HEARING OF THE AFRICAN WOODOWL,
STRIX WOODFORDII

by

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INTRODUCTION

In species of Woodowl (genera Strix and Ciccaba sensu Peters, 1940) size, asymmetry and complexity of structure of the external ears increase from the tropics to the temperate and boreal climatic zones. Voous (1964) has postulated that related to these features, an improvement of hearing—in particular directional hearing—is to be expected in the same climatological direction. The very silent nights, during winter especially, in the temperate and boreal woods, might favour specialisation into prey location by directional hearing. Tropical and subtropical woods, on the other hand, are unfavourable for the development of this specialisation, as they are noisy, due to the presence of numerous stridulent insects and chirping frogs. The omnipresent noise hampers location of one single prey by hearing.

Voous's hypothesis has been tested to some extent by van Dijk (1973), who has compared audiograms of the mainly temperate woodowl Strix aluco with those of the tropical species S. seloputo (S.E. Asia) and S. virgata (S. and M. America). He has found that hearing of S. aluco was better than that of both tropical species in the frequency range from 6–8 KHz. (Sound pressure thresholds appeared to be lower.) So his results seem to support the suggestion of Voous. In the present study additional evidence to support this hypothesis is presented. Audiograms of 2 specimens of an other tropical woodowl, S. woodfordii (Africa, south of the Sahara) were prepared.

MATERIAL AND METHOD

The tested specimens of S. woodfordii originated from Kpaudu, Ghana. One of them, code nr. 404 was one year old, the other, code nr. 403 was two years old, when tested. The sex was unknown. The determination of the hearing thresholds was performed in the same type of experiment (conditioning experiments) and with the same equipment as used by van Dijk (1973).
RESULTS AND DISCUSSION

The threshold values of *S. woodfordii* for the various frequencies are presented in Table I. At frequencies from 0.5–6 KHz, these values lay between $-4\frac{1}{2}$ and $-15$ db. For 8 KHz this value is $+27\frac{1}{2}$ db. These values are low when compared to those of many other birds (TRAINER, 1974; MANLEY, 1971), indicating that *S. woodfordii* has keen hearing like other owls (VAN DIJK, 1973). This is especially so for the frequencies of 0.5 – 6 KHz. At 8 KHz hearing is apparently poorer than at the other frequencies tested: at this frequency the threshold value is considerably higher.

These results would support the hypothesis of Voous that directional hearing in tropical woods is poorer than in temperate species, as may become clear from the following considerations. Although hearing of *S. woodfordii* from 0.5 – 6 KHz seems to be comparable to that of the temperate *S. aluco* (similar threshold values in both species) it is clearly inferior to that of the latter at 8 KHz. For this frequency the mean threshold value in *S. woodfordii* is $+27\frac{1}{2}$ db vs $+2\frac{1}{2}$ db in *S. aluco* (VAN DIJK, 1973). On the other hand the threshold values of *S. woodfordii* are rather similar at all frequencies to those of the two other tropical woodowls, *S. seloputo* and *S. virgata*, studied by VAN DIJK (1973). From the results of experiments on hearing and acoustical localisation in owls by PAYNE (1971), VAN DIJK (1973) and KONISHI (1973) it may be concluded that owls, specialised in acoustical localisation, are characterised by sensitive hearing between 6 and 9 KHz. So the difference found in hearing at 8 KHz between the tropical woodowls and the temperate *S. aluco* (VAN DIJK, 1973), would agree with the hypothesis that directional hearing is better developed in temperate woodowls.

### TABLE I

<table>
<thead>
<tr>
<th>Code nr.</th>
<th>Age</th>
<th>0.5</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>403</td>
<td>2 years</td>
<td>$-9$</td>
<td>$-15$</td>
<td>$-8$</td>
<td>$-5$</td>
<td>$-13$</td>
<td>$+24\frac{1}{2}$</td>
</tr>
<tr>
<td>404</td>
<td>1 year</td>
<td>$-10$</td>
<td>$-7$</td>
<td>$-1$</td>
<td>$-5$</td>
<td>$-17$</td>
<td>$+31$</td>
</tr>
<tr>
<td>mean</td>
<td></td>
<td>$-9\frac{1}{2}$</td>
<td>$-11$</td>
<td>$-4\frac{1}{2}$</td>
<td>$-5$</td>
<td>$-15$</td>
<td>$+27\frac{1}{2}$</td>
</tr>
</tbody>
</table>

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