

*Discovery of Megacerid Deer from
Totchū, Nagano-ken,
Central Japan*

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In the spring of 1956, some remains of Megacerid deer were accidentally discovered by Mr. Motomi ŌBORI, from Totchū, aza Ōashi, Nakagawate, Akashina-machi, Higashichikuma-gun, Nagano-ken. Those remains were composed of a left antler, eight ribs and other fragmentary bones, and were sent to our department through the Matsumoto City Museum for identification. Then, Mr. Kunio KOBAYASHI, Assistant-professor of our department, instantly sent some photographs of them to Dr. Nobuo NAORA, Waseda University. Dr. NAORA kindly responded his opinion in the letter to Mr. K. KOBAYASHI in which he stated that those were supposed to be remains of Megacerid deer of *Euryceros* type. In the next spring (1957), the Shinshu Loam Research Group excavated that locality under Dr. Makoto SUZUKI, Professor of Faculty of Medicine of the Shinshū University, in order to clarify stratigraphical position of that fossil bed. At that time, many collection of bones fragments and conifer flora from that Megacerid bed and of some artifacts, of Early Jōmon Age, from overlying bed, were obtained.

In the same year of this discovery, Dr. Hikohichiro MATSUMOTO and Mr. Hajime MORI had reported a part of interesting mammalian fauna which had occurred from Kanamori, Hanaizumi-machi Nishiiwai-gun, Iwate-ken, in the Zoological Magazine. When the present writer read that report, his attention turned to compare both fauna and flora, especially on Megacerid deer.

Fortunately, the writer could participate in the recent excavation of Hanaizumi, jointly done by two research group of the Shinshu Loam R. G. and the Kwanto Loam R. G. in November of 1958, and he had opportunity to observe the remains of Megacerid deer which had occurred there, by the courtesy of Mr. Morisuke SASAKI.

In this paper, the writer wishes to describe Megacerid deer of Totchū, and to compare this with those from other localities of Japan, especially with that of Hanaizumi. The materials from Totchū, examined here, are reposed in the Matsumoto City Museum, for exhibition.

Megaceros (Sinomegaceros) ordosianus (YOUNG) *minor* subsp. nov.

(Pl. 1, Fig. 1 a, b, c.)

Description

The materials dealt here consist of one left antler, its fragment, eight ribs bones and a fragmental piece of skull. Among them, feature of its left antler is characteristic, possessing horizontally palmated beam and foliated brow-tine, though most of that distal portion is broken. Those are distinct in oriental type of Megacerid deer, viz. *Sinomegaceros* or *Euryceros*, to be detailed hereafter.

The antler examined here, is imperfect owing to the lack of distal portion, but total length of this is more than 395 mm. and is coated with dark brownish colored film.

Proximal pedestal portion is elliptical in cross and is surrounded by massive rugose burr, about 10-12 mm. thick. Brow-tine springs from the beam directly above, almost in contact with, the burr. It extends to form flattened fan with distinct narrow basal portion, foliating sagittally to the frontal. Anterior peripheral extension of this brow-tine curved weakly to antero-distal direction, hence, its form looks like a spoon concave outwardly. Although the present brow-tine is broken at the point of 150 mm. from the bifurcation, rapid flattening to distal portion is obvious. Main beam is stout and has long cylindrical portion with the length of about 340 mm. from the bifurcation to the point of palmation, though almost of this palmated portion is destroyed in present material.

That cylindrical beam is sub-triangular in cross section. Setting this antler in orientated position, beam projects frontal laterally, nearly vertical to foliation of brow-tine and makes a faint curve on horizontal plane to anterior in somewhat drooping attitude. Brow-tine and main beam are diverged each other widely with the angle of about 110°. Surface is rather smooth but grooved roughly, especially, distinct on the posterior side of beam, without any knobby ornamentation. Those grooves run along the elongation of the beam, but they twist on the beam weakly.

As a whole, the present antler is characterized as follows.

- 1) Beam has long cylindrical portion.
- 2) Brow-tine is distinct to make foliated fan shape, but is narrow in its basal portion.
- 3) Beam projects horizontally to frontal-lateral and nearly vertical to sagittal foliation of brow-tine.
- 4) Bifurcation between beam and brow-tine starts immediately above the burr.
- 5) Divergence between beam and brow-tine is wide.
- 6) Surface is grooved roughly, without any knobby ornamentation.

Measurements of the present antler are listed below, with comparison to other species. (Table 1.)

