55 individuals (21 males & 34 females) of which 41 specimens were collected by sweeping net and 14 specimens collected by ultra violet light trap, the largest specimens number were collected upon clover in April from El Faiyum (Kom Oshim) (Table B9).

## B- Subfamily Tipulinae:

Table (B10): *Tipula oleracea* Linnaeus

Months	No. of specimens		Hosts	Localities	Methods of coll.	
	Males	Females			Net.	L.t.
January	2	4	Wheat, Clover	Abis	2	4
February	9	14	Wheat	Sidi Salem	7	16
March	11	17	Wheat, Clover	Bawiti	10	8
April	13	28	Wheat, Clover	Bilbies	14	27
May	1	6	Clover	Aga	7	0
June	0	2	Wheat	Kassasin	2	0
July	1	1	Wheat, Clover	El Marg.	2	0
August	1	2	Wheat, Clover	Minuf	1	2
September	0	1	Meadows	El Orman	0	1
October	2	5	Meadows	El Orman	3	4
November	5	7	Meadows, Grasses	El Wadi El Gedeed	0	12
December	3	8	Meadows	El Orman	0	11
Total no. of specimens	48	95			58	85
	143					

Only one species *Tipula oleracea* Linnaeus was collected during the study, 143 individuals (48 males & 95 females) from which 58 specimens were collected by sweeping net and 85 specimens by ultra violet light trap. The study indicated that this species was found all the year round and the highest specimens numbers were recorded in April on wheat and clover in Sharqiya (Bilbies).(Table B10)

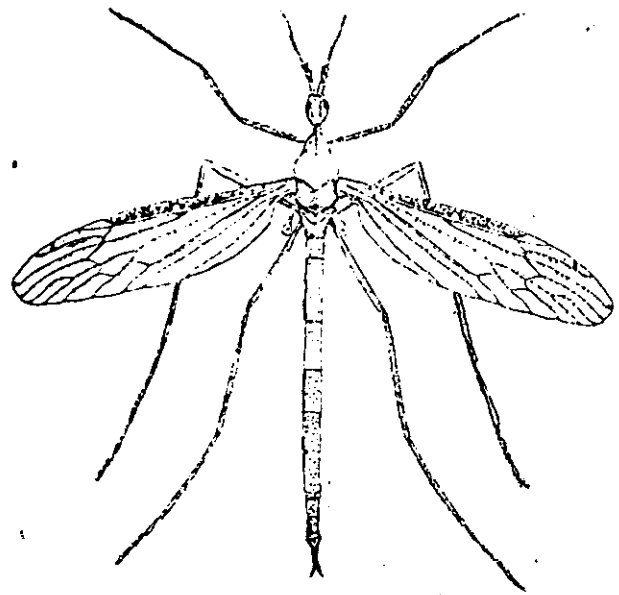


## 2- External morphology:

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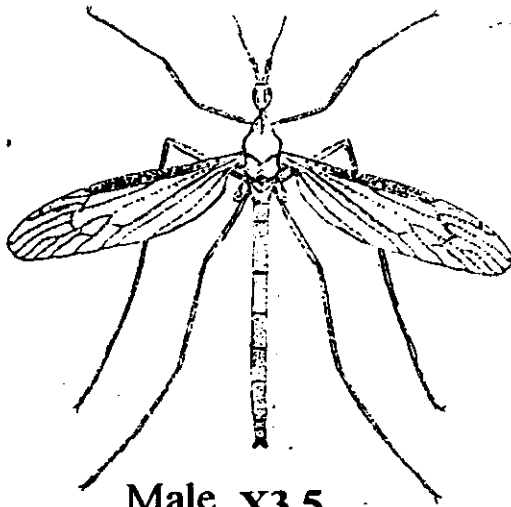
A- The morphological characters and abbreviations of male *Conosia irrorata* (Wiedemann) as representative of subfamily Limoniinae.

\* Male as female except in size, wing venation and structure of genitalia.



**Female X3.5**

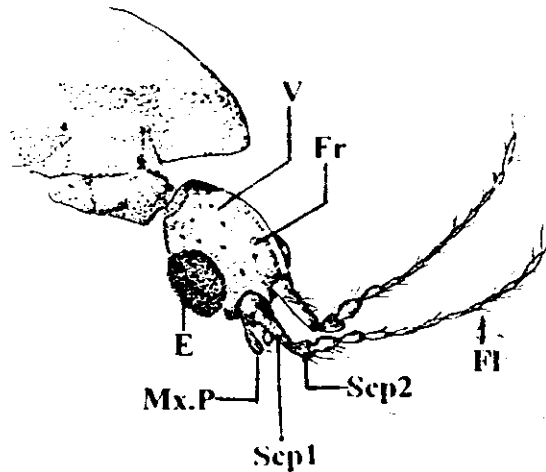
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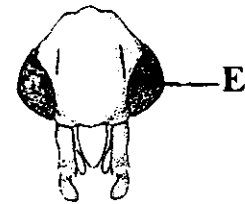
**Male X3.5**

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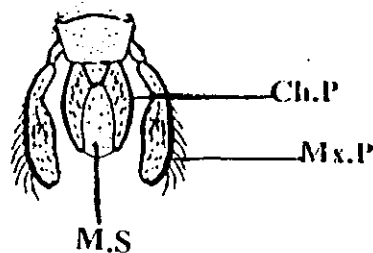
## I-Head:



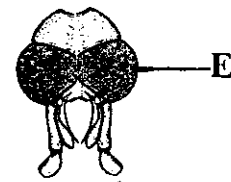
Dorsolateral view X17.5



Dorsal view X15



Mouth parts X28



Ventral view X15

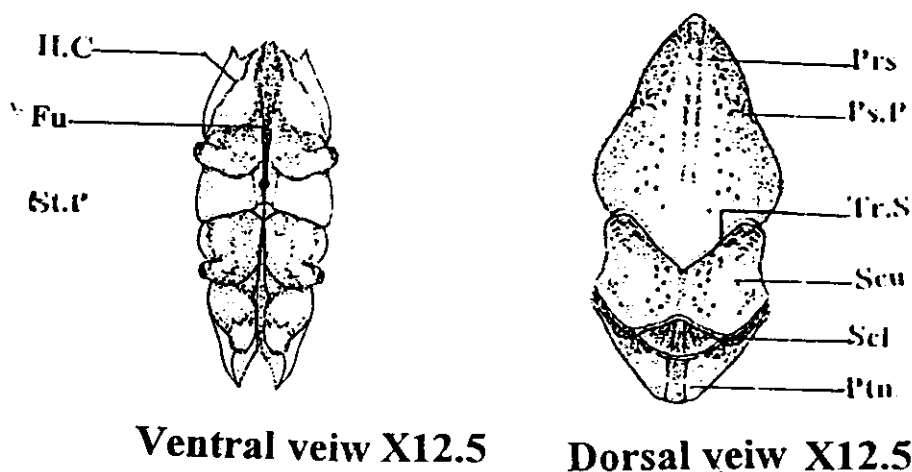
\***Head capsule** subglobular with **vertex (V)** strongly arched forming one-third of the entire width of head; **frons (Fr)** humped, more than the half length of vertex; **neck (Nc)** indistinct.

\***Compound eyes (E)** oblong ovate with slightly concave outer edges, widely separated dorsally, contiguous ventrally.

\***Antenna (An)** 12-jointed, with scape divided into **scapal joint one (Scp1)** hearty shaped, two times of **scapal joint two (Scp2)** and **flagellum (Fl)** thread like with irregular short pubescence, the terminal joint is the longest one.

\***Mouth parts** without **nasus (Na)** consists of bare **rostrum (Rt)**, shorter than the head; **maxillary palpi (Mx.P)** 2-jointed, the second joint flape-like, 9x as the length of the first joint; **labellae (La)** with spoon like membranous sheath surrounded by a **chitinated plate (Ch.P)**.

## II-Thorax:



Ventral veiw X12.5

Dorsal veiw X12.5

### (1) Dorsal view:

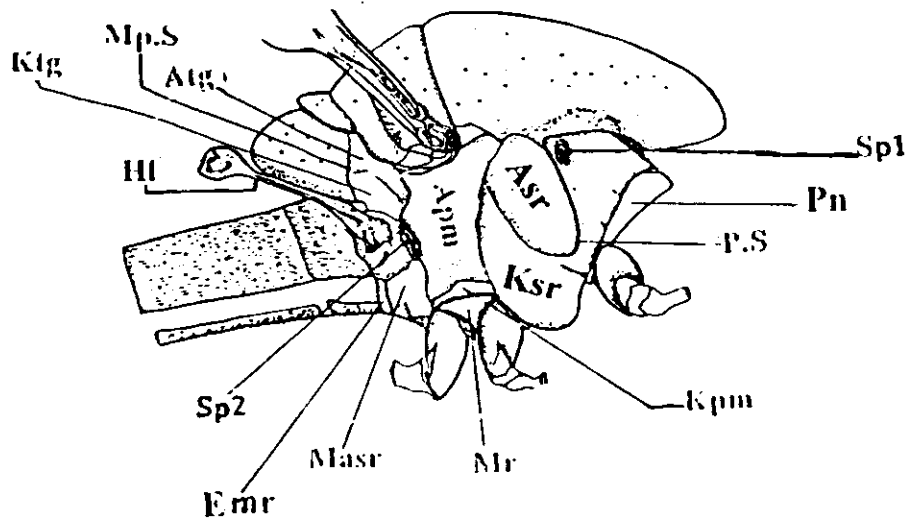
**\*Prothoracic segment with pronotum (Pn) hidden under Prescutum.**

**\*Mesothoracic segment** with a conical shaped **prescutum (Prs)** provided with a median light brown band surrounded by fine dark brown spots; **prescutal pits (Ps.P)** arising adjacent to the anterior margin of prescutum; **scutum (Scu)** slightly grooved at middle; **transverse suture (Tr.S)** represented by a weak line; **scutellum (Scl)** rhomboidal with two lateral arms; **postnotum (Ptn)** crescent in shape.

**\*Metathoracic segment** hidden beyond postnotum.

### (2) Ventral view :

Characterized by a wide black **furca (Fu)** at middle which divides the **sternal pleurite (St.P)** into two equal parts. **Humeral callus (H.C)** complete.



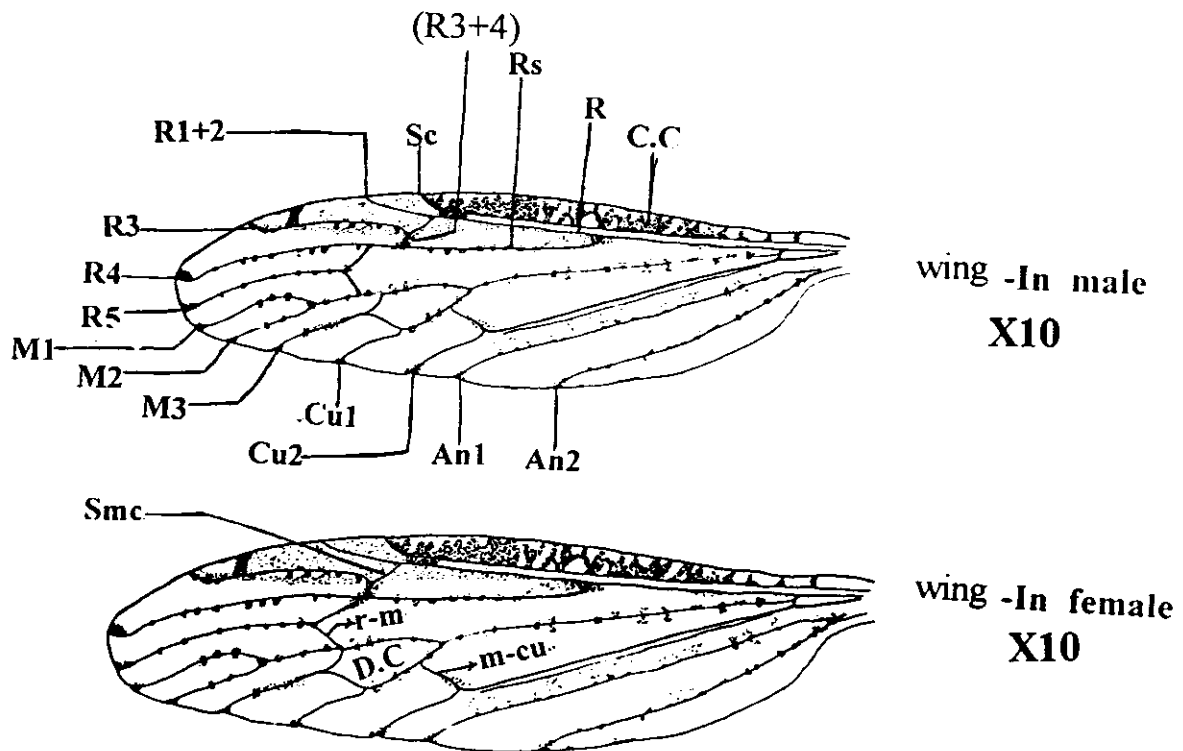
**X16.5**

**(2) Lateral view :**

**\*Prothoracic** segment with **pronotum (Pn)** represented by a rod like undivided plate; **propleuron (Prn)** indistinct.

**\*Mesothoracic** segment with vestigial **paratergite (Ptg)**; **pleural suture (P.S)** curved, divided the episternum into two unequal plates [large **anepisternum (Asr)** & small **katepisternum (Ksr)** ]; **anterior spiracle (Sp1)** placed at the posterodorsal margin of the anepisternum; **anepimeron (Apm)** oblong, subrectangular plate; **katepimeron (Kpm)** small, narrow plate; **meron (Mr)** triangular in shape with acute angle; **posterior spiracle (Sp2)** placed adjacent to the middle of the inner lateral side of anepisternum.

**\*Metathoracic** segment with **anatergite (Atg)** and **katatergite (Ktg)** medially marked by a weak **metapleural suture (Mp.S)**; **metepisternum (Masr)** represented by subquadrate undivided part; **epimeron (Emr)** narrow, short part; **halter (HI)** slightly surpassing the posterior margin of postnotum.



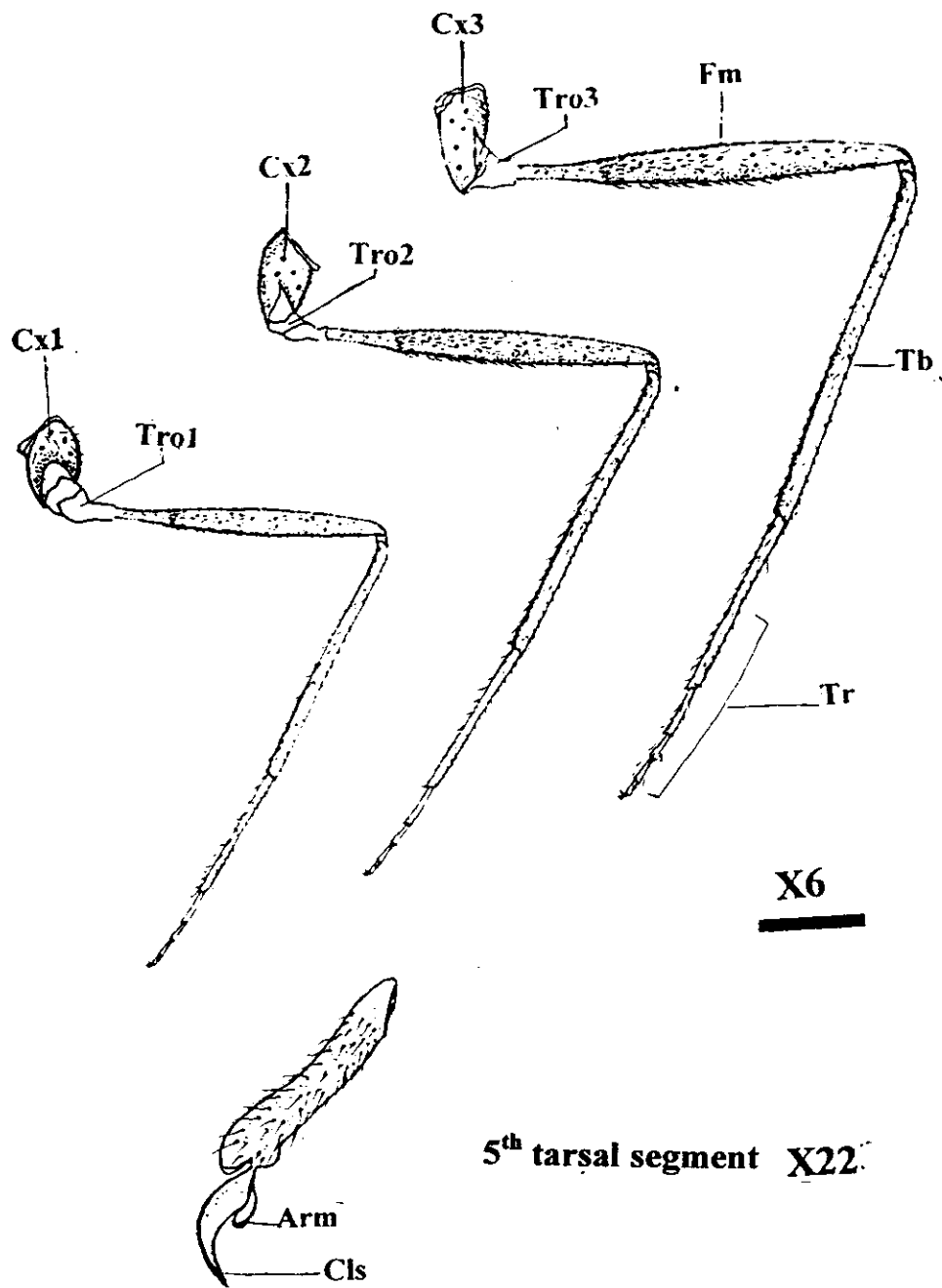
#### (4) Thoracic appendages:

##### a- Wings :

Shorter than the abdomen; costal cell (C.C) with irregular dark brown stigma; subcostal vein (Sc) ending in costa, not connected with radius (R); radial sector (R.S) forming acute angle with radius; 1<sup>st</sup> longitudinal vein (R1+2) little longer than (Sc); 2<sup>nd</sup> longitudinal vein (R3) slightly sinuate at the base of wing more than 2x of the length of (R1+2). Submarginal cross vein (Smc) distinct, connected with R3 at its origin, veins (R4+5) completely separated; discal cell (D.C) lozenge; posterior cross vein (m-cu) conspicuous, connected with discal cell beyond the anterior edge; 5<sup>th</sup> and 6<sup>th</sup> vein (Cu1 & Cu2) nearly straight; 7<sup>th</sup> vein (An2) nearly straight.

