

**SOME ADVENTIVE PLANT INVADERS AS HOSTS OF VARIOUS
APHID - APHID PARASITOID ASSOCIATIONS**

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In the paper we analyzed origin, distribution, habitats,
introduction time and associated aphids and aphid parasitoids of follows
adventive plants: *Oenothera biennis* L., *Asclepias syriaca* L., *Iva
xanthifolia* Nutt. and *Conyza canadensis* (L.) Cronq. *Oenothera biennis*
- *Aphis oenotherae* Oestlund - *Lysiphlebus fabarum* (Marsh.) association
is for the first time reported from Palaearctic.

Key words: adventive plants, distribution, aphid, aphid
parasitoid

INTRODUCTION

Alien and adventive plant species have become interesting with intensified antropogenic migrations. „Alien species” (synonyms: non-native, non-indigenous, foreign, exotic) is a species, subspecies, or lower taxon introduced outside its normal past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce (UNEP 2002, TOMANOVIĆ and JOVANOVIĆ, 2000).

Man introduces plants intentionally or by chance and they have certain consequences on ecological relationships and diversity of native species. Unintentionally introduced plants may be introduced by some of the following means: by animals, contaminated soil or seeds, by waste material, transportation means, etc. (FORMAN, 2001). Deliberately introduced plants most commonly belong to the group of decorative, cultivated, industrious plants or spices (SCHWANITZ, 1966; FORMAN, 2001).

Some consequences caused by introduction of alien plant species into native ecosystems are as follows: destruction of biogeographic barriers, changes in characteristics of biom, change of diversity of plant species, changes in general environmental conditions (VITAUSEK *et al.*, 1997). Introduced species may play role in the process of species extinction, especially in fragile ecosystems such as islands or aquatic ecosystems. Today, when more attention is paid to saving biodiversity and especially native species, unintentionally introduced species are considered the main cause of their extinction. Also, alien plant species can be associated with many exotic pest insects.

The aim of this paper is to analyse tritrophic associations (host plant - host aphid - aphid parasitoid) on some adventive plants in the Belgrade area.

MATERIAL AND METHODS

Samples from plants bearing aphid colonies consisting of both live and mummified aphids were collected in many localities around Belgrade during 1999-2002. Plants were pressed herbarized and later identified. Live aphids were preserved in 90% ethyl-alcohol and 75% lactic acid 2:1 (EASTOP and VAN EMDEN, 1972). Mummified aphids of the same species of the same plant sample were placed in groups in small plastic boxes till emergence of parasitoids. Slides were made in Canada balsam, with dissected parasitoids specimens for later identification (STARÝ, 1970; KAVALLIERATOS *et al.*, 2001, TOMANOVIĆ and KAVALLIERATOS, 2002).

RESULTS AND DISCUSSION

Oenothera biennis L.

Distribution and Origin: It is a native species in the eastern part of North America, but it is spread worldwide. The whole genus is considered invasive, especially in Central Europe. It was introduced to Europe about 1600 into Italy, from where it spread all over Europe (SARIĆ, 1986). First time reported in Serbia by HAYEK (1926).

Habitat: Grows on various soil types, but prefers sandy soil or clay. It requires well drained soil and can grow on the soil possessing small quantity of nutritive material. Prefers dry habitats, but can grow in humid ones as well. Tolerant to draught and frost as well as to PH value of the soil. Cannot grow in shade. It occurs spontaneously and grows by roads, railroads, in fields, in dry meadows. It also occurs in gardens, hedges and in nurseries.

Aphids: *Aphis oenotherae* Oestlund. North American's species introduced in Europe probably by aeroplane (MÜLLER, 1974). First time reported in Europe in 1971 (HILLE RIS LAMBERS, 1971). Aphid lives on flower buds, stem and leaves of *Oenothera* plants causing plant deformations (HEIE, 1986).

Parasitoids: *Lysiphlebus fabarum* (Marsh.) - Widely polyphagous species, with Holarctic origin. Introduced in North and South America and Australia. Parasitizes aphids from following genera: *Aphis*, *Semiaphis*, *Myzus*, *Hyperomyzus*, *Brachycaudus*, *Hyalopterus*, *Cavariella*, *Rhopalosiphum* (STARLI, 1963; KAVALLIERTOS and LYKOURESSIS, 1999; TOMANOVIĆ and BRAJKOVIĆ, 2001; KAVALLIERTOS *et al.*, 2001). Prefers steppe type of habitats. *Lysiphlebus fabarum* has become successfully adapted to parasitize the new immigrant aphid, *Aphis oenotherae*. Association *Oenothera biennis*/*Aphis oenotherae*/*Lysiphlebus fabarum* is for the first time reported from Palaearctic.

Asclepias syriaca L.

