

## N O T E

### ASSOCIATION OF THE EASTERN SUBTERRANEAN TERMITE, *RETICULITERMES FLAVIPES* (KOLLAR) (ISOPTERA: RHINOTERMITIDAE), WITH LIVING TREES IN CANADA

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Subterranean termites in the genus *Reticulitermes* are rarely reported in living trees. When such associations are reported, the infestation generally originates and spreads internally in the plant. That is, termites move from the soil into the roots and heartwood, with little evidence of infestation visible until extreme damage has occurred (cf. Banks and Snyder. 1920. U. S. Nat. Mus. Bull. 108; Harris. 1966. Forestry Abstr. 27: 173-78; Marlatt. 1908. USDA Bur. Entomol. Circ. No. 50). However, in southern Ontario, Canada, at the northernmost limits of its distribution, *Reticulitermes flavipes* (Kollar) initiates above-ground activity in living trees by constructing shelter tubes from the soil up the exterior surface of the bark, and constructing galleries between the inner and outer bark. This note is intended to document this behavior, and to stimulate consideration of the ecological rationale for this limited behavior over the wide geographic range of *R. flavipes*.

In 1980, approximately 17,800 street and park trees throughout Metropolitan Toronto were inspected for subterranean termite activity (Cooper. 1987. Proc. Can. Wood Preserv. Assoc. [1984] 5: 60-61). Of these, 4% had *Reticulitermes* shelter tubing on the bark. Termites were present on 19.3% of the horse chestnut, *Aesculus hippocastanum*, trees inspected, 17.8% of the silver maples, *Acer saccharinum*, and 13.7% of the sugar maples, *Acer saccharum*. These are the most frequently planted tree species in Toronto. No tubing was found on sycamore, *Platanus occidentalis*, spruce, *Picea* sp., or pine, *Pinus* sp. Although tubes did not always lead to decaying wounds, as observed by Esenther et al. (1961. Science 134: 50), such wounds were present on 54% of the termite-infested trees. However, tubing was also noted on trees with healed wounds (42% of those infested) and on an occasional tree with no apparent wounding.

Much of the tubing seen on trees may represent initial and unsuccessful explorations by *R. flavipes*. Although the bark is slightly scarred beneath exterior termite tubes, we have not observed direct penetration of sound phloem by *R. flavipes*, as reported by Rhoads, Meyer, and Jeffries (1979. J. Arboriculture 5: 162) on park trees in Philadelphia, PA.

In the 1980 study, a Norway maple, *A. platanoides*, (DBH 35 cm, height 15 m) with a dying crown and termite tubing extending to the top was dissected. Mixed castes of termites were found in the tubes, immediately under the bark in dead areas of the tree, and in dead branch stubs. Since urban shade trees are subject to numerous stresses and some degree of physical damage is not uncommon, exploration by *R. flavipes* up the exterior and interior bark surfaces probably leads to opportunistic feeding on dead areas. It is not known whether termite colonization

of these dead areas and traffic between the inner and outer bark contributes to tree mortality.

When inspecting buildings in Toronto for termite infestation, it is common practice among municipal building inspectors and pest control operators to also examine the adjacent trees. *Reticulitermes flavipes* is considered an introduced pest in Ontario (Urquhart, 1953. Can. Entomol. 85: 292-93), with a spotty distribution, and any occurrence in proximity to buildings is cause for concern. Infested trees are treated by pressure injection (rodding) of termiticide in the surrounding soil. This may prevent the colony from traveling through the treated soil to adjacent buildings, but eradication is unlikely. Spraying the trunk with termiticide prevents reconstruction of exterior tubing for at least one year (Cooper, loc. cit.), but is illegal under current labeling. Lack of proper disposal of infested wood after tree trimming or removal is also a serious concern to regulatory officials in Ontario, since movement of infested wood and (possibly) top soil are considered the major means of long-distance dispersal of *R. flavipes* in the province.

Investigations of the foraging and overwintering behavior of northern *R. flavipes* populations, and of the apparent preference for certain tree species, are necessary to develop practical recommendations for arboriculture and termite control in Ontario. Comparative studies with termite populations from other regions may help to explain why external shelter tubing on living trees is not commonly found among southern (*R. Scheffrahn*, personal communication) or western (*Grace*, unpublished observation) *Reticulitermes* populations.

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