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Kelisia riboceros nov. spec. from Greece - an important finding for the phylogeny of Kelisiinae (Homoptera Fulgoromorpha Delphacidae)

with

7 figures

bу

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Phylogeny, taxonomy, zoogeography, Greece, Kelisia riboceros n.sp., Kelisia ribauti WAGNER, Kelisia monoceros RIBAUT, Kelisiinae, Delphacidae, Fulgoromorpha

Abstract:

Kelisia riboceros n.sp., found in high altitudes above 2100 m in the Olymbos-Mountains in Greece, is described: it is closely related to K.ribauti WG., but differs from this and all other Kelisia-species by the shape of the σ -genitalia having uniquely developed slender subanal-processes in combination with a rather long, slightly asymmetrical process arising from the tongue-like linkage between the dorsal base of the aedeagus-theca and the - 180 -

ventral base of the analtube. The new species is of high phylogenetic significance as in a morphological row it mediates between the level of K.ribauti WG. (supposed to show the plesiomorphic configuration) and K.monoceros RIB.. By this theevolutionary origin of the single horn-like process in the male-genitalia of K.monoceros RIB. could be explained: the "horn" seems most probably to be homologous with the central spine on the linkage-tongue of K.ribauti WG.. This character seems toprove the monophyly of a group of taxa around K.ribauti WG..

During field-work in Northern Greece in August 1983 the author could collect in co-operation with H.Hoch, Marburg, in high altitudes of the Olymbos-Mountains (2100 m) a rather small Kelisia-species feeding on a low growing Carex-species (Carex montana?). This species externally looks slightly similar to Kelisia haupti WAGNER, 1939, which formerly was already collected in the same mountain range, but mostly in altitudes below 2000 m. The examination of the male genitalia revealed that the high-mountain-Kelisia did not belong into the K.haupti WG.-group. It showed instead obvious similarities to Kelisia ribauti WAGNER, 1938, but differed in several important characters. The differences in the d-genitalia are very constant. The morphological organisation of the mountain-Kelisia does not fit into the range of intraspecific variability of Kelisia ribauti WG., the special configuration of the male genitalia are supposed to be genetically fixed, thus the species could not be interpreted as a "mountain-variety" of ribauti WG., but as a separated species of its own. There is no evidence for any gene flow between the new species and ribauti WG., the latter being widespread in Greece from coastal zones up to high mountains about 2000 m.

As already pointed out in ASCHE 1985, this new species was highly important for weighing some relevant characters for the phylogeny of the delphacid-subgroup Kelisiinae WAGNER, thus it shall be officially described here in order to make it taxonomically - 181 -

available.

For its role in phylogeny of Kelisiinae see the discussion below.

Kelisia riboceros nov.spec. (figs. 4, 6a-d)

Description

Length: dd: 2,5-2,7 mm, 99: 2,7-3,0 mm.

Smallest species out of the <u>Kelisia ribauti</u> WG.-group so far. In proportions and colouration of head, pronotum, mesonotum, abdomen, legs and wings similar to <u>Kelisia ribauti</u> WG., perhaps in general aspect a bit more stout, the frons slightly darker brownish, the extension and intensity of the dark marking at the apex of the forewings more pronounced; the black spot on genae as well as on the lateral parts of the pronotum like in the mediterranean form of Kelisia ribauti WG. (see figs. 1-4).

General structures of body, drumming-organ, posttibialspur, tegulae, tegmina and wings including venation like in K.ribauti WG.. Differences to all other Kelisia-species are mainly found in special structures of the d-genitalia. While pygofer, shape of diaphragm, analtube and aedeagus are more or less conform to the corresponding structures of K.ribauti WG., the shape of the subanal-processes and of the chitinized tongue-like linkage between the dorsobasal margin of the aedeagus-theca and the ventrobasal margin of the analtube are different: Subanal-processes distinctly more slender, shorter, and especially in the distal part not as much curved as in K.ribauti WG.; - (see fig. 6a); central spine arising from the chitinized linkage-tongue between the bases aedeagus - and analtube remarkably longer than in K.ribauti WG., reaching almost the length of the subanal-processes, slightly asymmetrically curved, in ventral view almost slightly S-shaped. (see fig. 6b, c).

