The problem of non-genetic variation in comparative studies of planthopper vibration signals

By P.W.F. DE VRIJER

Laboratory of Entomology, Agricultural University, 6709 PD Wageningen, The Netherlands

In the past decade comparative acoustic studies have made several valuable contributions to the biotaxonomy of Auchenorrhyncha. Like any other biological feature acoustic behaviour may be subject to both genetic variation, and non-genetic modification. For taxonomic studies only genetic variation is relevent and therefore non-genetic variation should be eliminated as much as possible. Two factors responsible for non-genetic variation are discussed in particular: a) differences in temperature conditions during recording, and b) signal modification during substrate transmission.

The effects of temperature on acoustic behaviour, which are also known for other insect groups, are experimentally demonstrated to exist in *Javesella pellucida*. It was found that these effects are particularly manifest in the rate of song production, and strongly affecting parameters like 'pulse repetition rate' and 'strophe duration'. Comparative recordings should therefore preferrably be made under constant temperature conditions.

It was further found that the fine-temporal pattern in oscillograms of recorded signals showed extensive variation, even among signals recorded from the same specimen. This phenomenon most probably can be explained on basis of the particular nature of substrate transmitted vibrations, as recently elucidated by Michelsen et al (Behav. Ecol. Sociobiol., 1982, 11: 269-281). This type of variation is practically impossible to control, and therefore features that are particularly affected, such as fast oscillograms and frequency-spectrograms, should be used very cautiously in comparative studies.

On some problematic species - complexes of the family Delphacidae *(Homoptera)*

By S. DROSOPOULOS[1], M. ASCHE[2] and H. HOCH[2]

1. *Benaki Phytopathological Institute Kiphissia - Athens, Greece*
2. *Laboratory of Zoology, University of Marburg, P.O. Box 1929, W. Germany*

Among the 49 genera of the family Delphacidae from Greece, there are several polytypic genera. In some of them, the species are morphologically distinct and probably genetically well differentiated. However, there are others which contain very "closely related species" or, according to E. Mayr, "sibling species" (Table 1).

These species are excellent material for studying the probable historical pathway of species splitting (speciation) and the divergence these species have reached at present. Therefore, biosystematic studies, including morhpological, ecophysiological, cytogenetical and biochemical studies, should be performed on species such as those that, so far, are endemic for Greece or in general have differentiated in the southern part of the

Table 1. The closely related species, their food-plants and distribution.

1. *Kelisia brucki* Fieber, 1878	*Juncus* spp. - *Scirpus holoschoenus*	Pontomedit.
K. creticola Asche, 1982	-«- -«-	Endemic
K. perrieri Ribaut, 1934	-«- -«-	WC-Medit.
K. yarkonensis Linnavuori, 1962	-«- -«-	E. Medit.
1. *K. guttulifera* (Kirschbaum, 1868)	e.g. *Carex divulsa*	European
K. henschii Horvath, 1897	*Carex* spp.	European
K. melanops Fieber, 1878	-«-	Euromedit.
3. *K. ribauti* Wagner, 1939	*Juncus* spp. - *Carex* spp.	Eurosib. - Medit.
K. monoceros Ribaut, 1934	-«- -«-	European
4. *Stenocranus major* (Kirschbaum, 1868)	*Phalaris arrundinacea*	European
S. gialovus Asche & Hoch. 1983	*P. aquatica*	Endemic
5. *Eurysa lineata* (Perris, 1857)	many grass spp.	Euromedit.
E. duffelsi Drosopoulos & Asche, in press	?	Endemic
6. *E. forficula* (Horvath, 1908)	?	European
E. fornasta Asche, Drosopoulos / Hoch, 1983	?	Endemic
7. *Metropis latifrons* (Kirschbaum, 1868)	*Festuca* spp.	European
M. aris Asche, Drosopoulos & Hoch, 1983	-«-	Endemic
8. *Delphax pulchellus* (Curtis, 1833)	*Phragmites communis* — *Arundo donax*	European
D. ribautianus Asche & Drosopoulos, 1982	-«- -«-	Medit.
9. *Muellerianella extrusa* (Scott, 1871)	*Mollinia cearulea* — *Carex divulsa*	European
M. fairmairei (Perris, 1857)	*Holcus lanatus*	European
10. *Florodelphax leptosoma* (Flor, 1861)	*Juncus* spp. - *Cyperus* spp.	Eurosib. - Medit.
F. mourikisi Drosopoulos, 1983	*J. acutus* — *J. maritimus*	Endemic
11. *Xanthodelphax stramineus* (Stål, 1858)	many grass spp.	European
X. hellas Asche, 1982	-«-	Endemic
12. *Toya hispijimena* Asche, 1980	-«- (e.g. *Cynodon dactylon*)	Medit.
T. ibiturca Asche, 1980	-«- -«-	Medit.
13. *Ribautodelphax pallens* (Stål, 1854)	*Festuca* spp.	Eurosib.
R. falacron Asche, Drosopoulos & Hoch, in press	-«-	Endemic
14. *R. imitans* (Ribaut, 1953)	?	European
R. pungens (Ribaut, 1953)	*Brachypodium pinatum*	European

Balkan Penninsula (e.g. *Xanthodelphax hellas, Eurysa duffelsi, E. fornasta, Kellisia creticola, Stenocranus gialovus, Ribautodelphax falacron, Metropis aris, Florodelphax mourikisi)* et al.

The complexity of the *Circulifer* genus in Israel

By M. KLEIN and B. RACCAH

Departments of Entomology and Virology, The Volcani Center, ARO, Bet Dagan, Israel

Several species of the genus Circulifer were so far identified by Linnavuori (Linnavuori, R. 1962. Ann. Zool. Soc. "Vanamo", 24:1-108) and by Sternlicht (Personal communications) in Israel. These leafhoppers were mostly collected in the coastal plain and at random using entomological nets. Recently, looking for the possible vector of the citrus stubborn disease, we have caught a species most similar to *Circulifer tenellus* on *Atriplex halimus* bushes in the Jordan Valley. In this case the leafhoppers were abundant, adults as well as nymphs, apparantly in its host for reproduction. Attempts have been done to receive its real identification. While Dr. Oman and us identified it as *C. dubiosus* (Klein, M., Raccah, B. and Oman, P.W. 1982. Phytoparasitica, 10:237-240), other taxonomists claimed it was a variant of *C. tenellus.* These attempts questioned the former identifications of *Circulifer* species as such.

During our studies, we were aware of the presence of colored variants of the leafhopper, on other plant species belonging to the botanic family of the Betaceae, which showed similar male sex organs as those seen for *C. dubiosus.* It seems therefore, that a more comprehensive revision of this genus is necessary for the separation of species of such close proximity.

Are the green leafhoppers which are bred on peaches, grapevines and cotton related to each other?

By M. KLEIN

Department of Entomology, Agricultural Research Organization, The Volcani Center, Bet Dagan 50 250, Israel

In Israel peaches are frequently attacked by a green leafhopper, usually from May until the onset of the cold season, when growth ceases.

Cotton is also attacked by this group of leafhoppers, but somewhat earlier than peaches and grapes are attacked late in summer. Heavy damage is often caused to plants and many applications of insecticides are needed against this pest, especially in young peach trees. On cotton, adults and nymphs can be seen in abundance every year, feeding on the lower side of the leaves. Peaches are inhabited mostly by adults,