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FIRST RECORD OF *RETICULITERMES FLAVIPES* AND *RETICULITERMES HAGENI* IN OREGON (ISOPTERA: RHINOTERMITIDAE)

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The majority of pestiferous subterranean termites in North America belong to the endemic genus *Reticulitermes* (Isoptera: Rhinotermitidae). *Reticulitermes flavipes* (Kollar), the eastern subterranean termite, is the most economically important (Su 1993) and widespread termite (Austin et al. 2005a) in the United States. Existing taxonomic studies provide information on only 1 *Reticulitermes* spp. in Oregon, *R. hesperus* (Banks), the western subterranean termite, which is the most common termite pest species found from southern British Columbia to central California (Snyder 1954; Weesner 1965). Distribution studies on Pacific Northwest species of *Reticulitermes* have been addressed by Castle (1928) and Light & Pickens (1934). We report herein findings of two unreported *Reticulitermes* spp. (*R. flavipes* and *R. hageni*) from Oregon.

Soldiers, if available, and worker termites were collected from a total of 79 different colonies from 34 locations in Oregon located in the following counties: Clackamas, Coos, Jackson, Klamath, Lane, Linn, Marion, Multnomah, Polk, Umatilla, Washington, and Yamhill by our own collection efforts, by Pest Management Professionals (PMPs), and through the 2002 national termite survey. A 428-bp region of the mt-DNA 16s rRNA gene was amplified by PCR from 79 samples consisting of 1 worker from each colony and subjected to DNA sequencing per Szalanski et al. (2003).

Two *R. flavipes* soldier specimens collected from a colony at a collection site in Keizer, OR were identified morphologically, applying keys of Scheffrahn & Su (1994) and by evaluating soldier labra (Hostettler et al. 1995), and confirmed genetically via sequence data from a worker specimen (Szalanski et al. 2003). A worker specimen from a collection site in Salem, OR was identified genetically from sequence data as *R. hageni*. Soldiers were not collected from this colony and morphological identification was not performed. Both Keizer and Salem are located within 50 km from Portland, OR.

Reticulitermes flavipes is the most widely distributed *Reticulitermes*, and is found in the entire eastern region of North America as far as Ontario, Canada, and south to Florida (Snyder 1954; Weesner 1965). The known western distribution of the species extends through the central plains to the Rocky Mountains and down to Monterrey, Mexico (Banks & Snyder 1920; Snyder 1954; Weesner 1965; Messenger 2003). Austin et al. (2005a) reported the first occurrence of *R. flavipes* in California and Nevada, extending its distribution westward. The presence of *R. flavipes* in western states has subsequently been independently verified (Su et al. 2006; Tripodi et al. 2006). The *R. flavipes* 16S rRNA haplotype was FF (GenBank Accession D2001958), which is predominately found in the eastern United States (Austin et al. 2005a). Because this is outside of the previously known distributions of both *R. flavipes* and *R. hageni* (Banks & Snyder 1920; Snyder 1954; Weesner 1965; Messenger 2003; Austin 2005a), eastern introductions to Oregon from anthropogenic sources are implicated.

Because *R. flavipes* is a primary pest of structures in the United States (Austin et al. 2005a) and around the world (Scheffrahn et al. 1999; Austin et al. 2005b; Su et al. 2006), assessment of this pest should be carefully evaluated to determine whether its establishment in western Oregon will compete with *R. hesperus*, the dominant species of western Oregon (Szalanski et al. 2006). Likewise, it remains unknown whether these will be further dispersed or compete with eastern Oregon *Reticulitermes* species (Szalanski et al. 2006) as destructive pests in the future.

Reticulitermes hageni has been depicted as occurring throughout the southeastern United States, with distributions from the central Missouri valley expanding westward towards southeastern Kansas, south towards the Texas-Louisiana border areas (Light & Pickens 1934; Austin et al. 2006). Flight records of *R. hageni* (Banks) alates suggest that its western limit occurs around Kansas City, Kansas (Krishna & Weesner 1970; Hungerford 1935). *Reticulitermes hageni* has the least amount of genetic diversity among *Reticulitermes* spp. in North America, and is represented by only four haplotypes in North America (A.L.S., unpublished data). It has significantly retarded flight dispersal relative to other congeners (JWA, personal observation) and would likewise support the lack of genetic diversity and higher levels of inbreeding (Vargo & Carlson 2006). The *R. hageni* sample found was haplotype H1 (GenBank Accession AY257235), which has been observed throughout its known eastern Nearctic range (JWA unpublished). The presence of these *Reticulitermes* spp. in Oregon in the absence of native enemies will be interesting to

evaluate for their future impacts on urban and natural environments.

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Summary

A survey of *Reticulitermes* spp. in Oregon has resulted in the first report of 2 eastern Nearctic species, *R. flavipes* and *R. hageni*. These occurrences should be closely monitored and considered in future studies which attempt to delimit *Reticulitermes* species from Oregon in order to avoid misidentifications and future confusion about residing native *Reticulitermes* populations there.

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