Comparison

The material dealt here is limited to left antler, but its form and size is available to compare with other Megacerid deers. Those which had been discovered from eastern Asia are characterized by smaller size of antler and more extended brow-tine than those of European type. Therefore, YOUNG (1952) proposed generic name "*Euryceros*" to oriental Megacerid, based upon *Cervus megaceros mongoliae* BOULE et TEILHARD 1928, from Ordos, and named that as "*Euryceros ordosianus*"

But this "*Euryceros*" had already been preoccupied as a generic name of Buceridae Aves "*Euryceros* LESSON, 1832", then PEI W. C. (1934) newly proposed generic name "*Sinomegaceros*". *Euryceros* has, however, been used among Chinese paleontologists until now, synonymous to *Sinomegaceros*.

TEILHARD DE CHARDIN P. and PEI W. C. (1941) distinguished essential characters of Chinese Megacerid, among *Euryceros flabellatus* TEILHARD 1936, *E. pachyosteus* YOUNG 1932, *E. sp.* PEI 1934 and *E. ordosianus* (YOUNG) 1932. According to their description, *E. ordosianus* has following characters: "First tine expanding sagittally to the skull and transversally to the palmature, not pachyostosed (?)". Moreover, concerning the type specimens of *ordosianus*, BOULDE and TEILHARD DE CHARDIN (1928) pointed out followingly: 1) *Bois lisse (surtout à la base antérieure), présentant, le long de la perche, trois arêtes longitudinales....., 1' une médian, les deux autres latérales.* 2) *Tendance rapide à 1' aplatissement.* 3) *Premier andouiller placé au contact immédiat de la meule et largement aplati en cuiller, c'est-à-dire un peu concave en dessous. Sur tous les exemplaires, cet andouiller est brisé (par 1' tomme, semble-t-il) assez près de son point de naissance.* 4) *Deuxième andouiller placé très loin-du premier.*

Compared with the above described fundamental characters, any large differences are hardly recognized between the materials from Ordos and the present material from Totchū. This may allow to treat Megacerid deer from Totchū as *ordosianus* type.

One of other Megacerid remains of *ordosianus* type is *Megaceros cf. ordosianus* TOKUNAGA et NAORA, 1939, which has been reported from Kuhsiang-tung near Harbin, north-eastern China. Judging from the description and figures of those materials, it is also clear that the materials from Harbin belong to *ordosianus* type and are able to be identified with the present material except the former's larger size of antler and more widely extended brow-tine.

In Japan, occurrences of Megacerid deer are exceedingly rare. As enumerated below, those so far known are counted only about nine.

1. *Cervus (Sinomegaceroides) yabei* SHIKAMA 1939, Tuidi and Kadonosawa,

Kuzuu-machi, Aso-gun, Tochigi-ken; Upper Kuzuu formation, early-Late Pleistocene (SHIKAMA T., 1939, 1941, 1949, 1952)

2. *Megaceros* sp. NAORA 1954, locality *ibid.*; Early Pleistocene (NAORA N., 1954)

3. *Euryceros* sp. NAORA 1954, locality *ibid.*; Middle or Late Pleistocene (NAORA N., 1954)

4. *Megaceros* sp. NAORA 1954, from the bottom sediments of the Seto Inland Sea, age unknown (NAORA N., 1954)

5. *Megaceros* sp. NAORA 1954, Shühödō, Akiyoshi-mura, Mine-gun, Yamaguchi-ken (NAORA N., 1954)

6. *Megaceros* sp. NAORA 1954, Nagahama, Minato-machi, Kimitsu-gun, Chiba-ken: Early Pleistocene (NAORA N., 1954)

7. *Megaceros* sp. KISHIDA 1942, Shionoiri, Urasato-mura, Chiisagata-gun, Nagano-ken (YAGI T., 1942)

8. *Megaceros* sp. NAORA 1957, Akasaka, Higashidōri-mura, Shimokita-gun, Aomori-ken. (NAKAJIMA Z. & KUWANO Y., 1957)

9. *Megaceros kinryuensis* MATSUMOTO et MORI 1956, Kanamori, Hanaizumi-machi, Nishiiwai-gun, Iwate-ken; Latest Pliocene. (MATSUMOTO H. & MORI H., 1956)

Of those Japanese Megacerid deer, except some, precise descriptions have not yet been done until now. One of those exceptions, *Cervus (Sinomegaceroides) yabei* have been studied in details (SHIKAMA T., 1939, 1942, 1949), and it has been known to possess some essential characters of *ordosianus* type. Moreover, *Megaceros kinryuensis* has been fully described (MATSUMOTO H. & MORI, H. 1956), and has been considered as ancestral form of Megacerid deer. In spite of that consideration, the present writer inclined to lead another conclusion after observation of its type specimen. For instance, it has long cylindrical portion of beam and brow-tine expanding transversally to the palmature which are characteristic in *ordosianus* type (Pl. I figs. 2a, 2b, 2c).

