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Invasion genetics of two termite species: sources and breeding structure

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Compared to ants, there are surprisingly few truly invasive termite species. Two of the most successful and destructive termite invaders are the subterranean termites *Reticulitermes flavipes* and *Coptotermes formosanus*. We conducted phylogeographic studies using nuclear microsatellite markers and mitochondrial DNA sequence data to determine potential source populations for these species as well as patterns of spread in introduced areas. We also characterized colony breeding structure in native and introduced populations to determine whether their invasion success is associated with shifts in breeding structure in introduced populations toward more spatially expansive colonies with greater numbers of reproductives, as seen in many invasive ants. In the case of *R. flavipes*, a native of North America, our results indicate that introduced populations in Europe and Chile most likely originated from the vicinity of New Orleans. Colony breeding structure in introduced populations is similar to those in the putative source region, with a high proportion of colonies headed by inbreeding neotenics, but the numbers of neotenics appears greater in the introduced range and this appears to be associated with larger colonies. In the case of *C. formosanus*, native to China, introduced populations in Japan and the USA appear to be unrelated and likely arose through separate introduction events. Our data suggest there were multiple introductions from China to Hawaii, followed by at least two secondary introductions from Hawaii to the mainland USA. So far we have no strong evidence pointing toward specific source populations in China, although evidence favors a southern China origin. Colony breeding structure in this species is highly variable and introduced populations show no pattern of having greater numbers of reproductives. Thus, a shift to larger colonies with more reproductives may have played a role in the invasion success of *R. flavipes* but not *C. formosanus*.