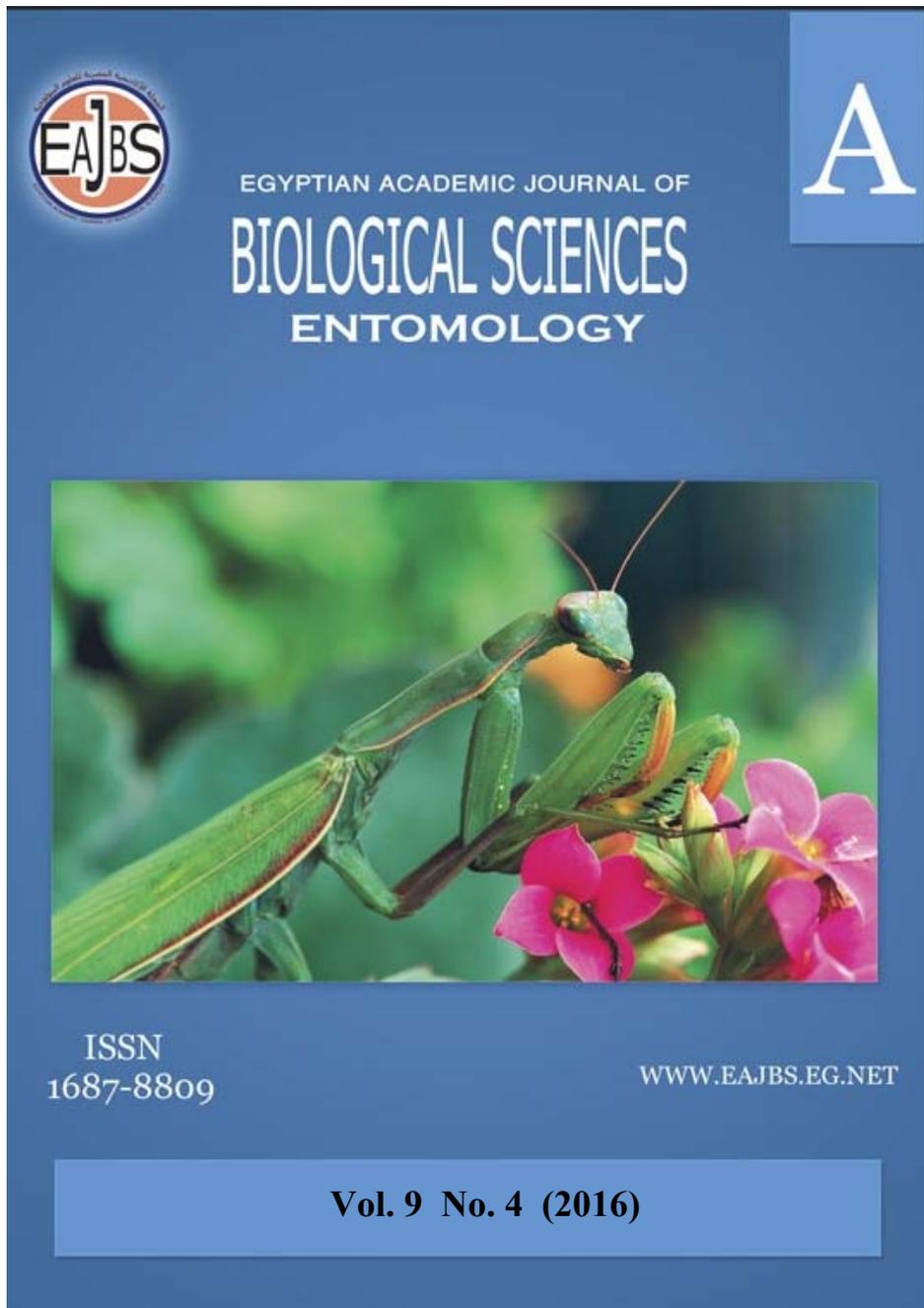
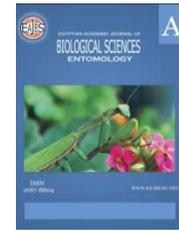


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Morphological Identification of Aphid Species Infesting Some Ornamental plants in Taif Governorate

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ABSTRACT

Aphid species were surveyed and identified from 18 ornamental plant in different localities in Taif governorate, KSA through 2015/2016 seasons. Eleven aphid species were recorded only on 14 ornamental host plants. *Rhodobium porosum*, *Brachyunguis tamaricis* and *Acyrtosiphon pisum* were recorded on *Rosa damascene* var *trigintipetala*. There were two aphid species were recorded on *Tecoma stans*; *Brachyunguis tamaricis* and *Aphis compositae*. *Aphis compositae* was more abundant. One aphid species was collected and identified on *Rosa damascena*, this species was known as *Rhodobium porosum*. For *Jasminum grandiflorum*, *Cestrum* sp. and *Tegetes marigold*, only one aphid species was recorded; namely *Myzus persica*, this aphid species was observed with very high density on *Cestrum* sp., followed by *Jasminum grandiflorum* but the lowest abundant was recorded on *Tegetes marigold*. *Brachyunguis tamaricis* also was the only recorded species on *Hibiscus rosa-sinensis*., it was observed in weak density. The four ornamental plants; *Bougainvillea* sp., *Nerium oleander*, *schefflera actinophyll* and *Ruta graveolens*, recorded no aphid infestation through the two tested seasons 2015 and 2016. Four aphid species were identified on *Ocimum basilicum* during the season; these species were *Rhopalosiphum maidis*, *Aphis copmpositae*, *Macrosiphum avenae* and *Rhodobium porosum*, the lowest observed abundant species was *Rhodobium porosum*. On *Plectranthus amboinicus*, there was only one recorded aphid species, it was identified as *Macrosiphum avenae*, and was recorded in high density. *Brachyunguis tamaricis* was the only species recorded on *Petunia* sp. and *Caesalpinia pulcherrima*, was demonstrated with high density on *petunia* sp. On *Rosa damascene* var *semperflorens*, there were four recorded species namely as; *Macrosiphum rosae*, *Macrosiphum avenae*,

Rhodobium porosum, and *Amphorophora agathonica*. Only one aphid species was recorded on each of *Artemisia vulgaris* and *Achillea Arabica*, they are *Macrosiphoniella absinthii* and *Liapaphis erysimi* respectively.

INTRODUCTION

Ornamental plants considered very important plants according to its beauty, smell and medical purpose. These plants were attacked by various insects pests including different aphid species which cause high annual losses. This pest may cause stopping the growth of leaf and flower buds, twigs and stems by sucking sap and also prohibits flowering and causes weakness of flower buds which lead to deformities and mottled petals. (Mehrparvar *et al.* 2009). Aphids cause indirect losses by secreting honeydew that attract many insects such as flies, ants and wasps, moreover, sooty mold will start to grow and finally photosynthesis and yield will be reduced. Furthermore, aphids are responsible for transferring viral diseases from infested plant to healthy plants. (Blackman and Eastop 2000). (Dawood 1971) recorded many species of aphids that attack ornamental plants in Egypt. The commonest species were *Aphis gossypii*, *Aphis craccivora* and *Myzus persicae* in which caused large damage on *Chrysanthemum indicum*, *Antirrhinum majus* and *Rosa* spp. (Blackman and Eastop 1984) recorded thirty-one species of aphids on *Rosa* spp., The most abundant were *Macrosiphum rosae*; potato aphid, and *Macrosiphum euphorbia*. Also (Blackman and Eastop 2000) have been reported about 55 aphid species already for roses. (Peronti1 and Silva 2002) collected a total of 25 aphid species from 49 ornamental plant species in Brazil; 12 aphids were monophagous, four oligophagous and nine polyphagous. (Salem 2009) recorded that five aphid species were attacking nine annual ornamental plants in Egypt. *A. gossypii* on *Verbena hybrida*, *S. farinacea*, *S. splendens*, *S. splendens*, *Coreopsis auriculata* and *A. mathiola* on *Mathiola incana*. *Myzus persicae* on *Antirrhinum majus*. *Lipaphis erysimi* on *Ageratum houstonianum*. *Capitophorus elaeagni* on *Gazania splendens*. (Rafi *et al.* 2010) recorded and identify aphid species that attack some ornamental plants in Aligarh. *Aphis gossypii* recorded on *Hibiscus rosa-sinensis*. *Macrosiphum roseiformis* recorded on Rose, *Aphis craccivora* on *Argimom* sp., *Aphis craccivora* on *Bougainvillea* sp., *Uroleucon compositae* on *Calendula*, *Aphis fabae solanella* on *Castrum nocturnum*. Yovkova *et al.* (2013) listed aphids that infesting some ornamental plants in Bulgaria, which includes 114 species from 95 genera. Studying about use of morphological traits for extant aphid species is necessary.

