

THRIPS INFESTING TEMPERATE FRUIT FLOWERS*

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SUMMARY

The composition and the distribution of thrips species infesting temperate fruit flowers in Antalya in the years 1988 and 1989 were studied. The most abundant, frequent and diversified species were *Taeniothrips meridionalis*, *Ta. inconsequens* and *Haplothrips reuteri*, and constituted 82.8 % of the thrips population collectively in fruit flowers in plateaus which have a continental climate. In coastal areas with a mediterranean climate the most abundant, frequent and diversified species was *Thrips major* and constituted 63.3 % of the thrips population. Ecological status and pest potential of some species is discussed so far the data at hand permitted.

INTRODUCTION

Some thrips species infest flowers of temperate fruit trees. Injuries like suberisations on epidermis and deformation^s of fruit^s have been reported as a result of thrips association with fruit flowers. Thrips damage to fruits is caused by adult feeding, egg deposition and subsequent larval feeding in flowers and newly formed fruits.

Several species of thrips are responsible for fruit damage in different parts of the world. *Taeniothrips inconsequens* Uzel infestations in buds, leaves and flowers of pears and prunes (also other fruits but less) caused heavy damage in California (Foster and Jones, 1911 and 1915; Bailey, 1938 and 1944). The other fruit flower infesting and injurious thrips species were *Frankliniella occidentalis* (Perg.), *F. moultoni* Hood and *F. minuta* Moulton in California (Bailey, 1944). Bournier (1975) reported five species of thrips causing damage to temperate fruits due to infestations at blooming stage in France, namely, *Taeniothrips meridionalis* Priesner, *Ta. inconsequens*, *Thrips minutissimus* Linne, *Thrips flavus* Schrank and *Frankliniella intonsa* Trybom.

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With the exception of *Frankliniella* species in California all other species mentioned above exist in Turkey.

The objective of the present study was to ascertain the composition, the distribution and the position as potential fruit pests of fruit flower infesting thrips in Antalya.

CHARACTERISTICS OF FRUIT GROWING AREAS

Temperate fruits are grown in two ecologically different areas in Antalya, plateaus and coastal plains. Main fruit growing areas of plateaus are in Korkuteli and Elmalı counties. The altitude of these areas varies between 800-1250 m and are isolated by high Taurus mountains from the Mediterranean Sea and have a distance of about 50-70 km to the coast. A typical continental climate exists in plateaus. Fruit and cereal production is practiced mainly and commercial orchards of apple, pear, peach and cherries prevail.

The areas of interest in coastal plains belong to Gazipaşa, Manavgat, Serik, Kumluca and central counties, and have altitudes of about sea level. Coastal plains enjoy a typical mediterranean climate. Mainly citrus, cotton banana and under cover vegetable growing is practiced but cereal production areas also are considerably large. As to temperate fruits only peach and to a very little extend apricot are grown commercially as early season fruits. Other fruit species exist either as wild plants or as single or dooryard plantings.

MATERIAL and METHOD

Samples were taken in spring time that is February-April in coastal areas and March-May in plateaus in the years 1988 and 1989. Thrips were collected by shaking blossoms on a white tray and a sample mostly consisted of specimens obtained after shaking blossoms on several branches of the same tree and branches of several trees.

RESULTS and DISCUSSION

Composition of Thrips Species

Plateaus

The total number of thrips in plateaus was 15 (Table 1).

Table 1. Thrips species infested temperate fruit flowers in plateaus of Antalya in 1988 and 1989 with their number in samples from each fruit species and the number of the samples they were present (frequency).

Fruit Species	No of Samples	AEOLOTHRIPIDAE										THRIPIDAE					PHLAEOTHRIPIDAE	
		A. collaris	A. tortuosus	A. intermedius	C. pallidivertis	F. intonsus	O. jugos	P. albicornis	Ta. atratus	Ta. inconsequens	Ta. meridionalis	Th. major	Th. minutissimus	Th. tabaci	Th. trichamel	H. reuteri		
Apple	6	-	-	3(2) ¹	1	2(2)	-	-	8(2)	49(18)	-	-	6(5)	-	-	22		
Pear	6	-	-	-	2(2)	5(3)	-	-	11(4)	41(5)	-	-	2(2)	-	-	11(4)		
Quince	3	-	-	-	-	-	-	-	5(2)	8(3)	-	-	-	-	-	7(2)		
Plum	7	-	2(2)	-	-	1	-	5(1)	32(5)	8(3)	-	-	2(2)	-	-	-		
Peach	5	-	-	2(1)	3(2)	-	-	-	8(4)	17(4)	-	-	-	-	-	-		
Almond	4	-	-	-	-	1	-	-	4(1)	2(2)	-	-	3(2)	-	-	12(3)		
Cherry	3	1	1	-	-	-	-	-	14(3)	12(3)	-	-	1	-	-	-		
Sour cherry	3	-	-	-	1	1	-	-	2(1)	17(2)	-	-	1	-	-	2(1)		
Total	1	5(5)	5(3)	7(6)	10(8)	2(2)	6(2)	1(1)	84(23)	154(30)	1	6(5)	16(14)	1	-	54(17)		
Samples	39																	
Individuals	353																	

¹ : Figures in parenthesis show the frequency.

