

**NOTE****Record of the lily leaf beetle *Lilioceris lili* (Coleoptera: Chrysomelidae) in Newfoundland**

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The lily leaf beetle, *Lilioceris lili* (Scopoli) was discovered in the summer of 2013 by gardeners in Grand Falls-Windsor, Newfoundland. These little red beetles are deceptively attractive and are a major concern to gardeners. In Newfoundland, it is the only beetle that has an all red thorax and elytra, black head and legs (Figure 1a). Both larvae and adults are voracious feeders on *Lillium* spp., *Fritillaria* spp., and *Cardiocrinum* spp. (Liliaceae) where they do extensive damage to all aerial parts of the plants (Figure 1b) (Ernst et al. 2007; Salisbury 2008).

These beetles are believed to be of Asian origin and have become naturalized in much of continental Europe (Orlova-Bienkowskaja 2013). The natural range of the species is the temperate latitudes of East Asia: South Siberia, northern China and Mongolia, and Kazakhstan (Orlova-Bienkowskaja 2013). Lily leaf beetles were first observed in North America in Montreal in 1943 (LeSage and Elliott 2003) where they remained as a small isolated population for nearly 40 years. In the 1980s it began to expand its range and it is now found in Ontario, Quebec, New Brunswick, Prince Edward Island and Nova Scotia (LeSage and Elliott 2003; Majka and Kirby 2011). Its southern most record is Connecticut (Maier 2012). There are recent confirmed sightings in Calgary and Edmonton, Alberta (Alberta Regional Lily Society, online).

The adults overwinter in the soil beneath the plants and can be observed in the spring and early summer. Salisbury (2008) reviewed the general biology of the lily leaf beetle. They mate and lay their eggs on the leaves of lily plants. Upon hatching the larvae feed on the foliage. Both larvae and adults can be seen feed on all parts of the plant including the flower parts throughout the summer (Figure 1c). Like many other chrysomelid beetles, the larvae of *Lilioceris lili* have an interesting behaviour of placing their faeces on their backs (Figure 1d), concealing them from potential predators (Jolivet et al. 1988). After feeding is completed they move to the soil to pupate. The adults emerge and feed before entering the soil again to overwinter.

In December 2012, a student in Grand Falls mentioned having the beetles on her lilies the summer before. In May 2013, after the overwintering adults emerged to begin feeding, a specimen was obtained from the student and its identification was confirmed. Voucher specimens are housed in the collection at College of the North Atlantic, Carbonear, Newfoundland. Two collection expeditions to the Grand Falls-Windsor area were made in May and July 2013. On both occasions, adults and larvae were observed. A survey of gardens throughout the town revealed the beetle occurring only in a centralized area of Grand Falls with no beetles in the adjacent Windsor part of town. Upon speaking with some residents, it was determined that the beetle became established at least 3 years ago (circa 2009). An additional unconfirmed report from a homeowner of the beetles occurring in Buchans (105km from Grand Falls-Windsor), around the same time, was also received however it is unsure if the beetle is established there. A media blitz, involving newspapers and radio, produced leads that had the beetles occurring in only one other region in the province, Spruce Hill Road in Topsail (26 June 2013 by BH), located on the Avalon Peninsula some 250 km from Grand Falls-Windsor. While these beetles are strong fliers and can disperse long distances, the large distance between the two observed populations suggests that introduction was likely not by winged dispersal but by contaminated soil or by the movement of potted lilies that may have contained concealed eggs or adults.

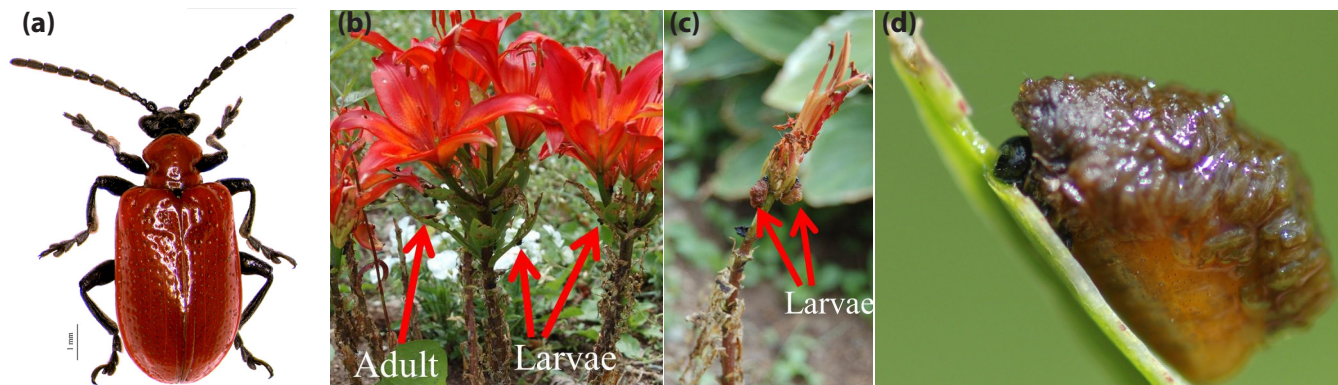
In other jurisdictions of North America, there is a concern that this beetle may threaten already endangered native *Lilium* species (Ernst et al. 2007). Salisbury (2008) showed that in non-choice experiments adult lily leaf beetles will feed

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Figure 1. Lily leaf beetle from a garden on Lind Avenue, Grand Falls, NL (48°56'13.06"N; 55°39'00.36"W), 17 July 2013. Habitus of lily leaf beetle (a); adult and larvae feeding on flower parts (b); damage caused by adults and larvae (c); larva concealed under its own faeces (d). **Note:** The specimen is housed at the College of the North Atlantic, Carbonear, Newfoundland.



on plants in 13 genera but complete development only on *Lilium*, *Fritillaria* and *Cardiocrinum*. Newfoundland does not have any native species in these plant genera. Ernst et al. (2007) did challenge adults on several novel wild hosts which do occur in Newfoundland. The lily leaf beetle larvae were successful in reaching the pupal stage on *Streptopus amplexifolius* (L.) DC. (Liliaceae) (Ernst et al. 2007). Other native (naturalised) Newfoundland plants that have tested positive as potential food plants by adults include: *Clintonia borealis* (Liliaceae), *Maianthemum canadense* Desf. (Asparagaceae), *Polygonatum* spp. (Asparagaceae), and *Solanum dulcamara* L. (Solanaceae) (Cox 2001; Ernst et al. 2007). Given that a number of Newfoundland plant species can serve as alternative food-plants for the dispersing adults, lily leaf beetles have the potential to increase their present limited range in Newfoundland. Although this species will remain a garden pest, it does not pose a threat to native plant species at this time.

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