**-In male:** Cross vein (R3+4) arising before the origin of (R5); anterior cross vein (r-m) ending beyond the posterior margin of discal cell (D.C).

**-In female:** Cross vein (R3+4) fused with (R5), cutting (R4) just at its half length; anterior cross vein (r-m) ending at the posterior margin of discal cell (D.C).

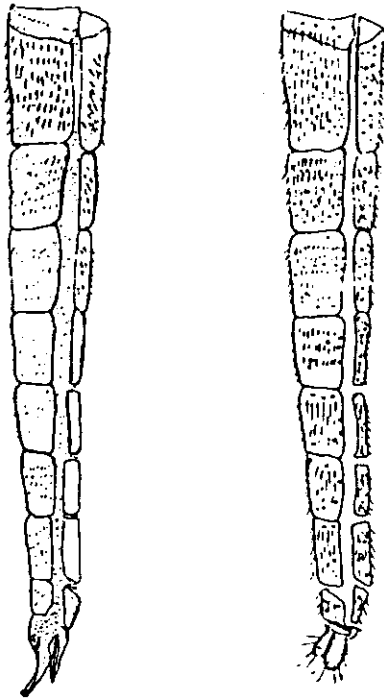


### b- Legs:

Slender, with pale yellow pubescence; coxa (Cx) with short hairs at the dorsolateral side; hind coxa (Cx3) rather wider and elongated than fore and mid coxae (Cx1 & Cx2); trochanter of the foreleg (Tro1) smaller than trochanter of mid and hind legs (Tro2 & Tro3); femur (Fm) thin and bare at base, more thick & robust at middle; tibia (Tb) without spurs; (Spu); tarsus (Tr) shorter than femur; claws (Cls) strong without teeth; arolium (Arm) scarcely visible.

### III-Abdomen:

**X12**  
**Male abdominal segments**

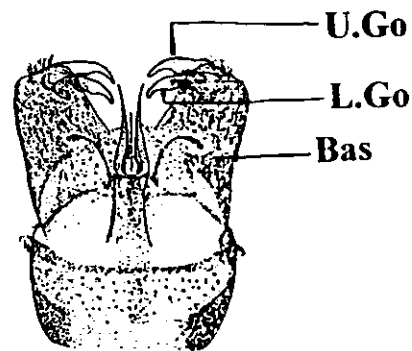


**Female abdominal segments**  
**X10**

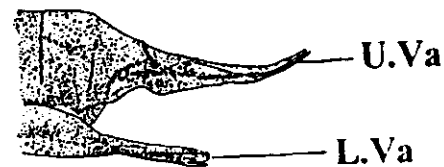
**Lateral view**



**X32**



**Male hypopygium X32**



**Female ovipositor X32**

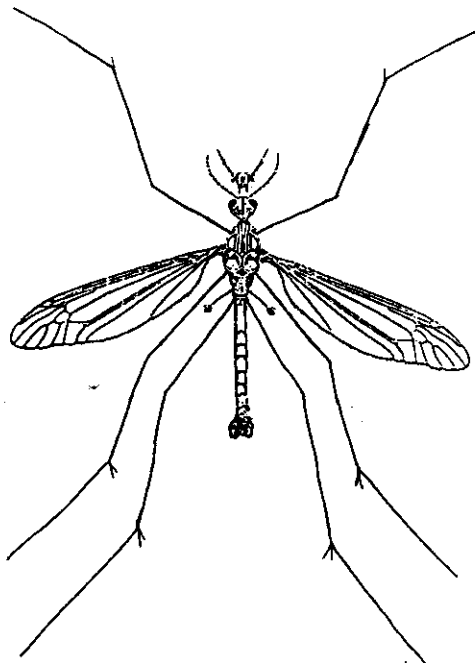
Cylindrical parallel sided in both sexes, with the first segment the shortest one, closely attached to thorax; second segment the longest one.

\***Male hypopygium** with undivided basistylus (Bas); upper gonostylus (U.Go) narrow, bearing several minute acute spines at apex; lower gonostylus (L.Go) hooked shaped, somewhat similar to the outer dististylus; ninth tergite (9Tg) semicircular.

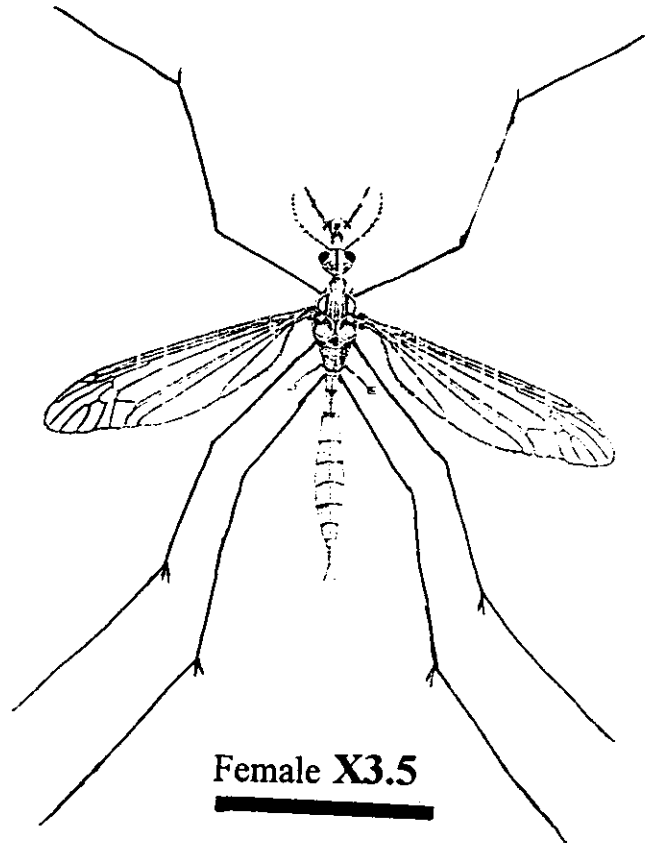
\***Female ovipositor** with arcuate upper valves (U.Va); lower valves (L.Va) narrow, with a row of dense spines; ninth sternum (9St) reduced.

**B- The morphological characters and abbreviations of female *Tipula oleracea* Linnaeus as representative of subfamily Tipulinae.**

\* Male as female except in size, shape of abdomen and structure of genitalia.



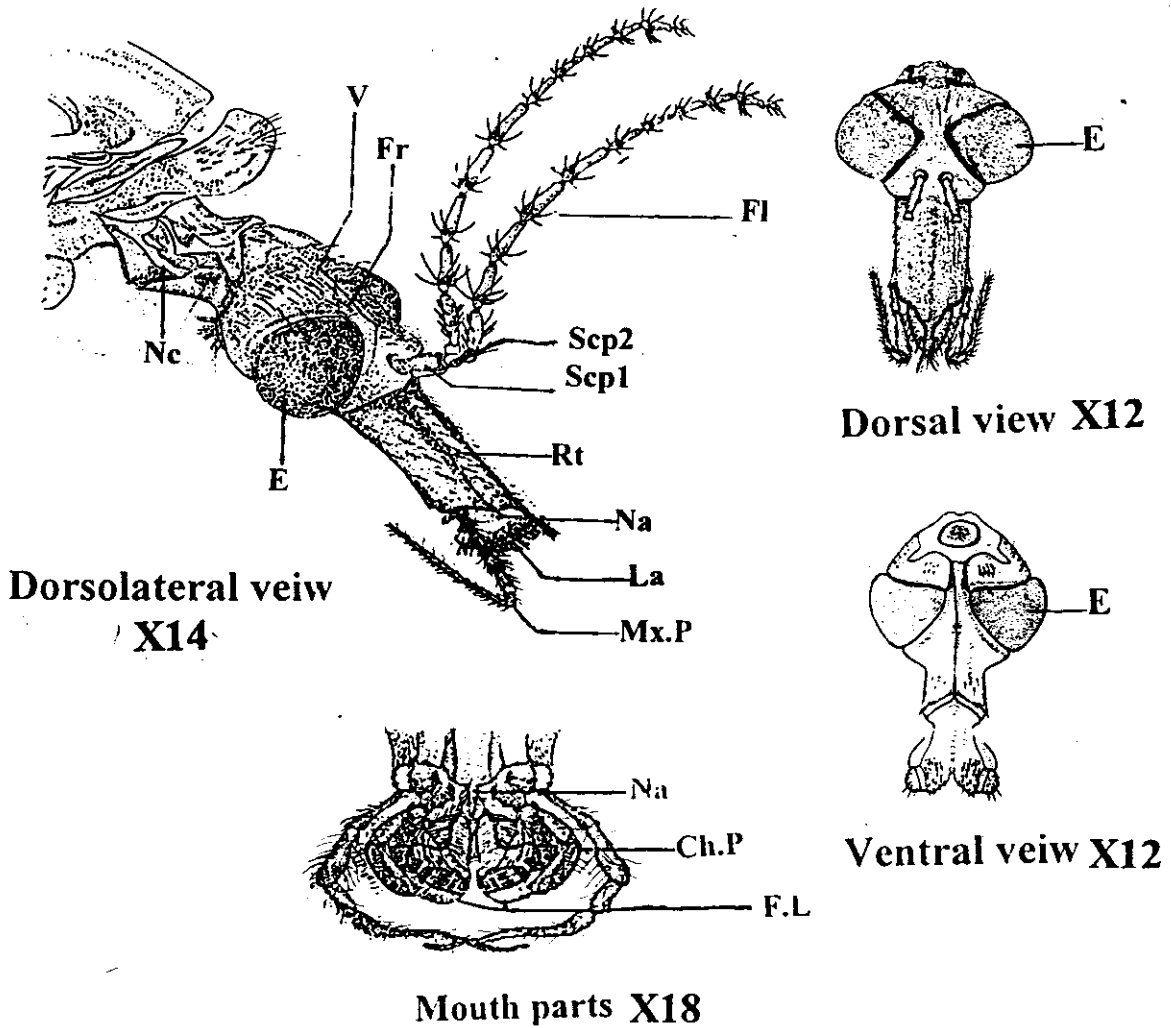
**Male X3.5**



**Female X3.5**



## I-Head:



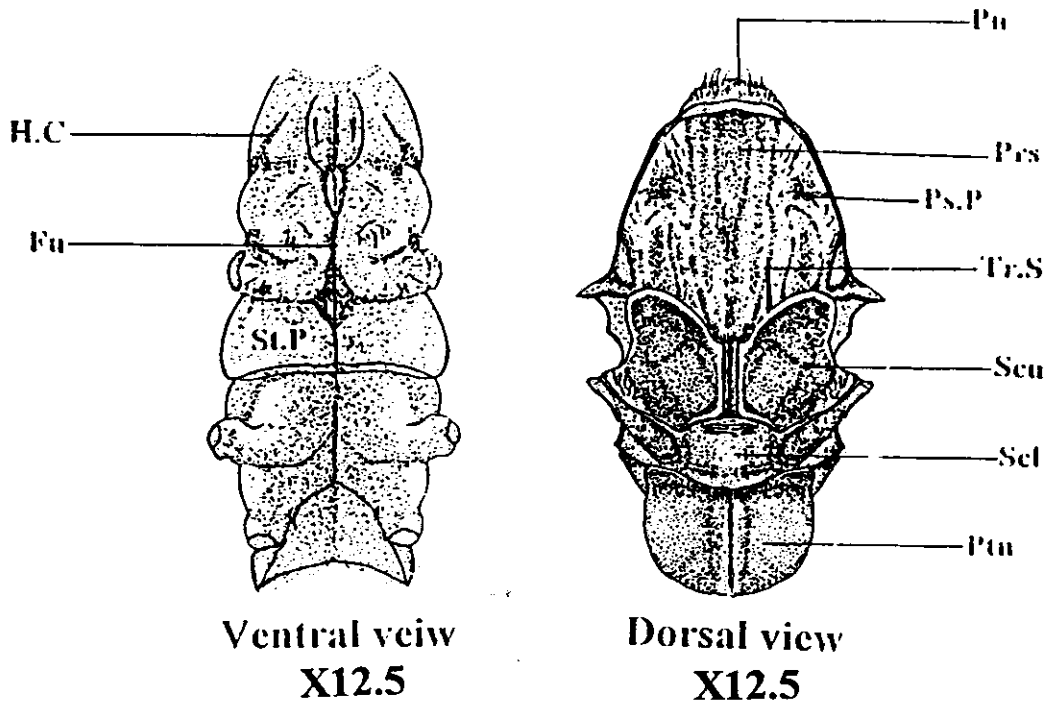
\***Head capsule** transversely elongate with vertex (V) slightly arched forming three fourths of the head width; frons (Fr) flattened, narrow, less than half the length of vertex; neck (Nc) distinct and provided with two small chitinized cervical sclerites (C.S.)

\***Compound eyes (E)** triangular with strongly concave outer edges, moderately separated dorsally and subcontiguous ventrally.

\***Antennae (An)** 13 jointed, with scap divided into scapal joint one (Scp1), 3 times as long as scapal joint two (Scp2) and flagellum (Fl) with whorls of short stiff bristly hairs arranged at the base of each joint, flagellar joints swollen basically, then gradually tapering to a narrow apex, the terminal joint reduced to a short style.

\***Mouth parts** consist of bristly prolonged rostrum (Rt), as long as the head; nasus (Na) present; maxillary palpi (Mx.P) 4-jointed, the last joint whiplash-like as long as the last three joints together; labella (La) represented by two fleshy lobes (F.L) supported externally by chitinized plates (Ch.P).

## II-Thorax:



### (1) Dorsal view:

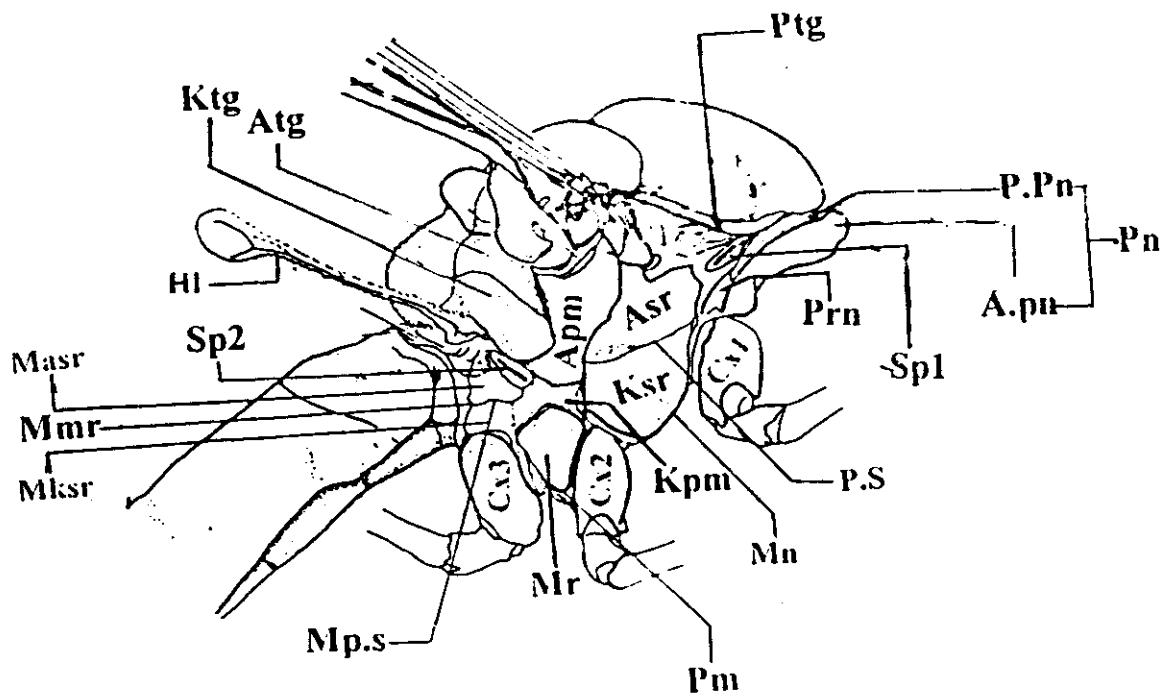
\*Prothoracic segment represented by a well developed **pronotum (Pn)** jutting anteriorly over prescutum.

