

THE CERVICAL VERTEBRAS OF THE CARPATHIAN BEAR

C. SPĂTARU*, MIHAELA SPĂTARU

University of Agricultural Sciences and Veterinary Medicine of Iasi

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ABSTRACT - *The atlas has a butterfly shape, presents an alary hole that is united with the vertebral hole through a wide alary trench. The transversal hole is found on the caudal edge of the wings of the atlas. The axis is particularized by the development of a spinal process, oblong anterior-posterior. The caudal edge of the spinal process is callous, provided with a deep muscular fosse delimited laterally by a bony crest. The dens, cylindrical process presents in front a plan surface cut oblique. The cervical vertebrae III-VII are characterized by an elongation of transversal processes, ended with a well-defined tuberos tubercle.*

Key Words: anatomy, osteology, Carpathian bear

REZUMAT – *Vertebrele cervicale la ursul carpatin. Atlasul are formă de fluture, prezintă gaura alară unită cu gaura vertebrală laterală printr-un șanț alar larg. Gaura transversă se găsește pe marginea caudală a aripilor atlasului. Axisul se particularizează prin dezvoltarea procesului spinos, alungit antero-posterior. Marginea caudală a procesului spinos este îngroșată, prevăzută cu o fosă musculară adâncă, delimitată lateral de câte o creastă osoasă. Procesul odontoid, cilindric prezintă anterior o suprafață plană, tăiată oblic. Vertebrele cervicale III-VII se caracterizează prin alungirea proceselor transverse, terminate cu cuspizi tuberoși, bine delimitați.*

Cuvinte cheie: anatomie, osteologie, ursul carpatin

INTRODUCTION

The morphological studies of the bony system present an importance for the identification of the species, especially on the animals of synergetic interest, in the case of solving some conflicts regarding poaching. The identification and description of morphological peculiarities of the cervical vertebrae present the

* E-mail: cspatarufmv@yahoo.com

advantage of having obvious differential criteria easy to identify without the risk of confusion.

MATERIALS AND METHODS

The study has been made on bear bones, provided from gunshot animals. The bones have been prepared by boiling or by disencumbering of the adjacent tissue.

We have studied the shape, lengthiness and development of bone processes and of the articulate surfaces, in comparison with the reference species, the particularities being illustrated by photographing.

RESULTS AND DISCUSSION

The atlas has a butterfly shape with its wings detached lateral-caudally. The cranial-lateral margin of the wings is rounded, achieving a semicircle, and the thicker caudal margin is separated by caudal surfaces through a deep fosse, perforated by the transverse hole. On the dorsal side of the wings, close to the vertebral dorsal axis at the front, 1/3 is perforated by the alary hole and the lateral vertebral hole, which are united by a long alary trench (*Figure 2*).

The dorsal arch, nosier than the ventral one, presents at the anterior side a rough spine and at posterior side, two tuberosities. The ventral axis on the ventral side is smooth (*Figure 3*).

The caudal articulate surfaces are slightly concave, of oval shape, delimited by a bony cutting crest that surpasses the vertebra surface, it continues with an articulate surface from the dorsal face of the ventral arch (for the *dens* process of the axis). The cranial articulate surfaces have a dorsal-ventral concave shape (horns of *Bos Taurus*) (Konig, Liebich 1992) and are separated dorsally and ventrally by wide rough surfaces (*Figure 3*).

The axis has an aspect of an anvil, has a spinal process flattened latero-laterally, stretched up to the cranial dens process and caudally it surpasses the caudal edge of the vertebral body (*Figure 4*).

The caudal edge of the spinal process appears rounded off in a transversal way, being continued ventrally with bone blades that connect the arched processes. Caudally, the two blades mark off a deep rough fosse (*Figure 6*).

The *dens* process has a cylindrical aspect (*Figure 5*), it presents the anterior extremity plane oblique dorsal-ventrally and caudal-cranial. The cranial articulate surface is slightly convex and is continued with the articulate surface from the ventral face of the *dens* process.

The transverse processes are oriented lateral-caudally and are terminated as a stiloid; they slightly surpass the caudal edge of the vertebra body. The vertebral incisions, caudal and cranial ones, are wide (*Figures 5, 6*).

The cervical vertebrae III-VII have a rochial aspect. The spinal processes are high (4-6 cm), with a slightly cranial-caudal ascension, with the cranial edge

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cutting and slightly convex dorsal-ventral. The caudal edge is slightly concave and it finishes thickened. The spinal process of the IIIrd vertebra is particularized by its reduction to a sharpened blade (*Figure 1*).

On the dorsal face of the caudal articulate processes, muscular tubercles are detached.

