

Asciodema obsoleta (Hemiptera: Miridae): New Records for British Columbia and First U.S. Record of an Adventive Plant Bug of Scotch Broom (*Cytisus scoparius*; Fabaceae)

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ABSTRACT

The European plant bug *Asciodema obsoleta* (Fieber) develops mainly on Scotch broom, *Cytisus scoparius* (L.) Link; it is one of several broom insects that apparently have been introduced to North America with shipments of nursery stock. This mirid first was reported in North America from British Columbia (Vancouver, Vancouver Island, Bowen Island) in 1966, but no additional records have been published. Based on specimens in BC museums and our recent field work, we extend the previously recorded BC distribution of *A. obsoleta* and provide the first U.S. record: Washington State (Point Roberts, Whatcom County).

Key Words: Canada, Palearctic immigrant, distribution, new U.S. record, *Laburnum anagyroides*, host plants

INTRODUCTION

Scotch broom (hereafter broom), *Cytisus scoparius* (L.) Link; Fabaceae, is a genistoid legume (tribe Genisteae, subfamily Faboideae) native to central and southern Europe. Introduced to coastal British Columbia as an ornamental in the 1850s, the plant became naturalized, mostly along or near roadsides on the Lower Mainland, Vancouver Island, and some Gulf Islands. Although broom no longer is planted along BC highways for ornament and slope stabilization, it has become sufficiently invasive in the Pacific Northwest to hinder reforestation and threaten native biodiversity, particularly in Garry oak and grassland ecosystems (Zielke *et al.* 1992, Peterson and Prasad 1998, Coombs *et al.* 2004, Haubensak and Parker 2004). Biological control efforts began in the 1950s, and several European insects of broom began to be released in the 1960s in California, Oregon, and Washington (Andres and Coombs 1995, Coombs *et al.* 2004).

Insects of broom are especially well known in England. From the mid-1950s to the mid-1960s, broom insects were studied intensively at Silwood Park (near Ascot, Berkshire, SW of London) by J.P. Dempster, O.W. Richards, N. Waloff and others at

Imperial College, London. Among the 35 insects consistently found on broom were 13 species of Hemiptera. Particular attention was given to the bionomics of the mirids *Asciodema obsoleta* (Fieber), *Heterocordylus tibialis* (Hahn), *Orthotylus adenocarpi* (Perris), *O. concolor* (Kirschbaum), and *O. virescens* (Douglas and Scott) (Waloff and Southwood 1960, Dempster 1964, Waloff 1968). The *Orthotylus* species and *H. tibialis* (subfamily Orthotylinae) essentially are restricted to broom, whereas *A. obsoleta* (subfamily Phylinae) also develops on gorse (*Ulex europaeus* L.), another genistoid legume. All five mirids are univoltine and overwinter as eggs, with their oviposition sites not overlapping substantially. Eggs hatch sequentially from March (sometimes April) to mid-June; adults first appear from about mid-May to mid-July, and, although all species can be found concurrently on broom, their periods of peak abundance differ; and all are omnivores that feed on the host and arthropods such as aphids and psyllids (Waloff and Southwood 1960, Dempster 1964, Waloff 1968).

Three of the British broom Miridae—*A. obsoleta*, *O. concolor*, and *O. virescens*—were

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accidentally introduced into the Pacific Northwest, probably with imported nursery stock (Waloff 1966, Wheeler and Henry 1992). Both species of *Orthotylus* are recorded from British Columbia and Pacific U.S. states (Wheeler and Henry 1992), but published BC records of *A. obsoleta* have been limited to Waloff's (1966) original North American study. The earliest collection was from Vancouver (University of British Columbia campus), 6.vii.1959, by G.G.E. Scudder (Barnes *et al.* 2000). Syrett *et al.* (1999) erroneously attributed the first North American record of *A. obsoleta* to Downes (1957). Waloff (1966), during field work in June and July 1963, recorded *A. obsoleta* from Vancouver (UBC), Vancouver Island (near Victoria), and Bowen Island (Howe Sound

NW of Vancouver); surveys for the mirid in the Fraser Valley (and in California) were negative. Syrett *et al.* (1999) updated the status of European insects established on broom in the Pacific Northwest, noting that no new information was available for *A. obsoleta*.

