

Update on taxonomic revision of New Zealand *Austrosimulium* (Diptera: Simuliidae)

Douglas Craig ^{*1}, Ruth Craig ¹, Trevor Crosby ²

¹ Department of Biological Sciences, University of Alberta, Edmonton T6G 0E2, Canada

² Landcare Research, 231 Morrin Road, Auckland, 1072, New Zealand

Our focus is an essentially complete taxonomic revision of larvae, pupae, and adults of New Zealand *Austrosimulium*. Some 19 species are now recognized. *Austrosimulium*, established by André Tonnoir (1925), is a small segregate of simuliids in Australia, New Zealand, and some outlying islands. It was Edwards (1931) who noted the relationship to a simuliid of South America, now recognized as the monotypic *Paraustrosimulium*. This latter genus is aberrant in some aspects, but there are convincing apomorphies shared with one segregate included in *Austrosimulium*, and molecular work by Moulton (2003) also strongly substantiates this relationship. Dumbleton's (1973) species groupings are strongly supported by cladistic analysis of morphological characters, and hence are maintained. Furthermore the groupings are extremely well supported by molecular analysis, albeit with minor variance. While the genus as a whole has Gondwanan connections, the major lack of divergence in the 16S ribosomal DNA indicates that the New Zealand *Austrosimulium* are of relatively recent origin. We suggest the genus arrived from Australia at some point following the Oligocene Epoch (25 mya), in keeping with recent evidence for major inundation of New Zealand at that time. This is congruent with biogeographical patterns reported for other elements of NZ's flora and fauna. The CO1 mitochondrial DNA has good divergence for some species groups; however, it is very poor for the great majority of terminal taxa, even though there is good morphological divergence. This further suggests speciation in *Austrosimulium* is recent. We comment about dispersal during lowered sea levels during the last glacial maximum.

