

Резюмета на трудовете
(гл. ас. Давид Господинов Йовчев)

Приложение 8.2. В.4. Хабилитационен труд - научни публикации (не по-малко от 10) в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация

VETERINARSKI ARHIV 82 (2), 193-200, 2012

Ultrasonographic features of the bulbourethral glands in the domestic rabbit (*Oryctolagus cuniculus*)

**Rosen S. Dimitrov*, Penka Y. Yonkova, Kamelia D. Stamatova,
and David G. Yovchev**

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

DIMITROV, R. S., P. Y. YONKOVA, K. D. STAMATOVA, D. G. YOVCHEV: Ultrasonographic features of the bulbourethral glands in the domestic rabbit (*Oryctolagus cuniculus*). Vet. arhiv 82, 193-200, 2012.

ABSTRACT

The aim of the study was to describe some of the ultrasonographic features of domestic rabbit bulbourethral glands, with regard to their relevance to reproductive pathology. The glands of ten sexually mature, clinically healthy, white, male New Zealand rabbits, aged 18 months, with body masses ranging from 2.8-3.2 kg, were investigated following anaesthesia. A perineal sonographic approach was applied. The glands were observed in two planes. They were viewed sonographically as solid, hyperechoic, heterogeneous structures. A hyperechoic gland without a hypoechoic center was visualized in sagittal section. In transverse section, normal bulbourethral glands were visualized dorsolaterally to the bulbar urethra, and a hypoechoic urethra was located ventromedially. As part of the study, the sonographic features of the bulbourethral glands were compared in a liquid isotonic medium. The analogous results of both methods allowed us to propose the use of perineal ultrasonography as a sufficiently definitive, non-invasive method for visualizing rabbit bulbourethral glands.

Key words: bulbourethral glands, ultrasonography, anatomy, rabbit



Original Contribution

**COMPARATIVE IMAGING ANATOMIC STUDY OF DOMESTIC
RABBIT LIVER (ORYCTOLAGUS CUNICULUS)**

**K. Stamatova-Yovcheva^{1*}, R. Dimitrov¹, P. Yonkova¹, A. Russenov², D. Yovchev¹,
D. Kostov¹**

¹Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

²Department of Internal Non-Infectious Diseases, Faculty of Veterinary Medicine, Trakia
University, Stara Zagora, Bulgaria

ABSTRACT

Aim: Comparing results from rabbit liver's ultrasonographic, computed tomographic and anatomical topographic studies.

Object: Nine healthy New Zealand white rabbits, aged 8 months, weighed 2.8 to 3.2 kg were studied. In the ultrasonographic investigation the animals were positioned in supine recumbency. The approach was transabdominal percutaneous hypochondrial.

The abdominal cavity was transversally and sagittally scanned by axial computer tomograph. The animals were positioned in supine recumbency.

In the native anatomical investigation topographic rabbit liver's features were compared with its imaging anatomical findings.

Results: The liver echogenicity was heterogeneous and lower than the close soft tissue structures. The gall bladder's wall was a hypoechoic finding. Cystic duct was observed in its beginning part.

In the computed tomographic study, the liver was a massive, heterogeneous, normodense soft tissue finding. There wasn't visible border between lateral and medial left hepatic lobe and right hepatic lobe.

In the native anatomical study the left and right hepatic lobes, quadrate lobe and gall bladder's parts were found.

Conclusion: The comparative analysis of rabbit liver's imaging anatomical and native transversal study could be applied in the interpretation and diagnosis of many rabbit liver diseases.

Key words: liver, gall bladder, imaging anatomy, cadaver anatomy, rabbit.



Original Contribution

**AGE MORPHOMETRY OF SOME INTERNAL ORGANS IN COMMON
PHEASANT (*PHASIANUS COLCHICUS COLCHICUS*)**

D. Yovchev^{1*}, R. Dimitrov¹, D. Kostov¹, D. Vladova²

¹Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

²Department of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture, Trakia
University, Stara Zagora, Bulgaria

ABSTRACT

AIM: To determine some morphometrical parameters of colchis pheasant internal organs.

MATERIALS: We studied 30 colchis pheasants, divided in three groups (each group was consisted of 5 males and 5 females) at 15, 17 and 19 weeks of age.

METHODS: Following euthanasia and evisceration, the digestive tract was separated in segments, corresponded to its different parts (esophagus, crop, proventriculus, gizzard, small intestine, caeca and rectum). The weight of digestive structures, heart, liver, spleen and testicles was determined by electronic scale and the length of the tubular digestive organs was measured with ruler and graph paper. The results were collected and recorded. The obtained data was processed via variable statistical methods.

RESULTS: The body weight of the female birds was significantly lower than that of the male ones. In males the gizzard's percent decreased significantly through the whole investigative period. The proventriculus and heart proportions were almost the same with age advancing. Females were with heavier livers and spleens than males, but the spleen difference was without statistical significance. The length of the crop, esophagus and intestines had lower values in males, compared to females

CONCLUSION: The older male and female pheasants had significantly shorter tubular digestive organs. The youngest male individuals had heavier liver, compare to the females. These alterations of the morphometrical parameters in the pheasant internal organs are provoked by sex dimorphism influence.

Key words: morphometry, internal organs, pheasant



10 years - ANNIVERSARY EDITION TRAKIA JOURNAL OF SCIENCES

Trakia Journal of Sciences, Vol. 10, No 2, pp 85-90, 2012

Copyright © 2012 Trakia University

Available online at:

<http://www.uni-sz.bg>

ISSN 1313-7050 (print)

ISSN 1313-3551 (online)

Original Contribution

**ANATOMICAL MACROMORPHOLOGICAL FEATURES OF THE LIVER IN
DOMESTIC RABBIT (*ORYCTOLAGUS CUNICULUS*)**

K. Stamatova-Yovcheva*, R. Dimitrov, D. Kostov, D. Yovchev

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

ABSTRACT

AIM: To determine some macromorphological characteristics of the normal liver in rabbits.

MATERIALS: We studied 12 mature, clinically healthy, euthanized rabbits, 8 months of age from New Zealand White breed and weighed between 2.8kg and 3.2kg.

METHODS: Following laparotomy and extirpation of the rabbit liver we studied its topography and linear parameters. The results were collected and recorded. The obtained data was processed via variable statistical methods.

RESULTS: The rabbit liver was situated in the epigastric region, between both costal arches. The caudate process touched the right kidney. The rabbit liver was caudally situated to the diaphragm and extended to the left and right abdominal walls. The left medial and lateral hepatic lobes were parallel to the right one. The quadrate lobe was too small. The gall bladder was cylindrical and didn't reach the ventral edge of the organ. The morphometric investigation showed that the left hepatic lobe was longer and bigger than the right one. The smallest structure in length and height was quadrate lobe. The gall bladder's three parts were with different sizes.

CONCLUSION: The rabbit liver was lobated organ, composed of five lobes. The left hepatic lobe with its medial and lateral parts is with the biggest extent in the organ, while the quadrate lobe is the smallest.

