

**MORPHOLOGICAL PROPERTIES OF THE BONES OF THE POSTERIOR EXTREMITIES
AND THE TRUNK AND DIFFERENCES BETWEEN THE FOX (*VULPES VULPES*) AND THE
DOG (*CANIS FAMILIARIS*)**

S. POPOVIĆ

*Institute of Morphology and Physiology, Faculty of Veterinary
Medicine, Beograd*

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SUMMARY

Comparative morphological investigations of the bones of the posterior extremities and the trunk of the fox and the dog have shown, first of all, that there are great similarities but also some characteristic differences between the two species.

Thus some characteristic differences were found in the vertebrae of the spinal column, which, to a greater or smaller extent, can help us in determinations.

A greater number of marked differences were found in the pelvic bones of the fox which could be significant for the differentiation of these bones from those of the dog.

Some characteristics of the femur of the fox were also noted, which can be of interest for the classification of the bones.

The other bones of the posterior extremities and trunk of the fox are so similar to those in the dog that it is impossible to differentiate between them, with the exception of the relative size of the bones to some extent.

INTRODUCTION

Knowledge of the morphological properties of and differences between the bones of domestic and wild animals is becoming more important both for pathomorphological and clinical investigations and with regard to forensic purposes.

Considering the need for the differentiation of very similar bones in the fox and the dog and the lack of data in the literature (Ellenberger and Baum, 1943; Miller et al., 1969; Romer, 1966; Atanasov, 1958; Martino, 1936), concerning this matter, we have undertaken a comparative examina-

tions of a part of the skeleton of these two animals. Present paper completes the comparative study of fox skeleton (Popović, 1972, 1973).

MATERIALS AND METHODS

The bones of 10 foxes and 10 dogs were studied. They were prepared using the method of maceration or boiling and then whitening in hydrogen peroxide.

RESULTS

Cervical vertebrae — Atlas (Figure 1 A, B). The caudal ends of the wing of the atlas in the dog commonly extended more caudally than in the fox. Nevertheless, in the dog, too, they were sometimes shorter

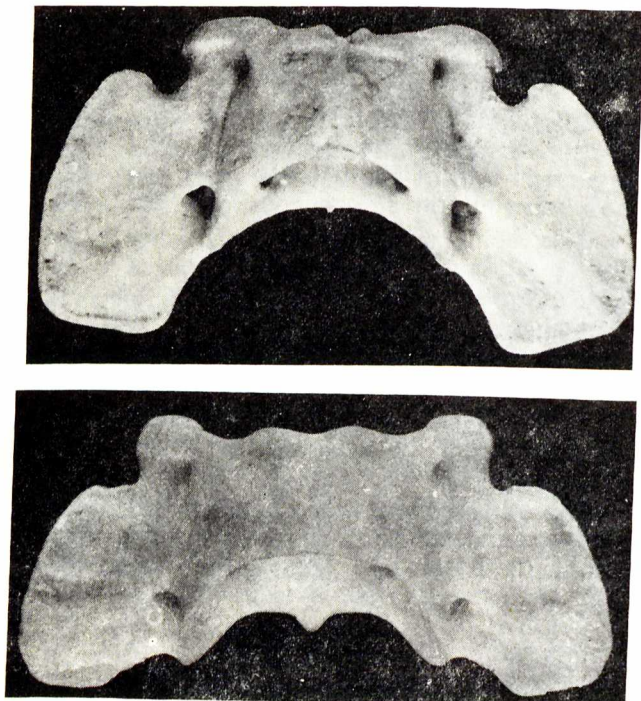


Figure 1. Atlas of the dog (A) and the fox (B): viewed from the dorsal side.

and extended caudally as in the fox. The other properties of the atlas were also similar and variable so that they are not worth considering in investigations of comparative differences.

Axis (Epistropheus) (Figure 2 A, B). The top of processus transversus in the fox commonly reached the caudal end of the vertebral body (corpus vertebrae) or it extended further towards it. In the dog it extended con-