Distribution and Origin: *Asclepias syriaca* originates from the north and central parts of USA and bordering area of Canada. Antropohorous, introduced into Europe in 17th century and can be found in central and southern Europe (SARIĆ, 1986). HAYEK (1925) reported this plant on the Balkan Peninsula only for Bosnia.

Habitat: It grows in both moderate and cold areas, on humid and dry habitats. It can be encountered in various places: in fields, on wood edges, on river banks, by roads. It can stand draught. It also grows well in poor soil and sandy soil.

Aphids: *Aphis nerii* Boyer de Fonscolombe - Distributed in tropical and subtropical areas. Originated from Mediterranean. It forms dense colonies on young shoots and leaves of *Asclepias syriaca*. Transmitted several plant viruses and potentially pest aphids.

Aphis fabae - Cosmopolitan, polyphagous species.

Parasitoids: Not found. In past 10 years we collected many samples of *Asclepias syriaca* infested with aphids and we never found any parasitoids. *Aphis nerii* infested *Nerium oleander* at Adriatic coast (Croatia and Montenegro) and many other Mediterranean plants (KAVALLIERATOS *et al.*, 2001). In Mediterranean climatic conditions we found two parasitoid of *A. nerii* in Adriatic coast - *Lysiphlebus fabarum* and *Lysiphlebus testaceipes* (introduced Nearctic species). In other Mediterranean country more parasitoid species were found as follows: *Aphidius colemani*, *Binodoxys angelicae*, *Diaeretiella rapae*, *Lysiphlebus confusus* (STARČ *et al.* 1977; SUAY CANO and MICHELENA SAVAL, 1998; KAVALLIERATOS *et al.*, 2001). Except for *Aphidius colemani* all other parasitoid species parasitize many aphid host in Serbia. There are two possible reasons why parasitoid species don't parasitize *Aphis nerii* on *Asclepias syriaca* in continental climatic condition. First, it is too short postintroduction time host plant and host aphid. Second, *Aphis nerii* is unsuitable host for parasitoids development in continental climatic conditions.

Aphis fabae as extremely polyphagous and cosmopolitan aphid was found very sporadically on *Asclepias syriaca*.

Conyza canadensis (L.) Cronq.

Distribution and Origin: Native in USA, to central Europe introduced around 1777, where it is widespread. It also occurs in parts of Asia (SARIĆ, 1986). PANČIĆ (1878) found it in the Belgrade vicinity.

Habitat: Along the roads, in fields, abandoned habitats, grass areas.

Aphids: *Brachycaudus helichrysi* - Cosmopolitan species, native for Palaearctic with many different host plants (HEIE, 1992).

Uroleucon erigeronensis (Thomas). North American's species, distributed in many European country. In Europe, first time reported from France in 1952. Host plants can be heavily infested, especially upper parts of stem (HEIE, 1986).

Parasitoids: Not found. *Brachycaudus helichrysi* was parasitized with many parasitoids in different host plants/host aphid associations, in Serbia and Montenegro as follows: *Aphidius matricariae*, *Binodoxys angelicae*, *Diaeretiella rapae*, *Ephedrus cerasicola*, *Ephedrus persicae*, *Ephedrus plagiator*, *Lysiphlebus fabarum*, *Praon abjectum* and *Praon volucre* (TOMANOVIĆ *et al.* 1998; KAVALLIERATOS *et al.*, 2003). But we didn't found any adapted parasitoid on *B. helichrysi/Conyza canadensis* associations.

Iva xanthifolia Nutt.

Distribution and Origin: Native in the central parts of North America; to our country introduced probably during the Second World War (TRINAJSTIĆ, 1984).

Habitat: It inhabits sandy and marshy habitats or those which get dry, especially river beds and floody plains, along roads, in gardens and pastures. It is not frequent, but it may occur in cultivated areas.

Aphids: *Aphis gossypii* Glover and *Brachycaudus helichrysi*. *A. gossypii* is polyphagous cosmopolitan species, but very common in subtropical and tropical areas (HEIE, 1986). *B. helichrysi* is native aphid species.

Parasitoids: Not found on *A. gossypii* / *Iva xanthifolia* and *B. helichrysi* / *Iva xanthifolia* associations

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NEKE ADVENTIVNE BILJNE VRSTE KAO DOMAĆINI RAZLIČITIM ZAJEDNICAMA BILJNIH VAŠIJU I NJIHOVIH PARAZITOIDA

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U radu je analizirano poreklo, vreme introdukcije, rasprostranjenje i tipovi staništa 4 adventivne biljne vrste: *Oenothera biennis* L., *Asclepias syriaca* L., *Iva xanthifolia* Nutt. and *Conyza canadensis* (L.) Cronq. Na navedenim biljkama su nađene biljne vaši i njihovi parazitoidi i analizirano je njihovo poreklo i rasprostranjenje. Trofička zajednica *Oenothera biennis* - *Aphis oenotherae* Oestlund - *Lysiphlebus fabarum* (Marsh.) je prvi put zabeležena u Palearktiku.

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