



USV 1842

Ministerul Educației
UNIVERSITATEA pentru ȘTIINȚELE VIEȚII
„ION IONESCU de la BRAD” din IAȘI
“Iasi University of Life Sciences”

SUBJECT AREA: VETERINARY MEDICINE

HABILITATION THESIS

**CONTRIBUTIONS ON THE STUDY OF THE ANIMALS’
ADAPTATION TO THE LIVING PECULIARITIES**

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IAȘI – 2022

A. ABSTRACT

National and international research regarding the adaptation of individuals to living conditions and lifestyle has shown that morpho-functional variability and the degree of divergence from a "*generalized phenotype*" has led to the correlation between form-function, cause-effect, a principle which implies a close relationship between the anatomical features and the biological function of an organ, apparatus or system. In this context, the survive of species has occurred only through adaptive diversification, starting from the type and mode of digestion and feeding to the mode or the type of movement. Thus, although most rodents are omnivorous or generally herbivorous, and other rodent species having carnivorous or insectivorous characteristics. The way of grasping and crushing the food leads to the developing of some peculiarities according to which the skulls are recognized belonging to the three main types, carnivores, herbivores, omnivores.

This type of research has been in our attention since the beginning of the university career. In the habilitation thesis entitled "***Contributions on the study of animal adaptation to the particularities of the living environment***" there are presented some research conducted in this direction, as well as other results of the evolution of the professional, scientific and academic career.

Thesis is structured in accord with the latest legislation and regulation of USV Iași regarding the organization and conducting of the process for obtain the habilitation attestation, in the following sections: *A – Abstract; B – Scientific and professional realisations; career's evolution and development plans; B.I. – Scientific, professional and academic realisations; B.II. – Evolution and development plans of my professional, scientific and academic career and B.III. – References, Evolution of professional, scientific and academic career.*

The selected results for highlighting the dynamic of the scientific career, after obtaining the title of Doctor in Veterinary Medicine from 2005, they are presented in the section B.I. being grouped in three subchapters which comprise the rsearch about adapting species to environmental conditions, aspects necessary both in the field of implantology and to increase the tolerance of animals and humans to newest challenges in the

matter of food production. To realise this part of habilitation thesis, 37 articles were used, they being published in the period between 2006–2022.

The results of the studies performed are briefly presented on the three directions of research, as found in *Chapter I. Scientific achievements*.

The first presented direction of research refers to some contributions regarding the study of the Locomotor System in some species with similar or different habitat in which the differences and similarities between the morphology of components of the Locomotor System in some rodents (muskrat, nutria, squirrel, rabbit, guinea pig, etc) and bear (a carnivore) were highlighted, system that has been adapted to different living conditions.

The conclusions show that within rodents there are a variety of modes of movement: terrestrial, semi-aquatic or through climbing. Generally, at terrestrial animals, the forelimbs support the weight of the body and the pelvic limbs are used for propulsion. In semi-aquatic rodents, both pairs of limbs are active involved in swimming and terrestrial moving and in squirrels, the vertical climbing has led to the use of the front limbs for propulsion and pelvic limbs for support. In the brown bear, the high body weight, the bipedal station, the displacement by walking, swimming or climbing led to the development of strong and efficient muscles, both in the thoracic and pelvic limbs. Also, in rodents, the mandible shows interspecific variations in its appearance and length. The detachment of the angular process, the height of the coronoid process or the level at which the mandibular condyle is placed differ depending on the specifics of the food and the way of grinding it. Following the research, a number of 27 papers and a monograph were published.

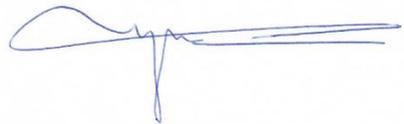
The second targeted direction of research in this thesis included research on the assessment of biocompatibility with the bone tissues of titanium-based alloys for use in medical prosthetics. The studied biomaterials showed a good compatibility with the bone tissue in the two species used as an experimental model, leporids and sheep. The newly bone has formed renewing the tissues without any significant inflammatory reaction, the alloys being delimited by a weakly vascularized fibrous capsule, being surrounded by osteoprogenitor cells that are involved in the bone remodeling. Following the research, a number of 6 ISI indexed papers were published.

The third direction of research is focused on the study of the effect on health of some compounds used in food industry and textile dyeing such as natural red dye (onion or beetroot) or a synthetic one (asorubine), using the laboratory mouse as an experimental model. If the onions caused hemolytic anemia accompanied by the formation of Heinz bodies in the red blood cells of cattle, sheep, horses, dogs and cats, but the experiments showed that the

hepatic and renal impairment was not severe in mice, suggesting a low toxicity to mice, as in majority of humans.

In *Chapter II. Professional realisations* – could be founded the most important results which were obtained in the matter of professionally and academically field, as follows: publication of 8 handbooks (5 as single or first author); grant director at two research projects obtained by competition and member in other 12 grants.

In *Section B.II* I included the proposed targets for career development, both for didactic sphere as well as in scientific field, in accordance with the development objectives of the “Ion Ionescu de la Brad” University of Life Sciences in Iași, as well as various possibilities to achieve them: promoting excellence in teaching or research, continuous training, establishing strong partnerships in research, focusing education on the student or the continuous improvement of study programs.

A handwritten signature in blue ink, consisting of a large, stylized initial 'I' followed by a series of horizontal strokes and a vertical line extending downwards.