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SCIENTIFIC NOTE

First record of *Xylosandrus compactus* (Eichhoff) (Coleoptera: Curculionidae: Scolytinae) on soursop, *Annona muricata* L. (Annonaceae) in Brazil, with a list of host plants

Xylosandrus compactus (Eichhoff), the black twig borer, is an ambrosia beetle (Coleoptera, Curculionidae, Scolytinae) of the tribe Xyleborini. *Xylosandrus* beetles are relatively easily distinguished from related genera, such as *Ambrosiodmus*, *Xyleborinus* and *Xyleborus*, by their stout body, non-contiguous procoxae and truncate elytral declivity (Atkinson *et al.* 1988). *Xylosandrus compactus* females are 1.4–1.7 mm long, *ca.* twice as long as wide, and very dark brown to almost black in color. Males are smaller, dwarfed, convex (Wood 1982) and flightless, as are other Xyleborini males (Atkinson *et al.* 1988).

The black twig borer is probably native to southeast Asia (Brader 1964), but now has a pantropical distribution (Browne 1968). This beetle has been known to occur in Brazil for over 20 years (Wood 1982), where it is distributed over a large area. It has been recorded for the states of Santa Catarina (Müller and Andreiv 2004), Bahia (Matiello *et al.* 1999), Pará (Couturier *et al.* 1999), Amazonas (Carvalho *et al.* 1999), Mato Grosso (Dorval *et al.* 2004), Espírito Santo and São Paulo (Flechtman unpub.). Despite this, the Brazilian Ministry of Agriculture (Ministério da Agricultura, Pecuária e Abastecimento, MAPA) still considers *X. compactus* to be a quarantine plague A1 (Brasil 1999), *i.e.*, still not present in the country, which hence seems to be inaccurate.

Considering that male *X. compactus* are flightless (Atkinson *et al.* 1988), only females initiate infestation of host plants (Mangold *et al.* 1977). They search for usually small-diameter twigs of their host plants to attack, and entrance tunnels are started typically on the underside of the twigs (Ngoan *et al.* 1976). The gallery system has a radial tunnel that leads to an irregular chamber, where eggs are laid in loose clusters (Ngoan *et al.* 1976; Beaver 1988).

Unlike the majority of ambrosia beetles, the black twig borer infests healthy plants (Hara and Beardsley 1979). This species is very polyphagous, and hundreds of host species have been reported, mostly tropical, in many different families (Schedl 1962; Brader 1964; Hara and Beardsley 1979). Among these, several hosts are of economic importance, such as coffee (*Coffea arabica*), cacao (*Theobroma cacao*), mango (*Mangifera indica*), and avocado (*Persea americana*) among others. Even orchids (Schedl 1962; Wolfenbarger 1973; Ngoan *et al.* 1976) and ornamental shrubs and trees (Mangold *et al.* 1977; Wood 1982) are attacked. However, it appears more economic damage is inflicted in nurseries and young plantations (Ngoan *et al.* 1976; Meshram *et al.* 1993; Couturier *et al.* 1999). Infestation rates of up to 40% of saplings in nurseries have been reported (Couturier and Tanchiva 1991; Villachica 1996).

There is very little information available in the literature associating species of Scolytinae and their hosts in Brazil. Furthermore, reports of damage caused by these beetles are even more meager. The objectives of this communication are to report a new host for *X. compactus* in Brazil, to present a list of known hosts in this country, and to provide some information on the level of damage that the beetle causes.

A commercial nursery in Brasília, state of Distrito Federal, Brazil, received saplings of soursop, *Annona muricata* L. (Annonaceae), in June 2004. These saplings were around 40 cm in height, and were grown in Dona Euzébia, state of Minas Gerais, Brazil. Some 10 days after arrival, some saplings started to wilt and dry. Closer examination of these plants indicated the presence of 0.8 mm diameter holes at about 30 cm from the collar. Each hole led to a short tube which extended into a gallery oriented parallel to the axis of the plant. This gallery led to an irregular chamber, where larvae and adults of a beetle species could be found, as described by Ngoan *et al.* (1976) and Beaver (1988). The beetle was identified as *Xylosandrus compactus*. Voucher specimens were deposited in the Museu de Entomologia da FEIS/UNESP (MEFEIS), in Ilha Solteira, state of São Paulo, Brazil.

