

## DISCUSSION

The relationship between *Rhyssa persuasoria* and *Sirex noctilio* merits further investigation. In particular more information on the early stages and the late larval diapause of *Rhyssa* is desirable. Insectary-kept logs tend to lose moisture more rapidly than logs in the field. The former also tend to be in a warmer environment. It is possible that this drier, warmer environment within the wood, inhibits the late larval diapause in at least some individuals of *Rhyssa* which would complete their development in 10–14 weeks instead of 8–10 months. As already stated, *Sirex* is liable to parasitism on three occasions in a two-year cycle. The first of these occurs in the summer of the year that the woodwasp attack is successful and involves those parasites which live into January and February (see Fig. 1). The second is in the following September to January, and the third one year later, or before and during the early part of *Sirex* emergence. Emergences of the parasite have been recorded from the first two attacks but not from the third. Cutting experiments have shown logs, subjected to this third attack, to have some siricid immatures present that appear to be carrying through to a third year. The number of siricids present at this time is low and none has completed development in the period of this study. Any of four reasons may account for the apparent failure of *Rhyssa* to parasitise its host in such logs. First, as hosts are few and the parasite is a poor searcher, there may be little chance of successful parasitism. Secondly, as hosts are few and the general level of parasitism is low, we may not have examined sufficient material to detect the low level of parasitism present. Thirdly, if the late larval diapause is inhibited in the drier logs kept at higher temperatures than in the field, then *Rhyssa*, resulting from the third period of parasitism, may emerge early and be confused with the later emergences resulting from the second. Fourthly, the *Rhyssa* from the third attack may have died because of unsatisfactory conditions in the wood, and if death had occurred in the early stages, the remains may not have been found. Female *Rhyssa* are greatly attracted to logs prior to and during the second emergence of *S. noctilio*. With this degree of activity by a parasite, one would expect some successful parasitism to result. Any of the first three reasons given seems to have merit, but one would tend to give decreased significance to the fourth because living larvae of *Sirex* can be found in the wood. Certainly, these do not mature, an important factor in this being the rapid progress of *Ceratocystis* sp. and *Diplodia* spp. (fungi apparently lethal to siricid immatures) through infested wood. This progress is assisted by the increased access, for water and fungal spores, that results from the siricid and ichneumonid exists from the logs.

Attempts by *Rhyssa* to parasitise host larvae held in glass tubes covered with brown paper, encourages the belief that successful parasitism might be obtained in this way by varying the technique. In our tests the parasites did not appear to be able to cling well to the surface of the paper. Some surface offering a better foothold to the insects during oviposition, such as bark, might well assist in obtaining parasitism. Should such a technique succeed, the parasitic behaviour of *R. persuasoria* and the development of its immature stages could be examined. If fresh bark is used as the cover over the exposed larvae, it could probably be made attractive for parasitic oviposition by sprinkling it with frass from the tunnels of siricid larvae.

The attraction of *Rhyssa* to *Sirex* appears to be an olfactory one. In those tests of material rated highly attractive (four + signs; see Table I) the behaviour