

Arthropod and Phytopathogen Natural Enemies of Several Weeds in Turkey

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Abstract

A preliminary survey was started in 1978 to identify potential biological control agents for crop weeds in Turkey. Several potential agents for major weeds were found.

Introduction

Crop weeds in Turkey have not been extensively sampled for their natural enemies. A preliminary survey was thus begun in 1978 to identify potential biological control agents found on several weed species in Turkey. This work is expected to guide future research for specific weed species.

Methods and Materials

The survey was carried out in crop fields. Natural enemies were investigated from May to September, when the biological agents were active. In this period, the biological agents were easily collected, and plant damaged was noted. Specimens collected were identified at the Plant Protection Research Institute.

Results and Discussion

Areas and weeds surveyed, and the natural enemies found, are given in Table 1. The weeds and their natural enemies (pathogens and arthropods) varied from one region to another, and their time of activity differed temporally and regionally.

Table 1. Natural enemies of weeds in Turkey, by region.

Region Surveyed	Weeds examined	Natural enemies found
Mersin	<i>Chrysanthemum</i> spp. (Asteraceae)	<i>Aphis</i> spp. (Homoptera: Aphididae) <i>Empoasca decipiens</i> (Paoli) (Homoptera: Cicadellidae) <i>Tetranychus</i> spp. (Acari: Tetranychidae)
	<i>Echinochloa colona</i> (L.) Link (Poaceae)	<i>Pricularia orize</i> (Bri. et Cav.) (Moniliales)
	<i>Lamium amplexicula</i> L. (Lamiaceae)	<i>Aphis</i> spp. <i>Bemisia</i> spp. (Homoptera: Aleyrodidae) <i>Empoasca</i> spp. <i>Tetranychus</i> spp.
	<i>Polygonum persicaria</i> L. (Polygonaceae)	<i>Aphis</i> spp. <i>Bemisia tabaci</i> (L.) <i>E. decipiens</i>

Table 1. Continued.

Region surveyed	Weeds examined	Natural enemies found
Adana	<i>Plantago</i> spp. (Plantaginaceae)	<i>Tetranychus</i> spp. <i>E. decipiens</i>
	<i>Rubus fruticosus</i> L. (Rosaceae)	<i>Tetranychus</i> spp. <i>Aphis</i> spp. <i>Bemisia</i> spp. <i>E. decipiens</i> <i>Tetranychus</i> spp.
	<i>Solanum nigrum</i> L. (Solanaceae)	<i>Aphis fabae</i> (Scopoli) <i>A. solanella</i> Theobald <i>B. tabaci</i> <i>Tetranychus</i> spp.
	<i>Sonchus oleraceus</i> L. (Asteraceae)	<i>Myzus persica</i> (Sulzer) <i>Uroleucon sonochi</i> (L.) (Homoptera: Aphididae)
	<i>Amaranthus retroflexus</i> L. (Amaranthaceae)	<i>Albigo candida</i> (Pers.) Tze. (Oomycetes)
	<i>Amaranthus</i> spp.	<i>B. tabaci</i> <i>Tetranychus</i> spp.
	<i>Anthemis arvensis</i> L. (Asteraceae)	<i>A. fabae</i>
	<i>Capsella bursa-pastoris</i> (L.) Medic. (Brassicaceae)	<i>A. candida</i> <i>Aphis</i> spp. <i>E. decipiens</i> <i>Tetranychus</i> spp.
	<i>Chenopodium album</i> L. (Chenopodiaceae)	<i>Aphis</i> spp. <i>Bemisia</i> spp. <i>E. decipiens</i> <i>Tetranychus</i> spp. <i>Puccinia</i> spp.
	<i>Cyperus</i> spp. (Cyperaceae)	
	<i>Datura stramonium</i> L. (Solanaceae)	<i>B. tabaci</i>
	<i>Echinochloa crus-galli</i> (L.) Beauv.	<i>A. fabae</i> <i>Helminthosporium</i> spp.
	<i>Heracleum sphodylium</i> L. (Apiaceae)	<i>A. fabae</i>
	<i>Mentha silvestris</i> (Lamiaceae)	<i>Tetranychus</i> spp.
	<i>Mercurialis annua</i> (L.) (Euphorbiaceae)	<i>Aphis</i> spp. <i>Bemisia</i> spp. <i>E. decipiens</i> <i>Tetranychus</i> spp.
	<i>Ranunculus</i> spp. (Ranunculaceae)	<i>A. fabae</i> <i>Bemisia</i> spp.
	<i>Raphanus raphanistrum</i> L. (Brassicaceae)	<i>Aphis</i> spp. <i>Bemisia</i> spp. <i>Tetranychus</i> spp.
	<i>Sinapis arvensis</i> L. (Brassicaceae)	<i>Bemisia</i> spp. <i>Delia patula</i> (Meigen) (Diptera: Anthomyiidae)
	<i>Sonchus</i> spp.	<i>Tetranychus</i> spp. <i>Aphis</i> spp. <i>Bemisia</i> spp. <i>Tetranychus</i> spp. <i>U. sonochi</i>
	<i>Urtica urens</i> L. (Urticaceae)	<i>A. fabae</i> <i>Aphis</i> spp. <i>B. tabaci</i> <i>E. decipiens</i> <i>Tetranychus</i> spp.
Hatay	<i>Erigeron canadensis</i> L. (Asteraceae)	<i>A. fabae</i> <i>Aphis</i> spp.
	<i>Malva neglecta</i> Wallr. (Malvaceae)	<i>A. fabae</i> <i>Aphis</i> spp. <i>Bemisia</i> spp. <i>E. decipiens</i> <i>Tetranychus</i> spp.
	<i>R. raphanistrum</i>	<i>Brevicoryne brassica</i> (L.) (Homoptera: Aphididae)
	<i>Rumex</i> spp. (Polygonaceae)	<i>A. fabae</i> <i>Aphis</i> spp.

