This means that nests suspended from an elongate object, such as a stalk or a palm leaflet, tend to be more elongate than those hanging from a leaf with a broad surface.

A banana leaf is very large, its lamina measuring about 180 × 60 cm. Its petiole is very stout and grooved, extending into the lamina region as the prominent mid-rib. The lower part of the petiole always remains vertical as it partially wraps the erect pseudo-stem. The long and broad lamina is thus adapted for upward or downward movement. Even when the lamina is blown horizontally, its mid-rib generally maintains the usual angle of inclination. The wasp nests only on the lower surface of the lamina and invariably along the raised mid-rib (Fig. 1*a*). On account of this position and since the banana leaf generally moves in a vertical plane, the hanging nests seldom lose their balance.

A leaf of *Diospyros discolor* measures about 20 × 6 cm and the plane and position of its lamina often change, since it easily responds to wind. The smaller size of the leaf (compared to that of the banana), the weaker petiole and the flexible nature of the shoots on which the leaves are borne are factors that tend to produce frequent changes in the position of the lamina.

59·6 per cent of nests of the eleven colonies on the banana plants possessed only two rows of cells each, and this figure differs significantly even at the 1 per cent level (χ^2 test with one degree of freedom) from the corresponding one for the nests on *Diospyros* (34 per cent).

In order to test how far the structure of the nests on the two plant species differed, tests for homogeneity of parallel samples[2] were performed after condensing the data as shown in Table 2, where group *A* represents nests on *Diospyros* and *B* on *Musa*.

The χ^2 test showed that this difference is significant at the 5 per cent level. The difference between the mean number of rows of cells per nest on banana and *Diospyros* (Table 1) was significant at the 5 per cent level ('*t*'-test).

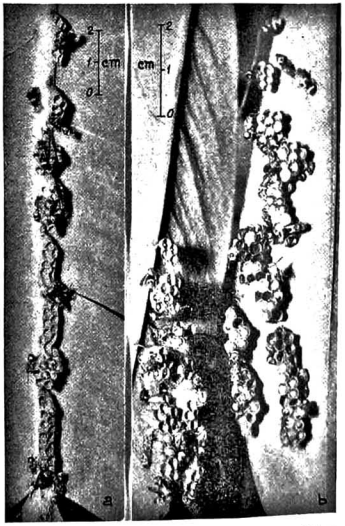

Fig. 1. Colonies of *Ropalidia variegata* (Smith) on the leaves of *Musa sapientum* (*a*) and *Diospyros discolor* (*b*)

Nest-structure of a Social Wasp varying with Siting of Leaves

THE nest-building habits of a social wasp, *Ropalidia variegata* (Smith) were closely observed at the Indian Statistical Institute, Calcutta, from November 1963 to July 1965. Each nest is constructed largely on the lower side of a leaf, to which it is attached by a stiff and rather brittle pedicel, which is continuous with the first cell. The remaining cells of the nest, arranged in vertical rows[1,3], hang almost vertically from the first cell, the second cell being placed about 45° to the right or left of the line of gravity of the first cell (Fig. 1).

Forty-seven nests, comprising eleven colonies, were built on leaves of the cultivated banana (*Musa sapientum*), and fifty-three nests (five colonies) on leaves of the dicotyledon, *Diospyros discolor*. It was found that the number of vertical rows of cells differed in the nests on the two types of leaves, and this is thought to have been due to the pronounced differences in the morphology of the leaves. That the shape of the nest of some species of *Ropalidia*, notably *R. fasciata*, depends to some extent on that of the object to which it is attached has been reported[1].

Table 1. NUMBER OF ROWS OF CELLS PER NEST OF *Ropalidia variegata*

No. of colonies	No. of nests	Plant	No. of vertical rows per nest 1	2	3	4	5	6	7	Mean
6	53	*Diospyros*	1	18	20	9	4	0	1	3·0180
11	47	*Musa*	1	28	11	7	0	0	0	2·5100

Table 2

Group	Rows of cells per nest < 3	3	> 3	Total
A	19	20	14	53
B	29	11	7	47
A + *B*	48	31	21	100

As the nests always hang from their first cells, they are unable to withstand permanent deviations from their initial vertical postures that may be caused by wind. When the position of a leaf bearing these nests is slightly altered, the stability of the tilted nest is restored by adding new cells or rows of cells along the side nearer to the line of gravity. A colony on a leaf lasts for a few months, and during this period the leaf may be subjected to further deflections in different directions. Thus, the number of cell-rows in a nest increases in course of time, and the nests show vast variations. In many nests, the early formed cells follow a two-row pattern. But, with time, more and more cells are added at various positions of the nest to combat the disturbances caused by the wind.

One of the nests of a colony, which had two rows of cells, slipped from its attachment and was refixed by a paper clip. Obviously the repair was not approved by the wasps, for they forthwith added new cells, forming a further five vertical rows of two cells each, thereby restoring the equilibrium of the nest[4]. The biological significance of this phenomenon is important. In changing the structure of the nest to suit different sites and trees, the wasp demonstrates adaptability to ensure survival under varying conditions.

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