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**FIRST REPORTED OCCURRENCE OF *XYLEBORINUS ALNI*
(COLEOPTERA: CURCULIONIDAE: SCOLYTINAE) IN THE EASTERN
UNITED STATES, WITH NOTES ON ITS RECOGNITION AND TREE HOSTS**

E. RICHARD HOEBEKE AND ROBERT J. RABAGLIA

(ERH) Department of Entomology, Comstock Hall, Cornell University, Ithaca, NY 14853-2601, U.S.A. (e-mail: erh2@cornell.edu); (RJR) USDA Forest Service, Forest Health Protection, Arlington, VA 22209 (e-mail: brabaglia@fs.fed.us)

Abstract.—*Xyleborinus alni* (Niisima), an Asian ambrosia beetle first detected in North America in the Pacific Northwest in the late 1990s, is reported for the first time from the eastern United States. Locality data for specimens captured in Lindgren funnel traps from nine eastern states are listed and mapped; these data suggest that this immigrant xyleborine is widely established in the Northeast. A habitus illustration and a diagnosis are provided to differentiate it from the other widespread immigrant *Xyleborinus* species in North America, *X. saxesenii* (Ratzeburg).

Key Words: Coleoptera, Curculionidae, Scolytinae, Xyleborina, eastern United States, exotic species, new distribution records

The genus *Xyleborinus* Reitter, previously recognized by most authors either as a subgenus or a synonym of *Xyleborus* Eichhoff (Wood 1982), is comprised of at least 81 nominate species distributed worldwide (<http://xyleborini.tamu.edu/browse.php?genus=Xyleborinus>), with the majority occurring in Africa and Asia. Three species of the genus are found in America north of Mexico, two of which are endemic to Europe and Asia (Rabaglia et al. 2006). *Xyleborinus saxesenii* (Ratzeburg) is transcontinental in North America. Although considered by some to be an unintentional exotic introduction (i.e., Atkinson and Peck 1994), others consider it to be naturally Holarctic, with Asia, Europe, and North America in its native distribution (Wood and Bright 1992). *Xyleborinus saxesenii* also has been introduced into Australia, Hawaii, and South America (Argentina,

Brazil, and Chile). *Xyleborinus gracilis* (Eichhoff) is native to South America and North America; in the United States, it is reported from Florida, Louisiana, North Carolina, and South Carolina (Rabaglia et al. 2006). It can be distinguished from *X. saxesenii* and *X. alni* (Niisima) by the absence of denticles on interstriae 1 and its small size (<2 mm). *Xyleborinus alni*, a native to Asia, was detected in North America during surveys conducted between 1996 and 1998 in the Pacific Northwest. Selected high-risk sites, such as importers, warehouses, wood recyclers, mills, and other businesses in or near ports or port areas in Washington and Oregon were closely monitored using baited Lindgren funnel traps (Mudge et al. 2001). All sites were known to have received or handled imported wood or wood products.

Xyleborinus alni was first found at 6 port area sites in Olympia, Washington, and at 4 such sites in Tacoma, Washington, between March 12 and April 17, 1996 (Lagasa et al. 1997). It also was trapped in Oregon at Rainer (Columbia Co.) in April and May 1997, and at Portland (Multnomah Co.) in March and May 1998 (Mudge et al. 2001). There are unpublished records for the earlier collection of *X. alni* in 1995 at 4 sites around Vancouver, British Columbia (L. C. Humble, unpublished data, cited in Mudge et al. 2001). In subsequent surveys, *X. alni* was again trapped at a number of high-risk sites in one county in Washington (Clark Co.) and in seven additional Oregon counties (Benton, Clackamas, Linn, Marion, Polk, Washington, and Yamhill) between 1999 and 2002 (LaBonte et al. 2005). Based on these new distributional records, it appears that *X. alni* is widely distributed throughout much of the Willamette Valley of northwestern Oregon (LaBonte et al. 2005).

As a result of extensive trapping surveys conducted as part of the joint USDA-APHIS-PPQ and USDA-Forest Service "Early Detection and Rapid Response" program between 2001 and 2005 in the northeastern United States, *X. alni* has been collected in Maine, Massachusetts, Michigan, New Jersey, New York, Ohio, and Pennsylvania. Additional distributional records for *X. alni* have resulted from the USDA's Cooperative Agricultural Pest Survey (CAPS) program conducted by Departments of Agriculture of New York, Pennsylvania, Maryland, Maine, and Vermont. These new state records represent the first documented occurrence of *X. alni* in the eastern United States.

Here, we list and map (Fig. 1) distributional data taken from specimens of *X. alni* captured in Lindgren funnel traps, with few exceptions, deployed as

part of these trapping surveys of the Northeast. The majority of specimens examined are deposited in the Cornell University Insect Collection (Ithaca, NY), and with others in the reference collections of the Maine Forest Service (Augusta), Maryland Department of Agriculture (Annapolis), Massachusetts Department of Conservation and Recreation (Amherst) (2005 collections), Pennsylvania Department of Conservation and Natural Resources (Middletown) (2005 collections), and in the personal collection of R. J. Rabaglia.

NEW EASTERN UNITED STATES RECORDS

Distribution records are followed by the number of specimens examined (in parentheses) and the lure types (AP-EtOH = alpha-pinene + UHR ethanol; Ips = 3-component Ipslure; Chal = Chalcoprax; EtOH-MB = ethanol + methyl butenol; AP-MB = alpha-pinene + methyl butenol; EtOH = ethanol only), when available.

MAINE: *Cumberland Co.*, Portland Harbor, 2-IV-2004 (1), (EtOH, 1); 30-IV-2004 (16), (Ips, 1; AP-EtOH, 2; EtOH, 13); 14-V-2004 (2), (AP-EtOH, 2); Mackworth Island, 14-V-2004 (2), (EtOH, 2); Falmouth, 14-V-2004 (18), (AP-EtOH, 8; EtOH, 10). *Kennebec Co.*, Gardiner, 2-VI-2004 (3); Waterville, 20-IV-2004 (3). *York Co.*, Saco, 14-IV-2004 (1). MARYLAND: *Frederick Co.*, Middletown, 7-II-2005 (1), (AP-EtOH, 1); Monrovia, 7-II-2005 (5), (AP-EtOH, 5); 7-III-2005 (8), (AP-EtOH, 8); Mt. Airy, 7-II-2005 (1), (AP-EtOH, 1). *Garrett Co.*, Accident, 2-30-VII-2002 (1), (Alison-Pike trap, 1); 14-19-IV-2004 (2), (Alison-Pike trap, 2); 3-V-2004 (1), (Alison-Pike trap, 1). *Montgomery Co.*, Boyds, 7-II-2005 (1), (AP-EtOH, 1); Dickerson, 7-II-2005 (5), (AP-EtOH, 5). MASSACHUSETTS: *Barnstable Co.*, Sandwich, 11-IV-2005 (66), (AP-EtOH, 10; EtOH, 56); 25-IV-2005 (45), (AP-EtOH, 5; EtOH, 40); 23-V-2005 (2), (AP-EtOH, 1; EtOH, 1); 6-VI-

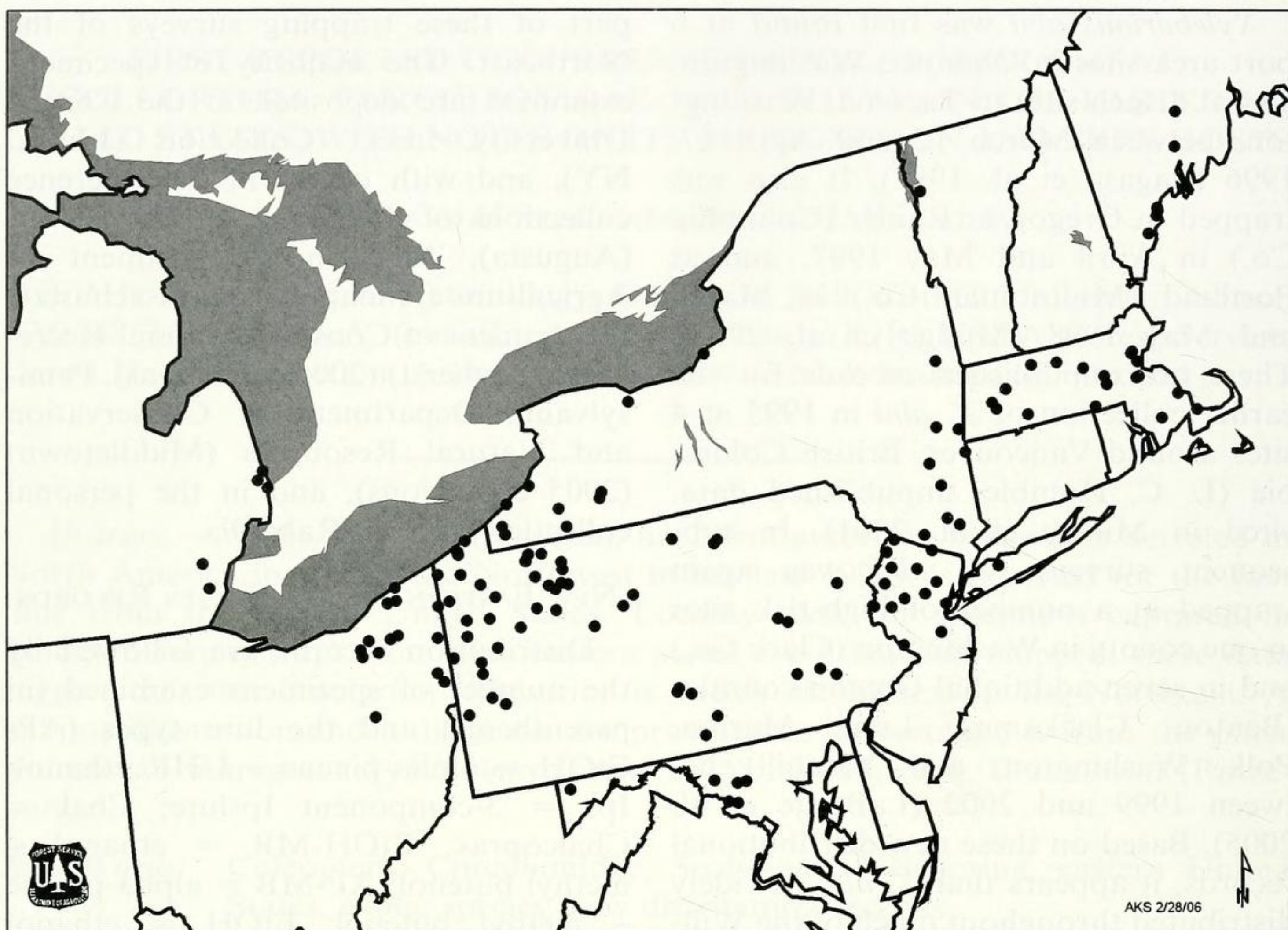


Fig. 1. Locality records of *Xyleborinus alni* in the eastern United States, based on specimens captured in baited Lindgren funnel traps deployed for the "Early Detection and Rapid Response" bark beetle survey and various state CAPS programs from 2001–2005.