\*Mesothoracic segment with arched **prescutum (Prs)** provided with four broad longitudinal dark brown bands and two lateral impressed **prescutal pits (Ps.P)** arising far distance from the anterior half of prescutal margin; **scutum (Scu)** deeply grooved at middle, separated from prescutum by strong V shaped **transverse suture (Tr.S)**; **scutellum (Scl)** subquadrate plate with two lateral arms; **postnotum (Ptn)** semicircular in shape with a thin dark brown stripe just at the middle.

\*Metathoracic segment hidden beyond postnotum.

### (2) Ventral view:

Characterized by a thin, black **furca (Fu)** at middle divided the **sternal pleurite (St.P)** into two equal parts. **Humeral callus (H.C)** incomplete.



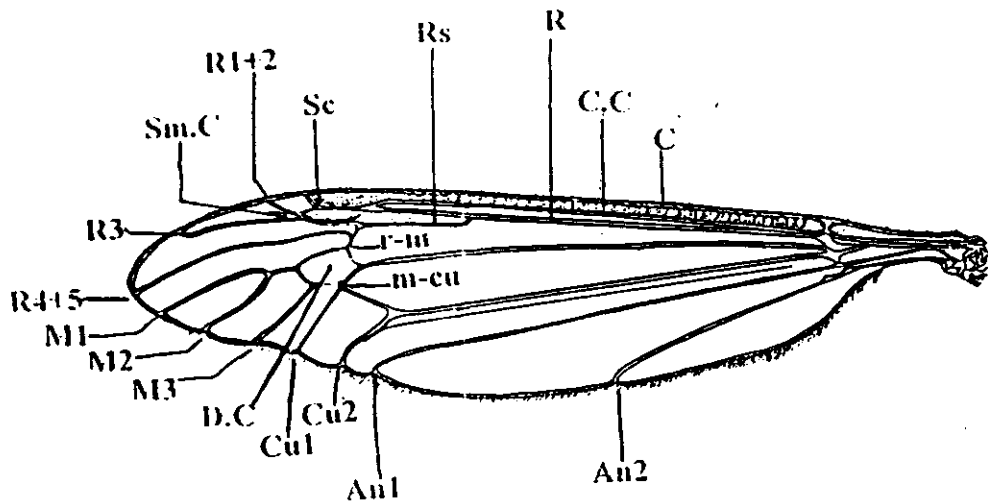
**X16.5**

### (3) Lateral view

\***Prothoracic** segment with pronotum (Pn) clearly divided into well-developed anterior antpronotum (A.Pn), posterior postpronotum (P.Pn); propleuron (Prn) represented by a small triangular part.

\***Mesothoracic** segment differentiated into an upper narrow transverse paratergite (Ptg) and a lower mesopleuron (Mso) which is divided by a sinuate longitudinal pleural suture (P.S) into two subequal episternal plates [anepisternum (Asr) & katepisternum (Ksr)]; anterior spiracle (Sp1) placed at anterodorsal margin of anepisternum; epimeron (Pm) consists of an oblong basically constricted anepimeron (Apm), a small transverse katepimeron (Kpm) and trapizoidal shaped meron (Mr). Posterior thoracic spiracle (Sp2) placed beneath the posterolateral margin of metanepisternum.

\***Metathoracic** segment consists of two upper subrectangular laterotergites [anatergite (Atg) & katatergite (Ktg)] and lower metapleuron (Mn) which is divided by metapleural suture (Mp.S) into anterior subquadrate metepisternal plates [metanepisternum (Masr) & metakatepisternum (MkSr)] and posterior narrow elongated metepimeron (Mmr). Halter (HI) extensively surpassing the posterior margin of postnotum.

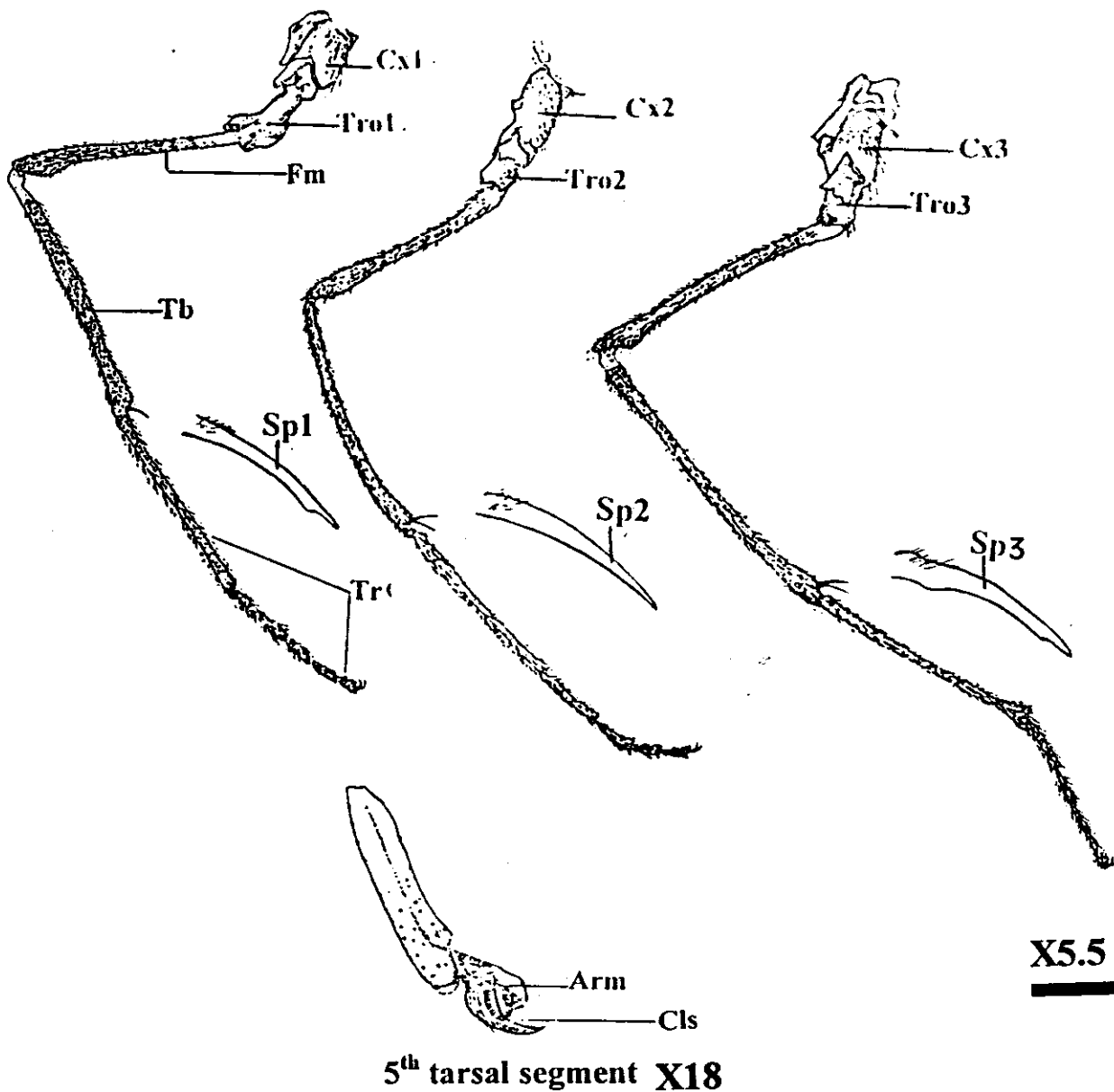


**X7.5**

#### (4) Thoracic appendages

##### a- Wings:

Longer than the abdomen; **costa (C)** the longest and strongest vein; **costal cell (C.C)** with weak neighborhood brown infuscated stigma; **subcostal veins (Sc)** fused with **radius (R)** at apical third; **radius sector vein (Rs)** parallel to the (R); 1<sup>st</sup> longitudinal vein (**R1+2**) little longer than (Sc); 2<sup>nd</sup> longitudinal vein (**R3**) 2.5X the length of (R1+2); **submarginal cross vein (Smc)** atrophied, connected with (R3) beyond its origin; 3<sup>rd</sup> longitudinal vein (**R4+5**) curved, 2X the length of (R3); 4<sup>th</sup> longitudinal vein branching at the same distance with (R4+5); **discal cell (D.C)** pentagonal in shape; **anterior cross vein (r-m)** connected with the discal cell at its anterior margin; **posterior cross vein (m-cu)** inconspicuous; **medium veins (M1 & M2)** petiolate; 5<sup>th</sup> longitudinal vein (**Cu1**) angled at the junction with the inconspicuous **posterior cross vein (m-cu)**. 6<sup>th</sup> longitudinal vein (**An1**) laying close to the (Cu2); 7<sup>th</sup> longitudinal vein (**An2**) nearly straight, less than one third of (An1).

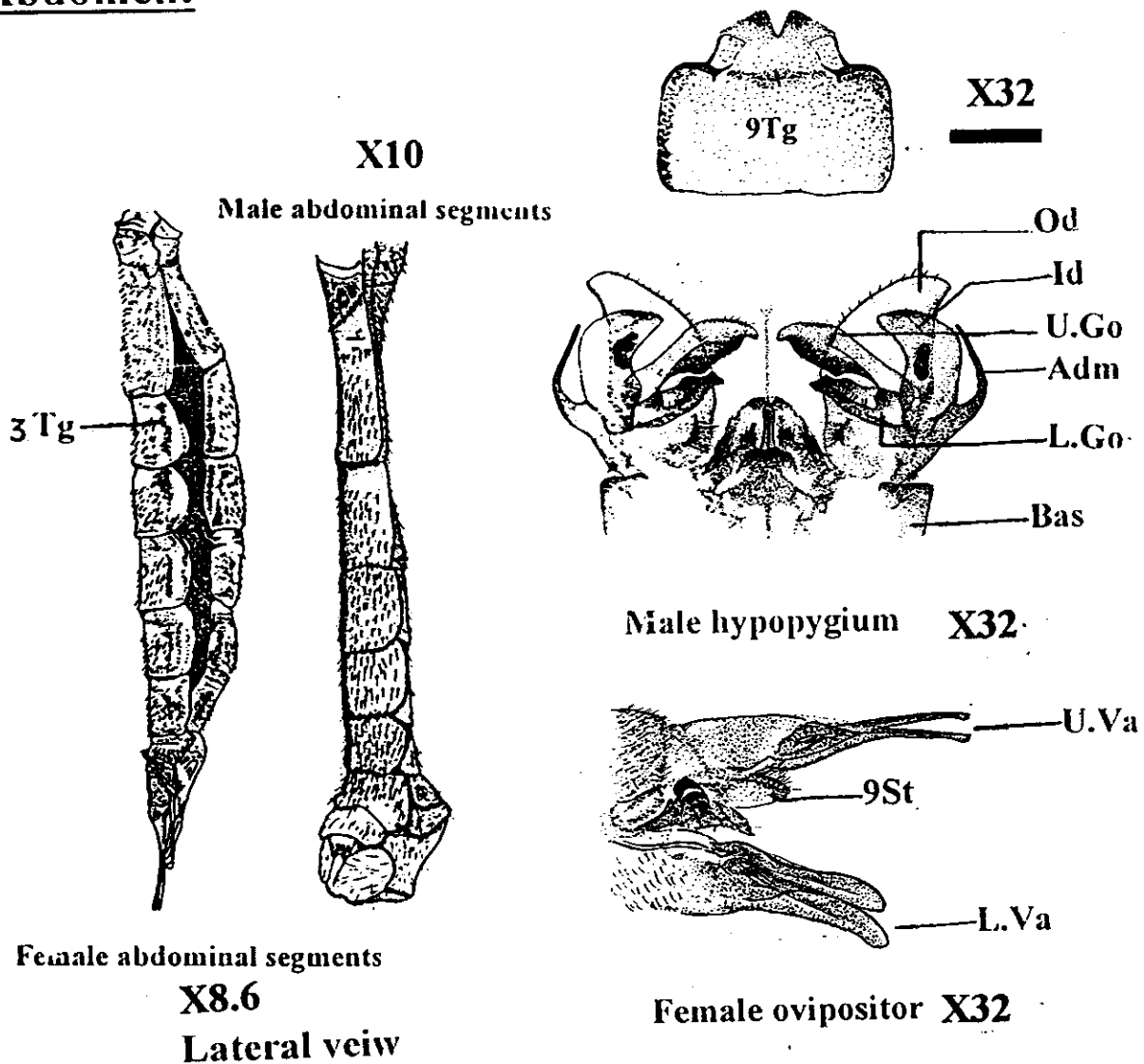


5<sup>th</sup> tarsal segment X18

#### b- Legs:

Slender, surrounded by dense strong setae; coxae (Cx) bear long stiff hairs at the dorsolateral side, fore coxa (Cx1) rather wider than mid coxa (Cx2) and hind coxa (Cx3); trochanter (Tro) provided with small bristles at the dorsolateral surface near the base, trochanter (Tro1) of the foreleg is frustum in shape, longer than mid and hind trochanter (Tro2&Tro3); femur (Fm) tapering at base, gradually widened toward apex; tibia (Tb) with spurs 1,2,2. on fore, mid and hind tibia, respectively; tarsus (Tr) 5 segmented with long black setae; claws (Cls) strong with basal teeth; arolium (Arm) with two distinct lobes.

### III-Abdomen:



Spindle shaped, conspicuously widened beyond the third tergite (Tg) in female; cylindrical parallel sided, apically widened in male; in both sexes the first segment is the shortest one, closely and broadly attached to the thorax, the second segment is the longest one.

\*Male hypopygium with a curved adminiculum (Adm); basistylus (Bas) divided into broad plate like outer dististylus (Od) & kidney shaped inner dististylus (Id) with seven disclosed standing mandrels; upper gonostylus (U.Go) claw like; lower gonostylus (L.Go) trench shaped; ninth tergite (9Tg) notched and lobed.

\*Female ovipositor consists of two pairs of valves (Val), the upper valves (U .Va) quite straight, the lower valves (L.Va) broad with dense hairs; ninth sternum (9St) prominent.

### 3- Taxonomic study:

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#### Family **Tipulidae** Linnaeus (Crane-Flies)

**Tipulidae** Linnaeus, 1758, Syst. Nat., Ed. X.: 585.

- 1- **Tipulid** flies were considered as subfamily (**Tipulinae**) of family **Limnobiidae**. [Bezzi, 1907]
- 2- Subfamily **Tipulinae** was elevated as a distinct family including three subfamilies. **Tipulinae** (Tribe: **Tipulini**). **Limnobiinae** (Tribes; **Limnobiini**, **Erioptrini**) and **Ptychopterinae** (Tribe, **Ptychopterini**). [Brunetti, 1912]
- 3- Subfamily **Ptychopterinae** was eliminated from family **Tipulidae**. [Adlard *et al*, 1920]
- 4- Two tribes (**Hexatomini**, **Pedicini**) were added under subfamily **Limnobiinae** and one tribe (**Dolichopezini**) were added under subfamily **Tipulinae**. [C.P. Alexander, 1922]
- 5- **Cylindrotominae** was a new subfamily was added to the family **Tipulidae**. [Alan *et al*, 1965]
- 6- Family **Tipulidae** was reclassified into two subfamilies; **Tipulinae** (Tribe, **Tipulini**) and **Limoniinae** (Tribes, **Limoniini**, **Erioptrini**, **Toxorhini**, **Styrinomyini**, **Lechriini**, **Hexatomini**). [Hutson A.M., 1977 & Theowald, 1986]
- 7- **Tipulinae**, **Cylindrotominae** and **Limoniinae** three subfamilies; were recorded in north America. [Borrer, 1983]
- 8- Family **Tipulidae** was recently reclassified into only two subfamily **Tipulinae** and **Limoniinae** [Jong, 1987]

\* In Egypt, Steyskal and El-Bialy (1967) listed 9 tipulid species under 8 genera.

\*The result of this study indicated the presence of 13 tipulid species and 10 genera under two subfamilies **Tipulinae** (Tribe, **Tipulini**) and **Limoniinae** (Tribes, **Limoniini**, **Erioptrini**).

**The main characters of the family:**

**Head:** eyes glabrous; genal bristles present near lower corner of the eyes; ocelli absent; maxillary palpi 2-4 jointed, bent to form a circle; antennae 12-16 jointed, the two basal joints forming the scape (scapal joint 1 & scapal joint 2) joints of flagellum separated.

