

## SOME OF THE FRUIT FLIES FAUNA OF CHICHEKLI REGION WITH A NEW REPORT FOR IRAN (DIPTERA: TEPHRITIDAE)

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**ABSTRACT:** Based on specimens collected from Chichekli region, located in East Azerbaijan province, during 2009-2011, eighteen species of nine genera were recognized. Identification key to the species is provided. The locality, host plants and figures of wing pattern of each species are given. *Urophora jaceana* (Hering, 1935) is being newly reported for the Iran insect fauna.

**KEY WORDS:** Tephritidae, Chichekli, East Azerbaijan province, Iran, New record.

There are more than 4000 described species of Tephritidae over the world. This family differs from other Tephritoidea by the following character: costal vein with two interruptions, one before humeral vein and the other at place of ending of subcostal vein (Rikhter, 1989). Most species of tephritids are phytophagous. Most tephritid larvae develop in fruit or within the flower heads of Asteraceus plants. A few tephritids are leaf miners; some species are stem borers and some others live in roots (White, 1988).

Chichekli region is located in west of Qaradag forests, a registered biosphere in world heritages by UNESCO since 1976 in East Azarbaijan province, Iran. This biosphere reserve situated in the north eastern Tabriz city with a distance of 64.8 km and UTM (Universal Transfer Mercator) coordinate system, X from 654517.66 to 655110.71 E; Y from 4306958.17 to 4308226.18 N and varying latitude from 1271 m to 1336 m. This area has rich grass lands with various species of Astraceae (*Achillea*, *Anthemis*, *Artemisia*, *Carthamus*, *Centaurea*, *Cirsium*, *Echinops*, *Helichrysum*, *Onopordum*, *Senecio*, *Sonchus* and *Tanacetum*), Apiaceae and Legominaceae.

The tephritids of this area have not been verified so it subjected for the present study.

### MATERIALS AND METHODS

Adult specimens were swept on flowers head of Asteraceus plants in twenty-nine localities which situated through the working area during 2009- 2011 (Fig. 1). The samples were killed in a killing jar containing potassium cyanide and the voucher specimens were deposited at Insect Museum of Tabriz University. The terminology primarily follows White et al. (2000).

### RESULTS

Eighteen species belonged to nine genera of the family Tephritidae were identified which infested the head of Astraceus plants. All of them are as new records for the region and *Urophora jaceana* (Hering, 1935) is being newly record

for the Iran insect fauna. The subfamilies, tribes and species are listed in alphabetic order.

