Recent collecting reveals new state records and geographic extremes in the distribution of the walnut twig beetle, *Pityophthorus juglandis* Blackman (Coleoptera: Scolytidae), in the United States

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Scientific Note

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The walnut twig beetle, *Pityophthorus juglandis* Blackman (Coleoptera: Scolytidae, *sensu* Wood 2007), was first described from specimens collected in 1896 in Grant Co., New Mexico (Blackman 1928). Bright (1981) and Wood & Bright (1992) reported a distribution for *P. juglandis* that included Arizona, California, and New Mexico in the U.S. and Chihuahua in Mexico. Cranshaw (2011) described the recent expansion of the range of *P. juglandis* to include the western U.S. states of Colorado, Idaho, Oregon, Utah, and Washington, as well as the eastern U.S. state of Tennessee.

Recent collecting for various biological and genetic studies as well as from demonstration trials of the *P. juglandis* aggregation pheromone has established new and very broad geographic extremes for the distribution of this species in the U.S. (Fig. 1). It currently ranges from approx. 47°43′ N in the north (Kootenai Co., Idaho) to approx. 31°24′ N in the south (Cochise Co., Arizona) and from approx. 123°13′ W in the west (Benton Co., Oregon) to approx. 75°8′ W in the east (Bucks Co., Pennsylvania). New state records are recorded formally here for Nevada, Pennsylvania, and Virginia. New California county records for unusually isolated populations (El Dorado, Lake, Santa Barbara, and Siskiyou Cos.) are also recorded.

The presence of *P. juglandis* in Virginia was first reported in the popular press in late July 2011 (http://www.clarkedailynews.com/virginias-black-walnut-trees-face-lethal-threat/23311) and in Pennsylvania in early August 2011 (The Pennsylvania Department of Agriculture http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_75292_10297_0_43/AgWebsite/ProgramDetail.aspx?name=Thousand-Cankers-Disease&navid=12&parentnavid=0&palid=137&). The first collection of *P. juglandis* in Nevada was made from the lower branches of *Juglans nigra* L. (Juglandaceae) by ADG and TWC on 8 May 2011 in Carson City (Nevada: Carson City Co., Carson City, near intersection of W. Park and N. Nevada Streets, 39°10′21.55″ N, 119°46′7.92″ W, approx. 1436 m elevation), however, the specimens were destructively sampled for an analysis of their mitochondrial DNA. Thus, the first record for Nevada with voucher specimens is 16 September 2011 from Washoe Co., Reno (see below).

With a directed national survey for *P. juglandis* anticipated in the coming years, it is likely that an expanded distribution of the beetle will be revealed in the eastern U.S. The northern limits of the distribution may eventually reach into Canada. The distribution of *P. juglandis* is not continuous within the geographic limits described here. It will be governed by the presence of walnut, *Juglans* spp., in the landscape and the degree of human-mediated movement of *Juglans* spp. raw logs or barked wood products.

New Records. ARIZONA: Cochise Co., Coronado National Forest, Hunter Canyon, approx. 1610 m elev., 31°24′9.22″ N, 110°15′8.71″ W, III-5-2011, coll. A.D. Graves, T.W. Coleman, ex: peeled from beneath the bark of dead branches from

