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First Report with Some Ecological Obervations of the Giant Brown Bark Aphis *Pterochloroid persicae* (Cholodkovsky) on Stone Fruit Trees in Abha, Assir Region, Southwestern Saudi Arabia

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Abstract. The population and distribution of *Pterochloroides persicae* (Cholodkovsky) were studied under field conditions on young and old peach, plum and apricot trees in Abha from June 1993 to May 1994. Aphids were first detected in mid-June, reached their peak numbers in August, and disappeared in October. Infestations started at the field perimeter, and then moved inside. Aphids first appeared on lower branches, and then moved up to cover the whole tree. Old peach trees were most susceptible. Young plum and old apricot trees were not infested.

Introduction

P. persicae is considered to be one of the most widely distributed and economically important aphid attacking stone fruit trees. It was found in Asia [1-4], in Europe [1, 5-11] and North Africa [12,13]. The aphid was also reported from apple, pear and cherry [4,5,7] and also collected from *citrus* trees [14].

No work on *P. persicae* has been carried out in Saudi Arabia. Therefore, the present work is aimed to study the appearance, spread and population build up of this aphid and factors affecting them under field conditions. We hope this work will lead to recognition of the magnitude and dangerousness of this pest. This may stimulate further study and gives the orchard owners certain information to take measures against it.

Materials and Methods

Biological and ecological observations were conducted under natural field conditions. The study area constituted an orchard in south Abha near the College of Education. This orchard contains about two hundred fruit trees of mainly plums, apricot, and peach with a few almond, apple, fig and pomegranate trees.

The distribution of the aphids within the field and within the infested trees were observed from June 1993 to May 1994. The field was visited twice a week from June to October and then once a week.

Number of colonies per plant, length of colony and density of aphids per 20 cm. were estimated using Way method [15]. Three yound and three old of plum, peach and apricot trees were selected randomly. Trees within 2 m. high and not fruiting were considered as young trees; whereas, trees within 4m. high and fruiting were considered as old trees. Accurate in situ counts of the aphid population were carried out. The average number of aphids per tree adequately describes the population [15]. Here the length and width of each aphid colony along a branch were measured using a meter and hence its area determined. The number of aphids in random 20 cm^2 areas were carefully counted with the help of a hand lens. Then the total number of the aphids in a colony was obtained by multiplying the average number of aphids in each 20 cm^2 area by the total area of the aphid colony after it being divided by 20. Counting included adults and nymphs and in all counts the means were separated.

Sample of *P. persicae* was sent to Natural History, British Museum for confirmation of the identification.

Results

The aphid distribution within the field and within tree were clearfully observed. Old and young peach, old plum, young apricot and old almond trees were infested in the field. Young plum, apple, fig, old apricot and pomegranate trees were never infested. Aphids were first detected on old peach and plum trees at the edge of the orchard in mid June. Later, aphids moved to trees in the center. Infestation occurred on the lower surface bark of thick horizontal branches. In the beginning of the season, aphids infested the lower branches, at most 1 m from the ground level. Aphids then moved up to cover the middle zone of the tree. In August, plants became almost completely infested with aphids.

The population density of *P. persicae* is shown in the following Table. Aphids were first detected on old peach and old plum trees in mid-June. At that time, number of colonies per plant and number of aphids per colony were low. Aphid population increased in late June, reached peak in August. Young peach trees were first infested in July with low level of infestation, compared with old ones. Young apricot trees were first infested in July with very low level of infestations. Aphid populations disappeared totally in late October.

Reproduction in *P. persicae* was by parthenogenesis. Few alate viviparae were observed. No sexual morphs, oviparous females or males, were observed throughout the season. The aphid population on trees produced large quantities of hony-dew that turned the branches underneath black, possibly because of the growth of sooty mould fungi. The colonies of *P. persicae* were free from associations with other aphids and no predators were observed.

Table. Estimation of the population of *P. persicae* on peach, plum and apricot from June-October, 1993 in Abha

Plant	Month	No. of colonies per plant	Length of colony (cm)	Density No. of aphids per sq. cm	Total area infested/plant $(cm)^2$	Total no. of aphids per plant
	June	–	–	–	–	–
Young	July	2	50-60	6.80 ± 2.81	154	1047.2
peach	Aug.	13	60-160	6.90 ± 2.78	420	2898
	Sep.		*Diffuse			u.c.
	Oct.	–	–	–	–	–
	June	2	5-15	3.57 ± 1.46	25.2	90.00
Old	July	17	30-160	5.42 ± 1.78	1310	7100
peach	Aug.	*Diffuse	u.c.			u.c.
	Sep	*Diffuse				u.c.
	Oct.	1	58	3.18 ± 0.94	75.4	240
	June	2	4-30	1.47 ± 0.44	54.4	80
Old	July	21	5-150	6.56 ± 2.15	278.3	1825.6
plum	Aug.	*Diffuse				u.c.
	Sep.	*Diffuse				u.c.
	Oct.	–	–	–	–	–
	June	–	–	–	–	–
Young	July	2	3-5	1.66 ± 0.11	12	20
apricot	Aug.	2	5-20	2.90 ± 0.10	27.5	80
	Sep.	–	–	–	–	–
	Oct.	–	–	–	–	–

Note: *Diffuse: the colonies overlapped and became unseparable.
u.c.: uncountable.