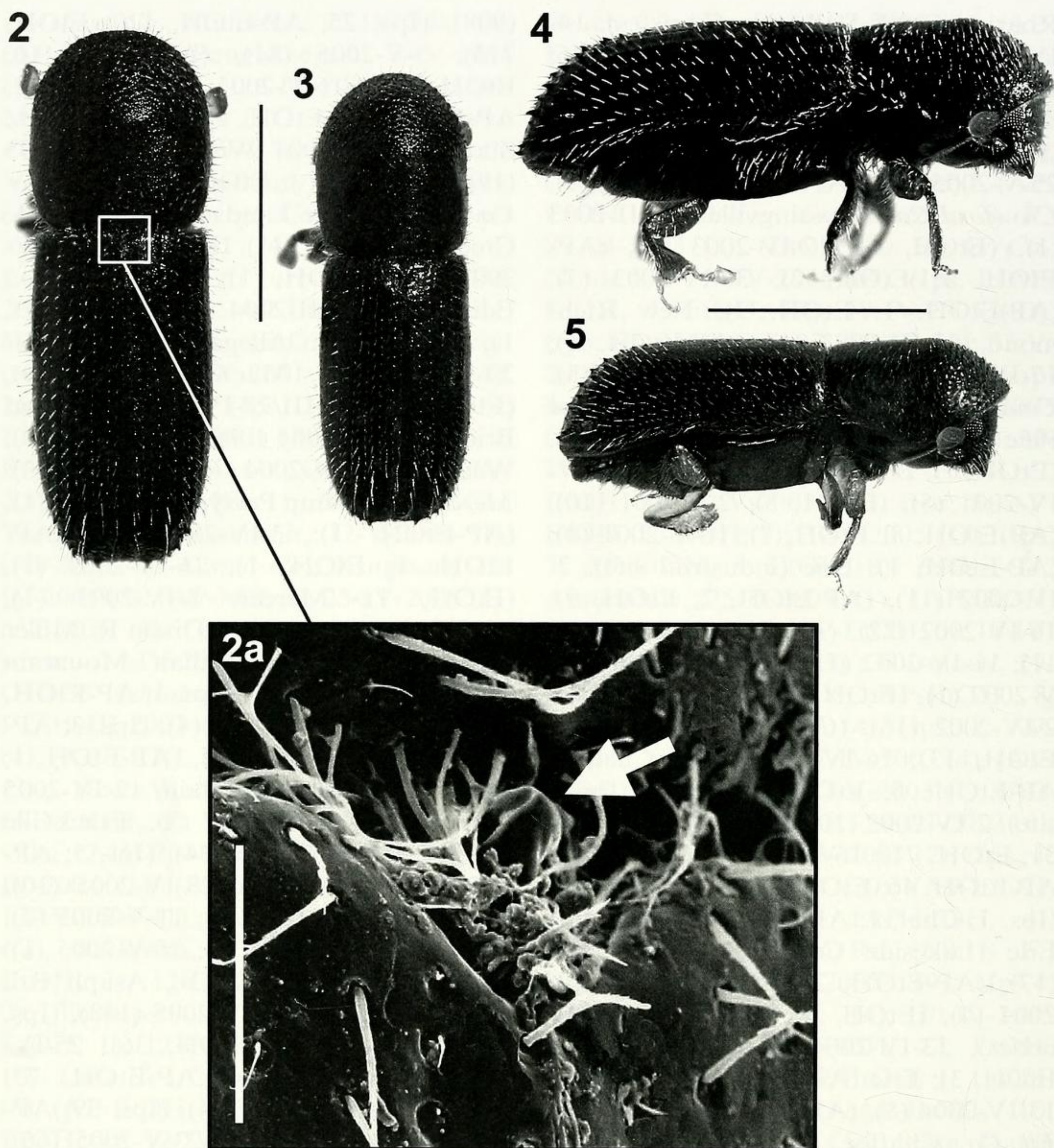
2005 (1), (EtOH, 1). *Bristol Co.*, Freetown (Freetown S. F.), 11-IV-2005 (4), (EtOH, 4); 25-IV-2005 (3), (AP-EtOH, 1; EtOH, 2). *Franklin Co.*, Erving (Erving S. F. Hdqts.), 19-IV-2005 (12), (AP-EtOH, 2; EtOH, 10); 2-V-2005 (5), (AP-EtOH, 1, EtOH, 4). *Hampden Co.*, Chester, 20-IV-2005 (9), (AP-EtOH, 3; EtOH, 6); 18-V-2005 (1), (EtOH, 1); Chicopee (Chicopee S. F.), 19-IV-2005 (31), (Ips, 3, AP-EtOH, 7; EtOH, 21); 16-V-2005 (1), (EtOH, 1). *Hampshire Co.*, Goshen, 25-IV-2005 (12), (Ips, 1; AP-EtOH, 2; EtOH, 9); 4-V-2005 (6), (AP-EtOH, 3; EtOH, 3); 18-V-2005 (1), (AP-EtOH, 1); Middlefield, 19-IV-2005 (45), (Ips, 2; AP-EtOH, 3; EtOH, 40); 2-V-2005 (12), (AP-EtOH, 2; EtOH, 10); 16-V-2005 (12), (Ips, 2; AP-EtOH, 2; EtOH, 8). *Middlesex Co.*, Hopkinton (Whitehall Boat Ramp), 11-IV-2005 (14), (AP-

EtOH, 7; EtOH, 7); Middlesex Fells Reserve, 9-IV-2004 (1), (AP-EtOH, 1); 26-IV-2004 (15), (AP-EtOH, 2; EtOH, 13); 23-V-2004 (1), (AP-EtOH, 1). *Norfolk Co.*, Blue Hills Reserve, 26-IV-2004 (1), (EtOH, 1); 7-VI-2004 (1), (EtOH, 1). *Plymouth Co.*, Plymouth (Myles Standish S. F.), 25-IV-2005 (1), (EtOH, 1). *Suffolk Co.*, Boston (urban site), 23-V-2004 (1), (AP-EtOH, 1); (forest site), 7-VI-2004 (1), (EtOH, 1). *Worcester Co.*, Douglas (Douglas S. F.), 19-IV-2005 (2), (AP-EtOH, 1; EtOH, 1); 17-V-2005 (1), (EtOH, 1); Southborough, 11-IV-2005 (21), (AP-EtOH, 21); 25-IV-2005 (1), (AP-EtOH, 1). *Sterling* (Central East Field Office), 19-IV-2005 (1), (EtOH, 1); 4-V-2005 (1), (EtOH, 1); 16-V-2005 (2), (AP-EtOH, 1; EtOH, 1); Templeton (Otter River S. F.), 19-IV-2005 (7), (AP-EtOH, 2, EtOH, 5). MICHIGAN: *St.*

