



Fig. 1. Arrangement of nest tree and foraging arena used in the laboratory experiments on recruitment in *Oecophylla longinoda*

reference to their nest trees and surrounding foraging area. According to Leston (1970, 1973) and Room (1971), only a few species of *Pheidole* and a single species of *Crematogaster* (?*castaneus*) have been observed to be common associates of *O. longinoda* on the same trees in Africa.

**2. Culturing Method and Experimental Arrangement.** Our research has been based on small queen-right colonies collected at several localities near Mombasa, Kenya (Rabai and Mtwapa in Kilifi District and Matuga in Kwale District) and transferred to our laboratory at Harvard University. When allowed access to potted grapefruit trees (*Citrus paradisi*) and fig trees (*Ficus* sp.), the colonies occupied them within a few hours, constructing nests by folding leaves and binding them together with larval silk. Thereafter the ants thrived on a diet of freshly killed insects (mostly *Nauphoeta cinerea* cockroaches) and honey water. Water was supplied in test tubes, trapped at the bottom of the tubes by plugs of cotton. The tubes were laid at the base of the nest trees, where they were visited frequently by the *Oecophylla* and even used as bivouacs by the ants. The trees were also treated daily with a fine water spray.

The colonies were allowed access to rectangular foraging arenas  $71 \times 142$  cm in floor area, surrounded by a 14-cm-high wall. Access was provided by a bridge of round sticks supported by Erlenmeyer flasks (Figs. 1 and 2). The ants were discouraged from climbing the walls of the arena by lining the walls with scotch tape and coating it with mineral oil. One colony was induced to live entirely in an artificial 'tree' consisting of test tubes held in clamps in a branching pattern around a metal holder. This colony, which flourished as well as those housed in natural trees, was useful for studies of behavior within the nest chambers. Where not mentioned otherwise, the statistical evaluation was based on Student's *t*-test and  $\chi^2$ -test.

## Results

In the present study no less than five distinct recruitment systems were discovered, each with different combinations of behavioral components and each with a unique function. These systems are furthermore separate from the alarm communication mediated by mandibular gland pheromones (Bradshaw et al.,