ABSTRACT

Keywords: boar, bacteria, viruses, epidemiology, zoonosis

The wild boar is one of the most important venison species in our country, from a sportive point of view, because the wild boars hunting is spectacular and full of sensations, but also from an economically point of view, for the meat and fur. The fact that the wild boar is present all over the country, and its hunting is interesting, offering to the hunter the most exciting moments, having a meat with an excellent taste – its economical and hunting related importance is considerable.

The wild boars are native animals in many regions of the world. Knowing the venison's diseases and how to prevent and fight them is mandatory in order to plainly reduce the maintenance and spreading of some diseases, out of which some are common in domestic animals as well. They also represent a known reservoir for different transmissible diseases in humans.

The studies made so far incriminate the wild boars in the transmission of Classic Swine Fever, *Brucella* infection, *Trichinella* infection in other domestic animals and the transmission of Hepatitis E, TB, *Leptospira* infection and Trichinella infection in humans. In these conditions, the countries that desire to eradicate these zoonotic diseases or to block the transmission in the wild boars of diseases like Aujeszky's disease or *Circovirus* associated diseases (PCVADs) have a major problem.

During the discussions approached on an European level, regarding pigs' disease, it has been admitted the presence of cross infections present between the wild boar and the domestic one. Studies taking into consideration the wild boar's behavior have been proposed, also the dynamic of their populations and the framing of a management strategy for the hunting program.

For this, there is required as much ecology and epidemiology knowledge on the wild boar as possible, in relation to the domestic pig with the main purpose of limiting the potential factors that influence the prevalence and persistence of diseases. Although there have been presented studies that show the responsibility of some of these factors, the information is still fragmented. Thus, it is necessary that a collection of information is realized, that comes from the countries the wild boar is present and continuously expanding in, such as England, Scandinavia and, we consider also, Romania.

The role of wild animals as natural reservoir of microorganisms with zoonotic impact creates concern for the authorities of the European Union. Meanwhile, there is an interest shown for the life management and preservation of wild animals, with both an economical value and recreation value. On an European level, the diseases transmitted by wild animals represent a threat on an ascending scale. Wild life related zoonotic diseases represent a complex problem that requires a tight collaboration between zoologists, veterinarians and other professionals in the public health sector.

The descriptive epidemiological surveillance studies are extremely valuable, especially in the areas where the wild boars haven't been very well supervised.

Considering the importance of the wild boar in the public health, through the venison consumption and its implications in the transmission of major importance diseases in domestic pigs within the common geographic region, it has been enforced the approach of research themes on this subject.

The accent placed on the quality of animal products and therefore, on food safety, by the European Commission, justifies the approach of an epidemiological, microbiological and immunological study in the wild boars present in our geographic area.

The thesis with the title "**MICROBIOLOGICAL AND IMUNOLOGICAL RESEARCH IN THE WILD BOAR (*SUS SCROFA FERUS*), CONCERNING THE FINDING OF PATHOGENS** " contains 166 pages, being written in VII chapters and is structured accordingly to effective criteria, in 2 parts.

The first part (chapters I, II and III) represents 33,13% and integrates the main bibliographical data from the specialty literature concerning the description, ecology, ethology and the ingathering and exploitation of the wild boar, some aspects regarding the sanitary

veterinary control of venison and the main major bacterial and viral diseases found in the wild boars, these representing the " Actual stage of knowledge".

The second part (chapters V, VI, VII) gives reference to the personal research and represents 66,86%. Each chapter included in the second part has in its summary the material and work methods, obtained results with their discussions and partial conclusions. In the VII th chapter, named " Final conclusions and recommendations " the 11 main conclusions are integrated, developed on the base of epidemiological, microbiological and immunological research, effectuated for the finding of pathogens and one recommendations.

The paper is illustrated with a number of 62 figures, representative 31 tables.

Chapter I, called "***Bibliographical data from the specialty literature concerning the description, ecology, ethology and the ingathering and exploitation of the wild boar***" , reports the existent information in the bibliographical sources to better know the subject taken into study.

Chapter II, entitled ***"Aspects concerning the sanitary veterinary control of the venison",*** approaches the subject of wild boar's meat from a chemical composition, nutritive value and microbiological perspective.