Key words: liver, anatomy, macromorphology, rabbit

Some Heavy Metals' Concentrations in the Metacarpal Bones of Paleontological Cattle from Azmashka Settlement Hill

Dimitar KOSTOV¹, Rosen DIMITROV^{1*}, Kamelia STAMATOVA-YOVICHEVA¹,
Alexandar ATANASOV², Penka YONKOVA¹, Diana VLADOVA³,
Radoslav MIHAYLOV³, David YOVICHEV⁴

¹Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University,
6000 Stara Zagora, Bulgaria

²Department of Animal Husbandry, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria

³Department of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture, Trakia University,
6000 Stara Zagora, Bulgaria

*Corresponding Author: Rosen DIMITROV Department of Veterinary Anatomy, Histology and Embryology, Faculty of
Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria
e-mail: rstefdimitrov46@abv.bg

Geliş Tarihi / Received: 28.09.2012

ABSTRACT

The aim of the present study was to investigate and determine concentrations of some heavy metals in the cattle metacarpal bones, found from Azmashka settlement hill. They belonged to four periods: Early Neolith (EN), Early Halkolith (EH), Late Halkolith (LH) and Early Bronze (EB). The natural bone material was obtained from the archaeological site Azmashka village mound, found 6 km east of Stara Zagora (Bulgaria) and also from the territory of Hrishteni village, following radiocarbonic analysis. In the sampling an atomic absorption spectrophotometry was used. The samples have been burned dry and dissolved in acid until solution with optimal element concentration. Higher concentrations of iron (Fe), copper (Cu), zinc (Zn), manganese (Mn), lead (Pb), chrome (Cr) and magnesium (Mg) were observed. The quantity of Fe, Cu, Zn, Mn and Pb were with higher values at Early Halkolith, compared to the same in the other periods. The highest heavy metals' concentrations were found, as following: iron, cooper, manganese, lead – at Early Halkolith and zink, chrome and magnesium – at Late Halkolith. The lowest heavy metals' concentrations were found, as following: iron, manganese, chrome, magnesium – at Early Neolith and cooper, zink and lead– at Early Bronze. Differences in the other elements' concentrations from the studied periods weren't significant. Qualitative differences influenced by the heavy metals in the bone structure weren't found. The content of heavy metals in the studied metacarpal bone material is considerably high compare to the normal values, mentioned by some researchers studied other species. The trend of concentration increasing is from Early Neolith to Early Bronze. This is due to the metacarpal bone contamination with soil, as which has been polluted from many years by the industrial manufacture of the nitrogen fertilizer.

Key Words: Heavy metal, bones, osteoarchaeology

REGULAR ARTICLE

Growth, rumen development and meat quality in lambs of Blackhead Plevan breed, weaned at 25 and 70 days of age

Miroslav Simeonov^{1*}, Nikolai Todorov², Krum Nedelkov², Stefan Ribarski², Teodora Popova³, David Yovchev², Atanas Kirilov¹ and Ina Stoicheva¹

¹Research Institute of Forage Crops, Plevan, 5800 Bulgaria

²Trakia University, Stara Zagora, 6000 Bulgaria

³Research Institute of Animal Sciences, Kostinbrod, 2232 Bulgaria

Abstract

The objective of this study was to compare the growth rate, rumen development and some quality parameters of carcass and meat in lambs weaned at 25 and 70 days of age. The average live weight gain during experimental period was 268 g per day for suckling lambs and 233 g per day for lambs on dry feed. The difference of 13.1% in daily gain was not significant at $P < 0.05$. The lambs weaned at 25 days of age showed tendency for higher dressing percentage and carcass weight, more separable internal fat, and better carcass fattiness ($P > 0.05$), compared to those weaned at 70 days of age. Therefore it is possible to obtain approximately the same growth in live weight and carcass in lambs weaned at 25 and 70 days of age. The lambs weaned at 25 kg live weight had higher weight of internal organs than the lambs weaned at 70 days, but the difference was significant ($P < 0.05$) only for lung liver, small intestine, thick intestine and rumen. The length and thickness of rumen papillae were higher in lambs weaned at 25 days of age compared to the lambs weaned at 70 days of age ($P < 0.05$). Significantly thicker was the rumen wall in the lambs weaned at 25 days of age compared to the weaned at 70 days ($P < 0.05$).

Key words: Body weight gain, Early weaning, Lambs, Meat chemical composition, Rumen histology

Importance for experiments in human medicine of imaging modalities for macroanatomical and histological study of rabbit suprarenal glands¹⁾

OMER GURKAN DILEK, ROSEN STEFANOV DIMITROV*,
KAMELIA DIMCHEVA STAMATOVA-YOVCHEVA*,
DAVID GOSPODINOV YOVCHEV*, RADOSLAV MIHAYLOV**

Department of Anatomy, Faculty of Veterinary Medicine, Mehmet Akif Ersoy University, Burdur, Turkey

*Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

**Department of Animal Morphology, Physiology and Nutrition, Faculty of Agriculture,
Trakia University, 6000 Stara Zagora, Bulgaria

Received 21.03.2019

Accepted 06.05.2019

Dilek O. G., Dimitrov R. S., Stamatova-Yovcheva K. D., Yovchev D. G., Mihaylov R.

Importance for experiments in human medicine of imaging modalities for macroanatomical and histological study of rabbit suprarenal glands







Summary

The morphological characteristics of the rabbit adrenal glands are currently investigated using routine imaging modalities. The aim of the study was to collect and interpret major findings and information in the literature on the rabbit as an animal model for investigations in humans. The suprarenal glands of thirty-four mature, clinically healthy New Zealand rabbits were studied using anatomical, routine histology, radiology, computed tomography, ultrasonography, and magnetic resonance imaging methods. The results demonstrated that the rabbit suprarenal glands are paired ellipsoid organs. The right gland was close to the right kidney, whereas the left gland was located at a distance from the left kidney. The capsule was composed of dense connective tissue. The parenchyma consisted of three zones: zona glomerulosa, zona fasciculata, and zona reticularis. The medulla was in the center of the glandular parenchyma. The glands' radiological and CT features defined their position relative to the right and left kidneys. The right suprarenal gland was with normal attenuation. The left suprarenal gland was located at a distance from the left kidney. The US features of the glands demonstrated variability in darkness and contrast, revealing specific histological features. The MRI peculiarities of the glands defined them as well visible findings.

Keywords: rabbit, suprarenal glands, imaging modalities, anatomy, histology



Feeding dihydroquercetin and vitamin E to broiler chickens reared at standard and high ambient temperatures

Vasil Radoslavov Pirgozliev ^a, Stephen Charles Mansbridge ^a,
Conor Andrew Westbrook^a, Sarah Louise Woods^a, Stephen Paul Rose ^a,
Isobel Margaret Whiting^a, David Gospodinov Yovchev^b, Atanas Georgiev Atanasov^{c,d,e,f},
Kristina Kljak^g, Genoveva Petrova Staykova^h, Sonya Georgieva Ivanova ⁱ,
Mehmet Reşit Karakeçili^j, Filiz Karadaş ^k and José Henrique Stringhini ^k

^aThe National Institute of Poultry Husbandry, Harper Adams University, Shropshire, UK; ^bFaculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria; ^cLudwig Boltzmann Institute for Digital Health and Patient Safety, Medical University of Vienna, Vienna, Austria; ^dInstitute of Genetics and Animal Biotechnology of the Polish Academy of Sciences, Magdalenka, Poland; ^eInstitute of Neurobiology, Bulgarian Academy of Sciences, Sofia, Bulgaria; ^fDepartment of Pharmacognosy, University of Vienna, Vienna, Austria; ^gFaculty of Agriculture, University of Zagreb, Zagreb, Croatia; ^hAgricultural Institute, Shumen, Bulgaria; ⁱAgricultural Academy, Sofia, Bulgaria; ^jDepartment of Animal Science, Yuzuncu Yil University, Van, Turkey; ^kUniversidade Federal De Goias, Goiania, Brazil

