

Survey on the presence of *Cacopsylla pruni* in Turkey: preliminary results

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Abstract

Although '*Candidatus* Phytoplasma prunorum' has been previously detected in different regions of Turkey, its vectors have not been identified yet. A survey was conducted in 2010 and 2011 in order to determine the presence of *Cacopsylla pruni* populations in six different fruit tree producing areas. The psyllid was found in Adana, Mersin, Bursa and Yalova on either *Prunus spinosa* or wild plums (*Prunus* spp.) and also on fir trees. The mean percentage of individuals of *C. pruni* infected with *Ca. P. prunorum* was around 23% in Mersin.

Key words: '*Candidatus* Phytoplasma prunorum', *Prunus* spp., psyllid vector.

Introduction

Stone fruits are important fruit crops in Turkey, where local land-races and new varieties are cultivated. In recent years, diseases caused by phytoplasmas have become increasingly important in stone fruit trees in this country. Severe decline of plum and apricot trees growing in nurseries and commercial orchards has recently reached alarming levels. For example, in foreign (e.g. 'Precoce de Tyrinthe', 'Fraccaso') and local (e.g. 'Sakit', 'Şekerpare', 'Alkayısı') apricot cultivars symptoms have been observed, i.e. deformation and rolling of the leaves, reduced yield, and decline; '*Candidatus* Phytoplasma prunorum' was detected on apricot or plums from different regions of Turkey (Jarausch *et al.*, 2000; Çağlayan *et al.*, 2004; Ulubaş Serçe *et al.*, 2006).

Despite these records, no information was presented on the presence of vectors of phytoplasma diseases and their prevalence in Turkish orchards. Therefore, the main objective of this research was to survey the presence of *Cacopsylla pruni* Scopoli the expected vector of '*Ca. P. prunorum*' in Turkey.

Materials and methods

Sixteen localities from six provinces where apricot, peach and plum growing is important in Turkey, were selected for surveys of *C. pruni* (figure 1). These surveys were carried out during the springtime of 2010 and 2011, respectively. Psyllids were essentially collected from wild *Prunus* species (e.g. *P. spinosa*, *P. cerasifera*), or *Prunus* orchards, and conifers (table 1).

DNA was extracted from *C. pruni* and then the presence of '*Ca. P. prunorum*' was determined from individual insects with the primers ESFYf/r as described by Thébaud *et al.* (2009).

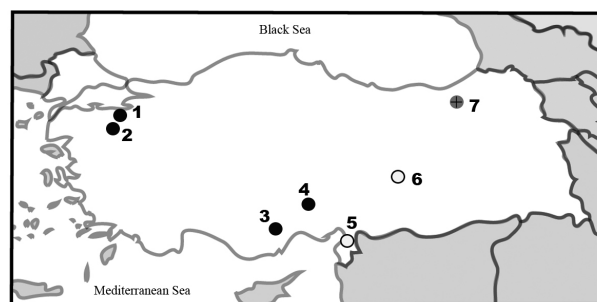


Figure 1. Sampled localities where the psyllid *C. pruni* was found (●) or not found (○) in Turkey in springs 2010 and 2011. Locality 7 was described by Güçlü and Burckhardt, 1996. See table 1 for more details on the host plants and the number of collected psyllids.

Results

Remigrant *C. pruni* individuals were found and collected at the end of March in all surveyed localities except those from Hatay and Malatya (table 1). Specimens on *P. spinosa* were found only in Bursa and Yalova provinces. In Adana and Mersin, the psyllids were abundant on wild *Prunus* and *Prunus* trees inside apple orchards. Psyllids have been found but very rarely on other host plants: *Malus domestica*, *Cydonia oblonga* and *Crataegus* ssp. Many overwintered individuals were collected from *Abies nordmanniana* subsp. *bornmulleriana* and *Pinus* ssp. from Uludağ, but never from other locations even there has been fir trees in the forests.

Nymphs of *C. pruni* were first detected on wild *Prunus* trees in the first half of May 2010 in Mersin. In June 2010 nymphs were also collected from apricot and peach trees.

The higher percentage of remigrant individuals of *C. pruni* infected with '*Ca. P. prunorum*' was around 23% and was found in Mersin (7 positives out of 30 specimen tested).

Table 1. Localities sampled during springs 2010 and 2011, and number of *C. pruni* collected on different host plants. “0” indicates that psyllids have been searched but not found, “-” not investigated. Pspi: *Prunus spinosa*, Psp: *Prunus* sp., Pdo: *P. domestica*, Cra: *Crataegus* sp., Cyd: *Cydonia oblongua*, App: apple, Apri: apricot, Con: conifers.

Province	District	Host-plant							
		Pspi	Psp	Pdo	Cra	Cyd	App	Apri	Con
1-Yalova	Center	27	-	-	-	-	-	-	-
	Keles	2	-	-	-	-	-	-	-
2-Bursa	Orhaneli	11	3	-	1	-	-	-	-
	Nilüfer	65	-	-	-	-	-	-	-
	Uludağ	-	-	-	-	-	-	-	143
3-Mersin	Silifke	-	> 100	-	2	-	1	0	-
	Mut	-	-	-	-	-	-	0	-
4-Adana	Pozanti	-	180	-	-	1	-	-	-
	Ceyhan	0	-	-	-	-	-	-	-
5-Hatay	Samandağ	0	0	-	-	-	-	-	-
	Center	0	0	-	-	-	-	-	-
	Yayladağ	0	0	-	-	-	-	-	-
	Iskenderun	0	0	-	-	-	-	-	-
6-Malatya	Doğanşehir	-	0	0	-	-	-	-	-
	Yeşilyurt	-	0	-	-	-	-	-	-
	Akçadağ	-	0	-	-	-	-	-	-

Discussion

These preliminary data presented here are the results of two consecutive spring surveys of *C. pruni* in Turkey. They exhibit limited distribution of the psyllid in some-surveyed areas, but abundant in the localities of the provinces of Bursa, Adana and Mersin. These are important provinces for growing apricot, peach and plum trees, where ‘*Ca. P. prunorum*’ infections have been recorded in previous research (Çağlayan *et al.*, 2004; Ulubaş Serçe *et al.*, 2006). Overwintered psyllids have been caught on conifers at Uludağ (National park in the Bursa province, 1510 m alt.), near (10-25 km) localities where we have found them on *P. spinosa*. Actually, in this region, the psyllids could complete their life cycles, and so they could play a major role in the phytoplasma dissemination at a local scale (Thébaud *et al.*, 2009).

Fortunately *C. pruni* has not been found near Malatya, the most important apricot growing province. In this region, the conifers are not common and the nearest conifer forests are 100-120 km as the crow flies. Thus, the insect would not be able to survive in that province.

In France, the highest range of phytoplasma infected remigrant *C. pruni* was recorded as 15% but is generally around 3% (Yvon *et al.*, 2004). In Turkey, this range was determined as 23% what seemed considerably high. This situation clearly revealed the potential spread risk of ‘*Ca. P. prunorum*’ by *C. pruni* in Turkey and the necessity of taking precautions.

Turkey is a centre of diversity of a wide range of fruit trees. To determine if only one or both genetic groups identified in *C. pruni* is found in Turkey will inform about the speciation history of the species, which can also be linked to phytoplasma transmission capacity. For this objective, all specimens collected in this survey will be typed for phytoplasma and for determining their genetic groups A or B.

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