### Key to studied species of the family Tephritidae

1. Wings hyaline, without distinct pattern (Fig. 2) ..... *Terellia serratulae*  
- Wings with distinct pattern or crossbands (Fig. 3 to 19) ..... 2
2. Wings with crossbands (Fig. 3 to 11) ..... 3  
- Wings pattern another forms (Fig. 12 to 19) ..... 11
3. Abdomen in black color ..... 4  
- Abdomen in yellow color ..... 7
4. Aculeus without subapical steps (Fig. 20) ..... *Urophora quadrifasciata*  
- Aculeus with subapical steps (Fig. 21 to 23) ..... 6
5. Aculeus with two subapical steps (Fig. 21) ..... *U. solstotoalis*  
- Aculeus with one subapical steps (Fig. 22, 23) ..... 7
6. Preapical and discal crossbands parallel (Fig. 5) ..... *U. mauritanica*  
- Preapical and discal crossbands not parallel (Fig. 6) ..... *U. jaceana*
7. Presutural dorsocentral setae present (Fig. 24) ..... *Chaetorallia jaceae*  
- Presutural dorsocentral setae absent (Fig. 25 to 27) ..... 8
8. Extension of cell cup extending well beyond bm-cu crossvein (Fig. 8) ..... *Orellia falcate*  
- Extension of cell cup ending approximately in line with bm-cu crossvein (Fig. 9, 10) ..... 9
9. Scutum with a black apical spot and pair of the base of each setae black basal spots (Fig. 26) ..... *Chaetostomella cylindrica*  
- Scutum usually without a black spot, at most with narrow basal-lateral basal spots (Fig. 27) ..... 11
10. Dark transverse bands of wings between R<sub>4+5</sub> and M displaced over apex of wings (Fig. 10) ..... *Terellia quadratula*  
- Pattern of wings not displaced over apex of wings (Fig. 11) ..... *Ter. gynaeochroma*
11. Abdomen in yellow color ..... *Ter. ruficauda*  
- Abdomen in black color ..... 13
12. Cell dm completely hyaline (Fig. 13) ..... *Acanthiophilus helianthi*  
- Cell dm not completely hyaline (Fig. 14 to 19) ..... 14
13. With three pair of frontal setae (Fig. 28) ..... *Acinia biflexa*  
- With two pair of frontal setae (Fig. 29, 30) ..... 14
14. With one pair of scutellar setae (Fig. 31) ..... 15  
- With two pair of scutellar setae (Fig. 32) ..... 16
15. Vein CuA<sub>1</sub> with a brown stripe along it from dm-cu to hind margin of wing (Fig. 15) ..... *Trupanea amoena*  
- Vein CuA<sub>1</sub> entirely with a hyaline area (Fig. 16) ..... *Tru. stellata*
16. Apical fork of wing absent, only isolated brown spots present at end of vein R<sub>4+5</sub> and M (Fig. 17) ..... *Tephritis formosa*  
- Apical fork of wing present (Fig. 18, 19) ..... 17
17. Hyaline area in cell dm not separate (Fig. 18) ..... *Tep. cometa*  
- Hyaline area in cell dm separate (Fig. 19) ..... *Tep. hurvitzi*

### Subfamily Tephritinae

#### Tribe Myopitini

#### *Urophora jaceana* (Hering, 1935)

**Material examined:** (1♂): Chichakli, 38°39' N, 46°31' E, 2140 m, 1 April 2009 (Gharajedaghi); (1♂): Chichakli, 38°40' N, 46°31' E, 2168 m, 24 March 2010 (Zarghani).

**Host plants:** *Centaurea jacea* L., and *C. nigra* L. (White and Korneyev, 1989).

**Distribution:** Most of Europe; from Ireland and France in the West and Norway and Northern Russia (Kola Peninsula) in the North to the Pyrenees, Alps, Caucasus, and Turkey in the South and Ural Mountains in the East; introduced into Eastern America (Korneyev and White, 1999; Kutuk, 2003). **New record for the Iran insect fauna.**

***Urophora mauritanica* Macquart, 1851**

**Material examined:** (1♂): Chichakli, 38°40' N, 46°31' E, 2148 m, 15 February 2009 (Gharajedaghi).

**Host plants:** *Carthamus arborescens* M.Bieb., *C. glaucus* M.Bieb., *C. tinctorius* L., *C. lanatus* L., and *C. tenuis* (Boiss.) Bornm. (Fraunfeld, 1857; White and Korneyev, 1989; Freidberg and Kugler, 1989).

**Distribution:** Albania, Algeria, Bulgaria, Crete, Cyprus, Czech Republic, French mainland, Greek mainland, Italian mainland, Sardinia, FYR Macedonia, Malta, Moldova, Morocco, south of European Russia, Spain, Ukraine, Turkey, Azerbaijan, Kazakhstan, Uzbekistan, Israel, Algeria, Libya (White and Korneyev, 1989; Merz and Korneyev, 2004) and Iran (Gharali et al., 2005).