ABSTRACT

The use of natural antioxidants, in particular polyphenols such as dihydroquercetin (DHQ), in animal nutrition has recently increased in popularity. This may partly be due to the risk of increased incidences of heat stress associated with raising livestock in warmer ambient temperatures, facilitated by global warming, reducing antioxidant capacity. The current research demonstrates the effect of dietary DHQ, vitamin E and standard or high ambient temperatures on growth performance, energy and nutrient metabolism, gastrointestinal tract (GIT) development, jejunal villus morphometry and antioxidant status in broiler chickens. Each of the four experimental diets was fed to 16 pens of five birds, which were allocated to four rooms (four pens in each room). The temperature in two rooms was maintained at a constant 35°C (high temperature; HT), and the temperature in the other two rooms was gradually reduced from 27°C at 7 d of age to 22°C at 20 d of age (standard temperature; ST). Rearing birds at HT reduced feed intake, weight gain, weight of small intestine, total GIT, liver, spleen, heart, villus height, villus surface area and lowered blood glutathione peroxidase (GSH-Px). Dietary DHQ increased blood GSH-Px and total antioxidant status, increased heart weight and reduced caecal size. When fed separately, DHQ and vitamin E improved hepatic vitamin E concentration. Feeding vitamin E increased spleen and liver weights. When fed together, DHQ and vitamin E reduced villus height, villus height to crypt depth ratio and villus surface area. Temperature and antioxidants did not affect energy and nutrient metabolism. There were no effects of dietary antioxidants on growth performance of broiler chickens and there were no mortalities. At present, it is unclear if feeding antioxidants (in particular DHQ) at different levels, using different dietary formulations, and rearing birds under a range of environmental conditions may be effective at enhancing production performance and bird health in hot ambient climates.

ARTICLE HISTORY

Received 3 June 2020
Accepted 2 September 2020

KEYWORDS

Broilers; dihydroquercetin;
environmental temperature;
glutathione peroxidase;
growth; performance;
vitamin E



The effect of selenium source on the oxidative status and performance of broilers reared at standard and high ambient temperatures

S. L. Woods^a, S. P. Rose^b, I. M. Whiting^a, D. G. Yovchev^b, C. Ionescu^c, A. Blanchard^c and V. Pirgozliev^b

^aNational Institute of Poultry Husbandry, Harper Adams University, Newport, Shropshire, UK; ^bFaculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria; ^cPancosma, Rolle, Switzerland

ABSTRACT

1. This study investigated the oxidative status of broilers fed diets containing selenium (Se) from 14 to 35 d of age and reared at two different constant temperatures. Measurements of oxidative status included blood glutathione peroxidase (GSH-Px) and plasma total antioxidant status (TAS). Other variables included feed intake (FI), weight gain (WG), feed conversion ratio (FCR), Se levels in breast and liver tissue, jejunal villus morphometry, percentage weight of organs in relation to body weight; apparent metabolisable energy adjusted for nitrogen (AMEn); dry matter retention (DMR); fat retention (FR) and nitrogen retention (NR).

2. The experiment started at 14 d of age, when 240 birds were randomly allocated to 48 pens (12 pens in four rooms). Treatments included a control diet 1 (SFC; 209.4 g/kg CP and 12.98 MJ/kg ME and no added Se containing saturated fat); diet 2 (SFSe) the control plus 12.605 mg/kg Se additive; diet 3 (USFC) was a second control diet (208.2 g/kg CP and 13.10 MJ/kg ME with no added Se containing unsaturated fat as rapeseed oil); diet 4 (USFSe) was the latter control plus 12.605 mg/kg Se additive. Two rooms were kept at a standard temperature of 20°C (ST) and two rooms were kept at high temperature of 35°C (HT).

3. A temperature x Se interaction existed for GSH-Px in birds reared at ST ($P < 0.05$), and these birds had the highest levels of Se in liver tissue ($P < 0.05$). Fat x Se interactions were evident in breast tissue with highest levels in USFSe ($P < 0.05$). Adding Se improved jejunal VH: CD in USFSe fed birds ($P < 0.001$).

4. Birds reared at ST had higher FI and WG than those reared at HT ($P < 0.001$), and had lower FCR than those reared at HT ($P < 0.05$). AMEn (MJ/kg DM) and FR were higher in birds fed USF diets, and lowest in birds fed SF ($P < 0.50$ and $P < 0.001$ respectively). NR was highest in birds raised at ST ($P < 0.50$).

5. Broiler growth performance was reduced by HT. Oxidative status and Se in liver tissue was improved by adding Se in both diets.

ARTICLE HISTORY

Received 28 May 2020
Accepted 4 August 2020

KEYWORDS

Rearing temperature;
selenium; antioxidant; FCR;
unsaturated fat

Adrenal Glands of *Chinchilla lanigera* - Study of Anatomical Features with Computed Tomography and Magnetic Resonance Imaging

Ömer Gürkan Dilek¹, Mehmet Erşen², Rosen Dimitrov³, Kamelia Stamatova-Yovcheva³, Seyyid Said Sabancı⁴, David Yovchev³ & Emine Karakurum¹

ABSTRACT

Background: Since chinchilla (*Chinchilla lanigera*) is frequently used as a laboratory animal, satisfactory data about the imaging anatomical appearance of its adrenal glands, such as their anatomical location and closeness with other abdominal soft tissue and vessels, are important. The aim of this study to determine anatomical features of the chinchilla adrenal gland's using computed tomography and magnetic resonance imaging.

Materials, Methods & Results: We used 12 chinchillas (6 males and 6 females), aged 18 months. The animals were in supine recumbency when contrast-enhanced computed tomography (CT) was performed. Transverse, sagittal and dorsal images of the adrenal glands were obtained with iodinated contrast medium, and 3D reconstruction of the obtained images was applied. The craniocaudal (CrCc - length), dorsoventral (DV - height) and lateromedial (LM - width) diameters were measured using an electronic calliper. Magnetic resonance imaging was performed, and coronal T1-weighted images were obtained. The transverse CT anatomical image at the level of the 3rd lumbar vertebra demonstrated the location of the both adrenal glands in accordance with the grey-white scale's variation. The right adrenal gland was hypo-attenuated and elliptic compared to the right kidney and in close contact to it and to the caudal vena cava. The left adrenal gland was oval and at a distance to the abdominal aorta. The dorsal MRI anatomical study of the chinchilla's abdominal organs at a distance of 10 mm from the spine and in a T1-weighted sequence showed that both adrenal glands were retroperitoneal organs.

Discussion: Post-contrasted CT defined the topography of both glands. The right adrenal gland has an oval shape and is cranially situated to the left gland, whose shape is cylindrical and elongated. The LM diameter of the right gland is higher than that measured in the left gland. Both DV and CrCc diameters of the right gland are lower compared to those of the left gland. The right adrenal gland is in close contact to the caudal vena cava, the right kidney and the liver, and the left adrenal gland is in a distance to the abdominal aorta. The right adrenal gland was close to the caudal vena cava and the right kidney and medially to the left kidney. The successful comparative analysis of the images in 3D reconstruction and post-contrast CT in 2D allowed us to conclude that 3D reconstruction is suitable to obtain detailed information in a summary form regarding the closeness of the glands and their shape, mainly because the results are in a real time and highly comprehensive. Our data are in agreement with previous findings about the advantages of 3D reconstruction. The research algorithm applied was based on the dorsal visualization of the glands in T1-weighted sequence, achieving a comprehensive and high-quality MRI imaging of the examined organs in chinchillas. Both adrenal glands were retroperitoneal organs and with low signal. The dorsal MRI anatomical study of the chinchilla's abdominal organs at a distance of 10 mm from the spine and in a T1-weighted sequence showed the whole profile of the right and left glands and the cranial position of the right gland to the left one, the close contact between the right gland and the kidney and the distance between the left gland and the left kidney. The MRI results are detailed and comprehensive for interpretation. In conclusion, the results of the present study are comprehensive, detailed and with high resolution. We present data for the anatomical relationships of the studied organs, their shape and macrometric parameters, concluding that the above mentioned modalities are very important tools for studying the chinchilla's adrenal glands to create a morphological base, which is necessary to investigate specific diseases.

