

COBRA SPECIES IN NAGO, OKINAWA

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沖縄県名護市で捕獲されたコブラの種の同定

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Abstract: One individual of cobra species killed in the field of Nago in 1993 and 50 cobra individuals imported by a show house in Nago were identified to be Thai cobra, *Naja kaouthia*.

要約: 名護市で捕獲されたコブラ 1 個体と、業者から提供された50個体のコブラはいずれもタイコブラ *Naja kaouthia* と同定された。

Key words: Cobra species; Identification; Thai cobra, *N. kaouthia*

INTRODUCTION

Recently, about 3500 individuals of Asiatic cobras (*Naja* sp.) have been imported per year from Malaysia into Okinawa for show business (Rido Company, personal communication). During 1991 to 1993, seven cobras were captured or observed in the field near the show houses in Nago, the northern part of Okinawa Island.

Asiatic cobra was recently reclassified into eight species (Wuster and Thorpe, 1989, 1990, 1991, 1992). An antitoxin of a certain species of this complex is not always effective to venoms of other species. For example, the antitoxin for *Naja kaouthia* is known to be ineffective on the bite of *N. sumatrana* (Warrell, 1986), and that antitoxin for *N. philippiensis* is not effective on the bite of *N. naja* (Vogtoman, 1950). It is, therefore, important to identify the cobra species precisely in order to prepare for the bite of cobra on Okinawa Island. We identified one individual of cobra killed in the field in 1993 and 50 specimens imported by the show house in Nago, Okinawa.

MATERIALS and METHODS

On 28 May in 1993, one male cobra crossing a road was killed by a car by Mr. Satoshi Shima at Beemata in Nago, and additional 50 frozen specimens imported from Malaysia by Rido Company for the snake show at "Nago Fruit Land",

were brought to our institute for species identification.

In all these specimens, snout-vent length and tail length were measured to the nearest 1 cm, and body mass was taken to the nearest 1g. Sex of each specimen was examined by probing a rod into the hemipenis. The number of ventrals, subcaudals, and dorsal scale rows at the neck (above 8th ventral) and at the midbody were counted. The shape of the hood mark of the each specimens were also recorded. The meristic characters of the present specimens were compared with those of the three cobra species distributed in Malaysia and Thailand (Wuster and Thorpe, 1991), i.e. *N. kaouthia* (Cox, 1991; Wuster and Thorpe, 1992), *N. sumatrana* (Cox, 1991) and *N. atra* (Pope, 1935).

In order to examine the reproductive condition of the specimens, female were dissected, and the length and width of the five largest follicles were measured to the nearest 0.1 mm, except those smaller than 2 mm in length.

RESULTS and DISCUSSION

Body size of the specimens are shown in Table 1. All specimens including the one collected in the field were larger than 100 cm in total length. Therefore, these specimens did not seem to *N. sumatrana*, which seldom exceeds 100 cm (Cox, 1991).

The numbers of ventrals, subcaudals and scale

Table 1. Length and weight of *Naja* specimens obtained in the field and from a show house in Nago, Okinawa.

History	Sex	N	SVL (cm)		Tail length(cm)		Body mass(g)	
			Mean	Range	Mean	Range	Mean	Range
In the field	Male	1	90		19		309	
From the show house	Male	31	116	105-123	19	2-26	540	299-840
	Female	19	118	107-128	18	6-22	606	342-929

SVL: Snout to vent length.

Table 2. Scale counts of the *Naja* specimens obtained in the field and from a show house in Nago, and those of three species of Asiatic cobras, *Naja kaouthia*, *N. sumatrana* and *N. atra*. The number of dorsal scale rows at the neck were counted at the 8th ventral. Sources are Cox (1991) and Wuster and Thorpe (1992) for *N. kaouthia*, Cox (1991) for *N. sumatrana* and Pope (1935) for *N. atra*.

