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On Two New Races of *Cervus nippon* from the Southern Islands of Kyushu, Japan

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(Communicated by Yô K. OKADA)

Among the small islands scattered about the southern part of the main island of Kyushu, there are, at present, three islands, i. e., Yakushima, Mageshima (sometimes called Makenoshima), and Kuchino-Erabujima, where we have wild deer.

Yakushima is situated 47 miles from the south end of the Satsuma Peninsula; its length measured from east to west is about 28 km., from south to north is about 26 km., and its area is about 500 square kilometers. It forms a roundish small island, with an even coastal line, and the lowland is very narrow, many high-peaked mountains rising immediately from the coast. Among these mountains, there are Miyano-uradake (1935 m.), the highest one in the Kyushu area, Nagatadake (1890 m.), Kuromidake (1836 m.), etc., which are more than 1,000 m. in height. These mountains amount to more than 30 in number, which are called, as a whole, Yaedake. The wild deer are found principally at elevations between 60—70% of the mountains' height, and in winter they migrate down toward the coastal line. The number of the herd of deer on Yakushima is said to be 3,000, so that climbers can often see them. One of the authors (Okada) climbed it several times and observed them running near the summits of the mountains. On this island, there lives a small number of hunters, who obtain an appropriate number of deer during the hunting season.

Mageshima is a small island, situated 7 miles southwest of Tanegashima; its length from east to west is about 2.5 km., from south to north is about 5 km., and its area is about 9 square kilometers. Formerly this island was covered with a dense forest, but now most of the space has become flat plain, dotted with *Cycas revoluta* Thunberg; the highest part (71 m.) of the island being situated almost in the center. Only the

southern part has a forested area left, where wild deer are found and often appear in the grassy plains. According to the inhabitants of Tanegashima, formerly Mageshima had several hundreds of deer, but at present, they have been diminished to only 50—60 in number, inclining toward extermination, as the result of abusive hunting during the Pacific War as well as poaching after the War. This little island is uninhabited, fishermen only removing here from Tanegashima during the fishing season of flying-fishes (May to June). Before the War, there was a sheep farm, but at present, it is discontinued.

The deer on Kuchino-Erabujima are said to have migrated in large numbers from Yakushima, and it is said that even now deer are often to be observed in the sea between these two islands. The number of deer inhabiting Kuchino-Erbujima is uncertain, but it is considered to be more than a hundred.

As to the deer of the above mentioned three islands, one of the authors (Okada) considered that they differ from the typical Japanese Deer, but lacking materials, he could not arrive at any conclusion. In recent times, however, he has collected some additional examples and has studied them almost completely. The result of his study agrees with that of Kuroda, so that they propose the following new names for Yakushima and Mageshima deer respectively:

Cervus nippon var. *yakushimae* Kuroda & Yosh. Okada, var. nov.

Japanese name: Yakushika.

Characters.- Similar to *Cervus nippon nippon* Temminck of Kyushu (including Shikoku) or *C. n. centralis* Kishida of Central Hondo, but distinguishable from them in having the size of body and skull as well as the antlers decidedly smaller; colour of the body paler in both winter and summer pelages; white spots of summer pelage indistinct; and the white patch on the hind limbs very sharply defined.

Antlers weaker than those of *C. n. nippon* or *C. n. centralis* and the warty appendages of *C. n. var. ceramae* (Kuroda) are not observable, only showing very low wavy protuberances. In general, antlers have two forks only, but it is said that they occasionally have three forks. The greatest combined breadth of both nasals is measured under 30 mm. (25—30 mm.), showing a breadth between those of *nippon* (31—33 mm.) and *keramae* (21—24.5 mm.).

Colour pale brown in winter, pale chestnut with indistinct whitish spots in summer; lower lip, buttock, and inner side of ear with white hairs; hinder part of hind limbs (heels) with a remarkable elliptical

white patch; a large white patch on the buttock with a narrow black one on the upper margin; the mane rather long and blackish.

Table I. Measurements of *C. nippon* var. *yakushimae* (In millimeters.)

Sex & age	Head & body	Tail	Height at shoulder	Hind limb	Hind limb with hoofs	Ear	Head	Neck	Trunk	Measured by :
♂, 4th	1060	100	685	510	560	100	260	260	680	Yosh. Okada
♀, 2nd	820	110	500	420	423	95	165	260	530	..
♀, 4th	....	...	600	...	...	...	...	...	...	..

The female in 4th year in the above table was in pregnancy, so it could not be measured.

Table II. Measurements of skulls and antlers of *C. n.* var. *yakushimae* (In millimeters.)

Material number	Sex	Upper length	Condylbasal length	Greatest height of skull with lower jaw	Zygomatic breadth	Nasals (median)
Y-1	♂	210	231	123	100	70
Y-2	♂	213	234	...	106	82
Y-3	♂	227	250	...	111	72
(Av.)		(213)	(235)	(123)	(106)	(75)
Y-4	♀	201	220	112	92	67

Greatest breadth of both nasals	Maxillary tooth row	Lower jaw	Mandibular tooth row	Length of antlers	Distance between apexes of both antlers
30	70 (right) 69 (left)	170	70 (r.) 70 (l.)	330 (r.) 320 (l.)	204
30	75 (r.) 74 (l.)	...	..	283 (r.) 267 (l.)	227
28	72 (r.) 73 (l.)	...	..	260 (r.) 255 (l.)	178
(30)	(72)	(170)	(70)	(269)	(203)
25	66 (r.) 67 (l.)	163	71 (r.) 70 (l.)	...	...