- Clair Co.*, Lakeport S. P. (urban forest), 22-IV-2004 (701), (Ips, 1; AP-EtOH, 57; EtOH, 643); 5-V-2004 (197), (Ips, 5; AP-EtOH, 117; EtOH, 75); 17-V-2004 (56), (Ips, 1; AP-EtOH, 55); 27-V-2004 (1), (EtOH-MB, 1); 7-VI-2004 (1), (AP-EtOH, 1); Port Huron RR (SWPM site), 22-IV-2004 (12), (Ips, 1; AP-EtOH, 6; EtOH, 5); 5-V-2004 (24), (AP-EtOH, 15; EtOH, 9); 17-V-2004 (3), (AP-EtOH, 2; EtOH, 1); Port Huron S. F. (rural forest), 22-IV-2004 (134), (Ips, 6; AP-EtOH, 19; EtOH, 109); 5-V-2004 (52), (Ips, 1; AP-EtOH, 9; EtOH, 42); 17-V-2004 (15), (AP-EtOH, 8; EtOH, 7).
- Wayne Co.*, Detroit Yazaki Corp. (SWPM site), 16-IV-2004 (2), (AP-EtOH, 1; EtOH, 1); 29-IV-2004 (2), (AP-EtOH, 1; EtOH, 1); Detroit Tree Farm (rural forest), 28-IV-2004 (6), (AP-EtOH, 2; EtOH, 4); 13-V-2004 (2), (EtOH, 2); Dearborn (Heritage Park), 7-IV-2005 (1), (EtOH, 1); 11-IV-2005 (108), (Ips, 8; EtOH, 100); 12-IV-2005 (120), (AP-EtOH, 120); 28-IV-2005 (3), (AP-EtOH, 3); 10-V-2005 (4), (AP-EtOH, 4); Inkster (Ford-Wixom plant), 14-IV-2005 (5), (EtOH, 5); Rockwood (F.W. Ritters & Sons), 29-IV-2005 (1), (AP-EtOH, 1); 11-V-2005 (1), (EtOH, 1).
- NEW JERSEY: *Essex Co.*, West Orange, 15-IV-2004 (1), (AP-EtOH, 1); 27-IV-2004 (1), (AP-EtOH, 1); 12-V-2004 (2), (AP-EtOH, 2). *Hunterdon Co.*, Voorhees S. P., 16-III-2004 (3), (EtOH, 3); 30-III-2004 (3), (EtOH, 3); 13-IV-2004 (4), (AP-EtOH, 1; Ips, 3). *Mercer Co.*, Washington Crossing S. P., 14-V-2002 (1), (Chal, 1). *Middlesex Co.*, Monroe Twp., 29-III-2004 (7), (Ips, 1; AP-EtOH, 5; EtOH, 1); 25-IV-2004 (1), (AP-EtOH, 1). *Morris Co.*, Blairstown, 22-III-2004 (1), (AP-EtOH, 1); 15-IV-2004 (1), (AP-EtOH, 1); Green Village, 20-II-2004 (1), (AP-EtOH, 1); 22-III-2004 (39), (AP-EtOH, 39); 1-IV-2004 (1), (AP-EtOH, 1); 15-IV-2004 (4), (AP-EtOH, 4); Hacklebarney S. P., 16-III-2004 (6), (EtOH, 6); 30-III-2004 (1), (EtOH, 1); 13-IV-2004 (2), (EtOH, 2); Marcella, 22-III-2004 (45), (AP-EtOH, 45); 1-IV-2004 (2), (AP-EtOH, 2); 15-V-2004 (13), (AP-EtOH, 13).
- Passaic Co.*, Ringwood S. P., 15-IV-2004 (2), (AP-EtOH, 2); 21-IV-2004 (1), (AP-EtOH, 1); Wanaque Reserve, 11-III-2004 (1), (AP-EtOH, 1); 15-IV-2004 (1), (AP-EtOH, 1).
- Sussex Co.*, Fredon, 15-IV-2004 (6), (AP-EtOH, 6); Hainesville, 15-IV-2004 (37), (AP-EtOH, 37); 23-IV-2004 (4), (AP-EtOH, 4); High Point S. P., 15-IV-2004 (4), (AP-EtOH, 4).
- Union Co.*, Carteret, 7-V-2004 (1), (EtOH, 1).
- Warren Co.*, Hope, 22-III-2004 (17), (AP-EtOH, 17); 15-IV-2004 (22), (AP-EtOH, 22); Merrill Creek Reservoir, 16-III-2004 (129), (AP-EtOH, 2; EtOH, 120; Ips, 7); 30-III-2004 (62), (AP-EtOH, 4; EtOH, 56; Ips, 2); 13-IV-2004 (125), (AP-EtOH, 9; EtOH, 115; Ips, 1); 27-IV-2004 (2), (EtOH, 2).
- NEW YORK: *Allegany Co.*, Belfast, 31-III-2004 (7), (AP-EtOH, 7); 13-IV-2004 (3), (AP-EtOH, 3); Cuba, 13-IV-2004 (8), (AP-EtOH, 8); 27-IV-2004 (1), (AP-EtOH, 1).
- Cattaraugus Co.*, Allegany S. P., 9-IV-2003 (58), (Ips, 6; AP-EtOH, 11; EtOH, 41); 23-IV-2003 (77), (Ips, 15; AP-EtOH, 17; EtOH, 45); 5-V-2003 (22), (Ips, 1; AP-EtOH, 3; EtOH, 18); 19-V-2003 (7), (Ips, 2; AP-EtOH, 1; EtOH, 4); 13-IV-2004 (46), (AP-EtOH, 46); 27-IV-2004 (2), (AP-EtOH, 2); Little Valley, 22-IV-2003 (7), (Ips, 1; AP-EtOH, 2; EtOH, 4); 13-IV-2004 (11), (AP-EtOH, 11).
- Chautauqua Co.*, Lake Erie S. P., 10-IV-2003 (2), (EtOH, 4); 23-IV-2003 (8), (AP-EtOH, 1; EtOH, 7); 6-V-2003 (5), (EtOH, 5); Mayville, 23-IV-2003 (2), (EtOH, 2); 13-IV-2004 (4), (AP-EtOH, 4); 27-IV-2004 (1), (AP-EtOH, 1); Panama, 10-IV-2003 (1), (AP-EtOH, 1); 23-IV-2003 (8), (Ips, 1; AP-EtOH, 3; EtOH, 4); 6-V-2003 (1), (AP-EtOH, 1); 13-IV-2004 (3), (AP-EtOH, 3); Silver Creek, 10-IV-2003 (2), (EtOH, 2).
- Columbia Co.*, Hillsdale, 21-IV-2005 (1), (AP-MB, 1); Hudson, 2-V-2005 (1), (AP-MB, 1).

- Dutchess Co.*, Millerton, 27-IV-2004 (2), (AP-MB, 2); Poughkeepsie, 8-IV-2004 (1), (AP-MB, 1); 26-IV-2004 (5), (AP-MB, 5); 6-V-2004 (1), (AP, 1). *Monroe Co.*, Rochester, 9-V-2005 (1), (Ips, 1). *Nassau Co.*, Woodbury, 8-IV-2005 (1), (AP-MB, 1). *Oswego Co.*, Oswego (port area), 25-IV-2001 (4), (AP-EtOH, 1; EtOH, 3); Oswego (urban site), 25-IV-2001 (17), (Ips, 1; AP-EtOH, 10; EtOH, 6); 9-V-2001 (6), (EtOH, 6); Oswego (forest site), 24-IV-2001 (1), (EtOH, 1); 25-IV-2001 (17), (Ips, 2; AP-EtOH, 4; EtOH, 11); 9-V-2001 (3), (AP-EtOH, 2; EtOH, 1). *Putnam Co.*, Garrison, 12-IV-2005 (1), (AP-MB, 1). *Rensselaer Co.*, Tomhannock Reservoir, 12-V-2004 (1), (AP-MB, 1). *Ulster Co.*, Kingston, 11-IV-2005 (3), (AP-MB, 3); 25-IV-2005 (1), (AP-MB, 1). *Westchester Co.*, Yorktown, 14-IV-2005 (2), (AP-MB, 2).
- OHIO: *Ashtabula Co.*, Pymatuning S. P., 31-III-2003 (1), (Ips, 1); 17-IV-2004 (4), (AP-EtOH, 3; EtOH, 1). *Columbiana Co.*, New Waterford, 12-III-2004 (1), (AP-EtOH, 1). *Cuyahoga Co.*, Brecksville, 12-III-2004 (1), (AP-EtOH, 1); 12-IV-2004 (1), (AP-EtOH, 1); Oakwood, 12-IV-2004 (1), (AP-EtOH, 1). *Geauga Co.*, Parkman, 27-III-2004 (7), (AP-EtOH, 7); 12-IV-2004 (9), (AP-EtOH, 9); Thompson, 27-III-2004 (1), (AP-EtOH, 1); 12-IV-2004 (16), (AP-EtOH, 16). *Lake Co.*, Leroy Center, 13-III-2004 (8), (AP-EtOH, 8); 27-III-2004 (9), (AP-EtOH, 9); 12-IV-2004 (19), (AP-EtOH, 19); North Madison, 13-III-2004 (11), (AP-EtOH, 11); 27-III-2004 (1), (AP-EtOH, 1); 12-IV-2004 (21), (AP-EtOH, 21). *Mahoning Co.*, North Lima, 25-III-2004 (1), (AP-EtOH, 1). *Portage Co.*, Mantua Corners, 27-III-2004 (7), (AP-EtOH, 7); 12-IV-2004 (17), (AP-EtOH, 17). *Summit Co.*, CVNP Horseshoe Pond, 12-III-2004 (1), (AP-EtOH, 1); CVNP Oak Hill PA, 28-III-2004 (1), (AP-EtOH, 1). *Trumbull Co.*, Youngstown State University arboretum, 3-IV-2003 (1), (AP-EtOH, 1). *Tuscarawas Co.*, Beach City Dam, 24-III-2004 (1), (AP-EtOH, 1).
- PENNSYLVANIA: *Allegheny Co.*, Beechwood Farms ANC, 19-III-2004 (19), (AP-EtOH, 19); 2-IV-2004 (3), (AP-EtOH, 3); Wexford, 19-III-2004 (4), (AP-EtOH, 4); 3-IV-2004 (5), (AP-EtOH, 5). *Beaver Co.*, Racoon S. P., 29-III-2003 (2), (EtOH, 2). *Berks Co.*, Nolde S. F., 5-IV-2005 (67), (Ips, 1; AP-EtOH, 4; EtOH, 62); 19-IV-2005 (83), (Ips, 16; AP-EtOH, 37; EtOH, 30); 31-V-2005 (1), (Ips, 1). *Bradford Co.*, Chapman Rd. (NNW of Canton), 11-IV-2005 (27), (Ips, 15; AP-EtOH, 6; EtOH, 6); 26-IV-2005 (102), (Ips, 50; AP-EtOH, 7; EtOH, 45); 9-V-2005 (11), (Ips, 3; AP-EtOH, 5; EtOH, 3); 23-V-2005 (14), (Ips, 3; AP-EtOH, 3; EtOH, 8). *Butler Co.*, Annandale, 25-II-2004 (1), (AP-EtOH, 1); 25-III-2004 (5), (AP-EtOH, 5); 10-IV-2004 (3), (AP-EtOH, 3); Harmony, 29-III-2003 (21), (Ips, 6; AP-EtOH, 8; EtOH, 7); 12-IV-2003 (4), (Ips, 1; AP-EtOH, 2; EtOH, 1); 27-IV-2003 (4), (AP-EtOH, 3; EtOH, 1); 17-V-2003 (1), (AP-EtOH, 1); Moraine S. P., 29-III-2003 (6), (Ips, 5; EtOH, 1); 12-V-2003 (2), (Ips, 1; EtOH, 1); 25-III-2004 (20), (AP-EtOH, 20); 10-IV-2004 (4), (AP-EtOH, 4). *Cameron Co.*, Lincoln Rd. (Elk S. F., Gibson Twp.), 6-IV-2005 (19), (Ips, 4; AP-EtOH, 1; EtOH, 14); 20-IV-2005 (104), (Ips, 10; AP-EtOH, 22; EtOH, 72); 6-V-2005 (2), (AP-EtOH, 1; EtOH, 1); 17-V-2005 (34), (AP-EtOH, 10; EtOH, 24). *Chester Co.*, State Game Lands No. 43 (Pine Swamp), 5-IV-2005 (8), (EtOH, 8); 19-IV-2005 (8), (Ips, 3; AP-EtOH, 3; EtOH, 2); 3-V-2005 (1), (EtOH, 1). *Clarion Co.*, Knox, 25-III-2004 (1), (AP-EtOH, 1); 10-IV-2004 (11), (AP-EtOH, 11); Tylersburg, 25-III-2004 (9), (AP-EtOH, 9); 10-IV-2004 (17), (AP-EtOH, 17). *Clearfield Co.*, Anderson Creek (W of Anderson Creek), 19-IV-2005 (121), (Ips, 16; AP-EtOH, 22; EtOH, 83); 4-V-2005 (24), (Ips, 1; AP-EtOH, 9; EtOH, 14); 17-V-2005 (17), (AP-EtOH, 5; EtOH, 12). *Columbia Co.*,

