Systematic Zoology and Development

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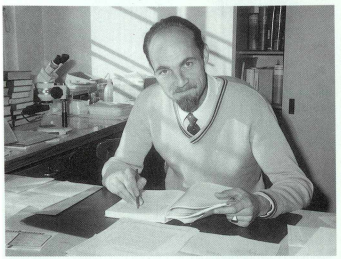


Research

The members of this Department conduct research on supraspecific and intraspecific metazoan relationships; emphasis is placed on "neuralgic" events in evolution and their impact on the systematic classification of mainly marine invertebrate taxa. The investigations themselves involve a detailed comparison of organizations, organogeneses and life cycles, and also stress faunas of particular habitats. Consequently, three main lines of research are pursued as part of our scientific program.

Comparative analysis of structures and organizations

Traditionally, research over the years was focused on the biology and relationships of indigenous limnic as well as Northern Adriatic marine gastropods. Initial investigations of the previously largely neglected organization of aplacophoran molluscs (Solenogastres, Caudofoveata) revealed the lack of knowlege about many morphological aspects of Mollusca in general and other invertebrate phyla. The currently extended scope of systematic investigations continues to the distinction of homology *vs.* analogy and of plesiomorphy *vs.* apomorphy at different systematic levels (intra- and interphyletic relationships). This research applies comparative-anatomical, histological, ultrastructural and (more recently) also molecular techniques. We are currently investigating lesser-known molluscan groups in a comparative way in order to gain information on 1) the particularities and variability in organization and biology (S.-Plawen: Caudofoveata & Solenogastres; G.Steiner: Scaphopoda), 2) problems in intraspecific variation and interspecific classification of selected terrestrial and limnic gastropods (H.Kothbauer: Helicidae; M.Haase: Hydrobiidae), 3) molecular systematics in selected bivalve and cnidarian groups (G.Steiner: Bivalvia; M. Haase: Anthozoa; S.-Plawen: Hydrozoa), 4) homology and analogy in photoreceptive sense organs among Spiralia (S.-Plawen; M.Blumer: larval gastropods), and 5) organizational differentiation in geographically isolated taxa (F.Starmühlner: Gastropoda).

Developmental studies

Analyses of relationships are necessarily also tied to developmental studies in order to reveal or clarify synapomorphies, caenogenetic events, and/or organizationally as well as structurally interbridging conditions. Within this framework, comparative investigations of larval organs among marine Spiralia are being carried out (B.Ruthensteiner: div. Gastropoda), different organogeneses of systematically and/or phylogenetically interesting species are being evaluated (B.Ruthensteiner, G.Steiner, S.-Plawen), and full life cycles are being elaborated (B.Ruthensteiner: div. Gastropda; S.-Plawen: interstitial Cnidaria). Research is conducted in situ, at marine stations, and in the laboratory of the Vienna Institute, which has the facilities to maintain and rear the respective marine animals.

Organisms of particular habitats

Three long-standing fields of interest are being pursued to analyse the adaptive characters of species in particular habitats: Marine interstitial sand (= mesopsammic) faunas, mainly Cnidaria and

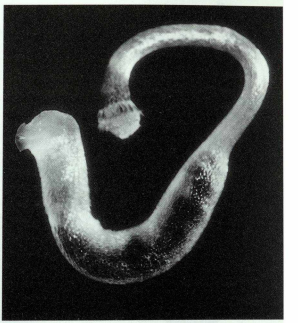
Mollusca, are being studied with respect to homologous *vs.* analogous adaptive differentiations in organization and biology (S.-Plawen). Limnic molluscs of (predominantly Indo-Pacific) islands are being comparatively described and investigated with regard to isolation events and systematic-phylogenetic consequences (F.Starmühlner). Finally, the molluscan distribution in specific terrestrial or limnic habitats is being recorded under these restricted environmental conditions relative to adjacent faunas (Ch. Frank). The ecology of such characteristic communities also contributes to archeological and pleistocene-paleontological research.

Teaching

The contribution to the curriculum includes two lectures which are obligatory for all students of zoology: "Principles of systematics and problems in metazoan phylogeny" (L,2h) and "Ontogenetic development in metazoans" (L,2h). Apart from seminars and other instruction, lectures are given in "Biology of indigenous invertebrates (excluding arthropods)" (L,2h), "Organization and biology of small marine invertebrate taxa" (L,3h), "The marine mesopsammon: Habitat and fauna" (L,2h), "Introduction to Zooparasitology" (L,2h), "Biology in ecologically extreme limnic habitats" (L,2h), etc. Members of the department cover one third (Gastroneuralia, excluding arthropods) of the two-semester obligatory courses in comparative anatomy (P,6h). Every two years a special course on Mollusca is held which covers the organization and biology of the eight molluscan classes (L,3h + P,6h).

International Cooperations

We have been participating in the program "Fauna iberica" which involves collecting, registering and determining the offshore marine fauna of the Iberian Peninsula. Similarly, research is being conducted within the "Fauna of Australia" and within the framework of "Marine Invertebrates of Scandinavia". There are also cooperations with individual scientists of various universities, museums and marine stations: Tel Aviv (Israel), Ancona and Ischia/ Napoli (Italy), Villefranche-sur-Mer and Banyuls-sur-Mer (France), Santiago de Compostela (Spain), Antwerp (Belgium), Plymouth (UK), Bergen and Trondheim (Norway), Woods Hole/Mass., Wilsall/Montana, Washington D.C. and Philadelphia (USA), Hawaii, Amakusa (Japan) and Sydney (Australia).



Falcidens gutturosus (KOW.), 15 mm, Mediterranean (Mollusca-Caudofoveata)

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