

(Onychophora: Peripatopsidae)

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**Keywords** New Zealand; mtDNA; *Peripatoides*;

ences among sister species (Trewick 1998), Tait & Briscoe (1995) noted that a combination of morphological characteristics (15 pairs of legs, midventral openings of anal glands in males, and lack of crural glands) in the Dunedin taxon distinguished it from other described genera. Allozyme data revealed no close relatives among the limited number of New Zealand and Australian *peripatus* studied (Tait &

morphological conservatism, genetic methods have revealed extensive cryptic diversity (Briscoe & Tait 1995), stimulated revision of morphology based taxonomy (Reid 1996) and provided insights into the origin of diversity within, and biogeography of, species (Hebert et al. 1991; Gleeson et al. 1998).

Previous genetic studies of New Zealand *Onychophora* have used allozyme variation (Tait & Briscoe

**METHODS**

Peripatus specimens were collected in the environs of Dunedin City and up to 220 km from it (Fig. 1). This collecting area is probably close to the range limit for ovoviviparous onychophora in south-

and NotLEUr (see Results for details). PCR reactions were performed in 25  $\mu$ l volumes and products gel-purified in 2% agarose stained with ethidium bromide. Bands of expected molecular weight were excised and the DNA extracted from the agarose using QIAquick spin columns (Qiagen). Purified

- 1 Styles Creek
- 2 Tomohawk Lagoon
- 3 Graham's Bush



COI gene and the COII gene is initiated with an "ATG" codon typical of many insects (Szymura et al. 1996). I designed primers in relatively conserved regions towards the 3' end of COI in order to be able to reliably amplify a 600–800 bp fragment for sequencing, as follows:

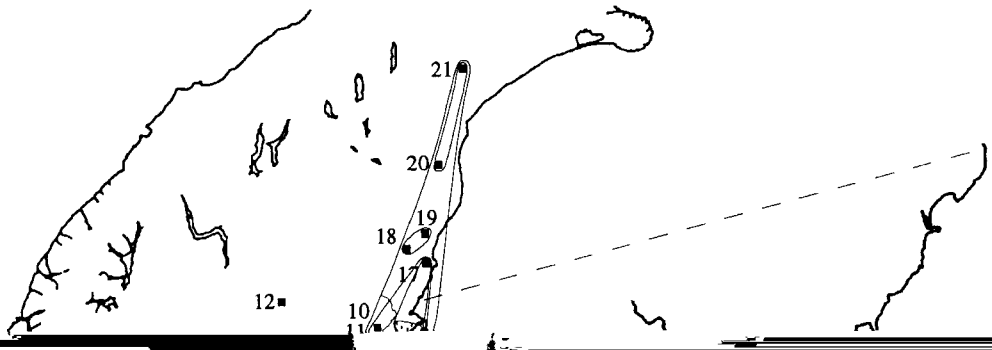
NotLEUr ATGATCAAAAGGAGGAAT (2961),  
and  
Perip24lr TATCGTCGAGGTATTCCACT (2770).

tutions did not include any aberrant stop codons (Table 2).

Eighteen unique haplotypes were obtained from 47 peripatus collected at 21 sites. Where several individuals from a particular site were analysed, all had the same haplotype except at Piano Flat, where two distinct haplotypes were present in a sample of four peripatus. Elsewhere, one haplotype was shared by nine peripatus from six sites (Botanic Garden, Caversham valley, Frasers Gully, Grahams Bush,









## DISCUSSION

and geographic distances, it appears that the D... U

All of the peripatus included in this study were consistent with Hutton's (1876) description of *Peripatoides novaezelandiae* in respect of leg number, integument colour, number of claws and distal papillae, and distribution. However, no specimens that I have dissected for this or previous studies were hermaphrodites as Hutton (1876), apparently erroneously claimed his were. The only distinction which Hutton (1876) made between *Peripatoides novaezelandiae* from different locations was to note

peripatus conforms to a single species-level taxon. The greater genetic distances revealed by comparisons of group A and B taxa (6–11%), despite close geographic proximity of some populations from these clades (Fig. 4), supports the notion that group A represents at least one additional non-interbreeding species. Within group A, peripatus from Piano Flat may also be justifiably considered as distinct species. The fact that genetic and geographic distances within group A are not correlated also suggest absence of gene flow. With the exception of *Peripatus*

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Haldane .A. T. . . . . A. . . . . C. T. . . . . T. . . . . T. . . . . A. . . . . G. T. A. . . . .  
Tomohawk Lgn. .A. T. . . . . C. . . . . T. T. A. . . . . G. T. . . . . A. A. . . . . G. T. A. . . . . A.  
Style's Creek .A. T. . . . . C. . . . . T. T. A. . . . . G. T. . . . . A. A. . . . . G. T. A. . . . . A.

Trewitt