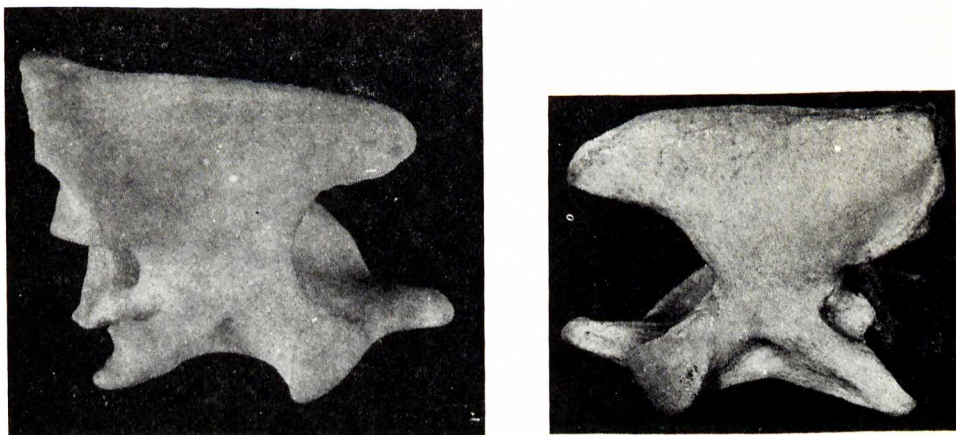


Figure 2. Axis (Epistropheus) in the dog (A) and the fox (B)

siderably more caudally from the caudal end of the vertebral body. The direction of extension in the dog was prevalently caudo-ventro-lateral, while in the fox it was more pronounced caudoventrally and less in the ventral direction. As for their other properties, these two bones did not differ essentially.

There were no essential differences between the other vertebrae of the fox and the dog.

Thoracic vertebrae (Figure 3 A, B). The thorny offset Th_1 in the dog was either straight or the top was bent caudodorsally while in the fox the top was bent more or less craniodorsally.

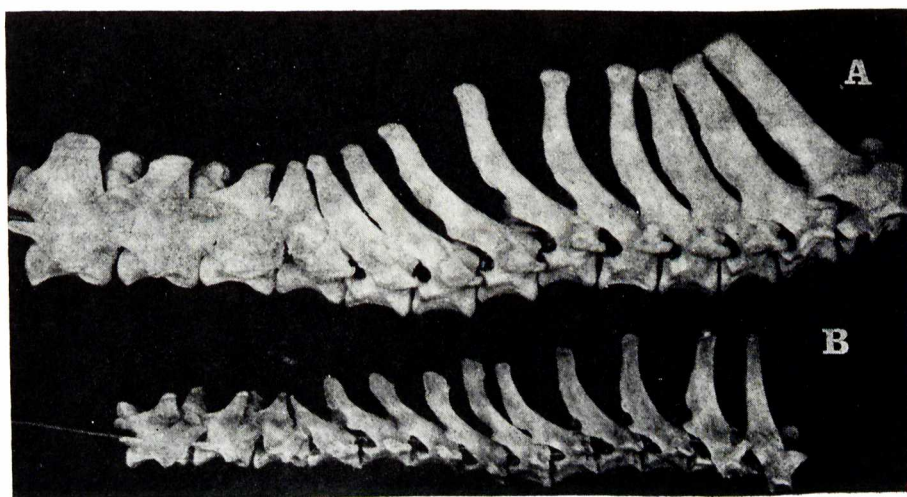


Figure 3. Thoracic vertebrae in the dog (A) and the fox (B)

The thorny offset Th_{10} in the fox was extremely pointed at the top unlike in the dog and it was considerably inclined caudodorsally.

The thorny offsets of the thoracic vertebrae in the dog were much more rounded, i.e. they had a more roundish section unlike in the fox where they were flattened and in the form of thin plates with very sharp cranial and caudal borders. The only exception was in the first few thoracic vertebrae.

The tops of the thorny offsets in the dog were thickened in the form of nodules, while in the fox such nodules were to be found only on the first few vertebrae.

Lumbar vertebrae (Figure 4 A, B). In the fox the lumbar vertebrae were relatively narrower and longer. Most of the lateral ends of

