PROC. ENTOMOL. SOC. WASH.
104(4), 2002, pp. 1058–1060

NOTE

Two Species of Western North American *Hylesinus* Fabricius (Coleoptera: Scolytidae) New to the Eastern United States

Historically, there have been three species of ash bark beetles, *Hylesinus* Fabricius, reported from the eastern United States: *Hylesinus aculeatus* Say, *H. fasciatus* LeConte, and *H. pruinosus* Eichhoff (Wood and Bright 1992). The eastern ash bark beetle, *H. aculeatus,* is a relatively common species infesting recently cut trees or those weakened by injury, disease or fire (Solomon 1995). Adults construct galleries in the bole or large branches of host trees in the genus *Fraxinus.* The biologies of *H. fasciatus* and *H. pruinosus,* although less well known, are similar to *H. aculeatus* (Solomon 1995, Wood 1982). *Hylesinus californicus* (Swaine) and *H. criddlei* (Swaine) are known from western and mid-western North America, respectively (Wood and Bright 1992). This note reports the first occurrence of these two species in the eastern United States.

Hylesinus californicus.—In the spring of 1999, adult *Hylesinus* were found boring into the bases of leaf petioles and constructing egg galleries in 1 to 3 year old twigs of healthy green ash, *Fraxinus pennsylvanica* Marshall, in suburban Maryland (Anne Arundel County, Linthicum, 9 July 1999). This behavior is atypical of the eastern species of *Hylesinus.* Beetles were collected and compared with specimens at the National Museum of Natural History, Smithsonian Institution, Washington D.C., and identified as *H. californicus* (this identification was later confirmed by Don Bright, Agriculture Canada, Ottawa). This is the first record of this species east of the Mississippi River.

In 2000, additional *H. californicus* were found infesting green ash in the Baltimore-Washington area (Anne Arundel Co., Glen Burnie, 20 July; Prince George's Co., Bowie, 2 June). In Bowie, green ash is a common landscape tree that has shown signs of decline for the past decade. When these trees were examined in 2000, many had evidence of past *H. californicus* attack in the portions of crowns with dieback. During 2001, additional evidence of *H. californicus* infestations was found in nursery stock (Montgomery Co., Ashton, September) and landscape trees (Baltimore City, July).

Hylesinus californicus is an occasional pest of green ash in the upper great plains of the United States and Canada (Langor 1994, McKnight and Aarhus 1973) and in California (Doane 1923). In Calgary, Alberta, Canada, a severe infestation of green ash occurred from 1987–1990 coincident with a drought in the area (Langor and Hergert 1993). In California, this species occasionally is a pest of olive trees (Essig 1917). Langor and Hergert (1993) give a detailed account of the life history and behavior of *H. californicus* in Alberta. Wood and Bright (1992) report the distribution of *H. californicus* as: USA: Arizona, California, Colorado, Montana, New Mexico, Oklahoma, Oregon, Texas, and Utah; Canada: Manitoba and Saskatchewan.

Although similar in appearance, *H. aculeatus* and *H. californicus* can be distinguished by the characters given in Table 1.

Hylesinus criddlei.—The reported range of *H. criddlei* is the upper mid-western United States (Colorado, Iowa, Illinois, Kansas, Michigan, Minnesota, Montana, North Dakota, and South Dakota) and Canada (Manitoba, Ontario, Quebec, and Saskatchewan) (Wood and Bright 1992). Hosts are listed as *Fraxinus pennsylvanica* and *F. americana* L. Very little is known of the biology of this species. McKnight and Aarhus (1973) report that *H. criddlei* adults often attack branches previously attacked by *H. californicus.*

Table 1. Characters used to distinguish *H. aculeatus* and *H. californicus*

Character	*Hylesinus aculeatus*	*Hylesinus californicus*
Male frons	Shallow, transversely impressed	Concave to upper level of eyes, with a smooth raised area
Female frons	Convex with a slight vertical carina	Convex with a distant vertical carina
Antenna	3 sutures visible, 3rd angulate	2 sutures visible
Propleuron	Setae hair-like, thin	Setae scale-like, divided into 2 or 3 filaments
Declivital interstrial scales	Median row of scales not noticeably different from other scales	Median row of scales much larger, more erect than others, especially in males

Since 1993, the Maryland Department of Agriculture has conducted detection surveys for *Tomicus piniperda* (L.) utilizing α-pinene-baited Lindgren funnel traps (PheroTech, Delta, BC, Canada). Traps are placed from late winter through early spring in Christmas tree plantations or forested areas dominated by *Pinus* species. Since 1993, all scolytids captured in these traps have been identified. Occasionally, specimens of *H. aculeatus* have been collected. In 2000, specimens of *H. criddlei* were collected in traps in Carroll Co., Manchester, 24 March and 20 April and in Garrett Co., Oakland, April 28, 2000. Specimens were identified and compared to specimens in the National Museum of Natural History, Smithsonian Institution, by the senior author, and later confirmed by Don Bright.

Hylesinus criddlei adults are distinguished from species of eastern North America *Hylesinus* by the paler coloration of scales; a weak, median frontal impression, and moderate sculpture on the interstriae (Wood 1982).