Keywords: adrenal glands, chinchilla, CT, imaging anatomy, MRI, 3D reconstruction

DOI: 10.22456/1679-9216.122142

Received: 15 March 2022

Accepted: 30 June 2022

Published: 24 July 2022

¹Department of Anatomy, Faculty of Veterinary Medicine, Burdur Mehmet Akif Ersoy University, Burdur, Turkey. ²Department of Radiology, Bucak State Hospital, Bucak, Burdur. ³Department of Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria. ⁴Department of Anatomy, Faculty of Milas Veterinary Medicine, Muğla Sıtkı Koçman University, Milas/Muğla, Turkey. CORRESPONDENCE: E. Karakurum [ekarakurum@mehmetakif.edu.tr]. Department of Anatomy, Faculty of Veterinary Medicine, Burdur Mehmet Akif Ersoy University. 15300 Burdur, Turkey.

Приложение 8.2. Г.7. Статии и доклади, публикувани в научни издания, реферирани и индексирани в световноизвестни бази данни с научна информация

Bulgarian Journal of Veterinary Medicine (2010), **13**, No 1, 13–17

**LOCALIZATION AND ACTIVITY OF TISSUE
LIPOPROTEIN LIPASE IN FELINE PROSTATE GLAND**

**R. DIMITROV, P. YONKOVA, K. STAMATOVA,
D. YOVCHEV & N. TSANDEV**

Department of Veterinary Anatomy, Histology and Embryology, Faculty of
Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

Summary

Dimitrov, R., P. Yonkova, K. Stamatova, D. Yovchev & N. Tsandev, 2010. Localization and activity of tissue lipoprotein lipase in feline prostate gland. *Bulg. J. Vet. Med.*, **13**, No 1, 13–17.

Tissue lipoprotein lipase (LPL) activity has been studied in prostate glands of 7 adult male European shorthair cats on cryostat cross sections by the Tween technique. The highest activity was observed at the luminal surface of the glandular epithelium, its apical parts, as well as in the lumen of glandular tubules of prostate body. A moderate intensity of LPL expression was found out in the basal parts of parenchymal epithelial cells. The enzyme was slightly expressed in the stroma of the gland, whereas no LPL activity was detected in the glandular capsule. The results provided evidence for a predilection in tissue LPL localization in epithelial components of the glands, as well as for higher enzyme activity in the luminal part of the epithelium, thus presuming a role of LPL in the lipid metabolism of glandular parenchyma, in the production and excretion of lipid products into the tubuloalveolar lumen.

Key words: cat, lipoprotein lipase, prostate gland

Effect of the addition of VemoZim F (phytase) to diets with decreased content of phosphorus on the microstructure of tibia in broiler chickens

V. Georgieva ^{1*}, D. Yovchev ², A. Atanasov ³

¹Department of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture, Trakia University, 6000 Stara Zagora, Bulgaria

²Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria

³Department of Animal Husbandry, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria

Abstract. *The subject of the study was to investigate the effect of the addition of different doses of the new Bulgarian enzyme preparation – VemoZim F (activity 5000 FTU/g) to wheat-corn-soyabean meal diets, with 30% decreased content of available phosphorus on the microstructure of tibia in broiler chickens. The experiment was performed with 180 one-day-old male chick broilers (Ross 308), up to the age 38 days, bred in battery cages, distributed in 5 groups, with 36 numbers in each one, equalized by body weight. The chicks from the control group obtained balanced diet, according to the requirements of the used hybrid, and these from the experimental groups, with 30% deficit of phosphorus diets (0,35, 0,32 and 0,30% in the starter, grower and finisher, respectively). The compound feed of IInd group of chicks was without addition of VemoZim F, compared to IIIrd, IVth and Vth experimental groups, in whose diets, 150 g/t of VemoZim F was added correspondingly (recommended dose, providing 750 FTU/kg feed), 1500g/t of the investigated additive (10 times higher dose of phytase) and in the chicks from Vth group 100 times more phytase than the recommended dose via the addition of 1500 g/t concentrate of phytase in VemoZim. The results of the histological analysis of tibial bone epiphysis showed, that in chickens that received 30% reduced content of available phosphorus without addition of VemoZimF, diversions in the ossification processes were observed, characteristic of phosphorus deficiency compared to the control. Remarkable differences in the chicken tibial microstructure from the control group and those that obtained 150 g/t VemoZimF (recommended dose, providing 750 FTU/kg feed) weren't found. The increased level of phytase 10 and 100 times (respectively, 7 500 and 75 000 FTU/kg feed) in the chicken diet compared to the experimental group led to different degree of structure alterations, with identical kind and localization in the epiphyseal cartilage of the tibial bones.*

Keywords: broilers, phytase, microstructure, tibial bones.

EVALUATION OF THE AGE WEIGHT AND SOME MORPHOMETRICAL PARAMETERS OF THE GLANDULAR STOMACH AND GIZZARD BRONZE TURKEY (*MELEAGRIS MELEAGRIS GALLOPAVO*)

D. YOVCHEV, D. DIMITROV and G. PENCHEV

Trakia University, Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, BG - 6000 Stara Zagora, Bulgaria

Abstract

YOVCHEV, D., D. DIMITROV and G. PENCHEV, 2013. Evaluation of the age weight and some morphometrical parameters of the glandular stomach and gizzard bronze turkey (*Meleagris Meleagris Gallopavo*). *Bulg. J. Agric. Sci.*, 19: 1130-1133

The aim of the study was evaluation of the age related development of the bronze turkey glandular stomach and gizzard. The obtained data gave information about the standard actual values of the metric parameters in the investigated organs. Ruler, graph paper and automatic scale studied the glandular stomachs and gizzards of sixty healthy clinically bronze turkeys (thirty males and thirty females) metrically. The birds were distributed in ten age related groups at the 1st, 7th, 14th, 28th, 35th, 49th, 56th, 90th, 120th and 240th days of age. Each group consisted of six turkeys. The absolute and relative weight and length were determined. During the period the absolute weight of the bronze turkeys' glandular stomachs and gizzards increased respectively by 43 and 70 times. The relative weight of both organs was with highest values at the 7th day of age. Their relative length reached peak values at the 1st day. The obtained results gave a motivation to make the conclusion that the development of the bronze turkey gizzards' weight and length were higher than the same of the glandular stomachs from hatching to the sexual maturity. Both structures development was more intensive than the body weight of the birds through the early growing period.

Key words: birds, digestive system, morphometry, weight, length

Ultrasound Anatomical Visualization of the Rabbit Liver

Kamelia Stamatova-Yovcheva^{*}, Rosen Dimitrov, David Yovchev,
Krassimira Uzunova, Rumen Binev

Trakia University, Faculty of Veterinary Medicine, 6000 Stara Zagora, Bulgaria

Abstract

The topic was to investigate the anatomical features of the rabbit liver by two- and three-dimensional ultrasonography. Eighteen sexually mature healthy clinically New Zealand rabbits aged eight months were studied. Two-dimensional ultrasonographic anatomical image of the rabbit liver presented it in the cranial abdominal region as a relatively hypoechoic finding. Its contours were regular and in close contact with the hyperechoic diaphragm. Liver parenchyma was heterogeneous. The gall bladder was visualized as an oval soft tissue structure, filled with anechoic content. Its walls were hypoechoic. Two-dimensional ultrasonographic anatomical image of left hepatic lobe was sharply distinguished to right hepatic lobe's outlines. In three-dimensional ultrasonographic anatomical study, the organ image was in three orthogonal planes. Its relief was regular and uninterrupted. Left hepatic lobe was found on the left and the right hepatic lobe was a soft tissue point for gall bladder position. Left and lateral was left lateral hepatic lobe. It was covered partly by left medial hepatic lobe. The right hepatic lobe was visualized as a single structure. The gall bladder was an oval finding. Its walls were hyperechoic and regular, without roughness. The results could be used as a base for modern interpretation of rabbit liver anatomy.

