UNITAS MALACOLOGICA

Abstracts

of the Eleventh International
Malacological Congress

Siena, Italy
1992

UNITAS MALACOLOGICA

ELEVENTH INTERNATIONAL MALACOLOGICAL CONGRESS

Siena, Italy, 30th August - 5th September 1992

ABSTRACTS

edited by

Folco Giusti & Giuseppe Manganelli

Published on behalf of Unitas Malacological
by the University of Siena, Italy, June 1992.

Printed by Centro Offset
Le Badesse (Monteriggioni, Siena, Italy)

Acknowledgments

The Congress has been supported by the following authorities and firms:

Ministero degli Affari Esteri
Ministero dell'Ambiente
Ministero dei Beni Culturali e Ambientali
Consiglio Nazionale delle Ricerche (CNR)
Regione Toscana
Comune di Siena
Università di Siena
Azienda di Promozione Turistica di Siena
Azienda Comunale Diritto allo Studio di Siena
Dipartimento di Biologia Evolutiva dell'Università di Siena
Monte dei Paschi di Siena
Banca Toscana
Cassa di Risparmio di Firenze

Abstr. 11th Intern. Malacol. Congr., Siena 1992 - F. GIUSTI & G. MANGANELLI eds.

STRUCTURAL ADAPTATIONS IN LANDSNAILS

Khokhutkin Igor M.

Institute of Plant & Animal Ecology, 8 Marta 202, Ekaterinburg, Russia

The aim was to approach the evolutionary ecology as the problem of adaptations as exemplified by landsnails of the Geophila order. Samples from populations of 8 species were studied, phene analysis of 967 species of this order from the literature was made. To study population structure the European species Bradybaena fruticum was chosen as the main object (over 30000 specimens). In 1968-1982 observations were made in the adjacent colonies of the species in the Preurals ans Transurals regions.

The species breeds by egg laying. Crossingover is present, self fertilization is very rare. The average number of eggs per a "female" varies from 14.7 to 44.2 % in different parts of the area. The maximal number of eggs in 2 spawns of the same specimen without repeated fertilization is 243. The young hatched after 8-50 days depending on the temperature and humidity. Embryonal mortality varies from 12.5 to 34.5 %; 30% of deaths is immediately after hatching (Staikou et al.,1990). Breeding size (Ne) of a population from Udmurtia (Preurals) has been estimated. It varied from 10 to 20 specimens with variation in the number of mating specimens from 0 to 146. Such Ne values should be evaluated as sufficiently high due to matings and long-term storage of the sperm by snails. This is characteristic of the species under study. The species is dimorph in coloration. Shells may have or lack one colour spiral band. A single-banded morph is recessive in homozigous allele (aa); inheritance of this system of characters ("banding") is monogenous. The analysis of variability of frequencies of the recessive gene (q) in big populations shows that their distribution is a normal curve with a very narrow base and high apex (I-shaped type) which corresponds to a great breeding size when all frequencies group around a stable equilibrium point. Calculations show increase of a dispersion value in the percentage of each homozygote at the expense of a diminution of the percentage of heterozygotes. This evidences of a population subdivision. The degree of subdivision in our case is insignificant (< 0.01).
In elementary systems of coloration characters an energetically profitable and rather free domination switching over (i.e.change of dominating morphs) is observed in the divergent evolution of close species. Alteration of the

ecological structure of these species expressed as the ratio of morphs frequencies permits a rough quantitative characterization of the species ecological niches. This is accompanied by "coding" by common phenes of any quantity of species due to innumerable variations within each morph and canalizytion of the main varieties of the phenotypical display of variability. Distribution of the species according to cohorts of characters is specific of Helicoidea and Hygromioidea; the difference in the number of band-lacking species is 26 %. Formation of species complexes in the biota of the regions can be described by elementary systems of the species characters. Different biotic complexes are specific in the character of the signs of composing species. The difference in the number of band-lacking Helicoidea in the New and Old World is 12.5 %, the difference in the number of polymorphic species in the Old World and the most lately formed Middle Asian fauna is 32.7 %.

It has been concluded that the model species populations subdivided into semi-isolated panmictic colonies (dems) have polymorphic stability in time. The described gene frequences distribution in them is connected with the stabilizing form of selective pressure. Canalization of phenes into systems of archetypic creods and their specificity in the biota of the regions are shown. Homeostatic mechanisms are realized on structural levels.

Staikou A., Lazaridou-Dimitriadou M.,Pana E. 1990.The life cycle, population dynamics, growth and secondary production of the snail Bradybaena fruticum (Müll.,1774) (Gastropoda, Pulmonata) in Northern Greece. J. Mollusc Stud.,56: 137-146.