This is the first record of the black twig borer on *A. muricata* in Brazil. Worldwide, the black twig borer had already been recorded on *A. muricata* in Africa (Brader 1964) and Hawaii (Hara and Beardsley 1979).

Table 1. List of known host plants of *Xylosandrus compactus* (Coleoptera, Curculionidae, Scolytinae) in Brazil.

Species	Family	Reference
<i>Annona muricata</i> L.	Annonaceae	new record
<i>Bixa orellana</i> L.	Bixaceae	Silva and Souza 1994
<i>Carapa guianensis</i> Aubl.	Meliaceae	Carvalho <i>et al.</i> 1999
<i>Coffea canephora</i> Pierre. ex Froehner	Rubiaceae	Matiello <i>et al.</i> 1999
<i>Euterpe oleracea</i> Mart.	Palmae	Oliveira <i>et al.</i> 2002
<i>Khaya ivorensis</i> A. Chev.	Meliaceae	Carvalho <i>et al.</i> 1999
<i>Mangifera indica</i> L.	Anacardiaceae	Carvalho <i>et al.</i> 1999
<i>Matisia cordata</i> Humb. and Bonpl.	Bombacaceae	Carvalho <i>et al.</i> 1999
<i>Myrciaria dubia</i> (H.B.K.)	Myrtaceae	Couturier <i>et al.</i> 1999; Ribeiro <i>et al.</i> 2002
<i>Nephelium lappaceum</i> L.	Sterculiaceae	Carvalho <i>et al.</i> 1999
<i>Swietenia macrophylla</i> King.	Meliaceae	Carvalho <i>et al.</i> 1999
<i>Theobroma cacao</i> L.	Sterculiaceae	Mendes <i>et al.</i> 1979
<i>Theobroma grandiflorum</i> (Willd. ex Spreng.)	Sterculiaceae	Carvalho <i>et al.</i> 1999

There are 12 known hosts, in 8 different families, in Brazil; present records adds one new host species and a new family to the list (Table 1). When compared to the potential range of know hosts worldwide, the present list is modest, probably indicating more surveys and studies on the black twig borer in Brazil are needed, and not that in this country the host range of this beetle is narrow.

Symptoms of infestation were typical for this species on the soursop saplings (Kalshoven 1958; Hara and Beardsley 1979); plants wilted initially and, starting from the pinholes and progressing upward, all plant tissue eventually died. Attacked saplings below 20 cm in height usually died, and those which withstood attack underwent a delay in development and produced lateral shoots (Kalshoven 1958), which decreased their commercial value. About 80 % of the lot, composed of 200 plants, had to be disposed of, in order to prevent them from becoming the source for attacks on other sapling species in the nursery.

This report of *X. compactus* attacking saplings in a nursery underscores the importance of this species in such an environment. Of the 12 previously known hosts for this pest in Brazil, nearly half of them were registered in nurseries: *B. orellana* (Silva and Souza 1994), *E. oleracea*, *M. dubia* (Oliveira *et al.* 2002), *T. cacao* (Mendes *et al.* 1979) and *T. grandiflorum* (Carvalho *et al.* 1999). The beetles were inflicting damage of varied levels in these nurseries, but never as high as presently presented.

The owner of the nursery in Brasília noticed that, on the same date that attacked soursop saplings were found, some saplings of *B. orellana* died, displaying the same symptoms. Additionally, in September 2006 half of a total of 50 saplings of sugar apple, *Annona squamosa* L. (Annonaceae), coming from Irecê, state of Bahia, died with the same symptoms as those seen on soursop. On both occasions, there was no verification that *X. compactus* was responsible for the deaths of the saplings.

Considering *X. compactus* is an exotic species to Brazil, this present report is a clear example of the importance of humans in contributing to the spread of an insect species (Haack 2001); infested saplings were transported from Dona Euzébia to Brasília, a distance of over 800 km.

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