



Genetic relationships of *Amaurobioides* (Anyphaenidae) spiders from the southeastern coast of New Zealand

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Abstract

Members of the genus *Amaurobioides* construct silk retreats in rock crevices of the marine spray zone, a harsh and unusual habitat for spiders. This study expands the distribution records of three morphological species of *Amaurobioides* found on the eastern and southern coasts of New Zealand's South Island and uses mitochondrial DNA to examine their relationships and characterize their dispersal capabilities. Both 16S and ND1 sequences distinguish *A. pletus* found on the northeastern coast from a complex of two southern species comprised of *A. maritimus* from the mainland and *A. picunus* from Stewart Island. Neither 16S DNA nor ND1 protein separates these southern species. However, ND1 parsimony and likelihood analyses place 10 of 11 Stewart Island specimens in a clade of low support that nests deeply within *A. maritimus*. A nested haplotype analysis characterizes *A. maritimus* and *A. picunus* populations as having restricted gene flow/dispersal but with some long distance dispersal. Genetic distances between *A. pletus* and the *A. maritimus*-*A. picunus* complex indicate a Pliocene origin, whereas distances between *A. maritimus* and *A. picunus* suggest a Pleistocene divergence.

Key words: *Amaurobioides maritimus*, *Amaurobioides picunus*, *Amaurobioides pletus*, mitochondrial DNA, nested haplotype analysis, biogeography

Introduction

Spiders of the genus *Amaurobioides* Pickard-Cambridge (family Anyphaenidae) live in the marine spray zone, where they construct silk retreats in rock crevices at or slightly below mean high tide level (Figs. 1; Forster 1970; Forster & Forster 1999; BDO personal observations). In New Zealand, these spiders are typically found on rock outcrops, although large boulders also provide suitable habitat (BDO unpublished observations). Consequently, soft sandstone that erodes easily or beaches of sand or gravel act as barriers to their dispersal. *Amaurobioides* are known from only a few sites, even along the eastern and southern coasts of New Zealand's South Island (SI), where collecting has been most extensive. Before the current study, *A. pletus* Forster was known only from Akaroa (Fig. 2), *A. maritimus* Cambridge only from Brighton, Black Head, and two sites a few km north of these, and *A. picunus* Forster only from Halfmoon Bay and adjacent Horseshoe Bay on the northeast coast of Stewart Island.

There are no conspicuous ecological differences among *Amaurobioides* species (BDO unpublished observations), although *A. maritimus* and *A. picunus* adults are larger than those of *A. pletus* (Forster 1970; BDO unpublished observations). Nothing is known about the mode or frequency of dispersal in *Amaurobioides*. After depositing an egg sac within her retreat, a female seals the retreat opening with silk and remains inside until spiderlings emerge from the sac (Forster 1970; BDO unpublished observations). Spiderlings live in the maternal retreat with the female for an undetermined period of time after they emerge from an egg sac (BDO