Chapter III, named " ***The main major diseases found in wild boars "*** describes some of the most important diseases produced by bacteria and viruses, approaching individually the history, prevalence and importance of the disease, the etiological agent, epizootologic characters, pathogenesis, clinical and anatomopathological signs, diagnosis, prognosis, prophylactic and fighting measures.

In chapter IV, the ***" Purpose and goals of the research "*** are related, standing at the base of the study.

The targets of the research were in accordance with the purpose of the proposed theme, being developed in a coherent and fluently manner during the study period and consist in: harvesting and processing biological samples from the wild boar's case immediately after shooting, but also from bodies that are eventually found in the woodland; the summarization and evaluation of data by comparing the results with the reference information in the specialty literature; running microbiological investigations effectuated on the harvested samples from the wild boars captured by shooting, executing immunological investigations on the harvested

samples from the sacrificed wild boars; performing an epidemiological screening concerning the pathological entity present in the wild boar populations in the area of Buzau.

In **chapter V**, named ""***Microbiological research on the detection of pathogenic agents at wild boar*** " are related the bacteriological investigations accomplished in the 2008-2009 period and the harvested samples were analyzed inside of the Bacteriology and Food Microbiology Laboratory within the State Laboratory in Buzau. The tonsils represent a real natural ecological recess for the various microorganisms, sterile samples being basically unavailable. The specialty literature offers a small amount of data regarding the pathogenic and conditionally pathogenic microflora present in the tonsils of domestic pigs, without reference to the tonsils of the wild boar. After the bacteriological investigations, from the tonsils of wild pigs, various bacterial species have been isolated, with a variable incidence: 46.42% *Erysipelothrix rhusiopathiae;* 10,7% *Streptococcus pneumoniae*, 39,28% *Streptococcus suis*; 50% *Staphylococus aureus*, 21,4% *Arcanobacterium pyogenes*, 71,4% *Dermatophilus like,* de 7,1% *Haemophilus suis*, 10,7% *Bordetella bronchiseptica*, 3,5% *Pasteurella multocida* şi 3,5% *Yersinia enterocolitica*.

In **chapter VI**, called ***"Imunological and epidemiological research regarding the determination of portage with some viral and bacterial pathogenic agents in wild boars"*** 5 smaller chapters can be found, according to the usage. Imuno-epidemiological data is presented, referring to the antibody detection for some major infectious diseases produced by viral and bacterial entities, such as: classic swine fever virus, respiratory and reproduction syndrome virus, hepatitis E virus, *Brucella suis, Salmonella spp., Erysipelothrix rhusiopathie, Escherichia coli O157H7.* The testing has been realised according to the effective National Surveillance rules, through direct imnuofluorescence methods and Elisa, a statistic with the disease's prevalence being made in Buzau county during 2007-2011.

The wild boar is considered the natural reservoir of the classic swine fever virus and in this national context, the vaccination against classic swine fever has been introduced again, both in the domestic pig and also in the wild pig, in the attempt to eradicate this viral disease off of Romania's teritory. The vaccination against Classic Swine Fever started in Romania in 2006 and has ended in 2009. The situation of classic swine fever in wild boars in Romania hasn't been relevant in the past years, and the epidemiological correlations between the classic swine fever

identified in wild boars and the pest holes identified in domestic pigs weren't fully investigated, as the evolution of classic swine fever in domestic pigs can be considered endemic.

In **2009**, out of 525 tested samples, 19 (3,6%) samples from 10 hunting funds, have been positive for classic swine fever. The repartition of those 19 positive samples in the year of 2009, in the 10 hunting funds is: 1(10%) positive sample in Măgura Tisău, 2 (20%) in Monteoru, 4(23.52%) in Brăieşti, 3(9.1%) in Umbrărelu, 4(9.75%) in Berca, 1(5.26%) in Pătârlagele, 1(25%) in Siriu, 1 (14.28%) in Harţagu, 1(5%) in Piciorul Caprei and 1(16.66%) in Săgeata.