***Urophora quadrifasciata* (Meigen, 1826)**

**Material examined:** (1♂, 1♀): Chichakli, 38°41' N, 46°31' E, 2163 m, 15 February 2009 (Gharajedaghi).

**Host plants:** The larvae develop in flowerhead galls on *Centaurea iberica* Trev. ex Spreng, *C. solstitialis* L., *C. aspera* L., *C. sterilis* L., *C. breviceps* Trev. ex Spreng., *C. nicaeensis* Trev. ex Spreng., *C. procurrans* Sieb., *C. jacea* L., *C. maculosa* Lam., *C. splendens* Sieb., *C. nigrescens* L., *C. cyanus* L., *C. calpitropa* L., *C. nigra* L., and *Serratula tinctoria* L. (Giray, 1979; White, 1988; White and Korneyev, 1989; Freidberg and Kugler, 1989; Merz, 1994; Korneyev and White et al., 1999; Kutuk, 2003).

**Distribution:** Most of Europe, Turkey, Kazakhstan, Israel, Iran, East Palearctic and Nearctic region, and North Africa (Kutuk and Ozgur, 2003; Merz and Korneyev, 2004) and Iran (Karimpoor and Merz, 2006).

***Urophora solstitialis* (Linnaeus, 1758)**

**Material examined:** (1♀): Chichakli, 38°40' N, 46°31' E, 2168 m, 1 January 2010 (Khaghaninia).

**Hostplants:** *Carduus defloratus* L., *C. nutans* L., *C. personata* (L.) Jacq., *C. acanthoides* L., *C. crispus* L., *Cirsium vulgare* (Savi) Ten., and *C. heterophyllum* (L.) Hill. (White, 1988; Merz, 1994; Kutuk, 2003).

**Distribution:** Most of Europe, except Spain and Mediterranean region (Merz and Korneyev, 2004), North Caucasus, Armenia, Turkey, Kazakhstan, Western China (Xingjian), Far East Russia (Magadan) (Korneyev and White, 1999), North America, Australia, and New Zealand (Norrbom et al., 1999), and Iran (Gharajedaghi et al, 2011b).

**Tribe Tephritini**

***Acanthophilus helianthi* (Rossi, 1794)**

**Material examined:** (2♂♂, 4♀♀): Chichakli, 38°39' N, 46°31' E, 2140 m, 20 February 2009 (Gharajedaghi); (5♂♂, 1♀): Chichakli, 38°39' N, 46°31' E, 2243 m, 10 July 2010 (Khaghaninia).

**Host plants:** The larvae develop in flower heads of various species of *Carthamus*, *Centaurea* and related genera of the family Asteraceae (Hendel, 1927; Freidberg, Kugler, 1989; Merz, 1994).

**Distribution:** North and East Africa; Central and South Europe; Kazakhstan, Kyrgyzstan, China, Transcaucasia, Turkey, Near and Middle East including Iran; Saudi Arabia, UAE, Pakistan, India and Thailand (Norrbom et al., 1999; Korneyev and Dirlbek, 2000; Merz and Dawah, 2005; Merz, 2008).

***Acinia biflexa* (Loew, 1844)**

**Material examined:** (2♂♂): Chichakli, 38°39' N 46°31' E, 2243 m, 15 February 2010 (Zarghani).

**Host plants:** *Inula britannica* (Baugnee, 2006).

**Distribution:** Belgique (Baugnee, 2006) and Iran (Gharajedaghi et al., in press).

***Tephritis cometa* (Loew, 1840)**

**Material examined:** (2♂♂): Chichakli, 38°39' N, 46°31' E, 2239 m, 20 February 2010 (Khaghaninia).

**Host plants:** *Cirsium gaillardotii*, *C. vulgare*, *C. arvense*, and *C. palustre* (Giray, 1979; White, 1988; Freidberg and Kugler, 1989; Merz, 1994).

**Distribution:** West and Middle Asia, Israel, Afghanistan, Russia, Estonia, Latvia, Lithuania, Ukraine, Moldova, Azerbaijan, Georgia, Armenia, Kazakhstan, Uzbek, Tajikistan, Kirghis, Turkomanas, Switzerland, England, Germany and Turkey (Foote, 1984; White, 1988; Freidberg and Kugler, 1989; Merz, 1994; Kutuk and Ozgur, 2003), and Iran (Mohamadzade et al. 2010b).