This study aimed to use morphological traits for identification aphids that infest some ornamental plants in Taif governorate.

MATERIALS AND METHODS

Experimental design:

This study was conducted at Taif governorate, Kingdom of Saudi Arabia. It was carried out through 2015/ 2016 season. Eighteen ornamental host plants were chosen randomly from different localities at Taif governorate. The investigated ornamental plants are: *Tecoma stans* is belonging to family Bignoniaceae, *Bougainvillea* sp. is belonging to family Nyctaginaceae, *Nerium oleander* is belonging to family Apocynaceae, *Schefflera actinophylla* is belonging to family Araliaceae, *Rosa damascene*, *Rosa damascena* var. *trigintipetala* and *Rosa damascena* var *semperflorens* are belonging to family Rosaceae, *Jasminum*

grandiflorum is belonging to family Oleaceae, *Cestrum* sp. is belonging to family Solanaceae, *Hibiscus rosa-sinensis* is belonging to family Malvaceae, *Tegetes marigold* and *Achillea arabica* are belonging to family Compositae, *Ruta graveolens* is belonging to family Rutaceae, *Ocimum basilicum* and *Plectranthus amboinicus* are belonging to family Lamiaceae, *Petunia* sp. and *Caesalpinia pulcherrima* are belonging to family Fabaceae, *Artemisia Vulgaris* is belonging to family Asteraceae

Collecting and preservation aphid species infesting ornamental plants:

Aphids infesting the mentioned host plants were collecting throughout two seasons (2015 and 2016). Aphid colonies often consist of winged and wingless form, the proportion of adults in the sample can be increased by keeping the plant parts that infested with apterous form alive for a few days in a cool place in glass jar covered with muslin clothe before preserving them. Specimens of alate form were collected with a soft brush to transfer aphids and preserved into sample tubes containing 75% ethanol alcohol with few drops of glycerin for the proper identification of host species, then the tubes labeled carefully. Ornamental aphid species which collected during this experimental period were brought to the laboratory for identification. The different characters of taxonomic importance were examined with an eyepiece micrometer at 400× magnification using a light microscope (Leica DM 2500). The collecting and preserving technique was based mainly on (Hille Ris Lambers 1950) method.

Preparation of mounted specimens:

Collected aphid species alate form were killed and preserved in 75% ethyl alcohol. Preserved alate forms of aphid species were cleaned with distilled water for several times, and then macerated in sodium hydroxide solution 10 % overnight at room temperature (this period may increase in cases of black specimens). Aphid samples were washed in 5% glacial acetic acid. Samples were dehydrated by gradually series of ethyl alcohol concentrations. (Ten minutes for each concentration of 50, 70, 85, 90, and 95%, respectively). For clearing specimen, samples were cleared by soaked in freshly chloral-phenol solution (1 vol. chloral hydrate: 1 vol. phenol) for 15 min. cleared specimen was transferred to clean micro slide glass with 2 drops of Swan's gum chloral media (Eastop and van Emden 1972; El-Kady 1959)., carefully covered by a clean cover slip to avoid any air bubbles, and then the slides left horizontally on a hot plate at 40 °C for 2 days to dry. Mounted specimens were identified by using taxonomic keys of aphids such as (Habib & El-Kady, 1961; Blackman & Eastop, 1984 and 2000) to identify species.

Statistical analysis:

Obtained data were analyzed by using SAS package (SAS Institute 1997), significant differences were determined by analysis of variance (ANOVA) and based on the least significant differences using General Linear Model procedure (proc GLM). These tests followed by using Duncan's test at 0.05 probability level (Duncan 1955).

RESULTS AND DISCUSSION

Survey of aphid species infesting some annual ornamental plant:

Aphid species were surveyed from eighteen ornamental plants in different localities in Taif governorate, KSA through 2015/ 2016 seasons. Eleven aphid species were recorded and belonging to (Family: Aphididae) and (Subfamily: Aphidinae), with two tribes (Macrosiphini and Aphidini). Aphids of tribe Macrosiphini are the most abundant whereas eight aphid species were belonging to this tribe, but three aphid species were belonging to tribe Aphidini.

Data in table (1), show the determined aphid species on the ornamental plants. Three aphid species were recorded on *Rosa damascena* var *trigintipetala*, they are *Rhodobium porosum*, *Brachyunguis tamaricis* and *Acyrtosiphon pisum*, these species were nearly equal in abundant where they formed weak densities. For *Tecoma stans*, there were two aphid species, *Brachyunguis tamaricis* and *Aphis compositae*. *Aphis compositae* was more abundant. One aphid species was collected and identified on *Rosa damascena*, this species was known as *Rhodobium porosum*, this species was weak abundant. For *Jasminum grandiflorum*, *Cestrum* sp. and *Tegetes marigold*, only one aphid species was recorded; namely *Myzus persica*, this aphid species was observed with very high density on *Cestrum* sp., followed by *Jasminum grandiflorum* but the lowest abundant was recorded on *Tegetes marigold*. *Brachyunguis tamaricis* also was the only recorded species on *Hibiscus rosa-sinensis*., it was observed in weak density. Data also showed that the four ornamental plants; *Bougainvillea* sp., *Nerium oleander*, *schefflera actinophyll* and *Ruta graveolens*, recorded no aphid infestation through the experimental period. Four aphid species were identified on *Ocimum basilicum* during the two tested seasons; these species were *Rhopalosiphum maidis*, *Aphis compositae*, *Macrosiphum avenae* and *Rhodobium porosum*, the lowest observed abundant species was *Rhodobium porosum*., the other three species were nearly equal abundant. On *Plectranthus amboinicus*, there was only one recorded aphid species, it was identified as *Macrosiphum avenae*, this species was recorded in high abundant. *Brachyunguis tamaricis* was the only recorded species on *Petunia* sp. and *Caesalpinia pulcherrima*, where the most density was demonstrated on *petunia* sp. On *Rosa damascena* var *semperflorens*, there were four recorded species namely as; *Macrosiphum rosae*, *Macrosiphum avenae*, *Rhodobium porosum*, and *Amphorophora agathonic*, while *Macrosiphum rosae* was the most observed abundant species but *Amphorophora agathonic* was recorded the lowest abundant on this host plant. Only one aphid species was recorded on each of *Artemisia vulgaris* and *Achillea Arabica*, they are *Macrosiphoniella absinthii* and *Liapapphis erysimi* respectively; these species were noticed in high densities.