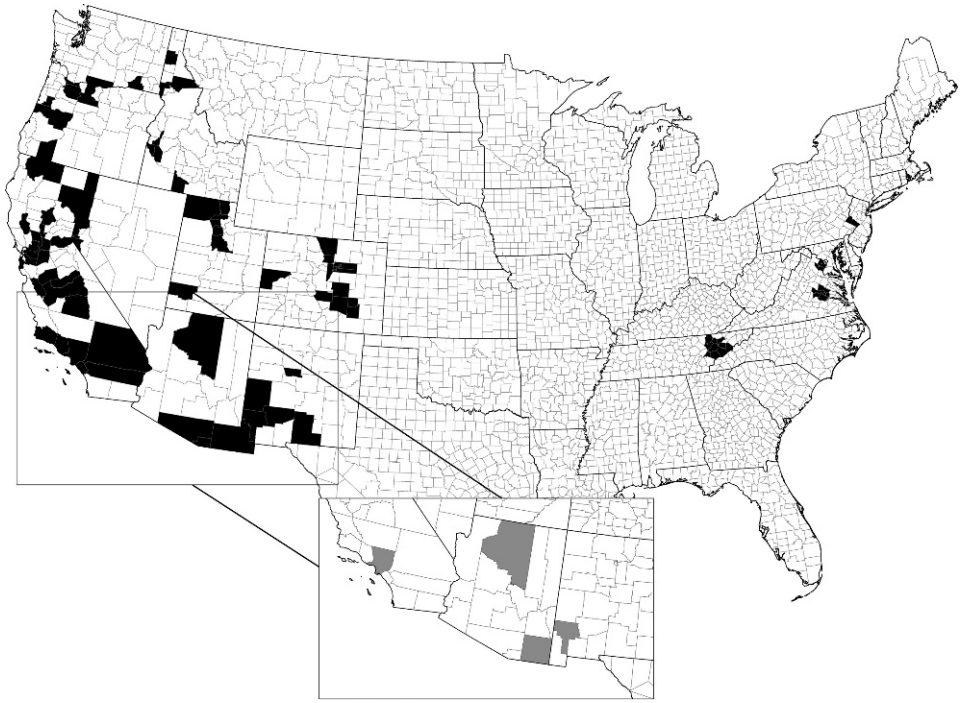

Figure 1. United States distribution of the walnut twig beetle, *Pityophthorus juglandis* Blackman, based on recent collections by the co-authors and various cooperators. Inset with gray-shaded counties is the distribution as of 1960 as reported in Bright (1981) and Wood & Bright (1992). Colorado distribution is based on collecting by the co-authors and a list of counties is available at: http://dictionary.sensagent.com/thousand+cankers+disease/en-en/ (accessed 28 May 2012). Distribution of *P. juglandis* as of July 2012 includes 90 counties in the United States (71 in the West and 19 in the East).

Juglans major (Torr.) A. Heller, 1 male and 4 female specimens; Coronado National Forest, entrance to Miller Canyon, east end near national forest boundary, approx. 1540 m elev., 31°25′37.52″ N, 110°15′13.82″ W, XII-27-2011, coll. J.A. King, ex: lower branches of *Juglans major*, one branch with large gall, emerged in the laboratory, 6 male and 7 female specimens. CALIFORNIA: El Dorado Co., near Greenwood Cemetery, 15 m S. Hwy 193, 540 m elev., 38°53′58.55″ N, 120°54′28.28″ W, VI-6-2012, coll. S.J. Seybold, R.L. Westcott ex: dying lower branch of *Juglans hindsii X regia*, Paradox walnut, 1 female specimen; Lake Co., 10005 Elk Mountain Road, Suchan-Valadez Walnut Farm and Nursery, Approx. 2 km NW of Upper Lake, 398.3 m elev., 39°10′21.36″ N, 122°54′32.22″ W, III-26-2009, coll. S.J. Seybold, ex: lower branches of *Juglans hindsii* (Jeps.) Jeps. ex R.E. Sm., northern California black walnut seed trees. 8 yr old trees (approx. 12.7–17.8 cm dbh), emerged in the laboratory, 1 male and 1 female specimen; Santa Barbara Co., Jose Baer Orchard, 4457 Santa Rosa Road, SW of Buelton, 83.8 m elev., 34°36′28.50″ N, 120°21′9.45″ W, III-17-2010, coll. S.J. Seybold, ex: Stem logs from *Juglans californica* S. Watson. Tree had died, but lower stem was still green; tree cut III-17-2010, beetles emerged in the laboratory between V-28- and VI-16-2010, 1 male and 1 female specimen; Siskiyou Co., Klamath River Rd., S. side of Klamath River near intersection with

