

**UNIVERSITY OF AGRICULTURAL SCIENCES AND VETERINARY MEDICINE
"ION IONESCU DE LA BRAD" IASI
FACULTY OF VETERINARY MEDICINE
DOMAIN : VETERINARY MEDICINE
SPECIALITY: NORMAL AND PATHOLOGIC MORPHOLOGY**

Acatrinei Dumitru Mihai

Abstract of the
DOCTORAL THESIS

PhD coordinator,
Prof.dr.dr.h.c. Ioan PAUL

IAȘI 2010

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**CONTRIBUTIONS TO THE STUDY OF THE CANINE
RESPIRATORY SYSTEM PATHOLOGY**

Doctoral thesis for PhD degree in Medical sciences field

PhD coordinator,
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ABSTRACT

The aim of this research study is represented by the identification and the morphological classification of the pathological processes of the canine respiratory system correlated with the habitat and the way of life in order to evaluate the hazard factors and to elaborate a complex prognosis system for the respiratory disorders of the dog.

The PhD thesis comprises 266 pages and is structured in two distinct parts: part I, that comprises bibliographical data on the subject of the thesis and part II, including the personal contribution performed during the research period.

The first part, “The current stage of knowledge regarding the pathology of the canine respiratory system” is structured in two chapters that summarize the information collected from 197 bibliographic sources.

Chapter 1 contains data regarding the morphological characteristics of the canine respiratory system (anatomical and histological structure).

Chapter 2 contains notions of the canine respiratory system pathology that is systematized in two sections. The sub-chapter 2.1 includes the description of the fundamental pathological processes of the respiratory tract and lungs, respectively the growth and developmental disorders, the dystrophies, the volumetric disorders, the circulatory disorders, the inflammations and the tumors. The sub-chapter 2.2 comprises the specific pathology caused by viruses, bacteria, parasites, fungi or other toxic substances.

The personal contribution, comprising 144 pages, includes the material and methods, the results and their interpretation and the general conclusions.

The investigations were performed during 2002-2009 on biologic material harvested from dead or euthanized dogs presenting different organ pathology. The cases were presented at the Internal Clinic of the Faculty of Veterinary Medicine from Iași, from private veterinary practices from Iași and the surrounding counties, dog shelters managed by the animal protection associations or by the public authorities from Iași, Bacău, Galați and Tulcea.

The studied material comprised 317 dogs of different ages, males and females, out of which on 136 were performed necropsies and the rest were submitted to different investigations including imaging techniques, ELISA tests, biochemical analyses, cytological investigations.

The harvested organs were photographed and registered and then, 3 to 6 fragments of lungs were selected and harvested from each case together with other organ samples in close anatomical and physiological relation to the lungs (heart, liver, kidney, spleen) for the histological examination.

To this purpose, the harvested samples were formaldehyde or Bouin fixed (10% aqueous solution), processed, paraffin embedded and sectioned at 5 μ m.

From the harvested tissue samples, slides were prepared using usual or special staining: hematoxylin-eosin (HE), hematoxylin-eosin-methylene blue (Masson, HEA), hematoxylin-eosin-safran (HES), periodic acid-Schiff Fuxine (PAS).

The histological examination of the slides from the studies cases allowed the identification and the classification of the pathological processes localized in the lungs and respiratory tract, in accordance with the taxonomy and the morphological criteria for the identification of the lesions from the specific compared pathology.

Hereby, the following pathological processes (groups of lesions) of the respiratory system are described and illustrated with 141 original photographs: growth and developmental disorders, circulatory disorders, dystrophies, inflammations and tumors.

Among the growth and developmental disorders, also known as adaptive bioplastic disorders, brachygnathia, palatoschisis and cheiloschisis were observed and described.

The circulatory disorders identified in dogs were rather frequent: pulmonary congestion, hemorrhages, thrombosis, embolism and edema. A wider study is dedicated to the coumarin raticides poisoning that cause all kinds of hemorrhages, from the tissue ones to the cavitory ones and to the circulatory disorders observed in a case of septicemic candidosis.

The pulmonary dystrophies observed on the cases were: vascular amyloidosis, anthracosis, jaundice and the metastatic calcification. The anthracosis was the most frequent, due to the etological characteristics of the dog that uses the smell as the main for analysis, learning, adaptation and orientation. Together with the olfactory information, the charcoal powder enters the respiratory system. The powder is captured by the macrophages and initially deposited as fine granulations in the lung and lymphnodes.

The inflammations identified in the segments of the respiratory system are structured on the 3 morphological types: predominantly alterative, predominantly exudative and predominantly proliferative. The alterative ones were represented only by the necrotic inflammation present in the epithelium of the respiratory tract caused by the respiratory viroses and especially in the CDV infections. The lesions of the exudative inflammations were observed in all the segments of the respiratory system beginning with the serous rhinitis caused by the pollen allergies and going to the purulent bronchopneumonias from the mixed viral and bacterial infections from canine distemper or kennel cough.

The primary pulmonary tumors were not present among our cases, all the 18 identified tumors being metastases of some neoplasms with a primary localization in the breast, liver, skin or staphylin vale.

The most spectacular tumors were represented by a staphylin melanoma with metastases in all the organs, especially in the lung, and an carcinoma of the bile ducts with renal and pulmonary metastases. The metastasis of the staphylin melanoma in the lungs transformed the essential respiratory organs into a cluster of melanotic and amelanotic tumors.

A special place is dedicated to the diagnosis of the first inland cases of cardiovascular and subcutaneous dirofilariosis in dogs that never left Iași county. Because of the novelty of the cases for the Moldavian area, Iași being the closest place to the north of the country where dirofilariosis was diagnosed, we thoroughly investigated the complex pathological aspects caused by this parasitism. A special distinct subchapter was dedicated to canine distemper, because of the large number of cases, and to dirofilariosis, because of the novelty of this disease in Moldavia.

The presence of adult parasites in the cardiovascular system produces lesions in the valvular and vascular endothelium , the dilatation of the pulmonary artery and of the heart and the thrombosis in the ramifications of the pulmonary artery. The larvae of both species of *Dirofilaria* in dog determines granulomatous lesions in the main organs and the rickettsia symbiont of the parasite *Wolbachia spp.* is responsible for causing the immune complexes and the lesions of the microcirculation in the affected territories.

The thesis ends with general conclusions that summarize the main lesions of the canine respiratory system identified by different diagnostic methods used during the research period.