The obtained results on *Rosa* spp. were agreed with the finding of (Merhrparvar *et al.* 2009; Rezvani 2001; Blackman and Eastop 1984). For *Artemisia vulgaris*, one aphid species was identified and recorded, this species was *Macrosiphoniella absinthii*, this species was formed moderate density. On *Achillea Arabica*, there was only one recorded species with moderate abundant; this species was identified as *Liapapphis erysimi* (Kaygin *et al.* 2009) in Turkey, identified 28 aphid species belonging to 14 genus and 4 tribes of the super family Aphidoidea on 38 host ornamental plants. *Aphis affinis* was recorded on *Mentha* sp., *Aphis gossypii* recorded on *Hibiscus mutabilis* L., *Aphis nasturtii* (Kaltenbach 1843) was recorded on *Hibiscus esculantus*. It was shown that recorded aphid species mostly infected *Nerium oleander* by *Aphis nerii*. *Hyadaphis foeniculi* was recorded on *Petroselinum* sp. *Macrosiphum euphorbiae* and *Macrosiphum rosae* were recorded on *Rosa damascena* var *trigintipetala*, *Rubus fruticosus*, *Taraxacum officinale*, *Rosa canina*. *Myzus persicae* recorded on *Cyclamen* sp. (Halima 2013) in Tunisia identified *Aphis Eugenia* as a new record on *Hibiscus rosacinensi* and *Hibiscus mutabilis*, while he recorded *Aphis Eugenia* on *Hibiscus rosacinensis* and *Hibiscus mutabilis* but *Toxoptera aurantii* and *Myzus persicae* were identified only on *Hibiscus rosacinensis*. Our obtained results recorded no aphid infestation on *schefflera actinophylla*, while the same author recorded *Aphis spirecola* on this host ornamental plant, this last mentioned species also was found on *Bougainvillea* sp. beside *Macrosiphum euphorbiae*. *Aphis craccivora*, *Aphis gossypii* and *Aphis fabae* were recorded on *Tecoma smithi*. *Aphis*

fabae, *Macrosiphum rosae* and *Rodbium porosum* was recorded on *Rosa indica*, while *Pseudaphis abyssinicae* was identified on *Rosa* sp. This author also determined *Aphis fabae* on *Cestrum nocturnum*, *Cestrum parquii*, *S. nigrum*, while in our current study only on recorded species namely as *Myzus persicae* on *cestrum* sp. In India, (Rafi 2010) recorded *Aphis craccivora* on *Bougainvillea* sp., while in the current study, there were no aphid infestation on this ornamental plant. *Aphis fabae* was observed on *Cestrum nocturnum*, *Aphis gossypii* and *Macrosiphum roseiformis* were recorded *Hibiscus rosa-sinensis*. Our results were agreed with (Jalalizand *et al.* 2012) where they identified the collected aphid samples of *Rosae* in Iran according to morphological traits, these samples were belonged to species *Macrosiphum rosae*, *Aphis gossypii*, and *Metopolophium dirhodum*. (Labanowski 2008) in Poland recorded *Macrosiphum euphorbiae* and *Nectarosiphon ascalonicus* on *Schefflera arboricola*, while he identified *Aphis nerii* on *Nerium oleander*. (Peronti *et al.* 2002) also found *Aphis nerii* only on *Nerium oleander*, and *Macrosiphum rosae* has been found in Brazil only one species on *Rosaceae*. (Maicoshi 1993) in Riyadh, recorded *A. gossypii* and *M. euphorbia* on *Tecoma stans* and *Rosa* sp.; also *M. rosae* was demonstrated on *Rosa* sp. *Nerium oleander* was infested with *Aphis nerii*. *Brachynguis tamaricis* was observed on *Tamarix* sp. *Myzus persicae* was recorded on *Bougainvillea* sp., *Cestrum nocturnum*, *Hibiscus rosa-sinensis* and *Tegetes* sp.

As shown in (Table 1), eleven identified species were found on the eighteen ornamental plants during the investigated season 2015 /2016 at Taif governorate. Statistical analysis showed highly significant differences between aphid densities, where *Rosa damascene* var *semperflorens* and *Ocimum basilicum* were the most attractive hosts to the aphids. Morphological characters of eleven aphid species were showed and represented in figures (1,2,3,4,5,6,7,8,9,10,11).

The cultivation of pest resistant plant is one way to counter pests. In recent years, studies conducted in the field of production and use of crop varieties resistant to insects has helped to significantly increase food production in major agricultural areas. In most pests management programs the subject of plant resistance to insects and the subject of the host preference of pests are important. In most cases, insect resistant varieties decrease the physical ability and physiological status of insect pests, (Baldin *et al.* 2007). There are several factors that make resistant plants inappropriate host plant for pests, different parts of plant, the plant age, the hairy leaves, chemical substances effective for feeding in aphid populations, (Toscano *et al.* 2002; Snyder *et al.* 1998).

Host plant resistance to pests is ubiquitous but there exists a great deal of variation in the levels expressed by plants. The level of resistance will obviously depend on the specific morphological and biochemical defenses utilized by the plant, but ultimately the expression and stability of the resistance characters depend on the plant genotype, the pest genotype and the genetic interactions between the plant and the pest (Gallun & Khush 1980; Han *et al.* 1991 and Nosser 1996)

(Goławska *et al.* 2008) identified plant phenolics with insecticidal properties towards insects. They compared of control and infested by *Acyrtosiphon pisum* (Harris) vegetative parts of pea plants. In the pea plants six flavonol aglycones were identified: quercetin, kaempferol+RCO-, kaempferol, tricetin, apigenin+RCO-, and apigenin. In unfested plants relatively high concentration of total phenols, o-dihydroxyphenols and total flavonoids in comparison with control were observed. It suggests that phenolics have negative effect on insects and they are good for control of the insect pests.

Table (1): Determined Aphid species inhabiting some ornamental plants in Taif governorate, KSA during 2015 and 2016 seasons.

Host number	Host ornamental plants	Aphid species	Intensity of aphids	Significant litters
1	<i>Rosa damascena</i> var. <i>trigintipetala</i>	1. <i>Rhodobium porosum</i> 2. <i>Brachyunguis tamaricis</i> 3. <i>Acyrtosiphon pisum</i>	+ + +	(d)
2	<i>Tecoma stans</i>	1. <i>Brachyunguis tamaricis</i> 2. <i>Aphis compositae</i>	++ +++++	(b c)
3	<i>Bougainvillea</i> sp	-	-	(f)
4	<i>Nerium oleander</i>	-	-	(f)
5	<i>schefflera actinophylla</i>	-	-	(f)
6	<i>Rosa damascena</i>	1. <i>Rhodobium porosum</i>	+	(e)
7	<i>Jasminum grandiflorum</i>	<i>Myzus persicae</i>	++++	(c)
8	<i>Cestrum</i> sp.	<i>Myzus persicae</i>	+++++	(c)
9	<i>Hibiscus rosa-sinensis</i>	<i>Brachyunguis tamaricis</i>	+	(e)
10	<i>Tegetes marigold</i>	<i>Myzus persicae</i>	+++	(d)
11	<i>Ruta graveolens</i>	-	-	(f)
12	<i>Ocimum basilicum</i>	1. <i>Rhopalosiphum maidis</i> 2. <i>Aphis compositae</i> 3. <i>Macrosiphum avenae</i> 4. <i>Rhodobium porosum</i>	++ ++ ++ +	(ab)
13	<i>Plectranthus amboinicus</i>	<i>Macrosiphum avenae</i>	++++	(c)
14	<i>Petunia</i> sp.	<i>Brachynguis Tamaricis</i>	++	(e)
15	<i>Caesalpinia pulcherrima</i>	<i>Brachynguis Tamaricis</i>	+	(e)
16	<i>Rosa damascena</i> var <i>semperflorens.</i>	1. <i>Macrosiphum rosae</i> 2. <i>Macrosiphum avenae</i> 3. <i>Rhodobium porosum</i> 4. <i>Amphorophora agathonic</i>	+++++ ++ ++ +	(a)
17	<i>Artemisia vulgaris</i>	1. <i>Macrosiphoniella absinthii</i>	+++	(d)
18	<i>Achillea arabica</i>	<i>Liapapphis erysimi</i>	+++	(d)
F value				123.6
L.S.D				22.3

*(+ very weak, ++ weak, +++ moderate, ++++ high, +++++ very high)

*Means within a column for hosts followed by different letters are significantly different (P < 0.05; using Duncan's multiple range clarifying by LSD test).

Helmi and Rashwan 2015, showed significant differences between different plant species/cultivars and population density of aphids, whiteflies, leafhoppers and thrips and also with their associated predators. Photosynthetic pigments (Chlorophyll a, Chlorophyll b and Carotenoids) analysis showed negative relationship with sap sucking insect's infestation. Also different leaf biochemical components such as total phenol, total soluble sugars and total free amino acids revealed negative relationship with sap sucking insect's infestation, while total flavonoids analysis showed insignificant differences. (Kamel and Gengaihi 2009) cited that total flavonoids group that is considered as a secondary plant metabolite had no biological activity either as anti-feedant or as repellent to different cucumber sap sucking insects. (Leite *et al.* 2006) demonstrated that plant chemical composition, levels of nitrogen and potassium beside density and structure of leaf trichomes can affect on intensity of pest attack.