Hwy 96, approx. 610 m elev., 41°50′00″ N, 122°37′15.7″ W, IX-2011, coll. Z. Heath, ex: small diameter branch of *Juglans hindsii* or *J. nigra*, emerged in the laboratory, 4 female specimens. IDAHO: Kootenai Co., 4221 Moccasin Road, Coeur d'Alene, Site #19, approx. 690 m elev., 47°43′10.20″ N, 116°50′11.80″ W, VIII-14- to VIII-31-2011, coll. L. Pederson, ex: Lindgren funnel trap (4-unit) baited with male-produced aggregation pheromone of *P. juglandis*, backyard of residence near *Juglans nigra*, 1 female specimen. NEVADA: Washoe Co., Reno, 144 Moran Street, along Sinclair Ave., approx. 1402 m elev., 39°31′13.73″ N, 119°48′27.93″ W, IX-16-2011, coll. S.J. Seybold, P.L. Dallara, ex: fading branch of *Juglans nigra* from top of tree at SW corner of Moran and Sinclair, emerged in the laboratory, 2 male and 2 female specimens. NEW MEXICO: Hildago Co., End of Hwy 338, near mile marker C001 44, USDA FS land parcel, Coronado National Forest, approx. 71 km S. Animas, approx. 1642 m elev., 31°26′26.10″ N, 108°58′45.27″ W, X-31-2010, coll. S.J. Seybold, A.D. Graves, ex: peeled from beneath the bark of branches from *Juglans major* in a riparian area near the Mexican border, 1 male and 1 female specimen. OREGON: Benton Co., 4545 Hwy 20, East side of Hwy 20, between Corvallis and Albany, in front of school, 87.5 m elev., 44°36′37.80″ N, 123°12′58.56″ W, VIII-10-2010, coll. S.J. Seybold, C.A. Leslie, ex: lower branches of *Juglans nigra*, row of 20–25 large trees in front of Farm House Special Needs School, emerged in the laboratory, 2 male and 2 female specimens; Lane Co., N. of Eugene, near Irving Rd.; Intersection of Hatton Ave and N. Park Ave., 133.5 m elev., 44°05′3.42″ N, 123°08′43.98″ W, VIII-10-2010, coll. S.J. Seybold, C.A. Leslie, ex: *Juglans nigra* old orchard rootstock that grew back and died. Located near a housing development, emerged in the laboratory, 2 male and 2 female specimens. PENNSYLVANIA: Bucks Co., Doylestown, approx. 112 m elev., 40°20′51.58″ N, W 75°7′39.50″ W, II-17-2012, coll. S. Lovenwirth, ex: dissected from small branches of *Juglans nigra*, 1 male and 3 female specimens. VIRGINIA: Chesterfield Co., Stubbs House, approx. 30 m elev., 37°26′1.32″ N, 77°26′32.64″ W, VIII-8- to VIII-15-2011, coll. N. Dart, ex: Lindgren funnel trap (12-unit) baited with male-produced aggregation pheromone of *P. juglandis*, VA-11-TCD-1p, near large diameter, dying *Juglans nigra*, 2 male and 2 female specimens.

All material was identified by SJS and voucher specimens of the adults were placed at the California Academy of Sciences, San Francisco, California. In this note, we have elected to use the original nomenclature for bark and ambrosia beetles (Coleoptera: Scolytidae) based on the argument presented in Wood (2007) and a more extensive treatment of the issue developed by D. E. Bright (personal communication), which is to be published in his third supplement to the world catalog of the Scolytidae and Platypodidae. In essence, morphological and fossil evidence of adult scolytids support the family-level treatment, whereas similarity in scolytid and curculionid larval morphology supports a subfamily placement. Because this issue is not entirely resolved, we prefer to take the more conservative approach of using the original nomenclature.

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