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XYLOSANDRUS CRASSIUSCULUS (MOTSCHULSKY), AN ASIAN AMBROSIA BEETLE RECENTLY INTRODUCED INTO FLORIDA (COLEOPTERA: SCOLYTIDAE)[1]

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INTRODUCTION: *Xylosandrus crassiusculus* (Motschulsky) (Coleoptera: Scolytidae) is a minute ambrosia beetle of Asian origin that was first detected in the continental U.S. near Charleston, South Carolina (Anderson 1974). It apparently has spread along the lower Piedmont region and coastal plain to North Carolina, Louisiana, Florida (Chapin and Oliver 1986, Deyrup and Atkinson 1987), and East Texas (Atkinson, unpublished) (Fig. 6). It was collected in western Florida in 1983 (Chapin and Oliver 1986), in southern Florida in 1985 (Deyrup and Atkinson 1987), and now is distributed throughout the state . In the Gainesville area it is abundant in urban, agricultural, and forested areas.

We recently observed damaging attacks on potted saplings of Shumard oak (*Quercus Shumardii* Buckl.) and Drake elm (*Ulmus parvifolia* Jacq. cv. Drake) in a commercial nursery in Gainesville. It has been reported as a pest of nursery stock and young trees in the Old World tropics (Browne 1961, Schedl 1962) and of peach trees in South Carolina (Kovach and Gorsuch 1985). It is a potentially serious pest of ornamentals and fruit trees throughout Florida.

DESCRIPTION: (Figs. 1-4). Like other species of the tribe Xyleborini, the head of *X. crassiusculus* is completely hidden by the pronotum in dorsal view, the antennal club appears obliquely cut, and the body is generally smooth and shining. *Xylosandrus* spp. are distinguished from related genera (*Xyleborus, Xyleborinus, Ambrosiodmus*) by the stout body, truncate elytral declivity, and non-contiguous procoxae. Female *X. crassiusculus* are 2.1-2.9 mm long, stout bodied; the mature color is dark reddish brown, darker on the elytral declivity. Males are much smaller than females (1.5 mm long) and very different in shape, with a radically reduced thorax, and a generally "hunch-backed" appearance. Males are flightless, like those of other xyleborines. *X. crassiusculus* is distinguished from related species in the southeastern U.S. by its large size (females of other species are 1.3-2.0 mm long), and the dull, densely granulate surface of the declivity (smooth and shining in other species). Larvae are white, legless, "C" shaped, and have a well developed head capsule. They are not distinguishable in any simple way from those of other Scolytidae or most Curculionidae.

SYNONYMS: *Phloeotrogus crassiusculus* Motschulsky, *Xyleborus crassiusculus* (Motschulsky), *Xyleborus semiopacus* Eichhoff , *Xyleborus semigranosus* Blandford, *Dryocoetes bengalensis* Stebbing, *Xyleborus mascarenus* Hagedorn, *Xyleborus okoumeensis* Schedl, *Xyleborus declivigranulatus* Schedl.

DISTRIBUTION: Native range probably tropical and subtropical Asia, widely introduced elsewhere. Currently found in equatorial Africa, India, Sri Lanka, China, Japan, Southeast Asia, Indonesia, New Guinea, South Pacific, Hawaii, Southeastern U.S. (Wood 1982, Kovach and Gorsuch 1985, Chapin and Oliver 1986, Deyrup and Atkinson 1987)

BIOLOGY: Females bore into twigs, branches, or small trunks of susceptible woody plants, excavate a system of tunnels in the wood or pith (Fig. 5), introduce the symbiotic ambrosial fungus, and produce a brood. Like other ambrosia beetles, they feed on ectosymbiotic fungi which they introduce into their tunnels and cultivate and not the wood and pith of their hosts. Eggs , larvae, and pupae are found together in the tunnel system excavated by the female. There are no individual egg niches, larval tunnels, or pupal chambers. It breeds in host material from 2-30 cm in diameter, although small branches and stems are most commonly attacked. Attacks may occur on apparently healthy, stressed, or freshly cut host material. High humidity is required for successful reproduction. Attacks on living plants usually are near ground level on saplings or at bark wounds on larger trees (Browne 1961, Schedl 1962). Females remain with their brood until maturity. Males are rare, reduced in size, flightless, and presumably haploid. Females mate with their brother(s) before emerging to attack a new host.