So, resistant hosts and varieties could be utilized as affected factor in the integrated pest management programs, (Han *et al.* 1991; Nossner 1996).

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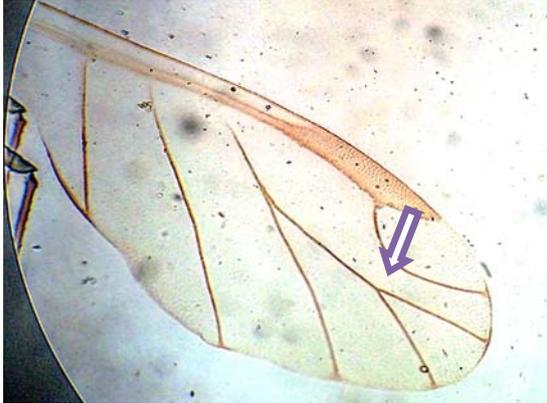
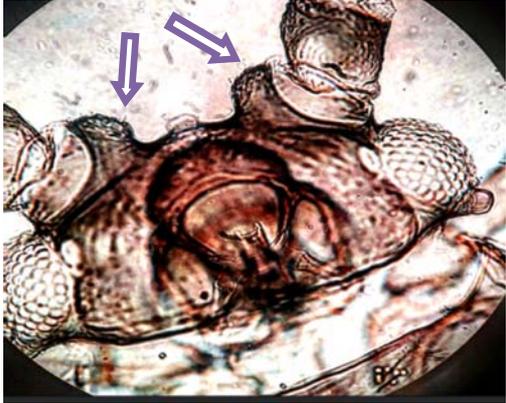
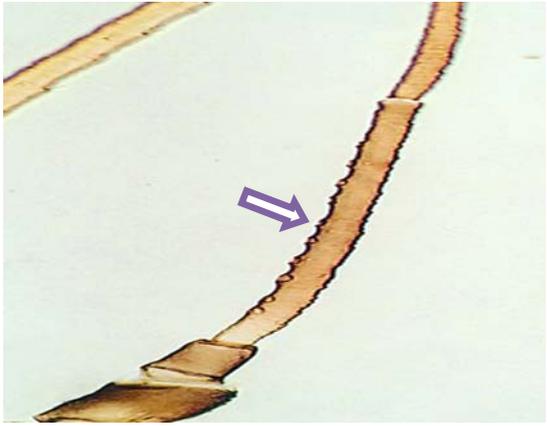
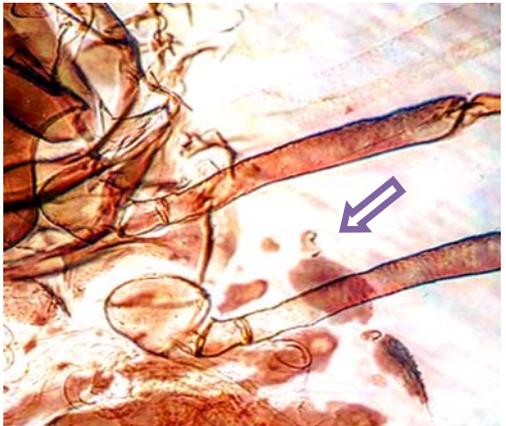
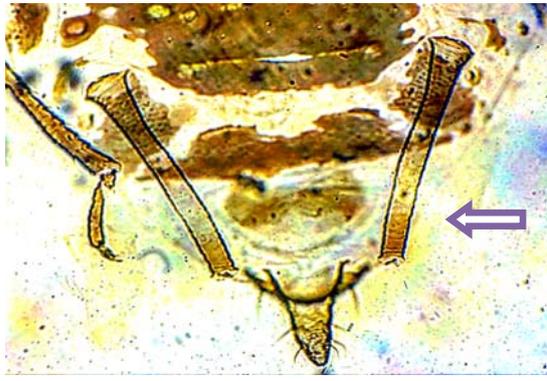
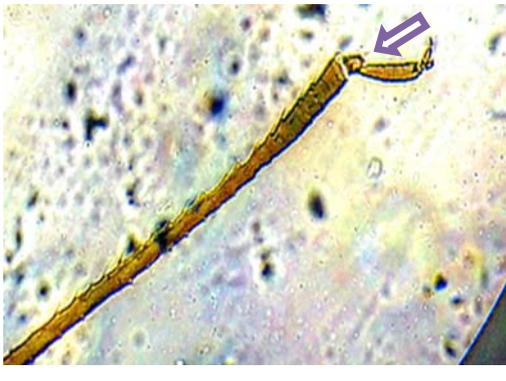
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles well develop (Converging)</p>
	
<p>Secondary rhinaria confined on 3rd antennal segment</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (Lateral abdominal tubercles Absent)</p>
	
<p>Cauda elongate and Siphunculi swollen at tip</p>	<p>1st tarsal segment with 2 hairs</p>

Fig (1): Morphological Characters of *Myzus persicae*

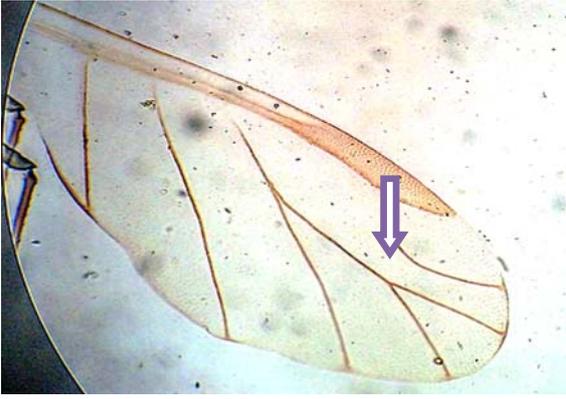
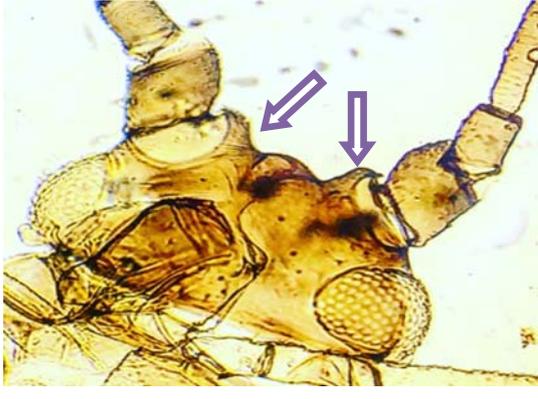
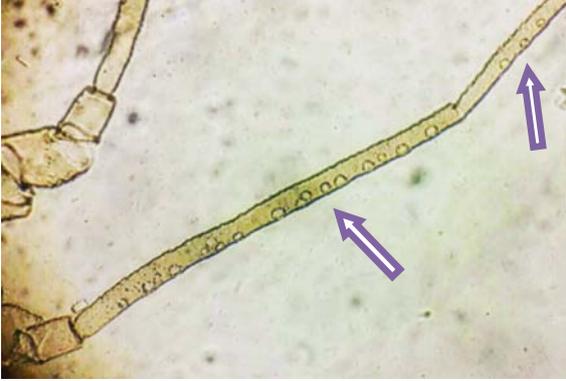
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not well develop</p>
	
<p>Secondary rhinaria confined on 3rd and 4th antennal segments</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda elongate and Siphunculi elongate</p>	<p>Apical rostral segment blunt</p>

