The Chatham Is taiko (Pterodroma magentae) or tchaik in the Moriori language, is one of the world’s rarest seabirds. The taiko is critically endangered with a population size of approximately 120-150 individuals including just 8-15 breeding pairs (G. A. Taylor, pers. comm.). The taiko is thought to have only ever bred on the main island of the Chatham group (Rēkohu/Wharekauri; Aikman et al. 2001). Current issues affecting the recovery of the taiko population include predation by introduced species (Johnston et al. 2003) and possibly the excess of unpaired males present at the colony (Lawrence et al. 2008a).

Very few museum specimens of the Chatham Is taiko exist. The type specimen (called the magenta petrel) is held in the Turin Regional Natural Science Museum in Italy (Giglioli & Salvadori 1869; Crockett 1994). No other taiko specimens are known to be held by any other overseas museum. Te Papa Tongarewa Museum of New Zealand holds 1 adult study skin (NMNZ OR.25209; Imber et al. 1998) and 1 mounted juvenile (NMNZ OR.27098; A.J.D. Tennyson, pers. comm.). We report the discovery of a mounted taiko specimen that had been misidentified as a Tahiti petrel (Pseudobulweria rostrata) at the Canterbury Museum.

We extracted DNA from a feather sample taken from the specimen labelled Tahiti petrel (Old registration number O1013.0, catalogue number AV14948; Fig. 1). DNA extraction and Polymerase Chain Reaction (PCR) set-up were carried out in a dedicated ancient DNA laboratory. Three regions of the mitochondrial cytochrome-\(b\) gene were amplified using PCR. Target region 1 was amplified and sequenced 3 times in 1 direction. Target regions...
2 and 3 were each amplified twice and sequenced in both directions. These 3 regions of the mitochondrial cytochrome-\(b\) gene totalled 311 base pairs (bp; Genbank accession number FJ463404; methods as in Lawrence et al. 2009). When compared, these DNA sequences from the Canterbury Museum specimen were identical to 1 of the most common haplotypes found in the modern taiko population and in ancient taiko bones (Lawrence et al. 2008b; Lawrence et al. 2008c).

We aligned a section of DNA sequence from the Canterbury Museum specimen with 150 bp of cytochrome-\(b\) sequence available on Genbank from Tahiti petrels (accession numbers U70482 and U70493; Bretagnolle et al. 1998). The 2 Tahiti petrel sequences from Genbank were identical and alignment revealed 16 nucleotide substitutions between these sequences and that of the Canterbury Museum specimen (11% of the total sequence was different).

We next performed phylogenetic analyses of the 150 bp of cytochrome-\(b\) data (with Bayesian inference, maximum likelihood and maximum parsimony methods as in Lawrence et al. 2009). These analyses showed that the Tahiti petrel diverged close to the outgroup (sooty shearwater/titi, \textit{Puffinus griseus}, Genbank accession number U74353). However, the Canterbury Museum specimen sequence was identical to that of \textit{Pterodroma magentae} and fell within a separate clade with a Bayesian probability of 100% and maximum likelihood bootstrap value of 87 (Fig. 2). These results reveal that the Canterbury Museum specimen is not a Tahiti petrel, but a Chatham Is taiko.

Subsequent morphological examination of the Canterbury Museum specimen also confirmed that the specimen is a taiko. The specimen has a pale chin, streaked under-tail coverts and flanks typical of a taiko – all features that the Tahiti petrel lacks (Onley & Scofield 2007). Measurements are all within the range of those published for taiko (Table 1). The specimen’s culmen and tarsus measurements are shorter than those published for Tahiti petrel (Villard et al. 2006).

The only information available on provenance of the specimen is that it was collected in the Pacific Ocean. It has been in the Canterbury Museum collection since at least 1910. Display of this specimen will help to increase the public profile of New Zealand’s most endangered seabird species.
ACKNOWLEDGEMENTS

We are grateful to all those who collected taiko samples, especially Graeme Taylor and landowners Bruce and Liz Tuanui. We also thank Tamara Sirey for technical advice. This research was supported by funding from the Allan Wilson Centre for Molecular Ecology and Evolution, Massey University and the University of Auckland.

LITERATURE CITED


Keywords Chatham Island taiko; Pterodroma magentae; mitochondrial DNA; museum specimen; Tahiti petrel; Pseudobulweria rostrata

Table 1 Standard measurements (range in millimetres) of the Canterbury Museum specimen, Tahiti petrel (Pseudobulweria rostrata) and Chatham Island taiko (Pterodroma magentae).

<table>
<thead>
<tr>
<th></th>
<th>Canterbury Museum Specimen</th>
<th>Tahiti Petrel</th>
<th>Taiko</th>
<th>Taiko Type Specimen</th>
<th>Te Papa Taiko Specimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culmen</td>
<td>31.2 mm</td>
<td>32.25 – 39.9</td>
<td>30.3 – 35.1</td>
<td>32</td>
<td>32.1</td>
</tr>
<tr>
<td>Bill depth</td>
<td>13.9 mm</td>
<td>12.7 – 16.5</td>
<td>13.1 – 17.4</td>
<td>15</td>
<td>16.3</td>
</tr>
<tr>
<td>Wing</td>
<td>306 mm</td>
<td>274 - 318</td>
<td>284 – 316</td>
<td>306</td>
<td>300</td>
</tr>
<tr>
<td>Tail</td>
<td>c. 129 mm</td>
<td>112 – 133</td>
<td>116.5 – 139</td>
<td>127</td>
<td>129</td>
</tr>
<tr>
<td>Tarsus</td>
<td>41.2 mm</td>
<td>43.3 – 52.95</td>
<td>38.0 – 45.0</td>
<td>42</td>
<td>41.5</td>
</tr>
<tr>
<td>Mid-toe claw</td>
<td>59.2 mm</td>
<td>-</td>
<td>53.0 – 62.0</td>
<td>54</td>
<td>58.5</td>
</tr>
</tbody>
</table>

a Villard et al. 2006
b Marchant & Higgins 1990; Crockett 1994
c Bourne 1964
d NMNZ OR.25209; Imber et al. 1998