***Tephritis formosa* (Loew, 1844)**

**Material examined:** (1♀): Chichakli, 38°41' N, 46°31' E, 1788 m, 21 July 2011 (Gharajedaghi).

**Host plants:** *Sonchus oleraceus*, *S. aspera*, *S. arvensis*, *Hypochaeris radicata*, and *Crepis virens* (White, 1988; Freidberg and Kugler, 1989; Merz, 1994).

**Distribution:** Europe, except Scandinavia, to Israel and Iran (Norrbon et al., 1999).

***Tephritis hurvitzi* Freidberg, 1758**

**Material examined:** (3♂♂, 3♀♀): Chichakli, 38°39' N, 46°31' E, 2229 m, 20 February 2009 (Khaghaninia).

**Host plants:** *Scorzonera syrica* and *Tragopogon longirostris* (Freidberg and Kugler, 1989).

**Distribution:** Europe, Middle Asia, Israel, Syria, Jordan, Lebanon, Iraq and Iran (Norrbon et al., 1999; Korneyev and Dirlbek, 2000, and Mohammadzade et al. 2010b).

***Trupanea amoena* (Frauenfeld, 1857)**

**Material examined:** (1♂, 1♀): Chichakli, 38°39' N, 46°31' E, 2229 m, 31 December 2010 (Khaghaninia).

**Host plants:** *Lactuca* sp., *Picris hieracioides* and *Sonchus* sp. (Merz, 1994).

**Distribution:** Iran: East Azerbaijan (Zaitzev, 1947), Khorasan Jonubi, Sistan and Baluchestan (Hering, 1956), Tehran (Gilasian et al., 2008); Europe, Israel, Syria, Iraq, Saudi Arabia and UAE (Norrbon et al., 1999; Korneyev and Dirlbek, 2000; Merz and Dawah, 2005; Merz, 2008).

***Trupanea stellata* (Fuesslin, 1775)**

**Material examined:** (1♀): Chichakli, 38°41' N, 46°31' E, 1788 m, 5 July 2011 (Gharajedaghi).

**Host plants:** *Senecio* spp., *Artemisia judaica*, *Inula graveolens* and *I. viscosa* in Israel (Freidberg and Kugler, 1989). In Europe reared from *Anthemis* spp., *Aster* sp., *Bidens* sp., *Centaurea* spp., *Crepis* spp., *Inula* sp., *Picris* sp., *Senecio* sp. and *Serratula* sp. (Merz, 1994).

**Distribution:** Iran: Kerman, Sistan and Baluchestan (Dirlbek, 1980), Europe, Israel, Iraq, Armenia, Saudi Arabia, India, Mongolia and Africa (Norrbon et al., 1999; Korneyev and Dirlbek, 2000; Merz and Dawah, 2005).

**Tribe Terelliini*****Chaetorellia jaceae* (Robineau-Desvoidy, 1830)**

**Material examined:** (1♂, 1♀): Chichakli, 38°39' N, 46°31' E, 2140 m, 1 January 2009 (Gharajedaghi).

**Host plants:** *Centaurea nigra* and *Cirsium* spp. (Korneyev and Konovalov, 2010; Richter, 1970; White, 1988).

**Distribution:** Western and central England (White, 1988), Northwest, central belt, south, Crimea. Central belt and south of Western Europe, Asia Minor (Richter, 1970) and Iran (Gharajedaghi et al., 2011a).