Fig (2): Morphological Characters of *Rhodobium porosum*

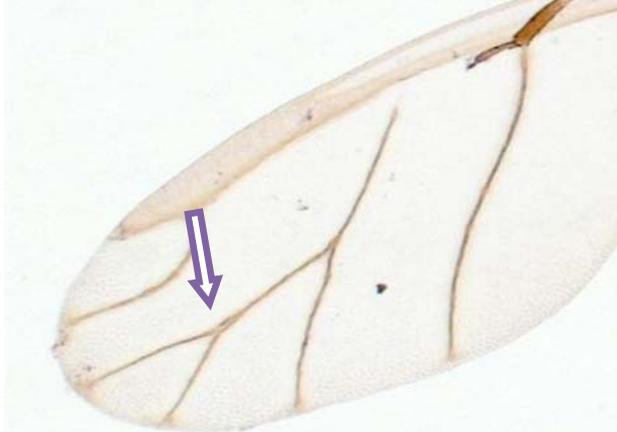
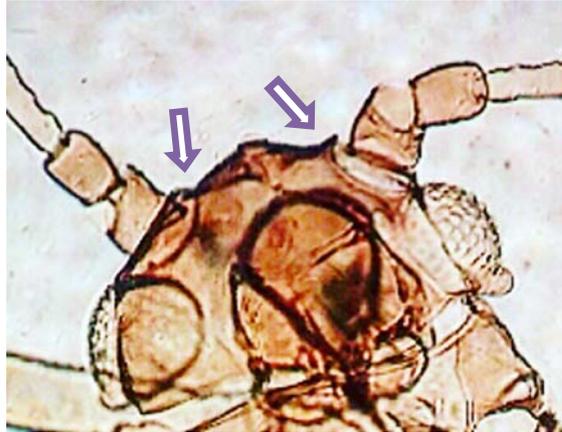
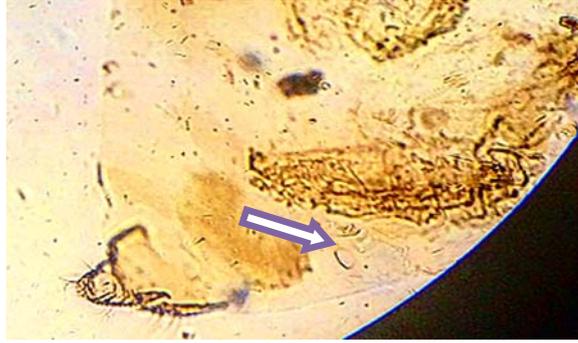
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not well develop</p>
	
<p>Unguis is very short and slightly more than half the length of the base</p>	<p>Spiracles of 1st and 2nd abdominal segments are far apart (L.A.T. present)</p>
	
<p>Cauda short and Siphunculi short</p>	<p>L.A.T. are placed posterior and slightly outer to spiracles of the 7th segment</p>

Fig (3): Morphological Characters of *Brachyunguis tamaricis*.

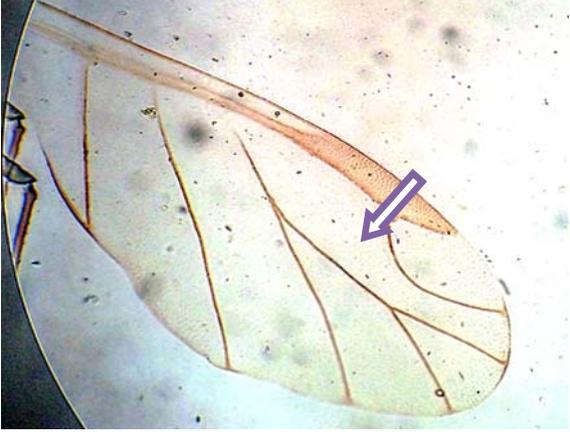
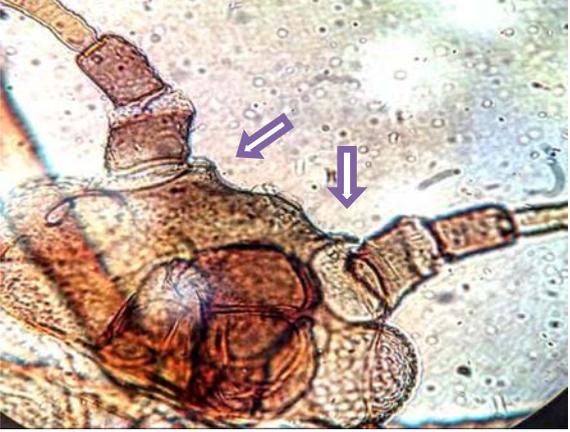
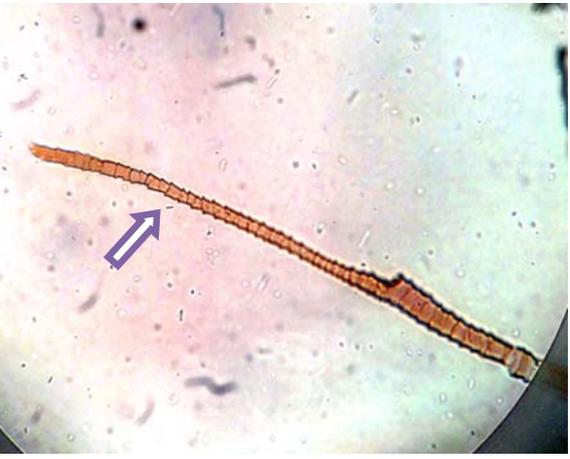
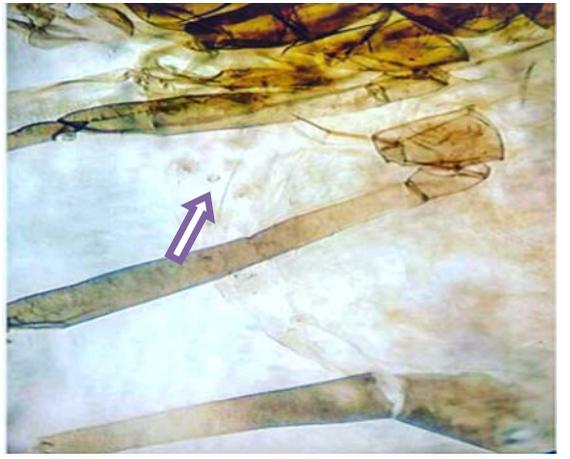
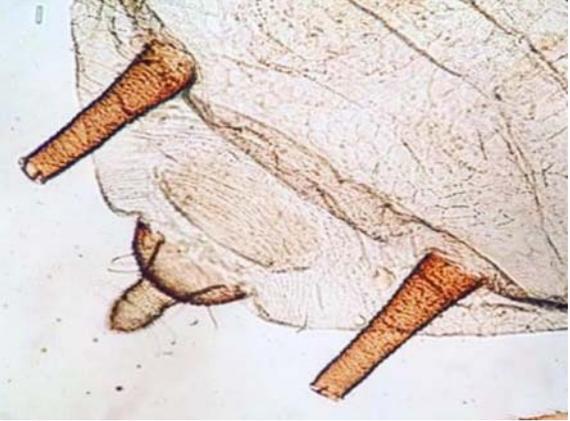
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not well develop</p>
	
<p>Unguis about longer than 3 times as long as the basal part.</p>	<p>Spiracles of 1st and 2nd abdominal segments are far apart (L.A.T. present)</p>
	
<p>Cauda elongate and Siphunculi elongate and shorter in length than 3rd antennal segment</p>	<p>Apical rostral segment blunt</p>

Fig (4): Morphological Characters of *Aphis compositae*.

