

NOTE

Introduced leaf beetles of the Maritime Provinces, 1:
Sphaeroderma testaceum (F.) (Coleoptera: Chrysomelidae)

Sphaeroderma testaceum (F.), reported from three localities in Nova Scotia by Hoebeke and Wheeler (2003), is the most recent of a long series of Old World beetles that have been introduced to North America through Nova Scotia and Atlantic Canada. Seaports offer many opportunities for such introductions and this region has a long history of commercial traffic. Some introduced species have spread little whereas others have used their foothold in Atlantic Canada as a springboard to spread to other portions of the continent. In some cases it is clear where and when the introductions were made; in other instances, specific evidence is lacking or is speculative (Majka and Klimaszewski 2004).

In 1997 (August 1, August 26, and September 17) while sweep-netting in an old field adjacent to the Nova Scotia Department of Natural Resources Insectary in Shubenacadie, Colchester County, Nova Scotia, Jeffrey Ogden collected 10 specimens of what proved on subsequent examination to be *Sphaeroderma testaceum* (Nova Scotia Department of Natural Resources Insectary, Shubenacadie, Nova Scotia, Canada) (Fig. 1). Hoebeke and Wheeler (2003) reported the species on Canada thistle (*Cirsium arvense* (L.) Scopoli) from collections made in 2001 and 2003 at Bible Hill, Antigonish, and New Glasgow in Nova Scotia (Cornell University Insect Collection, Ithaca, New York, USA). C. G. Majka subsequently collected *S. testaceum* along Highway 104, 3 km southeast of Kemptown, Colchester County (August 20, 2002) and near Pratts Lake, Colchester County (July 23, 2004). In 2005 more extensive sweep-netting surveys were undertaken and specimens were collected from Milford Station (July 26, 2005), Elmsdale (August 22, 2005), and Enfield (August 22, 2005) all in Hants County, and from

Bedford, Halifax County (August 22, 2005) (C. G. Majka Collection, Halifax, Nova Scotia, Canada). Thistle stands at other sites in Nova Scotia, New Brunswick, and Prince Edward Island were also surveyed but no specimens of *S. testaceum* were found (Fig. 2).

All the specimens collected have been on Canada thistle. Stands of Bull thistle (*Cirsium vulgare* (Savi) Tenore) and Swamp Thistle (*C. muticum* Michx.) were also swept but to date *S. testaceum* has not been found on either plant. Known host plants of *Sphaeroderma* are *Carduus*, *Cirsium*, *Onopordum*, *Carlina*, *Serratula*, and *Cynara* (Clark et al. 2004). Of these, *Carduus crispus* L., *Cirsium vulgare*, *C. muticum*, *C. palustre* (L.) Scop., and *C. arvense* occur in Nova Scotia (Roland 1998). Individuals were observed moving on the stalks of *Cirsium*. When disturbed, they would spring weakly, retract their legs, and feign death. The only other beetle found to be consistently associated with *S. testaceum* on this host was *Cassida rubiginosa* Müller, another adventive chrysomelid which also feeds on *Cirsium*.

At two sites (Enfield and Elmsdale) quantitative sampling was carried out to establish an index of *S. testaceum* abundance. Areas of thistle stands were measured and carefully swept. While not all specimens present would necessarily have been captured, the approach establishes a minimum level of abundance. At Enfield 0.24 individuals/m² were found while at Elmsdale abundance was 0.22 individuals/m².

The question arises as to how this species made its way to Nova Scotia. *Cirsium arvense* is Eurasian in origin and has been deliberately or inadvertently introduced to North America. *Sphaeroderma testaceum* would appear to have been introduced to the province in association



Fig1. Habitus photograph of *Sphaeroderma testaceum* (F.).