As stated precedingly, Megacerid deers of *ordosianus* type have been distinguished from others by their antler form being common among them, however, some differences would give rise to discussion between them. Firstly, the present materials from Totchū differ from type species *ordosianus*, *Cervus megaceros mongoliae* BOULE et TEILHARD, by its antler of smaller size and lower bifurcation and narrower brow-tine in the basal part. Also, among other Japanese species, *yabei*, *kinryuensis*, and *ordosianus* from Totchū, the antler of the latter is easily distinguishable by its smaller size, though lower bifurcation and narrower basal portion of brow-tine are common in those three. Consequently, the writer places, tentatively, Megacerid deer from Totchū as the subspecies of *Megaceros (Sinomegaceros) ordosianus* (YOUNG).

Table 1. Comparative measurements of some *ordosianus* type of Megacerid (in mm.)

		A	B	C	D	E	F	G	H	I	J
BURR	Circumference	205	292								
	Diameter, long	73	100	97	94	78	93	94			
	Diameter, short	55	90	62	88	60	85	65			
	Height of bifurcation from burr	55	74	47							
BEAM	Length of cylindrical portion	315	410						230	240	280
	Circumference of proximal portion	185	245								
	Circumference above bifurcation	125	192								
	Circumference of middle portion	127	173								
	Diameter of bifurcated portion, long	44	60	61	78	51	55	64			
	" " , short	38	53	43	58	45	47	47			
	Distance from bifurcation to distal	350	515		170				200	180	232
	Diameters of distal portion	50	117		80				55	48	60
		34	44		41			44	33	50	
BROW-TINE	Width of proximal portion	44	61	55	96	75	96	72			
	Thickness of proximal portion	31	39	38	22	19	24	17			
	Thickness of distal portion	16	24		7						
	Distance from bifurcation to distal	140	57		130						
ANGLE	Angle between beam and brow-tine (antero-distal side)	110°	117°	120°	130°						
	Angle between beam and burr-base (")	34°	36°	30°							
	Angle between brow-tine and burr-base (")	42°	38°	50°							

A: *Megaceros (Sinomegaceros) ordosianus minor* n. subsp. Totchū, left antler (the writer)

B: *Megaceros kinryuensis* MATSUMOTO et MORI, Hanaizumi, right antler (the writer)

C: *Cervus (Sino-megacero:ides) yabei* SHIKAMA, Kuzuu, right antler (SHIKAMA, T., 1949)

D-G: *Megaceros cf. ordosianus* TOKUNAGA et NAORA, Kuhsiangtung, D; left antler,

E, F, G: right antler (TOKUNAGA S. & NAORA N., 1939)

H-J: *Cervus megaceros mongoliae* BOULE et TEILHARD, Sjara-Osso-Gol of Ordos,

(BOULE M. & TEILHARD DE CHARDIN P., 1928)

Geological age

The stratigraphical position of Megacerid bearing bed of Totchū will be discussed in the paper of this journal by K. KOBAYASHI. According to his opinion, this bed may be considered to be Late Pleistocene (probably in Würm glacial age) from the view point of geological and geomorphological discussion.

Megacerid deer of *ordosianus* type which had been occurred from Ordos and Kuhsiangtung has been considered to be Late or Latest Pleistocene. Nevertheless, those from Japan have been considered older than them. Such inconsistency will be solved in future by stratigraphical and paleontological work. As to *kinryuensis*, after our recent excavation and observation of mammalian bed of Hanaizumi, it can be said that the age of this mammalian bed may not be so older than that of previous opinion and may be placed in

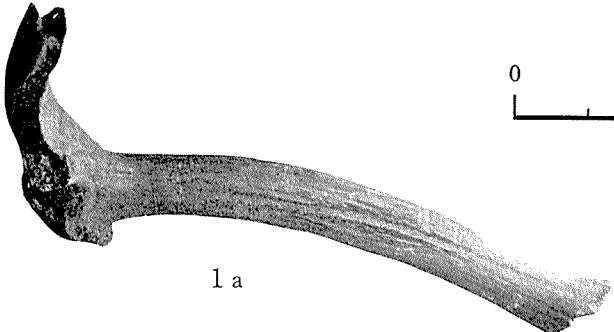
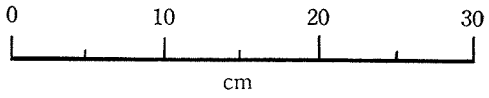
nearly the same horizon as the Megacerid bed of Totchū, and it is possible to think that this dwarfish subspecies of *ordosianus* may be near descendant form of *yabei* and *kinryuensis*.

References

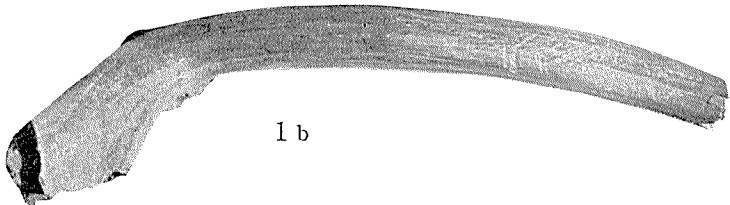
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Explanation of plates.

