

THE OVARY AND THE OVIDUCT OF THE GROUND SQUIRREL
(*Citellus citellus*)

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The studies were made on the morphology, topography and arteries of the ovary and oviduct in the ground squirrel. It was established that the ovary lies completely covered by the ovarian bursa, which is deep and wide. It is composed of the mesosalpinx. The ovary is heart-shaped and 3-4 mm in length. Its topographical position is at the lateral border of the psoas major muscle, caudally in relation to the kidney. The right ovary is located at the L4-5 and left one at the L5-6 vertebral level.

The oviduct is a winding body, about 40 mm in length. It is located medially and laterally to the ovary. The uterine ostium has a sphincter which penetrates into the ventrolateral side of the top of the uterine horn. On this place there are weakly developed papilla.

The structures of the ovary and oviduct are very similar to other rodents.

A. ovarica, the branch of the A. utero-ovarica, is the main blood vessel which supplies the ovary and oviduct.

Key words: The ovary, the oviduct, morphology, topography, arteries.

INTRODUCTION

The ground squirrel (*Citellus citellus*) is a rodent, which lives in Yugoslavia, Bulgaria, Austria and Russia. It is a typical hibernant and favourable for investigations of hypothermy and hibernation.

It is used as an experimental animal in parasitology, microbiology and biology.

Within the framework of investigations on the organs and organ systems in the ground squirrel (Stanojević et al., 1982., 1979., 1978., Stanojević, 1965., Nikolić et al. 1990.) the morphology, topography and arteries of the ovary and oviduct of this experimental animal are presented in this paper.

As well, studies were made to compare these organs with those in other experimental animals: the rabbit (Barone et al. 1973), guinea pig (Dumas, 1953.),

golden hamster (Schwarze and Michel, 1959., Michel, 1959.) and rat (Hebel and Stromberg, 1976., Schumacher et al. 1973.).

MATERIAL AND METHODS

A total of 20 adult female ground squirrels, of various ages were examined. After sacrifice the squirrels were bled from the abdominal aorta. The morphology and topography of the ovary and oviduct were studied on fresh and preserved organs. 4% formaldehyde solution was used as the preservative. For histological investigations, fresh organs were isolated and fixed in Bouin's solution. After dehydration in alcohol these organs were infiltrated with paraffin and cut into 5-6 m thick sections. They were thereafter stained with hematoxylineosin.

The blood vessels were examined using preparations injected with minium-stained gelatin and then photographed by the röntgen apparatus.

RESULTS AND DISCUSSION

THE OVARIES are paired glands and heart-shaped (Figure 1). The lateral surface is a little convex and the medial one nearly flat (Figure 1B). The hilus ovarii contains blood vessels, lymph nodes, lymph vessels and nerves. The

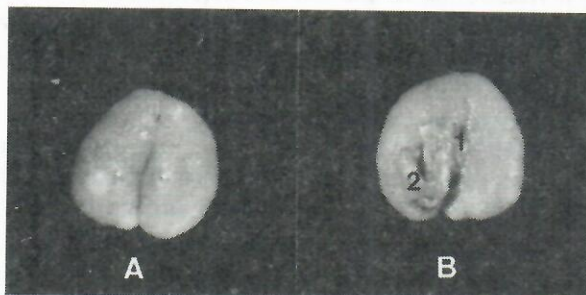


Figure 1. The ovaries of the ground squirrel
A — Facies lateralis, B — Facies medialis, 1 — Hilus ovarii, 2 — Oviduct

ovary of the ground squirrel is 3-4 mm long, similar to the rat (Schumacher et al. 1973.) where the length of the ovary is 3-5 mm. The weight of the two ovaries of the ground squirrel differs. The left is usually heavier, weighing 7-17 mg and the right one 5-15 mg. A single adult ovary of the rat (Schumacher et al. 1973.) is much heavier and weighs about 60 mg. The ovary of the ground squirrel is yellowish in colour and softly-elastic in consistency. Extremitas tubaria is twisted cranio-medially and Extremities uterina caudio-laterally.

