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RETICULITERMES SPECIES IN ARIZONA

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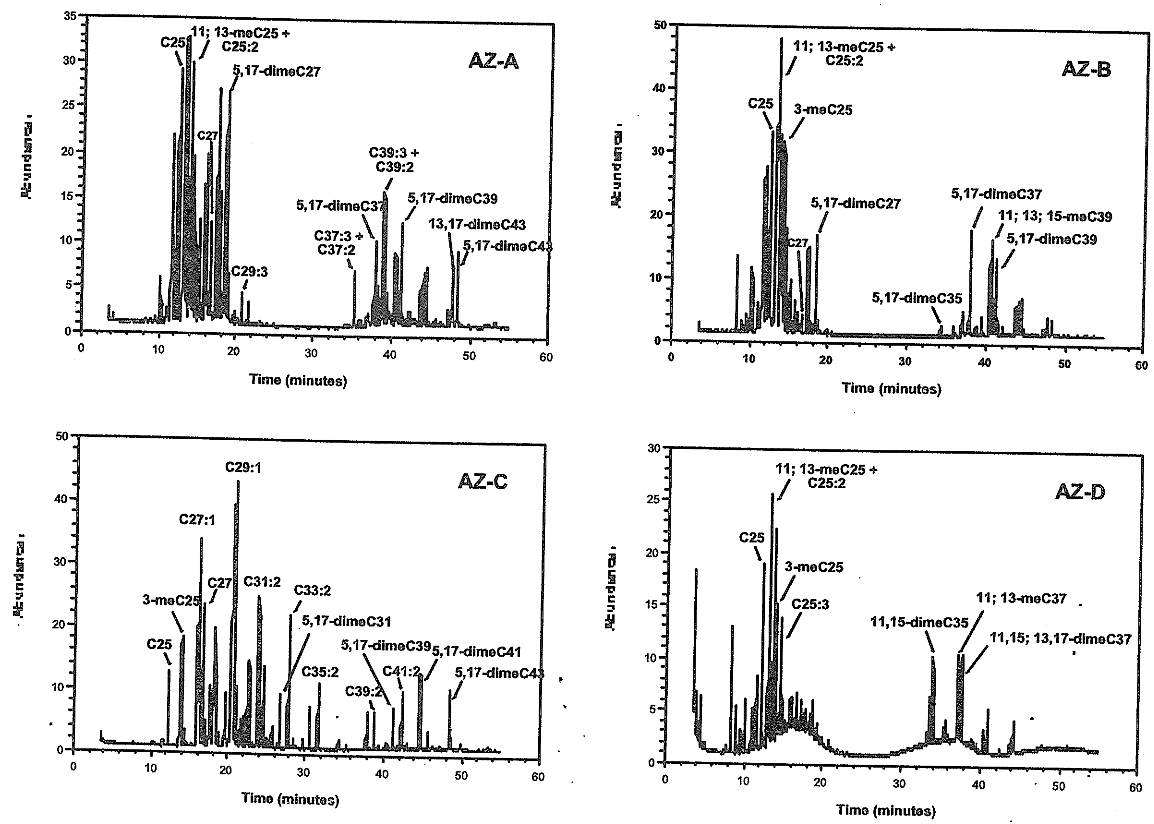
Biogeographical information on *Reticulitermes* in the U.S. suggests the only species found in Arizona is *R. tibialis* Banks. Much of this information was developed early in the last century and relies heavily on the original descriptions by Banks and Snyder and subsequent synonymies by Snyder. The Entomology

Museum at the University of Arizona has an extensive collection of *Reticulitermes* that was used to describe the distribution of *R. tibialis* relative to *Heterotermes aureus* (Snyder), an ecological equivalent occurring in the Sonoran Desert. *Reticulitermes* occurs naturally throughout Arizona with the exception of much of the Sonoran and Colorado Deserts. We have made additional collections of *Reticulitermes* from Arizona and neighboring states to characterize their cuticular hydrocarbons for taxonomic purposes. For *Reticulitermes* these mixtures appear to be more informative than morphological characters of soldiers. Cuticular hydrocarbon mixtures of *Reticulitermes* samples from disparate locations in Arizona provided unexpected results. Rather than only one taxon being found, we identified four taxa based on their cuticular hydrocarbon mixtures. We labeled them AZ-A, AZ-B, AZ-C, and AZ-D based on the order in which they were discovered.



