

New Introduction in California: The Redhaired Pine Bark Beetle, *Hylurgus ligniperda* Fabricius

An overwintering North American population of the redhaired pine bark beetle (RPBB) was first discovered in November 2000 in Rochester, New York. In July 2003 it was also detected at two locations in Los Angeles County, California near heavily urbanized areas where exotic pines of Mediterranean origin are favored landscape trees. California and New York currently have the only known established populations of RPBB in North America. The beetle feeds in the phloem of the basal portion of pine stems, large roots, or woody debris on the soil surface. However, the primary concern in western North America is that RPBB might become a highly effective vector of the pathogen for blackstain root disease, *Leptographium wageneri*, which is a serious native pest of conifers.

Identification

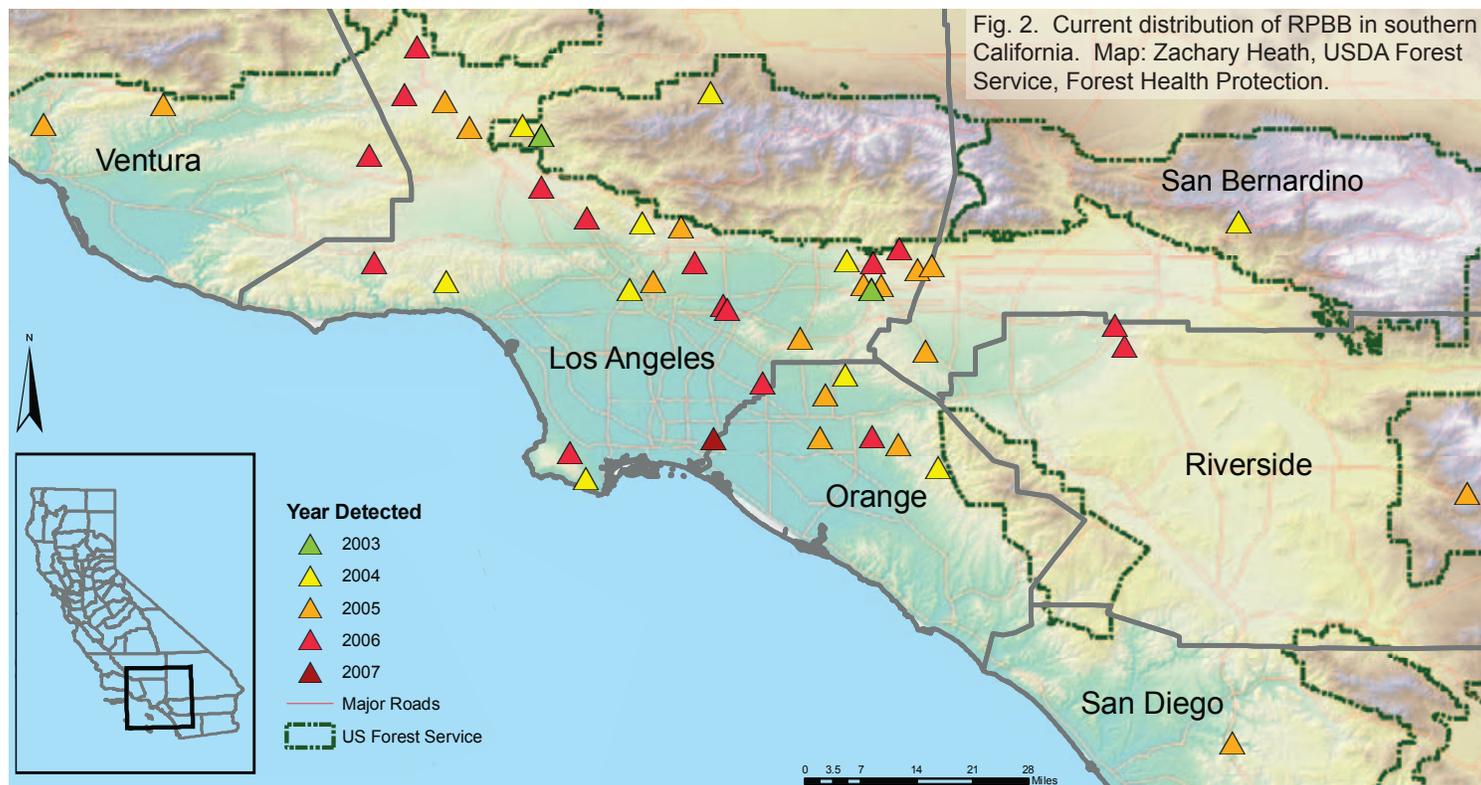
RPBB is a relatively small black beetle (Fig. 1A,B) about 6 mm long by 2 mm wide. Course, reddish hairs are particularly noticeable on the posterior slope of the wing covers (elytra), and it lacks teeth, spines, or bumps on the posterior margins of the elytra (Fig. 1C).



