Scientific Works. Series C. Veterinary Medicine. Vol. LXIV (2), 2018
ISSN 2065-1295; ISSN 2343-9394 (CD-ROM); ISSN 2067-3663 (Online); ISSN-L 2065-1295

ASPECTS REGARDING THE MORPHOLOGY OF CERVICAL VERTEBRAE IN COYPU (*MYOCASTOR COYPUS*)

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Abstract

This study was done on three bodies of adult coypu. The material was obtained by cleaning and macerating bones in 37°C water. Following the whitening process the bones were consequently cleaned under a water stream and left to dry. The cervical vertebrae generally have the spinous processes at a uniform height, oriented caudally for vertebrae III-V, dorsally for vertebra VI and cranially for vertebra VII. The body of the cervical vertebrae is short and flattened dorso-ventrally; the cranial and caudal terminal facets are plane. The ventral vertebral crest is absent. The transverse processes are the same length, slightly more developed at vertebra VII. The transverse foramen is present, wide in diameter, being replaced at vertebra VII by a vertebral incisura. The atlas has rounded transverse processes, oriented dorsally. The transverse foramen is located on the caudal edge of the atlas wing. The lateral vertebral foramen and the alar foramen are joined through a thick alar notch. The axis has a thick, developed spinous process that ends in a tuberosity. Its transverse processes slightly surpass the caudal terminal facet.

Key words*: cervical vertebrae, coypu, vertebral column.*

INTRODUCTION

Morphological aspects of the cervical vertebrae in coypu are important because they present certain particularities compared to other species of rodents (Coțofan et al., 1982, Hrițcu et al., 2000, Predoi, 2012). There are 7 cervical vertebrae, and the diverse aspects described in this study complete already existing data from scientific literature (Coțofan et al., 1987, Coțofan et al., 2003, Predoi et al., 2001).

The body of the cervical vertebrae is reduced, transversally wider and with a very large vertebral canal. The transverse foramen is wide, oval in shape and constantly located on the caudal edge of the atlas wings.

Unlike in scientific literature, where a cranial vertebra incisura is described for the atlas, this study revealed the presence of a large lateral vertebral foramen. The alar notch between the alar foramen and the lateral vertebral foramen is thick. Particularities of this species were also discovered in the transverse processes of vertebrae V and VI. In the seventh vertebra the transverse foramen is replaced with an incisura.

MATERIALS AND METHODS

Three bodies of adult coypu were used as material. The process of controlled maceration was used as method.

This particular method takes the following steps:

- Skinning the body
- Eviscerating the body
- Manually removing muscle mass from the bones.

The controlled maceration technique includes submerging the bones in water at 37°C. Following the maceration process the bones were washed under a stream of water and were submitted to a whitening process.

For the whitening process a solution of hydrogen peroxide 11% was used.

After the whitening process the bones were once again cleaned under a stream of water and left to dry at room temperature.

Following the preparation process, the bones were studied and photographed.

The naming of the structures was done in concordance with the norms imposed by Nomina Anatomica Veterinaria - 2005.

RESULTS AND DISCUSSIONS

In the cervical region, the vertebrae are characterised by a short body which is transversally wide. A wide vertebral canal can be observed. The atlas has well developed rounded wings that are slightly deviated dorsally (Fig. 1, 2, 3).

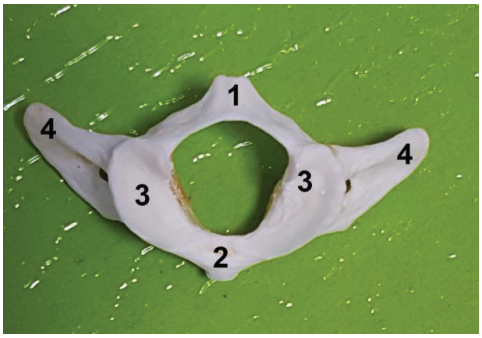

Fig. 1 Atlas of coypu, cranial view (original)
1-dorsal tubercle; 2-ventral arch; 3-glenoid cavities; 4-wings of the atlas.

