

POLYMORPHISM, SEX, SIZE AND OTHER ASPECTS OF THE AFRICAN SNAKE, *BOIGA BLANDINGI* (HALLOWELL, 1844)

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BLANDING'S Tree Snake was described by Hallowell (1844c:170) from a Liberian specimen (ANSP 10083) sent him by Dr. Blanding. In the type the throat, jaws and 'underparts' of the body were said to be light yellow and each side marked with 'leadен blotches'. Schmidt (1923:103) had 20 specimens from seven 'localities in the forest' and noticed that 'colouration is very variable, with two distinct phases' four black, rest, 'brownish, with more of less distinct wide dark cross-bars, -' and only five with divided 'anal' - cf. my Ugandan data. Pitman (1938:136) also recognised the existence two colour forms - on the one hand black, on the other brown, but only later did he (Pitman 1974:127) recognise that adult males are black whilst females are brown, and he asserted that Ionides and Leakey had found the same. Lawson (1993:65), in the light of five specimens from Cameroon, has echoed these claims.

A recent study of 50 Nigerian specimens by Luiselli et al. (1999a) led to no original observations on colouration, information of this being quoted from Pitman (1974). Coborn (1991:371) has felt able to write, '*Adults* almost uniformly black, juveniles brown with dark cross bands' [my ital.] and Cansdale (1961:43, 1973:43), 'Both colour forms are distinct *at all ages* and do not begin the same, - -' [my ital.].

In the light of these claims and ambiguities, an examination was undertaken of all specimens in the Natural History Museum, London (BMNH, 34 male, 27 female) and the results combined with my records (C3B) of 102 specimens from Ghana.

COLOURATION AND SEX

First, my Ghana records: Juveniles (11 male, 10 female: many were not sexed or details are

missing and the specimens no longer accessible) possess a distinctively bright and contrasting pattern of chocolate brown blotches (see Pitman's 1974, Plate V, fig. 5 at p. 122) which has often led to museum specimens being misidentified as *B. pulverulenta*. All but one (female, C3B92, 840+236 = 1076 mm) are less than one metre in total length. Otherwise adults are defined as over one metre in length and all males (36) are black and females (17) are khaki-brown and blotched (see photograph of Cameroon female, 1340 mm s-v length in Lawson 1993, fig. 39), with the following exceptional males, arranged in order of increasing snout-vent length [colour notes inadequate for remaining specimens]:

1. C3B42 791 + 217 = 1006 mm
2. C3B119 890 + 254 = 1144 mm
3. C3B3 1230 + 353+ = 1583+ mm
4. C3B43 1358 + 411 = 1769 mm
5. C3B95 1430 + 377 = 1807 mm
6. C3B116 1590 + 432 = 2022 mm
7. C3B24 1760 + 515+ = 2275+ mm

All these - with one exception, possess a blotched pattern increasingly obfuscated by deposition of melanin such that the pattern could be overlooked in nos. 5 - 7. The one exception (4 above) is of large size but shows no sign of darkening. This may be an example of delayed onset of melanisation or the exceptional 'transvestite' which is not unexpected after studying sexual dimorphism in *Dispholidus typus* (Hughes, unpubl. obs.). The process of darkening would seem to occur at a wide range of size and presumed age but is almost inevitable. Laurent (1964:109) had two male specimens from Dundo, Angola and remarked that one was black but implied that the larger (1858+394 = 2252 mm)

was not! No such change occurs in females and black females are known.

Vogel (2000: 40) has recently shown that *Boiga dendrophila gemmicincta* of Sulawesi darkens to black with age but without any restriction as to sex. Two specimens of *Boiga cynodon* (var. B of Boulenger 1896d: 79, specimen a, now BMNH 86.12.28.23 and specimen c, now 66.4.24.1) appear to be darkening, as though undergoing a process similar to the darkening of *Boiga blandingi* males.

The sex ratio is equal amongst juveniles but amongst adults there are twice as many males as females! This may reflect a greater activity of males making them more likely to be encountered and caught. Cansdale's (1955) claim that the black form is found in clearings, the brown in forest, may reflect the greater activity of the male or it may reflect the greater visibility of a black snake in an open space or, as Cansdale himself suggests, this may simply be an accident - of small sampling one may add!

SIZE

Pitman (1938: 136) had no specimens exceeding Sternfeld's (1910: 25) maximum of 2500 mm yet by 1974 (Pitman 1974: 126) he could write of specimens of 2438 mm (= 8 ft) being common and those of 2743 mm (= 9 ft) not rare! Our maximum sized male is 1710+485 = 2195 mm (C3B124, Legon Hill, collected 25 May, 1986 by James Cofie) and female 1820+530 = 2350 mm (C3B123, Legon Hill, collected by Godfrey Prah, early Nov. 1984). The largest male in the BMNH collection (73.4.24.1, from Gabon) is 1700+543 = 2243 mm, largest female (BMNH 1957.1.4.29, from Njala, Sierra Leone) is 1730+450 = 2180 mm. Goodman (1985a) had a Ugandan female of total length 2525 mm.