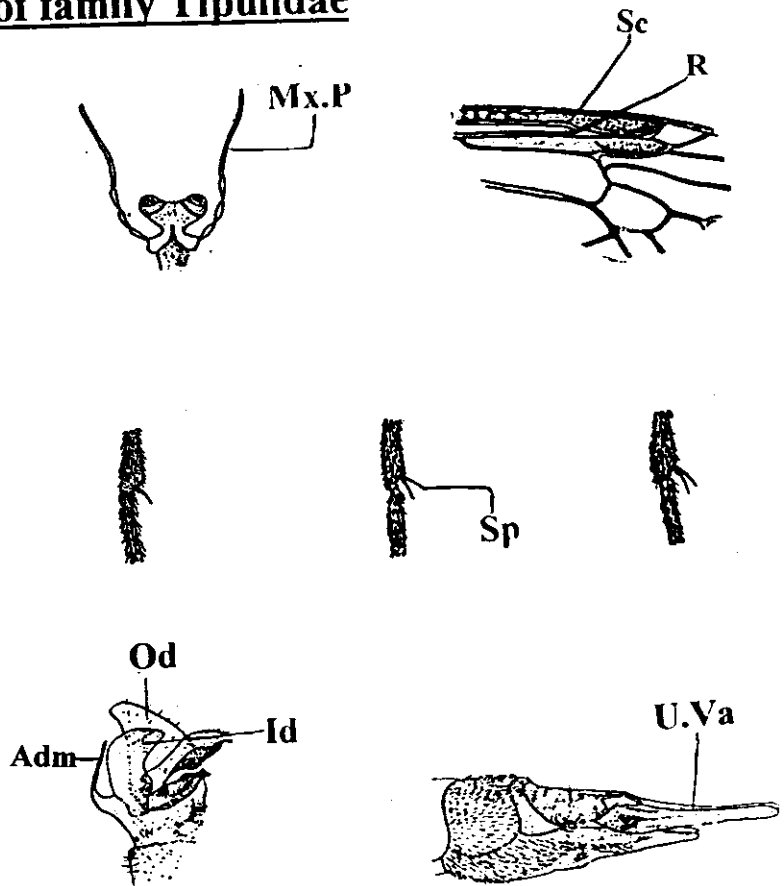
**Thorax:** longer than broad, with rounded angles; prothorax reduced to a very small disc-shaped piece, mesothorax large with V-shaped suture running transversely across the middle, legs very weak slender, longer than the body; tarsi five segmented, 1<sup>st</sup> segment the longest one; wings membranous, with two anal veins; halter with long stem.

**Abdomen:** elongated, nine segmented, the first segment the shortest one, closely and broadly attached to the thorax, the second segment larger than the remainder, the whole abdomen provided with inconspicuous pubescence, abdomen in male with bluntly tip & cup shaped hypopygium, in female with acicular tip & ovipositor with two pairs of aciculate valves.



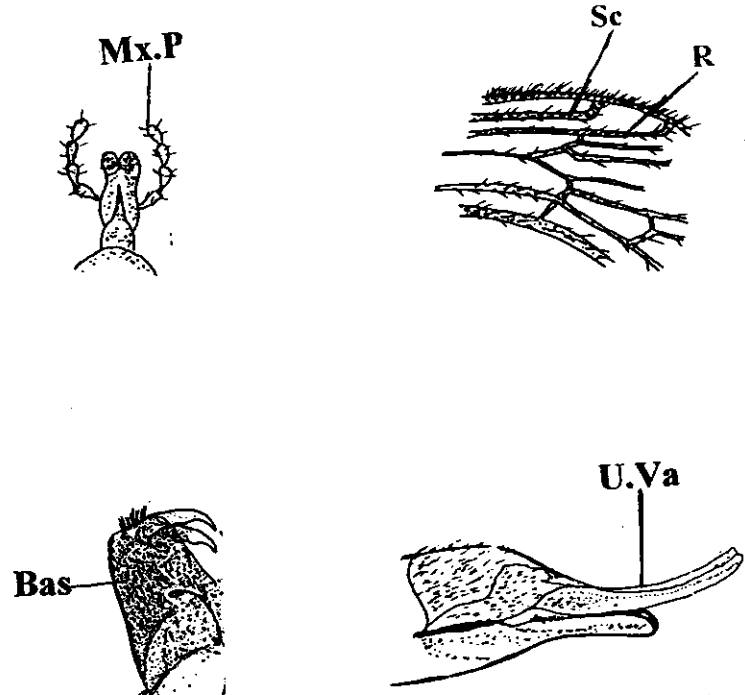
## Key to subfamilies of family Tipulidae

- 1(2)** Antennae 13-jointed; last joint of maxillary palpi long, whiplash-like; nasus present; pronotum well developed; wings with subcosta (Sc) fused with radius (R) at apical third, tibia with large spurs 1.2.2. on fore, mid & hind legs, respectively, male hypopygium with rod like adminiculum (Ad), basistylus divided into inner & outer dististylus (Id & Od); female ovipositor with straight upper valves (U.Va).



### Tipulinae

- 2(1)** Antennae 12-16 jointed; last joint of maxillary palpi not whiplash-like; nasus absent; pronotum reduced; wings with Sc not fused with R, tibial spurs absent or very minutely represented; male hypopygium without adminiculum (Ad), basistylus (Bas) undivided; female ovipositor with curved upper valves (U.Va).



### Limoniinae

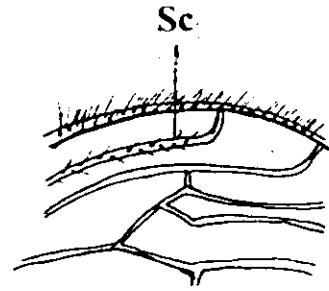
## **Subfamily Limoniinae:**

It represented in Egypt by 10 species and 8 genera under 2 tribes Erioptrini & Limoniini.

### **Key to tribes of subfamily Limoniinae**

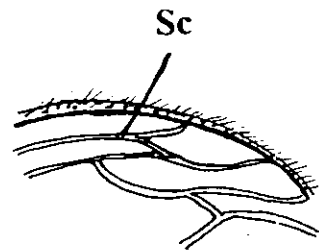
- 1(2) Claws smooth, wings with two submarginal cells, subcosta (Sc) not forked at tip; male hypopygium with horny hook like gonostylus.

#### **Erioptrini**



- 2(1) Claws toothed, wings with one submarginal cell, Sc forked at tip; male hypopygium with gonostylus variable in shape and size.

#### **Limoniini**



## Key to genera of tribe Eriopterini

1(4) **Wing with open discal cell.**

- 2(3) Eyes normally separated by triangular flattened frons; wing with distinct hairs along veins, first submarginal cell long (as long as the second) oblong in shape; abdomen of female more widened at middle; male hypopygium with two horny styli.

### *Erioptera* Meigen

- 3(2) Eyes widely separated by oblong, humped frons; wing with glabrous veins, first submarginal cell very short (more shorter than the second) triangular in shape; abdomen in female slightly widened at middle; male hypopygium with a number of long, acute styli.

### *Gonomyia* Meigen

4(1) **Wing with closed discal cell.**

- 5(6) Antennae 12-jointed; frons broad and humped; wing shorter than the abdomen; male hypopygium with basistylus stout and long, bearing two horny hooked gonostylus (similar in shape).

### *Conosia* Vander Wulp

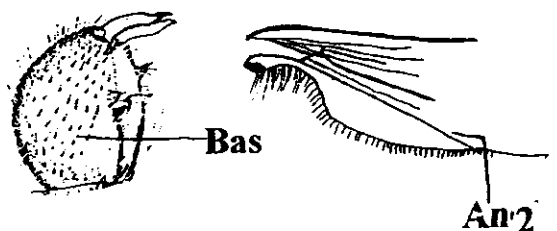
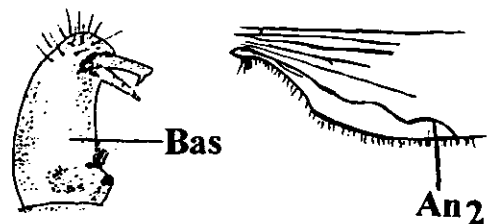
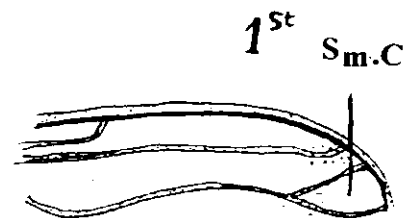
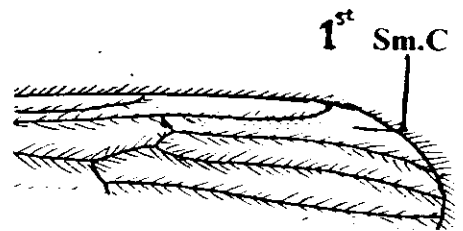
- 6(5) Antennae 16-jointed; frons triangular, flattened in shape; wing longer than the abdomen, more widened to outer margin; male hypopygium with two horny hooked differ in shape.

- 7(8) Antennae with subcylindrical flagellar joints; wing glabrous, spotted, second anal vein strongly sinuated; male hypopygium with elongate basistylus bearing two horny gonostylus the outer one bluntly in form.

### *Symplecta* Meigen

- 8(7) Antennae with fusiform flagellar joints; wing with stout setae along the veins, not spotted, second anal vein normally straight; male hypopygium with bulbous basistylus bearing two horny hooked greatly similar to each other.

### *Trimicra* Osten Sacken



Genus *Conosia* Vander Wulp

*Conosia* Vander Wulp, 1880, Tijdschr. V. Ent., XXIII : 159.

Type Species: *Limnobia irrorata* Wiedemann, 1828,

Ausser europ. Zweitt. Ins., I:574.

**Diagnosis:**

Head with antennae 12-jointed, rostrum short, not exceeding rest of head; prescutum produced over pronotum, wing with Sc terminating distad to fork of Rs, Rs about four times m-cu, three branches of Rs attaining wing margin, R2 reflexed back at basal section, consequently proximal end of cell R2 acutely pointed. cell M1 & 1<sup>st</sup> M2 present; male hypopygium with basistyles stout and long, ovipositor with elongated up curved upper valves.

*Conosia irrorata* (Wiedemann)

[Plate, I]

*Limnobia irrorata* Wiedemann, 1828, Aussereurop. Zweittl. Ins., I:574

*Limnobia substituta* Walker, 1848, List Dipt. Brit. Mus., 1:39

*Limnophila crux* Doleschall, 1857, Natuark tijdschr. Nederl. Indie, XIV:388

*Conosia irrorata* Wiedemann, Bezzi & Stein, 1907, Katalog der . palearktscken Diptera . band, III : 302.

**Diagnosis:**

Male 16-20 mm. wing 9-13 mm.

Female 18-23 mm. wing 12-16 mm.

Body colour yellow with brownish spots on all parts; antennae with first scapal joint two and half times as long as broad, second scapal joint globular, joints 5-9 fusiform, ultimate joint larger than preceding joints; wing with brown spots on the longitudinal veins increased on costal area, cell R3 consequently long and narrow, halter brown, the base of the stem narrowly pale; abdomen with first eight sternites elongate, projecting beyond the eighth and ninth tergites; male hypopygium with caudal margin of ninth

tergite produced, slightly concave at middle, bearing two hook-like upper & lower gonostyli (U.Go&L.Go), basistylus somewhat swollen basically, with tuft of hairs at apical margin, ovipositor with the lower valve, stout, straight & tapering toward apex.

**Specimens examined:**

Cleopatra: 22-7-1921 [2 M & 1 F], Moharem Bey 3-9-1921 [1 F]. Helwan 22-11-1935 [1 F], Heliopolis 6-5-1940 [1 F].

.....[C.Coll.].

El-Orman 11-5-1993 [2 M & 3 F] 23-5-1994 [1 M & 2 F] 9-5-1995 [2 M & 1 F]. Ezbet Khalaf 26-6-1995 [1 M & 3 F]. El

Nubareia 4-7-1995 [1 M & 1 F]. Kassasin 12-8-1995 [2 F].

Bilbeis 7-9-1993 [2 M & 9 F] 22-9-1994 [3 M & 7 F] 27-9-1994 [2 M & 5 F] 3-9-1995 [2 M & 3 F]. Sidi Salem 5-10-1993 [7 F]

22-10-1994 [1 M & 3 F] 9-10-1995 [1 M & 3 F]. Aga 27-11-1993 [2 F] 12-11-1994 [2 M & 3 F] 1-11-1995 [1 M & 2 F].

.....[Ayman Coll.]

## Plate ( I )

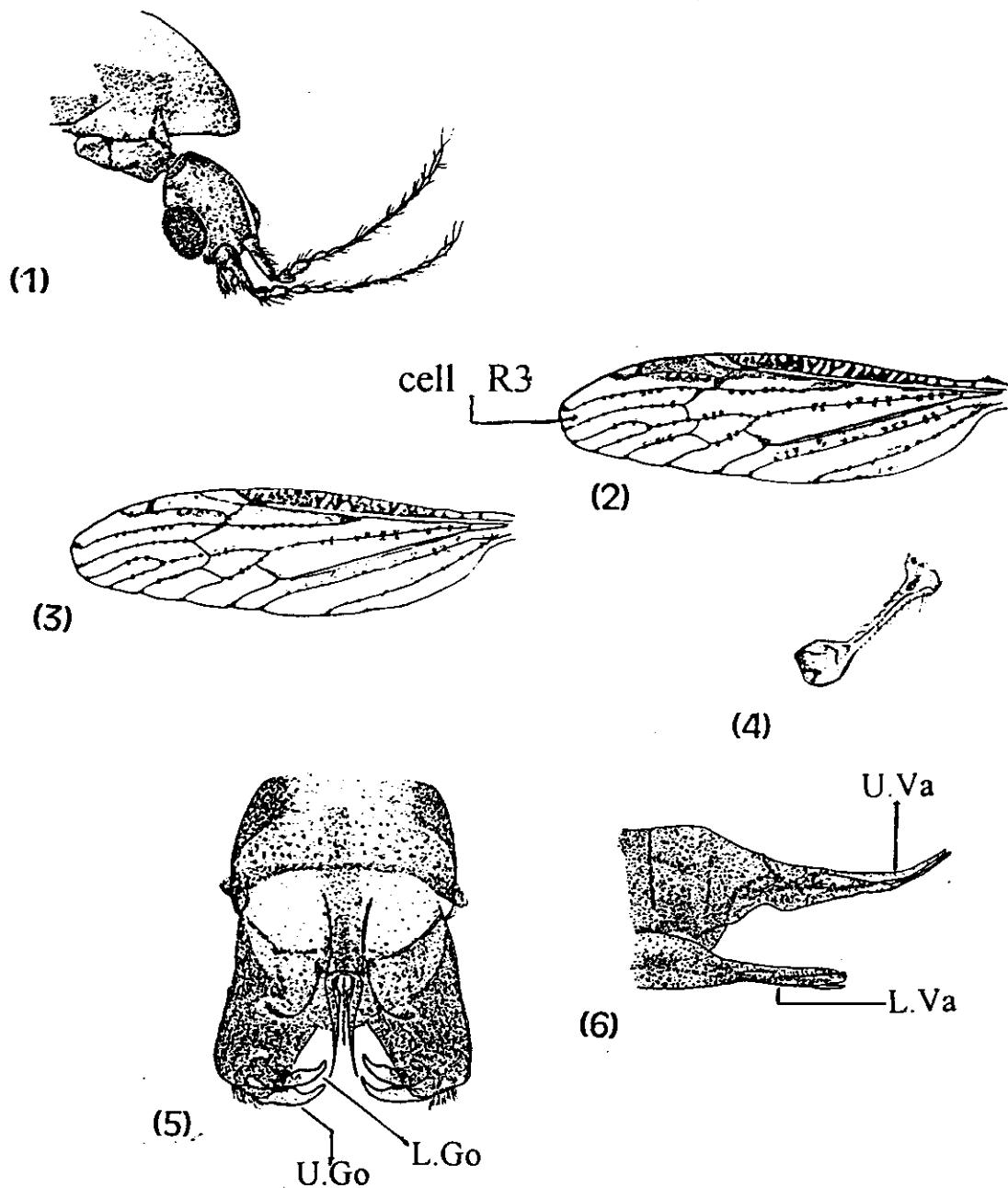
*Conosia irrorata* ( Wiedemann)

Fig. (1) Laterodorsal view of head and appendages (female). X15

Fig. (2) Wing venation of male. X7

Fig. (3) Wing venation of female. X7

Fig. (4) Ventral view of halter (female). X15.5

Fig. (5) Ventral view of male genitalia. X36

Fig. (6) Lateral view of female genitalia. X36

Genus *Erioptera* Meigen

*Erioptera* Meigen, 1803, Illiger's Magaz., II: 262.

Type-Species: *Erioptera lutea* Meigen, 1804, by designation of Coquillett (1910: 540).

*Chemalida* Rondani, 1803, Prodr., I: 180.2.

*Octavia* Bigot, 1854, Annal. Soc. Ent. Franc., Ser. 3. II: 475.

*Limnaea* Rondani, 1865, Prodr., I: 181.7.

*Limnoica* Rondani, 1861, Prodr., IV. Corring.,: 11.

**Diagnosis:**

Antennae 12-16 jointed, simple in both sexes, legs, slender. tibia without apical spurs; claws smooth on the under side; wing with two submarginal cells & four posterior cells, discal cell open, Sc1 terminating near Sc2 and posterior to mid-length of Rs, three branches of Rs reach wing margin, cell M1&1<sup>st</sup> M2 absent; male hypopygium with stublobed basistyle, bear movable chitinized hooked gonostylus.

