



The Society for  
Integrative &  
Comparative  
Biology

SICB Annual Meeting 2017  
January 4-8, 2017  
New Orleans, LA

**Evolution of the Proboscis-Armature in Schizorhynchia (Platyhelminthes;  
Kalyptorhynchia): Multiple origins and losses?**

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Schizorhynchia includes approximately 150 species of predators that use an anterior proboscis to capture prey. The proboscis comprises dorsoventrally paired muscular tongues often armed with hooks or teeth. Taxonomy in this group has relied heavily on the light-microscopic structure of the proboscis, with the taxa possessing an unarmed proboscis regarded as primitive, and taxa possessing an armed proboscis, as derived. Molecular phylogenies do not support this view—the Cheliplanidae, with a proboscis armed with hooks, is basal, and the genus *Carcharodorhynchus*, with a proboscis armed with teeth, lies immediately above it. Other Schizorhynchia possessing armed proboscides are scattered throughout the tree, suggesting that the proboscis has lost and/or re-evolved armature several times. We examined proboscides in Schizorhynchia using CLSM, TEM, and/or serial-block-face SEM. Comparison of armed proboscides in *Baltoplana*, *Cheliplana*, *Carcharodorhynchus* and *Lehardyia* with the unarmed proboscides in *Proschizorhynchella*, *Carolinorhynchus* and *Schizochilus* suggest that the proboscis has undergone increasing specialization in the basal Cheliplanidae, typified by the rather derived (and speciose) genus *Cheliplana*. In contrast, the armed proboscis in *Lehardyia* bears similarities to the unarmed proboscides, implying that the armature here has arisen from the unarmed condition. Unfortunately, although we have data on prey-preferences of Schizorhynchia from PCR-based diet studies, we lack observations of feeding dynamics necessary to form hypotheses about how prey specialization might have driven morphological evolution in these interesting organisms. Support: WU Research Council and SC-INBRE (P20GM103499 from the NIGMS, NIH)