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Out of Africa? A dated molecular phylogeny of the cicada tribe Platypleurini Schmidt (Hemiptera: Cicadidae), with a focus on African genera and the genus *Platypleura* Amyot & Audinet-Serville

BENJAMIN W. PRICE[1], DAVID C. MARSHALL[2], NIGEL P. BARKER[3], CHRIS SIMON[2] and MARTIN H. VILLET[4]

[1]Life Sciences Department, Natural History Museum, London, U.K., [2]Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT, U.S.A., [3]Faculty of Natural & Agricultural Sciences, University of Pretoria, Hatfield, South Africa and [4]Department of Zoology & Entomology, Rhodes University, Grahamstown, South Africa

Abstract. The Platypleurini is a large group of charismatic cicadas distributed from Cape Agulhas in South Africa, throughout tropical Africa, Madagascar, India and eastern Asia to Japan, with generic diversity concentrated in equatorial and southern Africa. This distribution suggests the possibility of a Gondwanan origin and dispersal to eastern Asia from Africa or India. We used a four-gene (three mitochondrial) molecular dataset, fossil calibrations and molecular clock information to explore the phylogenetic relationships of the platypleurine cicadas and the timing and geography of their diversification. The earliest splits in the tribe were found to separate forest genera in Madagascar and equatorial Africa from the main radiation, and all of the Asian/Indian species sampled formed a young clade nested well within the African taxa. The tribe appears to have diversified during the Cenozoic, beginning *c.* 50–32 Ma, with most extant African lineages originating in the Miocene or later, well after the breakup of the Gondwanan landmass. Biogeographical analysis suggests an African origin for the tribe and a single dispersal event founding the Asian platypleurines, although additional taxon sampling and genetic data will be needed to confirm this pattern because key nodes in the tree are still weakly supported. Two Platypleurini genera from Madagascar (*Pycna* Amyot & Audinet-Serville, *Xenga* Distant) are found to have originated by late Miocene dispersal of a single lineage from Africa. The genus *Platypleura* is recovered as polyphyletic, with *Platypleura signifera* Walker from South Africa and many Asian/Indian species apparently requiring assignment to different genera, and a new *Platypleura* concept is proposed with the synonymization of *Azanicada* Villet **syn.n.** The genera *Oxypa* Distant and *Hamza* Distant, currently listed within separate tribes but suspected of platypleurine affinity, are nested deeply within the Platypleurini radiation. The tribe Oxypini **syn.n.** is here synonymized while the tribe Hamzini is pending a decision of the ICZN to preserve nomenclatorial stability.

Introduction

Many studies of taxa distributed in both Africa and Asia generally consider two biogeographical scenarios: the commonly cited 'Out of Africa' hypothesis (post-Gondwanan, African origin followed by dispersal into Asia) and the less commonly cited 'Out of India' hypothesis (Gondwanan origin with dispersal into Asia mediated by rafting on proto-India). 'Out of Africa' dispersal is often followed by diversification in Asia and subsequent 'Out of Asia' dispersal back into Africa (Pollitzer & Brooks, 2007; Krishnamurthy & Wahlberg, 2007). It is

Correspondence: Ben Price, Life Sciences Department, Natural History Museum, Cromwell Road, London, SW7 5BD, U.K. E-mail: b.price@nhm.ac.uk