

Eriophyid mites as biological control agents of two invasive alien plants in Europe: *Ailanthus altissima* and *Ambrosia artemisiifolia*

Francesca MARINI^{1*}, Biljana VIDOVIC², Radmila PETANOVIC², Peter TOTH³, Matthew AUGÉ¹, Domenico VALENZANO⁴, Enrico de LILLO⁴ & Massimo CRISTOFARO^{1,5}

Invasive alien plant species may have a strong impact on indigenous biodiversity and this is the case of *Ailanthus altissima* and *Ambrosia artemisiifolia*, whose control in the Euro-Mediterranean areas is required.

Ailanthus altissima, commonly known as Tree of Heaven, is a fast-growing deciduous tree native of China, with is highly invasive. It is considered worldwide (Europe, Asia, South Africa, South-eastern Australia, North America) a serious invasive plant species of disturbed urban sites, competing with autochthonous flora and causing structural damages to railways, roads, buildings and historical monuments. In addition, it is also an important pest in rural areas, invading cropland, fencerows, forest edges and rocky areas.

Ambrosia artemisiifolia, Common Ragweed, is an annual herbaceous plant, native of temperate North America regions, but considered invasive in Europe, parts of Asia and Australia. Its success as an invasive species is probably due to its ecological amplitude and its ability to colonise and dominate disturbed agricultural and anthropogenic habitats. The main impact is primarily due to the its abundant and highly allergenic pollen that induces health respiratory problems among human populations, but it is also an agricultural pest, competing with cultivated crops.

Despite several attempts employing different control methods, it is clear that the total eradication of these alien species cannot be achieved and efforts have to be addressed

¹ Biotechnological and Biological Control Agency (BBCA) Onlus, Rome, Italy

² Department of Entomology and Agricultural Zoology, Faculty of Agriculture, University of Belgrade, Belgrade-Zemun, Serbia

³ Department of Plant Protection, Slovak University of Agriculture, Nitra, Slovak Republic

⁴ Dipartimento di Scienze del Suolo, della Pianta e degli Alimenti, sezione di Entomologia e Zoologia, University of Bari Aldo Moro, Bari, Italy

⁵ Centro di Ricerca Casaccia, Agenzia Nazionale Nuove Tecnologie, Energia, e Sviluppo Economico (ENEA), Rome, Italy

for the ecological preservation of these ecosystems by the use biological and integrated control approaches. Conducting geographical surveys of the invasive species in question is the first step for potentially finding candidates to be used in the classical biological control of alien species. In particular, among the potential candidate agents associated with the target weed, eriophyid mites play a relevant role, because they are obligate plant feeders with high host specificity. For this reason, eriophyid mites have been considered potential control agents for both *A. altissima* and *A. artemisiifolia*.

Very few eriophyid species have been recorded in association with the Tree of Heaven in its native areas. Recently, a new eriophyid species on *A. altissima* has been described in Hungary, pointing out the chance that a potential biocontrol agent of this invasive species is already present in the Palaearctic Region. This mite forms dense populations on the undersurface of the leaflets, which are responsible of making the lamina narrow, deformed, twisted, with edges folded or rolled downward toward the main vein of the leaflets. Drying and necrosis of the apical parts of the stems have been observed on heavily infested plants; whereas high infestations in young plants are also associated to the premature loss of leaves.

An eriophyid mite species is already know to be associated with Common Ragweed in Europe and it seems to prevent male flower development and hence pollen production, but also result in a decrease in the number of viable seeds.

First surveys regarding the distribution of these eriophyid mites associated with *A. altissima* and *A. artemisiifolia*, respectively, were carried out and will be presented in this communication, together with the first data regarding the potential impact of these mites on both invasive alien plant species.