*Erioptera septemtrionis* Osten Sacken  
[Plate, II]

*Erioptera septemtrionis* Osten Sacken, 1859, Maine. N.Y.; Wash.  
To Nfld., S. to calif., kans., and Fla:  
226.

*Erioptera subseptemtrionis* Alexander, 1920d, Colo.  
Entomologist 53: 109.

**Diagnosis:**

Male 2.6 mm. Wing 1.9 mm.

Female 3 mm. Wing 2.1 mm.

General colour of the body yellow, antenna 14 jointed, joints of flagellum rounded apically; wing light yellow, hairy,

Sc short, ending beyond origin of Rs, Sc1 elongated, at least two times the length of R2+3+4, (R3+4) absent, Rs long, almost straight, three and a half times as its petiol, Cul sinuate near tip; male hypogium with hairy basistyles (Bas), twice as long as broad, gonostylus with weld (U.Go) and hooked (L.Go) provided with acute chitinized apices; ovipositor with strongly curved upper valves (U.Va).

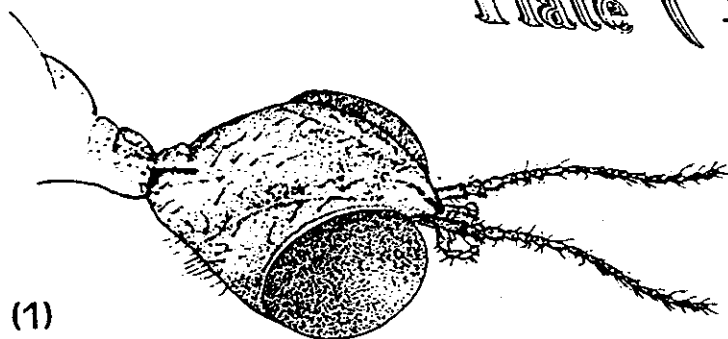
**Specimens examined:**

**El Kharga Oasis** (El Wadi El Gedeed) 23.24,25-6-1995  
(19 M & 34 F).

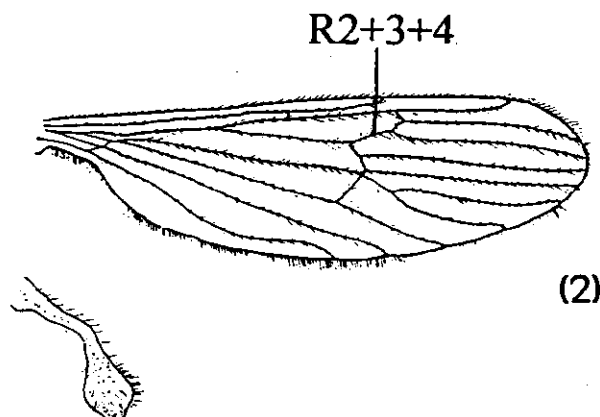
.....[Ayman Coll.]



## Plate ( II )



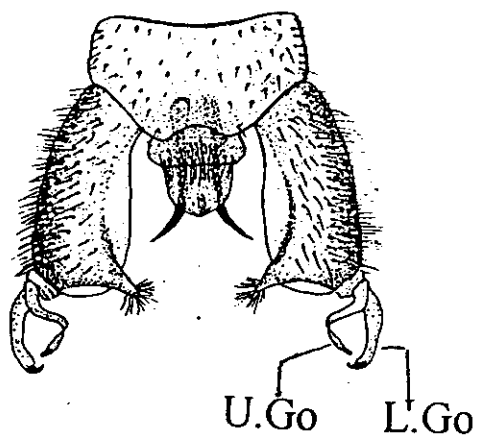
(1)



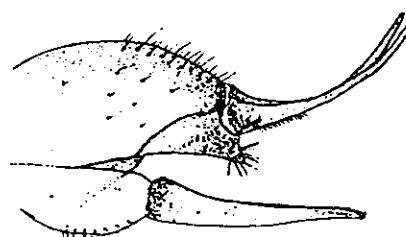
(2)



(3)



(4)



(5)

*Erioptera septemtrionis* Osten Sacken

- fig. (1) Laterodorsal view of head and appendages (female). X41  
 fig. (2) Wing venation of male. X21  
 fig. (3) Dorsal view of halter (female). X21  
 fig. (4) dorsal view of male genitalia. X47  
 fig. (5) Lateral view of female genitalia. X47

Genus *Gonomyia* Meigen

*Gonomyia* Meigen, 1818, S.B., I: 146.

Type species: *Limnobia tenella* Meigen, 1818, S.B., I: 146

*Taphrosia* Rondani, 1856, Prodr., I: 182.

*Goniomyia* Osten – Sackin, 1869, Monogr. Dipt. N. America,  
IV.

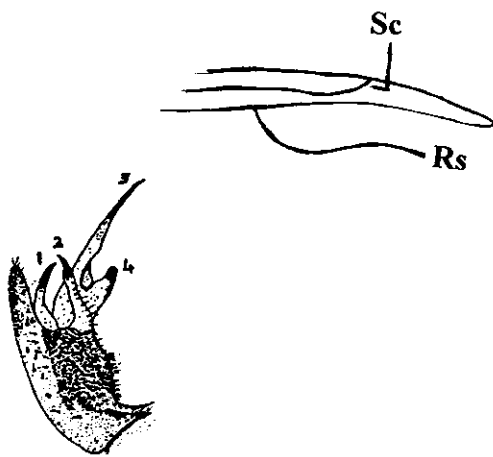
**Diagnosis:**

Antennae 16-jointed, simple in both sexes, rostrum short not exceeding rest of head, frons about one-third to one-fifth the width of the head, wing lanceolate, Sc1 moderately long not extending mid-length of Rs, discal cell open, marginal cross-vein absent, three branches of Rs reaching wing margin. cell R3 short, vein R3 shorter than petiole of cell R3; ninth abdominal tergite produced to form lobes, male hypopygium with gonostylus multi-branched at least with four horny arms, ovipositor with upper valves wide basically, lower valves blade like.

Key to species of genus *Gonomyia* Meigen

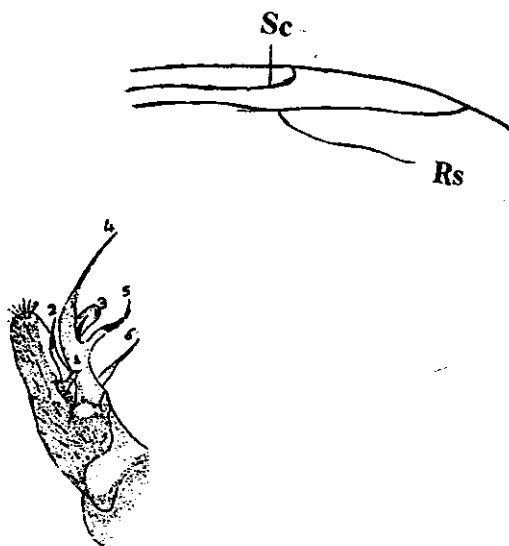
- 1(2)Antennae hairy, not pubescent; wing with a dark brownish stigma. Subcosta (Sc) ending beyond 2<sup>nd</sup> longitudinal vein (Rs), inner end of Rs forkation placed beyond tip of 1<sup>st</sup> longitudinal vein; male hypopygium with four large arms.

*G. sexguttata* Dale



- 2(1)Antennae hairy and pubescent; wing pale grey without stigma, subcosta(Sc) ending with the origin of 2<sup>nd</sup> longitudinal vein (Rs), inner end of Rs forkation placed before tip of 1<sup>st</sup> longitudinal vein; male hypopygium with six large arms.

*G. spuria* Bergroth



*Gonomyia sexguttata* Dale  
[Plate, III]

*Gonomyia sexguttata* Dale, 1842, Annal. Mag. Nat. Hist., VIII:  
431.

*Limnobia pulchripennis* Loew., 1856, Neue Beitr., IV: 23.

**Diagnosis:**

Males 4.2 mm; wing 3 mm.

Females 4.5 mm; wing 3.3 mm.

Body greyish brown in colour; antennae 13 segmented, scapal joint one 2.5 times as long as broad, scapal joint two large, globular, remaining joints fusiform; rostrum and palpi brown; pronotum dark brown with two Y shaped stripes at lateral sides; halter with dark brown knob and pale yellow stem; wing with dark brown veins, radius connected with medium at the base till  $1/3$  of wing, R2 shorter than R3, Rs branched into R2, R3 and R4+5; abdomen brown, caudal margin of ninth abdominal tergite notched at middle and provided with long setae at lateral sides; male hypopygium with basistylus prolonged laterally, upper gonostylus with two equal forceps like arms, lower gonostylus differentiated into inner short obtuse arm & outer prolonged pointed arm; ovipositor with upper valves strongly upcurved, yellow, gradually darkened at base.

**Specimens examined:**

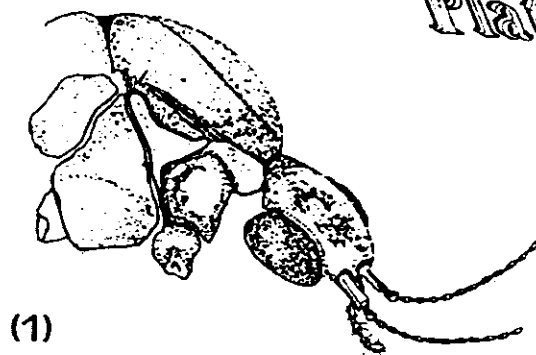
Cleopatra 12-7-1921 [1M & 1F], 10-9-1921[1F]

.....[C.Coll.]

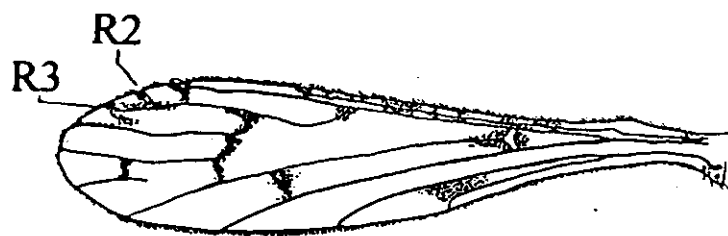
El Kharga Oasis (El Wadi El Gedeed) 23-8-1994 [1M & 1F]

.....[Ayman Coll.]

## Plate ( III )



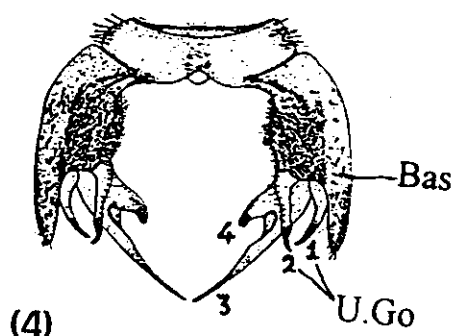
(1)



(2)



(3)



(4)



(5)



(6)

*Gonomyia sexguttata* Dale

- Fig. (1) Laterodorsal view of head and appendages (female). X36  
 Fig. (2) Wing venation of female. X28  
 Fig. (3) Ventral view of halter (female). X22  
 Fig. (4) Ventral view of male genitalia. X41  
 Fig. (5) Lateral view of aedeagus X62  
 Fig. (6) Lateral view of female genitalia. X41

*Gonomyia spuria* Bergroth  
[Plate, IV]

*Gonomyia spuria*, Bergroth, 1888, Ent. Tidskrift, Vol.9, P.134.

*Gonomyia proxima*, Brunetti, 1913, Ann.Mag.Nat.Hist, Ser.8,  
Vol.11, P.575-578.

**Diagnosis:**

Male 4-6 mm, wing 3.2 mm.

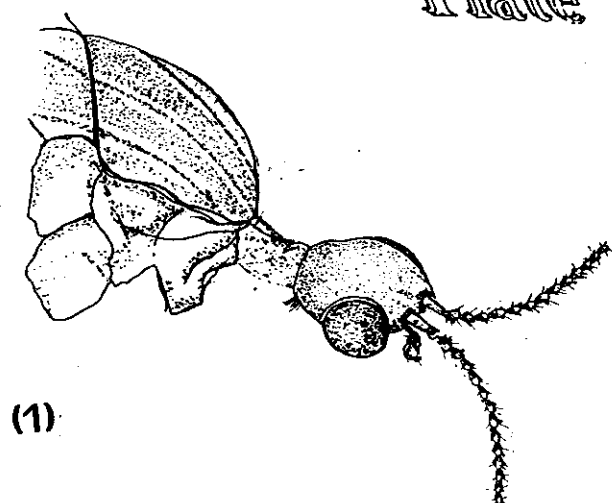
Head dark grey to blackish; antennae light to dark brown, with three long hairs on each joint & short black pubescence; thorax dark grey with four brownish longitudinal stripes; wings pale grey, 1<sup>st</sup> longitudinal vein R1, free tip; legs yellowish, darker towards tips; abdomen brown, with pale pubescence : male hypopygium with prolonged basistylus, provided with tuft of long setae at apical margin, gonostylus with one short obtuse arm & five horny hooked filamentous arms.

**Specimens examined:**

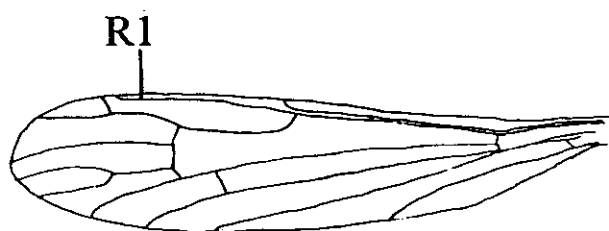
(Ismailiya) Kassasin 12-7-1996 [1 M]

.....[ Ayman Coll. ]

# Plate ( IV )



(1)



(2)



(3)



(4)

## *Gonomyia spuria* Bergroth

Fig. (1) Laterodorsal view of head and appendages of male X33

Fig. (2) Wing venation of male X22

Fig. (3) Ventral view of halter X26

Fig. (4) Ventral view of male genitalia X48

Genus *Symplecta* Meigen

*Symplecta* Meigen, 1830, S. B., VI. 282.

Type Species: *Limnobia punctipennis* Meigen, 1818, S. B., I. 147.

*Idioneura* Phil., 1865, Verh. Zool. Bot. Ges. Wien, XV. 615. 7.

*Symplectomorpha* Mik, 1886, Wien. Ent. Zeitg., V. 318.

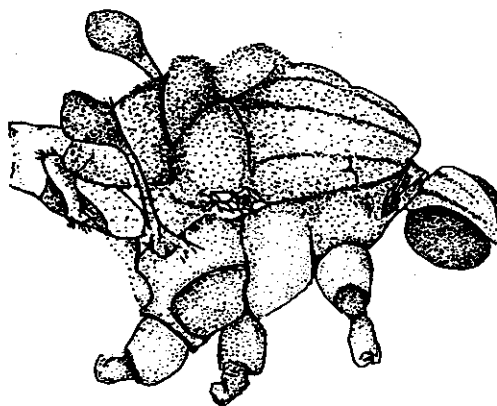
**Diagnosis:**

Antennae 16 segmented, filiform; rostrum & maxillary palpi of short, wing with two submarginal cells & four posterior cells, discal cell present, 2nd anal vein sinuated (An2), subcostal cross-vein absent, legs long, pubescent, middle legs shorter than fore & hind legs, claws small; male hypopygium with horny upper and lower gonostyli (U.Go&L.Go).

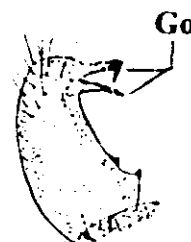
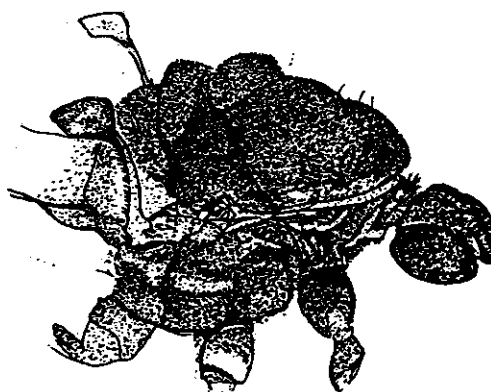


Key to species of genus *Symplecta* Meigen

- 1(2) Frons with two black strips, thorax dark grey with 3 black dorsal lines, wings with grey patches, veins pale, subcosta (Sc) ending at the same distance with recurrent cross-vein. 2<sup>nd</sup> anal vein with one senuation; male hypopygium with gonostylus (Go) (subterminal) originate under the tip of basistylus  
*S. punctipennis* (Meigen)



- 2(1) Frons without strips, thorax black without lines, wings, with black patches, veins black. Sc ending after the recurrent cross-vein, 2<sup>nd</sup> anal veins with two sinuations, male hypopygium with gonostylus (Go) (terminal) originates at the tip of basistylus.



*S. stictice* Meigen

*Symplecta punctipennis* (Meigen)  
[Plate, V]

*Limnobia punctipennis* Meigen, 1818, S.B., I. 147.

*Limnobia cana* Walker, 1848, List. Dipt. Brit. Mus., I. 48.

