Acceptability of clover flea as prey for common pasture spiders

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Clover flea (*Sminthurus viridis*) is present throughout New Zealand causing significant damage to white clover (*Trifolium repens*) in localised areas of the North Island. Insecticides are available for clover flea control, but their use is harmful to beneficial pasture invertebrates. While predatory mites are present in New Zealand pastures, previous research has indicated that they are relatively ineffective at moderating clover flea populations. Other species in pasture, such as spiders, may prove to be more effective predators. The feeding and survival of clover flea was compared when caged with common pasture spiders (Lycosidae or Linyphiidae) at either 15°C or 20°C. Spiders had a significant effect on clover flea survival, and there was no difference between spider families. At 15°C, clover flea survival in the presence of spiders was less than 21% compared with 94% survival in the spider-free controls ($P < 0.001$). At 20°C, clover flea survival was further reduced to 12% compared with 41% in the controls ($P < 0.001$). Clover flea feeding scores were significantly lower when caged with spiders ($P < 0.001$). There were no feeding differences between spider families or temperatures. This work highlights the role beneficial invertebrates can play in controlling pest abundance and damage.

Microctonus hyperodae in Otago and Southland

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In 1990 *Microctonus hyperodae* was released in Otago and Southland as a biocontrol agent against Argentine stem weevil (ASW) (*Listronotus bonariensis*). At that time ASW was New Zealand's major pasture pest but attained only sporadic importance in the southern South Island. Since then, possibly due to higher nutritional qualities of modern ryegrass cultivars and/or changes in annual thermal accumulation, ASW has increased in significance. Farmers once relied on endophyte-free ryegrasses but now sow infected grasses. While endophyte helps protect against ASW damage, augmentation by *M. hyperodae* parasitism is desirable. Establishment and localised spread of *M. hyperodae* was measured around the release sites, but subsequent distribution over the wider southern South Island was not. Between September and November 2011 52 pastures were sampled and ASW was found in all. *Microctonus hyperodae* was reared from 18 of these pastures at levels of 1-33% parasitism, but in 15 pastures parasitism was less than 7%. The information gathered covers a limited period but suggests that *M. hyperodae* is not as successful in the far south as in other parts of New Zealand. The reasons for this and possible implications warrant further investigation both to understand the situation and to investigate if supplementary releases of *M. hyperodae* can be usefully undertaken.