The transverse foramen is large, oval shaped, placed horizontally on the caudal edge of the atlas wings.
Compared to scientific literature, this study reveals the bone to have a large lateral vertebral foramen as well as an alar foramen, united through an alar notch.
The cranial articular surfaces are slightly excavated.

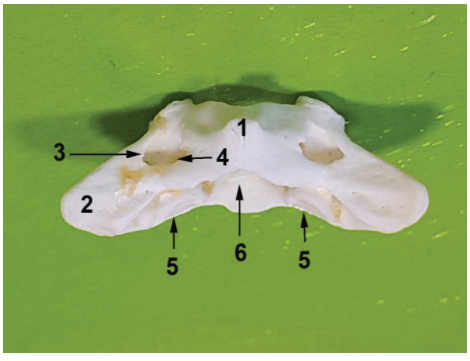

Fig. 2 Atlas of coypu, dorsal view (original)
1-dorsal tubercle; 2-wings of the atlas; 3-hole alar foramen; 4-transverse foramen; 5-caudal articular surfaces; 6-vertebral foramen.

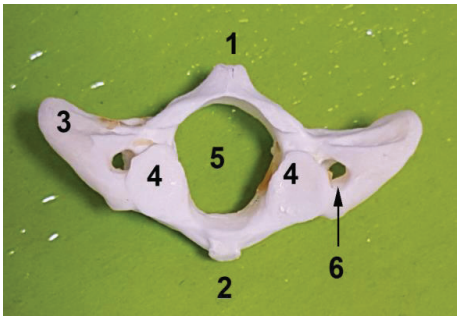

Fig. 3 Atlas of coypu, caudal view (original)
1-dorsal tubercle; 2-ventral arch; 3-wings of the atlas; 4-caudal articular surfaces; 5-vertebral foramen; 6-transverse foramen.

The axis has a well-developed spinous process, thick all throughout its length, which ends dorsally in a reduced tuberosity.
The transverse processes are developed and slightly surpass the terminal caudal facet. The transverse foramina are broad with vertebral incisurae which are also wide, while the terminal caudal facet has a shallow glenoid cavity.
The terminal cranial facet features an odontoid process in the shape of a cone that is slightly deviated dorsally.

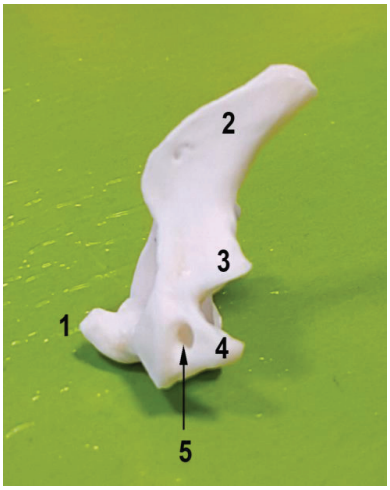

Fig. 4 Axis to coypu, lateral view (original)
1- odontoid process; 2-spinous process;
3-caudal articular processes; 4-transverse processes;
5-transverse foramen.

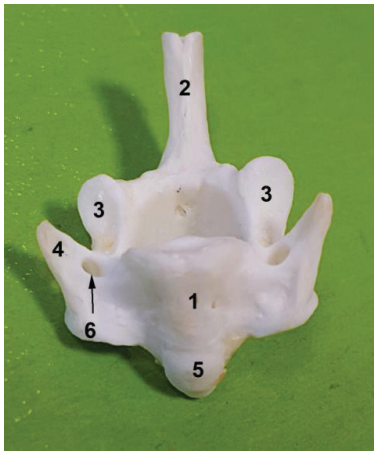

Fig. 5 Axis to coypu, ventro-caudal view (original)
1-the body of axis; 2-spinous process; 3-caudal articular processes; 4-transversale process; 5- odontoid process; 6-transversale foramen.

