

33. Male hind tibia with hairpencil, directed towards medial secretory zone on the second abdominal sternite.
34. Scoloparial dilatation of ansa is formed by dilation of the ansa air canal.
35. Gnathos basally fused with tegumen and uncus.
36. Subanal plate fused with median part of gnathos.
37. In males, tibial hairpencil composed of thickened springy hairs, medial groove on hind tibia and marginosternal processes on second abdominal sternite absent.
38. Labides separated distally from costula by narrow membranous fold.
39. On forewing, vein M_1 relatively very long and section between point of branching from R_s stem and discal vein is longitudinally orientated.
40. Discal spots on the wings have light nucleus, different in colour from groundcolour of wings.

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Evolutionary Relationships within the Australian Geometrinae – Research Update

Catherine J. Young

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This ongoing study examines the relationships between Australian geometrine genera and the relationships between these groups and other geometrid subfamilies. Geometrinae are strongly represented in Australia and this includes many genera of the Pseudoterpnini, the so called robust or grey Geometrinae. Very little has been published on the systematics of this group apart from the important and comprehensive work by Pitkin et al. (2007) on the Pseudoterpnini. Previous research into the higher order relationships within geometrid subfamilies has shown that they may be a sister group relationship between the Geometrinae and the Oenochrominae s. str. based on both morphological and molecular data (Young 2006, Yamamoto & Sota 2007). The Pseudoterpnini are also interesting in an evolutionary context because they have been postulated as being basally derived. In this study, data from two genes, 28S D2 and LW Rhodopsin were used to construct phylogenies for geometrine species and representatives of other geometrid subfamilies. Preliminary results show that:

- The Pseudoterpnini most likely do not form a separate clade within the Geometrinae;
- The Pseudoterpnini are most likely not basally derived;
- A sister relationship between Oenochrominae

and Geometrinae is uncertain, but is evident from Rhodopsin data;

- Dysphanini is a separate tribe from the Geometrinae on Rhodopsin data only;
- *Chlorocoma* is not monophyletic as '*Prasinocyma semicrocea*' most likely belongs to *Chlorocoma*, whereas *Chlorocoma cadmaria* does not;
- *Anomogenes* is possibly an ennomine and not a geometrine.

To further clarify these relationships, molecular data will be analysed using Bayesian inference. Morphological data, based mainly on adult characters, but also some immature characters, will be analysed to further understand relationships.

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