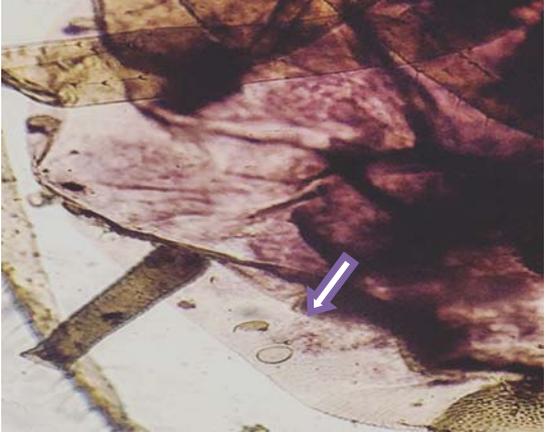
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not well develop</p>
	
<p>Unguis about three times as long as the basal part</p>	<p>L.A.T. are placed posterior and slightly inner to spiracle</p>
	
<p>Cauda and Siphunculi elongate, post siphuncular sclerite present</p>	<p>Apical rostral segment blunt and shorter than 2nd hind tarsal segment</p>

Fig (5): Morphological Characters of *Rhopalosiphum maidis*

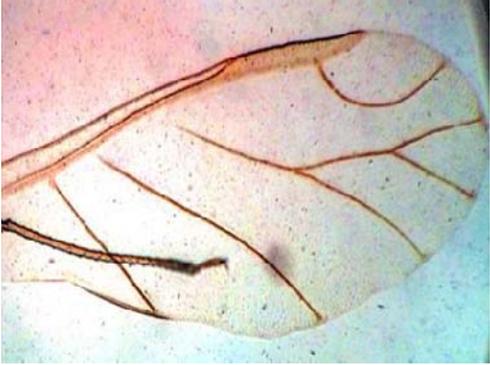
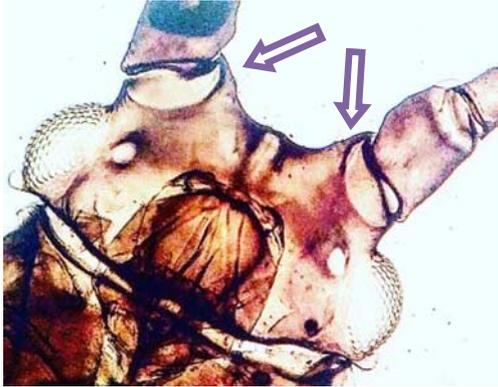
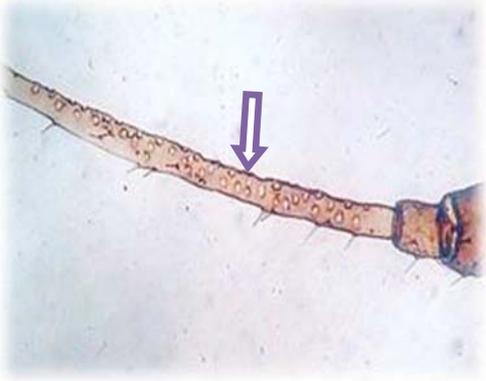
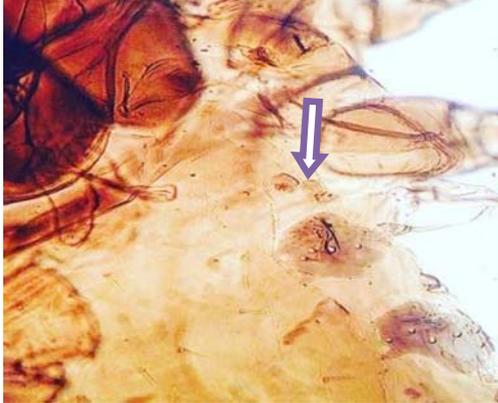
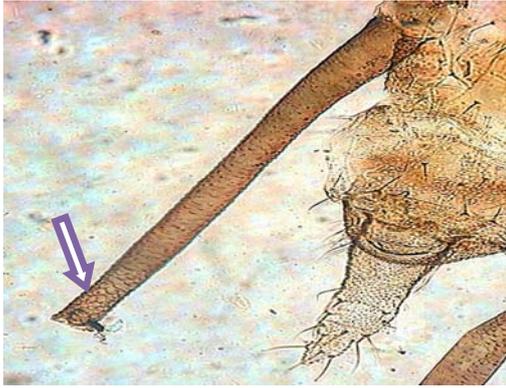
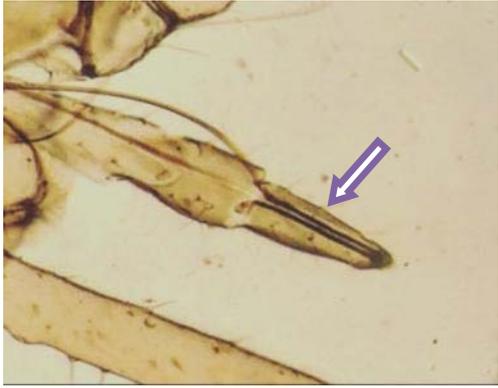
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles well developed (diverging)</p>
	
<p>Secondary rhinaria on 3rd antennal segment more than 20. 6th antennal s. as long as siphunculus</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda elongate and Siphunculi elongate with reticulated apex</p>	<p>Apical rostral segment blunt</p>

Fig (6): Morphological Characters of *Macrosiphum rosae*

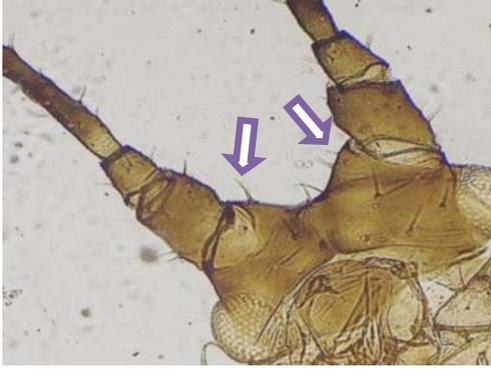
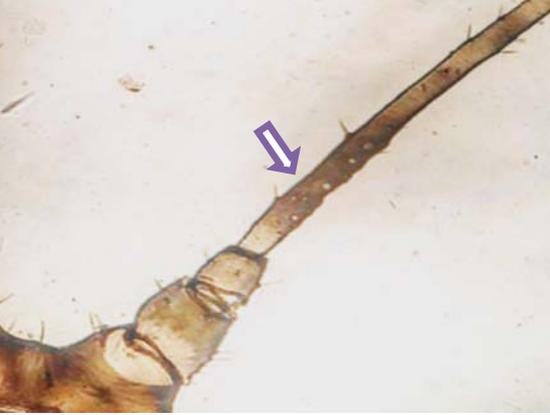
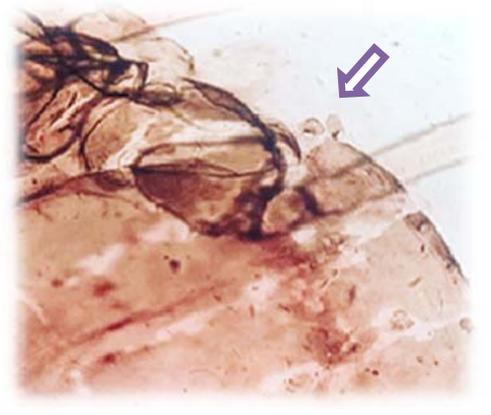
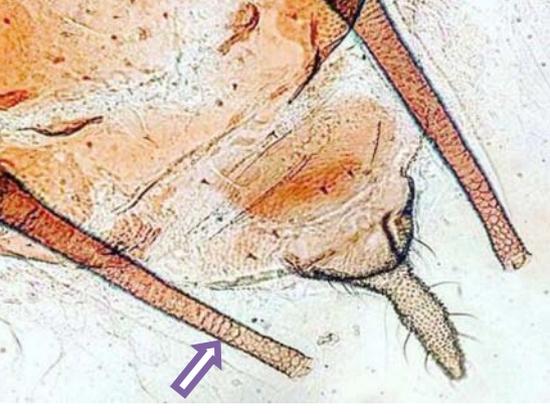
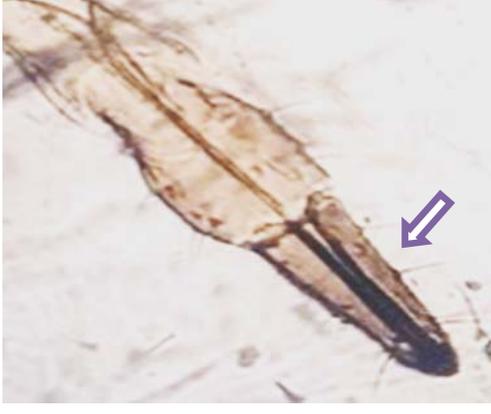
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles well develop (Diverging)</p>
	
