

Impact of *Harmonia axyridis* on native ladybird species in Belgium: 1. Niche overlap and population trends.

Adriaens Tim ¹, San Martin y Gomez Gilles ², Branquart Etienne³, Maes Dirk ¹

¹Research Institute for Nature and Forest, B-1070 Brussels, Belgium

² Unité d'écologie et de biogéographie, Université Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium

Belgian Biodiversity Platform, Research Centre for Nature, Forests and Wood, B-5030 Gembloux, Belgium

The Harlequin ladybird *Harmonia axyridis*, an introduced biocontrol agent, has rapidly invaded Belgian ecosystems and occurs now in a wide range of habitats, including habitats of conservation value. The first feral *H. axyridis* population in Belgium was recorded in 2001 and the species has expanded its range since and colonised the whole country. Recorded occupancy in Belgium showed an average rate of increase of 189% between 2002 and 2006. In less than five years it has become the predominant species in ladybird assemblages, posing a threat on native tree dwelling aphidophagous species. Since 1999, the Belgian Ladybird Working Group is mapping all Belgian Coccinellidae and recording data on substratum plants and habitat. Based on data of this field survey we assessed potential impact of the species on native guilds. A niche overlap analysis based on plant use data showed that the potential to affect native species is higher for generalist, deciduous and coniferous tree species than for heathland and wetland specialist ladybirds. Also, habitat and land cover analysis showed that *H. axyridis* is, at present, more frequently found in urbanised landscapes than in semi-natural areas, suggesting that natural ecosystems show some resilience to invasion by *H. axyridis*. Preliminary trend analysis of native ladybird species shows the tree dwelling species *Adalia bipunctata* and *Adalia decempunctata* to be struck hardest which is consistent with studies on intraguild predation by *H. axyridis* in the field. Phenology data showed that *H. axyridis* is able to reproduce longer in the year than native species and thus has a competitive advantage over indigenous species. The potential pest status of *H. axyridis* is evaluated using reports on nuisance. Moreover, we address the usefulness of large-scale field survey for impact monitoring and discuss possible control options for this invasive alien.

Adriaens, T, Branquart, E. & Maes, D. (2003). The Multicoloured Asian Ladybird *Harmonia axyridis* Pallas (Coleoptera : Coccinellidae), a threat for native aphid predators in Belgium? Belg. J. Zool., 133 (2) : 201-87

Adriaens T, San Martin y Gomez G, Maes D (2008). Invasion History, habitat preferences and phenology of the invasive ladybird *Harmonia axyridis* in Belgium. BioControl 53: 69-88