Holotyped : Greece, Olymbos-Mountains, supra Prionia: supra EOT-hut A, 2100-2700 m, 19.8.1983, Asche & Hoch leg., in coll. - 182 -

Asche, Marburg.

Paratypes (14 dd , 11 99) from same locality and date, Asche & Hoch leg., in soll. Asche & Hoch, Marburg.

Biology:

Only found in August as adults in high elevations (2100 m) on a low-growing Carex-species (like C.montana or C.humilis) in more or less open slopes covered by sporadic meadows above the Pinus-nigra-zone. K.riboceros n.sp. was the only Kelisia-species found here, the localities for Kelisia haupti WG. in this region are altogether situated below 2000 m. One single nymph (female: 4th instar) could be found. Although there is a high probability that this nymph belongs to K.riboceros n.sp., it can not be associated to this species with certainty so far.

Geographic distribution:

Endemic to Greece: Olymbos-Mountains, according to its phylogenetic significance possibly an old relict-species (remained nowadays island-like conditions in high-mountain separation?).

Discussion

The Kelisiinae WAGNER, 1963, today form a well defined monophyletic subgroup within the Delphacidae.

While WAGNER's concept of the <u>Kelisiinae</u> was quite unclear and by the use of his own-developed method of so-called "dynamic taxonomy" leading to rather severe confusion, even to paraphyletic groupings (see ASCHE 1985: 139 ff.), we could prove for the first time by cladistic analysis the monophyly of this group by means of synapomorphic characters. Amongst others the most important synapomorphy of the group could be settled in the o-genitalia by the existence of a pair of in most of the species elongated spine- or thread-like subanal-processes originating - 183 -

from the tongue-like, stronger chitinized structure linking the dorsobasal margin of the aedeagus-theca and the ventrobasal margin of the analtube (WAGNER 1963 misinterpreted these subanal-processes as derivates of the analtube).

As well known exception within the Kelisiinae one species exists, which possesses only one asymmetrical horn-shaped process arising at the corresponding place: Kelisia monoceros RIBAUT, 1934. WAGNER (1.c.) interpreted this horn-like structure to be part of the aedeagus-theca, and did dare to homologize it with the distantly similar looking detached theca-horn of Stenocranus FIEB.-species. As already pointed out in ASCHE & REMANE 1982, ASCHE 1984 and ASCHE 1985 this interpretation by WAGNER again does not meet the morphological facts. In all Kelisiinae-species checked so far the theca remains entire from its base to the very distal part. The ventrobasal processes of the theca in some North American species (e.g. in K.pectinata BEAMER, 1945, K.curvata BEAMER, 1945 et al.) are specially developed. - that means those structures are most probably convergently evolved and not homologous with the "horn" of Stenocranus-species. According to our morphological studies the horn-shaped process of K.monoceros RIB. is neither homologous with the Stenocranus-horn, nor with the special theca-derivates of the corresponding North American Kelisia-species. Its origin, however, obviously is completely different. By comparison with the morphologically similar species K.ribauti WG. and with the (inexpectedly discovered) closely related Kelisia riboceros n.sp. the origin of the single "horn" of monoceros now seems evident.

As already shown by WAGNER Kelisia ribauti WG. bears a short, slightly curved spine on the chitinized area mediodorsally of the bases of the two elongated subanal-processes. This spine was morphologically misinterpreted by WAGNER as remnant of a degenerated aedeagus-theca: WAGNER l.c.: fig. 21b: "th". This spine - derivate of the linkage-tongue between aedeagus and analtube - most probably has to be assumed to be a new invention of Marburger Ent. Publ. 2(3) 1986 ASCHE: Kelisia riboceros nov. spec. from Greece

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K.ribauti WG.. In Kelisia riboceros n.sp. the spine-like process is considerably longer and obviously curved in a similar asymmetrical way like the single "horn" of K.monoceros RIB.. Moreover in K.riboceros n.sp. the subanal-processes are remarkably shorter than in K.ribauti WG..