<p>Secondary rhinaria on 3rd antennal segment less than 15. 6th antennal s. more than twice as long as siphunculus</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda elongate and Siphuncula elongate with reticulated apex</p>	<p>Apical rostral segment blunt</p>

Fig (7): Morphological Characters of *Macrosiphum avenae*

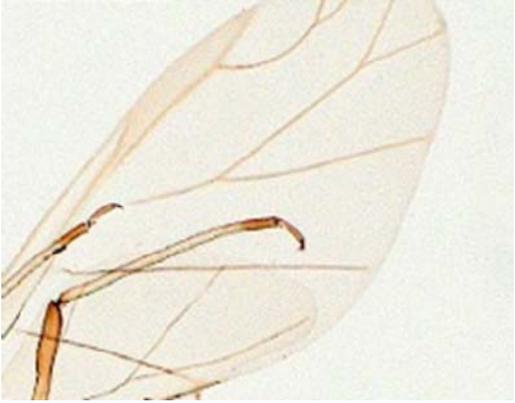
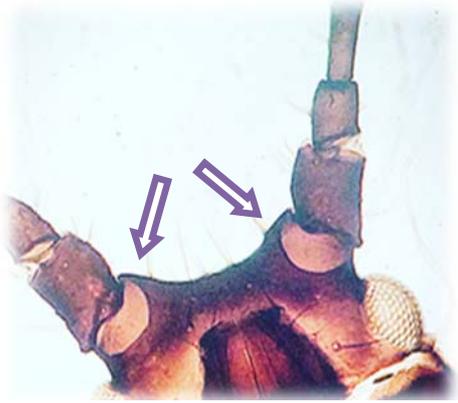
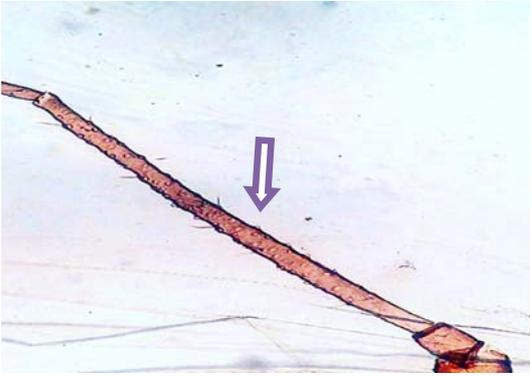
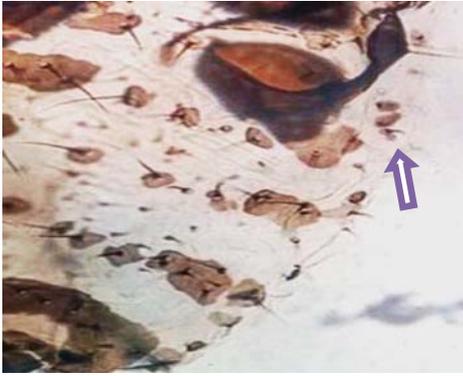
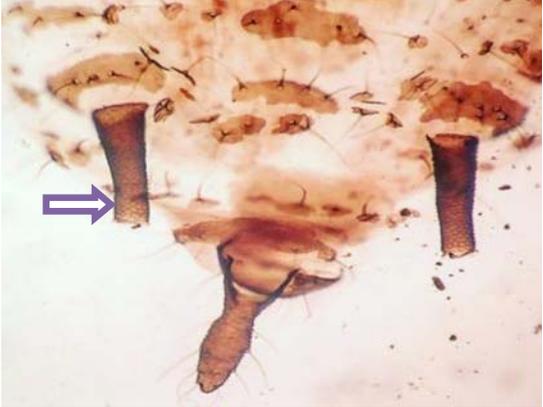
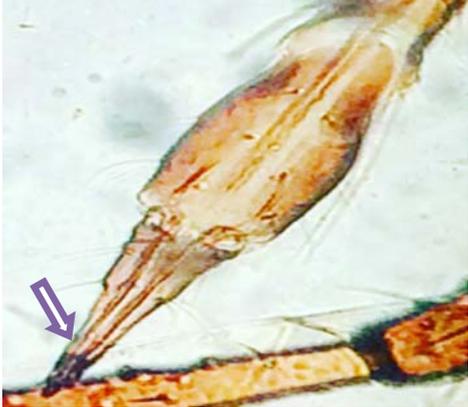
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles little developed and diverging</p>
	
<p>3rd antennal segment with high number of rhinaria (less than 100)</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Reticulated part of siphunculi about half the whole length</p>	<p>Apical rostral segment stiletto-shaped</p>

Fig (8) Morphological Characters of *Macrosiphoniella absinthii*

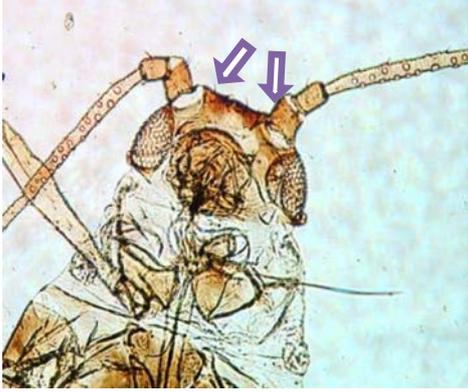
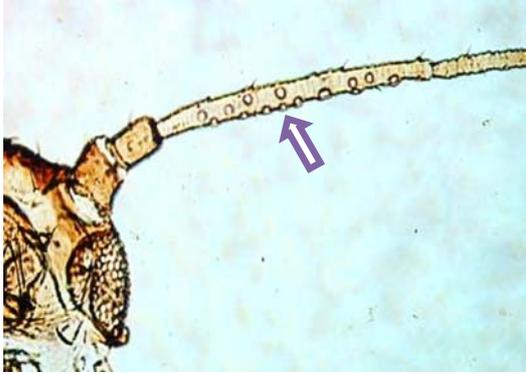
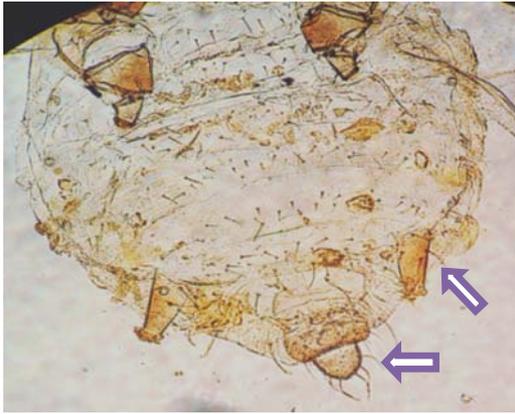
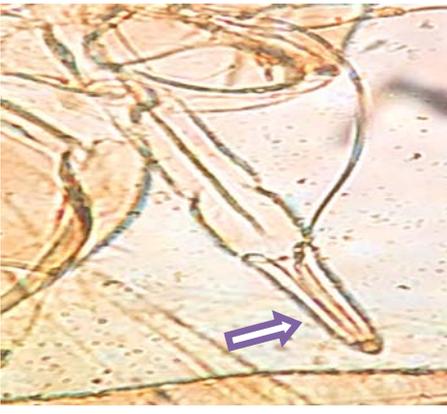
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not develop</p>
	
<p>Rhinaria confined only on 3rd antennal segment</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda short and Siphunculi short</p>	<p>Apical rostral segment acute</p>

