[3610] EVOLUTION AND SPECIATION OF CIXIIDAE IN THE PACIFIC: A COMPARATIVE STUDY OF HAWAII AND THE GALÁPAGOS ARCHIPELAGO (HEMIPTERA: FULGOROMORPHA)

H. Hoch, Museum für Naturkunde, Humboldt-Univ., Invalidenstr. 43, D-10115 Berlin, Germany, E-mail hannelore.hoch@rz.hu-berlin.de.

The current knowledge of the taxon *Oliarus* paints the following picture: the "genus" is distributed worldwide and rather speciose (ca. 350 species). Centers of species density are in the Afrotropical region, North America and the Pacific Islands. The Hawaiian Archipelago being the best studied island group is known to harbour at least 85 endemic *Oliarus* species, including seven evolutionary lineages that have independently invaded the subterranean biome on Molokai (1), Maui (3), and Hawaii Island (3). From other high Pacific Islands with a comparable habitat diversity, only few *Oliarus* species have been described (Cooks: 1, Societies: 3, Marquesas: 18, Galápagos: 5). A biogeograhic analysis of the colonization history of the Pacific Islands, however, is hampered by the lack of a cladistic analysis. So far, there is no morphological evidence for *Oliarus* s.l. to be a monophyletic group. The Hawaiian *Oliarus* species, however, may form a monophyletic group, i.e., they are likely to have derived from a single ancestral species colonizing the islands. Their phylogenetic relationships to the "*Oliarus*" species from any adjacent continent or other Pacific islands are largely unclear. A comparative morphological study of previously uninvestigated material from Galápagos revealed: 1) species diversity is much higher than previously assumed, 2) the species from Galápagos do not share any synapomorphic characters with the taxon occuring in Hawaii; they certainly do not belong to the same monophylum, and 3) the "*Oliarus*" species from Galápagos share a set of characters that may be interpreted as synapomorphies, thus for now we assume, that – like Hawaii – Galápagos has been colonized by a single ancestral species that subsequently underwent speciation. Observed patterns suggest that species may not only have formed by allopatric speciation, i.e., on different islands, but differentiated within a given island according to habitat diversity (host-plants, altitude). The species richness in the Galápagos Islands can thus be most likely attributed to adaptive radiation. Interestingly, parallel evolution has led to the colonization of subterranean habitats (lava tubes) also in the Galápagos by a blind, flight- and pigmentless species. Objectives of current research on these two parallel cases of colonization of island biota with subsequent adaptive radiation to similar habitat types are 1) to reconstruct the phylogenetic relationships within each group, 2) to relate speciation events to evolutionary time based on genetic information, and 3) to identify the potential source area from where colonization commenced. Especially South America deserves an in-depth investigation in regard to its cixiid fauna which so far must be regarded as extremely poorly known.

Index terms: *Oliarus*, phylogeny, zoogeography

[3611] THE ENIGMATIC NEOTROPICAL DELPHACIDAE (INSECTA, HEMIPTERA, FULGOROMORPHA) – A STATUS REPORT OF OUR KNOWLEDGE ABOUT A LONG NEGLECTED GROUP

M. Asche, Museum für Naturkunde, Humboldt-Univ., Invalidenstr. 43, D-10115 Berlin, Germany, E-mail manfred.asche@rz.hu-berlin.de.

The Delphacidae contains >2000 species worldwide, many of which are important vectors for plant diseases; others have been considered as indicator species for determining environmental quality. In contrast to many other regions, the Neotropics are very poorly investigated in regard to their delphacid fauna: ca. 260 species were reported, i.e., ca.12% of the world´s known species with 80 % endemism. Nearly 70 % of the species were described by only four taxonomists (Crawford, Muir, Caldwell, Fennah). Ca. 35 % of the species were published by Muir in 1926, mainly based on single collections from Equador and Brazil, thus, these two countries are still leading in totals of delphacid species compared with the rest of the Neotropics. 44 species are currently known from Equador, but only 2 resp. 3 from the adjacent countries Peru and Bolivia. This unsatisfactory situation applies to nearly all other countries in Central- and South America, and in the Carribbean. Moreover, almost nothing is known about biology and ecology (not even host plants). Our fragmentary knowledge of the neotropical delphacids, especially their poor systematic status, may lead to misinterpretations of taxa and misconceptions of distributional patterns. The lack of a phylogenetically based systematics does not allow sound zoogeographical analyses: almost 100 neotropical species are still generically misplaced, e.g., in the European genera *Delphacodes* and *Euides*; however, none of the New World species shares any synapomorphies with the corresponding European monophyla. A preliminary evaluation of recently collected samples from various neotropical areas has revealed a considerable increase of species, e.g., 1.) in Ugyopinae about 80 % of the species were found to be new to science; 2.) in Plesiodelphacinae the number of species in the genus *Burnilia* will rise from 5 to 15; in the Delphacinae genus *Megamelus* the total of species will increase from 3 to about 12. Similar increase may be predicted for other delphacid taxa. The Stenocraninae – previously believed to be absent from the Neotropics – appear to be well represented with several yet undescribed species. Consequently, we may expect the current total of neotropical delphacid species to be doubled or even tripled, i.e., 500- 700 species. Future research on neotropical Delphacidae should address the following fields: 1) completing the inventory, 2) description of taxa and systematic evaluation on a phylogenetic basis, 3) zoogeographical analysis of the neotropical fauna, - also in respect of potential source areas for the colonisation of Pacific islands, 4) dissemination of information via electronic media. For reaching these goals, it is absolutely essential to train and educate local students in all countries of the Neotropics.