- Roaring Creek S. F. (N of Aristes), 14-IV-2005 (591), (Ips, 165; AP-EtOH, 66; EtOH, 360); 28-IV-2005 (173), (Ips, 36; AP-EtOH, 41; EtOH, 96); 11-V-2005 (91), (Ips, 12; AP-EtOH, 31; EtOH, 48); 25-V-2005 (17), (AP-EtOH, 8; EtOH, 9). *Crawford Co.*, Crossingville, 31-III-2003 (1), (EtOH, 1); 17-IV-2003 (3), (AP-EtOH, 1; EtOH, 2); 30-IV-2003 (3), (AP-EtOH, 1; EtOH, 2); New Richmond, 31-III-2003 (1), (AP-EtOH, 1); 17-IV-2003 (6), (AP-EtOH, 1; EtOH, 5). *Cumberland Co.*, Micheaux Rd. (W. of Pine Grove Furnace), 12-IV-2005 (1), (EtOH, 1). *Erie Co.*, Erie (port area), 17-IV-2001 (5), (EtOH, 5); 2-V-2001 (10), (AP-EtOH, 3; EtOH, 7); 16-V-2001 (1), (AP-EtOH, 1); Erie (industrial site), 2-IV-2002 (11), (AP-EtOH, 2; EtOH, 9); 16-IV-2002 (22), (AP-EtOH, 11; EtOH, 11); 16-IV-2002 (11), (AP-EtOH, 11); 1-V-2002 (1), (EtOH, 1); Erie (urban site), 2-IV-2002 (16), (Chal, 1; AP-EtOH, 2; EtOH, 13); 16-IV-2002 (25), (Chal, 2; AP-EtOH, 5; EtOH, 18); Erie (forest site), 2-IV-2002 (103), (Ips, 1; AP-EtOH, 31; EtOH, 71); 16-IV-2002 (175), (Ips, 2; AP-EtOH, 46; EtOH, 127); 1-V-2002 (6), (Ips, 1; Chal, 1; AP-EtOH, 1; EtOH, 3); Erie (Lakeside Cemetery), 13-IV-2004 (17), (AP-EtOH, 2; EtOH, 15); 28-IV-2004 (4), (EtOH, 4); Erie (Eriez Magnetics), 13-IV-2004 (5), (AP-EtOH, 2; EtOH, 3); Erie (Asbury Nature Center), 13-IV-2004 (8), (AP-EtOH, 1; EtOH, 7). *Elk Co.*, Chaffee, 16-IV-2004 (24), (AP-EtOH, 24); 30-IV-2004 (2), (AP-EtOH, 2); Highland Corners, 16-IV-2004 (31), (AP-EtOH, 31); 30-IV-2004 (1), (AP-EtOH, 1). *Forrest Co.*, Lynch, 16-IV-2004 (22), (AP-EtOH, 22); Pigeon, 16-IV-2004 (1), (AP-EtOH, 1). *Franklin Co.*, Irishtown Rd. (E of Sidetown), 12-IV-2005 (1), (EtOH, 1). *Huntingdon Co.*, Indian Hanna Hunt Club (NNE of Valley Point), 12-IV-2005 (22), (AP-EtOH, 5; EtOH, 17). *Jefferson Co.*, Barkett Rd. (NE of Clear Creek S. P.), 5-IV-2005 (1), (AP-EtOH, 1); 19-IV-2005 (908), (Ips, 25; AP-EtOH, 110; EtOH, 773); 3-V-2005 (81), (AP-EtOH, 10; EtOH, 71); 16-V-2005 (365), (Ips, 2; AP-EtOH, 80; EtOH, 283). *Juniata Co.*, State Farm (N of Wistie), 12-IV-2005 (19), (AP-EtOH, 1; EtOH, 18). *Lancaster Co.*, State Game Lands No. 46 (Middle Creek), 5-IV-2005 (1), (EtOH, 1); 19-IV-2005 (1), (EtOH, 1). *Lawrence Co.*, Edinburg, 25-III-2004 (1), (AP-EtOH, 1). *McKean Co.*, Allegany N. F., 25-II/29-III-2004, M. MacKenzie, coll. (9), (EtOH, 9); 29-III/22-IV-2004 (3); Red Bridge, 16-IV-2004 (19), (AP-EtOH, 19); Wetmore, 16-IV-2004 (3), (AP-EtOH, 3). *Mercer Co.*, Camp Perry, 19-III-2003 (1), (AP-EtOH, 1); 3-IV-2003 (2), (AP-EtOH, 1; EtOH, 1); 16-IV-2003 (1), (EtOH, 1); Mercer, 3-IV-2003 (1), (EtOH, 1). *Monroe Co.*, Dixon R. Miller Rec. Area, (N of Indian Mountain Lake), 14-IV-2005 (6), (Ips, 1; AP-EtOH, 1; EtOH, 4); 28-IV-2005 (4), (Ips, 3; AP-EtOH, 1); 11-V-2005 (2), (AP-EtOH, 1; EtOH, 1). *Perry Co.*, Blain, 12-IV-2005 (9), (EtOH, 9). *Schulkill Co.*, Frackville cloverleaf, 14-IV-2005 (34), (Ips, 5; AP-EtOH, 9; EtOH, 20); 28-IV-2005 (10), (AP-EtOH, 3; EtOH, 7); 11-V-2005 (2), (AP-EtOH, 1; EtOH, 1); 25-V-2005 (1), (AP-EtOH, 1). *Tioga Co.*, Asaph Rd. (NW of Asaph), 11-IV-2005 (148), (Ips, 82; AP-EtOH, 30; EtOH, 36); 25-IV-2005 (208), (Ips, 74; AP-EtOH, 73; EtOH, 61); 9-V-2005 (94), (Ips, 39; AP-EtOH, 32; EtOH, 23); 23-V-2005 (65), (Ips, 1; AP-EtOH, 42; EtOH, 22); Groover Rd. (W of Canton), 11-IV-2005 (88), (Ips, 34; AP-EtOH, 24; EtOH, 30); 26-IV-2005 (151), (Ips, 8; AP-EtOH, 61; EtOH, 82); 9-V-2005 (25), (Ips, 8; AP-EtOH, 7; EtOH, 10); 23-V-2005 (62), (Ips, 14; AP-EtOH, 24; EtOH, 24). *Venango Co.*, Polk, 19-III-2003 (1), (EtOH, 1); 3-IV-2003 (3), (EtOH, 3); 16-IV-2003 (2), (Ips, 1; EtOH, 1); Wallaceville, 8-IV-2003 (2), (EtOH, 2); 6-V-2003 (1), (AP-EtOH, 1). *Warren Co.*, Chandlers Valley, 8-IV-2003 (1), (EtOH,