Here we extend the known distribution of *A. obsoleta* in BC, report Washington State as the first U.S. record, and give golden chain tree (*Laburnum anagyroides* Medik.; Fabaceae) as a new host record. We use the name *A. obsoleta* rather than *A. obsoletum* because the genus *Asciodema*, considered neuter by Steyskal (1973), is considered feminine in the most recent world (Schuh 1995) and Palaearctic (Kerzhner and Josifov 1999) catalogs of the Miridae.

MATERIALS AND METHODS

We collected *A. obsoleta* in late June of 2010 and 2011 during efforts to update the distributions of European Hemiptera of broom in the Pacific Northwest (Wheeler and Lattin 2008, Hoebeke and Wheeler 2010, Wheeler and Hoebeke 2012). The mirid was collected into small plastic vials after broom was swept or its branches were beaten over a shallow net. In June of both years *A. obsoleta* dominated the plant bug fauna of broom in BC. The only other mirid present as late instars and adults was *O. virescens*, whose eggs hatch later than those of *A. obsoleta* (Waloff and Southwood 1960). Nymphs of *A. obsoleta* could be separated in the field from those of *O. virescens* by their darker color, the indistinct opening of the dorsal abdominal scent gland, and overall different Gestalt of the late instars.

Under magnification, the parempodia (= arolia) of *A. obsoleta* appear hairlike (setiform) rather than fleshy and apically convergent, as in *O. virescens*. Fourth or fifth instars (n = 5) identified in the field as *A. obsoleta* and reared to adulthood all proved to be that species; similarly, the identity of two fifth instars of *O. virescens* was confirmed through rearing. All collections presented below (Specimens examined) were made by the authors and, unless noted otherwise, *Cytisus scoparius* was the host plant. Nymphs are recorded only by the instars observed, e.g., IV–V. Voucher material of *A. obsoleta* is deposited in the Cornell University Insect Collection (Ithaca, NY) and the National Museum of Natural History, Smithsonian Institution (Washington, DC).

RESULTS AND DISCUSSION

Museum records. Several unpublished records of the mirid are available, based on specimens in the Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, ON (CNC); Royal British Columbia Museum, Victoria, BC (RBCM); and Spencer Entomological Collection, Beaty Biodiversity Centre, University of British Columbia, Vancouver, BC (UBC): *Lower Mainland*: Burnaby Lake, Burnaby, 9.vii.1998, D.J.M. Quiring, 1♀ (CNC); Vancouver, 7.vii.1977, J.A. van

Reener, 5♀ (UBC); *Southern Gulf Islands*: Galiano Island, north end, 24.vi.1989, G.G.E. Scudder, *Cytisus scoparius*, 1♂; *Vancouver Island*: Jordan River, 27.vii.1988, G.G.E. Scudder, *C. scoparius*, 1♂; 19 km E of Jordan River, 27.vii.1988, G.G.E. Scudder, *C. scoparius*, 1♀ (CNC); Metchosin, Camas Hill summit, 29.viii.–5.ix.1999, L. & C. Rosenblood, 1♂, 9♀ (RBCM).

Field surveys. On the Lower Mainland of BC, we found *A. obsoleta* in the Greater (Metro) Vancouver area (Delta, Langley,

Lions Bay, Surrey, and West Vancouver) as far south as the Tsawwassen community of Delta; the plant bug also was found north of Vancouver at Squamish and east in the Fraser Valley at Deroche. Additional field work probably would show that the mirid is established farther north and east of Vancouver than is indicated by our limited sampling. Collections on Vancouver Island were made from Victoria to just north of Ladysmith. The first U.S. record is based on the collection of late instars and adults at Point Roberts, a small area (~12.7 km²) of Washington State (Whatcom Co.) that is cut off from the mainland.