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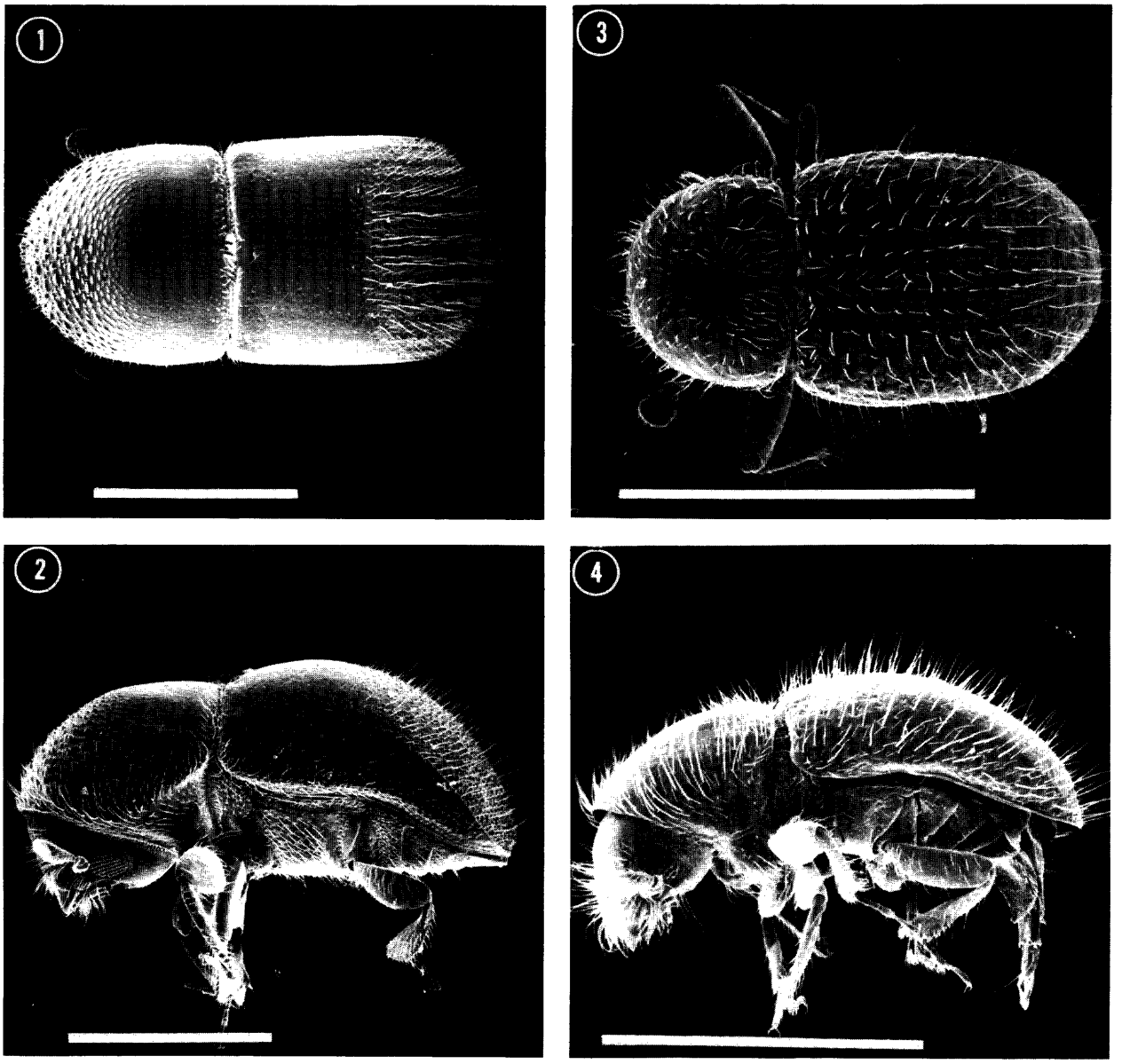
HOSTS: It is capable of breeding in a wide variety of hosts. Known hosts in the U.S. include peach, plum, cherry, persimmon, golden rain tree, sweet gum, Shumard oak, Chinese elm, sweet potato, and magnolia. Schedl (1962) listed 124 hosts, mostly tropical, in 46 families including coffee, cacao, mango, papaya, Australian pine, rubber, camphor, mahogany, tea, and teak.

Figs. 1-4. *X. crassiusculus.* 1) dorsal view, female ; 2) lateral view, female; 3) dorsal view, male; 4) lateral view, male. White line in each figure represents 1.0 mm.