Table 1. Continued.

Region surveyed	Weeds examined	Natural enemies found
	<i>Sorghum halepense</i> (L.) Pers. (Poaceae)	<i>Helminthosporium tursicum</i> "pass" (Subram and Jain) (Basidiomycetes) <i>Ustilago avenae</i> (Pers.) Rostr. (Basidiomycetes)
Kahramanmaraş	<i>Cirsium arvense</i> (L.) Scop. (Asteraceae)	<i>A. fabae</i> <i>Aphis</i> spp. <i>Bemisia</i> spp. <i>Brachycaudus helichrysi</i> <i>E. decipiens</i> <i>Tetranychus</i> spp.
	<i>Rumex obtusifolius</i> L.	<i>A. fabae</i>
Gaziantep	<i>Convolvulus arvensis</i> L. (Convolvulaceae)	<i>Aphis</i> spp. <i>Bemisia</i> spp. <i>Tetranychus</i> spp.
	<i>Euphorbia peplus</i> L. (Euphorbiaceae)	<i>B. tabaci</i>
Eskisehir	<i>Aegilops</i> spp. (Poaceae)	<i>Ustilago</i> spp.
	<i>Amaranthus blitoides</i> S. Watts. <i>Bromus tectorum</i> L. (Poaceae)	Coleoptera spp. <i>Puccinia</i> spp.
	<i>C. album</i> <i>Hordeum bulbosum</i> L. <i>H. murinum</i> L.	Coleoptera spp. <i>Puccinia</i> spp. <i>Erysiphe</i> spp.
Bolu	<i>Onopordon</i> spp. (Asteraceae)	Coleoptera: Cleridae and Curculionidae Homoptera: Cercopidae Hemiptera: Miridae Diptera <i>Anisoplia</i> spp. <i>Coreus</i> spp. Issidae
Ankara	<i>Aegilops</i> spp. <i>B. tectorum</i> <i>Chondrilla juncea</i> L. (Asteraceae) <i>C. arvense</i> <i>Euphorbia</i> spp. <i>H. bulbosum</i> <i>H. murinum</i>	<i>Ustilago</i> spp. <i>Puccinia</i> spp. <i>Puccinia</i> spp. <i>Puccinia</i> spp. <i>Erysiphe</i> spp. <i>Tieletia</i> spp. <i>Ustilago</i> spp. <i>Piricularia</i> spp.
	<i>Phragmites</i> spp. (Poaceae)	
Zonguldak	<i>Vicia</i> spp. <i>B. tectorum</i> <i>C. arvense</i>	<i>Puccinia</i> spp. <i>Puccinia</i> spp. Coleoptera: Coccinellidae, Curculionidae, Saldidae, Elsteridae, Elmidae Hemiptera: Miridae <i>Coreus</i> spp., Forficulidae
	<i>Eryngium campestre</i> L. (Apiaceae)	<i>A. fabae</i> Carabidae <i>Graphosoma</i> spp. <i>Delycoris</i> spp.
	<i>Onopordon</i> spp.	Coleoptera: Curculionidae, Aphidae, Halictidae Aphididae