The Snakes of Osun Grove:
 a World Heritage Site in Osogbo, Nigeria

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Abstract: The Osun Grove, Osogbo, Nigeria, is a protected area covered by riparian forest, dry high forest and derived savanna. In January and June 2000 a total of 25 of snake species were recorded with Afronatrix anoscopus and Calabaria reinhardtii being prominent. The incidence of Philothamnus semivariegatus, a savanna species, may be the result of the invasive savanna produced by farming activities around the grove. Nine species, led by A. anoscopus, accounted for 69.7 % of the snake community. The dominant species are either aquatic or terrestrial, with the exception of Boiga blandingi and Dendroaspis viridis that can be both arboreal and terrestrial, and C. reinhardtii that is fossorial. Arboreal species mostly preyed on tree frogs and birds including eggs and nestlings, and the aquatic forms preyed on fish and frogs. Mammals, reptiles and toads constitute the prey items of terrestrial species while fossorial species feed on annelids, molluscs, arachnids, myriapods, hexapods, amphibians, reptiles and mammals. Rev. Biol. Trop. 55 (2): 717-721. Epub 2007 June, 29.

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Throughout the tropics, the original vegetation is rapidly being replaced by cultivated plants, urban development or by other products of human activity. Hence, in Southwestern Nigeria, most of the primary forests have already disappeared except in areas designated as “National Parks or Game Reserves” and culturally protected sites. One of the culturally protected sites is the Osun Grove, located in Osogbo (7°36’ N, 4°35’ E), a town in Southwestern part of Nigeria (4°10’ and 6°00’ N, 2°45’ and 8°35’ E). The grove which covers an area of 750 000 m² is almost encircled by the Osun River and is also the site of shrines to the Yoruba deities which normally attract visitors from Brazil, the Caribbean, Europe and United States of America. The grove is subdivided into sub-forests on the basis of the deities therein to which names are given. Three vegetation types are present in the grove viz: The Riparian Forest, dry high forest and derived savanna. Most of the grove is covered by high forest. The canopy structure of the riparian forest and dry high forest is irregular, with crowns at all levels, due to the mixed composition of species, ages and size classes of trees. The largest trees belong to the category of emergents, and usually have large wide-spreading well-separated crowns. These provided most of the commercial timbers eg. Lovoa trichilioides, Milicia excelsa, Sterculia rhinopetala, Terminalia superba, Triplochiton scleroxylon, etc. The middle stratum species have relatively slender boles and small crowns, while the under storey consists of trees with short boles and spreading flattish crowns. Below these are the shrub and herb layers, whose density depends on the amount of disturbance to the forest. Woody climbers and epiphytes are frequent, hanging from boles and branches of the trees. Oil palms are found, although usually scarce.

The derived savanna/grassland are in two locations within the grove. A larger portion
located towards the Southeast portion of the
grove contains common grass species like
Andropogon tectorum, Imperata cylindrica,
etc. The shrubs and trees include Acacia ataxa-
cantha, Anthoeleista vogelii, Elaeis guineensis,
Albizia zygia, Cola milleni (Plate 3). Other
details of the vegetation and relationship
between climate and vegetation are given by
Schiotz (1963).

The herpetofauna of Osun grove, (now
a World Heritage Centre, sponsored by
Osun Grove Support Group and NC-IUCN
Netherlands according to UNESCO (2005)),
was surveyed within the framework of other
zoological and botanical inventories because
the primary forest is still extant in most areas
of the grove. The grove is equally known
to house the endangered White-throated
monkey, Cercopithecus erythrogaster and
threatened tree species like Afzelia africana,
Entandrophragma candollei, Guarea cedrata,
M. excelsa, Pseudospondias microcarpa, etc.
Records of snakes from specific areas of the
Nigerian forest zone have come from Romer
(1953), Blackwell (1967), Joger (1981) and
Butler and Reid (1986).

This paper presents the records of snakes
within the grove in terms of species richness
and abundance to augment attempts at compiling
a list of Nigerian snakes.

