

# AN ADDITIONAL HEAD OF THE M. FLEXOR DIGITORUM SUPERFICIALIS FOUND IN A GOAT

V. RAJTOVÁ, J. DANKO

Department of Anatomy and Histology, University of Veterinary Medicine, Košice, Slovak Republic

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## Abstract

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The finding of an additional head for the m. flexor digitorum superficialis on the hind limb of one male goat is documented here. Its possible classification is discussed.

*Hind limb, m. flexor digitorum superficialis, caput accessorium, male goat*

The m. triceps surae occurs on the laterocaudal part of the crus in domestic mammals. In most of them, it consists of the m. gastrocnemius and the m. soleus. Exceptions can be found in the dog family in which the more laterally placed m. soleus is absent (Ellenberger and Baum 1943; Kolda 1950; Koch 1960; Schwarze 1960; Getty 1975; Nickel et al. 1986; Dyce et al. 1987; Evans 1993). In cats, however, this muscle is present at the same place as in other domestic mammals (Nickel et al. 1986; Spoor and Badoux 1989; König 1992). When dissecting the hind limb muscles in some species of carnivores, Spoor and Badoux (1989) found on the lateral part of the m. flexor digitorum superficialis an additional head of various sizes arising from the superficial flexor of digits, and immersing by means of a tendon into the tendo calcaneus communis. On the basis of vascularisation, innervation and topography, Spoor and Badoux (1989) consider this additional head as homologous with the missing m. soleus.

To our knowledge, division of the m. flexor digitorum superficialis in a way similar to that found in the dog or hyena has not been found in domesticated mammals.

## Materials and Methods

A macroscopic dissection of muscles in the regio cruris in 58 adult sheep and 25 goats of both sexes was carried out. Great attention was paid to the m. triceps surae and m. flexor digitorum superficialis.

## Results

In all the sheep and goats, the m. triceps surae consisted of two heads m. gastrocnemius situated on the crural caudal part and a small but distinct m. soleus (Plate I., Fig. 1/c). The muscle belly of the m. flexor digitorum superficialis was homogenous and undivided. Of all the small ruminant material used, there was a well-developed muscular strip on both hind limbs covered by the caput laterale m. gastrocnemii in only one adult male goat. It emerged

### Address for Correspondence:

Prof. MVDr. Viera Rajtová, DrSc.  
Department of Anatomy and Histology  
University of Veterinary Medicine  
Komenského 73  
041 81 Košice, Slovak republic

Phone: +421 95 6229 924  
Fax: +421 95 6323 666  
E-mail: anatomia@vsvnov.uvm.sk

from the perimysium of the lateral part of the belly of the m. flexor digitorum superficialis (Fig. 2/h). Distally, it formed a narrow tendon, which by means of two short branches (Plate II., Fig. 3/c. arrows) terminated in the tendo calcaneus communis close to the tuber calcanei. The source of vascularisation and innervation (Fig. 4/d) originated from the m. flexor digitorum superficialis and tiny branches entered the medial surface of the additional head. They are branches from the a. et v. femoris caudalis and from the n. tibialis.

## Discussion

When comparing the findings of Spoor and Badoux (1989) concerning the presence of the additional head at the m. flexor digitorum superficialis in the dog and hyena with our findings, even if in only one male goat, it has to be stated that they are almost identical with regard to their external morphology, origin, attachment, and blood supply sources. An exception is only m. soleus, which in the male goat was developed to the same extent as in the other sheep and goats used. This muscle, however, is absent in the Canidae and Hyenidae and according to Spoor and Badoux (1989) it is replaced by the additional head of the m. flexor digitorum superficialis.

What name can be given to the additional head for the m. flexor digitorum found in one male goat, when the original m. soleus is present? Is it the case of a doubled m. soleus with a superficial and deep part, or rather a rare presence of the caput accessorium of the m. flexor digitorum superficialis? In the literature (Ellenberger and Baum 1943; Kolda 1950; Koch 1960; Getty 1975; Nickel et al. 1986) or NAV (1994) the caput accessorium at the m. flexor digitorum superficialis on the hind limb has not been reported in domestic mammals, with the exception of Spoor and Badoux (1989) who described it only in the dog and hyena. As in these two carnivore species and in the male goat, the additional head originated from the muscle belly of the m. flexor digitorum superficialis and terminated in the tendo calcaneus communis by two short thin tendons. It has the same source of vascularisation and innervation as the flexor superficialis muscle, which is in a similar state to e.g. the dog.

The presence of the caput accessorium on the m. flexor digitorum superficialis of the hind limb in the male goat tested, will probably have its origin in its prenatal or phylogenetic development.