Evidence of semiochemical-based communication in *Hylesinus* was reported for *H. californicus* in Oregon (Rudinsky and Vernoff 1979) and *H. varius* (F.) (= *fraxini* (Panzer)) and *H. toranio* (Danthione) (= *oleiperda* (F.) in Europe (Rudinsky and Vallo 1979). Kohnle (1985) found *H. varius* responded to ethanol-baited traps, and trap catch was increased by the male-produced *exo*-brevicomin, while another male-produced compound, 7-methyl-1,6-dioxaspiro (4,5) decane (conophthorin) inhibited response.

In 2000, to see if *H. californicus* responded to *exo*-brevicomin, funnel traps baited with this compound (PheroTech) were placed where *H. californicus* or other *Hylesinus* were previously collected. During the four month trapping period (March–

Table 2. *Hylesinus* species collected in exo-brevicomin-baited funnel traps in Maryland during 2000.

County	*Location*	*Species*	*Number of Beetles*
Anne Arundel	Linthicum	*H. criddlei*	76
		H. aculeatus	76
		H. fasciatus	1
		H. pruinosus	1
Allegany	Flintstone	*H. criddlei*	14
Prince George's	Bowie	*H. criddlei*	8
		H. aculeatus	146
		H. fasciatus	1
		H. pruinosus	7

Table 3. *Hylesinus* species collected in baited funnel traps in Maryland, 2001.

Species	*exo-brevicomin*	*endo-brevicomin*	*conophthorin*
Hylesinus aculeatus	15	52	28
Hylesinus criddlei	54	108	8
Hylensinus pruinosus	2	3	3

June), no *H. californicus* were collected in the *exo*-brevicomin-baited traps although *H. californicus* were collected in branches of trees containing some of the traps. In each location, however, *H. criddlei* and other *Hylesinus* were collected in the *exo*-brevicomin-baited traps (Table 2).

From March through June, 2001, additional funnel traps were baited with either *exo*-brevicomin, *endo*-brevicomin or conophthorin (PheroTech) in Anne Arundel Co., Linthicum; Baltimore Co., White Marsh; Carroll Co., Manchester; and Cecil Co., Port Deposit. Three species of *Hylesinus,* including *H. criddlei,* were collected in the traps (Table 3). Also in 2001, specimens of *H. criddlei* were collected in an Allison-Pike suction trap in Garrett Co., Accident.

Although trapping was not part of a controlled experiment, the data clearly show that *H. criddlei* is established in Maryland. In addition, trapping results suggest that *H. criddlei* is attracted to *exo-* and *endo*-brevicomin. Future experiments are planned to test the attraction of *H. criddlei* and *H. californicus* to semiochemicals.

Acknowledgments.—We thank Don Bright (Agriculture Canada, Ottawa) for confirming the identifications and Natalia Vandenberg (Systematic Entomology Laboratory, U.S.D.A.) for access to the collection at the National Museum of Natural History, Smithsonian Institution, Washington D.C.

Literature Cited

Doane, R. W. 1923. *Leperisinus californicus* Sw. killing ash trees. Canadian Entomologist 55: 217.

Essig, E. O. 1917. The olive insects of California. California Agricultural Experiment Station (Berkeley) Bulletin 283: 43–64.

Kohnle, U. 1985. Investigations of chemical communication systems in secondary bark beetles (Coleoptera: Scolytidae). Zeitschrift für Angewandte. Entomologie 100: 197–218.

Langor, D. 1994. Western ash bark beetle. Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forest Centre, Edmonton Alberta. Forest Leaflet 24.

Langor, D. and C. Hergert. 1993. Life history, behaviour, and mortality of the western ash bark beetle, *Hylesinus californicus* (Swaine) (Coleoptera: Scolytidae) in southern Alberta. Canadian Entomologist 125: 801–814.

McKnight, R. C. and D. G. Aarhus. 1973. Bark beetles, *Leperisinus californicus* and *L. criddlei* (Coleoptera: Scolytidae), attacking green ash (Fraxinus pennsylvanica: Oleaceae) in North Dakota. Annals of the Entomological Society of America 66: 955–957.

Rudinsky, J. A. and V. Vallo. 1979. The ash bark beetles *Leperisinus fraxini* and *Hylesinus oleiperda*: Stridulatory organs, acoustic signals, and pheromone production. Zeitschrift für Angewandte. Entomologie 87: 417–429.

Rudinsky, J. A. and S. Vernoff. 1979. Evidence of a female-produced aggregative pheromone in *Leperisinus californicus* Swaine (Coleoptera: Scolytidae). Pan-Pacific Entomologist 55: 299–303.

Solomon, J. D. 1995. Guide to insect borers in North American broadleaf trees and shrubs. United States Department of Agriculture, Forest Service, Agriculture Handbook AH-706. 735 pp.

Wood, S. L. 1982. The bark and ambrosia beetles of North and Central America (Coleoptera: Scolytidae), a taxonomic monograph. Great Basin Naturalist, Memoirs No. 6.

Wood, S. L. and D. E. Bright. 1992. A catalog of Scolytidae and Platypodidae (Coleoptera), Part 2: Taxonomic Index. Great Basin Naturalist, Memoirs No. 13.

Robert J. Rabaglia, *Forest Pest Management, Maryland Department of Agriculture, 50 Harry S Truman Pkwy, Annapolis MD 21401, U.S.A. (e-mail: rabaglrj@mda.state.md.us)* and Gaye L. Williams, *Plant Protection and Weed Management, Maryland Department of Agriculture, 50 Harry S Truman Pkwy, Annapolis MD 21401, U.S.A.*