



UNIVERSITATEA DE ȘTIINȚE AGRONOMICE  
ȘI MEDICINĂ VETERINARĂ – BUCUREȘTI



## HABILITATION THESIS

*Advanced research approaches in the field  
of veterinary parasitology in Romania*

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**FIELD OF RESEARCH: BIOMEDICAL SCIENCES, VETERINARY MEDICINE**

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## SUMMARY

This *Habilitation Thesis* reflects the activity of the author, performed after defending the PhD (2004-2012). It is based on the professional achievements, original scientific contributions and academic accomplishments acquired in this period subsequently of the research activity performed at University of Agronomical Sciences or Veterinary Medicine of Bucharest, Romania, but also in international research trainings/fellowships in the United States of America and Europe (Germany, France, Italy).

The specific of my research interests is the application of molecular biology and advanced research techniques (ex. Polymerase Chain Reaction and PCR- based methods) in various topics of veterinary parasitology, both for diagnosis and for research. Nevertheless, I was also involved in classical parasitology studies that have been proved as valuable tools, especially for epidemiological and clinical studies. The most significant of my scientific achievements that have been also published in international ISI journals (with impact factor) consist of follows.

- i. *Studies on equine parasites and the associated anthelmintic resistance*: my scientific contributions in this topic include several studies on evaluation the activity of different antiparasitic compounds (benzimidazoles, tetrahydropyrimidines, macrocyclic lactones), equine parasites: *field studies on evaluation of parasitocidal activity of fenbendazole, ivermectin, oxbendazole, and pyrantel pamoate in horse foals with emphasis on ascarids (Parascaris equorum); evaluation of efficacy macrocyclic lactones (ivermectin and moxidectin) against small strongyles in horses (foals, yearlings, and older animals)*. The results of these studies emphasized the value of constant monitoring of the ever-changing status of parasite populations in horses on farms as well as for indications of changes in activity of parasiticides. An important and well recognized scientific achievement of mine in this topic is *using of a PCR-based Reverse Line Blot hybridization assay for monitoring the cyathostomin populations at the species level under field conditions, before and after ivermectine treatment*. This method has an advantage in that it is non-invasive and has proved as a valuable tool for both epidemiological and anthelmintic resistance studies. Our study confirmed the ability of the PCR-RLB assay for simultaneous species-specific differentiation of equine strongyle eggs, indicating a valuable way of furthering drug-resistance studies;
- ii. *molecular identification and genetic characterization of Babesia canis and Babesia vogeli* for the first time in Romania, that provides basic information toward a better understanding of the epidemiology of canine babesiosis in Romania and will help to promote an effective control.
- iii. *molecular screening for tick-borne pathogens in Romania*: the results of the study showed a wide distribution of very diverse bacterial and protozoan pathogens (*Rickettsia, Borrelia, Anaplasma, Ehrlichia, Babesia*) in the very diverse Romanian tick fauna, with the potential of causing both human animal and human diseases. Four rickettsial species were identified for the first time in this study in Romania and all were associated previously to human diseases.
- iv. *epidemiological studies and molecular genotyping of Echinococcus granulosus in livestock from Romania*; the study emphasized the hyperendemic presence and ongoing active transmission of *E. granulosus* in Romania, especially in areas where pastoral activities are prominent. Species identification of animal isolates (sheep, cattle) and one human isolate (by PCR-RFLP of the mitochondrial nad1 gene partial sequencing of the cox1 gene) showed the same RFLP band pattern (*E. granulosus sensu stricto*) and were identified as the 'sheep strain' G1 by sequencing. The one human cyst analyzed in our study was found to belong to the same taxon highlighting its high potential for zoonotic transfer;

v. *seroepidemiological studies on Neospora caninum infection in cattle and dogs from southern Romania*; results indicated exposure to infection with *N. caninum* both of cattle and dogs in the study areas and suggest increasing importance of horizontal contamination path. Findings will help in further epidemiological studies for identifying the animal populations at risk;

vi. *research on marine mammals parasites, including studies on hookworms (Uncinaria lucasi) and acanthocephalans in northern fur seals (Callorhinus ursinus) on Saint Paul Island, Alaska (2007) and studies on hookworms (Uncinaria spp.) in California sea lion (Zalophus californianus) and northern fur seals (Callorhinus ursinus) on San Miguel Island, California, USA (2008)*; updated data about the prevalence of hookworms in these marine mammals were reported; also, identification of three species of *Corynosoma* revealed the first finding of *C. obtuscens* and *C. validum* in northern fur seals and the common occurrence of *C. strumosum* in pinnipeds. Cystacanths in the genus *Bolbosoma* are believed to be the second report of this genus in this host.

During of the postdoctoral period, I was **Director** and the main investigator of two academic grants, gained by national competition, having as main goals advanced studies in epidemiology and molecular biology on vector-borne pathogens. Both grants, with a total budget of aprox. 115,000 Euros were successfully finalized in 2006 and 2010, respectively.

Also, I was the **Scientific responsible** of a Partnership project, having as main topic: *Molecular epidemiology of echinococcosis/ hydatidosis in Romania*. The project, with a total budget of: ~ 200,000 Euros, was successfully finalized in 2011. I was also member in the research teams of other 5 research grants, with different topics in the veterinary medicine field. Currently, I am member in the team of an EU Project (NOVICE), in which our Faculty is a Partner near by other 4 Veterinary Faculties from Utrecht, Hannover, London, Budapest.

During of the postdoctoral period, I was interested on ongoing professional education gaining and performing nine international trainings in prestigious universities from the United States (University of Kentucky: 2006, 2007, 2008, and 2009) and Europe (Ecole Nationale Vétérinaire d'Alfort, France, 2007; Ludwig Maximilians University, Munich, Germany, 2010, 2011; University of Hohenheim, Stuttgart, Germany, 2011; University of Bari, Italy, 2012).

I participated in two international research expeditions in Alaska, Saint Paul Island (2007) and California, San Miguel Island (2008), in which I was invited to take part, having as main goals studying parasites in marine mammals (pinnipeds: northern fur seals and sea lions).

After defending of the PhD thesis I published 10 scientific papers in ISI journals with a total Impact Factor of 20.789. Of these, for three I am the first author and for two I am the senior author. These papers have total citations of 68, and the sum of Times Cited without self-citations, 64. h-index: 4. Other 53 scientific papers I published in Romanian scientific journals (all ranked as CNCSIS B+).

Apart from publications in prestigious scientific journals, my scientific activity was acknowledged by invited keynote-speaker/accepted papers at national and international conferences, invited reviewer for prestigious journals, co-author for an international monograph, chapter on *Important gastrointestinal parasites* (by Wiley-Blackwell Publishing). I have been nominated as Expert Evaluator by the CNCSIS for several projects.

To date, I am member of Romanian Association of Parasitologists, American Society of Parasitologists, and World Association for the Advancement of Veterinary Parasitology. Since 2011, I am *Resident* of the European Veterinary Parasitology College.

In the last chapter of the thesis are presented the perspectives for professional development of the academic and scientific career.