*Symplecta punctipennis*, Meigen, Osten Sacken (1869)

Monograph of north American Diptera  
Part IV : 26 .

**Diagnosis:**

Male 3.4 mm. wing 3 mm.

Female 4 mm. wing 3.2 mm.

Colour, dark grey at the dorsal part of the body, head grey with two brown lines, eyes black, contiguous dorsally, antennae black, scapal joint one cylindrical. three times as long as broad, scapal joint two globular. flagellum with joint one elongate, fusiform, maxillary palpi black; thorax grey, with 3 black lines, wing with scattered black patches, divided by crossvein, coxa grey, legs dark brown with black last tarsal segment black; abdomen dark grey, gonostylus of male hypopygium subterminal, outer division of gonostylus expanded outwardly covered with long spines, ovipositor acicular, rather elongate, of normal construction.

**Specimens examined:**

Kerdasa (Giza) 20-1-1921 [2 Male & 1 Female].

.....[Cairo Coll.]

*Symplecta stictica* Meigen  
[Plate, VI]

*Symplecta stictica* Meigen, 1818, S. B., I. 158.

*Limnobia similis* Schummel, 1829, Beitr. 2. Ent., I. 156.

**Diagnosis:**

Male 4.1 mm. wing 3.3 mm.

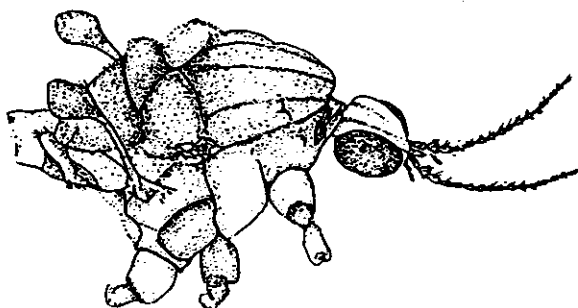
Resemble *Symplecta punctipennis* Meigen, but the colour, black at the dorsal part of the body; thorax with yellow paratergites, halter with bifid base, stem weakly darkened, knob brownish black, legs with all coxae and trochanters brownish black, wing with pale grey patches distributed along the cross vein, second anal vein long and more sinuated; abdominal tergite obscure brown with clear dorsal brown band, male genitalia yellow, with posterior edge of tergite gently emarginate, producing 2 broad lateral lobes, U shaped, covered with long stiff setae.

**Specimens examined:**

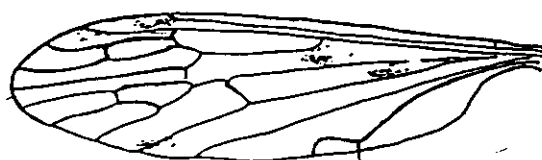
Nubareia 6-5-1995 [1 Male].

.....[Ayman Coll.]

## Plate ( v )

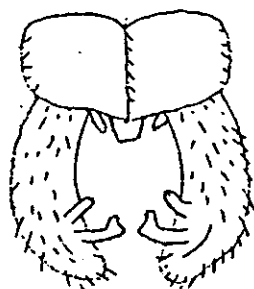


(1)



(2)

An 2



(3)

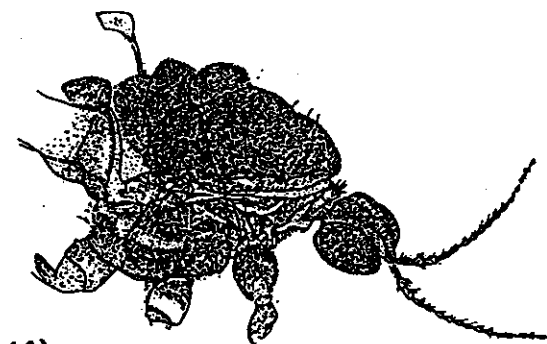
*Symplecta punctipennis*(Meigen)

Fig. (1) Laterodorsal view of Head and thorax (Male). X38

Fig. (2) Wing venation of Male. X21

Fig. (3) Dorsal view of male genitalia. After Brunetti (1912a)

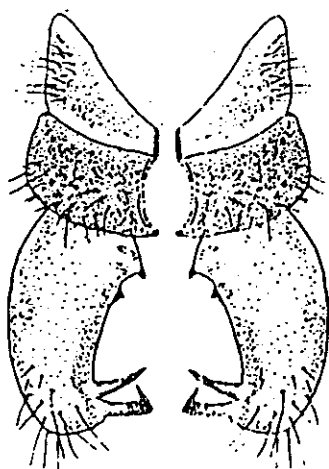
## Plate ( VI )



(1)



(2)



(3)

*Symplecta stictica* Meigen

Fig. (1) Laterodorsal view of Head and thorax (Male). X36

Fig. (2) Wing venation of Male. X21

Fig. (3) Dorsal view of male genitalia. X48

Genus *Trimicra* Osten-Sacken

*Trimicra* Osten-Sacken, 1861, Proc. Acad. Nat. Sc. Philad., 290.

Type species: *Trimicra anomala* Osten-Sacken, 1861

*Ilisia* Rondani, 1826, Prodr., I. 182. 13 pp.

**Diagnosis:**

Antennae 16-jointed, last three joints conspicuously narrowed and shortened, rostrum short, not exceeding rest of head; wing with Sc1 very long, exceeding one-half of Rs. three branches of Rs reach wing margin, cell R2 at margin wider than cell R3, vein R3 longer than petiole of cell R3, R3 & R4 nearly equal in length, cell M1 absent, cell 1<sup>st</sup> M2 small, less than one-half of distal section of M1+2; coxae of middle and hind legs widely separated; male hypopygium with bulbous basistylus clothed with setae, gonostylus represented by two rod like branches; female ovipositor with strongly up curved upper valves.

*Trimicra inconspicua* (Loew)

[Plate, VII]

*Gonophomyia inconspicua* loew, 1866, Berl. Ent. Z. 10:29

*Trimicra inconspicua* loew, Alexander, 1917, Amm. S. Afr.

Mus. 17:149 .

**Diagnosis:**

Male 5-7 mm, wings 4-6 mm.

Female 6-8 mm, wing 5-7 mm.

Antennae with scapal joint 1 cylindrical, twice as long as broad, scapal joint 2 subglobular, joints 5-11 of flagellum triangular; wing with delicate pubescence along veins. Sc1 long, exceeding fork of Rs, Cu1 straight & stout, m-cu meeting M at base of discal cell in male, meeting M before (D.C) in female; male hypopygium with semispherical basistylus, upper gonostylus with obtuse apex, lower gonostylus with heavily chitinized spine like claw; ovipositor short with blade like valves.

**Specimens examined:**

El Faiyum (Kom Oshim) 1-4-1994 [2 M & 5 F], 15-4-1994  
[3 M & 4 F], 11-4-1995 [4 M & 4 F], Giza (El-Orman) 1-5-1993  
[1 M & 2 F], 7-5-1994 [1 M & 2 F], Sinai (El-Arish) 13-9-1994  
[1M & 2 F], 22-9-1995 [2 M & 3 F], Daqahliya (Aga) 1-10- 1994  
[3 M&5F], 28-10-1995 [4 M & 7 F]  
.....[Ayman Coll.]

## Plate (VII)

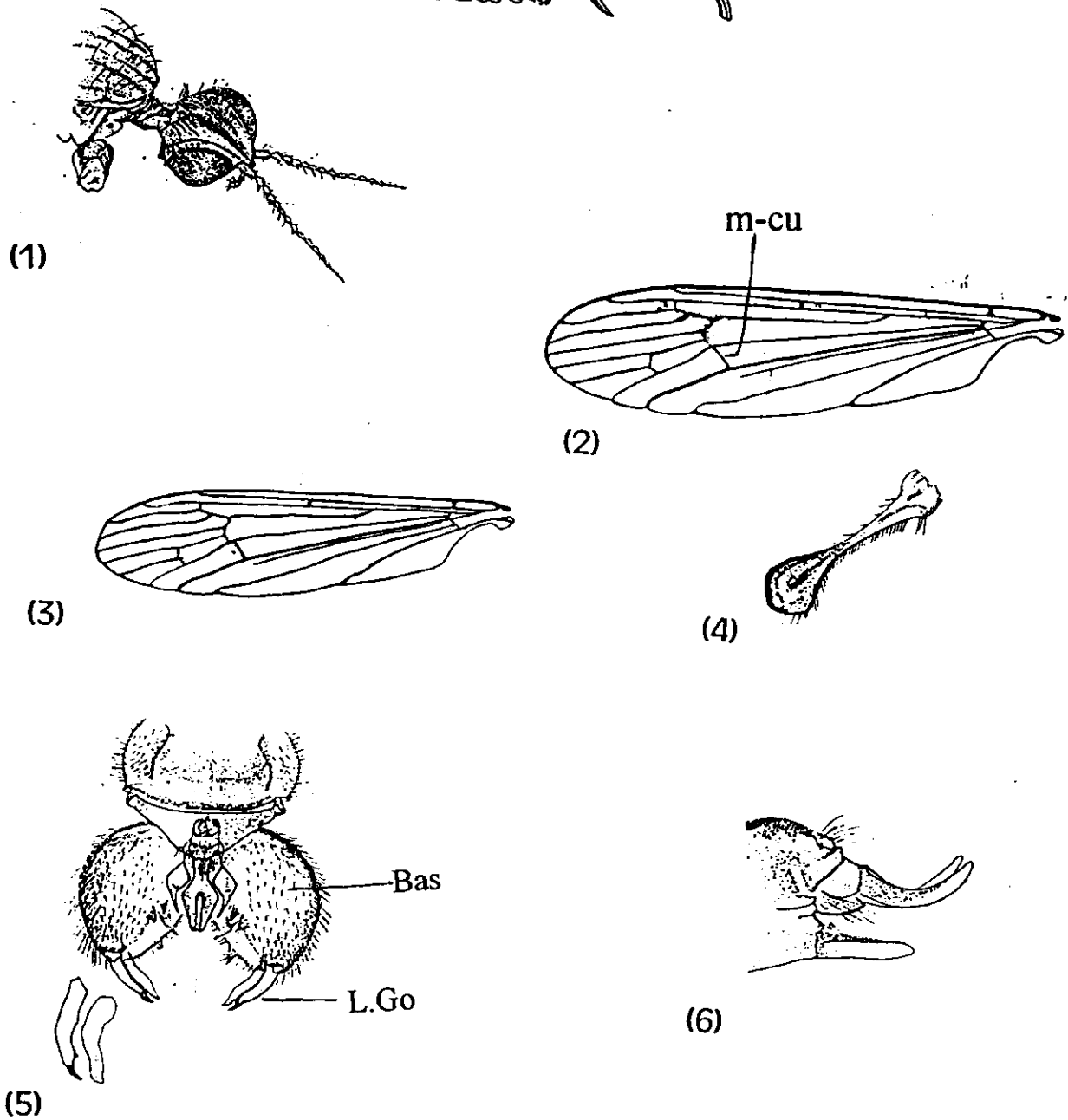
*Trimicra inconspicua* (Loew).

Fig. (1) Laterodorsal view of head and appendages (female). X21

Fig. (2) Wing venation of male. X13

Fig. (3) Wing venation of female. X13

Fig. (4) Ventral view of halter (female). X21

Fig. (5) Ventral view of male genitalia. X32

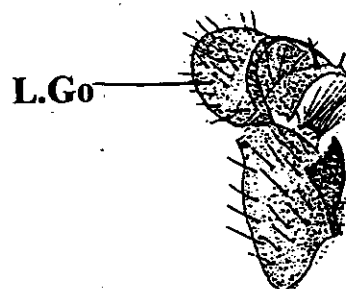
Fig. (6) Lateral view of female genitalia. X32



**Key to genera of tribe Limoniini**

- 1(2) Rostrum shorter than the head; legs with a single tooth on lower side of claws; male hypopygium with enlarged fleshy lobed lower gonostylus.

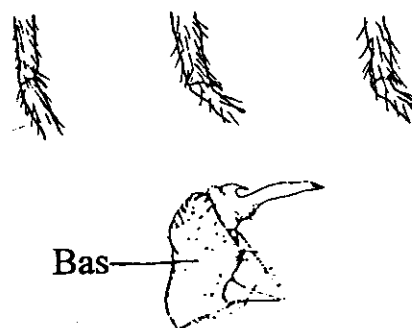
***Dicranomyia* Sch.**



- 2(1) Rostrum at least as long as head; legs with a row of teeth on lower side of claws; male hypopygium with horny hooked lower gonostylus.

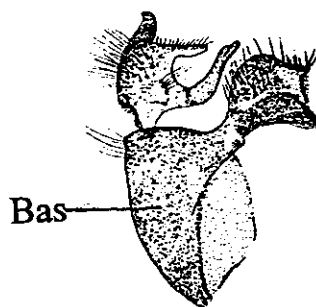
- 3(4) Antennae 16-jointed; rostrum longer than head; marginal cross-vein absent; tibia with very short apical spurs; gonostylus of male hypopygium fixed on inner side of basistylus, lower gonostylus bare.

***Helius* Pel.&Ser.**



- 4(3) Antennae 14-jointed; rostrum shorter than head; marginal cross-vein present; tibia without spurs; gonostylus of male hypopygium articulated with basal margin of basistylus, lower gonostylus provided with setae.

***Limnobia* Meigent**



Genus *Dicranomyia* Stephen

*Dicranomyia* Stephen, 1829, Catal. of Brit. Ins., II: 248.

*Glochina*, Meigen, 1830, S. B., VI: 280.

*Siagona*, Meigen, 1830, S. B., VI. t. Lxv. f: 7.

*Numantia*, Bigot, 1854, Annal. Soc. Ent. Franc., Ser. 3. II. 470pp.

**Diagnosis:**

Head with large eyes, subcontiguous ventrally, proboscis shorter than head; antennae 14-jointed, with joints of flagellum, oval to more elongate, pubescent; neck well developed, triangular at the side view; legs with very short pubescence; claws with a distinct tooth on the under side near base; wings with one submarginal cell & four posterior cells, discal cell closed, the first longitudinal vein ends in the costa near stigma, submarginal cell shorter than marginal cell and longer than first posterior cell; male hypopygium with hooked upper gonostylus & movable fleshy lobed lower gonostylus; ovipositor short, narrow & arcuate.

*Dicranomyia ventralis* (Schummel)

[Plate, VIII]

*Limnobia Ventralis*, Schummel, 1829, Beitr. Z. Ent., I.  
136. 24. t. I.f. 10.

*Dicranomyia ventralis* Schummel, Lackschewitz, 1940  
Dept. pal. Rg. 2:20

**Diagnosis:**

Male 6.5 mm. Wing 4 mm.

Female 7 mm. Wing 4.3 mm.

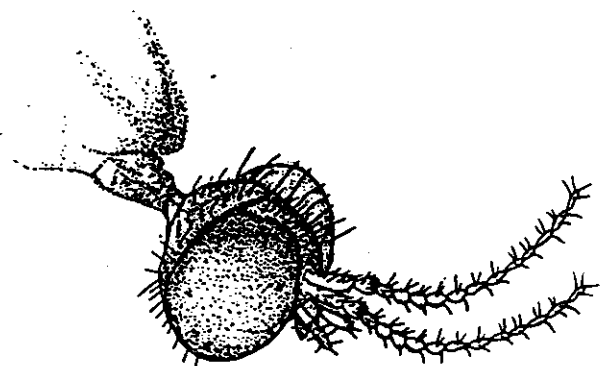
Head light gray, vertex with small and broad face, antennae with scape and pedicel black, flagellum dark brown, with oval segments narrowed apically, long verticils increase toward apex; rostrum brown, palpi black; pronotum dark brown with yellow

sides; halter light brown with yellow base; wings with pale brown oval stigma, Sc short, forked apically to Sc1 & Sc2, Rs as long as cell 1<sup>st</sup> M2, basal deflection of Cu1 at the fork of M; ninth abdominal tergite with long marginal setae, male hypopygium dark brown, with basistylus longer than gonostylus, upper gonostylus sickle shaped, lower gonostylus large & fleshy.

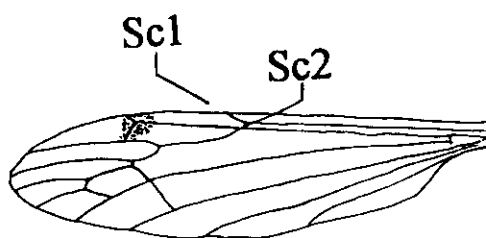
**Specimens examined:**

(Ain Shams) 4-5-1994 (1 M), 11-5-1995 (2 F). (El-Orman) 28-6-1994 (1 M & 1 F), 22-6-1995 (1 M & 3 F), 17-6-1995 (2 M).  
 ..... [Ayman Coll.]