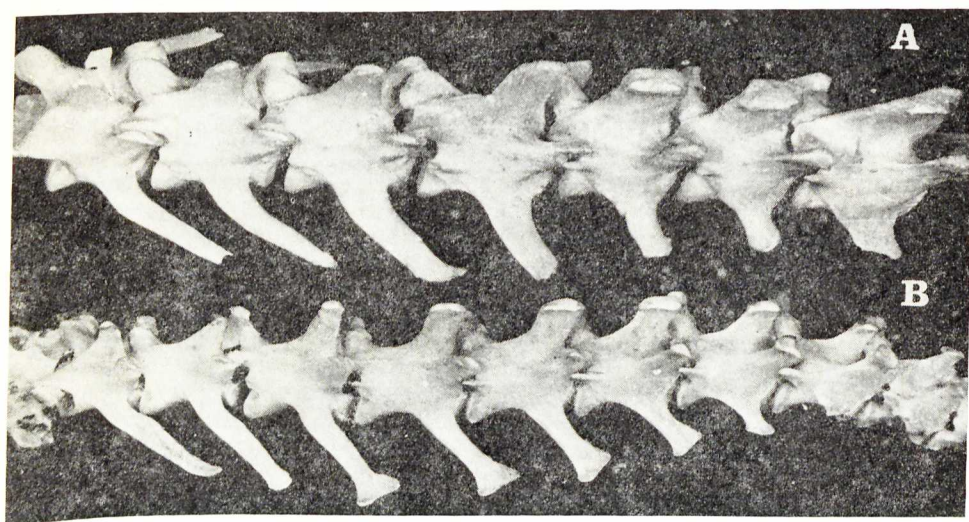


Figure 4. Lumbar vertebrae in the dog (A) and the fox (B), I—VII

the lateral offsets (processus transversi) were relatively wider than in the dog. The lateral offsets were relatively narrower and the spaces between them were wider than in the fox.

Sacral bone. The lateral offset of the final sacral vertebra was relatively longer and more laterally directed in the fox. Arcus vertebrae of the first sacral vertebrae was considerably more cut in caudally in the dog and therefore its spatium lumbosacrale was larger.

Coccygeal vertebrae. The lateral offsets of the first coccygeal vertebrae were more developed in the fox than in the dog.

The ribs and the chest bone in the fox did not differ essentially from the same bones in the dog.

Pelvis (Figures 5, 6 A and B). Eminentia iliopubica (Figure 6 B) in the fox was frequently, relatively or absolutely larger than in the dog (Figure 6 A). In the fox its medial part protruded to a great extent cranially in the

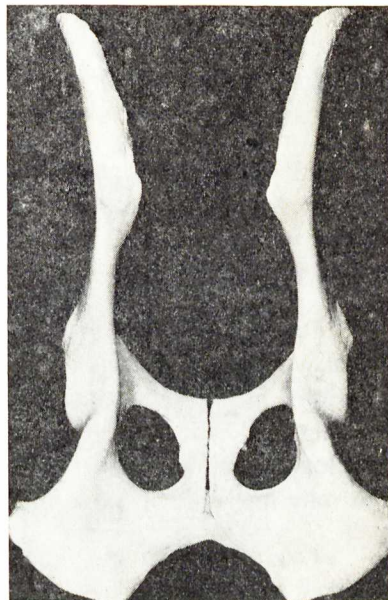
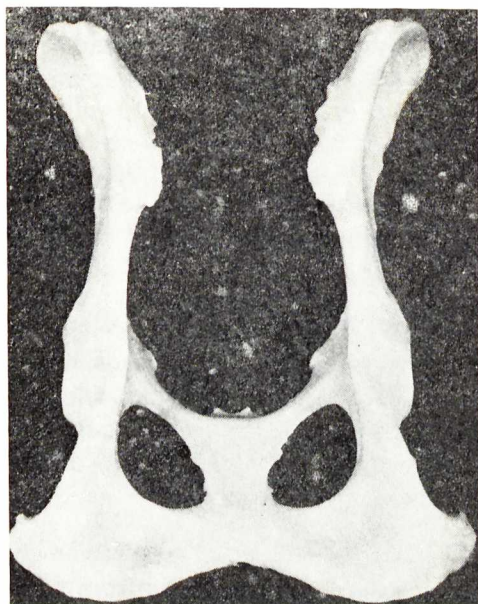


Figure 5. Pelvic bones in the dog (A) and the fox (B); viewed from the dorsal side.

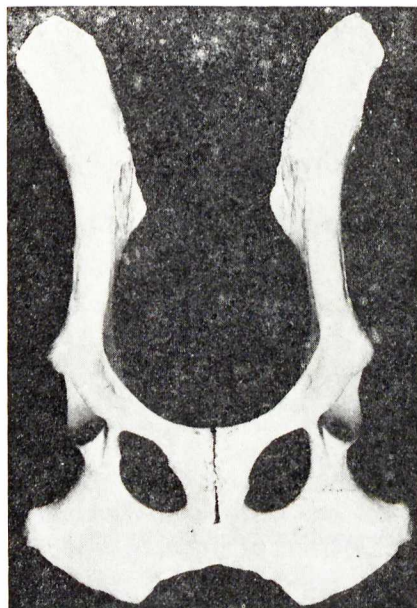


Figure 6. Pelvic bones in the dog (A) and the fox (B); viewed from the ventral side.

form of a characteristic pointed top and it was clearly demarcated from the lateral parts of eminentia. In the dog a specially protruded part on the bony part of eminentia was not prevalent.

