

## FIRST RECORDS OF THE INVASIVE PEST, *HALYOMORPHA HALYS* (HEMIPTERA: PENTATOMIDAE), IN ONTARIO AND QUEBEC

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### Scientific Note

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*Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae), the Brown Marmorated Stink Bug (BMSB) also known as the East Asian Stink Bug, is an agricultural pest native to China, Japan, Korea, and Taiwan that was first collected in North America in 1996 at Allentown, Pennsylvania, though the first published report was in 2001 (Hamilton 2003; Hoebeke and Carter 2003; Smith and Whitman 2007). BMSB is now almost ubiquitous in the USA where its pest status has dramatically increased – a considerable change in its status since it was first reported as an over-wintering nuisance (Smith and Whitman 2007). For Canada, the first official report of BMSB was from Balzac, AB (Bercha 2008). In late fall and early winter, 2010, we received two specimens for identification. The senior author identified both as *Halyomorpha halys*. Here we report these and other specimens intercepted in late 2010 as the first occurrences of BMSB in Ontario and Quebec. All the specimens are deposited in the Canadian National Collection of Insects, Arachnids and Nematodes (CNC), the Canadian Food Inspection Agency collection (CFIA) in Ottawa and the Department of Entomology, Guelph University (DEBU).

**CANADA. British Columbia:** Burnaby, 18.xi.2010, originating in Virginia on *Populus* lumber (4 adults, CFIA #10-07116); Vancouver, intercepted xi.2008 from China, Tianjin, Xingang via Busan, Korea (1 adult, CNC). **Ontario:** Hamilton, xii 2010, D. Wells, collected on a living room curtain in a private residence (1 adult, CNC); 6.x.2010, collected indoors (1 adult, CFIA #11-392); 10.vi.2011, inside private residence, homeowner reported seeing insects previously indoors and on garden tomatoes (1 adult, CFIA); 29.ix. private residence, specimen observed flying into home via ninth floor balcony (1 adult, DEBU); 18.xi, private residence, several adults in window AC unit (DEBU). Ottawa, collected 5.x.2011 from a car arriving from at a private residence in Virginia: Rappahannock Co., Washington, J. and C. Brown, (2 adults, CNC) and intercepted 15.x.2010 in spa sheets originating from New Jersey (6 adults, CFIA #10-06657). **Quebec:** Montreal x.2010, collected near a skid from USA (1 adult, CNC).

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The method of arrival into Canada of the Hamilton specimens is unknown. They may have migrated on their own from the USA or may have been accidentally transported in vehicles. The remaining specimens show how far and how easily BMSB may be passively transported by human activity to or within North America.

Adults of BMSB are about 14–17 mm long and 8 mm wide and generally brown with darker longitudinal streaks on the pronotum. Dorsally, the head, pronotum, scutellum, and hemi-elytra are densely covered with small brown pits on a whitish background (Figure 1). When the fore wings are spread each hemi-elytron is seen to have a distinct reddish tinge. The lateral margins of the abdomen have alternating whitish and black areas, iridescent green in certain lights. Ventrally, the body is paler in colour, with sparser brown pits distributed mostly laterally, and with transverse brown areas on each abdominal segment (Figure 1). Each tibia has a poorly defined white median band. The colour pattern on the two apical antennal segments is diagnostic for BMSB (Hoebecke and Carter 2003; Welty et al. 2008; Jones and Lambdin 2009)—the penultimate antennal segment is white basally and apically, and the apical segment is white basally so that the apical white band of the penultimate segment and basal band of the apical segment appear as a single band.

Nymphs and adults of BMSB feed on a wide range of crops including vegetables, fruit trees, woody ornamentals and some forest trees (Hoebecke and Carter 2003; Nielsen and Hamilton 2009). Adults generally feed on fruits whereas nymphs feed on leaves, stems and fruits. The pale green, barrel-shaped eggs are usually found in clusters of 20–30 (Hamilton 2003; Welty et al. 2008; Jacobs 2011) and hatch after about one week. The nymphs are small, oval-shaped, yellowish brown and mottled with white. Nymphs pass through five stages of one week each. Leaf damage is characterized by small lesions of about 3 mm in diameter which may then become necrotic and coalesce. Fruit damage is often in the form of small grooves, brown discoloration and necroses. Secondary damage may occur when other invertebrates or micro-organisms take advantage of the lesions and aggravate the BMSB damage.

Adult BMSB are strong fliers and highly mobile, and consequently are capable of spreading rapidly on their own. They are found in homes during their search for overwintering sites but are harmless to humans and pets. They can become a nuisance when large numbers invade homes or land on building walls; penetration into homes is usually via structural openings and mostly around doors and windows. Sealing all cracks and crevices in outside walls of the home will help reduce entry (Day et al. 2011). Changing exterior lighting to yellow bulbs or sodium vapor will reduce their attractiveness to buildings. Control in agricultural crops remains a challenge. Although some active ingredients that control other stink bugs may also work against BMSB, research is needed to screen insecticides for effectiveness. In North America no natural enemies have yet been reported. In Asia, BMSB populations are kept in check by *Trissolcus* sp. (Hymenoptera: Scelionidae) (Arakawa and Namura 2002), which parasitize the eggs. Yang et al. (2009) described a new species from China, *T. halyomorphae* Yang, with parasitism rates of up to 70% on eggs of BMSB.

A comprehensive survey for BMSB in agricultural areas is needed because of the potential threat of BMSB as a serious invasive pest in Canada.



FIGURE 1. Brown Marmorated Stink Bug, *Halyomorpha halys* (Stål)(Pentatomidae), dorsal and ventral views. Arrows indicate diagnostic features.

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