Fig (9): Morphological Characters of *Lipaphis erysimi*

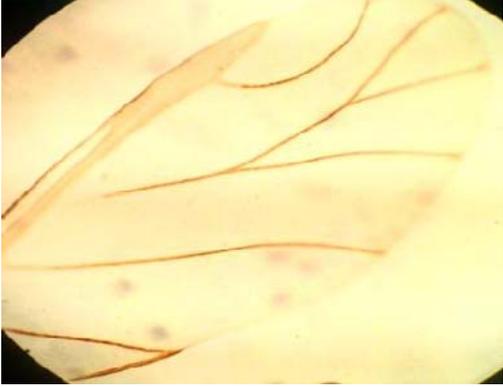
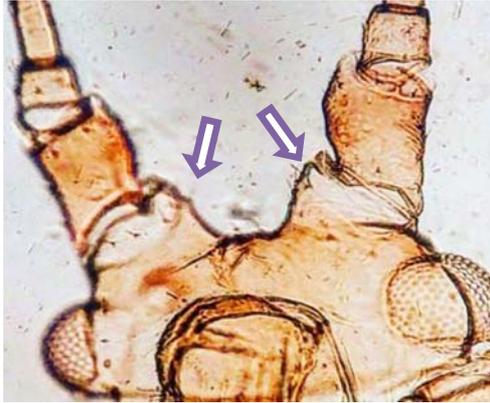
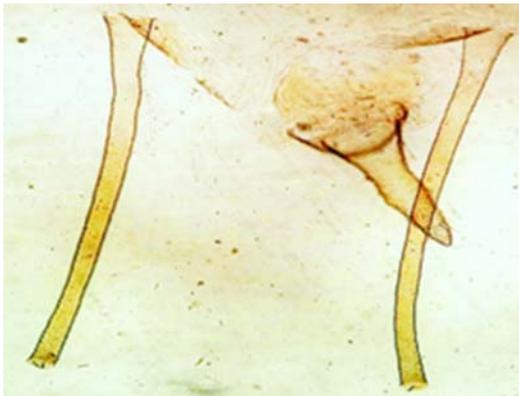
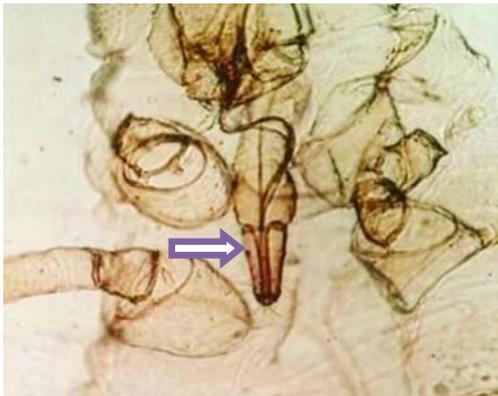
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles well develop (diverging)</p>
	
<p>Secondary rhinaria confined on 3rd antennal segment only</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda elongate and Siphunculi long</p>	<p>Apical rostral segment blunt</p>

Fig (10): Morphological Characters of *Acyrtosiphon pisum*

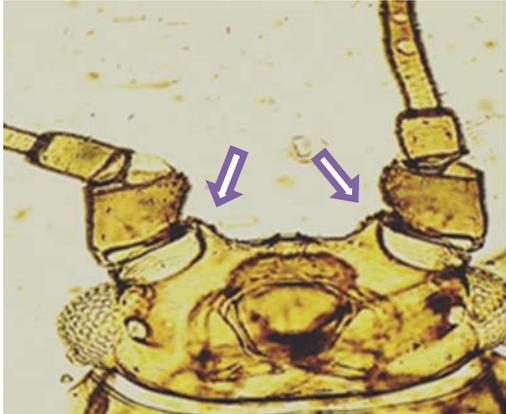
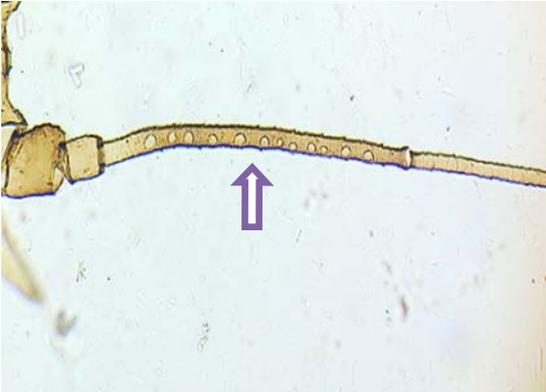
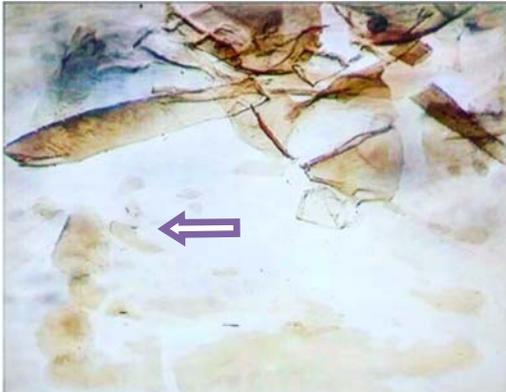
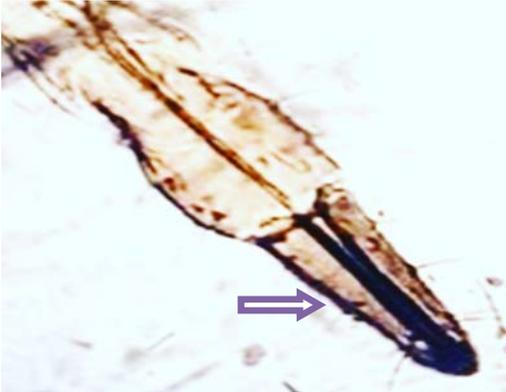
	
<p>Media of fore wings twice branched</p>	<p>Frontal tubercles not well develop</p>
	
<p>Secondary rhinaria confined on 3rd antennal segment only</p>	<p>Spiracles of 1st and 2nd abdominal segments are closed together (L.A.T. Absent)</p>
	
<p>Cauda elongate and Siphunculi swollen</p>	<p>Apical rostral segment blunt</p>

Fig (11): Morphological Characters of *Amphorophora agathonic*

ARABIC SUMMERY

التعريف المورفولوجي لحشرات المن التي تصيب بعض نباتات الزينة في محافظة الطائف

رانيا صلاح رشوان¹ و أكرم صالح الغامدي² و سهام سفر الثقفي²

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تم حصر وتعريف انواع المن على 18 عائل نباتي من نباتات الزينة المختلفة في محافظة الطائف في المملكة العربية السعودية خلال موسم 2016/2015. وسجل 11 نوع من حشرات المن على 14 عائل نباتي فقط من نباتات الزينة. وأوضحت النتائج أنه تم تسجيل

ثلاثة أنواع من حشرات المن على نبات الورد الطائفي وهما *Rhodobium porosum* نوعين أيضاً من حشرات المن هما *Brachyunguis tamaricis* و *Acythosiphon pisum* وكان النوع الثاني هو الأكثر تواجداً. وتم تسجيل نوع واحد فقط من حشرات المن على نبات الورد الجوري وهو *Rhodobium porosum*. كما سجل أيضاً نوع واحد فقط من المن على نبات الياسمين و ملكة الليل والقטיפفة وهو *Myzus persicae* وسجل أعلى تعداد له على نبات ملكة الليل واقلهم على نبات القטיפفة. أما على نبات الهيبسكس فقد تم تسجيل النوع *Brachyunguis tamaricis*، ولوحظ انه كان ضعيف التعداد. أما النباتات التي لم يلاحظ تسجيل إصابات عليها طوال موسم الدراسة هي نبات الجهنمية والدفلة والشفليرا والشذب. أما أنواع المن التي تم تسجيلها على نبات الريحان هي *Rhopalosiphum maidis* و *Aphis compositae* و *Macrosiphum. avenae* و *Rhodobium. porosum* ، وسجل الأخير أقل تعداد. كما تم تسجيل النوع *Macrosiphum avenae* على نبات الشارة. أما النوع *B. tamaricis* هو النوع الوحيد الذي تم تسجيله على نبات البيتونيا والسيزالبينا. تم تسجيل اربعة انواع مختلفة من حشرات المن على نبات ورد السلطان وهم *Rhodobium. porosum. Macrosiphum avenae Macrosiphum rosae* و *Amphorophora agathonica* و كان النوع *Macrosiphum rosae* هو الأكثر شيوعاً على هذا النبات.

وقد تم تسجيل نوع واحد من حشرات المن على نبات الارتميسيا *Macrosiphoniella. absinthii*، اما نبات الاشيليا فقد تم تسجيل النوع *Liapapphis erysimi* عليه بتعداد متوسط.