DAMAGE: Large numbers of attacks were found in Shumard oaks along the lower 1m of stem in 3 m saplings with no other symptoms of disease, attack by other insects, or visible stress. Female beetles were boring into green, fresh, unstained portions of the stems. Visible symptoms included wilted foliage and strings of boring dust from numerous small holes. The large numbers of attacks apparently resulted in the death of the trees. Large Drake elm saplings showed isolated attacks on the lower stems which did not directly kill plants. Subsequently, large cankers formed at the site of attacks, in some instances, resulting in the death of trees by girdling. This type of damage is similar to that reported by Browne (1961) and Schedl (1962). Kovach and Gorsuch (1985) reported attacks on branches of apparently healthy young peach trees in coastal South Carolina.

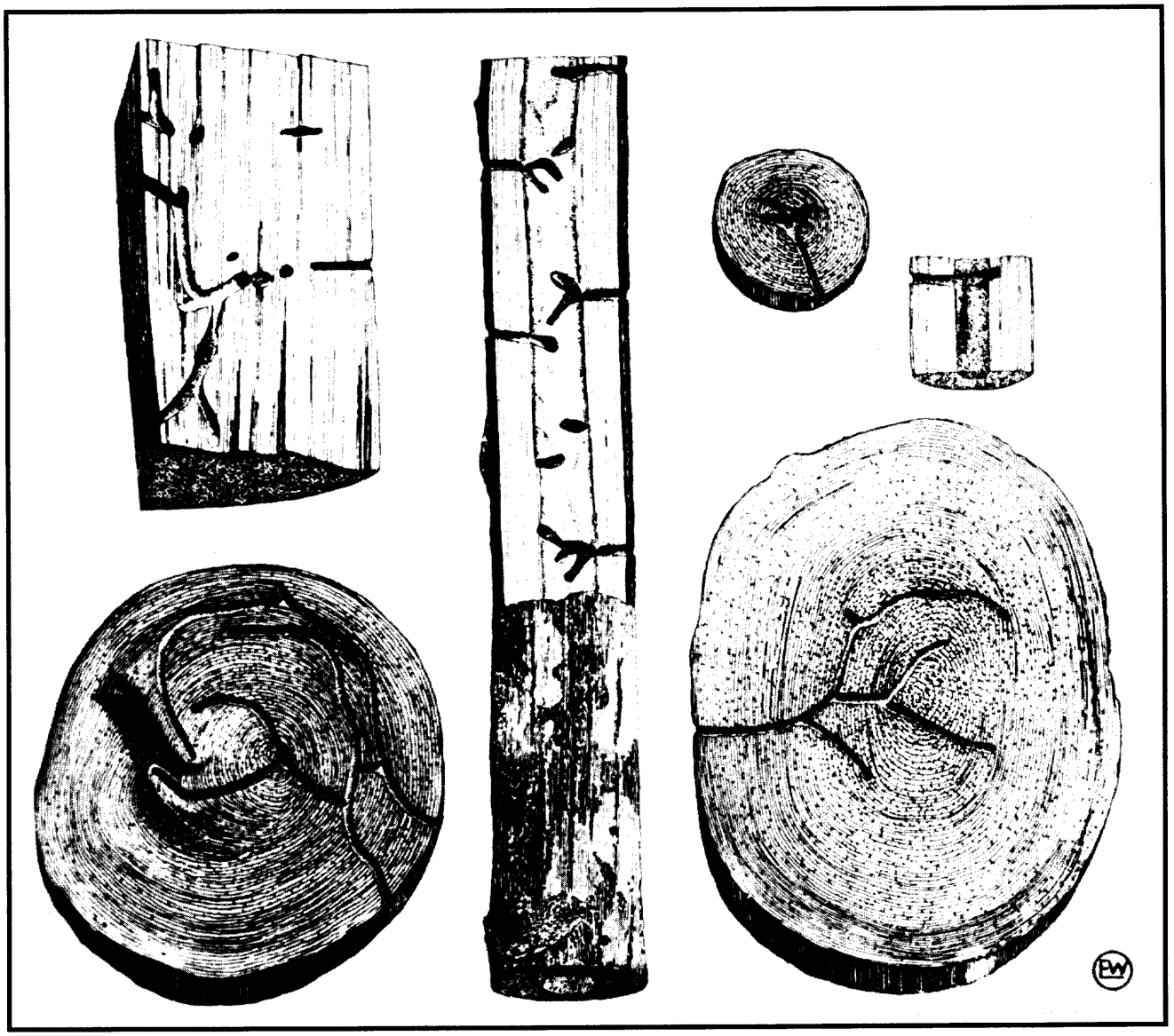


Fig. 5. Galleries of *X. crassiusculus* in different size host tissues. Taken from Schedl (1962).

