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NOTES ON OWL PELLETS FOUND IN THE UDZUNGWA SCARP FOREST RESERVE, TANZANIA

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During a survey of the avifauna of the Udzungwa Scarp Forest Reserve in the Udzungwa Mountains, Tanzania, E. A. Mulungu found pellets on the forest floor that had been regurgitated by owls. Based on the size and consistency of the pellets we conclude that they were produced by the Usambara Eagle Owl *Bubo poensis vosseleri* and report the contents to contribute to the information regarding owls in Udzungwa forests. The pellets were found at 0800 hrs on 27 December 1997 at the following locality: Iringa Region, Iringa District, Udzungwa Scarp Forest Reserve, 10 km SE Mbawi (Massissiwe B), approximately 1,800 m and approximately 8°19'S and 35°55'E. The habitat was submontane forest and was relatively far from recently disturbed habitat (see Fjeldså, 1999). The specific habitat was in an ecotone between forest and tussock grass with a small stream running through the grass. One pellet was found on top of a clump of grass at the base of a dry dead tree leading Mulungu to conclude the pellets had been regurgitated by an owl (or owls) roosting in the tree. The other pellets were recovered after digging through the grass. All were recovered within a 1 m² area.

A total of eight pellets were found ranging in size from 35 by 25 by 20 mm to 50 by 35 by 25 (table 1). Based on the size and consistency of the pellets, and the reasons presented below, we assume that they were produced by the Usambara Eagle Owl *Bubo poensis vosseleri*. We have recorded vocalisations of the Eagle Owl less than 10 km from the site where the pellets were found (Moyer and Mulungu, in prep). T. Butynski and C. Ehardt have also recorded this eagle owl in the northern part of the Udzungwa Scarp Forest Reserve (pers. comm.). The only other candidate for a large owl (though not as big as the Eagle Owl) in the deep forest is the African Wood Owl *Strix woodfordii* which produces a friable pellet usually containing fine invertebrate remains (Fry *et al.*, 1988). The pellets we collected were not friable and contained no invertebrate remains. The Barn owl *Tyto capensis* and the African grass owl *T. alba* produce pellets of roughly the size of the ones of this study, but we don't think either of these species produced the material we found based on the following:

1. *T. capensis* has not been recorded in Udzungwa Mountain forest habitat, although T. Butynski and A. Perkin (pers. comm.) observed and recorded *T. capensis* in a large area of short grassland ("Luala Valley") within the Ndundulu Forest Reserve of the Udzungwas;
2. Nests of *T. capensis* commonly include associated tunnels that pellets are found in or near and no such tunnels were found;
3. *T. alba* is commonly found near human habitation and rarely in undisturbed forest habitats (Fry *et al.*, 1988).

Table 1. Aspects of mammal skulls found in eight owl pellets in the Udzungwa Scarp Forest, Tanzania. R = right, L = left. Adult and subadult determinations based on toothwear. Taxonomy follows Hutterer (1993) and Musser and Carleton (1993).

Pellet	Measurements (mm)	Species found with parts of skull found
1	45X25X20	2 <i>Grammomys ibeanus</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary; subadult-rostral section of 1 cranium; 1 R dentary <i>Crocidura hildegardae</i> : 1 L dentary
2	35X25X20	2 <i>Grammomys ibeanus</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary; adult-1 L dentary 1 <i>Dendromys cf. nyikae</i> : adult-1 R, 1 L dentary
3	45X35X20	1 <i>Grammomys ibeanus</i> : adult-1 almost complete cranium; 1 R, 1 L dentary 1 <i>Myosorex kihaulei</i> : rostral section of cranium, 1 L, 1 R dentary
4	40X35X20	1 <i>Grammomys ibeanus</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary; 1 <i>Dendromys mysticalis</i> : adult-1 partial cranium, 1 R, 1 L dentary
5	45X30X20	1 <i>Grammomys ibeanus</i> : adult-1 complete cranium; 1 R, 1 L dentary 1 <i>Hylomyscus denniae</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary
6	50X35X25	2 <i>Grammomys ibeanus</i> : subadult-rostral section of 1 cranium; 1 R, 1 L dentary; subadult-rostral section of 1 cranium; 1 R, 1 L dentary 2 <i>Sylvisorex megalura</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary; adult-rostral section of 1 cranium; 1 R, 1 L dentary
7 (pellet made up of two parts)	50X35X20 30X25X20	1 <i>Grammomys ibeanus</i> : adult-rostral section of 1 cranium; 1 R, 1 L dentary; 1 <i>Otomys cf. anchietae</i> : adult-1 nearly complete cranium; 1 R, 1 L dentary
8	58X25X30	1 <i>Grammomys ibeanus</i> : adult-complete rostral section of 1 cranium; 1 R, 1 L dentary 1 <i>Myosorex kihaulei</i> : complete rostral section of cranium, 1 L, 1 R dentary

The pellets were dissected to examine the prey remains, which were predominately mammalian. Each pellet contained the remnants of at least one mammalian cranium, as well as other bones. A list of the mammals found is presented in table 1. Although other skeletal elements of the species identified were found in the pellets, in each case none of the non-

cranial elements contradicted the minimum number of individuals (MNI) estimated to be in each pellet based on cranial elements. Paired elements of the skull (dentaries, maxilla, *etc.*) were used to estimate the MNI listed in table 2.

Table 2. Species composition of the eight owl pellets found. Mass measurements based on specimens collected from Udzungwa Scarp Forest Reserve and housed at the Field Museum of Natural History.

Species	MNI	% total individuals	average mass in grams (n)	% total biomass
<i>Crociodura hildegardeae</i>	1	5.3	6.7 (39)	1.1
<i>Myosorex kahaulei</i>	2	10.5	10.1 (16)	3.3
<i>Sylvisorex megalura</i>	2	10.5	6.1 (4)	2.0
<i>Otomys cf. anchietae</i>	1	5.3	115.7 (3)	18.9
<i>Dendromus mystacalis</i>	1	5.3	5 (1)	0.8
<i>Dendromus nyikae</i>	1	5.3	6.8 (1)	1.1
<i>Grammomys ibeanus</i>	10	52.6	42.9 (6)	70
<i>Hylomyscus denniae</i>	1	5.3	17.5 (27)	2.8
Totals	19	100	613/19 = 32.3	100

All species identified in the remains are known from the Udzungwa Scarp Forest Reserve based on recent surveys (Stanley *et al.*, 1998). All the species of rodents identified are scansorial in nature, with the exception of *Otomys*. Vernon (1972) reported on the remains of pellets produced by *Tyto* that contained remains of rodent species known to be primarily terrestrial, further evidence that the pellets reported here were not produced by *Tyto*. It is interesting to note that no ground dwelling rodents such as *Praomys delectorum* and *Lophuromys flavopunctatus* were found in the remains although these are the most abundant of any of the species of rodent we have observed during our surveys (Stanley *et al.*, 1998). The shrews found in the remains are all strictly ground dwelling.

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