## Plate (VIII)

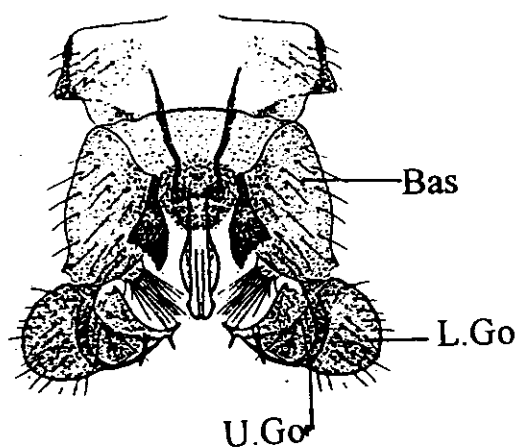


(1)

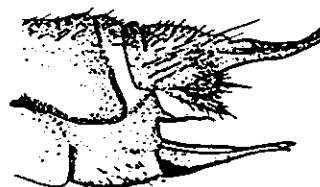


(2)

(3)



(4)



(5)

*Dicranomyia ventralis* (Schummel).

- Fig. (1) Laterodorsal view of head and appendages (Female) . X36  
 Fig. (2) Wing venation of Female. X14  
 Fig. (3) Ventral view of halter (Female) . X21  
 Fig. (4) Ventral view of male genitalia. X42  
 Fig. (5) Lateral view of Female genitalia. X42

*Genus Helius* Peletier&Serville

*Helius* Peletier&Serville, 1825, Encyel. Meth. Ins., index.: 831.

Type species: *Limnobia longirostris* Wiedeman, 1828,

Ausser europ. Zweitt.Ins., I:574.

*Megarhina* St. Fargeau, 1825 Encyel. Meth. Ins., X: 585.

*Leptorhina* Steoh., 1829 Cata. Prit. Ins., II: 243.

*Rhamphidia* Meigen, 1830, S.B., VI: 281.

**Diagnosis:**

Body, cylindrical, slightly pubescent, eyes rounded; proboscis slender, straight, twice the length of the head, shorter than thorax; antennae 16-jointed; palpi reflexed, the three first joints oblong, the fourth a little longer and more slender; thorax elliptical; wings, bare, narrow with one submarginal cell & four posterior cells, discal cell closed, marginal cross vein absent, subcosta ending at the origin of the second vein; legs with very short spurs; gonostylus of male hypopygium represented by finger like horny processes with acute apices.

*Helius longirostris* (Wiedemann)

[Plate, IX]

*Limnobia longirostris* Wiedemann, 1828, Aüs. Z.Ins., I:574

*Helius longirostris*, Wiedemann, Lackschewitz, 1940

Dept. pal. Rg. 2:62

**Diagnosis:**

Male length 6-8 mm. Wing 5-7 mm.

Female 5-7 mm. Wing 4-6 mm.

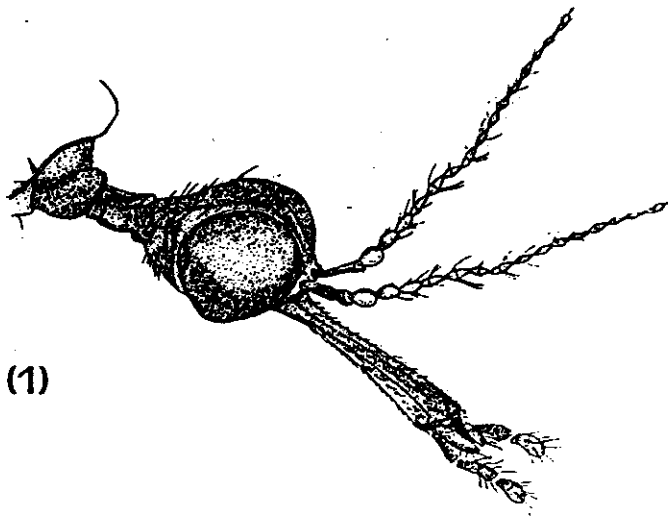
General colouration, rusty greyish brown; head prolonged by long snout, antennae light brown, segments of flagellum bristly, scapal joint one cylindrical, scapal joint two oval, reminder joints whorl shaped with different size; palpi brown, pronotum strongly circular with three black brown long stripes; legs slender, long, with coxa and base of femora yellowish, apex of femora, tibia and

tarsi brown, wings with pale brown stigma, humeral cross vein present; abdomen brown, with ninth tergite, elongate triangular, with acute apex; male hypopygium with basistylus longer than broad provided with several stiff setae on outer margin, upper gonostylus fixed on basical notch of basistylus, lower gonostylus articulated with apical notch of basistylus and divided into small curved chitinized hook & elongated heavily chitinized process; ovipositor with upper valves slender, directed strongly dorsally, lower valves blade like, with delicate hairs along its apical fourth.

**Specimens Examined:**

Raw leb 12-8-1921[1F]; Cleoptera 22-7-1921 [4M & 6F]  
 .....[ C.Coll.]  
 El. Faiyum (Kom Oshim) 21-6-1921 [3 M & 4 F]  
 .....[Ayman Coll.]

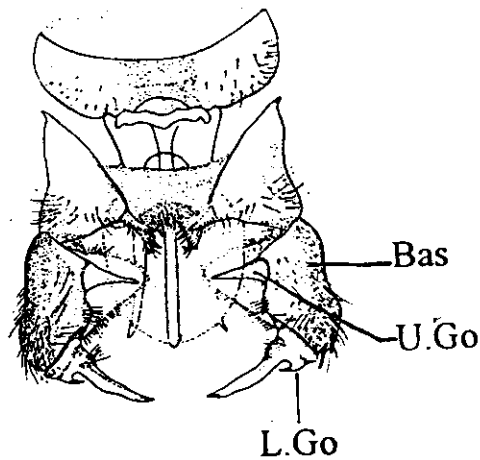
## Plate ( IX )



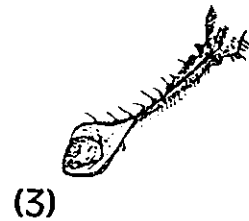
(1)



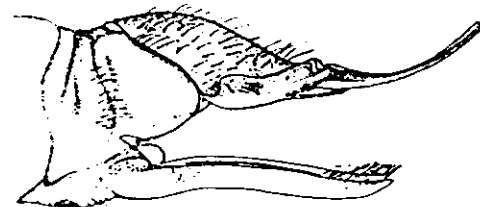
(2)



(4)



(3)



(5)

*Helius longirostris* (Wiedemann)

- Fig. (1) Laterodorsal view of head and appendages (female). X38  
 Fig. (2) Wing venation of male. X17  
 Fig. (3) Dorsal view of halter (female). X21  
 Fig. (4) dorsal view of male genitalia. X48  
 Fig. (5) Lateral view of female genitalia. X48

Genus *Limnobia* Meigen

*Limnobia* Meigen, 1818, S. B., I. XIV.: 116.

*Limnobia* Migen, 1803, Fllig., II. 262.

*Numantia* Bigot, 1854, Annal. Soc. Ent. Franc., Se'r. 3. II. 470.

P.P

*Limnomyza* Rondani, 1856, Prodr., I. 185. 26.

**Diagnosis:**

Body, cinereous in colour to yellow; head small, hemispherical, eyes rounded, proboscis moderately lengthed, palpi pubescent, nearly equal in length, first joint thick, second joint cup-shaped; thorax elliptical; wings with one submarginal cell and four posterior cells; legs strong, tibiae without spurs at tip, claws with several teeth on the under side giving them apectinate appearance; male hypopygium with bilobed basistylus, lower gonostylus petiolate .

*Limnobia marginata* (Macquart)

[Plate, X]

*Dicranomyia marginata* Macquart, 1826, Recneil Soc. Sc. Agric. Lill, 151. 14.

*Limnobia marginata* Macquart, Meigen 1838, Rec. Ind. Mus. XV. P. 290.

**Diagnosis:**

Male 7 mm. Wing 4 mm.

Female 8 mm. Wing 4.5 mm.

Body shiny black; face very narrow, bristly; antennae 14-jointed, cylindrical with scapal joint one dark brown, the following segments gradually dark brown at basical half, pale brownish at apical half; proboscis broad, palpi dull brown, surrounded by stiff long hairs; neck black; wing yellowish brown with three large marginal brown patches, Sc1 complete, Rs slightly spurred at origin, R1+2 longer than R2, R4 and R5 fused to margin, two branches of M reaching margin, M1 and M2 fused,



m-cu in male connected with discal cell directly but before it in female; halter with light yellow stem, knob dark brown; abdomen with a large shining black spot at base of each segment, ninth tergite with long conspicuous setae on mesal face near apex, male hypopygium with lower gonostylus narrow at base, unequally bifid at apex, ovipositor with upper valves slightly curved, lower valves stout with broad base & pointed apex.

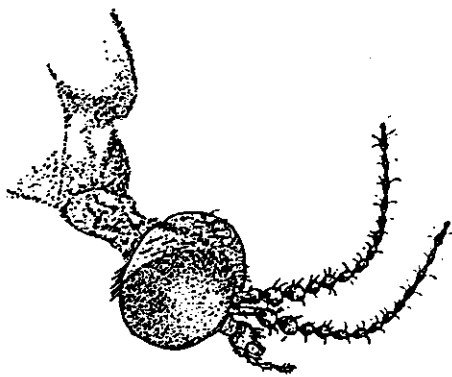
**Specimens examined:**

Ain Shams 11-2-1994 [5M.&8F].

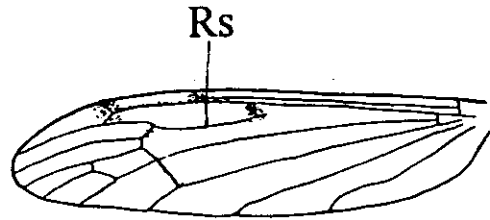
El-Orman 8-10-1995 [3M.&5F].

.....[Ayman Coll.]

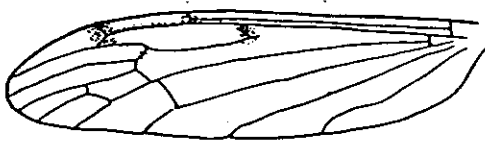
## Plate ( x )



(1)



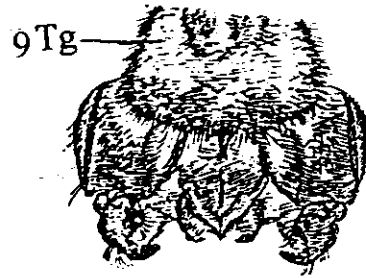
(2)



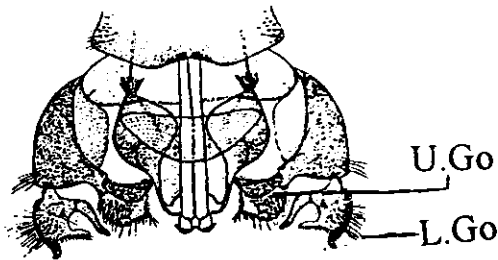
(3)



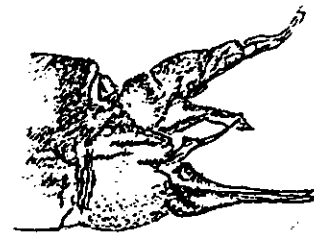
(4)



(5)



(6)

*Limnobia marginata* (Macquart)

- fig. (1) Laterodorsal view of head and appendages (Female). X32  
 fig. (2) Wing venation of male. X14  
 fig. (3) Wing venation of female. X14  
 fig. (4) Ventral view of halter (Female). X22  
 fig. (5) Dorsal view of male genitalia. X42  
 fig. (6) Ventral view of male genitalia. X42  
 fig. (7) Lateral view of female genitalia. X42

### Subfamily Tipulinae:

It is represented in Egypt by 2 species and 2 genera under tribe **Tipulini** in which antennae verticillat, the terminal joint reduced; claws with a single tooth just before mid length, empodia distinct; wings with one marginal cell, two submarginal cells and five posterior cells, discal cell closed.

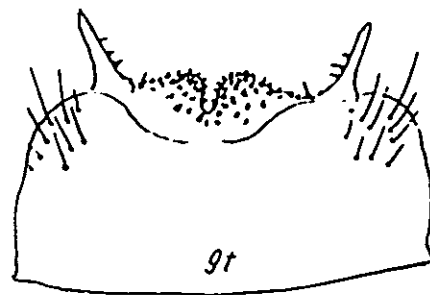
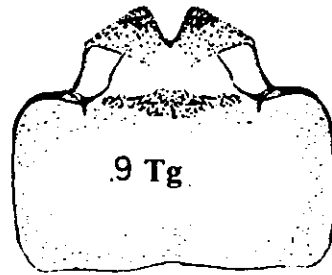
#### Key to genera of tribe Tipulini

- 1(2) Body dull grey in colour;  
Rs long, exceeding R1+2  
Sc2 connected with R1  
after the origin of Rs,  
second posterior cell  
petiolate, Cu forked  
before the inner tip of  
discal cell(D.C), m-cu  
atrophied; male hypop-  
ygium with ninth tergite  
notched and lobed.

#### *Tipula* Linnaeus

- 2(1) Body shiny black in  
colour ; Rs short, not  
exceeding R1+2, Sc2  
connected with R1 at  
origin of Rs, second  
posterior cell sessile,  
Cu forked at the same  
distance with the inner  
tip of (D.C), m-cu  
distinct; male hypopyg-  
ium with ninth tergite  
notched but never  
produced to form a lobe.

#### *Plaes* Meigen



Genus *Pales* Meigen

*Pales* Meigen, 1800, Nouv. Class. Mouch. : 14.

Type species: *Tipula crocata* Linnaeus, 1758, Syst. Nat. X: 585.

*Nephrotoma* Meigen, 1803, Illigers Mag., 3: 262.

*Nephrotoma* Meigen, 1818, S.B. (XVIII. Flekkenmukke). I:262

*Tipula* Schummel, 1833, Beitr. Z. Ent. III: 17.

*Pachyrhina* Macquart, 1834a, Hist. Nat. Ins., Dipt., 1: 88.

*Pachyrhina* Zetterstedt, 1851, Dipt. Scand. X: 3985.

*Pachyrhina* Schiner, 1864, F. A. II: 502-503.

*Pachyrhina* Vander Wulp, 1877, Dipt. Neerl., I: 382.

**Diagnosis:** [After Mannheim, 1951]

Body jet black; terminal joint of maxillary palpi 4-6X as the length of penultimate joints together, antennae 13-jointed, longer in males than in females; wing with Rs short, less than m-cu, cell M1 short, 1<sup>st</sup> M2 present, Sc1 atrophied, male hypopygium with caudal margin of ninth tergite concave, median portion notched but never produced to form a lobe, outer margin of inner dististylus carinate and membranous, basal margin produced into low ridge.

*Pales crocata* (Linnaeus)

[Plate, XI]

*Tipula crocata* Linnaeus, 1758, Syst. Nat. X: 585.

*Tipula flavofasciata* De Geer, 1776, Mem. Hist. Ins. VI: 349.

*Tipula perpulchra* Harris, 1782, Exp. Brit. Ins.: 159.

*Pachyrhina crocata* Linnaeus-Schiner, 1864, F. A. II: 507-508.

*Pachyrhina crocata* Linnaeus-Vander Wulp, 1877, Dipt. Neerl. I: 376.

*Pachyrhina crocata* Linnaeus-Riedel, 1910, D. E. Z.: 418.

*Pachyrhina crocata* Linnaeus-Pierre, 1921, Ass. Franc. Acad. Sci. Congres de Rouen: 663.

*Pachyrhina crocata* Linnaeus-Brolemann, 1923, Bull. Soc. Hist. Nat. Toulouse, 51 23: 486-489.

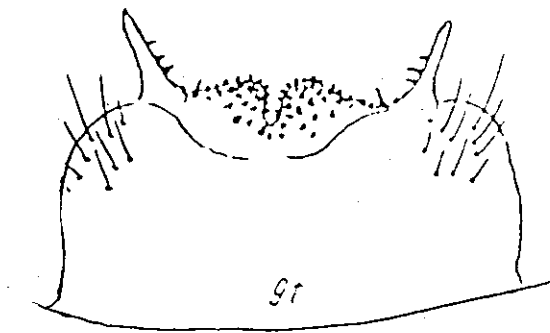
*Pales crocata* Linnaeus :Audcent, 1932, Trans. Ent. Soc. South Engl. VIII, 1:9.

**Diagnosis:** [After Mannheim, 1951]

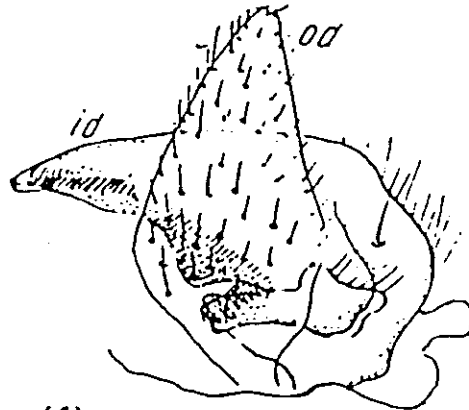
Length: Male 8 mm. Female 10 mm.

Head black with yellow frons, antennae blackish brown; prothorax black with 6 yellow spots; wing with blackish brown spots, the apex and middle brown, tarsi brown, abdomen black velvent with 3 longitudinal bands, male genitalia with ninth tergite large and broad, with fine setae scattered on ventral surface at lateral edges; caudal margin armed with 6 black spicules and a conspicuous median U shaped incision, basistyles of medium size, slightly produced to truncate apices, on inner side of which articulate two dististyli, outer dististylus fleshy, narrowed basically, slightly dilated at middle, then rapidly tapering to rounded apex, the outer side covered with setae, inner dististylus well developed, slightly concave blade, apex curved dorsally.