Table 2. Thrips species infested temperate fruit flowers in coastal plains of Antalya in 1969 and 1980 with their numbers in samples from such fruit species and the number of the samples they were present (frequency)

Fruit Species	No of Samples	AEOLOTHRIPIDAE										THRIPIDAE				PHILAEOTHRIPIDAE	
		A.collaris	A.gloriosus	M.fuscus	F.intonus	L.cerecallum	O.sajoo	Ta.annulatus	Ta.inconsequens	Ta.meridionalis	Th.major	Th.minusculissimus	Th.tabaci	H.andreae	H.andreae		
Wild apple	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1
Wild pear	6	2(2) ¹	4(3)	-	1	-	2(1)	-	3(3)	5(3)	16(4)	7(3)	-	-	-	-	-
Quince	1	-	-	-	-	-	-	-	-	-	6(1)	-	-	-	-	-	-
Almond	7	1	-	-	-	1	1	-	-	11(2)	21(7)	-	-	-	-	7(2)	1
Peach	7	3(2)	-	2(2)	7(2)	-	-	-	1	3(3)	18(6)	-	-	-	-	4(2)	-
Apricot	4	-	-	-	1	-	-	-	1	-	16(4)	-	-	-	-	-	-
Plum	3	-	4(1)	1	4(1)	-	1	-	1	3(3)	20(3)	5(3)	-	-	-	-	-
Sour cherry	1	-	-	-	-	-	-	-	-	-	7(1)	-	-	-	-	-	-
Total	30	6(5)	8(4)	3(2)	12(5)	1	5(4)	1	6(6)	22(11)	104(26)	12(6)	-	-	-	13(6)	2(2)
Samples	30																
Individuals	195																

¹ : Same as in table 1

The most abundant, frequent and diversified species was *Ta.meridionalis* followed by *Ta.inconsequens* and *Haplothrips reuteri* (Karny). These species constituted 43.7 %, 23.8 % and 15.3 % of the population (collectively 82.8) and were present in 76.9 %, 58.9 % and 43.5 % of the samples respectively.

The other species which were present at least in 10 % of samples were *Thrips tabaci* Lindeman, *F.intonsa*, *Ceratothrips pallidivestis* (Priesner), *Aeolothrips gloriosus* Bagnall and *Th.minutissimus*.

Aeolothrips collaris Priesner, *Aeolothrips intermedius* Bagnall, *Oxythrips ajugae* Uzel, *Physothrips albidicornis* Knechtel, *Taeniothrips atratus* (Haliday), *Thrips major* Uzel and *Thrips trehernei* Priesner are rated as rare species.

Ta.meridionalis dominated the thrips population in majority of fruits, however *Ta.inconsequens* and *H.reuteri* dominated in plums and almonds, and cherries respectively so far samples revealed.

As to diversity, *Ta.meridionalis* and *Ta.inconsequens* were present in flowers of all fruit species. *H.reuteri* diversified less than *Th.tabaci* which is a less abundant and less frequent species.

Coastal Plains

The number of thrips species was 13 in plains. *Th.major* was the most abundant, frequent and diversified species in this part. It constituted 63.3 % of the population and existed in 89.6 % of samples. The second most abundant, frequent and diversified species was *Ta.meridionalis* but with a significant difference from the first. This species constituted 11.5 % of the population and existed in 37.9 % of the samples. *Th.tabaci*, *Th.minutissimus*, *F.intonsa*, *A.collaris*, *A.gloriosus*, *O.ajugae* and *Ta.inconsequens* were represented in 13.3-20.0 % of samples.

Melanthrips fuscus Sulzer, *Limothrips cereallium* Haliday, *Taeniothrips annulatus* Karny and *Haplothrips andresi* Priesner were extremely rare species.

Th.major existed and dominated the population in almost all species of fruits. Although it was more abundant and frequent, *Ta.meridionalis* diversified equally with *Th.tabaci*.

Comparison of Thrips Compositions

One of the major differences in thrips composition of plateaus and coastal plains exists in the dominating species. *Ta.meridionalis*, *Ta.inconsequens* and *H.reuteri* which are the dominating species on different fruits in plateaus also occur in coastal plains but not at the same level. First two diminished in abundance, frequency and diversity but the third never was encountered on fruit flowers although was detected on other plants in very few numbers in coastal areas. *Ta.meridionalis* is a species that disappears in summer months (from June to October) but exists in winter and spring months in coastal plains. Although it is known to inhabit on a very wide range of plant species (including herbs) is never encountered in considerable numbers in coastal areas.