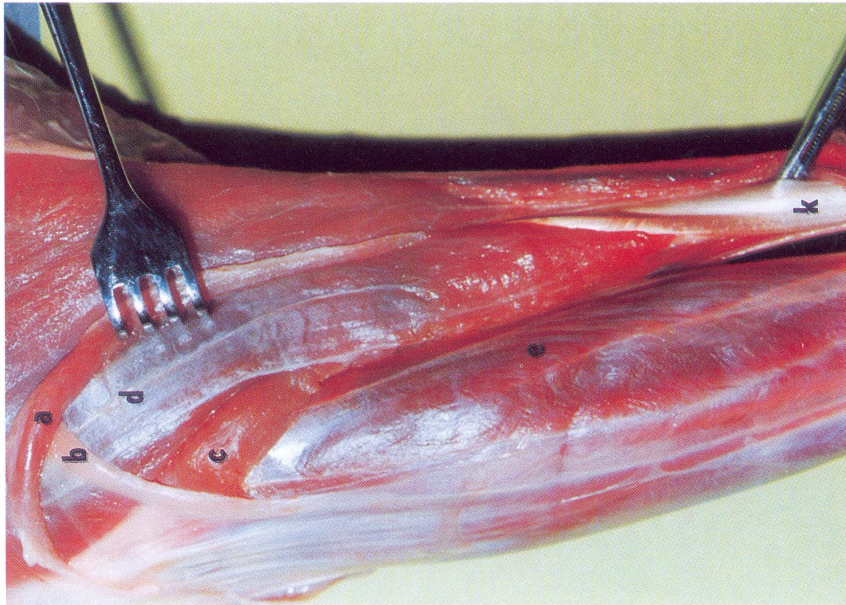
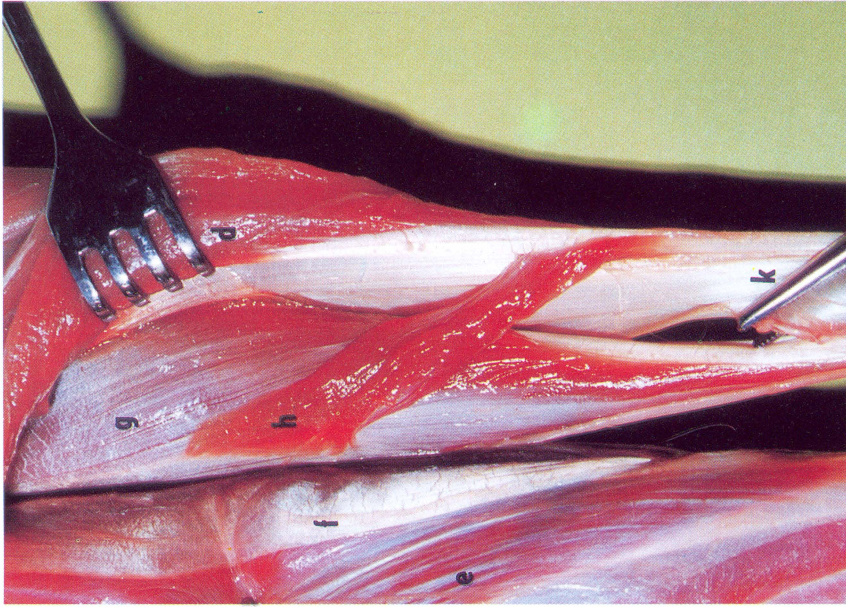
## Nález prídavnej hlavy m. flexor digitorum superficialis u kozy

V práci sa dokumentuje ojedinelý nález prídavnej hlavy m. flexor digitorum superficialis na panvovej končatine u samca kozy. Diskutuje sa jeho možná klasifikácia.

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Figs. 1, 2. Lateral view of the crural muscles of the male goat; Fig. 1 superficial, Fig. 2 deeper layer, a – attachment of the m. gluteobiceps, b – n. peroneus communis, c, d – m. triceps surae, c – m. soleus, d – caput laterale of the m. gastrocnemius, f – m. tibialis caudalis, g – m. flexor digitorum superficialis, h – its additional head, k – tendo calcaneus communis.





Figs. 3, 4. Lateral view of the crural muscles of the male goat; a – caput laterale m. gastrocnemii, b – m. flexor digitorum superficialis, c – its additional head with the two attachment tendons (arrows), d – the branch from a. et v. femoris caudalis, r. muscularis n. tibialis, e – tendo calcaneus communis, f – m. flexor digitorum lateralis.