

HOMOLOGY OF MALE GENITAL SCLERITES IN  
NEUROPTERIDA – AN ADVENTURE\*

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Interpretation of male genital sclerites of Neuropterida has always been fraught with ambiguity. Previous controversial approaches may be summarised by the slogan: archaic derivatives versus derived novelties. Arguments for homologizing via a gonocoxite concept are presented here. The primitive machilid (Archaeognatha, Machilidae) structures provide the background for identifying the amazingly similar male genital sclerites of Raphidioptera. The comparatively complete segment 9 of Raphidioptera consists of tergite, sternite, large gonocoxites, styli and gonapophyses; it serves as a reference model for our understanding of segment 10 and 11 in Raphidioptera and of male genital sclerites in Megaloptera and Neuroptera. The large machilid / raphidiopteran gonocoxites 9 changed to appendage-like sclerites in Megaloptera and Neuroptera, and even shifted into the genital chamber in some neuropteran taxa, or became obliterated. The styli of segment 9 have been lost independently several times. Gonapophyses 9 remained rod-like or evolved substantially in Raphidiidae (hypovalva), but were lost in Megaloptera and in most Neuroptera. Sclerites of segment 10 underwent the most dramatic changes, and obliterations reflected in requirements for copulation: only the tergite remained, but amalgamated with tergite 11, forming the ectoproct. All other sclerites shifted into the genital chamber. Gonocoxites 10 apparently became lost, although their gonapophyses persist as parameres (*e.g.* in *Phaeostigma* NAVÁS and *Italochrysa* PRINCIPI). The mediuncus (penis) is interpreted as the fused styli of the otherwise lost gonocoxites. Sclerites of segment 11 are still traceable: the tergite (amalgamated in the ectoproct), and the sternite, possibly as a tiny subanale. The gonarcus is interpreted as the gonocoxites 11, the entoprocessus as the corresponding gonapophyses, and the arcessus as the fused styli of gonocoxites 11. The hypandrium internum, irrespective of its true nature (which still remains doubtful), may indeed be a peculiarity of the Neuropterida – although most likely lacking in Megaloptera.

\* Unchanged abstract of the lecture presented by the author. A comprehensive paper entitled “Male genital sclerites of Neuropterida: an attempt at homologisation (Insecta: Holometabola)” will be published in *Zool. Anz.* 241 (2002): 161–171.