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ABSTRACTS AND AUTHOR INDEX

EFFECTS OF HABITAT FRAGMENTATION ON THE SOIL SURFACE ARTHROPOD COMMUNITY IN A SOUTH GERMAN HEATHLAND. M. Dieterich, Department of Entomology, Oregon State University, Corvallis, Oregon 97331, USA.

Pitfall trapping was used to compare the arthropod community in open pasture with that in areas fragmented by early stages of forest succession. Data were collected for 2 seasons on a 2.5 hectare study site in a dry grassland at the edge of the Suevoian Alb mountains. Using a trap which allowed live capture of the animals, Carabidae, Staphilinidae and Orthoptera were determined to the species level. Other arthropods were identified to genus or family.

Adults of 3 and larvae of 2 carabid species, as well as 3 species of Staphilinidae and 2 species of Orthoptera were found to be most common in open grassland areas. For Carabidae Renkonen indices showed highest similarities between study plots in open pasture (80.5%) and between sites fragmented by woody vegetation (79.4%). Indices were lower comparing open to fragmented sites. Similar trends were observed for Staphilinidae. In some species different areas were used depending on life stage or time of the year. Other factors that affected species abundance and distribution were vegetation density, abundance of grass tussocks and ant density. Shrew predation also was important in the hedges.

COMMUNITY STRUCTURE OF FLOWER-VISITING INSECTS (HYMENOPTERA APOIDEA, LEPIDOPTERA, DIPTERA) IN DIFFERENT GRASSLAND TYPES OF SOUTHWESTERN GERMANY. A. Kratochwil, Inst. Biol. II, Univ. of Freiburg, Schänzlestr. 1, D-7800 Freiburg, FRG.

Inside a small vegetation mosaic of 10 acres the different plant communities (Xerobrometum, Mesobrometum, Molinietum, Arrhenatheretum) are characterized by special communities of flower visitors. Seen in the light of biogeography plant communities with a high percentage of submediterranean plant species (Xerobrometum, Mesobrometum) own a flower visitor community consisting of many species with submediterranean distribution. In the same study area the Arrhenatheretum is characterized by a high percentage of Central European and Eurosiberian plant species and the flower visitors are predominantly of the same geoelement. Flower-visiting insects from special area-types prefer to gather nectar and pollen from those plant species and plant communities which belong to their own geoelement. Even insects with a high flight capacity use this pattern in the study area. The community structure based on the historical processes of the flora and fauna is similar to that of subsystems with identical areageographical origin.

SOIL INVERTEBRATES IN THE CANOPIES OF TROPICAL CLOUD FORESTS. M. G. Paoletti*, D. H. Stinner and B. R. Stinner, Department of Biology, University of Padova, Padova, Italy.

Communities of invertebrates were quantified in epiphytic and suspended soils of a Venezuelan cloud forest at Rancho Grande National Park at two locations, relatively wet and dry sites. Invertebrates from these canopy soils were compared to those animals inhabiting the forest floor. Invertebrate (earthworms, isopods, millipedes, spiders, beetles and ants) density was greater in the canopy than the forest floor environment for both sites. However, the difference in invertebrate density between the canopy and forest floor habitats was greater in the wet site. These results are discussed in terms of organic matter dynamics and nutrient cycling processes.

COMMUNITY STRUCTURE OF THE FAUNA OF TROPICAL TREES AND AN ANALYSIS OF THE DIVERSITY OF THE INSECTA. N. S. Parshuram, Department of Entomology, British Museum, Cromwell Rd., London SW7 5BD.

Use of knockdown insecticides on tropical trees has provided a unique insight into the arthropod fauna. These samples were analysed to investigate the structure of the arthropod community associated with the trees in terms of numbers of individuals, species richness, and body size. Variation in the structure of the fauna with forest type, season and altitude are also considered. Erwin's global estimate of 30 million species of insects in tropical forests is reanalysed using this new data.

GUILD STRUCTURE AND DYNAMICS IN CYNIPID PARASITOID FAUNA OF QUERCUS. Michael J. Crawley* and Rosemary Halls, Department of Pure and Applied Biology, Imperial College at Silwood Park, Ascot, Berkshire, SL5 7PY, England.

The cynipid gall fauna of *Quercus robur* provides an attractive group for studies on guild structure and dynamics. Differences in the relative abundance of different gall species are predictably related to host plant phenotype. While none of the parasitic enemies of the cynipids are strict specialists, almost all of them show distinct preferences for one species. Changes in relative abundance have occurred following the introduction of two cynipid species from Southern Europe. Two species, the knopper gall of acorns (*Andricus quercuscalicis*) and *Andricus lignicola* have increased in abundance since the early 1960s to form perhaps the most conspicuous element of the gall fauna in Southern England. The relationship between these two species and the resident guild of parasitoids is described, along with the extraordinary sex ratios exhibited by those parasitoids which attack the sexual generation of *Andricus quercuscalicis* on Turkey Oak (*Quercus cerris*). The parasitoids attacking these sex galls produce virtually 100% male progeny. This behavior is examined in the light of theories relating to optimal sex ratio determination.

SYMPATRIC SPECIATION IN INSECT PARASITOID ASSOCIATED WITH GALL MAKERS OF THE EUROPEAN BEECH. K.-H. Lampe, Abt. Zoologische Parasitologie, Museum Alexander Koenig, Erbertallee 150-164, D-5300 Bonn 1, W. Germany.

In the course of their evolution from free, external feeders to gall formers phytophagous insects have lost many of their original, typical parasitoids. The recent gall makers have instead acquired new polyphagous parasitoids from other phytophagous insect groups with similar life histories. The European beech, *Fagus sylvatica* L., harbors only a few species of phytophagous insects, e.g. the systemically isolated Cecidomyiidae *Mikiola fagi* Htg. and *Hartigia annulipes* Htg. The Cynipidae and other gall makers are missing completely. *M. fagi* and *H. annulipes* are exploited by 3-4 species of *Aprostocetus* and by 3-4 species of *Meteorus* each. The parasitoid complex of these gall midges on the European beech can best be interpreted by likening the radiation processes on very remote islands.