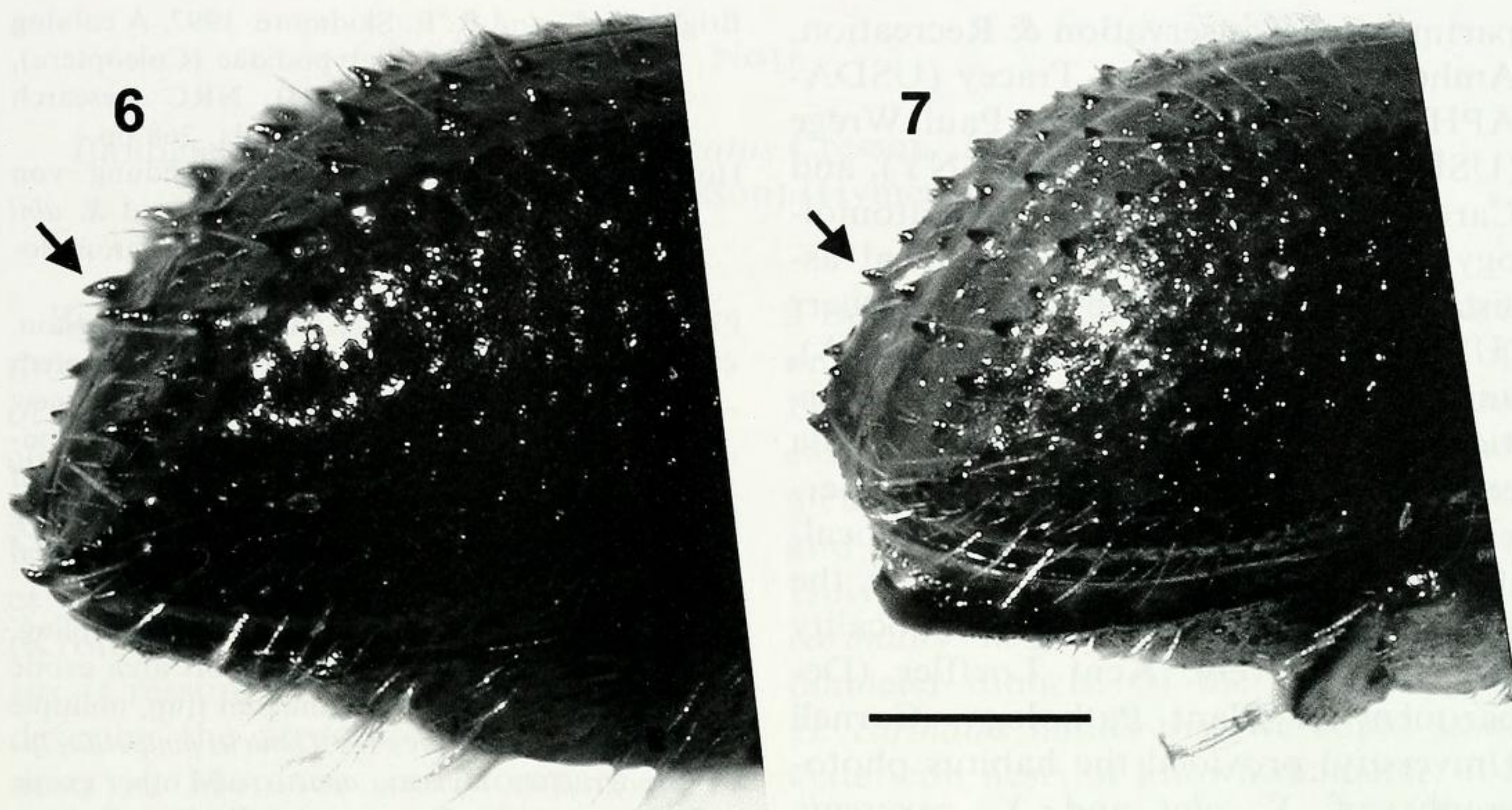


Figs. 2–5. Dorsal and lateral habitus of *Xyleborinus* spp. 2 and 4, *Xyleborinus alni*. 3 and 5, *Xyleborinus saxesenii*. 2a, Scanning electron micrograph of scutellum of *X. alni*; arrow denotes conical scutellum. Scale line for Figs. 2–5 = 1 mm; scale line for Fig. 2a = 100 μ m.

1); 22-IV-2003 (7), (AP-EtOH, 2; EtOH, 5); Hearts Content, 16-IV-2004 (44), (AP-EtOH, 44); 30-IV-2004 (4), (AP-EtOH, 4); Youngsville, 8-IV-2003 (4), (AP-EtOH, 1; EtOH, 3); 22-IV-2003 (4), (AP-EtOH, 2; EtOH, 2; 16-IV-2004 (4), (AP-EtOH, 4). VERMONT: *Chittenden Co.*, Burlington, 23-IV/7-V-2002 (1), (AP-EtOH, 1).

RECOGNITION FEATURES

Species of *Xyleborinus* are distinguished from those of *Xyleborus* by the conical scutellum (Fig. 2a), the basal margin of the elytra being abrupt and precipitous in the median area, and by the posterior margin of the elytral declivity bearing distinct short or hooked denticles or tubercles (Figs. 6, 7). *Xyle-*



Figs. 6–7. Elytral declivity of *Xyleborinus* spp. 6, *Xyleborinus alni*. 7, *Xyleborinus saxesenii*. Arrow denotes elytral tubercles.

borinus alni (Figs. 2, 4) can be separated from *X. saxesenii* (Figs. 3, 5) by its larger size (2.5–2.8 mm vs. 1.9–2.4 mm), by the larger, hooked tubercles of the elytral declivity (Fig. 6 vs. 7), and by a slightly shorter pronotum (Fig. 2 vs. 3) (Holzschuh 1994).

NATIVE DISTRIBUTION and KNOWN HOSTS

Xyleborinus alni is native to Asia (Japan and eastern USSR), but also is adventive in Europe (Austria, Czechoslovakia, Germany and Poland) (Wood and Bright 1992, Bright and Skidmore 1997, http://xyleborini.tamu.edu/query.php?tax_id=829). In the Palearctic Region, known hosts include a variety of deciduous trees: *Alnus glutinosa* (L.) Gaertn., *A. hirsuta* (Spach.) Rupr., *Alnus* spp., *Betula japonica* Sieb. ex H. Winkler, *B. latifolia* Regel, *B. platyphylla* var. *japonica* Hara, *Corylus avellana* L., *Quercus robur* L., *Q. petraea* (Matuschka) Liebl., (also known and cited as *Q. sessiflora*), *Salix alba* L., *S. viminalis* L., *S. caprea* L., and *Tilia*

amurensis Rupr. (Wood and Bright 1992, Holzschuh 1994, Bright and Skidmore 1997, http://xyleborini.tamu.edu/query.php?tax_id=829). A breeding population from wind-blown red alder, *Alnus rubra* Bongard, was verified near the port of Olympia, Washington, in April 1997 (Mudge et al. 2001). Also, a specimen was extracted from a trunk of flowering cherry (*Prunus* “Canada Red”) from a Salem, Oregon (Polk Co.) nursery in May 2001 (LaBonte et al. 2005).

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FIRST REPORTED OCCURRENCE OF XYLEBORINUS ALNI

(COLEOPTERA: CURCULIONIDAE: SCOLYTINAE) IN THE EASTERN

UNITED STATES, WITH NOTES ON ITS RECOGNITION AND TREE HOSTS

E. Richard Hoebeke and Robert J. Rabaglia

(ERH) Department of Entomology, Comstock Hall, Cornell University, Ithaca, NY 14853-2601, U.S.A. (e-mail: erh2@cornell.edu); (RJR) USDA Forest Service, Forest Health Protection, Arlington, VA 22209 (e-mail: brabaglia@fs.fed.us)

Abstract. — *Xyleborinus alni* (Niisima), an Asian ambrosia beetle first detected in North America in the Pacific Northwest in the late 1990s, is reported for the first time from the eastern United States. Locality data for specimens captured in Lindgren funnel traps from nine eastern states are listed and mapped; these data suggest that this immigrant xyleborine is widely established in the Northeast. A habitus illustration and a diagnosis are provided to differentiate it from the other widespread immigrant *Xyleborinus* species in North America, *X. saxesenii* (Ratzeburg).

Key Words: Coleoptera, Curculionidae, Scolytinae, Xyleborina, eastern United States, exotic species, new distribution records

The genus *Xyleborinus* Reitter, previously recognized by most authors either as a subgenus or a synonym of *Xyleborus* Eichhoff (Wood 1982), is comprised of at least 81 nominate species distributed worldwide (<http://xyleborini.tamu.edu/browse.php?genus=Xyleborinus>), with the majority occurring in Africa and Asia. Three species of the genus are found in America north of Mexico, two of which are endemic to Europe and Asia (Rabaglia et al. 2006). *Xyleborinus saxesenii* (Ratzeburg) is transcontinental in North America. Although considered by some to be an unintentional exotic introduction (i.e., Atkinson and Peck 1994), others consider it to be naturally Holarctic, with Asia, Europe, and North America in its native distribution (Wood and Bright 1992). *Xyleborinus saxesenii* also has been introduced into Australia, Hawaii, and South America (Argentina, Brazil, and Chile). *Xyleborinus gracilis* (Eichhoff) is native to South America

and North America; in the United States, it is reported from Florida, Louisiana, North Carolina, and South Carolina (Rabaglia et al. 2006). It can be distinguished from *X. saxesenii* and *X.alni* (Niisima) by the absence of denticles on interstriae 1 and its small size (<2 mm). *Xyleborinusalni*, a native to Asia, was detected in North America during surveys conducted between 1996 and 1998 in the Pacific Northwest. Selected high-risk sites, such as importers, warehouses, wood recyclers, mills, and other businesses in or near ports or port areas in Washington and Oregon were closely monitored using baited Lindgren funnel traps (Mudge et al. 2001). All sites were known to have received or handled imported wood or wood products.

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Xyleborinus alni was first found at 6 port area sites in Olympia, Washington, and at 4 such sites in Tacoma, Washington, between March 12 and April 17, 1996 (Lagasa et al. 1997). It also was trapped in Oregon at Rainer (Columbia Co.) in April and May 1997, and at Portland (Multnomah Co.) in March and May 1998 (Mudge et al. 2001). There are unpublished records for the earlier collection of X. alni in 1995 at 4 sites around Vancouver, British Columbia (L. C. Humble, unpublished data, cited in Mudge et al. 2001). In subsequent surveys, X. alni was again trapped at a number of high-risk sites in one county in Washington (Clark Co.) and in seven additional Oregon counties (Benton, Clackamas, Linn, Marion, Polk, Washington, and Yamhill) between 1999 and 2002 (LaBonte et al. 2005). Based on these new distributional records, it appears that X. alni is widely distributed throughout much of the Willamette Valley of northwestern Oregon (LaBonte et al. 2005).

