

Patterns of geographic distribution in the planthopper genus *Hyalesthes* Sign. (Homoptera Fulgoroidea Cixiidae): a phylogenetic approach

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In their revision of the planthopper genus *Hyalesthes* Hoch & Remane (1985) carried out a cladistic analysis which revealed not only the monophyly of the genus *Hyalesthes* altogether, but also showed the existence of 5 monophyletic subgroups (see Fig. 1).

The geographic distribution of each of these monophyletic subgroups is shown in Fig. 2.

It seems remarkable that – by comparing the recent position of the areas of monophyletic groups – «sister-groups» have colonized \pm disjunct areas: the *H.obsoletus*-group is found in general north of the Mediterranean – the *H.productus*-group south of it; the *H.angustulus*-group occurs mainly on the Mid-Atlantic Island – the *H.luteipes*-group in the eastern Mediterranean region.

Focussing on the species-density within the whole range of the genus (which comprises at least 28 species) we find two regions in which a remarkably higher number of species occurs (\pm sympatrically) than in others: one of these

centers is found in the Mid-Atlantic Islands (Canaries and Madeira), while the other is situated in the eastmediterranean region (Turkey: Anatolia) (see Fig. 3).

These findings raised the question whether the current position of these centers of species-density could also provide some indication of where the (hypothetical) centers of speciation could have been situated. Comparing the number of species occurring on the Mid-Atlantic Islands with the number of monophyletic groups to which these species belong, we realize that 6 out of 7 species belong to only one group (*H.angustulus*-group) – we have similar findings in Turkey: Anatolia where 6 out of 10 species belong to the *H.luteipes*-group.

These results may support the idea that the centers of speciation of these two groups in fact may coincide with their current centers of species-density: the special insular situation of the Mid-Atlantic Islands may as well as the remarkable orogenetic division of the East-mediterranean have favoured (besides their

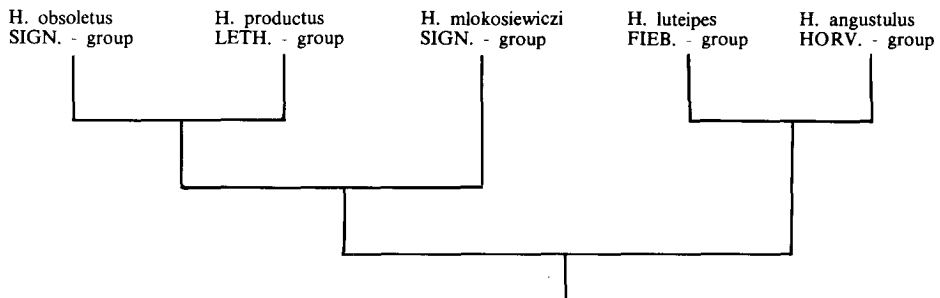


Fig. 1: Phylogenetic relationships within the genus *Hyalesthes* Sign. (after Hoch & Remane, 1985).

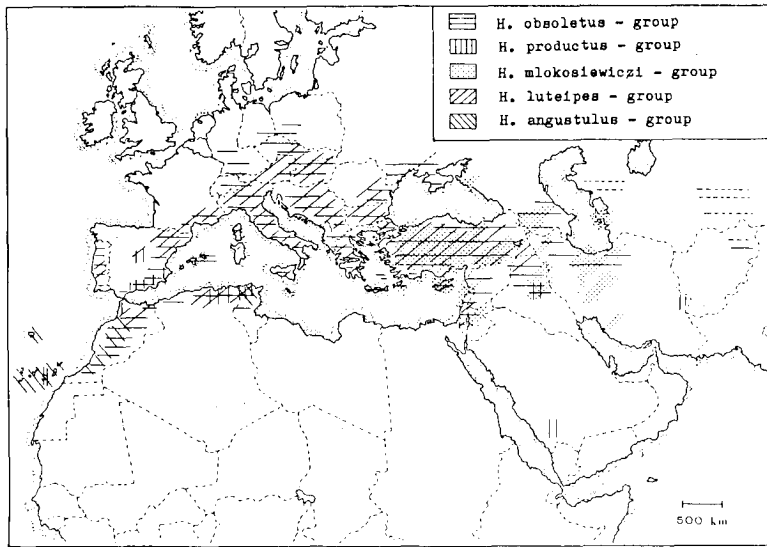


Fig. 2: Geographic distribution of the monophyletic *Hyalesthes* Sign. – subgroups (after Hoch & Remane, 1985).

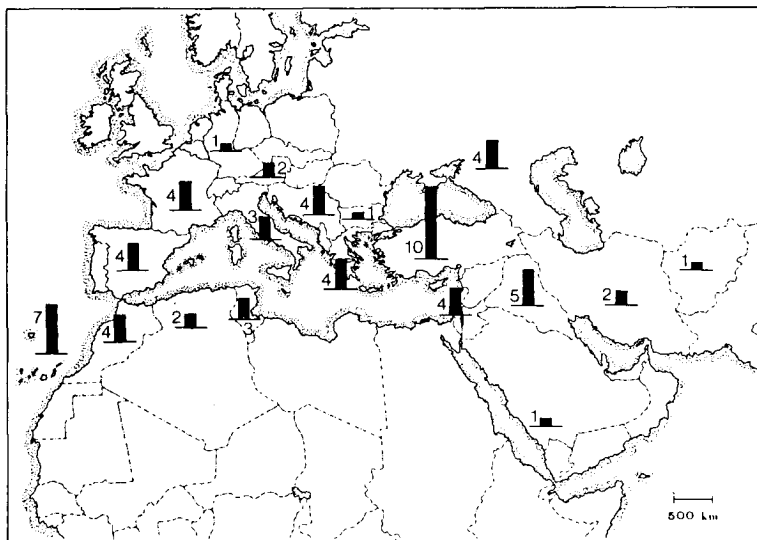


Fig. 3: Density of *Hyalesthes* Sign. – species in the Southwest Palearctic region.

function as refugial areas) evolutionary processes.

As unfortunately we lack sufficient knowledge about the geological age not only of the monophylum *Hyalesthes* but also of its monophyletic subgroups, any correlation of speciation processes taken place in this genus with geological events

(e.g. the progress of glaciation during the pleistocene) would be hazardous.

References

- Hoch, H. & Remane, R., 1985. Evolution und Speziation der Zikaden-Gattung *Hyalesthes* Sign., 1865 (Hom. Auch. Fulgoroidea Cixiidae). – Marburger Ent. Publ., 2 (2): 1-427.