The ovary is completely covered with the ovarian bursa (Figure 2₁) which is wide and deep. The ovairan bursa in the ground squirrel is formed of the wide mesosalpinx but in the rat (Hebel and Stromberg, 1976) and the guinea pig (Dumas, 1953.) it is formed of two ligaments: Lig. ovarii proprium and Mesosalpinx. Both ligemants fuse near the tip of the uterine horn.

The right ovary is located at the lateral border of the psoas major muscle at the L₄₋₅ vertebral level, caudally from the right kidney. Hebel and Stromberg, (1976) established that the right ovary in the rat is located 7-12 mm caudally



Figure 2. The ovary and the oviduct of the ground squirrel
1 — Bursa ovarii, 2 — Oviduct, 3 — Cornu uteri

from the right kidney. We were not able to measure this distance in the ground squirrel, owing to contraction of the uterine horn and intestines after sacrifice. In the ground squirrel this ovary contacts the duodenum.

The left ovary lies at the L₅₋₆ vertebral level along the lateral edge of the left psoas major muscle, caudally to the left kidney. In the ground squirrel as in the guinea pig (Dumas, 1953.) the left ovary touches the left colon.

The parenchymatous zone forms a cuplike enclosure for the vascular zone. It is composed of follicles in various stages of development, corpora lutea and connective tissue. Most primary follicles are found singly or in groups near the tunica (Figure 35). Growing follicles are located mainly deeper in the

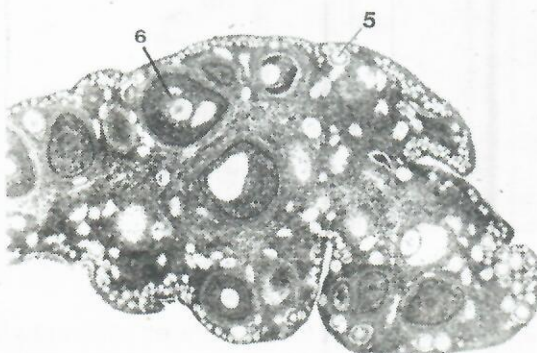


Figure 3. The parenchymatous zone of the ovary
5 — Primary follicle, 6 — Secondary follicle

parenchymatous zone (Figure 3₆). Mature Graffian follicles produce protrusions on the surface of the ovary. The connective tissue is rich in cells and originates from the tunica.

The vascular zone is composed of blood vessels, branches of the A. et V. ovarica and loose connective tissue, rich in fibrous and elastic fibers.

THE OVIDUCT in the ground squirrel is a winding body. Its tuns are situated medially and laterally to the ovary (Figure 4B). All convoluted oviduct winds are linked to the Mesosalpinx. The extended length of the oviduct is about 40 mm in the ground squirrel but in the rat (Hebel and Stromberg, 1976.) it varies from 18 to 30 mm. The infundibulum is funnel-shaped similar to the rabbit (Barone, 1957.) and guinea pig (Dumas, 1953.). A large part of the infundibulum is attached to the ovarian hilus with fimbriae. The final loop of the oviduct penetrates into the ventro-lateral side of the uterine horn. The Ostium uterinum tubae is edged by a sphincter which is topped by a weakly developed papilla.



Figure 4. Topographical position of the oviduct
A — Ovarium, B — Oviduct, C — Cornu uteri

The mucous membrane of the oviduct forms wrinkles which are branched (Figure 5). The muscular fold is made up of smooth muscles which increase in thickness towards the distal part of the oviduct. The circular stratum is stronger than the longitudinal, similar to all rodents (Barone, 1973., Michel, 1959., Hebel and Stromberg, 1976.).