As a result of extensive trapping surveys conducted as part of the joint

USDA-APHIS-PPQ and USDA-Forest Service "Early Detection and Rapid Response" program between 2001 and 2005 in the northeastern United States, *X.alni* has been collected in Maine, Massachusetts, Michigan, New Jersey, New York, Ohio, and Pennsylvania. Additional distributional records for *X.alni* have resulted from the USDA's Cooperative Agricultural Pest Survey (CAPS) program conducted by Departments of Agriculture of New York, Pennsylvania, Maryland, Maine, and Vermont. These new state records represent the first documented occurrence of *X.alni* in the eastern United States.

Here, we list and map (Fig. 1) distributional data taken from specimens of *X.alni* captured in Lindgren funnel traps, with few exceptions, deployed as part of these trapping surveys of the Northeast. The majority of specimens examined are deposited in the Cornell University Insect Collection (Ithaca, NY), and with others in the reference

collections of the Maine Forest Service (Augusta), Maryland Department of Agriculture (Annapolis), Massachusetts Department of Conservation and Recreation (Amherst) (2005 collections), Pennsylvania Department of Conservation and Natural Resources (Middletown) (2005 collections), and in the personal collection of R. J. Rabaglia.

New Eastern United States Records

Distribution records are followed by the number of specimens examined (in parentheses) and the lure types (AP-EtOH = alpha-pinene + UHR ethanol; Ips = 3-component Ipslure; Chal = Chalcoprax; EtOH-MB = ethanol + methyl butenol; AP-MB = alpha-pinene + methyl butenol; EtOH = ethanol only), when available.

MAINE: Cumberland Co., Portland Harbor, 2-IV-2004 (1), (EtOH, 1); 30-1 V-

2004 (16), (Ips, 1; AP-EtOH, 2; EtOH, 13); 14-V-2004 (2), (AP-EtOH, 2); Mackworth Island, 14-V-2004 (2), (EtOH, 2); Falmouth, 14-V-2004 (18), (AP-EtOH, 8;

EtOH, 10). Kennebec Co., Gardiner, 2-VI-2004 (3); Waterville, 20-IV-2004 (3). York Co., Saco, 14-IV-2004 (1). MARYLAND: Frederick Co., Middletown, 7-II-2005 (1), (AP-EtOH, 1); Monrovia, 7-II-2005 (5), (AP-EtOH, 5); 7-III-2005 (8), (AP-EtOH, 8); Mt. Airy, 7-II-2005 (1), (AP-EtOH, 1). Garrett Co., Accident, 2-30-VII-2002 (1), (Ahson-Pike trap, 1); 14.19-IV-2004 (2), (Ahson-Pike trap, 2); 3-V-2004 (1), (Ahson-Pike trap, 1). Montgomery Co., Boyds, 7-II-2005 (1), (AP-EtOH, 1); Dickerson, 7-II-2005 (5), (AP-EtOH, 5). MASSACHUSETTS: Barnstable Co., Sandwich, II-IV-2005 (66), (AP-EtOH, 10; EtOH, 56); 25-IV-2005 (45), (AP-EtOH, 5; EtOH, 40); 23-V-2005 (2), (AP-EtOH, 1; EtOH, 1); 6-VL

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Fig. 1 . Locality records of *Xyleborinus alni* in the eastern United States, based on specimens captured

in baited Lindgren funnel traps deployed for the "Early Detection and Rapid Response" bark beetle survey and various state CAPS programs from 2001-2005.

2005 (1), (EtOH, 1). Bristol Co., Free-town (Freetown S. F.), II-IV-2005 (4), (EtOH, 4); 25-IV-2005 (3), (AP-EtOH, 1; EtOH, 2).). Franklin Co., Erving (Erving S. F. Hdqts.), 19-IV-2005 (12), (AP-EtOH, 2; EtOH, 10); 2-V-2005 (5), (AP-EtOH, 1, EtOH, 4). Hampden Co., Chester, 20-IV-2005 (9), (AP-EtOH, 3; EtOH, 6); 18-V-2005 (1), (EtOH, 1); Chicopee (Chicopee S. F.), 19-IV-2005 (31), (Ips, 3, AP-EtOH, 7; EtOH, 21); 16-V-2005 (1), (EtOH, 1). Hampshire Co., Goshen, 25-IV-2005 (12), (Ips, 1; AP-EtOH, 2; EtOH, 9); 4-V-2005 (6), (AP-EtOH, 3; EtOH, 3); 18-V-2005 (1), (AP-EtOH, 1); Middlefield, 19-IV-2005 (45), (Ips, 2; AP-EtOH, 3; EtOH, 40); 2-V-2005 (12), (AP-EtOH, 2; EtOH, 10); 16-V-2005 (12), (Ips, 2; AP-EtOH, 2; EtOH, 8). Middlesex Co., Hopkinton (Whitehall Boat Ramp), II-IV-2005 (14), (AP-EtOH, 7; EtOH, 7); Middlesex Fells Reserve, 9-IV-2004 (1), (AP-EtOH, 1); 26-IV-2004 (15), (AP-EtOH, 2; EtOH,

13); 23-V-2004 (1), (AP-EtOH, 1). Norfolk Co., Blue Hills Reserve, 26-IV-2004 (1), (EtOH, 1); 7-VI-2004 (1), (EtOH, 1). Plymouth Co., Plymouth (Myles Standish S. F.), 25-IV-2005 (1), (EtOH, 1).). Suffolk Co., Boston (urban site), 23-V-2004 (1), (AP-EtOH, 1); (forest site), 7-VI-2004 (1), (EtOH, 1). Worcester Co., Douglas (Douglas S. F.), 19-IV-2005 (2), (AP-EtOH, 1; EtOH, 1); 17-V-2005 (1), (EtOH, 1); Southborough, II-IV-2005 (21), (AP-EtOH, 21); 25-IV-2005 (1), (AP-EtOH, 1).); Sterling (Central East Field Office), 19-IV-2005 (1), (EtOH, 1); 4-V-2005 (1), (EtOH, 1); 16-V-2005 (2), (AP-EtOH, 1; EtOH, 1); Templeton (Otter River S. F.), 19-IV-2005 (7), (AP-EtOH, 2, EtOH, 5). MICHIGAN: St.

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Clair Co., Lakeport S. P. (urban forest),
22-IV-2004 (701), (Ips, 1; AP-EtOH, 57;

EtOH, 643); 5-V-2004 (197), (Ips, 5; AP-EtOH, 117; EtOH, 75); 17-V-2004 (56), (Ips, 1; AP-EtOH, 55); 27-V-2004 (1), (EtOH-MB, 1); 7-VI-2004 (1), (AP-EtOH, 1); Port Huron RR (SWPM site), 22-IV-2004 (12), (Ips, 1; AP-EtOH, 6; EtOH, 5); 5-V-2004 (24), (AP-EtOH, 15; EtOH, 9); 17-V-2004 (3), (AP-EtOH, 2; EtOH, 1); Port Huron S. F. (rural forest), 22-IV-2004 (134), (Ips, 6; AP-EtOH, 19; EtOH, 109); 5-V-2004 (52), (Ips, 1; AP-EtOH, 9; EtOH, 42); 17-V-2004 (15), (AP-EtOH, 8; EtOH, 7). Wayne Co., Detroit Yazaki Corp. (SWPM site), 16-IV-2004 (2), (AP-EtOH, 1; EtOH, 1); 29-IV-2004 (2), (AP-EtOH, 1; EtOH, 1); Detroit Tree Farm (rural forest), 28-IV-2004 (6), (AP-EtOH, 2; EtOH, 4); 13-V-2004 (2), (EtOH, 2); Dearborn (Heritage Park), 7-IV-2005 (1), (EtOH, 1); 11-IV-2005 (108), (Ips, 8; EtOH, 100); 12-IV-2005 (120), (AP-EtOH, 120); 28-IV-2005 (3), (AP-EtOH, 3); 10-V-2005 (4), (AP-EtOH, 4); Inkster (Ford-Wixom plant), 14-IV-2005 (5), (EtOH, 5); Rockwood (F.W. Ritters & Sons), 29-IV-2005 (1), (AP-EtOH, 1); 11-V-2005 (1), (EtOH, 1). NEW JERSEY: Essex Co., West Or-

ange, 15-IV-2004 (1), (AP-EtOH, 1); 27-IV-2004 (1), (AP-EtOH, 1); 12-V-2004 (2), (AP-EtOH, 2). Hunterdon Co., Voorhees S. P., 16-III-2004 (3), (EtOH, 3); 30-III-2004 (3), (EtOH, 3); 13-IV-2004 (4), (AP-EtOH, 1; Ips, 3). Mercer Co., Washington Crossing S. P., 14-V-2002 (1), (Chal, 1). Middlesex Co., Monroe Twp., 29-III-2004 (7), (Ips, 1; AP-EtOH, 5; EtOH, 1); 25-IV-2004 (1), (AP-EtOH, 1). Morris Co., Blairstown, 22-III-2004 (1), (AP-EtOH, 1); 15-IV-2004 (1), (AP-EtOH, 1); Green Village, 20-11-2004 (1), (AP-EtOH, 1); 22-III-2004 (39), (AP-EtOH, 39); I-IV-2004 (1), (AP-EtOH, 1); 15-IV-2004 (4), (AP-EtOH, 4); Hacklebarney S. P., 16-III-2004 (6), (EtOH, 6); 30-III-2004 (1), (EtOH, 1); 13-IV-2004 (2), (EtOH, 2); Marcella, 22-III-2004 (45), (AP-EtOH, 45); I-IV-2004 (2), (AP-EtOH, 2); 15-V-2004 (13), (AP-EtOH, 13). Passaic Co., Ringwood S. P., 15-IV-2004 (2), (AP-EtOH, 2); 21-IV-2004 (1), (AP-EtOH, 1); Wanaque Reserve, 11-III-2004 (1), (AP-EtOH, 1); 15-IV-2004 (1), (AP-EtOH, 1). Sussex Co., Fredon, 15-IV-