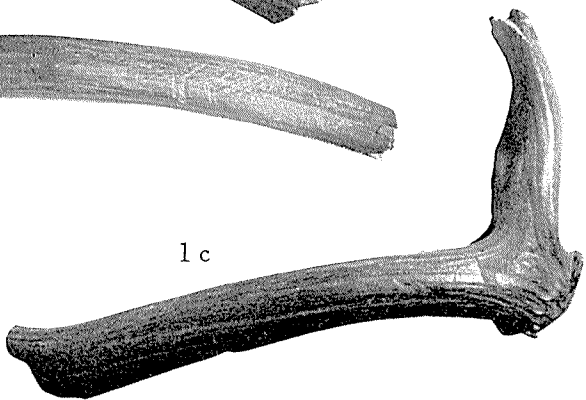
1. *Megaceros ordosianus* (YOUNG) *minor* nov. subsp.: left antler
a: frontal view, b: dorsal view c: posterior view
2. *Megaceros kinryuensis* MATSUMOTO et MORI right antler (photo. by Y. SUZUKI)
a: posterior view b: dorsal view c: frontal view



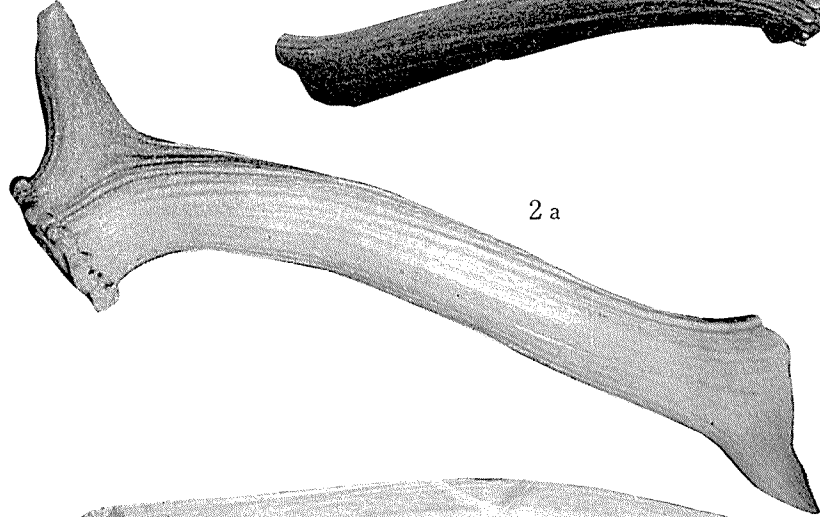
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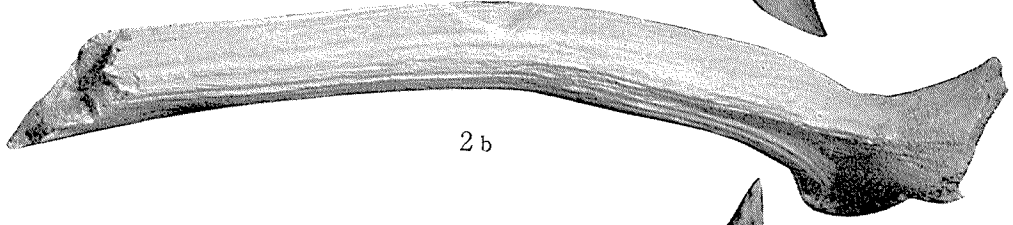
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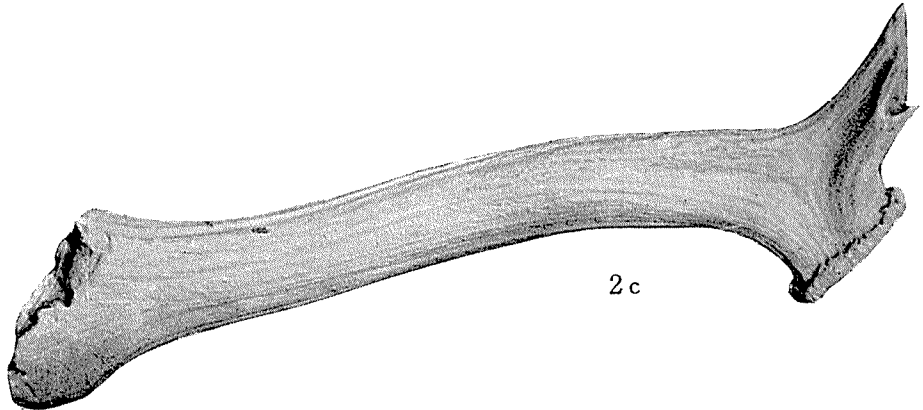
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2 b



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