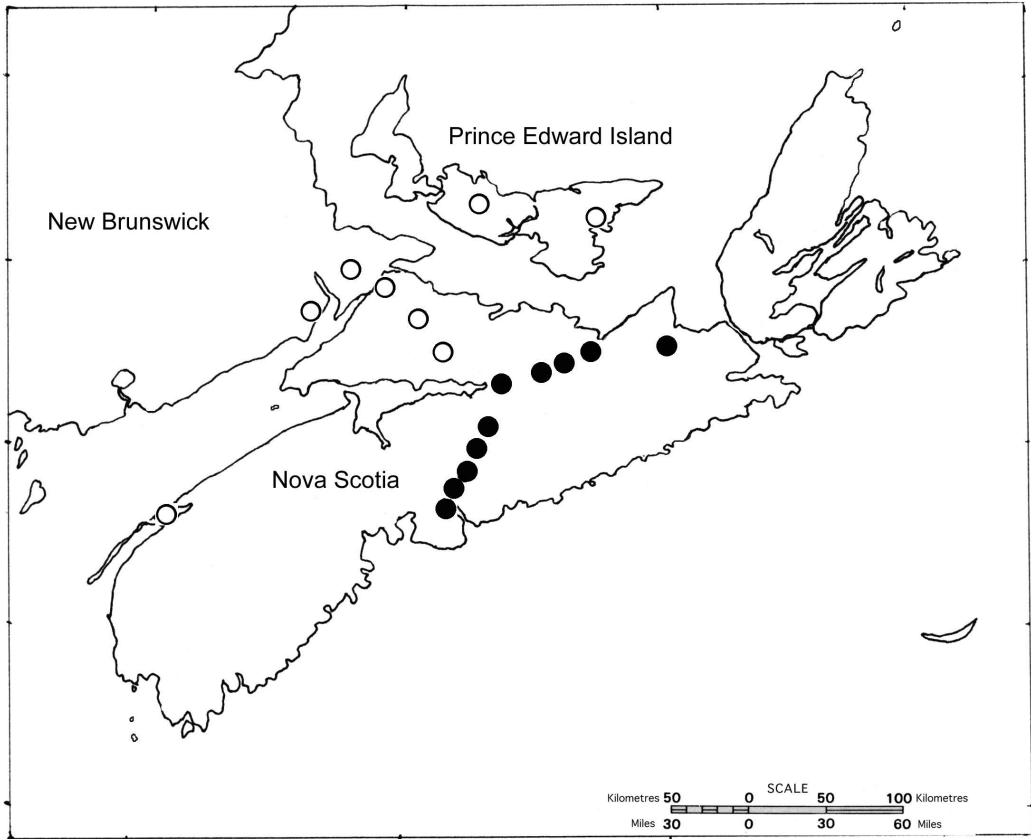


Fig 2. Distribution of *Sphaeroderma testaceum*. Closed circles indicate localities where the species has been found. Open circles indicate localities where thistle stands were examined for *S. testaceum* but no specimens were found.

with its importation. *Cirsium arvense* is considered one of the world's worst weeds (Holm et al. 1977, McClay et al. 2002) and is a serious pest in Nova Scotia where it is found throughout the province (Roland 1998). In this context, Hoebeke and Wheeler (2003) raised the possible biocontrol potential of *S. testaceum*.

To date *S. testaceum* has only been found along major transportation corridors. The line of points plotted in Fig. 2 follows Highway 102 (the main arterial route leading from Halifax as well as the Canadian National Railways line leading from the port of Halifax) from Bedford Basin (at the head of Halifax Harbour) to Truro and thence eastward along the Highway 104 (the trans-Canada Highway) to Antigonish. Every

thistle stand examined in this corridor yielded specimens of *S. testaceum*. Westward from Truro along Highway 104, and in other parts of Nova Scotia, New Brunswick, and Prince Edward Island, no specimens have been found. At present *S. testaceum* would appear to be confined to an area in the north-central mainland of the province. The pattern of distribution might be indicative of an introduction through the port of Halifax with a subsequent spread along the Highway 102 and 104 transportation corridors. Majka and Klimaszewski (2004) discuss eleven species of adventive beetles known to have been introduced to North America through the port of Halifax. Species such as *Meligethes viridescens* (F.) have subsequently spread from there to a

large number of other localities in Nova Scotia and Prince Edward Island (Mason et al. 2003).

This introduction appears to have taken place relatively recently. Since 1986 staff of the Nova Scotia Department of Natural Resources Insectary (based in Shubenacadie, NS) have regularly collected and monitored Coleoptera populations in Colchester, Antigonish, Hants, and Pictou Counties, including some of the locations where *S. testaceum* has been found, yet no specimens of *S. testaceum* were found prior to 1997. Thus, the recent appearance of this species and the current extent of its distribution in the province raise the possibility that it is rapidly expanding its range along traffic corridors where *Cirsium arvense* grows.