Tuberculum m. psoas minoris (Tuberculum psadicum) (Figure 6 B) was extremely well marked in 8 of the 10 investigated foxes, in the form of a clearly marked pointed top. In the dog, it is not usually marked at all, or it was in the form of a low, slightly rounded nodule (Figure 6 A).

Tuberculum pubicum ventrale (Figure 6 B) was very well developed in 5 and well developed in the other 5 foxes. In the investigated dogs it was possible only in one case to find tuberculum pubicum ventrale, while in the others it was not developed at all. The more tuberculum pubicum was developed the more its anterior parts protruded cranially, that is, cranio-ventrally in the form of a pointed top.

Arcus ischiadicus (Figure 5 A and B) is relatively much shallower and wider in the fox than in the dog. On it, somewhat more medially from tuber ischiadicum, in 8 foxes was noticed a small, clearly bordered depression which was oval in form (Figure 7). In the foxes no depression was detected. At the same site in the dog there was no depression at all.

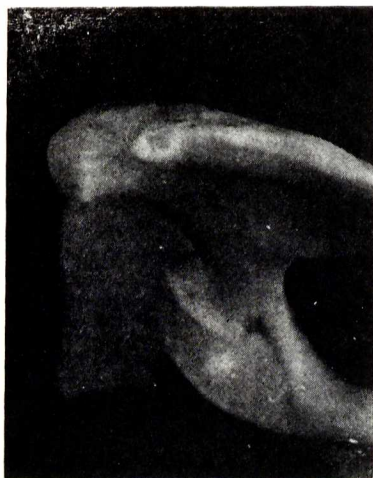


Figure 7. The left pelvic bone (os coxae) in the fox; viewed from the caudal side.

Tabula ossis ischii (Figure 5 A and B) was so thin in the medial part that was transparent in the fox. This was not the case in the dog.

The femur (Figures 8, 9 A and B). Trochanter major (Figure 8 A) in the dog was clearly divided into a considerably larger caudal part and a smaller cranial part. In the fox this division was hardly visible (Figure 8 B). This property represented the greatest difference between the femurs of the fox and the dog. The border of the joint surface caput femoris was

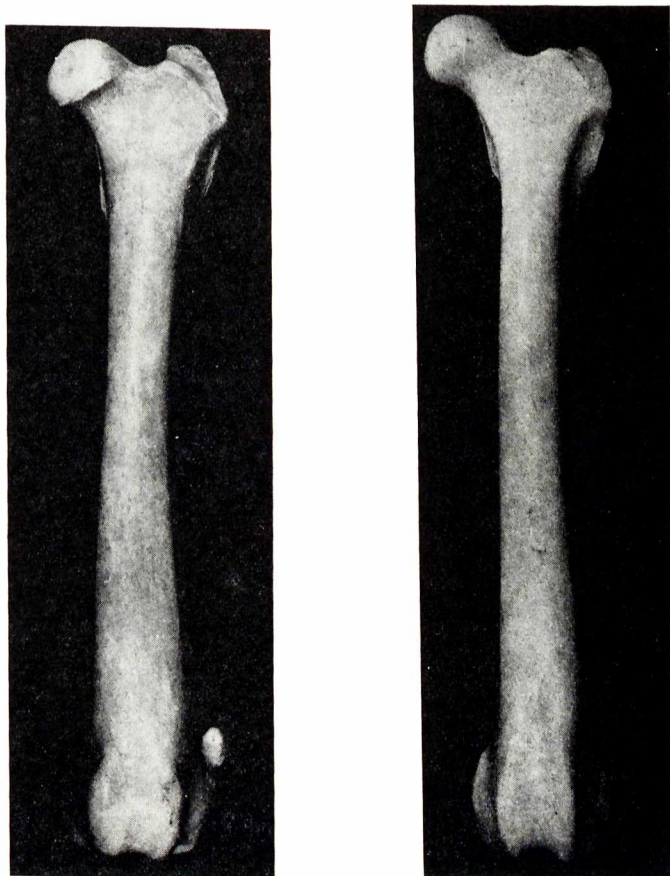


Figure 8. Femur in the dog (A) and the fox (B); viewed from the dorsal side.

commonly marked in the form of a sharp ridge in the dog, while it was slightly rounded in the fox. Fovea capitis in the fox was deeper, more distinctly delineated and, generally speaking, it was better marked than in the dog. The other properties of the femur in the dog and the fox were nearly identical.

