ENTOMOLOGY

Male Genitalia of *Apis* Species

THE external parts of the male genitalia of *Apis* species are poorly developed, and an elaborate structural modification of the internal walls of the aedeagus is everted during copulation. Hitherto undescribed except for *A. mellifera*, this apparatus has now been examined in specimens of the other three species from Ceylon kindly obtained by Dr. B. A. Baptist and Mr. L. A. S. Perera.

Fig. 1 shows the organs of *A. indica* and *A. mellifera* (in an over-everted condition which is not reached in natural mating[1]). *A. indica* lacks the hard plates of *A. mellifera* and has the small projections at the bases of the sticky horns enlarged to trilobed structures. The shapes and proportions of the various parts also differ. In the other two species only uneverted organs of preserved specimens were examined. Neither has hard plates. *A. dorsata* has three additional pairs of sticky horns, which correspond to the trilobed structures of *A. indica*, and five additional bristly projections. *A. florea* has trilobed structures somewhat like those of *A. indica*, a single pair of sticky horns which are relatively much longer than in the other species, and no bristly projections. The endophallus differs markedly in shape from that of the other species and has fleshy areas (presumably glandular) in its walls.

Endophallic plates, apparently identical with those of European bees, were found in bees from Palestine, Uganda, Tanganyika (received from Dr. F. G. Smith) and South Africa (all of which are considered to belong to sub-species of *A. mellifera*). It would be interesting to know whether they ever occur in the apparently closely allied *A. indica*. Male specimens of both species would be welcomed from regions of possible overlap between them, such as Persia, Afghanistan, Pakistan or northern China. They should preferably be preserved in glycerine.

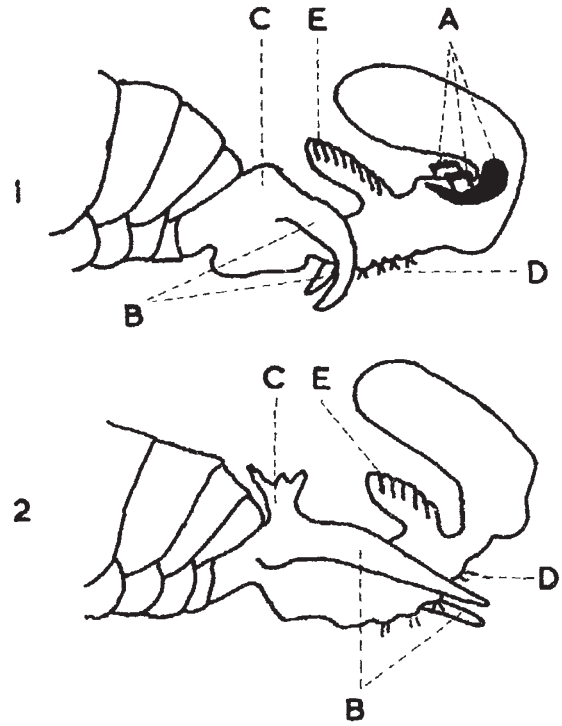

Fig. 1. Male genitalia. 1, *A. mellifera*; 2, *A. indica*. *A*, Hard plates; *B*, sticky horns; *C*, basal projection and homologous trilobed structure; *D*, four hairy projections; *E*, fimbriate lobe

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[1] Woyke, J., and Ruttner, F., *Bee World*, **39**, 3 (1958).

Homocatechol in an Insect Cuticle

DURING the course of an investigation into the hardening of the cuticle of the desert locust *Schistocerca gregaria*, 4-methyl-catechol, a substance not previously recorded from insect cuticles, was identified chromatographically in abundant amounts from fully hardened cuticles after acid hydrolysis as well as after alkaline hydrolysis under reducing conditions. This substance, although absent from the soft cuticles newly exposed on moulting, is readily detected after they have been artificially tanned with *B*-(3 : 4-dihydroxyphenyl)acetic acid, indicating decarboxylation of the tanning agent. If *B*-(3 : 4-dihydroxyphenyl)propionic acid is used in place of the acetic derivative to tan the cuticles a compound with similar properties is recovered from the cuticles. This latter compound, which is also present in aqueous extracts of naturally tanned cuticles, has an R_F value, in benzene/acetic acid/water, slightly higher than that of 4-methyl-catechol. It can only be presumed to be 4-ethyl-catechol similarly formed by decarboxylation. *B*-(3 : 4-dihydroxyphenyl)acetic acid and 4-methyl-catechol have also been detected after tanning cuticles with *B*-(3 : 4-dihydroxyphenyl)-propionic acid, and the formation of these compounds seems a clear indication that degradation of *ortho*-diphenolic compounds in an insect cuticle[1] to compounds having shorter side-chains may be accompanied by decarboxylation. Hackman and Todd[2] have already demonstrated the decarboxylation *in vitro* of 3 : 4-dihydroxybenzoic acid in the presence of a plant phenolase.

In the course of this work, it was found that *B*-(3 : 4-dihydroxyphenyl)propionic acid is present in the soft cuticle of *Schistocerca*. This is important, for Hackman[3] has suggested that the degradation of *B*-(3 : 4-dihydroxyphenyl)alanine may not proceed through the propionic derivative.

In the full account of this work, to be published elsewhere, it will be shown that the exocuticle of *Schistocerca*, which differs markedly from the amber exocuticle of other insects[4], is not tanned by *para*-quinones[5,6] but by *ortho*-benzoquinone derived from catechol.

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[5] Dennell, R., *Proc. Roy. Soc.*, B, **148**, 176 (1958).
[6] Kennaugh, J. H., *J. Insect Physiol.*, **2**, 97 (1958).