MATERIALS AND METHODS

The survey involved extensive systematic
combing of the study site, for four weeks. A
total of 28 days was spent in the field between
January and June 2000. On these days 84 h
were spent carefully searching the forest on
foot (78 h by day-6 h by night). When a sighting
was made, the time, nature of habitat, number,
activity and identity of the sighting were noted.
Captured specimens were examined, identified
and then released at the capture site. Others
were merely observed, through telescopic lens
and photographed using Zenith TTS LR with
56 mm lens for subsequent identification using
the keys provided by Leeson (1950), Hughes
(1985) and Schatti (1985). Two officials of
the National Commission for Museums and
Monuments were co-opted into our searches to complement our efforts.

RESULTS

Table 1 shows that a total of 25 species
of snakes belonging to seven families were
recorded for Osun grove during the period of
study and out of this, the families Colubridae
and Viperidae accounted for 64 % and 12 % of
the species respectively. A. anoscopus which
accounted for 18 specimens out of a total of
109 specimens represented 16.5 % of the snake
community. This species together with the next
eight abundant species, ie. Natriciteres varie-
gata (13), Dendroaspis viridis (9), Mehelya
poensis (7), Boiga blandingii (7), Calabaria
reinhardtii (6), Bittis gabonica (6), Mehelya
crossii (5) and Grayia smythii (5) constituted
69.7 % of the entire snake community. The
remaining species made up almost 30 %. Out
of the 25 species, 11 species had in their diet
amphibians and another 11 species had reptiles
mostly lizards.

DISCUSSION

The herpetofauna of Osun grove is not
known although it shares the same vegeta-
tional structure with rain forest zone of Southern
Nigeria. Most of the original primary forest had
disappeared and are being replaced by second-
ary regrowth forest except within the confines
of the grove where, due to cultural protection, it
still flourishes. Two species, Afronatrix anosco-
opus and C. reinhardtii considered by Butler and
Reid (1990) to be either scarce of non-exis-
tent in southwestern Nigeria were recorded.
Philothamnus semivariegatus known to be a
savanna species is gradually finding its way
into the forest zone through cultivated forest
areas thus confirming the suggestion of Menzies
(1966). Several of the remaining recorded spe-
cies were known to exist in Nigeria.
# TABLE 1

*Species, activity, microhabitat and prey items in Osun grove snake community, Osogbo, Nigeria*