We could interprete this situation as an evolutionary scale of morphological changes starting from <u>K.ribauti</u> WG. (here supposed to be the most primitive species of this group) with rather long and strongly developed subanal-processes and only a relativly short central spine via <u>K.riboceros</u> n.sp. with shorter and more slender subanal-processes, but with a distinctly more developed central spine to <u>K.monoceros</u> RIB., which shows a complete reduction of the subanal-processes, but an enormous enlargment of the central-spine which here forms the single "horn".

It seems quite unlikely to us that these characters have been evolved just viceversa starting from the morphological organisation of K.monoceros RIB. as the most plesiomorphic species via a morphological form like K.riboceros n.sp. to K.ribauti WG., which consequently would mean that the subanal-processes have been evolved only within the Kelisiinae, thus not being constitutive for the group as a whole. Moreover it would mean that the centrally arising spine on the linkage-tongue between analtube and aedeagus would possibly form a synapomorphic character all species united in Kelisiinae, which in our opinion is hardly to prove. It is much more likely that the asymmetrical configuration of K.monoceros RIB. has been derived from a symmetrical one, - the more, as Anakelisia fasciata (KBM.), - a species, which we consider to be possibly more plesiomorphic in the shape of the genitalia than all other taxa of the Kelisiinae - does possess symmetrical elongated subanal-processes, but no central spine. However, the presence of this spine might be treated as a homologous synapmorphous character for a group of species comprising not only K.ribauti WG., K.riboceros n.sp. and K.monoceros RIB., but also K.sabulicola WG., 1952: morphologically

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hardly to distinguish from K.ribauti WG., but it is said to be ecologically different by feeding monophagous on Carex arenaria growing on sand dunes. Last not least here also belongs K.pannonica MATS., 1910, but this species is taxonomically unclear at the moment (separate species or identical either with ribauti, or with sabulicola?).

The systematic position of this monophyletic group of species around K.ribauti WG. and its relationships to other taxa within the Kelisiinae shall be discussed in another paper.

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Figures

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- Fig. 5-7: abdomen macerated in 10% KOH and transferred into glycerin, resp. glycerin-gelatine.

Figs. 1-4: head in profile left lateral view

- Fig. 1: Kelisia ribauti WAGN., "mediterranean form"
 (\$\phi\$ NW-Greece, Nomos Florina, E Pisoderion, 1.9.81,
 Asche leg.)
- Fig. 2: <u>Kelisia ribauti</u> WAGN., "mountainous form" (NE-Italy, Mti. Dolomiti, Comelico Superiove, 1400 m, 11.8.82, Asche leg.)
- Fig. 3: Kelisia monoceros RIBAUT (W-Germany, Hessen, Wetterau, Münzenberg, 3.7.77, Asche leg.)
- Fig. 4: <u>Kelisia riboceros</u> n.sp. (paratype o 1)



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Figs. 5-7: d-genitalia

Fig. 5: Kelisia ribauti WAGN. (data see fig. 1)

a: d-genitalia without pygofer in left lateral view

b: aedeagus, ventral view

c: aedeagus, seen from about right side

Fig. 6: Kelisia riboceros n.sp. (paratype d 1)

a: d-genitalia without pygofer in left lateral view

b: aedeagus, ventral view



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Fig. 6 (cont.): Kelisia riboceros n.sp. c: aedeagus, dorsal view d: aedeagus, seen from about right side Fig. 7: Kelisia monoceros RIBAUT (data see fig. 3) a: d-genitalia without pygofer on left lateral view b: aedeagus, ventral view c: aedeagus, dorsal view d: aedeagus, seen from about right side



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