

## Field Explorations in Anatolia for the Selection of Specific Biological Control Agents for *Onopordum acanthium* (Asteraceae)

M. Cristofaro<sup>1</sup>, F. Lecce<sup>2</sup>, A. Paolini<sup>2</sup>,  
F. Di Cristina<sup>2</sup>, L. Gültekin<sup>3</sup> and L. Smith<sup>4</sup>

<sup>1</sup>ENEA C.R.Casaccia, UTAGRI-ECO, Via Anguillarese, 301, 00123 S. Maria di Galeria (Rome), Italy [massimo.cristofaro.cas@enea.it](mailto:massimo.cristofaro.cas@enea.it)

<sup>2</sup>Biotechnology and Biological Control Agency, Via del Bosco, 10, 00060 Sacrofano (Rome), Italy

<sup>3</sup>Atatürk University, Faculty of Agriculture, Plant Protection Department, 25240 TR Erzurum, Turkey

<sup>4</sup>USDA-ARS, 800 Buchanan Street, Albany, CA 94710, USA

### Abstract

Scotch thistle, *Onopordum acanthium* L. (Asteraceae), is a biannual thistle of Eurasian origin, accidentally introduced in North America in the late 1800s. It occurs in most of the western states especially in rangelands, pastures and disturbed soils. When abundant, it reduces forage availability for livestock and wildlife. Western Europe has previously been explored for prospective biological control agents, and seven species of insects have been released in Australia. However, host specificity requirements in N. America are more stringent for these agents because of the presence of many native *Cirsium* species. Some of the agents released in Australia do not appear to be sufficiently specific to use in N. America. Therefore we decided to conduct foreign exploration further east in areas not previously explored. Since 2007 we conducted several explorations and survey trips to discover new potential biological control agents in Turkey. Among the most promising candidates are three weevils *Larinus latus* (Herbst.), *L. gigas* Petri and *L. grisescens* Gyllenhal that were collected in Central Anatolia. The larvae of these species develop in the flowerheads and destroy most seeds. Other candidates are *Psylliodes cf. chalcomera* Illiger and *Lixus cardui* Olivier, whose larvae develop inside stems and leaves. Preliminary laboratory host specificity tests show a narrow host range of some biotypes of both potential biological control agents. Specimens from these experiments are currently undergoing genetic and morphological study to understand if there are distinct genetic entities not distinguishable by morphological traits. A new species of eriophyoid mite, *Aceria* sp., was recorded for the first time in the vicinity of Isparta, Western Turkey associated with the target weed. It causes stem atrophy and flower bud abortion with a consequent decrease of seed production. An unidentified nematode species causing visible blisters on Scotch thistle leaves was found in Central Turkey.