Keywords: anatomy, liver, rabbit, ultrasound

Anatomical and Ethological Changes in Poultry Affected by Osteopetrosis

**Krassimira Uzunova^{*}, Kamelia Stamatova-Yovcheva, Vanya Dimova,
David Yovchev, Mehmed Halil**

Trakia University, 6000-Stara Zagora, Bulgaria

Abstract

An integral veterinary hygiene survey in a farm rearing stock layers, 4 months of age, has been performed to throw light on the unknown etiology of sporadic osteopetrosis outbreaks. Observations (ethological and anatomical) were conducted to evidence the development of the disease. The welfare of affected birds was assessed as poor after detailed analysis of all elements of housing environment. This was the cause for the development of the severe illness regardless of the fact that birds were preliminary vaccinated

Keywords: anatomical and ethological changes, osteopetrosis, poultry, welfare

Light microscopy of the adipose tissue distribution along the coronary branches in the myocard of the New Zealand White rabbit

D. Vladova^{1*}, D. Yovchev², R. Dimitrov², M. Stefanov¹, P. Hristov³

¹Department of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture, Trakia University, 6000 Stara Zagora, Bulgaria

²Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria

³Student of Animal Science, Faculty of Agriculture, Trakia University, 6000 Stara Zagora, Bulgaria

Abstract. *The New Zealand White rabbit (*Oryctolagus cuniculus*) is bred as a laboratory animal, pet and last but not least for meat production. It is prone to accumulating a lot of fat and muscle. The aim of the study is to examine the morphological nearness of the myocardial coronary branches with adipocyte depots in rabbits by means of optical microscopy. Histological preparations were made from the walls of rabbit hearts and were studied through light microscopy. The spread of adipose tissue along the coronary branches in the cardiac muscle was examined. Subepicardially the coronary branching is attended by vast fat depots. However, intramurally it is free from adipocytes.*

Keywords: light microscopy, adipose tissue, coronary arteries, myocard, rabbit

Histological definition for the gray scale ultrasonography of the rabbit liver

Kamelia Stamatova-YOVCHEVA*, Rosen DIMITROV*, David YOVCHEV*,
Diyana VLADOVA*, Omer Gurkan DILEK**, Radoslav MIHAYLOV***

Abstract: The aim of the present study is to prove that the morphological and histological features of the rabbit liver are base for the creation of proper anatomical US image. For the purpose, we use 12 clinically healthy New White Zealand rabbits. In the histological study, we use the routine staining with Hematoxylin/Eosin. The US study was carried out with ultrasonic equipment for 2D visualization. The US image of the rabbit liver was produced by the different acoustic impedance of the tissues, which composed the organ. The variability of the grey and white nuances when observing the anatomical US image of the rabbit liver is produced by its histological features. It is not relative to the orientation of the transducer to the field of study. There was a variability of the US acoustics of the liver at the same intensity of the US wave. This is also owing to the histological features of the liver and biliary ducts. US visualization of the rabbit liver is because of the dispersion character of the echo-signal, generated by parenchyma, perivascular connective tissue and extrahepatic biliary ducts. The different acoustics of *capsula fibrosa* and liver parenchyma is related to the following US indices: brightness and contrast, in accordance to the grey-

white scale, a variety of the grey nuance and speed of the US wave. We present the following conclusion: The US morphological character of the studied organ is defined by its histological features. These histological features of the liver could be accepted as "Golden standard", because they define the US anatomical visualization of the organ.

Keywords: Rabbit, liver, histology, ultrasonography.

Tavşan karaciğerinin gri skala ultrasonografisi için histolojik olarak tanımlanması

Öz: Bu çalışmanın amacı, tavşan karaciğerinin morfolojik ve histolojik özelliklerinin uygun anatomik ultrason (USG) görüntüsünün elde edilmesi için referans teşkil edebileceğini kanıtlamaktır. Bu amaçla, çalışmada 12 adet klinik olarak sağlıklı Yeni Zelandalı tavşanı kullanılmıştır. Histolojik incelemede, Hematoksilen / Eozin rutin boyama yöntemi kullanılmıştır. Ultrason çalışması ise 2D görselleştirme için ultrasonik ekipmanlarla gerçekleştirilmiştir. Tavşan karaciğerinin ultrason görüntüsü, organı oluşturan dokuların farklı akustik empedansı ile üretilmiştir. Tavşan karaciğerinin anatomik USG görüntüsü gözlemlenirken oluşan gri ve beyaz nüansların değişkenliği ise histolojik

* Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria.

** Department of Anatomy, Faculty of Veterinary Medicine, University of Mehmet Akif Ersoy, Örtülü, 15030 Burdur, Turkey.

*** Department of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture, Trakia University, 6000 Stara Zagora, Bulgaria.



INVESTIGATION OF ALKALINE PHOSPHATASE EXPRESSION IN THE SMALL INTESTINES OF THE BRONZE TURKEY (*MELEAGRIS GALLOPAVO*)

D. Yovchev*, G. Penchev

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary
Medicine, Trakia University, Stara Zagora, Bulgaria

ABSTRACT

The aim of our investigation was to study the expression of the enzyme Alkaline phosphatase in the small intestines of the bronze turkey in the age aspect. Forty clinically healthy bronze turkeys (twenty males and twenty females) were studied. The groups of the birds were at age 1, 7, 14, 28, 35, 49, 56, 90, 120, and 240 days. Each group consisted of five males and five female birds. The enzyme's expression was investigated by Gomori staining. The most significant expression of tissue alkaline phosphatase was observed in the epithelial cells of the duodenum. It was weaker in the jejunum and weakest in the ileum. In the three intestinal segments, high enzyme activity was observed during the first weeks of hatching (from the 1st to the 14th day in the duodenum and ileum, and from the 1st to the 28th day in the jejunum).

Key words: bronze turkey, alkaline phosphatase, small intestines, histochemistry



Sagittal anatomic investigation of the rabbit liver

Kamelia Stamatova-Yovcheva¹, Rosen Dimitrov¹, Ömer Gurkan Dilek², David Yovchev¹

¹Department of Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, Stara Zagora/BULGARIA

²Department of Anatomy, Faculty of Veterinary Medicine, Burdur Mehmet Akif Ersoy University, Burdur/TURKEY

Key Words:

rabbit
liver
sagittal topography
anatomy

Received : 31.01.2021
Accepted : 20.03.2021
Published Online : 30.04.2021
Article Code : 871506

Correspondence:
K. STAMATOVA-YOVCHEVA
(kameliastamatovayovcheva@gmail.com)

ORCID
K. STAMATOVA-YOVCHEVA : 0000-0002-1121-0033
R. DIMITROV : 0000-0002-5308-838X
ÖG. DİLEK : 0000-0002-5717-3928
D. YOVCHEV : 0000-0003-4357-0858

ABSTRACT

The aim of the research was to study the topography of the liver and to image on computed tomography of the white New Zealand rabbit. We used ten rabbit cadavers. We obtained sagittal frozen cuts. At the level of the plane 10 mm to the left, the left medial lobe was cranial to the left lateral lobe. Caudally were the spleen, the left kidney and parts of the small and large intestines. At the level of the plane 20 mm to the left, the left lateral lobe touched caudally the stomach fundus and body, the papillary process was dorsal to the stomach fundus. At the level of the plane 10 mm to the right, the right lobe was cranially situated to the other lobes. Between the right lobe and caudate lobe were fundus and body of the stomach. Caudate process was caudal to the fundus of the stomach and dorsal to the cranial part of duodenum and ascending colon. It had anatomical contact with the right kidney. Papillary process covered the dorsal part of the stomach. At the level of the plane 20 mm to the right, the right lobe was cranial to the other lobes of the liver. The left medial lobe was covered partially by quadrate lobe. Gall bladder did not reach the ventral border of the liver. The left medial lobe was cranial to the body of the stomach. Caudate lobe touched the muscles of the spine.