Snakes	Sex	N	Ventrols	Subcaudals	Scale rows	
					Neck	Midbody
In the field	Male	1	-	-	28	21
From the show house	Male	31	178 - 190	50 - 60	27 - 31	21 - 23
	Female	19	185 - 194	44 - 60	26 - 31	19 - 21
<i>N. kaouthia</i>			170 - 196	43 - 58	27 - 29	21(23)
<i>N. sumatrana</i>			188	*	21	19(17)
<i>N. atra</i>			163 - 178	39 - 51	23 - 29	21(19)

*: The first four or five of subcaudals are single.

rows at the neck and at the midbody of the specimens are shown in Table 2. The cobra killed by the car at road was seriously damaged, and the numbers of ventral and subcaudal scales of the snake could not be counted accurately.

All specimens examined in the present study had greater number of scale rows at the neck than those in *N. sumatrana*. The subcaudal scales of the snakes examined were all paired. These facts indicate that all specimens are not *N. sumatrana*.

Numbers of dorsal scale rows at the neck and at the midbody of the specimen obtained from field were 28 and 21, respectively. These were within the ranges of corresponding characters in *N. kaouthia*

and in *N. atra*. The numbers of ventrols, subcaudals, and dorsal scale rows of the specimens from the show house, except for four females and two males, were within the ranges of these characters in *N. kaouthia*. The numbers of subcaudals and scale rows at the neck and at the midbody of some specimens from the show house were within the ranges of *N. atra*. However, only one specimen had the number of ventrols (178) within the range of *N. atra*. The scale counts of this specimen, the specimen obtained from field and other five specimens with 179 ventrols were shown in Table 3. Except the former two specimens, other five specimens had numbers of subcaudals greater

than those in *N. atra*. Therefore, those are not *N. atra*. The former two specimens could not be identified based on the number of scales.

Table 3. Scale counts of seven male cobras within the both range of *N. kaouthia* and *N. atra*. The upper two had all the counts within the range of *N. atra*. The other five had the number of ventrals (179) similar to that of *N. atra* (163-178).

Specimen	Ventrals	Subcaudals	Scale rows	
			Neck	Midbody
In the field	-	-	28	21
From the show house				
1	178	42	28	21
2	179	57	30	21
3	179	56	29	21
4	179	56	28	21
5	179	51	30	21
6	179	59	29	21

The number of scale rows at the neck of three females were out of the range in *N. kaouthia* (Table 4). However, the numbers of ventrals and subcaudals of those specimens were out of the range of those in *N. atra* except one specimen with broken tail. Those three snakes, therefore, were judged to be *N. kaouthia*.

Table 4. Scale counts of two males and four females with the scale rows at the neck or at the midbody out of range of those in *N. kaouthia* (27-29, 21).

Sex	Ventrals	Subcaudals	Scale rows	
			Neck	Midbody
Male	190	59	28	22
Male	185	57	28	23
Female	185	53	28	19
Female	188	53	31	20
Female	190	15*	26	21
Female	185	53	26	21

* Tail broken

All specimens, including the two individuals that could not be identified by meristic characters, had monocellate hood mark (Fig. 1) peculiar to that of *N. kaouthia* (Cox, 1991). *N. sumatrana* has a

patternless hood (Cox, 1991). *N. atra* usually has a spectacled hood mark like a mask-shaped figure (Pope, 1935; Mao, 1963).

Based on the meristic characters and the hood mark, the all snakes examined in the present study were identified to be *N. kaouthia*.

Maximum follicles obtained from snakes from the show house were smaller than 8.1 mm in length, and lengths of most follicles were smaller than 6.0 mm. These follicles was pearly white, not yellowish, which suggests that yolk deposition was not occurred in them. All females had a large amount of coelomic fat body. Shiroma (1993) indicated that the amount of coelomic fat body of the habu, *Trimeresurus flavoviridis*, is negatively correlated to the follicle size. Therefore, the female cobras from the show house were not in reproductive condition in June. This result does not deny the possibility of the breeding and the establishment of the cobra species in Okinawa. Sakishima-habu, *Trimeresurus elegans*, was established in the southern part of Okinawa Island. If a large number of cobras had escaped and were still alive in the field, those cobras may breed and established in Okinawa Island like as sakishima habu.