2004 (6), (AP-EtOH, 6); Hainesville, 15-IV-2004 (37), (AP-EtOH, 37); 23-IV-2004 (4), (AP-EtOH, 4); High Point S. P., 15-IV-2004 (4), (AP-EtOH, 4). Union Co., Carteret, 7-V-2004 (1), (EtOH, 1). Warren Co., Hope, 22-III-2004 (17), (AP-EtOH, 17); 15-IV-2004 (22), (AP-EtOH, 22); Merrill Creek Reservoir, 16-III-2004 (129), (AP-EtOH, 2; EtOH, 120; Ips, 7); 30-III-2004 (62), (AP-EtOH, 4; EtOH, 56; Ips, 2); 13-IV-2004 (125), (AP-EtOH, 9; EtOH, 115; Ips, 1); 27-IV-2004 (2), (EtOH, 2). NEW YORK: Allegany Co., Belfast, 31-III-2004 (7), (Ap-EtOH, 7); 13-IV-2004 (3), (AP-EtOH, 3); Cuba, 13-IV-2004 (8), (AP-EtOH, 8); 27-IV-2004 (1), (AP-EtOH, 1). Cattaragus Co., Allegany S. P., 9-IV-

2003 (58), (Ips, 6; AP-EtOH, 11; EtOH, 41); 23-IV-2003 (77), (Ips, 15; AP-EtOH, 17; EtOH, 45); 5-V-2003 (22), (Ips, 1; AP-EtOH, 3; EtOH, 18); 19-V-2003 (7), (Ips, 2; AP-EtOH, 1; EtOH, 4); 13-IV-

2004 (46), (AP-EtOH, 46); 27-IV-2004 (2), (AP-EtOH, 2); Little Valley, 22-IV-

2003 (7), (Ips, 1; AP-EtOH, 2; EtOH, 4);

13-IV-2004 (11), (AP-EtOH, 11). Chau-
tauqua Co., Lake Erie S. P., IO-IV-2003
(2), (EtOH, 4); 23-IV-2003 (8), (AP-
EtOH, 1; EtOH, 7); 6-V-2003 (5),
(EtOH, 5); Mayville, 23-IV-2003 (2),
(EtOH, 2); 13-IV-2004 (4), (AP-EtOH,
4); 27-IV-2004 (1), (AP-EtOH, 1); Pan-
ama, IO-IV-2003 (1), (AP-EtOH, 1); 23-
IV-2003 (8), (Ips, 1; AP-EtOH, 3; EtOH,
4); 6-V-2003 (1), (AP-EtOH, 1); 13-IV-

2004 (3), (AP-EtOH, 3); Silver Creek, 10-
IV-2003 (2), (EtOH, 2). Columbia Co.,
Hillsdale, 21-IV-2005 (1), (AP-MB, 1);
Hudson, 2-V-2005 (1), (AP-MB, 1).

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Dutchess Co., Millerton, 27-IV-2004 (2),
(AP-MB, 2); Poughkeepsie, 8-IV-2004
(1), (AP-MB, 1); 26-IV-2004 (5), (AP-
MB, 5); 6-V-2004 (1), (AP, 1). Monroe
Co., Rochester, 9-V-2005 (1), (Ips, 1).

Nassau Co., Woodbury, 8-IV-2005 (1),
(AP-MB, 1). Osuego Co., Oswego (port
area), 25-IV-2001 (4), (AP-EtOH, 1;
EtOH, 3); Oswego (urban site), 25-IV-
2001 (17), (Ips, 1; AP-EtOH, 10; EtOH,
6); 9-V-2001 (6), (EtOH, 6); Oswego
(forest site), 24-IV-2001 (1), (EtOH, 1);
25-IV-2001 (17), (Ips, 2; AP-EtOH, 4;
EtOH, 11); 9-V-2001 (3), (AP-EtOH, 2;
EtOH, 1). Putnam Co., Garrison, 12-IV-
2005 (1), (AP-MB, 1). Rensselaer Co.,
Tomhannock Reservoir, 12-V-2004 (1),
(AP-MB, 1). Ulster Co., Kingston, 11-
IV-2005 (3), (AP-MB, 3); 25-IV-2005 (1),
(AP-MB, 1). Westchester Co., York-
town, 14-IV-2005 (2), (AP-MB, 2).

OHIO: Aslitabula Co., Pymatuning S.
P., 31-III-2003 (1), (Ips, 1); 17-IV-2004
(4), (AP-EtOH, 3; EtOH, 1). Cohunbiana
Co., New Waterford, 12-III-2004 (1),
(AP-EtOH, 1). Cuyahoga Co., Brecks-
ville, 12-III-2004 (1), (AP-EtOH, 1); 12-
IV-2004 (1), (AP-EtOH, 1); Oakwood,
12-IV-2004 (1), (AP-EtOH, 1). Geauga
Co., Parkman, 27-III-2004 (7), (AP-
EtOH, 7); 12-IV-2004 (9), (AP-EtOH,
9); Thompson, 27-III-2004 (1), (AP-
EtOH, 1); 12-IV-2004 (16), (AP-EtOH,

16). Lake Co., Leroy Center, 13-III-2004 (8), (AP-EtOH, 8); 27-III-2004 (9), (AP-EtOH, 9); 12-IV-2004 (19), (AP-EtOH, 19); North Madison, 13-III-2004 (11), (AP-EtOH, 11); 27-III-2004 (1), (AP-EtOH, 1); 12-IV-2004 (21), (AP-EtOH, 21). Mahoning Co., North Lima, 25-III-2004 (1), (AP-EtOH, 1). Portage Co., Mantua Corners, 27-III-2004 (7), (AP-EtOH, 7); 12-IV-2004 (17), (AP-EtOH, 17). Summit Co., CVNP Horseshoe Pond, 12-III-2004 (1), (AP-EtOH, 1); CVNP Oak Hill PA, 28-III-2004 (1), (AP-EtOH, 1). Trumbull Co., Youngstown State University arboretum, 3-IV-2003 (1), (AP-EtOH, 1). Tuscarawas Co., Beach City Dam, 24-III-2004 (1), (AP-EtOH, 1). PENNSYLVANIA: Allegheny Co., Beechwood Farms ANC, 19-III-2004 (19), (AP-EtOH, 19); 2-IV-2004 (3), (AP-EtOH, 3); Wexford, 19-III-2004 (4), (AP-EtOH, 4); 3-IV-2004 (5), (AP-EtOH, 5). Beaver Co., Racoon S. P., 29-III-2003 (2), (EtOH, 2). Berks Co., Nolde S. F., 5-IV-2005 (67), (lps, 1; AP-EtOH, 4; EtOH, 62); 19-IV-2005 (83), (lps, 16; AP-EtOH, 37; EtOH, 30); 31-V-

2005 (1), (Ips, 1). Bradford Co., Chapman Rd. (NNW of Canton), II-IV-2005 (27), (Ips, 15; AP-EtOH, 6; EtOH, 6); 26-IV-2005 (102), (Ips, 50; AP-EtOH, 7; EtOH, 45); 9-V-2005 (11), (Ips, 3; AP-EtOH, 5; EtOH, 3); 23-V-2005 (14), (Ips, 3; AP-EtOH, 3; EtOH, 8). Butler Co., Annandale, 25-11-2004 (1), (AP-EtOH, 1); 25-III-2004 (5), (AP-EtOH, 5); 10-IV-

2004 (3), (AP-EtOH, 3) ; Harmony, 29-III-2003 (21), (Ips, 6; AP-EtOH, 8; EtOH, 7); 12-IV-2003 (4), (Ips, 1; AP-EtOH, 2; EtOH, 1); 27-IV-2003 (4), (AP-EtOH, 3; EtOH, 1); 17-V-2003 (1), (AP-EtOH, 1); Moraine S. P., 29-III-2003 (6), (Ips, 5; EtOH, 1); 12-V-2003 (2), (Ips, 1; EtOH, 1); 25-III-2004 (20), (AP-EtOH, 20); IO-IV-2004 (4), (AP-EtOH, 4).

Cameron Co., Lincoln Rd. (Elk S. F., Gibson Twp.), 6-IV-2005 (19), (Ips, 4; AP-EtOH, 1; EtOH, 14); 20-IV-2005 (104), (Ips, 10; AP-EtOH, 22; EtOH, 72); 6-V-2005 (2), (AP-EtOH, 1; EtOH, 1); 17-V-2005 (34), (AP-EtOH, 10; EtOH, 24). Chester Co., State Game Lands No. 43 (Pine Swamp), 5-IV-2005

(8), (EtOH, 8); 19-IV-2005 (8), (Ips, 3;
AP-EtOH, 3; EtOH, 2); 3-V-2005 (1),
(EtOH, 1). Clarion Co., Knox, 25-III-
2004(1), (AP-EtOH, 1); IO-IV-2004 (1 1),
(AP-EtOH, 11); Tylersburg, 25-III-2004
(9), (AP-EtOH, 9); IO-IV-2004 (17), (AP-
EtOH, 17). Clearfield Co., Anderson
Creek (W of Anderson Creek), 19-IV-

2005 (121), (Ips, 16; AP-EtOH, 22;
EtOH, 83); 4-V-2005 (24), Ips, 1; AP-
EtOH, 9; EtOH, 14); 17-V-2005 (17),
(AP-EtOH, 5; EtOH, 12). Columbia Co.,

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Roaring Creek S. F. (N of Aristes), 14-
IV-2005 (591), (Ips, 165; AP-EtOH, 66;
EtOH, 360); 28-IV-2005 (173), (Ips, 36;
AP-EtOH, 41; EtOH, 96); II-V-2005
(91), (Ips, 12; AP-EtOH, 31; EtOH, 48);
25-V-2005 (17), (AP-EtOH, 8; EtOH, 9).
Crawford Co., Crossingville, 31-III-2003