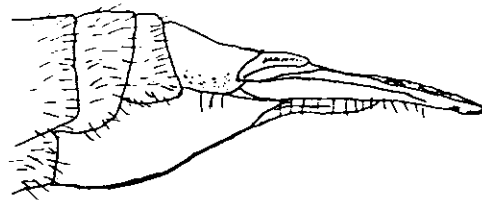
## Plate ( XI )



(2)



(1)



(3)

*Pales crocata* (Linnaeus) [After Mannheim, 1951]

Fig. (1) Half part of male hypopygium

Fig. (2) Dorsal view of ninth tergite of male abdominal segment

Fig. (3) Lateral view of female genitalia

Genus *Tipula* Linnaeus

*Tipula* Linnaeus, 1758, Syst. Nat., Ed. X: 585. 221.

Type Species: *Tipula oleraceae* Linnaeus, 1758, Syst. Nat. Ed., X: 585.

**Diagnosis:**

Body opaque; female longer than male, terminal joint of maxillary palpi elongate, 2.5- 4 X as the length of penultimate joints together; antennae 13-jointed swollen basically, wings lanceolate longer than abdomen, narrow at base, rounded at tips, Sc2 connected with R1 after the origin of Rs and separated before the submarginal cross-vein, male hypopygium with ninth tergite notched and lobed, ninth sternite with each basistyle, the inner dististyle complex in structure; female ovipositor elongate

*Tipula oleraceae* Linnaeus  
[Plate, XII]

*Tipula oleracea* Linnaeus, 1758, Syst. Nat. Ed., X: 585.

*Tipula pratensis* Degli 1776, Mem. Pour Serv. D. Ins., Vi: 339.

**Diagnosis:**

Male 19-23 mm. Wing 15-18 mm.

Female 21-25 mm. Wing 17-20 mm.

Body greyish brown in colour; antennae little shorter than head and pronotum together, antennal joints yellow with brown base and two pairs of verticils; labium dark brown; thorax whitish grey powdered prescutum with four fairly dark brown broad bands; wings smoky grey with dark brown patches in costal margin, discal cell pentagonal of moderate size; legs brown with darker tarsi, abdomen dorsally with a longitudinal brown stripe along all segments and transverse yellowish grey bands between each segment; male hypopygium with adminiculum light curved, scythe shaped, black brown, inner dististylus flattened, crescent shaped, upper gonostylus claw shaped, sharp ending, lower gonostylus trench shaped, with some relatively long acute setae

along inner eadge; female ovipositor with shining yellowish brown valves.

**Specimens examined:**

Bahariya oasis 16.23-2-1938 [3M.&7F.], Siwa 7.14-2-1939 [1F.], Elgabal Elasfar 4-7-1953 [1F.].

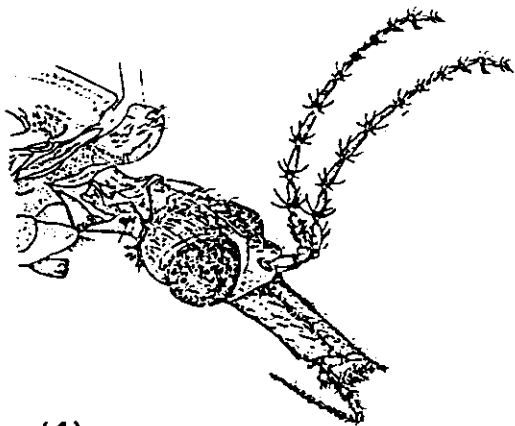
.....[C.Coll.]

Abis 12-1-1993 [1F.], 27-1-1994 [1M. & 2F.], 18-1-1995 [1M. & 1F.]; Sidisalem 21-2-1993 [3M. & 4F.], 9-2-1994 [4M. & 6F.], 3-3-1995 [3F.], 18-2-1996 [2M. & 4F.]; Bawiti 4-3-1994 [3M. & 5F.], 12-3-1995 [5M. & 8F.], 9-3-1996 [3M. & 4F.]; Bilbies 12-4-1993 [8M. & 11F.], 11-4-1994 [2M. & 9F.], 28-4-1995 [1M. & 8F.]; Aga 1-5-1993 [1M.], 12-5-1994 [1M. & 3F.], 21-5-1995 [2F.]; Kassassin [2F.]; El Marg 8-6-1995 [1F.], 3-6-1996 [1M.]; Minuf 11-6-1993 [2F.], 1-1995 [1M.]; El-Orman 3-9-

.....[Ayman Coll.]



## Plate (XII)



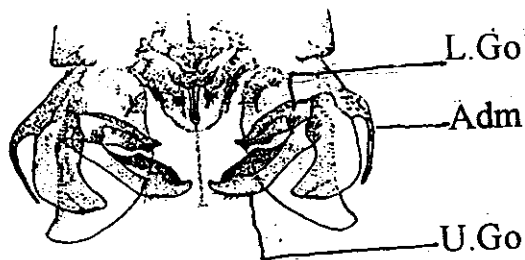
(1)



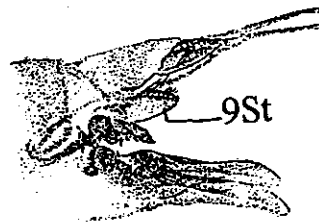
(2)



(3)



(4)

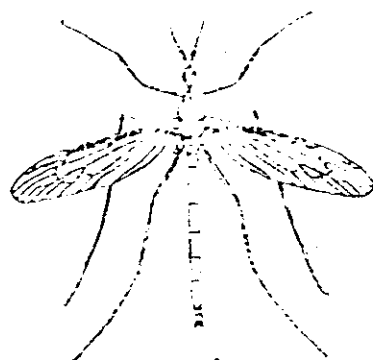


(5)

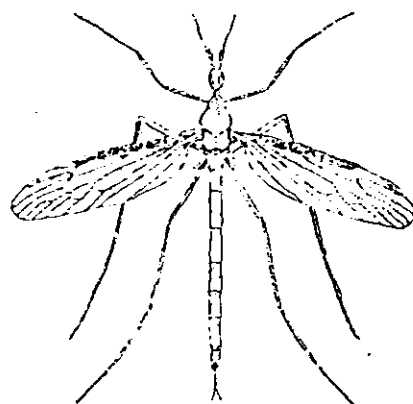
*Tipula oleracea* Linnaeus

- 1) Laterodorsal view of head and appendages (Female). X12
- 2) Wing venation of Female. X5.5
- 3) Ventral view of halter (Female). X11
- 4) Ventral view of male genitalia. X28
- 5) Lateral view of Female genitalia. X28

# Plate (XIII)



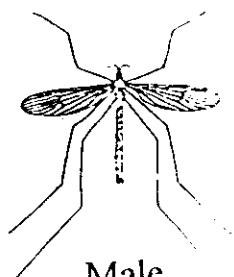
Male



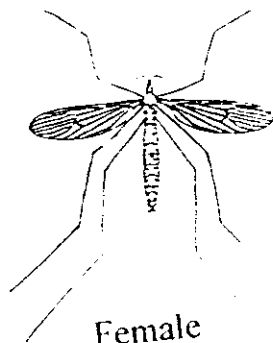
Female

*Conosia irrorata* (Wiedemann)

**X2.5**



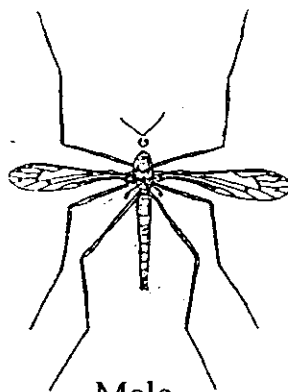
Male



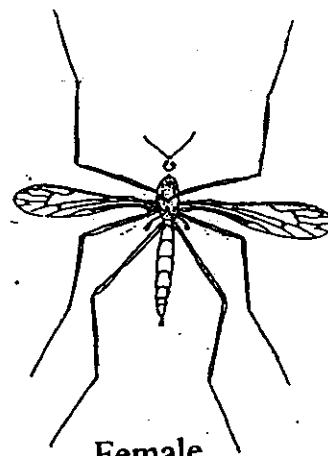
Female

*Erioptera septentrionis* Osten Sacken

**X6.5**



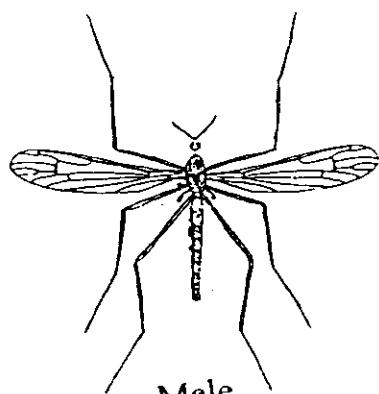
Male



Female

*Gonomyia sexguttata* Dale

**X5**

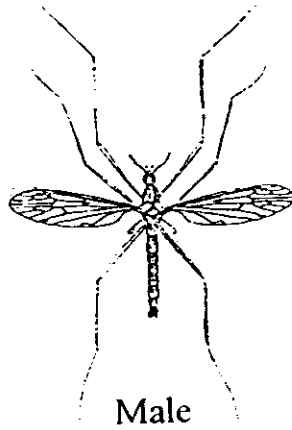


Male

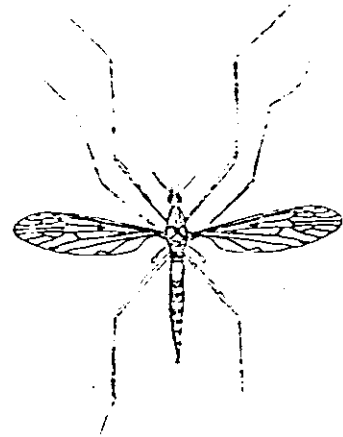
*Gonomyia spuria* Bergroth

**X5**

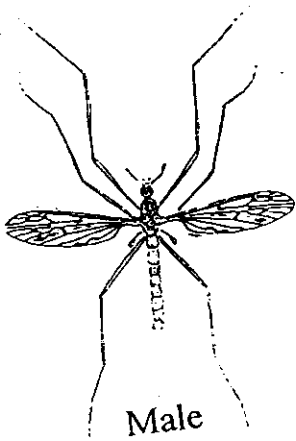
## Plate (XIV)



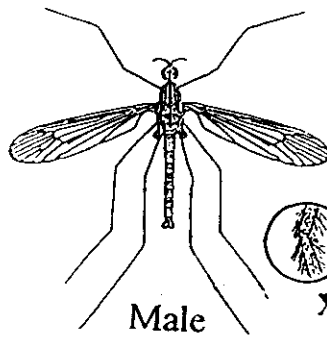
Male



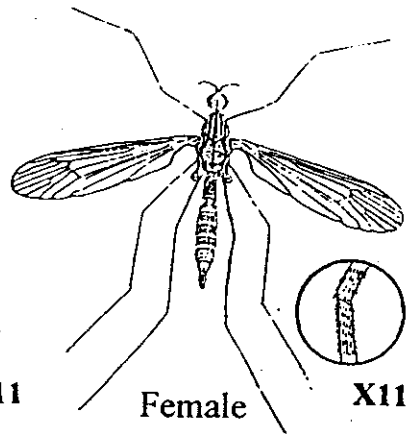
Female

*Symplecta punctipennis* Meigen**X6**

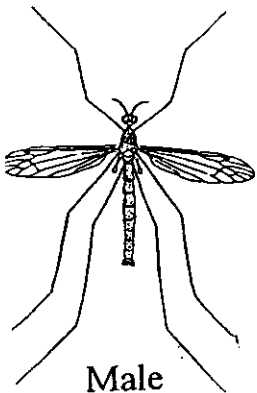
Male

*Symplecta stictica* Meigen**X5.5**

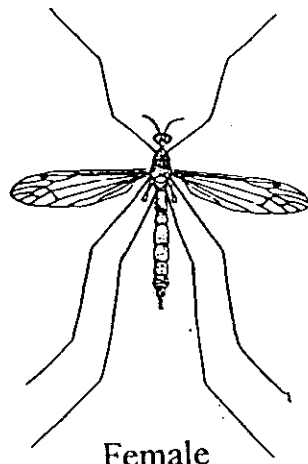
Male

**X11**

Female

**X11***Trimicra inconspicua* (Loew)**X4**

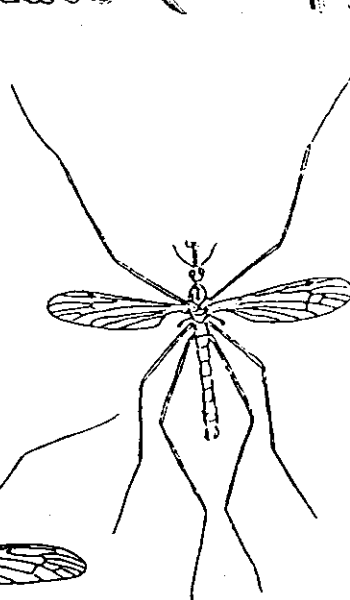
Male



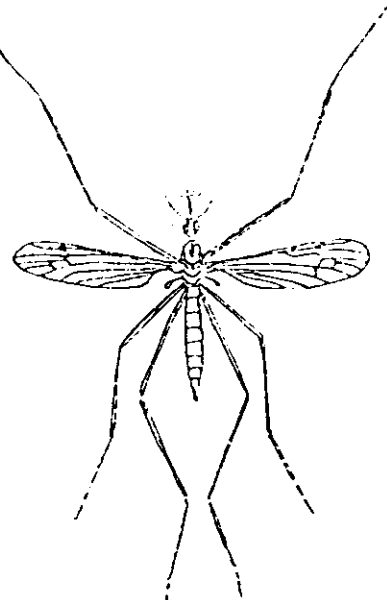
Female

*Dicranomyia ventralis* (Schummel)**X4.5**

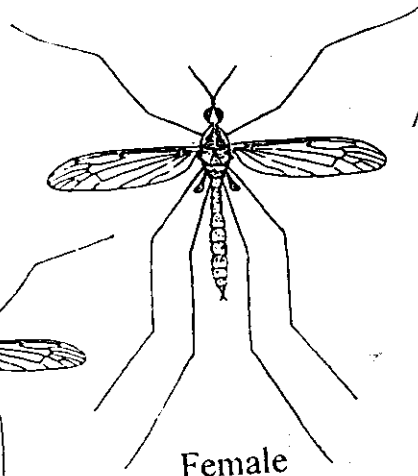
## Plate ( xv )



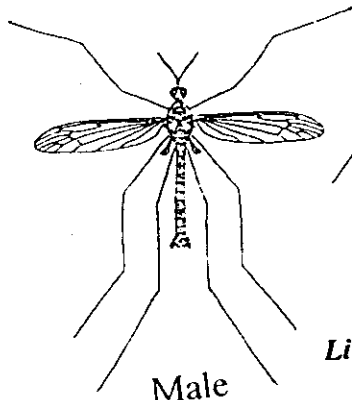
Male



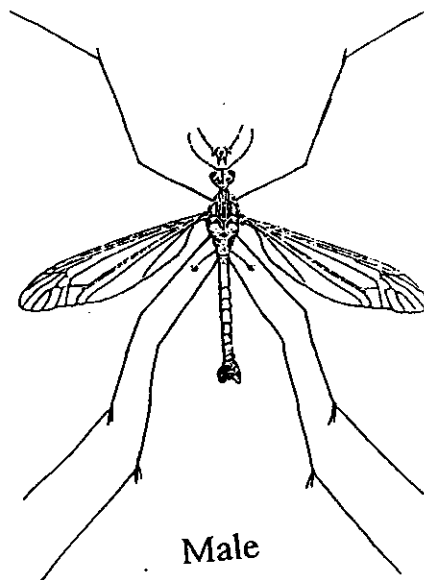
Female

*Helius longirostris* (Wiedemann)**X4**

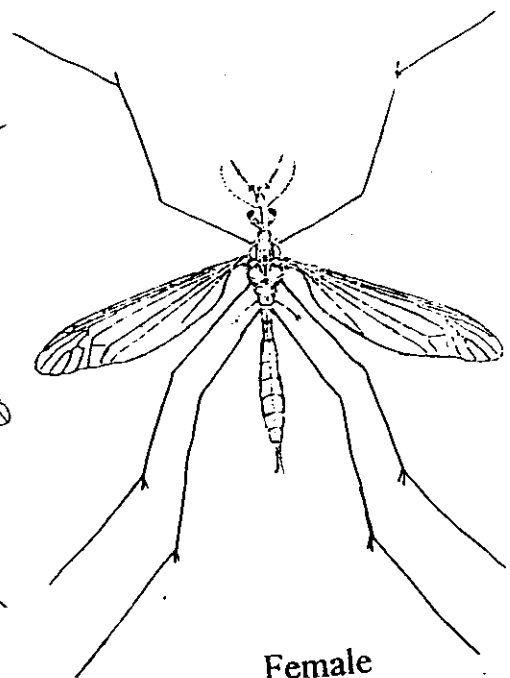
Female



Male

*Limnobia marginata* (Macquart)**X4.5**

Male



Female

*Tipula oleracea* Linnaeus**X2.5**