

DISTRIBUTION OF *KALOTERMES APPROXIMATUS*
(ISOPTERA: KALOTERMITIDAE) IN NORTH CAROLINA

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The drywood termite *Kaloterme*s *approximatus* (Snyder) ranges along the Gulf Coast and Coastal Plain of the southeastern United States, including the southern parts of Mississippi, Alabama and Louisiana, the Florida panhandle, and central Florida north along the Atlantic Coast to Cape Henry, in the southeast corner of Virginia. The northwestern and western limits of its range are not precisely established (Snyder 1924, Syren & Luykx 1981, Nickle & Collins 1989). Weesner (1970) suggested that this species may have a much wider range than is generally believed, but is rarely encountered because it frequents houses less often than some other drywood termites. A recent collection of the species in the North Carolina Piedmont prompted a review of the species' distribution and hosts within the state.

There are scattered reports of *K. approximatus* collected in North Carolina; I assembled available records from published literature (Weesner 1970, Syren & Luykx



FIG. 1. *Kaloterms approximatus* damage in living red cedar. Arrow indicates a frass-filled gallery a few mm beneath the bark. Note centrally located damage and the high proportion of heartwood.

1981), the records of the North Carolina State University Insect and Disease Clinic, and specimens housed in the North Carolina State University Insect Collection. The record of *K. approximatus* that instigated this review was from a red cedar (*Juniperus virginiana* L.) growing in a suburban residential area of Raleigh (Wake Co., 35°46'N, 78°38'W). The tree was approximately 20m in height, estimated to be 60 years old, appeared healthy, and was growing in the impermeable clay subsoil characteristic of the region. The tree forked into two trunks 1m from the ground; one of the trunks was overhanging a residence, and on 25 May 1995, was removed. The cut surface of the trunk revealed a centrally located pipe of termite damage in the heartwood, 10cm in its widest dimension, and a few frass-filled galleries just under the bark (Fig. 1). Galleries extended approx. 81cm into the removed trunk; it was obvious that the colony was well established and reproductively active. No alates or nymphs were present, but a number of larvae were observed. The termites were identified from soldiers as *Kaloterms approximatus* by R. H. Scheffrahn (University of Florida, Fort Lauderdale). Fecal pellets in the galleries were found in the impressed masses characteristic of the species (Snyder 1924). Four red cedars on the same property fell during Hurricane Fran in September of 1996; these were milled into lumber and none exhibited signs of termite infestation.

Including the present report, *K. approximatus* has been collected in North Carolina at least 12 times since its first record in the State in 1965 (Fig. 2). Two collections were probably adventive: alates emerging from recently shipped furniture (Burke Co.), and alates collected from a 3 year-old home (Buncombe Co.). Two other instances appear to be structural infestations: alates collected from the kitchen and basement of a home (Wake Co.), and alates found beneath the kitchen sink of a 10-15 year-old beach house (Brunswick Co.). One additional record (not mapped) was of alates taken

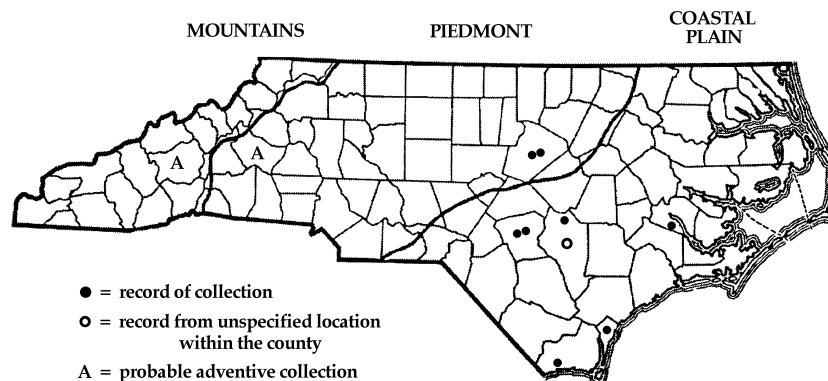


FIG. 2. Collections of *Kalotermes approximatus* in North Carolina. The placement of lines separating physiographic provinces is from Radford et al. (1968).

from a house in which further details were unavailable. The remaining 7 collections were taken from trees identified as walnut (*Juglans nigra* L.; Juglandaceae, Cumberland Co.), white oak (*Quercus alba* L.; Fagaceae, twice in Sampson Co.), elm (*Ulmus* sp.; Ulmaceae, Cumberland Co.), and live red cedar (*Juniperus virginiana* L.; Cupressaceae, Wake Co.). Except for the latter, there was no indication of whether these trees were alive or dead. In one of the collections from oak, the infestation was more than 9m above the ground. Records for Beaufort Co. and New Hanover Co. are from Syren & Luykx (1981), who indicated their collections were from oak, sweetgum, and magnolia.

In Florida, Hetrick (1961) reported that winged reproductives are most frequently encountered during autumn, however, Snyder (1925) collected alates in coastal Virginia during August. In North Carolina, alates have been collected on 21 and 27 July, 15 and 28 September, and 18 and "late" October.

Some of the tree hosts listed here (red cedar, walnut) expand the reported dietary range of the species (Miller 1949, Syren & Luykx 1981). The collection from *J. virginiana* is of particular interest, as the allelochemicals present in the heartwood generally render the species resistant to termites (reviewed by Scheffrahn 1991). As a whole, however, Kalotermitidae are generalist feeders with a broad host range and not particularly selective on host type (R. Scheffrahn, pers. comm.).

K. approximatus is usually characterized as feeding on dead wood or in the dead areas of living trees (Snyder 1954, Weesner 1970, Nickle & Collins 1989). Hetrick (1961), however, found the species in the heartwood of a living cherry (*Prunus serotina* Ehrh.) and a living but decadent pear tree (*Pyrus communis* L.). Syren and Luykx (1981) report that in the northernmost part of its range, *K. approximatus* is often found in the wood of living trees. Because *Kalotermes* spp. have a higher water requirement than many drywood termites (Collins 1969), it is likely that the moisture level of living heartwood influences their choice of these hosts. It is also possible that the surrounding live wood is an effective buffer from the environmental extremes they may encounter at the limits of their range. Raleigh is the furthest north a natural infestation of *K. approximatus* has been collected inland, approximately 180km from the moderating effect of the Atlantic Ocean. I thank Rudi Scheffrahn for the termite identification, Susan Jones for a critical reading of the manuscript, and Dave Stephan and Mike Waldvogel for help in locating records.

SUMMARY

Records of the drywood termite *Kalotermes approximatus* are summarized for North Carolina. A recent collection from a live red cedar in Raleigh (Wake Co.), expands both the host and geographic range of the species.

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