

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

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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 relevant 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 preferably 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*)

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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 morphological, 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