Abstracts: Theme 6 – Evolutionary Processes

Why are there no species-specific natural enemies for giant hogweed?

M.K. Seier\textsuperscript{1} and M.J.W. Cock\textsuperscript{2}

\textsuperscript{1}CABI UK Centre, Silwood Park, Buckhurst Road, Ascot, Berkshire SL5 7TA, UK
\textsuperscript{2}CABI Switzerland Centre, Rue des Grillons 1, 2800 Delémont, Switzerland

Based on surveys for and laboratory studies of the insect herbivores and fungal pathogens recorded from giant hogweed, \textit{Heracleum mantegazzianum} Sommier & Levier (Apiaceae) in the Caucasus as its native range, we assess the potential for classical biological control of giant hogweed in Europe. Surveys revealed a guild of natural enemies, arthropods and pathogens, associated with the target plant and other \textit{Heracleum} spp. in the western Caucasus Mountains. However, none of the evaluated insects and pathogens was considered to be suitably host-specific for introduction into Europe. A hypothesis is proposed to explain the absence of monospecific natural enemies of giant hogweed in the Caucasus, based on the dynamic and interactive evolution of populations of closely related and hybridizing species of \textit{Heracleum} spp. in this mountain range over successive glaciation events during the Pleistocene.

Specificity and plant host phenology: the case of \textit{Gephyraulus raphanistri} (Diptera: Cecidomyiidae)

J. Vitou\textsuperscript{1}, J.K. Scott\textsuperscript{2} and A.W. Sheppard\textsuperscript{3}

\textsuperscript{1}CSIRO-EL, Campus de Baillarguet, 34980 Montferrier sur Lez, France
\textsuperscript{2}CSIRO Entomology, Private Bag 5, PO Wembley, Western Australia 6913, Australia
\textsuperscript{3}CSIRO Entomology, GPO Box 1700, Canberra, Australian Capital Territory 2601, Australia

Wild radish (\textit{Raphanus raphanistrum} L.) is one of the most important weeds of crops in southern Australia. The potential for classical biological control of this weed was investigated, and recent confirmed host records show that the flower gall midge, \textit{Gephyraulus raphanistri}, is restricted to \textit{R. raphanistrum} throughout Europe. \textit{G. raphanistri} has never been confirmed from Canola in Europe, where 3 million hectares are grown each year. Field host specificity testing \textit{G. raphanistri} by manipulating host plant phenology of actual and potential hosts in the genera \textit{Raphanus} and \textit{Brassica} revealed that no host plant preference was observed. All tested species, \textit{Raphanus raphanistrum raphanistrum} (wild radish), \textit{Raphanus raphanistrum landra} (coastal wild radish), \textit{Raphanus sativus} (radish) and \textit{Brassica napus} (an oilseed rape cultivar) were resynchronized for initial flowering to the natural \textit{R. raphanistrum} landra plants hosting a natural population of \textit{G. raphanistri}. The high field host specificity observed in this gall midge in Europe is driven by synchrony of oviposition and flower availability. When phenologically resynchronized, Canola was an equally acceptable host in the field for oviposition and larval development. In Australia, the new environment might generate new phenological conditions and thus significantly increase the risk associated with this midge as a biological control agent.