Index terms: systematics, faunal inventory, species estimates

[3612] THE NEW WORLD ACHILIXIIDAE & RICANIIDAE (HEMIPTERA: FULGOROMORPHA)

M. R. Wilson[1] & A. Stroinski[2], [1]Department of Biodiversity & Systematic Biology, National Museum of Wales, Cardiff, CF10 3NP, Wales, UK, E-mail: mike.wilson@nmgw.ac.uk; [2]Museum and Institute of Zoology PAS, Wilcza 64, P.O. Box 1007, 00-679 Warszawa, Poland, E-mail: adam@robal.miiz.waw.pl.

The planthopper family Achilixiidae is one of the smallest of the Fulgoromorpha. There are only two genera recognised; *Achilixius* from the Oriental region with 16 species (revised by Wilson, 1989 Systematic Entomology 14, 487-506) and *Bebaiotes* with 8 species from Central and South America. The family is characterised by the possession of one or two pairs of processes arising laterally from the abdomen. Relationships to other families are somewhat unclear. Further study will be necessary to define generic relationships and also to place the family within the other Fulgoromorpha. All species are known from tropical lowland and medium altitude rain forest where the nymphs probably feed on plant tissue. Although only 8 species are described from south and central America it is now clear that achilixiids may be more common than previously thought and additional species remain to be described. The family Ricaniidae is a medium-sized family of the Fulgoromorpha and contains 52 tropical and subtropical genera with about 400 species mostly in Old World. Only four genera (8 sp.) are known in the Neotropics. Neotropical ricaniids (with two exceptions) are restricted to Central America: Mexico (Chiapas), Panama, Costa Rica, Colombia and Venezuela to Peru. As part of a cladistic analysis of the ricaniid genera, new morphological characters have been investigated, with emphasis on female genitalia. In particular, Neotropical Ricaniidae share some diagnostic characters: gonoplac without teeth, posterior margin at least partly membranous; gonophysis VIII short and wide, with numerous teeth on its posterior margin; bursa copulatrix without observable ornamentation; absence of gonospiculum. *Cotrades* and *Semestra* seems closely related and are characterized by a ring-like anal tube, the middle part of the gonoplac posterior margin membranous, by a single tooth on gonophysis VIII lower margin, by a posterior vaginal process weekly sclerotinized and by the bursa copulatrix with two pouches. *Kruegeria* differs from them by a flattened anal tube, the fully membranous posterior margin of gonoplac, the lower margin of gonophysis VIII without tooth, the posterior vaginal process well sclerotinized and the bursa copulatric formed by a single pouch. Future cladistic analysis will show if these characters are synapomorphies. Do the neotropical ricaniids form a monophyletic group and Do they represent an old gondwanian lineage or a more recent lineage which reached the neotropics via dispersion through North America?

Index terms: systematics, morphology, female genitalia.

[3613] NEOTROPICAL KINNARIDS: THE MISSING LINK? (HEMIPTERA, FULGOROMORPHA)

T. Bourgoin, Muséum national d'Histoire naturelle, Lab. Entomologie & ESA 8043 CNRS, 45, rue Buffon, F-75005 Paris, France. E-mail: bourgoin@cimrs1.mnhn.fr

Recent cladistic analysis showed that within the Fulgoromorpha, Kinnaridae and Meenoplidae form a strongly supported monophyletic group (Bourgoin, 1993). Within this clade the monophyly of the Meenoplidae also is well supported while Kinnaridae appears paraphyletic, their clade including the meenoplids. Three main clades [1+(2+3)] were observed as follow: 1. South Asian genus *Kinnara*, sister group of all other taxa; 2. Canarian kinnarids + (Mascarene genus *Nesomicrixia* + Central American Prosotropinae); 3. Central American genus *Oeclidius* + (Palaearctic kinnarids + (Neotropical genus *Southia* + all Meenoplidae genera)). In this phylogenetic perspective, these results seem unsatisfactory from the viewpoint of historical biogeography. No clear biogeographical track supports the observed distribution and two obvious gaps are seen: the near absence of kinnarids in both the Neotropical and Afrotropical areas. Recently several new meenoplid genera have been discovered (Bourgoin, 1997, Bonfils & Attié, 1998) and particularly several new Neotropical kinnarid genera (Bourgoin, *in prep.*), a family previously considered absent from South America. New cladistic phylogeny inferred with new morphological characters and including these new Neotropical kinnarid taxa allow reworking the Meenoplidae-Kinnaridae relationships, testing the kinnarid paraphyly, and the support of the three previously recognized clades. A new biogeographical scenario is proposed.

Index terms: systematics, phylogeny, historical biogeography, Meenoplidae.