PREY

In Nigeria, Luiselli et al. (1998b: 127, table 3) had six records of bird-eating (*Nectarinia sp.*) in a sample of seven, whereas Luiselli et al. (1998a: 432) with a sample of 52 found specimens less than 1300 mm total length to include only one

mammal amongst 11 prey items which were otherwise reptilian, and specimens exceeding 1300 mm in total length to have ingested eight birds and three rodents but no reptiles. The outcome may well depend upon sample size, an earlier study (op. cit. 1998b) including but two records of *Mehelya* and so missing the well-known ophiophagy of species of this genus. Analysis of my Ghana records along the same lines as Luiselli et al. (op. cit.) provides the following:

500+130 = 630 mm	skink
577+165 = 742 mm	<i>Agama</i>
712+188 = 900 mm	<i>Agama</i>
955+275 = 1230 mm	mouse
e1005+335 = 1340 mm	bird
e1017+338 = 1355 mm	bird
1120+344 = 1464 mm	<i>Agama</i>
1130+285+ = 1415+ mm	bird, fledgling

1300 mm snout-vent length is the 'break' point of Luiselli et al. 1998b.

1315+345 = 1660 mm	bird, Bulbul
1318+365+ = 1683 mm	<i>Agama</i>
1333+390+ = 1723 mm	<i>Agama</i>
1450+455 = 1905 mm	bird, ?weaver
1480+46 = 1943 mm	bird, dove
1508+232+ = 1740+ mm	bird, as feathers
1510+354+ = 1864+ mm	<i>Agama</i>
1645+470 = 2115 mm	<i>Agama</i>
1650+? = ? mm	bird, fledgling weaver + <i>Agama</i>
1760 + 515+ = 2275 mm	bird, as feathers

This shows how agamids remain an important component in the diet of large individuals and this may well depend on the availability of large specimens as prey rather than a supposed ontogenetic change in prey preference. Johnsen (1962: 120) found a bird in the mouth of a juvenile female (880 mm total length) from Liberia. Laurent (1964: 109) too, writing on specimens from Dundo, Angola, mentions a juvenile which contained the remains of a bird. Similarly, Groves (1973: 107) found that five young (660 - 690 mm total length) in captivity refused lizards and frogs offered them and took



Fig. 1 Black specimen of *Boiga blandingi* from Ghana, assumed to be male, sent alive to USA.



Fig. 2. Brown-blotched female *Boiga blandingi* from Kakamega, Kenya (Photograph courtesy of Stephen Spawls).

only 'small mice'. This contradicts Green's (1989: 201) neat but misleading categorization.

Cansdale (1961: 44) mentions that in Ghana this species is known by the same Twi (typo as 'tree'!) name as the Egg-eating Snake (*D. fasciata*) in the forest zone. When in Ghana I came across complaints of this species taking eggs from poultry (eg. C3B29, 85, 91), but the Black Cobra (*Naja melanoleuca*) reaches a similarly large size and is also known to sometimes exhibit the same habits.

HABITAT

'This snake appears to be associated directly with forest away from which it is never found', says Pitman (1938: 137) and later (Pitman, 1974: 125) gives its range as 'Equatorial Rain Forest species' and marks it (Table II, at p. 171) as 'forest' only. This supposed restriction to forest is repeated by eg Witte (1941: 210), Roux-Estève (1969: 116), Chippaux (1999: 142). Similarly, I have listed this species as of the rain

forest (Hughes 1983: 342) but have for long been aware of records from outside the forest zone and far removed from gallery forest eg. at Binaparba (09.14N 00.46E, Hulselmans et al., 1970: 316) in part of Togo contributing to the 'Dahomey Gap' in West African rain forest; at Zonkwa (00.47N 08.17E) in Nigerian savanna; at Golokuati (07.00N 00.26E) in Ghana (Leston 1970: 143); and on the University of Ghana campus, Legon. When mapped, there is an association with the forest zone but this is a tree snake and will occur where there is enough tree cover, its principal food appearing to be birds, roosting or nesting.

GEOGRAPHIC RANGE

Loveridge (1957c: 269) gives the geographic range as from Guinea in the west to Uganda and Angola in the east and south. Pitman (1974: 125) notes occurrences in Zambia and Angola as well as Uganda; Angel (1933e: 756) and Villiers (1950b: 92, 1975: 127) gives a range of Senegal to Uganda. The source of the Senegal record seems to be Rochebrune (1884a: 180) or Boulenger (1896d: 78) who writes, '- - from the Senegal to the Congo; -' which I read as referring to the Senegal River, not the country by that name. More discerningly Chippaux (1999: 141) gives the range as from Guinea to Kenya. Rasmussen (1997b: 97) has published a reliable, one-degree-square map of

the geographic distribution of *Boiga blandingi* which excludes Senegal from the range.

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