

**COMPARATIVE ASPECTS REGARDING SOME SKULL BONES
IN NANDU (*RHEA AMERICANA*) AND OSTRICH (*STRUTHIO
CAMELLUS*)**

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Summary

In most adult birds the bones of the cranium have coalesced so completely as to be undistinguishable. But in the adult struthious bird in a greater or less extent, the boundaries of the various bones are obvious enough. We remarked on the studied species (*Rhea* and *Struthio*) that the hard palate is formed generally by premaxillaries, maxillopalatines, palatines, prevomer and the skull base is formed by presphenoid, basisphenoid and basioccipital. Although, there are many differences into this species, which are presented extensively as follow.

One general feature of the adult bird's skull is the almost complete disappearance of the sutures between the bones of the cranium, whilst another is the great movability of the palatal whole.

The structure of the palate represent one of the most important taxonomical criterion in the bird world. Taking this aspect into account and because the data from reference material are in small numbers, we realized a comparative study of palatal bones and its relationship with the skull base.

Materials and methods

The material for the study was represented by 10 skull of *Rhea americana* and 8 skull of *Struthio camellus*, obtained from juvenile and adult birds.

The skulls was prepared by maceration and manual cleaning afterwards (only the last in young birds). We used the N.A.A. – 1993.

Results and discussions

In **nandu (*Rhea americana*)** the pterygoid and palatine are ankylosed where are in contact. The palatines are in the form of flat bony plates; the medial portion of the external laminae being developed. The internal border of the medial plate sutures with the prevomer and underlaps the external portion of the posterior prevomerine branch of the fork. The palatine shaft is very short and the maxillary runs back along its external side for some distance.

The prevomer is very large and broad. It is divided into two branch posteriorly by a longitudinal slit about a third the length of the mid line of the bone. The branches are very closely related. They lie wholly ventral to the parasphenoid and do not include it between them. The anterior extremity of the prevomer is also

forked, the forks separated by a deep, rounded notch. These branch are long and pointed, but almost completely underlapped by the palatal processes of the premaxillares.

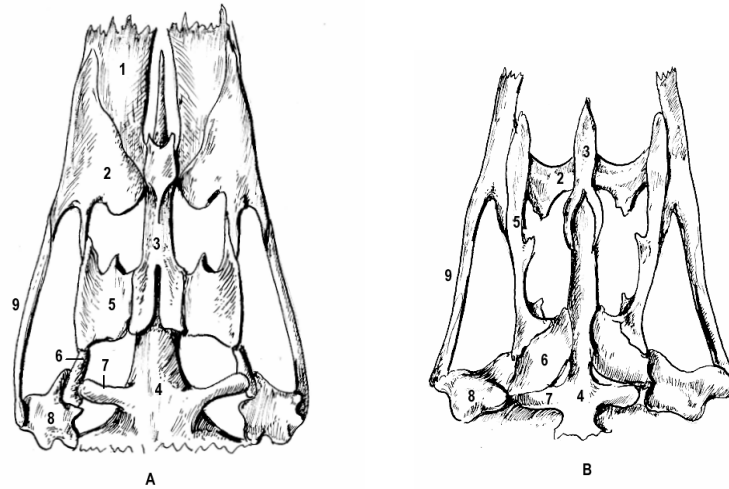


Fig. 1 The bones of palate and skull base in Rhea (A) and Struthio (B)
- ventral view

1- os premaxillare; 2- proc. maxillopalatinus; 3- vomer (prevomer); 4- os parasphenoidale; 5- os palatinum; 6- os pterigoideum; 7- proc. basipterygoideus; 8- quadrate; 9- os jugale.



Fig. 2 The vomer in Rhea – dorsal view
1- vomer; 2- os parasphenoidale

The maxillopalatines are very low and flat plates, sometimes fenestrated, which extend inward to abut against the sides of the anterior part of the prevomer, and forward to overlap the posterior portion of the palatal processes of the premaxillares. The palatines articulate with the posterior portion of the external third of the maxillopalatines, and a portion of the maxillopalatine runs down the external side of the palatine shaft.

The basipterygoid processes arise from the base of the parasphenoid. They are long and almost transverse to the axis of the skull. The parasphenoid rostrum is long, extending well anterior to the mid line of the prevomer.

In **ostrich (*Struthio camellus*)** the pterygoid is better represented to nandu. The anterior extremities of the pterygoids are pointed. The pterygoid is well separated from the prevomer, but a tough ligament connects the anterior extremity of the pterygoid with the posterior extremity of the prevomer. Posteriorly the palatine broadens out to suture with the middle third of the outer border of the pterygoid. The dorsal lamina of the maxillopalatine, extends medially to articulate with the prevomer. The palatine has no contact with prevomer.

The prevomer is short, forked behind and pointed anteriorly. It contacts neither pterygoid nor palatine. The caudal third is simple, pointed and flat. It is furcated by a broad triangular notch.

The premaxillaries are entirely devoid of palatal processes, and do not at all enter into the formation of the palate or contact any of its bones. The parasphenoid and basipterygoid processes are much stouter than in other birds.

Conclusions

1. Although the two species are very approaching from phylogenetical point of view, the skull bones present a lot of important differences.

In *Struthio* the prevomer is much reduced by loss of its posterior half. Its halves are well fused, the bone being pointed anteriorly and shallowly furcate posteriorly.

2. In *Rhea* the premaxillary has a strong palatal process.

Struthio has no palatal process.

3. In *Rhea* the pterygoid overlaps and sutures squamously with the prevomer, then curves backward and outward to overlap and ankylose with the posterior extremity of the palatine.

In *Struthio* the pterygoid is simple and plate-like, its anterior extremity contacting the parasphenoid. It contacts neither prevomer nor maxillopalatine.

4. In *Rhea* the prevomer is large, its halves imperfectly fused, the bone being deeply furcate before and behind.

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