

## Host plant selection and local adaptation in a polyphagous herbivore, *Eucolaspis* Sharp (Coleoptera: Chrysomelidae)

Prasad Doddala <sup>\*1</sup>, Maria Minor <sup>1</sup>, Qiao Wang <sup>2</sup>, Dave Rogers <sup>3</sup>, Mary Morgan-Richards <sup>1</sup>, Emily Koot <sup>1</sup>, Steve Trewick <sup>1</sup>

<sup>1</sup> Ecology group, Institute of Agriculture & Environment, Massey University, Palmerston North

<sup>2</sup> Agriculture & Horticulture group, Institute of Agriculture & Environment, Massey University, Palmerston North

<sup>3</sup> Plant and Food Research, Havelock North

The range of host plants that a generalist herbivore can use depends on several factors. A generally accepted theory is that diet-breadth of generalists may depend on nutritional requirements as well as toxic compounds such as plant secondary metabolites. Some suggest that a generalist herbivore is made of several populations of locally specialized individuals. Phenotypic plasticity sustained within populations of herbivores enable radiation of individuals / populations into new ecological niches. Plant volatiles are known to shape such insect-host plant association in many insect groups. More pronounced association is widely documented in specialist herbivores, but little is known in generalist herbivores. We used a polyphagous native beetle from New Zealand, *Eucolaspis* (Chrysomelidae: Eumolpinae) to explore role of olfaction and other cues in locating host plants and local adaptation. Olfactory bioassays and feeding bioassays were conducted in the laboratory. Adult *Eucolaspis* beetles were attracted to fresh leaf / fruit volatiles from Rosaceae plants, apple and blackberry. Male and female beetles behaved similarly to olfactory and contact cues of host plants; however males spent more time to decide. An indication of evolutionary affiliation was observed in geographically isolated conspecific populations. It appears that local adaptation did involve fine scale olfactory capabilities for differentiation between closely related plant genera. However, other cues (gustatory and tactile) were shown to override olfactory cues in feeding preference. Blackberry and bushlawyer leaves were more palatable than apple leaves to both populations. We argue that plant volatiles play important role in host choice by *Eucolaspis* despite being a generalist.