***Chaetostomella cylindrica* (Robineau-Desvoidy, 1830)**

**Material examined:** (1♀): Chichakli, 38°41' N, 46°31' E, 1788 m, 12 July 2011 (Gharajedaghi).

**Host plants:** *Centaurea nigra* and many species of Cardueae (White, 1988).

**Distribution:** Southern England, Europe, North Africa, Asia as far east as Mongolia (White, 1988), and Iran (Mohamadzade, 2010b).

***Orellia falcata* (Scopoli, 1763)**

**Material examined:** (2♀♀, 1♂): Chichakli, 38°39' N, 46°31' E, 2140 m, 24 March 2009 (Gharajedaghi).

**Host plants:** Larvae bore into the stem base and root of *Tragopogon pratensis* (White, 1988; Richter, 1970).

**Distribution:** England, Scotland, Europe (White, 1988), and Iran (Gilasian and Merz, 2008).

***Terellia gynaecochroma* (Hering, 1937)**

**Material examined:** (2♀♀): Chichakli, 38°39' N, 46°31' E, 2229 m, 1 January 2010 (Khaghaninia).

**Host plants:** *Carduus acanthoides* L., *Onopordum acanthium* L. (Hendel, 1927; kutuk, 2006; Mohamadzade, 2010, b), *O. anisacanthum* Boiss., *O. illyricum* L. (Khouzama et al., 2002) and *O. heteracanthum* (Mohamadzade, 2010, b).

**Distribution:** North West, South, Crimea, Trans-caucasus, Central belt, Europe (Richter, 1970), Cyprus, Israel, Jordan, Syria (Freidberg, Kugler, 1989; Norrbom et al., 1999; Korneyev and Dirlbek, 2000) and Iran (Mohamadzade, 2010a and b).

***Terellia quadratula* (Loew, 1869)**

**Material examined:** (1♂, 2♀♀): Chichakli, 38°40' N, 46°31' E, 2168 m, 13 February 2010 (Khaghaninia).

**Host plants:** *Echinops viscosus* (Freidberg and Kugler, 1989).

**Distribution:** Israel, Lebanon, Caucasus (Norrbom et al., 1999; Korneyev and Dirlbek, 2000; Korneyev, 2006) and Iran (Mohamadzade, 2010b).

***Terellia ruficauda* (Fabricius, 1794)**

**Material examined:** (1♂, 1♀): Chichakli, 38°41' N, 46°31' E, 1788 m, 20 March 2011 (Gharajedaghi).

**Host plants:** *Cirsium arvense* (Mohamadzade, 2010, b), *C. palustre* (L.) Scop., *C. arvense* (L.) Scop., *C. eriophorum* (L.) Scop., and *C. dissectum* (L.) Scop. (White, 1988; Merz, 1994; Kutuk and Ozgur, 2003).

**Distribution:** North America, Europe, Russia, Kazakhstan, Kyrgyzstan, Mongolia, China; (Norrbom et al., 1999) and Iran (Mohamadzade, 2010, b).

***Terellia serratulae* (Linnaeus, 1758)**

**Material examined:** (2♂♂, 2♀♀): Chichakli, 38°41' N, 46°31' E, 2163 m, 15 March 2009 (Gharajedaghi).

**Host plants:** *Cirsium arvense*, (Mohamadzade, 2010, b), *Carduus acanthoides* L., *Card. defloratus* L., *Card. nutans* L., *Cirsium alatum* (Gmel.) Bobr., *Cirs. erisithales* (Jacq.) Scop., *Cirs. oleraceum* (L.) Scop., *Cirs. tuberosum* (L.), and *Cirs. vulgare* (Ten.) Savi are recorded (Zwolfer, 1965; White, 1988; Merz, 1994). References of *Cirs. arvense* (L.) Scop., *Cirs. Phyllocephalum* Boiss., (Kugler and Freidberg, 1975), *Galactites tomentosa* Moench., *Lamyropsis cynaroides* (Lam.) Dittrich, and *Card. pycnocephalus* L., (Neuenschwander and Freidberg, 1983).