Discussion

There were no former records of an attack by *P. persicae* in the southwestern region of Saudi Arabia. During the past three years complaints of attacks to stone fruit trees by this aphid began to arrive to the staff of the Ministry of Agriculture in Abha.

In this study *P. persicae* was found to form heavy populations over a short period of time during the summer of 1993. The size and spread of the aphid colonies on young and old peach and on old plum were found to be similar; being in both large and dense. Van Emden [16] stated that population development and performance is of very practical relevance for determination of susceptibility and resistance of plants to aphids. Thus peach and old plum trees seem to be more susceptible to this aphid attack than apricot which showed very light infestation only on young trees. In former Yugoslavia both young and old peach trees showed high densitites of *P. persicae* [7,8].

Population started first on edge plants of the orchard, possibly by flying alatae. According to Van Emden [16] edge plants are more likely to be colonized than are plants at the center. Several workers have stated the occurrence of this aphid on the lower bark of the main branches of stone fruit trees causing serious injury [3,4,7,12,13]. The reason why the aphids preferred the lower surface of branches may be due to the fact that these parts are always under shade away from direct sunlight. Similar observations were reported by Broadbent and Hollings [17]. This habit of colonizing lower surfaces of bark was explained by Talhouk [4] that the aphids tend to avoid being smeared by their own hony-dew. However, the appearance of the aphids on the bottom branches and then gradually creeping upwards, supports the idea of them avoiding sunlight. Horizontal zones of 0.3, 1.5, 3, 4.5, and 6 m from the ground has been described for aphids [16].

The population of *P. persicae* in Abha were clearly summer populations. This aphid has fully exploited the favourable sunny months to produce very large populations. It has been reported that duration of sunshine associated with temperature influence epidemiology of aphids [18]. *P. persicae* was reported from apple [4] and from *Citrus* trees [14] in the Mediterranean but in Abha it occurred only on *Prunus*. In Abha *P. persicae* proved to be anholocyclic. This was the case in Italy, Sicily and Egypt whereas in cooler areas it enjoys a holocyclic life-cycle [1,4,13]. It seems that in Abha, the absence of competition from other aphids and of predators have helped this aphid population to grow without interruption. In Lebanon this aphid experi-

enced fewer predators compared to other species [4]. The decrease in the aphid population after October may be attributed to the low winter temperatures which causes *Prunus* plants to lose their leaves. Many workers have recognized the adverse effects of low winter temperatures on the growth of plants and on the growth of aphid populations [15,18,19,20,21]. In Egypt *P. persicae* showed dwindling populations after October and through the winter [13]. It seems that other environmental factors such as relative humidity, amount of rain, wind speed and atmospheric pressure have no effects on the populations of *P. persicae;* this agrees with other workers findings [9,18,20].

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ملاحظات بيئية على حشرة مَنّ القلف البنية *Pterochloroides persicae* على أشجار الفاكهة الحجرية (اللوزيات) في منطقة عسير (أبها) جنوب غرب المملكة العربية السعودية

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(ورد البحث في ١٤١٥/١٠/١٢هـ؛ وقُبل للنشر في ١٤١٦/٦/٢٢هـ)

ملخص البحث. تعد حشرة المنّ البنية من الآفات الخطيرة على أشجار الفاكهة الحجرية في قارات العالم المختلفة مسببة الكثير من الخسائر لهذا المحصول. وهذه هي المرة الأولى التي تسجل فيها هذه الحشرة في المملكة العربية السعودية. في صيف عام ١٩٩٣م تمت ملاحظة ظهور أعداد هائلة من أفراد تلك الحشرة. في هذه الدراسة تمت مراقبة نمو المستعمرات منذ بداية ظهورها في نهاية شهر يونيو وخلال شهور يوليو، أغسطس، سبتمبر وحتى اختفت المستعمرات من الأشجار في أكتوبر. لقد تمت مناقشة كيفية انتشار الحشرات في الحقل وكيفية توزيع الحشرات على الأشجار وقد تمت مناقشة بعض العناصر البيئية التي يمكن أن يكون لها تأثير على انتشارها وذلك بغية التوصل إلى بعض المعلومات التي قد تساعد في مكافحتها.