The vertebral body is slightly flattened dorsal-ventrally, the articulate surfaces have oval shape with the transverse diameter approximately two times higher than the dorsal-ventrally. The ventral face of the vertebrae is smooth.

The transverse process is particularized through the obvious detaching from the vertebral body, being swept at the base by the wide transversal hole.

The transverse processes are terminated laterally by well-delimited tuberos tubercle. All the transversal processes of the cervical vertebrae have the tendency of bicuspidity. At the VIth vertebra, the third cuspid looks like a spine and at the seventh vertebra, the transverse process is unicuspid, with a triangular shape (*Figure 1*).

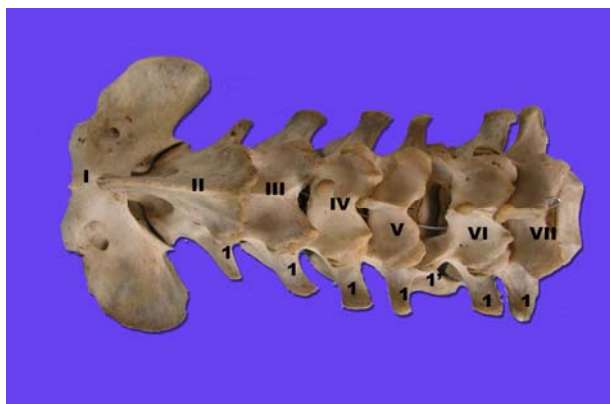


Fig. 1 - Cervical vertebrae
1. Transverse process

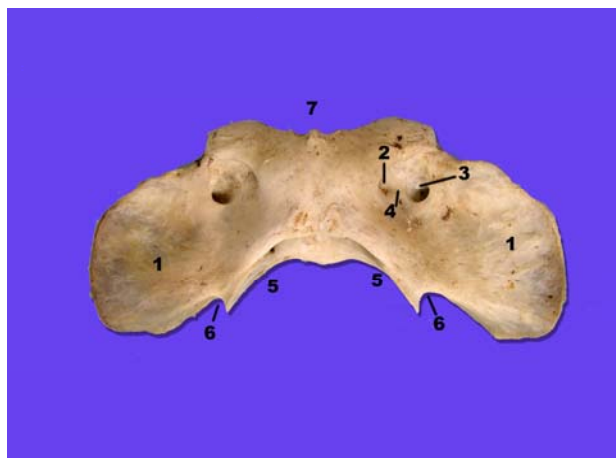


Fig. 2 - Atlas, dorsal view
1. Wing of atlas
2. Lateral vertebral foramen
3. Wing foramen
4. Sulcus wing
5. Articulare facies
6. Caudal notch
7. Dorsal tuber

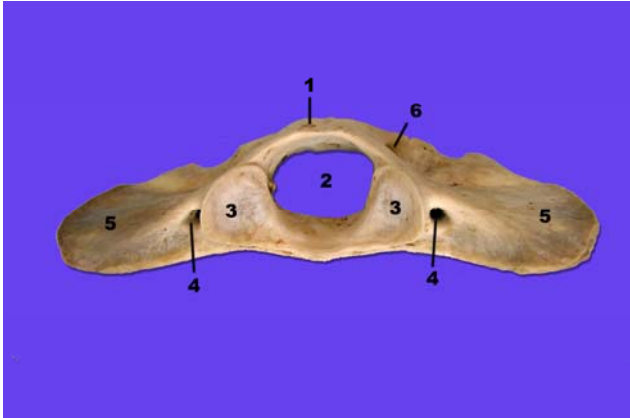


Fig.3a – Atlas, caudal view

1. Dorsal tuber
2. Neural foramen
3. Articulare facies caudale,
4. Transverse foramen
5. Wing of atlas



Fig. 3b – Axis, lateral view

1. Spinous process
- 1'. Cranial spine
2. Transverse process
3. Transverse foramen
4. Cranial articular surface
5. Dens



Fig. 4. Axis, cranial view

1. Spinous process
- 1'. Cranial spine
2. Transverse process
3. Transverse foramen
4. Cranial articular surface
5. Dens

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Fig. 5 - Axis, caudal view

1. Spinous process
2. Wing of caudal process spinous
3. Caudal articular process
4. Neural foramen
5. Caudal articular vertebra

CONCLUSIONS

The atlas has a butterfly aspect; it presents the alary ditch that connects the alary hole with the lateral vertebral hole. The transverse hole is found on the caudal edge of the wings.

The axis is particularized by the presence of a deep rough fosse delimited by bony blades that connect the caudal arched articulate processes.

The cervical vertebrae III-VII are characterized by the detaching of the transverse processes that are terminated by tuberos cuspides well set off, that demonstrate the presence of a strong cervical muscular.

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