Fig. 1. Lateral (A) and dorsal (B) views of adult male RPBB. Dense, red setae on the elytral declivity (C) and longitudinal tubercle (projection) on the frons of the head (D). Photo credit, Dr. Anthony G. Gutierrez (Chief) and Danielle N. Thomas, Molecular Biology Lab, Entomological Sciences Program, U.S. Army CHPPM, Aberdeen Proving Ground, MD.

A Cosmopolitan Pest of Pines

The native distribution of RPBB includes southern and central Europe, Russia, the Mediterranean region, and the nearby Atlantic Ocean islands. It has also been introduced and has established populations in Australia, Japan, New Zealand, South Africa, parts of South America (Chile, Brazil, and Uruguay), Sri Lanka, and now the U.S. It continues to be intercepted frequently at ports of entry in China and Scandinavia. The nearly global spread of this bark beetle can be attributed to increased international trade and the solid wood packing material that has accompanied containerized shipments of goods.



Current Distribution in California

As of May 2007, RPBB has been collected by hand or in attractant-baited survey traps in six counties in southern California (Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura) (Fig. 2). The northern most collection point has been near the community of Castaic on the southern base of the transverse Tehachapi Mountain Range. RPBB has been frequently encountered in cut logs of Aleppo pine, *Pinus halepensis* Mill., and Canary Island pine, *Pinus canariensis* Smith, in green waste piles in Los Angeles County.

Biology in California

Adult RPBB are good fliers and can disperse over several kilometers in response to host volatiles. They have been observed feeding and reproducing in the phloem of large dimensional logs of *P. halepensis* and *P. canariensis*, and females prefer to colonize through surfaces of cut logs in contact with moist soil (Fig. 3A and 5A). In other locations female RPBB have laid up to 500 eggs in their galleries (Fig. 3B). In 2006 and 2007, field observations and flight trapping data suggested that RPBB can complete at least two generations a year in Southern California. Colonization by parents of the first generation has been observed from late February through mid-March. After this initial flight and period of colonization, subsequent peak flight activity was observed in early May and late July. Flight activity continues year round, but it has been variable, depending on the locality.

Potential Impacts to Pines in California

RPBB has a broad host range among pines and has been reported to kill healthy trees and seedlings in locations outside the U.S. (Fig. 4). In Chile, New Zealand, and South Africa, RPBB has been a pest in Monterey pine, *Pinus radiata* D. Don, plantations and sometimes has damaged seedlings. Among insects associated with Chilean *P. radiata* plantations, RPBB was rated as having the highest pest risk potential for the U.S. Pines are prevalent in California's urban landscape, including adventive plantings of *P. radiata*, (Greater San Francisco Bay Area), and the exotic species, *P. halepensis*, *P. canariensis*, and Italian stone pine, *Pinus pinea* L. (Central Valley, Los Angeles Basin, Inland Empire, and other southern California regions). Native populations of RPBB in the Mediterranean region have damaged the exotic pines noted above for many years. Another major concern in the U.S. is that RPBB will vector black-stain root disease, *Leptographium wageneri*, a virulent native pathogen that currently threatens western conifers through a native bark beetle vector system. In New Zealand, more than 70% of RPBB examined carried spores of *L. truncatum* and *L. procerum*; the latter is the causative agent for white pine root decline. Since adults overwinter gregariously in galleries beneath the bark of roots, they may easily cross contaminate each other with fungal spores. RPBB is present in a wide range of climates throughout the world, so it could potentially survive in other regions of the West outside of California.