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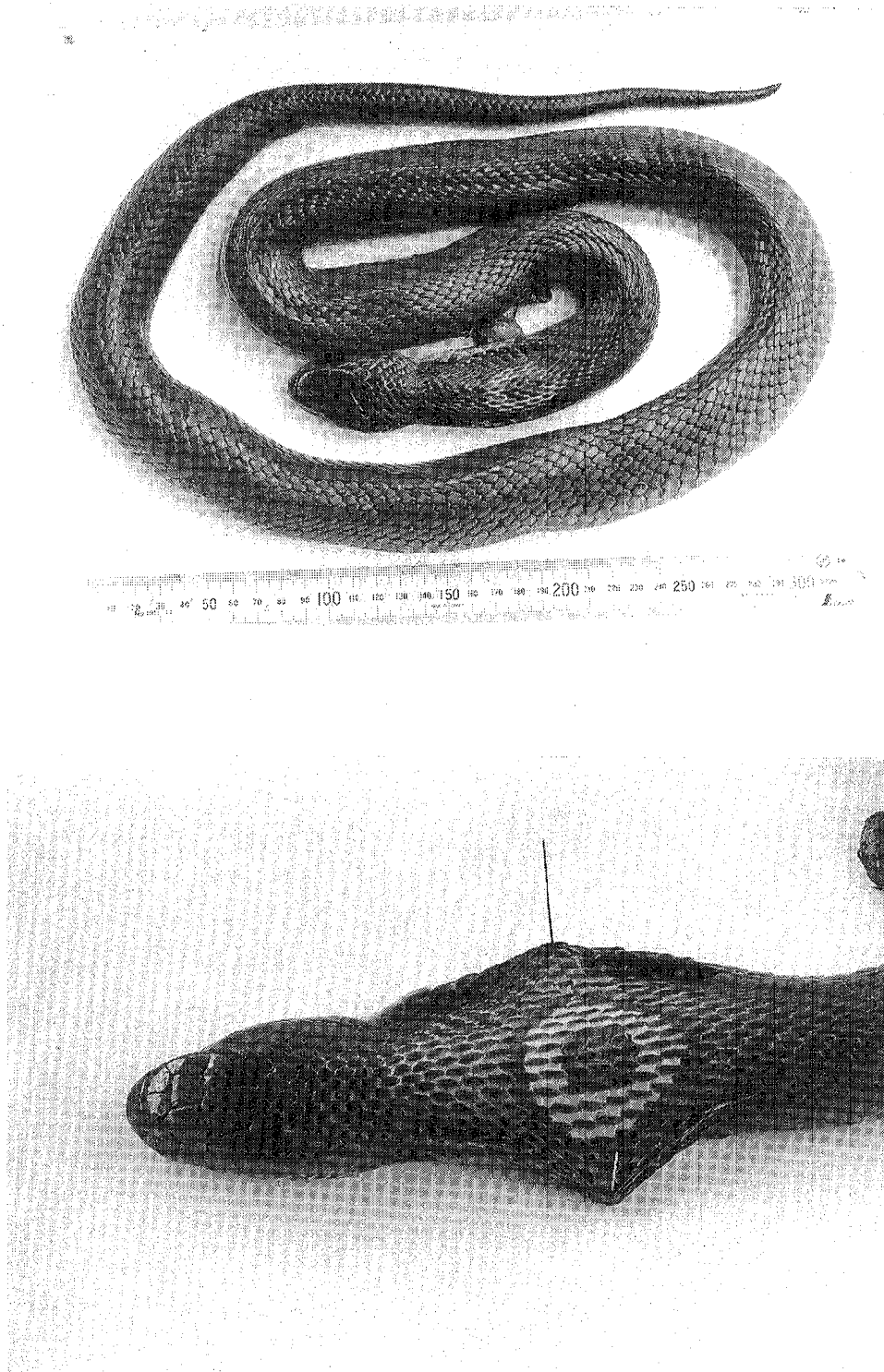


Fig. 1. The monocellate hood mark of the cobra specimens peculiar to the *N. kaouthia*.