We sampled broom on nearly the same dates in both years: 26-30.vi.2010 and 22-28.vi. 2011. Populations might have been slightly advanced in 2010, with more adults, few of which were teneral, and fewer late-instar nymphs compared with 2011. Earlier instars (II-III) were observed only in 2011 at two sites north of Vancouver. The presence of fifth instars and teneral adults on golden chain tree (*Laburnum anagyroides*), another genistoid legume, suggests that this small Palearctic tree can serve as a host plant. At all three sites where *A. obsoleta* was found on *L. anagyroides*, broom was present within 100 m. More field work is needed to determine whether the mirid can complete its development on *Laburnum* and if this plant association persists.

Specimens examined. CANADA: British Columbia, Abbotsford, 49°02.387'N 122°16.306'W, 26.vi.2011, 3♂, 5♀, IV-V; Abbotsford, 49°03.609'N 122°17.177'W, 27.vi.2011, 6♂, 2♀, IV-V; Delta, nr Boundary Bay Airport, 49°04.938'N 123°00.096'W,

27.vi.2010, 2♀; Delta, Ladner, 49°05.413'N 123°02.618'W, 27.vi.2010, 3♂, 5♀, V; Delta, Tsawwassen Ferry Causeway, 49°01.400'N 123°06.293'W, 22-23.vi.2010, 4♂, V; Deroche, 49°11.454'N 122°04.062'W, 26.vi.2011, IV-V; Langley, 200th St. & 56th Ave., 49°06.454'N 122°40.143'W, 28.vi.2011, 2♂, 1♀, IV-V; Lions Bay, 49°27.211'N 123°14.253'W, 27.vi.2011, 1♂, IV-V; E of Mission, River Rd. S of Rt. 7, 49°08.919'N 122°11.018'W, 26.vi.2011, IV-V; Porteau Point, Rt. 99, 49°32.711'N 123°14.430'W, 27.vi.2011, II-IV; Squamish, 49°41.968'N 123°09.067'W, 27.vi.2011, III-V; Surrey, Guildford, 100th Ave. nr 140th St., 49°10.994'N 122°50.195'W, 26.vi.2010, 2♂, 14♀, V; Surrey, 16th Ave. & 192nd St., 49°01.871'N 122°41.552'W, 28.vi.2011, 1♂, IV-V; Vancouver Island, Chemainus, 48°55.701'N 123°43.257'W, 30.vi.2010, 1♂, 2♀ ex *Laburnum anagyroides*; Vancouver Island, Ladysmith, Transfer Beach Park, 48°59.352'N 123°48.552'W, 30.vi.2010, 1♂, 2♀, V; Vancouver Island, Rt. 1, 5 km N of Ladysmith, 49°02.293'N 123°51.938'W, 28.vi.2010, 2♂, 6♀; Vancouver Island, Saanich, Mount Tolmie Park, 48°27.449'N 123°19.375'W, 29.vi.2010, 5♂, 5♀; Vancouver Island, Victoria, Burnside Rd. W & McKenzie Ave., 48°27.741'N 123°24.172'W, 29.vi.2010, 4♂, 5♀, V ex *L. anagyroides*; West Vancouver, Eagle Harbour, Westport Rd., 49°21.627'N 123°15.463'W, 28.vi.2010, 5♂, 1♀, V ex *L. anagyroides*; West Vancouver, Marine Dr., Whytecliff Park, 49°22.297'N 123°17.426'W, 28.vi.2010, 5♀. UNITED STATES: Washington, Whatcom Co., Point Roberts, 48°58.811'N 123°04.209'W, 24.vi.2011, 3♂, 1♀, IV-V.

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