Sphaeroderma testaceum is a recent addition to the lengthy catalogue of species introduced to the continent through Atlantic Canada. The beetle fauna of Nova Scotia, in particular, includes 329 introduced species, or 14.6% of its total beetle fauna including 23 species of Chrysomelidae (C. Majka, unpublished data). While some, such as *S. testaceum*, *Chrysolina hyperici* (Förster), and *Aphthona cyparissiae* (Koch) are considered to be beneficial species, others such as *Pyrrhalta viburni* (Paykull), *Lilioceris lili* (Scopoli), *Crioceris duodecimpunctata* (L.), *C. asparagi* (L.), *Oulema melanopus* (L.), and *Meligethes viridescens* (F.) are potentially serious pests. Although shipping and inspection practices now are more rigorous than they were prior to 1965 when quarantine restrictions on soil and plant material were imposed (Spence and Spence 1988), such introductions continue because exchanges and importations are considerably more frequent than in the past.

In Nova Scotia, recent programs by the Canadian Food Inspection Agency (CFIA) to exterminate the introduced *Tetropium fuscum* (F.) and *Popillia japonica* Newman have cost millions of dollars, generated tremendous public controversy, and significantly disrupted forestry and horticultural practices (LeBlanc 2002, Ma-

jka and Klimaszewski 2004). Continued vigilance is warranted lest other such inadvertent introductions result in unplanned environmental consequences.

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LITERATURE CITED

- Clark, S.M., D.G. LeDoux, T.N. Seeno, E.G. Riley, A.L. Gilbert, and J.M. Sullivan. 2004. Host Plants of Leaf Beetle Species Occurring in the United States and Canada. Coleopterists Society, Special Publication No. 2. Athens, GA. 476 pp.
- Hoebeker, E.R. and A.G. Wheeler Jr. 2003. *Sphaeroderma testaceum* (F.) (Coleoptera: Chrysomelidae), a Palearctic flea beetle new to North America. Proceedings of the Entomological Society of Washington 105: 990–994.
- Holm, L.G., D.L. Plucknett, J.V. Pancho, and J.P. Herberger. 1977. The World's Worst Weeds: Distribution and Biology. University of Hawaii Press, Honolulu. 609 pp.
- LeBlanc, N. 2002. CFIA program to eradicate Japanese beetle in Halifax. Canadian Food Inspection Agency news release, March 25, 2002. Available from <http://www.inspection.gc.ca/english/corpaffr/newcom/2002/20020325e.shtml> (accessed 19 August 2005)
- Majka, C.G. and J. Klimaszewski. 2004. *Phloeocharis subtilissima* Mannerheim (Staphylinidae: Phloeocharinae) and *Cephennium gallicum* Ganglbauer (Scydmaenidae) new to North America: a case study in the introduction of exotic Coleoptera to the port of Halifax, with new records of other species. Zootaxa 781: 1–15.
- Mason, P.G., O. Olfert, L. Sluchinski, R.M. Weiss, C. Boudreault, M. Grossrieder, and U. Kuhlmann. 2003. Actual and potential distribution of an invasive canola pest, *Meligethes viridescens* (Coleoptera: Nitidulidae), in Canada. Canadian Entomologist 135: 405–413.
- McClay, A.S., R.S. Bouchier, R.A. Butts, and D.P. Peschken. 2002. *Cirsium arvense* (L.) Scopoli, Canada thistle (Asteraceae), pp 318–330. In Mason, P.G. and J.T. Huber (eds.), Biological Control Programmes in Canada, 1981–2000. CABI Publications, Wallingford, U.K.

- Roland, A.E. 1998. Roland's Flora of Nova Scotia (revised by M. Zinck). Nimbus Press and Nova Scotia Museum, Halifax, Nova Scotia. 1,297 pp.
- Spence, J.R. and D.H. Spence. 1988. Of ground-beetles and men: introduced species and the synanthropic fauna of western Canada. *Memoirs of the Entomological Society of Canada* 144: 151–168.

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