The predominant hydrocarbons in AZ-A have 25 and 27 carbons in the parent chain, including 5,17-dimeC27. The late-eluting compounds are comprised primarily of dienes, trienes, a homologous series of internally branched mono- and dimethylalkanes, and 5,17-dimethylalkanes. AZ-B differs from AZ-A by lacking the late-eluting dienes and trienes and produces smaller amounts of hydrocarbons with 27 carbons in the parent chain. AZ-C is very different from all of the other western *Reticulitermes*. The cuticular hydrocarbons in AZ-C are composed primarily of olefins; C29:1 is the most abundant, and with C27:1, C31:2 and C33:2 predominates the hydrocarbon mixture. This phenotype also has a homologous series of 5,17-dimethylalkanes from C27 to C43. AZ-D is distinguished by the absence of any 5-methylalkanes, 5,17-dimethylalkanes, or late-eluting dienes or trienes. The hydrocarbon mixture of AZ-D most closely resembles that of *R. hesperus* from northern California.

AZ-A is not common; the few samples we have collected are all at the higher elevations 6,000 to 7,000 feet on the Mogollon Rim. AZ-B is probably the most common and can be found throughout the state from Fairbank (ca. 4,000 feet) to Jacob Lake (ca. 8,000 feet). This phenotype is also found in southern Nevada and Utah. AZ-C is sympatric with AZ-B over most of the distribution of the latter, but is allopatric in southern Arizona. AZ-C occurs at high elevations on the desert islands of southeastern Arizona, such as the Santa Catalina, Santa Rita, Chiricahua, and Pinaleno Mountains, whereas AZ-B occurs at lower elevations, usually associated with a riparian area.

Soldier defense secretion mixtures have been characterized for samples of AZ-A, AZ-B and AZ-C. Soldiers of AZ-A have mostly geranyl linalool (82.4%) and γ-cadinene (16.8%) in their defense secretions. AZ-B has a similar terpene profile, though quantities were variable. AZ-B generally has more γ-cadinenal (0.5 to 13.2%) than AZ-A (0-1.3%), and the percentage of geranyl linalool ranged from 26.4% to 78.3% (mean = 64.4%), γ-cadinene from 9.7% to 66.7% (mean = 23.1%). Soldier defense secretions from AZ-C show evidence of geographic differences. Samples from the Mogollon (Interior) biogeographic province, from Prescott to Springerville, had soldier defense secretions consisting mainly of myrcene (1.3-20.3%), *Z*- and *E*-ocimenes (0-19.8%), β-bisabolene (17.8-57.3%), γ-cadinene (1.8-40.5%), and geranyl linalool (0-50.4%). We summarized these samples as one group, AZ-C(I), though they were quite variable. There was much less variability in SDS profiles from samples collected in the higher elevations of the Santa Catalina, Santa Rita, Chiricahua, and Pinaleno Mountains of the Sonoran biogeographic province. Samples of this SDS phenotype, AZ-C(II), all produced ≥94.7% geranyl linalool. Collections from the type locality of the original collection named *R. tumiceps* are AZ-C. Only this phenotype has been collected from the vicinity of Stratton, AZ, thus *R. tumiceps* is a valid taxon and should be resurrected. We have not yet collected live soldiers of AZ-D from Arizona, but collections from Nevada with the nearly identical hydrocarbon phenotype were analyzed for soldier defense secretions. The composition from these samples was similar to that of AZ-A, averaging 82.6% geranyl linalool and 14.9% γ-cadinene.