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PHORETIC CARRYING CAPACITY OF FLYING SOUTHERN PINE BEETLES (COLEOPTERA: SCOLYTIDAE)

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Mites do not have wings, but in their course of evolution many species have developed an association with insects, using them as a vehicle of distribution. Occasionally they cover the host so completely that the insect cannot fly. The literature is replete with these observations. Except for a single speculation (Fronk 1947), there are no reports as to how many mites *Dendroctonus frontalis* Zimmerman can support and still fly to its intended destination.

Of 2539 southern pine beetles trapped in flight with Stickem Special®[1] (Moser 1976), 23.3% possessed at least one deutonymph of *Trichouropoda australis* Hirschmann (Fig. 1), one of the larger mites associated with *D. frontalis*. The mean number of *T. australis* per infested beetle was 4.9 for male beetles and 5.1 for females. The greatest number of these mites found on a single infested beetle was 64 deutonymphs on a male beetle and 41 on a female.

When 51 live *T. australis* deutonymphs were extracted from laboratory-reared beetles and immediately weighed on a Cahn® electrobalance, they averaged 0.0064 mg each. Barras and Hodges (1974) showed that emerging males and females of *D. frontalis* weighed about 2.07 and 2.14 mg each, respectively. Hence, an average

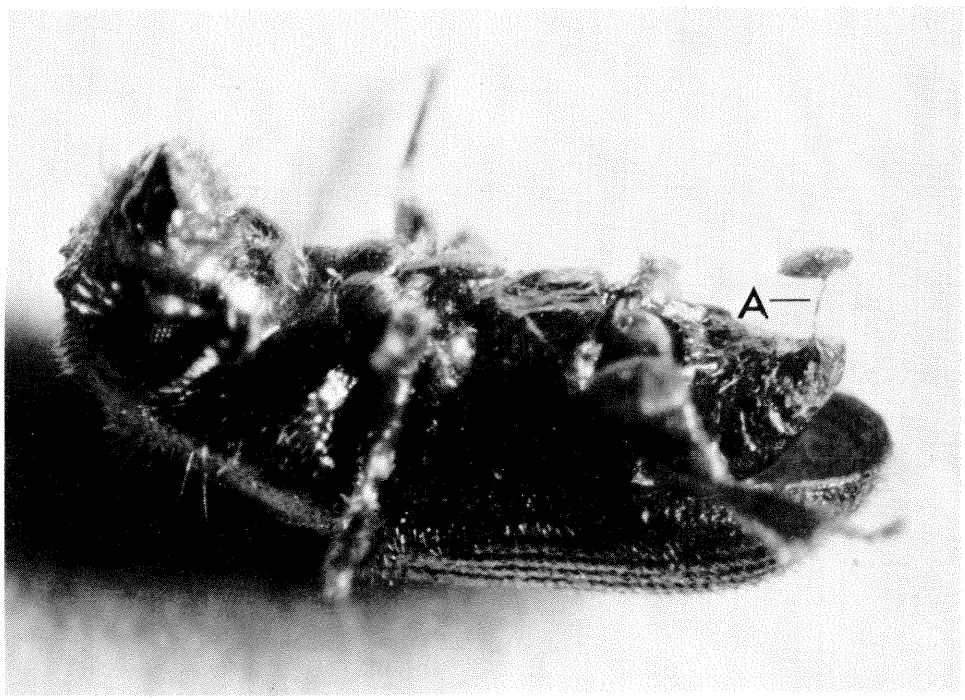

FIG. 1. Adult southern pine beetle with deutonymph of *Trichouropoda australis* attached by anal pedicel (A).

[1]Mention of trade name is solely to identify material used and does not imply endorsement by the U.S. Department of Agriculture.

male carrying 64 deutonymphs is supporting about a 20% additional load, and a female with 41 deutonymphs, a 12% additional load. Average additional loads supported by both sexes were ~~1.5%~~ 15%.

The critical weight that *D. frontalis* can sustain in flight is still unknown, but Fronk's (1947) contention that *D. frontalis* cannot fly with over 40 uropodids attached seems wrong. Although Fronk's specimens were taken from Virginia, we can reasonably assume that he was dealing with the same uropodid. *T. australis* not only occurs there but is the only uropodid associated with *D. frontalis* that attaches in such large numbers.

References

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