**Distribution:** British Is., Scandinavia, Kazakhstan, Israel, Syria, Iraq and Africa (Norrbom et al., 1999; Korneyev and Dirlbek, 2000), and Iran (Mohamadzade et al., 2010b).

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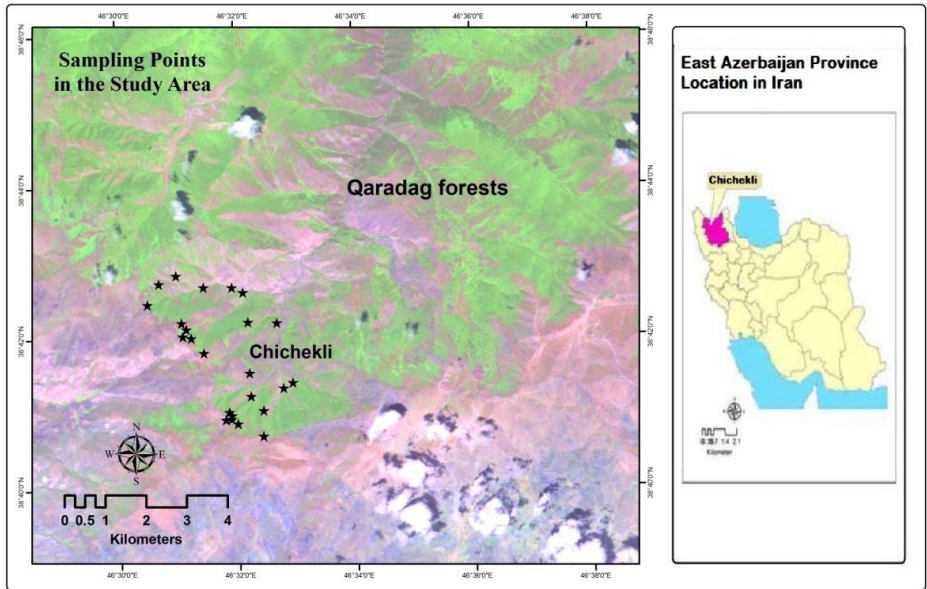
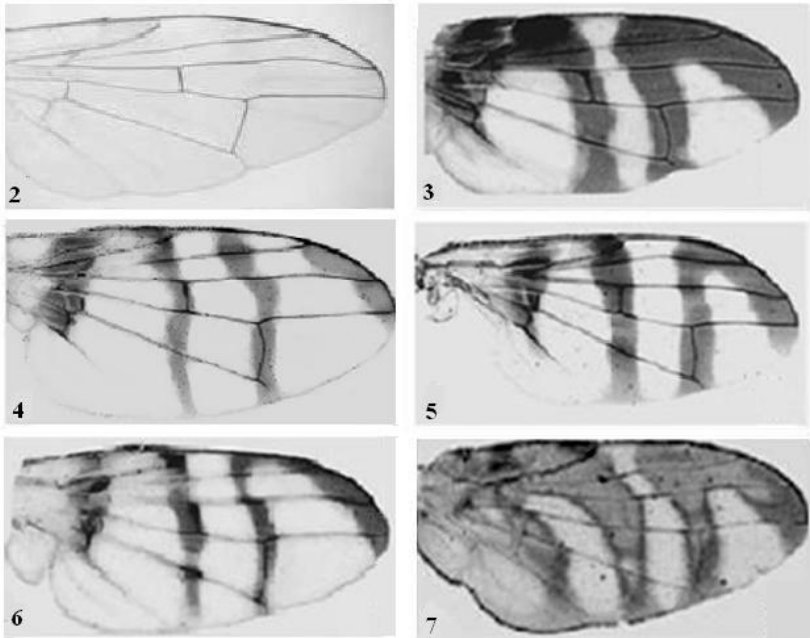
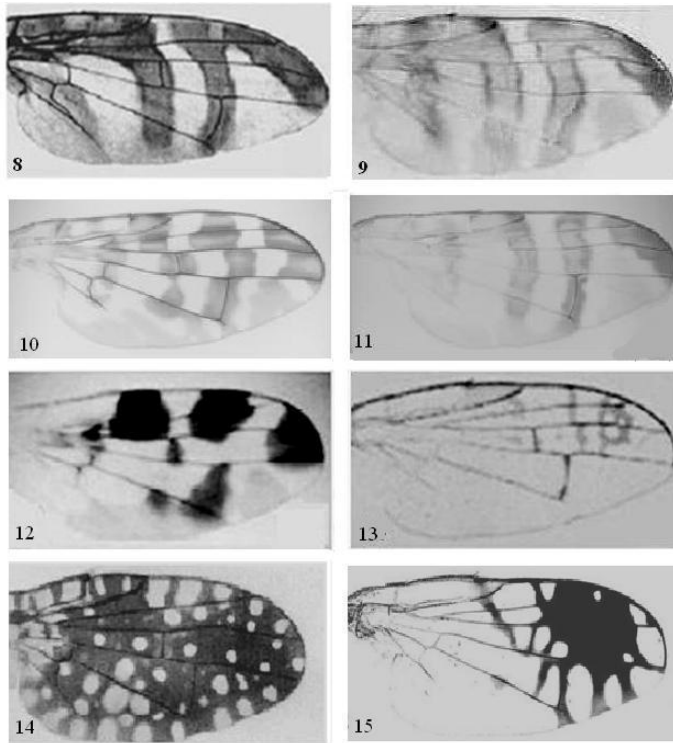


