DIFFERENCES BETWEEN VIOLET AND GREEN WOODHOOPOE MANTLE FEATHERS

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AVIAN TAXONOMY

DIFFERENCES BETWEEN VIOLET AND GREEN WOODHOOPOE MANTLE FEATHERS

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Abstract

Taxonomic status of Namibian Violet Woodhoopoe *Phoeniculus d. damarensis* was determined by microscopic differences in violet and green mantle feathers. Outer iridophore diameters from Green Woodhoopoe *P. p. purpureus* barbules (0.22 ± 0.03 µm, n = 244) were smaller than those from violet barbules (0.28 ± 0.04 µm, n = 248) whereas the inner diameters were similar in both cases.

Introduction

The Namibian Violet Woodhoopoe *P. d. damarensis* has an uncertain taxonomic status (Cooper *et al.* 2001a; Cunningham & Cherry 2005; Simmons *et al.* 2005). Here we provide some resolution to the taxonomic status of the Violet Woodhoopoe by comparison with the green woodhoopoe, using microscopic details of mantle feathers.

Materials and Methods

Mantle feathers were sampled from netted live Violet (Namibia: Hobatere and Omaruru; n = 9) and a dead Green Woodhoopoe (Morgan Bay; n = 1) in 1999. Mantle feathers were soaked for 30 min in 0.25M NaOH, followed by 2 hours in formic acid: EtOH (2:3 v/v) and 3 days in 15% (v/v) Spurr’s resin in propylene oxide. They were then embedded in Spurr’s resin. Both transverse and longitudinal sections of the barbules were cut, revealing that the iridophores of both species were hollow prolate cylinders. Iridophore cylinder widths were calculated and statistically compared using the T-Test calculator for Independent means (http://www.socscistatistics.com/tests/studentttest/Default.aspx).

Results

Mantle feathers and iridophores from Namibian Violet Woodhoopoe *P. damarensis* and Green Woodhoopoe *P. p. purpureus* are shown (Figures 1-3). Birds identified as *P. d. damarensis* had predominantly violet mantles. The difference between woodhoopoe species’ colours is shown in Figure 1 below. The outer iridophore diameters from green barbules were smaller than those from violet barbules, whereas the inner diameters were similar (Table 1). Outer and inner diameters were significantly different from each other (t = 4.66667, n = 2, p = 0.02149).

![Figure 1](image-url) – Close-up light microscope image of a Green Woodhoopoe, *P. purpureus* mantle feather (left) and Violet Woodhoopoe, *P. damarensis* mantle feather (right).
Table 1. Iridophore sizes of woodhoopoe mantle feathers

<table>
<thead>
<tr>
<th>Character</th>
<th>P. damarensis</th>
<th>P. purpureus</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner diameter (µm)</td>
<td>0.11±0.03</td>
<td>0.11±0.02</td>
<td>248</td>
</tr>
<tr>
<td>Outer diameter (µm)</td>
<td>0.28±0.04</td>
<td>0.22±0.03</td>
<td>244</td>
</tr>
</tbody>
</table>

Discussion

Examination of mantle feathers from Violet and Green Woodhoopoe indicates these are separate entities. A simple model cannot account for differences between iridophore diameters, but differences are enough to distinguish Green from Violet (Cooper et al. 2001b).

References