CONTROL: Currently, no control methods are known. Lindane (0.25-0.5 %) generally is effective against most bark and ambrosia beetles. Chlorpyrifos (0.6 g a.i./ l water) is effective against the related *Xylosandrus compactus* (Mangold et al. 1977). If infestations occur, affected plants should be removed and burned and trunks of remaining plants should be treated with an insecticide and kept under observation. Any obvious conditions causing stress to trees should be corrected.

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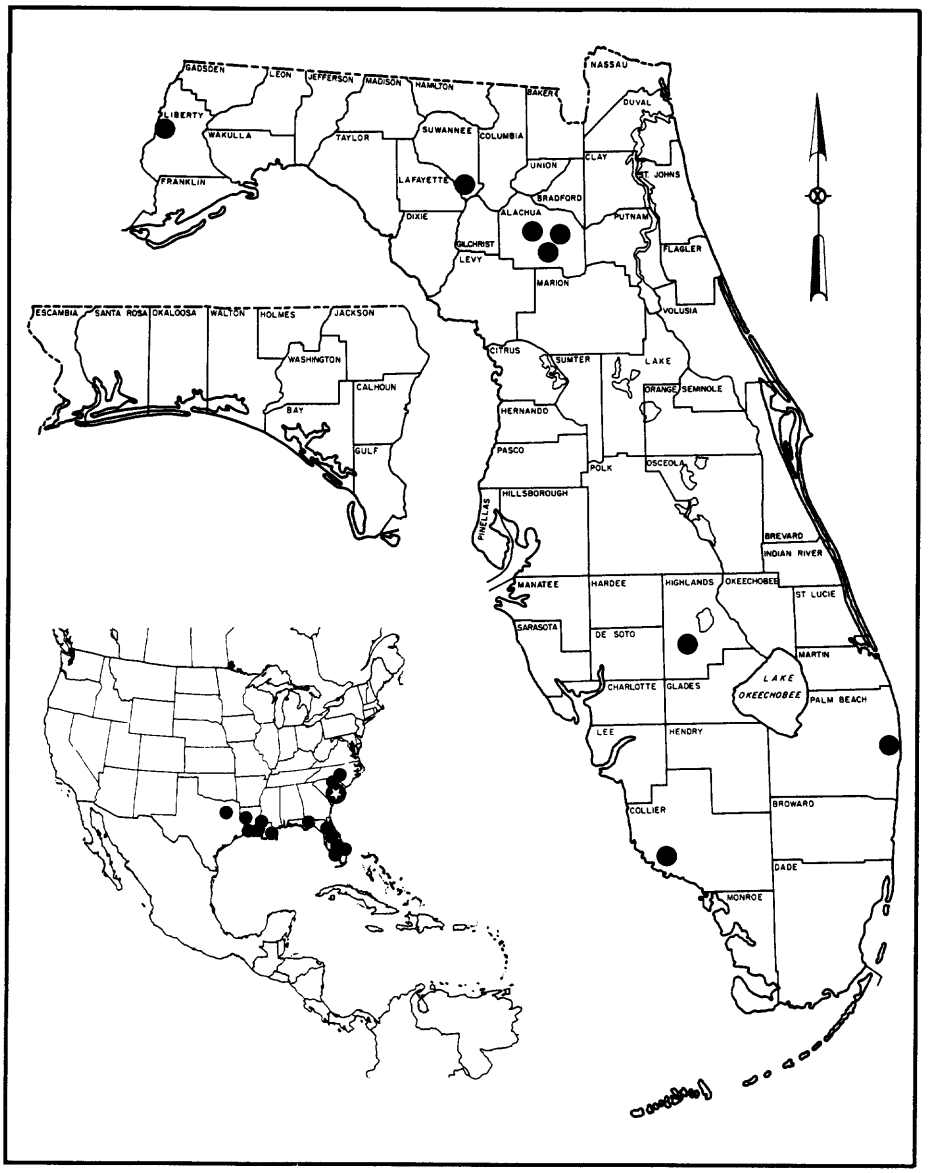

Fig. 6. Distribution of *X. crassiusculus* in Florida and the southeastern U.S. Star marks site of initial detection

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