Figure 1. Location of sampling points on satellite image (SPOT) of Chichekli region.

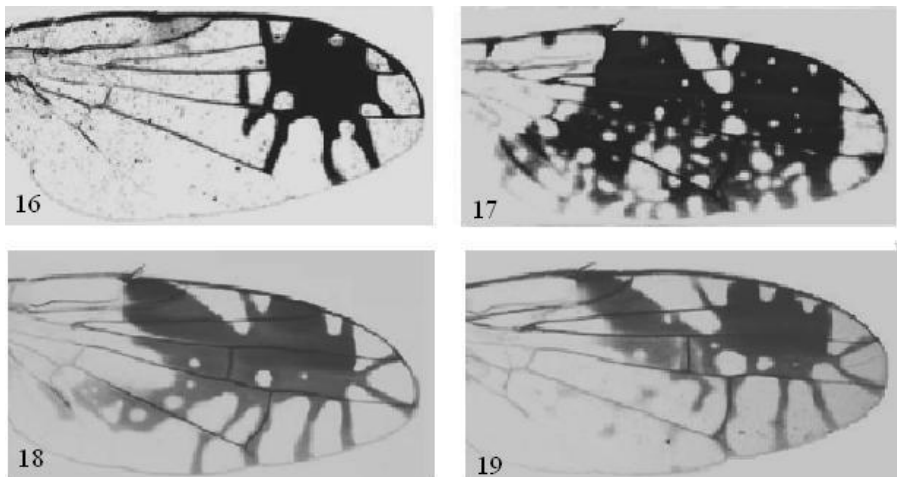


Figures 2-9. Right wings of fruit flies: 2- *Terellia serratulae*, 3- *Urophora quadrifasciata*, 4- *U. solstitialis*, 5- *U. mauritanica*, 6- *U. jaceana*, 7- *Chaetorellia jaceae*.