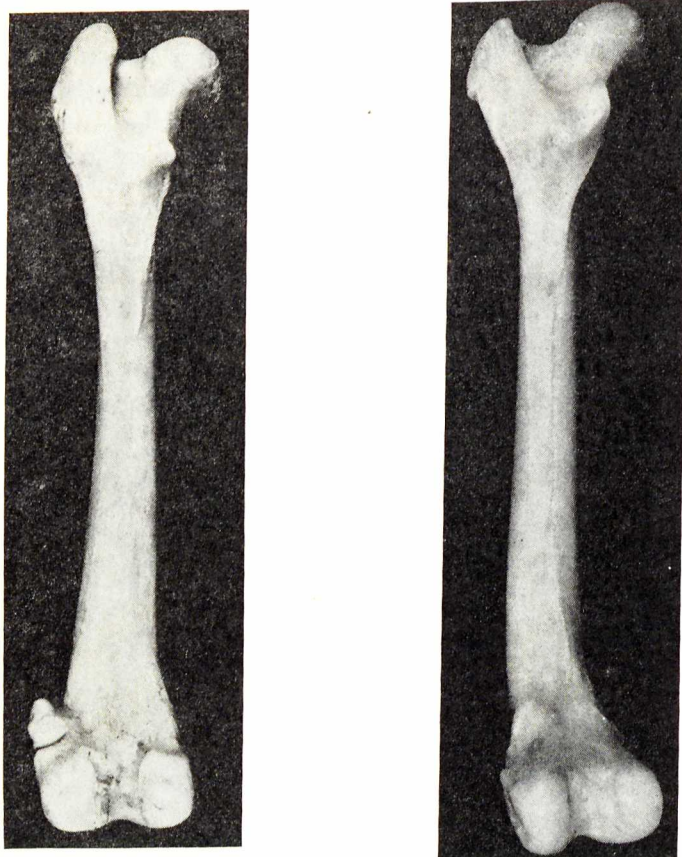


Figure 9. Femur in the dog (A) and the fox (B); viewed from the caudal side.

Ossa cruris. There were no significant differences in *ossa cruris* between the dog and the fox (Figure 10 A and B).

Ossa tarsi et metatarsi and *phalanges digitorum* in the dog and the fox were also very similar, so they cannot be differentiated by their form. However, the size of the bones, to some extent, indicates, that a smaller dog or fox is involved.

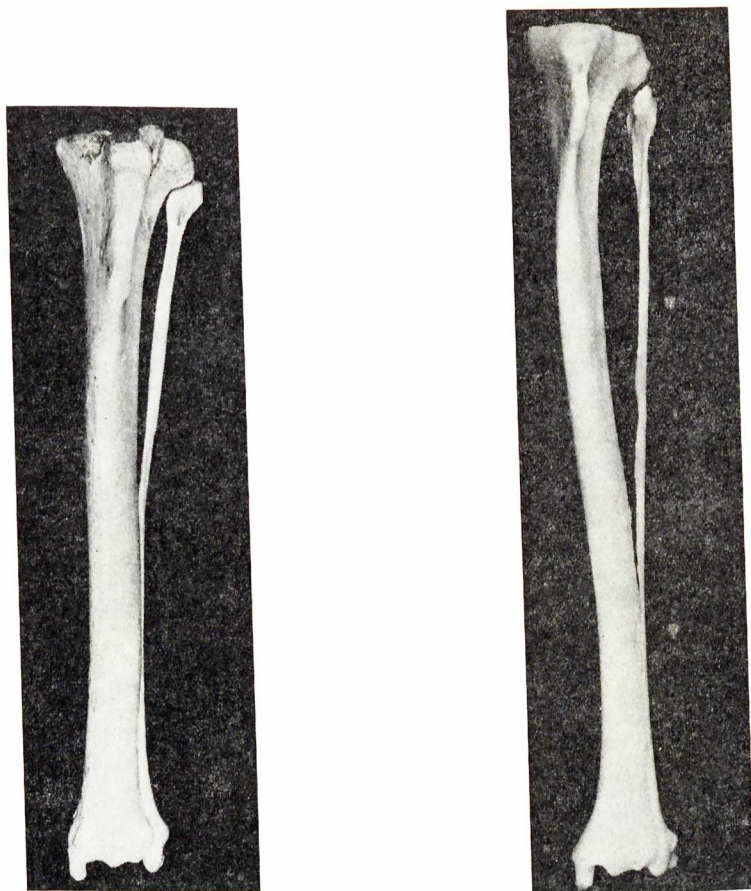


Figure 10. Ossa cruris in the dog (A) and the fox (B); viewed from the dorsal side.

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