However *Ta.inconsequens* was extremely abundant in flowers of *Arbutus andrachne*, a forest tree which densely populated forests in higher elevations up to 600 m in the coast.

Th.major likewise *Ta.meridionalis* disappear in summer months (June-September) and reappear in October in coastal areas. It dominates the thrips population in almost all trees and shrubs flowering between October and April. Therefore it is not difficult to explain its domination in flowers of fruit trees. But its extreme scarcity during the flowering period in plateaus indicates its asynchrony with the phenology of fruit trees since it becomes relatively more frequent afterwards in foliage of fruit trees but never so abundant and frequent as in coastal areas.

In plateaus a relatively frequent species, *C.pallidivestis* was missing in the samples from coastal areas where it exists on other plants and does not coincide with the flowering period of temperate fruits. However its position in fruit trees is of no importance since it is known to inhabit mainly in flowers of Compositae.

Th.tabaci, *F.intonsa* and *Th.minutissimus* were present in frequencies that might indicate a consistent association between them and fruit flowers in both areas of Antalya.

Position of Thrips as Potential Fruit Pests

The population levels of thrips that cause injury to fruits is not known. Foster and Jones (1915) stated that the number of the hibernating larva of *Ta.inconsequens* per square foot of the soil in orchards varied between 120-1725 in California where it was a serious pest. Bailey (1944) reported that up to 1200 *Ta.inconsequens* adults have emerged from a square yard soil under the drip of trees. But they did not mention the number of thrips in flowers of fruits. However Bailey (1944) gave figures like 50 *Ta.inconsequens* adults per bud and 8-10 often shaken from individual prune bud clusters.

Highest number of *Ta.inconsequens* in one sample was 20 and was taken from plum in the area studied. The highest number of *Ta.meridionalis* was 17 from pear. For mixed populations the highest number of thrips in one sample did not exceed 21. As it is understood from the statements in the material and method one sample involves hundreds of flowers in this study. When the number of thrips per individual flower is considered it can be speculated that thrips infestation was not in considerable levels in Antalya. However higher population levels might be attained in some spots or trees that might be overlooked during the study.

Nevertheless this study showed that species having highest potential as fruit pest is *Ta.meridionalis* in plateaus and *Th.major* in coastal areas in Antalya.

ÖZET

ILIMAN MEYVE ÇİÇEKLERİNE ARIZ OLAN THRİPSLER

Ilıman meyve çiçeklerine âriz olan bazı thrips türleri, erginlerin çiçeklerde beslenmesi ve yumurtlaması, daha sonra çıkan larvaların çiçek ve yeni oluşan meyvelerde beslenmesi sonucu meyve epidermisinde mantarlaşma ve meyve deformasyonuna yol açmaktadır. Burada 1988 ve 1989 yıllarında Antalya'nın yayla (Elmalı, Korkuteli) ve sahil kesimlerinde (Gazipaşa, Manavgat, Serik, Merkez, Kumluca, Finike) ılıman meyve çiçeklerine âriz olan thrips türlerine ilişkin çalışmalara yer verilmektedir. Buna göre yaylada meyve çiçeklerinde tespit edilen 15 türden en kalabalık, yaygın ve konukçu çeşitliliğine sahip olanlar sırasıyla *Taeniothrips meridionalis*, *Ta.inconsequens* ve *Haplothrips reuteri*'dir (Çizelge 1). Bu türler sırasıyla populasyonun % 43.7, % 23.8 ve % 15.3'ünü oluşturmuş ve toplanan örneklerin % 76.9, % 58.9 ve % 43.5'ünde mevcut olmuşlardır. Ilıman meyve olarak turfanda şeftali ve çok az miktarda kayısı yetiştiriciliği yapılan ve 13 türün

tespit edildiği sahilde ise bu özellikleri taşıyan tür *Thrips major*'dur. Thrips popülasyonunun % 63.3'ünü oluşturmuş ve toplanan örneklerin % 89.6'sında yer almıştır (Çizelge 2).

Yukarıdaki parametreler bakımından ele alındığında yayla ekolojik şartlarının ilk üç türe, sahil ekolojisinin de son türe daha uygun olduğu sonucuna varılabilir.

Thripslerin meyvelerde zarara yolaçan çiçek dönemi yoğunluklarına ilişkin sağlıklı bilgiler bulunmamaktadır. Bu bakımdan bu çalışma ile tespit edilen thrips yoğunluklarının meyvelerde zarara yolaçıp açmayacaklarını kestirmek güçtür. Ancak küçük spotlar veya ağaçlarda ulaşılacak ve değerlendirilememiş yüksek yoğunluklar hariç tespit edilen yoğunluklar önemli görülmez.

Antalya'da ılıman meyvelerde zararlı olma potansiyeline en fazla sahip türler yaylada *Ta.meridionalis*, sahilde ise *Th.major*'dur.

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