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Proceedings of the Forum Herbulot 2006 **Integration of molecular, ecological and morphological data:** **Recent progress towards the higher classification of the Geometridae** **(Hobart, 19-20 January 2006)**

Axel Hausmann & Peter McQuillan (eds.)

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The Forum Herbulot 2006 in Hobart, Tasmania was focussed on the establishment of an integrated taxonomical approach in geometridology, including morphological and molecular techniques as well as data from biogeography and ecology. In fourteen lectures and five posters various studies and results on geometrid moths were presented using a wide range of different techniques. Extensive discussions helped to put these studies into a common context, and to plan integrative approaches and cooperations for the future.

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Short Report and Results

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1. The chairmen outlined once more the aims of the FORUM HERBULOT (see www.herbulot.de). After a brief inaugural address from Claude Herbulot, Paris (presented *in absentia* by Axel Hausmann), the participants welcomed the research initiative and stressed the need for, and advantages of, the opportunities offered for close scientific cooperation among geometrid experts.

2. The seminar session highlighted promising possibilities for systematic research. The first five talks (session on 'Biosystematics & Phylogeny': S.-W. Choi, J. Viidalepp, E. Öunap, C. Young, P. McQuillan) presented and summarised the actual stage of research concerning the phylogeny of Geometridae on the subfamily and tribal levels as resulting from different types of data sets, such as larval morphology (Viidalepp), adult morphology (all), host-plant

relationships and zoogeographical patterns (McQuillan), and molecular analysis (Young, McQuillan, Öunap). The results focussed on Larentiinae (Choi, Viidalepp, McQuillan), but also offered deeper insights into the Geometrinae (Young) and the Sterrhinae (Öunap). Various different molecular data sets, derived from different nDNA and mtDNA genes, suggest a basal position of the Larentiinae within geometrid phylogeny (Öunap, Young). These results led to an extensive discussion of various possible scenarios in the evolution of this family.

In the session on 'Biogeography' distribution patterns were used to analyze refuges of Palaeogenic elements within the southern African geometrid fauna (M. Krüger), and to discuss taxonomy of great variation between island races (D. Stünig). In addition, diversity and phenology patterns in coastal Queensland were presented (P. Mackey).

The third session on 'Informatics and methodology' emphasized the importance of modern IT-based information systems to geometrid workers (African Geometridae: H. Staude; type specimens: A. Hausmann), of a new application of molecular techniques in ecosystem research (Hausmann) and of a new method for the study of egg morphology (Hausmann). Cooperation was agreed upon to collect and exchange digital images of, and information on, type specimens.

Refinement of molecular methods as valuable tools for evolutionary and systematic studies had been postulated by the previous Forum Herbulot 2001 and Forum Herbulot 2003 in order to supplement morphological and ecological data sets. Now, the first results of the four 'molecular' groups currently working on Geometridae, i.e. C. Young / P. McQuillan (Tasmania), E. Öunap / J. Viidalepp / U. Saarma (Estonia), A. Hausmann / S. Erlacher / M. Miller (Germany), T. Tammaru / N. Snäll (Estonia-Finland), offer a promising basis for future research. Closer cooperation in collecting and exchange of DNA samples was agreed upon, such as the coordinated use of techniques and target genes. Working plans were established in order to focus future common research on a better understanding of the basic phylogeny of Geometridae.

A statement of P. Sihvonen (Finland) with a number of theses for improvement of research coordination was distributed and welcomed. A common project could disclose and verify, in an integrated taxonomic approach, the relationships of the geometrids of Tasmania (C. Young / P. McQuillan), Chile (A. Hausmann), and South Africa (M. Krüger) ('southern clades').

Structure of, and access to, the Forum Herbulot webpage (www.herbulot.de) was discussed and open access to the 'scientific tools' emerged as the favoured option. The structure of the site will be changed in the course of 2006. The number of available type images of Geometridae will be restricted, but updated full versions of the type databases will be distributed to the active FH members in 2-year-intervals, at the FH meetings.

3. FORUM HERBULOT 2006 offered a very well organised post-conference tour in the South of the island. This tour and the collecting activities during the meeting brought very good results, and more than 130 of the 310 known Tasmanian geometrids could be recorded. Special tissue samples were collected for DNA analysis and common projects were planned. The results are presented and documented on the homepage (www.herbulot.de).

4. When receiving the sad message that Claude Herbulot passed away at the day of the opening of the Forum Herbulot 2006, the participants expressed their deep respect for the scientific achievements of the grandmaster of geometridology and patron of the Forum.

5. A proposal to have the next FORUM HERBULOT in Munich, Germany, in early 2008 (organisation: A. Hausmann) was discussed and welcomed. Future venues were proposed by the museums in Pretoria (South Africa) and Gainesville (Florida, U.S.A.). These offers were generally much appreciated by the participants.

6. Participants expressed their thanks to the organizers and sponsors of the FORUM HERBULOT 2006.

Hobart, 24.1.2006

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