Distance between bases of both antlers (median)	Interior angle between bases of antlers	Length between outer side of an antler and a line from apex to base (median)	Number of forks of antlers	Distance between tines of antlers	Length of 1st tine	Length of 3rd tine
95	21°15'	41 (right) 49 (left)	2	42-171-123 (r.) 39-165-117 (l.)	39 (r.) 57 (l.)	100 (r.) 80 (l.)
105	28°10'	33 (r.) 24 (l.)	2	34-129-120 (r.) 32-125-118 (l.)	35 (r.) 42 (l.)	34 (r.) 37 (l.)
98	19° 5'	42 (r.) 51 (l.)	2	27-127-115 (r.) 31-142-100 (l.)	45 (r.) 19 (l.)	31 (r.) 12 (l.)
(99)	ca. (23°)	(38)	(2)	(34-143-115)	(40)	(49)
...

Size of antlers at base, except disk	Height of warty appendages	Locality	Date	Measured by :	Note
27.5 × 24 (right) 27 × 24 (left)	ca. 1	Awa-jisaki, Shimoyaku-mura	10.ii.1949	Yosh. Okada	Type
28 × 20 (r.) 27 × 25 (l.)	ca. 1	Awa-jisaki, Shimoyaku-mura	1947	"	Without lower jaw
27 × 25 (r.) 28 × 21 (l.)	ca. 1	Oseida, Kamiyaku-mura	5.ii.1950	"	"
(28 × 23)	(ca. 1)	Oseida, Kamiyaku-mura	5.ii.1950	"	"
.....	.....	Oseida, Kamiyaku-mura	5.ii.1950	"	Type

Type.-♂ (skull with antlers); Yosh. Okada coll. no. Y-1; Awa-jisaki, Shimoyaku-mura, Yakushima, south of Kyushu; February 10, 1948.

Habitat.—It inhabits the forests at elevations between 60—70% of the summit on Yaedake in Yakushima and in winter often seems to migrate down toward the village houses. Deer on Kuchino-Erabujima are not yet examined, but it is said that they once immigrated in large numbers from Yakushima, and even today the deer are said to be seen on the sea between these two islands. Therefore, the deer of these two islands seem to be of the same race. Mr. Imaizumi (1949, p. 287) has also included Tanegashima in the distribution of *C. n. nippon*, but our materials have not come from this island.

Cervus nippon var. *mageshimae* Kuroda & Yosh. Okada, var. nov.

Japanese name; Mageshika.

Characters.—Resembles *C. n. nippon* or *C. n. centralis*, being distinguished from them by a body size smaller than these, but apparently larger than *C. n. yakushimae* (height at shoulders reaching 770 mm. in 4th year male). The coloration of the body in both winter and summer pelages is like that of *yakushimae*, paler than *nippon*, but with the hair

generally more or less longer than those of the former race. The white spots on the back and sides of the body of the summer pelage are indistinct like those of *yakushimae*. Although the lower lip, buttock and inner side of ears have white hairs like those of *nippon* and *yakushimae*, the white hairs of the inner sides of the ears are generally sparser than in the latter race. The white spots on the back and sides of the body of the summer pelage are indistinct like those of *yakushimae*. The white patch on the buttock with a black patch on the upper margin is as in *yakushimae*.

Antlers much larger as in those in *nippon*, the warty appendages somewhat higher, and with three forks in old males. The combined breadth of nasals is under 30 mm. (24–30 mm.), showing the breadth between those of *nippon* and *keramae* as in the case of *yakushimae*.

Table III. Measurements of skulls and antlers of *C. nippon* var. *mageshimae*
(In millimeters.)

Material number	Sex	Upper length	Condylbasal length	Greatest height of skull with lower jaw	Zygomatic breadth	Nasals (median)
Y-5	♂	260	235	130	119	82
Y-6	♀	208	227	120	99	75

Greatest breadth of both nasals	Maxillary tooth row	Lower jaw	Mandibular tooth row	Length of antlers	Distance between apexes of both antlers
30	75 (right) 75 (left)	190	80 (r.) 80 (l.)	407 (r.) 419 (l.)	278
24	71 (r.) 71 (l.)	173	77 (r.) 76 (l.)	....	...

Distance between bases of both antlers (median)	Interior angle between bases of antlers	Length between outer side of an antler and a line from apex to base (median)	Number of forks of antlers	Distance between tines of antlers	Length of 1st tine
110	22°	76 (right) 81 (left)	3	46-135-135-130 (r.) 57-132-113-150 (l.)	88 (r.) 74 (l.)
...

Length of 3rd tine	Length of 4th tine	Size of antlers at base, except disk	Height of warty appendages	Locality	Date	Measured by:	Note
72 (r.) 54 (l.)	55 (r.) 36 (l.)	28×27 (r.) 28×26 (l.)	2	Mageshima	1950	Yosh. Okada	type
...	...	.....	..	Mageshima	iii. 1950	Yosh. Okada	type

Type.-♂ (skull with antlers); Yosh. Okada coll. no. Y-5; Mageshima, south of Kyushu; coll. in 1950.

Habitat.-The deer are confined to the Island of Mageshima, where a very few of them remain, tending to extinction. It is said that in the near future some people will move here from Tanegashima or other places, and if this actually takes place, this kind of deer will immediately be exterminated as an animal harmful to crops.

The present authors earnestly desire to preserve this rare animal from extermination by some reasonable plan of protection such as creating them one of the Natural Monuments or designation of the island as a prohibition area of shooting and snaring, in the Game Law.

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