Some macrometric anatomical parameters of the adrenal glands in the New Zealand white rabbit

Kamelia Stamatova-Yovcheva¹, Rosen Dimitrov¹, Ömer Gurkan Dilek², David Yovchev¹

¹Department of Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, Stara Zagora/BULGARIA

²Department of Anatomy, Faculty of Veterinary Medicine, Burdur Mehmet Akif Ersoy University, Burdur/TURKEY

Key Words:

adrenal glands
anatomy
macrometry
rabbit

Received : 23.04.2021
Accepted : 09.06.2021
Published Online : 31.08.2021
Article Code : 926614

Correspondence:

K. STAMATOVA-YOVCHEVA
(kameliastamatovayovcheva@gmail.com)

ORCID

K. STAMATOVA-YOVCHEVA : 0000-0002-1121-0033
R. DIMITROV : 0000-0002-5308-838X
ÖG. DİLEK : 0000-0002-5717-3928
D. YOVCHEV : 0000-0003-4357-0858

A part of this study was presented at 4th International Health Science and Life Congress which held on 8-10 April 2021, in Burdur

ABSTRACT

The anatomical features of the rabbit adrenal glands have been investigated in some aspects, either via classic anatomical methods and routine histology, either using imaging modalities in our previous experiments. The present study is focused on obtaining data, concerning the objective values of three macrometric indices – lateromedial, craniocaudal and dorsoventral diameters. We used the cadavers of thirty-four 8-month old (sexually mature) healthy white New Zealand rabbits weighing 2.8-3.2 kg. We reached the abdominal cavity after median incision. The both kidneys were kept in abdominal cavity with a view to find more easily the location of the right and left adrenal glands. The material was documented using a digital camera. The craniocaudal, dorsoventral and lateromedial diameters have been measured using a digital caliper, as the obtained values were accurate to the second sign. Descriptive analysis of the results using Statistica 8 - StatSoft DELL was performed. The lateromedial diameter of the right adrenal gland was $5.1 \text{ mm} \pm 1.0$, craniocaudal diameter was $9.3 \text{ mm} \pm 1.2$ and the dorsoventral diameter - $5.0 \text{ mm} \pm 0.8$. For the left adrenal gland were measured the following values - the lateromedial diameter was $6.5 \text{ mm} \pm 1.2$, the craniocaudal diameter was $10.2 \text{ mm} \pm 1.4$ and the dorsoventral diameter was $6.3 \text{ mm} \pm 0.9$. Our results showed that the studied parameters of the left gland were with higher values compared to the right gland. The results from the conducted anatomical study deepens the knowledge for the macroscopic features of the rabbit adrenal glands.



Original Contribution

**HISTOLOGIC AND MICROMETRIC STUDY OF
THE PROVENTRICULUS AND GIZZARD OF
THE WILD BRONZE TURKEY (*MELEAGRIS GALLOPAVO*)**

D. Yovchev*

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

ABSTRACT

The purpose of the present study was to investigate the histologic and micrometric study of the proventriculus and gizzard of the wild bronze turkey (*Meleagris gallopavo*). Thirty clinically healthy Bronze turkeys (15 females and 15 males) were used for the study. Twelve tissue samples (six from the proventriculus and six from gizzard) from the corresponding age group were used to prepare histological slides. The preparations were stained with hematoxylin (Erich) - eosin and Masson's trichrome. The wall of the proventriculus was composed of four layers. They were *tunica mucosa*, *tunica submucosa*, *tunica muscularis* and *tunica serosa*. Mucosa had many grooves and plicae with simple columnar epithelium. The proventricular submucosa had compound tubuloalveolar glands which took the greatest part of the wall. The gizzard had *tunica mucosa*, *tunica muscularis* and *tunica serosa*. Compound tubular glands were found in the mucosa. On the mucosal surface was observed a thick keratinized layer, which was produced by the glands. In *lamina propria mucosae* were found compound tubular glands which opened on the mucosal surface by a short neck. The glands in the grooves were more branched, compared to those localized in the folds. *Lamina muscularis mucosae* was not found.

Key words: bronze turkey, proventriculus, gizzard, glands



Original Contribution

HISTOLOGICAL AND HISTOMETRIC FEATURES OF THE LARGE INTESTINE IN THE BRONZE TURKEY (*MELEAGRIS GALLOPAVO*)

D. Yovchev*

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine,
Trakia University, Stara Zagora, Bulgaria

ABSTRACT

The focus of the investigation was to study the large intestine (both ceca and rectum) of the bronze turkey using Hematoxylin/Eosin staining. Fifty-four clinically healthy Bronze Turkeys from state forestry Mazalat were separated into 27 female and 27 male birds. We used 9 age groups (one-day, 7-day, 14-day, 28-day, 35-day, 49-day, 56-day, 90-day, and 120-day). There were six turkeys in every group. The intestinal segments in all of the studied groups were composed of *tunica mucosa*, *tela submucosa*, *tunica muscularis* and *tunica serosa*. *Tunica mucosa* is comprised of *lamina epithelialis mucosae* covering a fine layer of loose connective tissue (*lamina propria mucosae*). Both tissue layers formed well expressed mucosal folds. The surface covering epithelium was presented by columnar cells and goblet cells. *Tunica submucosa* was less developed compared to the other layers of the wall. It was vascularized. *Tunica muscularis* had two sublayers – the inner was circular and the outer was longitudinal. *Tunica serosa* was the outermost layer supported by dense connective tissue. *Villi intestinales* were well developed in both ceca and rectum.

Key words: bronze turkey, cecum, rectum, *villi intestinales*



Original Contribution

**HISTOCHEMICAL INVESTIGATION OF THE ESOPHAGUS
OF THE WILD BRONZE TURKEY (*MELEAGRIS GALLOPAVO*)**

D. Yovchev*, G. Penchev

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary
Medicine, Trakia University, Stara Zagora, Bulgaria

ABSTRACT

The aim of the present study was to investigate the thoracic part of the esophagus in the bronze turkey, using Masson's trichrome stain and Alcian blue-PAS staining. Thirty-six clinically healthy bronze turkeys (eighteen males and eighteen females) were studied. The groups of the birds were at age 1, 7, 14, 28, 35 and 49 days. Each group consisted of three male and three female birds. The histological features of the organ were similar in the studied groups. It consisted of *tunica mucosa*, *tunica submucosa*, *tunica muscularis*, and *tunica serosa*. There were no specifics in the organ regarding the sex and the age of the birds. The esophageal glands in all of the studied groups, demonstrated intensive PAS and AB reaction, because of the mucous, produced by the epithelial glandular cells. *Lamina propria* exhibited a weak PAS reaction, visible in all ages, either in males, either in females.

