The lack of arolia in many species, especially species of *Rhytidoponera*, raises functional, ecological, and behavioural questions. It is tempting to suggest that modern ponerines arose from hypogeaic ancestors in which arolia were not particularly useful and so were lost. But this evolutionary hypothesis faces the difficulty that the most hypogeaic living group examined, *Amblyopone*, has retained arolia, whereas these are lacking in some epigeaic forms, such as the totally arboreal *Rhytidoponera aspera*.

The lack of worker arolia in arboreal species such as *Rhytidoponera aspera* is intriguing. Our experience with *Rhytidoponera* in the laboratory indicates that these ants should have difficulty climbing on such smooth surfaces as many leaves, especially on windy days. Do foragers of such species, in fact, confine themselves only to the trunks and stems of trees foraged over? The presence of arolia in *Paraponera clavata* is noteworthy in this connection: workers of this species wound the petioles of certain of the plants on which they forage, and collect the sap exuded (Young 1977).

Finally, there is the presence of arolia on *Rhytidoponera* males to consider. Two hypotheses can be proposed to explain this inter-caste difference. Firstly, hymenopteran males, especially those of ants, are usually morphologically relatively conservative compared with the females, and the presence of arolia may then simply represent evolutionary inertia. Secondly, the males do have to grip a relatively smooth surface, the body of the females, during copulation, and it is tempting to suggest that the males need arolia to complete courtship. This second hypothesis is, in principle, open to test.

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