In **2010**, out of 454 tested samples with both methods, 22 (4,8%) samples from 13 hunting funds have been positive. The repartition of those 22 positive samples in 2010, in the 13 hunting funds is: 1(7.14%) in Grăjdana, 1(9.1%) in Brăieşti, 3(8.33%) in Umbrărelu, 1(33.33%) in Pătârlagele, 2(7.69%) in Colţi, 2(20%) in Valea Nehoiului, 2(9.52%) in Basca Mare, 2(15..38%) in Piciorul Caprei, 1(14.28%) in Nehorna Muşa, 2(7.69%) in Beceni, 2(7.4%) in Aldeni, 1(3.12%) in Câlnău and 2(33.33%) in Făgetu.

All positive samples were shown through Elisa test, the direct iunofluorescence reactions beiong negative.

The presence of positive samples in this period and in this region are due to the anti-classic swine fever vaccinal antibodies, as a result of previous vaccinations imposed by the national program. This way, it can be seen that the anti – classic swine fever antibodies have been detected for 2 years in a row, as a consequence of necesity vaccination. Considering the reduced procentage of post vaccinal antibodies detection, we can assume either the weak antigenic reaction of the used vaccine, or the refuse of baits consumption by the checked individuals.

The testing for the determination of anti PRRS antibodies portage has been realised on 79 serum samples, harvested during the year of 2011. The results have shown 21 positive samples (26,5%) for the swine respiratory and reproduction syndrome virus, in 9 hunting funds: 5 positive samples in Berca, 4 in Umbrărelu, 3 in Căldărăşti, 2 in Beceni, 2 in Vintilă Vodă, 2 in Cilnău, 1 in Breazău, 1 in Colţi and 1 in Harţagu. The obtained results show a higher prevalence compared to the other studies available in this field.

The research performed for determining the anti hepatitis E antibodies portage have been achieved on 79 serum samples, harvested from wild boars in 2011. The results have shown 25 (32,05%) positive samples for hepatitis E, 53 (67,9%) negative samples and a degraded sample

which could not be tested. The repartition of positive samples in the hunting funds was: 5 samples in Harţagu, 3 in Berca, 2 in Aldeni, 2 in Pătârlagele, 2 in Beceni, 2 in Câlnău, 2 in Vintilă Vodă, 1 in Glodeanu Sărat, 1 in Făgetu, 1 in Oreavu, 1 in Piciorul Caprei, 1 in Tăbărăşti, 1 in Zărneşti şi 1 in Scutelnici. The results indicate a medium prevalence, with a resemblence to other data in the specialty literature. The results show that the wild pigs carry the hepatitis E virus and can be an infection source for domestic pigs and humans.

The same number of samples (79) have been tested for the detection of anti *Brucella suis* antibodies in the tested wild boars' serum. Out of the 79 analyzed samples in the period of 2011, there has been no positive sample for *Brucella suis* in comparation to other specialty evaluations that have shown the anti Brucella suis antibodies, biovariety 2.

In respect to the research made for the detection of specific antibodies for *Salmonella spp., Erysipelothrix rhusiopathiae, Listeria spp., E. coli O157:H7,* a classical method has been used to obtain antigenic suspensions, using standard stems, which have been put in contact, through the fast blade seroagglutination technique , with serum samples harvested from the 79 wild boars in 2011.

The results have shown a positive prevalence of 8,8% (7 samples) for *Erysipelothrix rhusiopathiae* identified in the hunting funds: Berca (2 samples), Umbrărelu (1 sample), Aldeni (2 samples), Piciorul Caprei (1 sample) and in Vintilă Vodă (1 sample). For *Salmonella* the seropositivity was of 5,06% (4 samples) their distribution being in the hunting funds as follows: Berca (1 sample), Pătârlagele (2 samples) and Piciorul Caprei (1 sample). The test results haven't shown specific antibodies for *Listeria spp. and E. coli O157:H7.*

It can be concluded that the serologic control for these infectious agents is very important in the prevention management of some high risk zoonoses, produced by *HEV, Brucella spp. şi Salmonella spp.*

Chapter VII entitled „***Final conclusions and recommendations***", presents 11 final conclusions consequent on the performed research and a recommendation concerning in the expanding passive surveillance in hunting funds may constitute an additional measure effective classical swine fever prevention and more.

The bibliography has 104 titles from the specialty literature, most of them presented in other countries and less in Romania, due to the low amount of information regarding the approached subject.