(1), (EtOH, 1); 17-IV-2003 (3), (AP-EtOH, 1; EtOH, 2); 30-IV-2003 (3), (AP-EtOH, 1; EtOH, 2); New Richmond, 31-III-2003 (1), (AP-EtOH, 1); 17-IV-2003 (6), (AP-EtOH, 1; EtOH, 5). Cumberland Co., Micheaux Rd. (W. of Pine Grove Furnace), 12-IV-2005 (1), (EtOH, 1). Erie Co., Erie (port area), 17-IV-2001 (5), (EtOH, 5); 2-V-2001 (10), (AP-EtOH, 3; EtOH, 7); 16-V-2001 (1), (AP-EtOH, 1); Erie (industrial site), 2-IV-2002 (11), (AP-EtOH, 2; EtOH, 9); 16-IV-2002 (22), (AP-EtOH, 11; EtOH, 11); 16-IV-2002 (11), (AP-EtOH, 11); 1-V-2002 (1), (EtOH, 1); Erie (urban site), 2-IV-2002 (16), (Chal, 1; AP-EtOH, 2; EtOH, 13); 16-IV-2002 (25), (Chal, 2; AP-EtOH, 5; EtOH, 18); Erie (forest site), 2-IV-2002 (103), (lps, 1; AP-EtOH, 31; EtOH, 71); 16-IV-2002 (175), (lps, 2; AP-EtOH, 46; EtOH, 127); I-V-2002 (6), (lps, 1; Chal, 1; AP-EtOH, 1; EtOH, 3); Erie (Lakeside Cemetery), 13-IV-2004 (17), (AP-EtOH, 2; EtOH, 15); 28-IV-2004 (4), (EtOH, 4); Erie (Eriez Magnetics), 13-IV-2004 (5), (AP-EtOH, 2; EtOH, 3); Erie (Asbury Nature Center), 13-IV-2004 (8), (AP-EtOH, 1; EtOH, 7). Elk Co., Chaffee, 16-IV-2004 (24), (AP-

EtOH, 24); 30-IV-2004 (2). (AP-EtOH, 2); Highland Corners, 16-IV-2004 (31), (AP-EtOH, 31); 30-IV-2004 (1), (AP-EtOH, 1). Forrest Co., Lynch, 16-IV-2004 (22), (AP-EtOH, 22); Pigeon, 16-IV-2004 (1), (AP-EtOH, 1). Franklin Co., Irishtown Rd. (E of Sidetown), 12-IV-2005 (1), (EtOH, 1). Huntingdon Co., Indian Hanna Hunt Club (NNE of Valley Point), 12-IV-2005 (22), (AP-EtOH, 5; EtOH, 17). Jefferson Co., Barkett Rd. (NE of Clear Creek S. P.), 5-IV-2005 (1), (AP-EtOH, 1); 19-IV-2005 (908), (Ips, 25; AP-EtOH, 110; EtOH, 773); 3-V-2005 (81), (AP-EtOH, 10; EtOH, 71); 16-V-2005 (365), (Ips, 2; AP-EtOH, 80; EtOH, 283). Juniata Co., State Farm (N of Wistie), 12-IV-2005 (19), (AP-EtOH, 1; EtOH, 18). Lancaster Co., State Game Lands No. 46 (Middle Creek), 5-IV-2005 (1), (EtOH, 1); 19-IV-2005 (1), (EtOH, 1). Lawrence Co., Edinburg, 25-III-2004 (1), (AP-EtOH, 1). McKean Co., Allegany N. F., 25-11/29-III-2004, M. MacKenzie, coll. (9),

(EtOH, 9); 29-III/22-IV-2004 (3); Red
Bridge, 16-IV-2004 (19), (AP-EtOH, 19);
Wetmore, 16-IV-2004 (3), (AP-EtOH, 3).
Mercer Co., Camp Perry, 19-III-2003 (1),
(AP-EtOH, 1); 3-IV-2003 (2), (AP-
EtOH, 1; EtOH, 1); 16-IV-2003 (1),
(EtOH, 1); Mercer, 3-IV-2003 (1),
(EtOH, 1). Monroe Co., Dixon R. Miller
Rec. Area, (N of Indian Mountain
Lake), 14-IV-2005 (6), (lps, 1; AP-EtOH,
1; EtOH, 4); 28-IV-2005 (4), (lps, 3; AP-
EtOH, 1); II-V-2005 (2), (AP-EtOH, 1;
EtOH, 1). Perry Co., Blain, 12-IV-2005
(9), (EtOH, 9). Schuylkill Co., Frackville
cloverleaf, 14-IV-2005 (34), (lps, 5; AP-
EtOH, 9; EtOH, 20); 28-IV-2005 (10)
(AP-EtOH, 3; EtOH, 7); II-V-2005 (2)
(AP-EtOH, 1; EtOH, 1); 25-V-2005 (1)
(AP-EtOH, 1). Tioga Co., Asaph Rd
(NW of Asaph), II-IV-2005 (148), (lps
82; AP-EtOH, 30; EtOH, 36); 25-IV
2005 (208), (lps, 74; AP-EtOH, 73
EtOH, 61); 9-V-2005 (94), (lps, 39; AP-
EtOH, 32; EtOH, 23); 23-V-2005 (65)
(lps, 1; AP-EtOH, 42; EtOH, 22)
Groover Rd. (W of Canton), 11 -IV
2005 (88), (lps, 34; AP-EtOH, 24; EtOH
30); 26-IV-2005 (151), (lps, 8; AP-EtOH
61; EtOH, 82); 9-V-2005 (25), (lps, 8

AP-EtOH, 7; EtOH, 10); 23-V-2005 (62)
(Ips, 14; AP-EtOH, 24; EtOH, 24)
Venango Co., Polk, 19-III-2003 (1)
(EtOH, 1); 3-IV-2003 (3), (EtOH, 3)
16-IV-2003 (2), (Ips, 1; EtOH, 1); Walla-
ceville, 8-IV-2003 (2), (EtOH, 2); 6-V-
2003 (1), (AP-EtOH, 1). Warren Co.,
Chandlers Valley, 8-IV-2003 (1), (EtOH,

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Figs. 2-5. Dorsal and lateral habitus of *Xyleborinus* spp. 2 and 4, *Xyleborinus aini*. 3 and 5, *Xyleborinus saxesenii*. 2a, Scanning electron micrograph of scutellum of *X. alni*; arrow denotes conical scutellum. Scale line for Figs. 2-5 = 1 mm; scale line for Fig. 2a = 100 μ m.

1); 22-IV-2003 (7), (AP-EtOH, 2; EtOH, 5); Hearts Content, 16-IV-2004 (44), (AP-EtOH, 44); 30-IV-2004 (4), (AP-EtOH, 4); Youngsville, 8-IV-2003 (4), (AP-EtOH, 1; EtOH, 3); 22-IV-2003 (4), (AP-EtOH, 2; EtOH, 2; 16-IV-2004 (4), (AP-EtOH, 4). VERMONT: Chittenden Co., Burlington, 23-IV/7-V-2002 (1),

(AP-EtOH, 1).

Recognition Features

Species of *Xyleborinus* are distinguished from those of *Xyleborus* by the conical scutellum (Fig. 2a), the basal margin of the elytra being abrupt and precipitous in the median area, and by the posterior margin of the elytral declivity bearing distinct short or hooked denticles or tubercles (Figs. 6, 7). *Xyle-*

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Figs. 6-7. Elytral declivity of *Xyleborinus* spp. 6, *Xyleborinusalni*. 7, *Xyleborinus saxesenii*. Arrow denotes elytral tubercles.

borinusalni (Figs. 2, 4) can be separated from *X. saxesenii* (Figs. 3, 5) by its larger size (2.5-2.8 mm vs. 1.9-2.4 mm), by the larger, hooked tubercles of the elytral declivity (Fig. 6 vs. 7), and by

a slightly shorter pronotum (Fig. 2 vs. 3)
(Holzschuh 1994).

Native Distribution and Known Hosts

Xyleborinus alni is native to Asia
(Japan and eastern USSR), but also is
adventive in Europe (Austria, Czecho-
slovakia, Germany and Poland) (Wood
and Bright 1992, Bright and Skidmore
1997, [http://xyleborini.tamu.edu/query.
php?tax_id=829](http://xyleborini.tamu.edu/query.php?tax_id=829)). In the Palearctic Re-
gion, known hosts include a variety of
deciduous trees: *Alnus glutinosa* (L.)
Gaertn., *A. hirsuta* (Spach.) Rupr., *Alnus*
spp., *Betula japonica* Sieb. ex H. Winkler,
B. latifolia Regel, *B. platyphylla* var.
japonica Hara, *Corylus avellana* L.,
Quercus robur L., *Q. petraea* (Mat-
tuschka) Liebl., (also known and cited
as *Q. sessiflora*), *Salix alba* L., 5".
viminalis L., *S. caprea* L., and *Tilia*

aniurensis Rupr. (Wood and Bright
1992, Holzschuh 1994, Bright and Skid-
more 1997, [http://xyleborini.tamu.edu/
query.php?tax_id=829](http://xyleborini.tamu.edu/query.php?tax_id=829)). A breeding pop-
ulation from wind-blown red alder,

Alnus rubra Bongard, was verified near the port of Olympia, Washington, in April 1997 (Mudge et al. 2001). Also, a specimen was extracted from a trunk of flowering cherry (*Prunus* "Canada Red") from a Salem, Oregon (Polk Co.) nursery in May 2001 (LaBonte et al. 2005).

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vided the image of the scutellum of *X. alni*, made possible by a NSF-PEET grant (DEB-0328920) awarded to Anthony Cognato (TAMU).

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