Fig. 3. Entry and boring dust (A) from RPBB on underside of cut log of Aleppo pine; egg gallery constructed by female (B) (Riverside Co., CA) D.-G. Liu, photo.



Fig. 4. Adult RPBB maturation feeding on a pine seedling in Chile, W.M. Ciesla, photo.

Management

Maintaining healthy trees and sanitation are the keys to preventing attacks. Infested trees or tree parts should not be moved from infested to uninfested counties, they should be removed and chipped or burned in infested areas; green pine firewood should not be stored near live trees (Fig. 5). Topically applied insecticides (carbamates and pyrethroids) can be used to protect live trees from RPBB, but they are difficult to apply below the soil line and may have deleterious environmental impacts. Research is proceeding on the development of non-toxic behavioral repellents to protect valuable pines in urban settings. The synergistic combination of ethanol and α -pinene can be used as a trap bait for early detection.

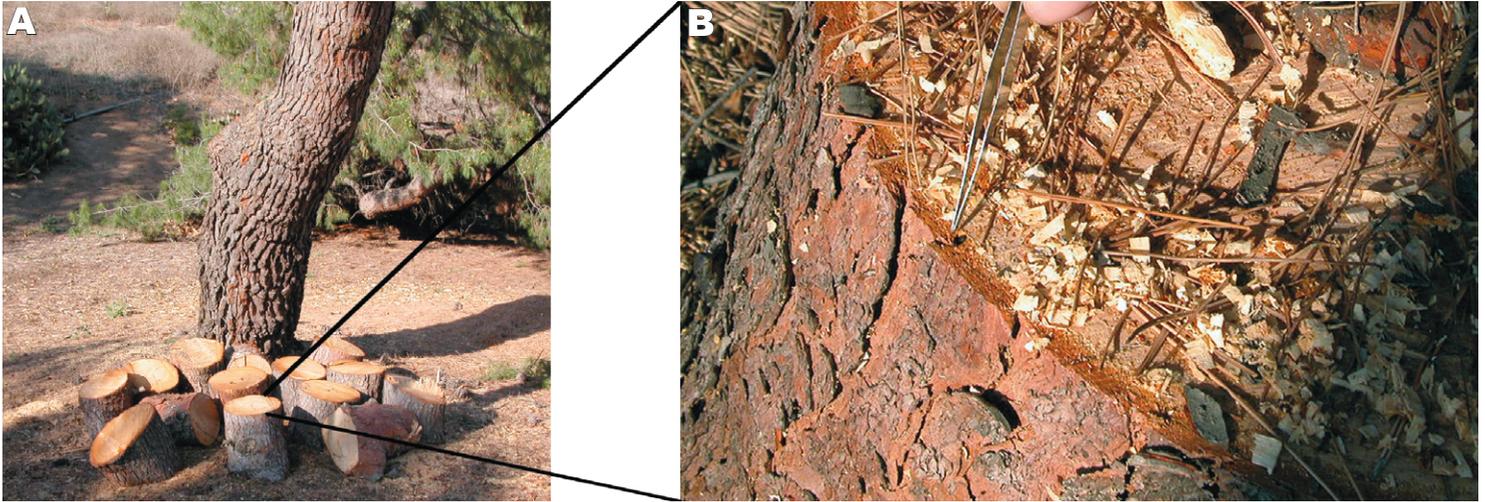


Fig. 5. Adult RPBB frequently colonizes the cut ends of fresh logs in contact with soil (A), so logs should not be stored near living pines as in this case of Aleppo pine (Los Angeles Co., CA). (B) Close-up of cut end of log showing entrance hole. S.J. Seybold, photo.

Sources

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- USDA APHIS. 2000. Pest risk assessment for importation of solid wood packing materials into the United States: Bark beetles, pp 183-185, Raleigh, North Carolina.

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