

# PROCEEDINGS OF THE SIXTH INTERNATIONAL CONGRESS OF ZOOLOGY

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tribution range of *A. latronum* seems to be restricted in China. Multivariate analyses were carried out to

clarify intra- and interspecific morphological variation of *Apodemus* species by using 18 characters of skull.

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## GROUND BEETLES (COLEOPTERA, CARABIDAE) IN FOREST ECOSYSTEMS OF STEEP ZONE OF UKRAINE

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During 10-year studies the 120 species of ground beetles were registered in forests of steppe zone of Ukraine. About 70 of them inhabit in the forest ecosystems only. Because Carabidae is the more abundant polyphagous, they promote the redistribution of trophic loads on mass invertebrates and prevent the outbreaks of insect's reproduction. For determinate role of *Pterostichus oblongopunctatus*, *P. melanarius*, *P. anthracinus*, *Harpalus rufipes* in forest ecosystems of the steppe zone the simulation of population characters was made. Field and laboratory researches showed that these species are polyphagous, eating the most inhabitants of forest litter. Different species of Carabidae are on the two-three trophic

levels in various consortia of steppe forests. It was shown that *Formica* species has a greatest influence on populations of ground beetles. Almost all species of Carabidae except *Amara similata* and *H. rufipes* ignore areas with high density of ants. Between congeneric species of ground beetles the more competitive interactions are observed. However the mechanisms of coexisting of two related species with similar feeding ration, daily activity and soil layer needs in the additional studies. The method of topological spectrum has been designed. It allows describe the soil moisture, mineralization and mechanical composition on the basis of ground beetles diversity without indicator ones.

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## INTEGRATIVE BENEFITS OF THE CULTURABLE MODEL "RICE PLANT-SPIDER-SNAIL" ON ECOLOGICAL MANAGEMENT FOR PESTS IN THE RICE-BASED ECOSYSTEM

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This paper reported a new culturable model "rice plant-spider-snail" on ecological management for pests in paddyfield of Hunan, China. This model was created based on the author studying on the distribution character of spider fauna, the structure and function of spiders community for many years. The main collocate measures which included protecting the spiders to control the pest insects, keeping the snails (*Ampullias gigas*) to eat weed and use their egesta to fertilize rice-plant, withal assist with the effective biological pesticide to control the outbreak of pests were adopted in the model. The test was put in practice in the rice-field of Yueyang, Hunan Province, China during 2002–2003. The results showed that the dosage of pesticide decrease to 35%, and the content of rudi-

mental pesticide in the soil and the paddy is lower in the trial field than that in the chemical control field, but the index of species diversity is obviously higher in the trial field than that in the chemical control field. It means this model can protect the biodiversity of the paddy area. The weed community is lower significantly in the trial field than that in the chemical control field, for the snail eat them. It is unnecessary to add chemical fertilizer for the plentiful excrement of snail supplying the nutrition that the crop needed; For stereo-culture is applied, agricultural benefit in the integrative regulation fields is much higher than that in the chemical control fields. In terms of all kinds of analyses, the model take the nicer effects in the ecology, economy and society.