The cranial articular surfaces are triangular in aspect. The caudal articular processes emerge at a distance from the spinous process and appear flat (Fig. 4, 5).
The third cervical vertebra has a short, dorso-ventrally flattened body. The ventral vertebral crest is absent. Both the terminal cranial facet and the terminal caudal facet appear flat. The spinous process is relatively well developed, but it lacks a dorsal tuberosity. The transverse processes exceed the terminal caudal facet, oriented dorso-caudally. The transverse foramen is wide. (Fig. 6)

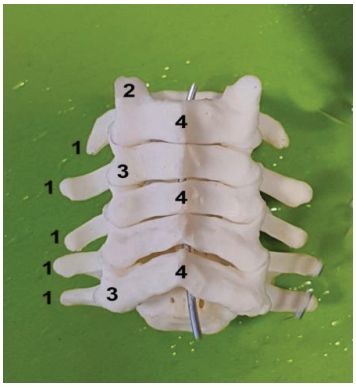

Fig. 6. Cervical vertebrae III-VII in coypu, dorsal view (original)
1-transverse processes; 2-cranial articular processes; 3-caudal articular processes; 4-spinous processes.

The fourth cervical vertebra exhibits wider and thicker transverse processes compared to the third vertebra, while the spinous process is dorsally widened and levelled with the one corresponding to the previous vertebra.
The fifth cervical vertebra has a widened transverse process, oriented in the same direction as in the case of the third and fourth vertebrae. The transverse foramen is wide.
Ventro-medially from the transverse process an osseous dint can be observed, which is flattened, oriented cranially and ended with a crest.
The sixth vertebra has a short body, flattened dorso-ventrally, and it exhibits flat terminal faces as well as the absence of the ventral vertebral foramen. The transverse foramen is very wide. The transverse processes feature ventro-caudally two thick osseous laminae which are well detached and flattened.

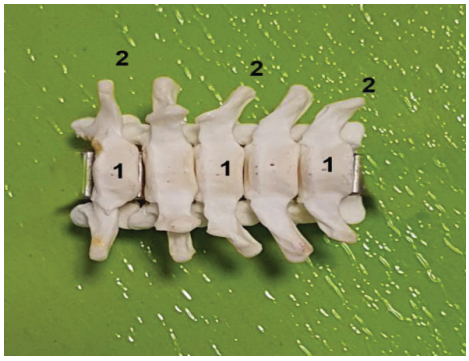

Fig. 7 Cervical vertebrae III-VII in coypu, ventral view (original)
1-vertebral body; 2-transverse processes;

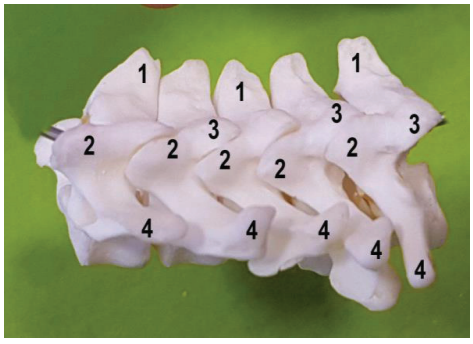

Fig. 8 Cervical vertebrae III-VII to coypu, lateral view (original)
1-spinous processes; 2-cranial articular processes; 3-caudal articular processes; 4-transverse processes.

The seventh cervical vertebra features its spinous process oriented cranially, widened at the same height as in the previous vertebrae.
The transverse process is very wide dorso-ventrally and is oriented caudally.
Instead of transverse foramina, vertebral incisurae are present (Fig. 7, 8).

CONCLUSIONS

The bodies of the cervical vertebrae is short and flattened dorso-ventrally, and it lacks a ventral vertebral crest.
The vertebral canal of this species is particularly wide.
Unlike what is presented in existing specialty literature, the atlas does present a wide lateral vertebral foramen and not a lateral vertebral incisura. The alar foramen is also present. The transverse foramen is on the caudal edge of the atlas wings.
The axis does present lateral vertebral incisurae, a cone-shaped odontoid process that is slightle deviated dorsally and the caudal terminal facet is represented by a shallow glenoid cavity.
The spinous process of the III-VII vertebrae is thick and levelled.
In the fifth vertebra, the transverse process features an osseous dint that is flattened cranially and ends with a crest.
In the sixth vertebra the transverse processes feature ventro-caudally two thick osseous laminae which are well detached and flattened.
The seventh vertebra features an incisura in place of the transverse foramina.

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