Key words: bronze turkey, esophagus, histochemistry, glands

Приложение 8.2. Г.8. Статии и доклади, публикувани в нереферирани списания с научно рецензиране или публикувани в редактирани колективни томове

65 години



Аграрен университет - Пловдив, Научни трудове, т. LV, кн. I, 2010 г.
Юбилейна научна конференция с международно участие
Традиции и предизвикателства пред аграрното образование, наука и бизнес
Agricultural University - Plovdiv, Scientific Works, vol. LV, book I, 2010
Jubilee Scientific Conference with International Participation
Traditions and Challenges of Agricultural Education, Science and Business

**МЕТОДИКА ЗА ЦЕКОЕКТОМИЯ СЪОБРАЗНО БАЛАНСОВИ
ОПИТИ С ПЕТЛИ
I. ХИРУРГИЧЕСКА ИНТЕРВЕНЦИЯ**

Атанас Бочуков¹, Виолета Георгиева², Давид Йовчев³

Аграрен университет – Пловдив¹, Тракийски университет - Аграрен факултет - Стара Загора², Тракийски университет – Ветеринарно-медицински факултет – Стара Загора³

**METHODS OF CAECOECTOMY ACCORDINGLY TO BALANCED
EXPERIMENTS WITH COCKERELS
I. SUDGICAL INTERVATION**

Atanas Bochukov¹, Violeta Georgieva,² David Yovchev³

Agricultural University – Plovdiv¹, Trakia University, Faculty of Agriculture - Stara Zagora²,
Trakia University, Faculty of Veterinary Medicine - Stara Zagora³

Резюме

Извършено е оперативно отстраняване на слепите черва на 6 петли от породата Бял плимутрок съобразно балансовите опити при тях. Описани и документиран са всички етапи на операцията, която се понася добре от птиците. След приключването на оперативната намеса всички птици са третирани с антибиотик. Не са наблюдават усложнения в следоперативния период.

Ключови думи: хирургическа интервенция, цекоектомия, петли

Abstract

It was carried out removing of ceca of the 6 cockerels accordingly to balanced experiments. All stages of surgical intervention are described and photo documented. At the end of operation the birds were threated by antibiotics. There was no complication in the period after the surgical intervention.

Key words: surgical intervention, caecoctomy, hens

През последните години беше постигнат значителен напредък в уточняването на пътищата и начините на използване и трансформиране на хранителните вещества, които постъпват в организма на птиците от фуражите. Това стана възможно с прилагането на различни методи –

ПРИЛОЖЕНИЕ НА ТРАНСАБДОМИНАЛНАТА УЛТРАСОНОГРАФИЯ ЗА ОБРАЗНОАТОМИЧНОТО ИЗСЛЕДВАНЕ НА ЧЕРНИЯ

ДРОБ ПРИ ЗАЕКА (*Oryctolagus cuniculus*)

Камелия Стаматова*, Росен Димитров*, Антон Русинов, Давид Йовчев***

***Катедра “Ветеринарна анатомия, хистология и ембриология”,**

****Катедра “Вътрешни незаразни болести”,**

Ветеринарномедицински факултет, Тракийски Университет, 6000

Стара Загора, България, e-mail: K_STAMATOVA@abv.bg

За целта изследвахме 9 полово зрели, клинично здрави заека. Животните бяха анестезирани и позиционирани в гръбно лежащо положение. Сонографският достъп беше трансабдоминален перкутанен хипохондриален. Черният дроб беше ехогенна структура със сравнително по-нисък ехогенитет от съседните меки тъкани Той бе с гладки и правилни контури, които бяха в непосредствен контакт с хиперехогенната диафрагма. Чернодробният паренхим показваше ехогенитет с хетерогенен характер и показваше хиперехогенни линейарни находки с латерална позиция. Левите разклонения на V. portae показваха сравнително по-висок ехогенитет на стената и лумена си, в сравнение със същите структури на Vv. hepaticae. Настоящите данни биха били полезни за проучване и диагностика на редица чернодробни заболявания при човека и бозайниците.

Key words: hepar, ultrasonography, anatomy, rabbit.

КОМПЮТЪРТОМОГРАФСКО АНАТОМИЧНО ИЗСЛЕДВАНЕ НА ЧЕРНИЯ ДРОБ ПРИ ЗАЕКА (*Oryctolagus cuniculus*)

Камелия Стаматова, Росен Димитров, Давид Йовчев, Димитър Костов
Катедра “Ветеринарна анатомия, хистология и ембриология”,
Ветеринарномедицински факултет, Тракийски Университет, 6000
Стара Загора, България, e-mail: K_STAMATOVA@abv.bg

Резюме

Изследвахме черния дроб на 7 клинично здрави заека на възраст 8 месеца, от породата Новозеландски бял, с тегло от 2.8 kg до 3.2 kg. Животните бяха анестезирани. Изследването беше проведено чрез аксиален компютърен томограф. Черният дроб при заека се визуализираше като масивна, хетерогенна, нормоденсна, мекотъкнна находка с добре очертани ръбове. Левият дял беше добре отграничен от фундуса и корпуса на стомаха. Органът беше позициониран кранидорзално спрямо стомаха, дорзално от меката коремна стена, като се наблюдаваше вентрално от 8 интеркостално пространство до L1. Компютъртотомографското изследване на черния дроб при заека може да се използва за демонстриране на топографията и анатомичните му особености, с оглед интерпретацията на някои чернодробни заболявания при този вид.

Key words: hepar, computed tomography, anatomy, rabbit.

COMPARATIVELY MORPHOMETRIC STUDY OF THE HEAD SKELETON IN SOME SPECIES OF SUIDAE FAMILY

R. Mihaylov, R. Dimitrov*, K. Stamatova-Yovcheva*, D. Yovchev*, St. Stoyanov

Thrakia University, Faculty of Agriculture - Stara Zagora

*Thrakia University, Faculty of Veterinary Medicine - Stara Zagora

SUMMARY

The aim of the study was to make a comparative craniological analysis of wild and domestic swine and warthog. We investigated the head skeleton of 27 individuals belonging to 3 animal species of family Suidae – wild swine (*Sus scrofa scrofa*), domestic swine (*Sus scrofa familiaris*) and warthog (*Phacochoerus africanus*). The values of 9 craniological parameters, were determined. In domestic swine the head skeleton was shorter, compared to the wild swine and warthog. Domestic swine's condylobasal length was the greatest. The facial skeleton was more developed than the brain one that proves thesis that face's shortening is connected with adaptation to predation. Wild swine's head skeleton shape differed to this of domestic swine and warthog. Greater height of domestic swine's brain cranium was resulted by the fact that its frontal bones are not plate and they form an angle along them. The brain cavity's volume is the greatest in the wild swine, which probably is an advantage for mammals' surviving.

Key words: *osteology, craniometry, wild and domestic swine and warthog.*

Corresponding Author: Rosen Dimitrov; E-mail: rosiros38@abv.bg

РАДОСЛАВ МИХАЙЛОВ*, РОСЕН ДИМИТРОВ**¹, КАМЕЛИЯ СТАМАТОВА-ЙОВЧЕВА**,
ДАВИД ЙОВЧЕВ**, ВЕСЕЛИН РАДЕВ*, ТОДОР СЛАВОВ*

* Тракийски университет, Аграрен факултет, Катедра „Морфология, физиология и хранене на животните“, Стара Загора

** Тракийски университет, Ветеринарномедицински факултет,
Катедра „Ветеринарна анатомия, хистология и ембриология“, Стара Загора

¹ E-mail: rosiros38@abv.bg

Сравнително морфометрично изследване на скелета на главата при някои видове от сем. *Canidae* в България

Comparative Morphometric Analysis of the Skull of Some *Canidae* Species in Bulgaria

R. Mihaylov*, R. Dimitrov**¹, K. Stamatova-Yovcheva**, D. Yovchev**, V. Radev**, T. Slavov*

* Thracian University, Faculty of Agriculture,

Department of Animal Morphology, Physiology and Nutrition, Stara Zagora, Bulgaria

** Thracian University, Faculty of Veterinary Medicine,

Department of Veterinary Anatomy, Histology and Embryology, Stara Zagora, Bulgaria

Abstract

Objective: We performed craniomorphometrical analysis of the head skeleton (skull) in 24 mature animals, possessed of four (4) species from family *Canidae*. The skulls were parts from the osteological collections.