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Activity</th>
<th>Microhabitat</th>
<th>Prey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reference (abundance)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Boidae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Calabaria reinhardtii</em> (6)</td>
<td>N</td>
<td>F</td>
<td>5,6,8</td>
</tr>
<tr>
<td><strong>Colubridae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Afronatrix anoscopus</em> (18)</td>
<td>D</td>
<td>Aq</td>
<td>4,5</td>
</tr>
<tr>
<td><em>Aparallactus lineatus</em> (2)</td>
<td>N</td>
<td>F,T</td>
<td>2,3</td>
</tr>
<tr>
<td><em>Boiga blandingii</em> (7)</td>
<td>D</td>
<td>A,T</td>
<td>6,7,8</td>
</tr>
<tr>
<td><em>Boiga pulverulenta</em> (2)</td>
<td>D</td>
<td>A,T</td>
<td>6,7</td>
</tr>
<tr>
<td><em>Bothrophthalmus lineatus</em> (1)</td>
<td>N</td>
<td>T</td>
<td>8</td>
</tr>
<tr>
<td><em>Crotaphopeltis hotamboeia</em> (3)</td>
<td>N</td>
<td>T</td>
<td>5</td>
</tr>
<tr>
<td><em>Gastropyxis smaragdina</em> (1)</td>
<td>D</td>
<td>T</td>
<td>5,6</td>
</tr>
<tr>
<td><em>Grayia smythii</em> (5)</td>
<td>D</td>
<td>Aq</td>
<td>4,5</td>
</tr>
<tr>
<td><em>Mehelya crossii</em> (5)</td>
<td>N</td>
<td>T</td>
<td>6,8</td>
</tr>
<tr>
<td><em>Mehelya guirali</em> (1)</td>
<td>N</td>
<td>T</td>
<td>6</td>
</tr>
<tr>
<td><em>Mehelya poensis</em> (7)</td>
<td>N</td>
<td>T</td>
<td>6</td>
</tr>
<tr>
<td><em>Natriciteres variegata</em> (13)</td>
<td>D</td>
<td>Aq</td>
<td>4,5</td>
</tr>
<tr>
<td><em>Philothonnus heterodermus</em> (1)</td>
<td>D</td>
<td>A</td>
<td>5,7</td>
</tr>
<tr>
<td><em>Philothonnus irregularis</em> (2)</td>
<td>D</td>
<td>A,T</td>
<td>5,6,7</td>
</tr>
<tr>
<td><em>Philothonnus semivariegatus</em> (3)</td>
<td>D</td>
<td>T</td>
<td>5,6</td>
</tr>
<tr>
<td><em>Psammophis elegans</em> (2)</td>
<td>D</td>
<td>T</td>
<td>6,8</td>
</tr>
<tr>
<td><strong>Elapidae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dendroaspis viridis</em> (9)</td>
<td>D</td>
<td>A,T</td>
<td>7,8</td>
</tr>
<tr>
<td><em>Naja nigicollis</em> (2)</td>
<td>D</td>
<td>T</td>
<td>6,8</td>
</tr>
<tr>
<td><strong>Leptotyphlopidae</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Leptotyphlops bicolor</em> (4)</td>
<td>N</td>
<td>F</td>
<td>1,2,3</td>
</tr>
<tr>
<td><strong>Pythonidae</strong></td>
<td></td>
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<td></td>
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<tr>
<td><em>Python sebae</em> (3)</td>
<td>D</td>
<td>A</td>
<td>8</td>
</tr>
<tr>
<td><strong>Typhlopidae</strong></td>
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<td></td>
</tr>
<tr>
<td><em>Typhlops punctatus</em> (1)</td>
<td>N</td>
<td>F</td>
<td>1,2,3</td>
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<tr>
<td><strong>Viperidae</strong></td>
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<tr>
<td><em>Bitis gabonica</em> (6)</td>
<td>N</td>
<td>T</td>
<td>8</td>
</tr>
<tr>
<td><em>Causus maculates</em> (1)</td>
<td>D</td>
<td>T</td>
<td>5</td>
</tr>
<tr>
<td><em>Causus rhombeatus</em> (4)</td>
<td>D</td>
<td>T</td>
<td>5</td>
</tr>
</tbody>
</table>

**Activity**: D= Diurnal; N= Nocturnal. **Microhabitat**: Aq= Aquatic, A= Arboreal; F= Fossorial; T= Terrestrial. **Prey**: (1= annelids and Molluscs; 2= arachnids and myriapods; 3= hexapods; 4= fishes; 5= amphibians (Anurans and Caecilians); 6= reptiles (Lizards and snakes); 7= Birds (adults, nestlings and eggs); 8= Mammals (rodents, bats & large mammals).
The dominant species were either aquatic or terrestrial with the exception of *B. blandingi* and *D. viridis* that can be both arboreal and terrestrial, and *C. reinhardtii* that was fossorial. No nocturnal aquatic and arboreal snakes were encountered. This was not unexpected in the aquatic forms in that it was an antipredator strategy of ectothermic reptiles. Arboreal species mostly preyed on tree frogs and birds including eggs and nestlings, and the aquatic forms preyed on fish and frogs. Mostly, mammals constituted the diet of arboreal, terrestrial and fossorial species. All these demonstrated a great trophic diversity of Osun grove snake community.

Species richness data from countries like Central African Republic, Gabon, Ghana and Nigeria (Chabanaud 1921, Leston and Hughes 1968, Trape 1985, Butler and Reid 1990) ranged between 35 and 73 species. It is worthy of note that these species included Guinea, Sahel and Sudan Savanna species as well as mountain vegetation species. The 25 species recorded for the relatively small forest enclosure (Osun grove) presented a rich snake community similar to the records of Butler and Reid (1986) on the snakes from Cross River State, Nigeria. This region is still continues with the rain forest belt of Nigeria but on the eastern part of River Niger. It is, however, very likely that the number of species recorded during the present study could be exceeded if the study period was extended and specimens were allowed to be taken for laboratory examination in order to determine actual food preference, reproductive state and parasitic infections.

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REFERENCES


