Host selection and location of feeding tissues by leafhoppers: Behavioral evidence for the importance of the precibarial sensilla

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The precibarial chemosensilla of leafhoppers (Homoptera: Cicadellidae) are located along the path of fluid uptake, near the cibarium within the head. Successful ablation of these sensilla has been performed on the species *Graphocephala atropunctata* SIGNORET, with subsequent effects on feeding behavior, host recognition, and the ability to locate a specific feeding tissue. Denervation of the sensilla was accomplished by surgically cutting through the cuticle of the clypellus, to sever the sensillar nerves below it. Such denerved leafhoppers were unable to distinguish between a plant which was highly preferred by control insects, and one which was not preferred. Two-choice preference tests and electronic measurement of feeding behavior were the methods used to document this inability of the denerved insects. When forced to feed on a preferred host plant, denerved insects probed with greater average frequency, much less average duration than did either sham-operated or normal controls. Denerved insects also ingested less than half the time that control insects did. Both controls behaved similar to one another. These results indicate the importance of the precibarial sensilla for the perception of internal plant chemicals which trigger long-term ingestion. Work is in progress to paraffin-section representative samples of salivary sheaths produced during these probes, to determine feeding tissues of the insects. Preliminary results indicate that the denerved insects were unable to locate xylem tissues, the preferred feeding site of this species. These results, when final, will indicate the mediation of feeding-location behaviors by the precibarial sensilla.

Biosystematics of the delphacide genus Ribautodelphax in Europe

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In the last few years several new *Ribautodelphax* species were discovered. This genus now comprises at least 12 species in Europe, 8 species of which belong to the *R. collinus* (BOH.) complex. This study is aimed at the clearance of the taxonomic status of several populations and to study the reproductive isolating mechanisms. The main fields of research concern: morphology, hostplant relations, acoustics, karyology, hybridisation and electrophoresis. Information is given on two of these aspects.

Hostplant relations. Field and laboratory studies show that the *Ribautodelphax* species are monophagous or oligophagous. Oligophagous *Ribautodelphax* species are restricted to species of the same plant genus. Only *R. imitans* (RIBAUT),

possibly consisting of a sibling pair, is found on two plantspecies belonging to different genera. In experimental studies on hostplantrelations geographic variation was observed both in planthopper and in hostplant populations.

Acoustic behaviour. Differences between some species in male songs are clear, but the songs of other species strongly overlap in various features. Although female songs are less complex than male songs, differences between species are sometimes more pronounced in females than in males.

R. imitans represents an interesting problem. Probably this species comprises two siblings that are not strongly differentiated. The siblings differ in hostplants and acoustic behaviour and it is suggested that a shift in hostplants preceded acoustic differentiation.

Parthenogenesis in Delphacidae

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Pseudogamic parthenogenesis is already known for some time in Delphacidae. Pseudogamic females must mate with males although their all-female offspring receives only maternal genes; these females depend on the sperm of their sexual relatives. Associations of pseudogamic triploid females occur with the following bisexual species: *Muellerianella fairmairei* (PERRIS) on *Holcus; M. extrusa* (SCOTT) type II on *Arrhenatherum; M. extrusa* type III on *Carex; Ribautodelphax pungens* (RIBAUT) on *Brachypodium spp.* and *R. imitans* (RIBAUT) on *Brachypodium phoenicoides.*

Recently a parthenogenetic triploid delphacid population was found in Greece, that reproduces without the interference of males. This delphacid population represents the second case of true parthenogenesis in Auchenorrhyncha.

Two hypotheses exist on the origin of the parthenogenetic triploid Delphacidae: 1. Alloploidy: triploids arise after hybridisation of related species and backcrossing with one of the parent species. 2. Autoploidy: triploids are for instance produced after a premeiotic doubling of the chromosome number and fertilization of the diploid egg nucleus. If the delphacid triploids have an alloploid origin then characters of both parent species would be expected in the triploids. In *Ribautodelphax* triploids resemble very closely the species they live associated with and there is no indication found for an alloploid origin in: electrophoretic patterns, acoustics, hostplant relations, hybridisation and geographic distribution. Indications are found in *Ribautodelphax* that a premeiotic doubling of the chromosome numbers is possible.

The preliminary conclusion from these results is that an autoploid origin of the triploid *Ribautodelphax* females might be possible.

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