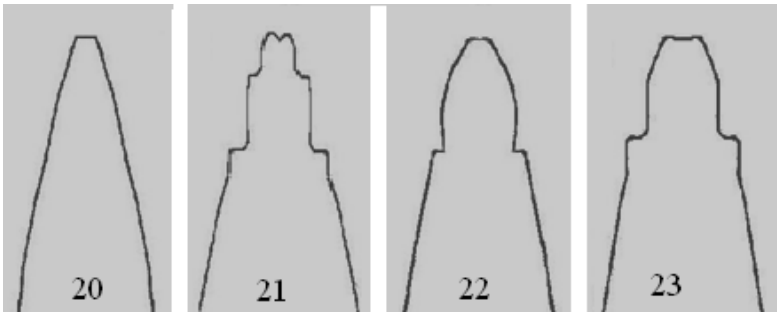




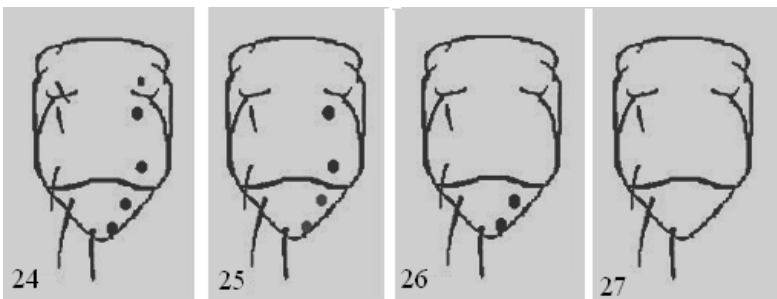
Figures 8-15. Right wings of fruit flies: 8- *Orellia falcata*, 9- *Chaetorellia cylindrica* 10- *Terellia quadratula*, 11- *Ter. gynaechroma*, 12- *Ter. ruficauda*, 13- *Acanthiophilus helianthi*, 14- *Acinia biflexa*, 15- *Trupanea amoena*.



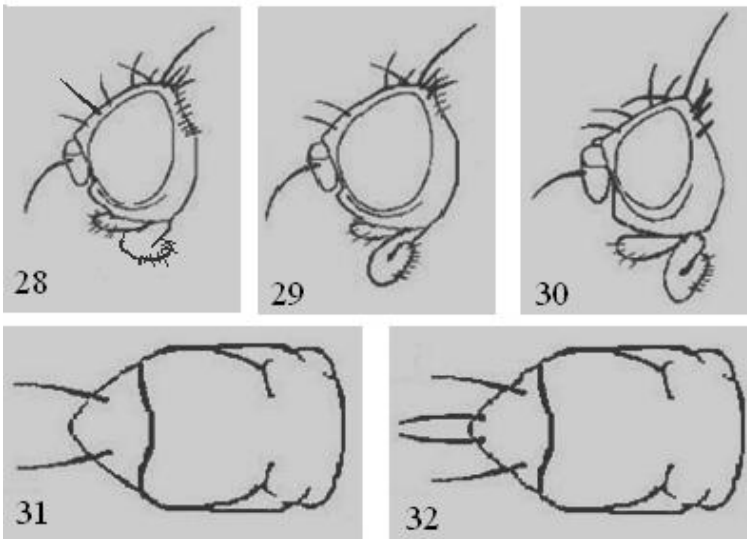
Figures 16-19. Right wings of fruit flies: 16- *Trupanea stellata*, 17- *Tephritis formosa*, 18- *Tep. hurvitzii*, 19- *Tep. cometa*.



Figures 20-23. Aculeus of fruit flies: 20- *Urophora quadrifasciata*, 21- *U. solstitialis*, 22- *U. mauritanica*, 23- *U. jaceana* (dorsal view).



Figures 24-27: Tergum of fruit flies: 24- *Chaetorella jaceae*, 25- *Orellia falcata*, 26- *Chaetostomella cylindrica*, 27- *Terellia gynaecochroma* (dorsal view).



Figures 28-30. Head of fruit flies: 28- *Acinia* spp., 29- *Trupanea* spp., 30- *Tephritis* spp. (lateral view); 31-32: Scutellum setae of fruit flies. *Trupanea* spp., 32- *Tephritis* spp. (dorsal view).