Methods: The studied eleven parameters were presented by native figures and X-ray images. The results were processed by variable statistical analysis. The longest measurements of the head skeleton (skull) were determined.

Results: Condilobasal length showed lower absolute measurements compared to the biggest length of the head skeleton. The dorsal length of the brain skeleton of the wolf was 55.9%, in the dog – 56.4%, in the jackal – 55.5%, and in the fox – 54.2% of the biggest length of the head skeleton. The basal length of the brain skeleton showed lower absolute measurements compared to the dorsal length of the brain (cranial) skeleton. The dorsal length of the facial skeleton was with lower measurements compared to the dorsal length of the brain skeleton. The wolf's and jackal's zygomatic width was 55.8% of the biggest length of the head skeleton, the dog's – 55.1% and the fox's – 54.2%. The internal length of the brain (cranial) cavity was 46% from the biggest length of the head skeleton of the wolf, 44.1% of the dog, 48.7% of the jackal and 45.8% of the fox. The height of the brain (cranial) skeleton was 29% of the biggest length of the head skeleton of the wolf, 30.5% of the dog, 30.9% of the jackal and 28% of the fox. The brain skeleton volume was greatest in the wolf and smallest in the fox.

Conclusion: The volume-body coefficient (VBW) is an indirect indicator for the relative size of the brain, as it was highest in the fox and lowest in the dog. The obtained X-ray images demonstrated the investigated by us craniological markers and could be used for the craniomorphometric characteristics of the studied species. Our results and the published information from many authors motivate us to purpose, that the animals with greater size of brain cavity volume, respectively with greater cerebrum adapt better. Therefore, we could support the theory of connection between the size of the brain and the survival of the mammals in new environment.

Key words: craniology, craniometry, wolf, dog, jackal, fox

**Anatomical radiological features of abdominal aorta and some of its branches
in the rabbit in the segment Th12-L3**

ABSTRACT

Ten sexually mature rabbits of New Zealand white breed were studied. Post mortal angiography of abdominal aorta was conducted. The results from post mortem angiography in ventrodorsal recumbency presented topography and anatomical location of abdominal aorta and some of its branches in the cranial and middle abdominal region. Celiac artery was visualized at the transition between Th13 and L1. Splenic artery belongs to the common gastrolial trunk. Left gastric artery, gastroduodenal artery, common hepatic artery, proper hepatic artery arise from celiac artery as separate branches. Left and right hepatic arteries are branches of proper hepatic artery. The post mortem angiography of abdominal aorta and its branches in dorsoventral aspect in the segment between Th12-L3 gives information about topography, anatomical location and way of the abdominal aorta, celiac artery, right and left renal arteries. Left cranial abdominal artery is well defined vessel. In both projections (ventrodorsal and dorsoventral), the transition between Th13 and L1 is anatomical landmark for beginning of celiac artery.

Keywords: abdominal aorta, celiac artery, anatomy, radiology



SEM: MICROVASCULAR CORROSION CASTING OF THE FELINE MYOCARDIUM

D. I. VLADOVA¹, R. S. DIMITROV¹, D. L. KOSTOV¹,
K. D. STAMATOVA-YOVCHEVA¹, D. G. YOVCHEV¹ & M. G. STEFANOV²

¹Department of Veterinary Anatomy, Histology and Embryology, Faculty of
Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria; ²Department
of Morphology, Physiology and Animal Nutrition, Faculty of Agriculture,
Trakia University, Stara Zagora, Bulgaria

Summary

Vladova, D. I., R. S. Dimitrov, D. L. Kostov, K. D. Stamatova-Yovcheva, D. G. Yovchev &
M. G. Stefanov, 2017. SEM: Microvascular corrosion casting of the feline myocardium.
Bulg. J. Vet. Med., **20**, Suppl. 1, 50–56.

Scanning electron microscopy of corrosion vascular casts of the heart allows morphological and anatomical three dimensional observations and description of the distribution, diameter and internal surface of the collected replicas. Polymerised vascular casts with following corrosion of the heart have been obtained from cadavers of 6 sexually mature male cats (*Felis silvestris catus*). The obtained microvasculature replicas have been studied by SEM. In the atrial myocardium of the feline heart, the capillaries are relatively S-like curved, equally distributed and form network-like structures with predominant Y-like anastomoses. In the ventricular myocardium the capillaries are grouped in bundles and form between themselves H- and Y-type anastomoses, as predominate these of H-type. This finding gives us to make a motivation, regarding the hemodynamics that the observed morphological features are extremely favourable to provide a steady and permanent blood flow, which itself favours the metabolic and gas exchange.

Key words: cat, corrosion casting, myocardium, SEM



AGE-RELATED LIGHT MICROSCOPY HISTOMETRIC INVESTIGATION ON BURSA OF FABRICIUS IN THE COMMON BRONZE TURKEY (*MELEAGRIS MELEAGRIS GALLOPAVO*)

D. S. DIMITROV, G. PENCHEV, D. YOVCHEV & K. STAMATOVA-YOVCHEVA

Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Stara Zagora, Bulgaria

Summary

Dimitrov, D. S., G. Penchev, D. Yovchev & K. Stamatova-Yovcheva, 2017. Age-related light microscopy histometric investigation on bursa of Fabricius in the common bronze turkey (*Meleagris meleagris gallopavo*). *Bulg. J. Vet. Med.*, **20**, Suppl. 1, 71–75.

The study was conducted on permanent histological preparations from biological material obtained from 54 common bronze turkeys. The birds were at the age of 7, 14, 28, 35, 49, 56, 90, 120 and 240 days. Each of the 9 age groups consisted of 6 birds (3 male and 3 female). Histometric studies of all microstructural elements of the organ were done with a light microscope with a built-in eyepiece micrometer. The results showed that the for all investigated period (7–240 day), the number of microstructural parameters – mucous folds, glandular crypts and thymus like lobules decreased respectively by 2.05; 5.40 and 20.90, but mucous fold height increased respectively by 1236.87 μm ; 34.27 μm and 302.53 μm . The analysis of results of investigations allowed concluding that this process was different and independent for each age.

Key words: *Bursa Fabricius*, histometry, bronze turkey



MICROMETRICAL STUDY OF THE OESOPHAGEAL WALL OF THE WILD BRONZE TURKEY (*MELEAGRIS GALLOPAVO*)

D. G. YOVCHEV, G. P. GEORGIEV & D. S. DIMITROV

Department of Veterinary Anatomy, Histology and Embryology,
Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

Summary

Yovchev, D. G., G. P. Georgiev & D. S. Dimitrov, 2017. Micrometrical study of the oesophageal wall of the wild bronze turkey (*Meleagris gallopavo*). *Bulg. J. Vet. Med.*, **20**, Suppl. 1, 76–79.

The aim of the present study was to conduct a morphometrical investigation of the oesophageal wall of the Wild bronze turkey. For the purpose we used 42 clinically healthy bronze turkeys equally separated in males and females. The groups of the studied birds were at age 1, 7, 14, 28, 35 and 49 days. Our results showed that the oesophageal wall was composed of four layers – *mucosa*, *submucosa*, *tunica muscularis* and *adventitia*. *Mucosa* was constructed by stratified squamous nonkeratinised epithelium in all of the studied ages. The amount of the oesophageal glands depended on the age they were more in the young bird at focus under 100×. The mean thickness of epithelium increased significantly from first to twenty-eight days of age. The thickness of the muscular layer increased also in the first fourteen days of age.

Key words: bronze turkey, histology, micrometry, oesophagus