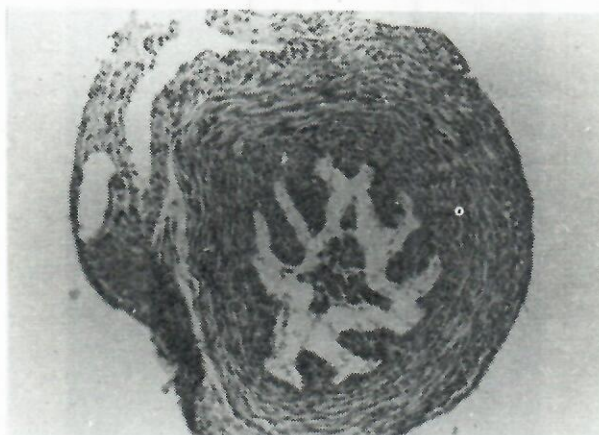


Figure 5. The structure of the oviduct

A. ovarica, the stronger branch of the A. utero-ovarica, is the main artery which supplies the ovary and oviduct. A. utero-ovarica (Stanojević, 1965.) branches from the ventral side of the abdominal aorta, the right branch (Figure 61) 1mm more cranial than the left one. It extends through the Mesovarium, crosses the ureter ventrally and then runs in a curve towards ovary. In front of the ovary A. utero-ovarica is divided into A. ovarica and Ramus uterinus.

A. ovarica is a larger branch than Ramus uterinus and runs in the from of a snake towards the ovarian hilus. In front of it two branches are given off (Figure 62) which go into the hilus and are then continued as Ramus tubarius (Figure 63) to supply the oviduct. Ramus tubarius anastomoses with A. uterina media (Figure 64).

Ramus uterinus is the second branch of A. utero-ovarica. It runs ventrocaudally through the broad ligaments (Stanojević, 1965.) and supplies the cranial part of the uterus. It anastomoses with A. ovarica and A. uterina media.

As in the ground squirrel, in the rabbit (Barone, 1973.) guinea pig (Dumas, 1953.) and rat (Hebel and Stromberg, 1976.) A. ovarica supplies the ovary and oviduct. In the golden hamster (Michel, 1959.) Ramus ovaricus, a branch of A. spermatica interna, supplies the ovary and A. uterina media supplies the oviduct and uterus.

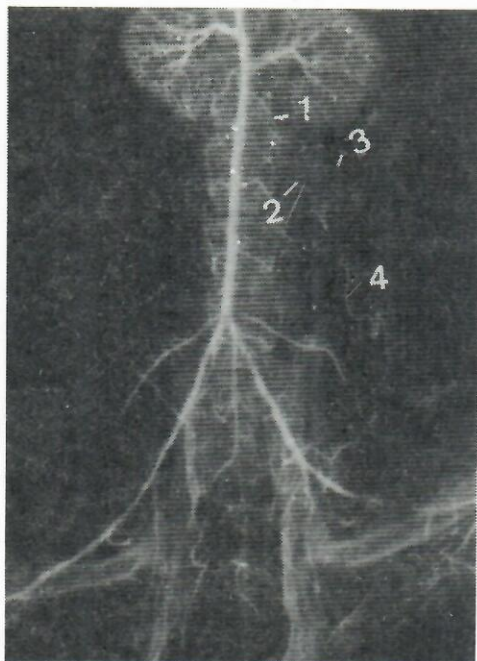


Figure 6. Roentgenogram of the abdominal aorta
 1 — A. utero-ovarica sinistra 2 — ovarica, 3 — ramus tubarius, 4 — A. uterina media

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JAJNIK I JAJOVOD U TEKUNICE (*Citellus citellus*)

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SADRŽAJ

U radu su proučavani morfologija, topografija i arterije jajnika i jajovoda tekunice.

Ustanovljeno je da je jajnik potpuno pokriven sa bursom ovarii. Bursa ovarii je duboka, široka i građena isključivo od Mesosalpinx-a. Jajnik je srcolikog oblika, dužine 3-4 mm. Topografski položaj jajnika pokazuje da se on nalazi uz lateralni rub M. psoas major, kaudalno od bubrega. Desni jajnik leži u visini 4.-5. a levi u visini 5.-6. slabinskog pršljena.

Jajovod je izuvijan, dugačak oko 40mm. Nalazi se medijalno i lateralno oko jajnika. Ostium uterinum tubae ima sfinkter kojim završava na ventrolateralnoj strani vrha roga materice. Na tom mestu uočava se slabo razvijena papila.

Struktura jajnika i jajovoda je slična ostalim glodarima.

Krv u jajnika i jajovod u tekunice dovodi A. ovarica, grana A. utero-ovarica.

