



UNIVERSITY OF AGRICULTURAL SCIENCES AND VETERINARY
MEDICINE CLUJ-NAPOCA

DOCTORAL SCHOOL: AGRICULTURAL SCIENCES ENGINEERING

HABILITATION ABSTRACT

Studies regarding morphological, biochemical and organoleptic characteristics of fruits in different horticultural species and their importance in the breeding process

Domain: Horticulture

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ABSTRACT

The habilitation thesis, titled "Studies regarding morphological, biochemical and organoleptic characteristics of fruits in different horticultural species and their importance in the breeding process" is focus on scientific, professional, academic achievements, career development and development plans in horticultural thematic directions. The habilitation thesis is structured in three chapters as follows:

Chapter 1 of the thesis contains the presentation of the professional training, the didactic, scientific, publishing activity since the defense of the doctoral thesis until now and the managerial activity at institutional level. I am carrying out my academic activity in USAMV Cluj-Napoca from 1999 until now. During my 26 years of teaching experience, I have published, in horticultural area: 3 scientific books (first author), 1 teaching manuals and 1 workbook at national publishing houses. I carried out research activities within the USAMV CN research collectives, through research and consulting projects, respectively institutional development projects in which I had the position of project director (6 projects) or member of the project team (4 projects). The results of the research were materialized throughout the publication of numerous scientific works as follows: in ISI Thomson Reuters rated journals (9), in journals and the volumes of some events scientific publications indexed in other intonation databases as full-length articles (16), in the volumes of scientific events indexed by BDI as short communication (8), in the volumes of international conferences with a program committee (6). The published articles accumulated a total of 502 citations in ISI and BDI listed journals.

Chapter 2 of the habilitation thesis includes the presentation of the achievements obtained as a result of the research activity carried out after obtaining the title of Doctor in 2008. The research was carried out within the framework of research collectives from USAMV Cluj-Napoca and other institutions with a horticultural profile and were supported by research contracts carried out with institutions and with the economic environment.

Chapter 2.2. Research on the biochemical composition and morphology of fruits of different shrub varieties

Subchapter 2.2.1. Raspberry (Rubus idaeus L.) The main morphological characteristics, the chemical composition of the fruits and the possibilities of their improvement through breeding - the studies related to physical parameters, biochemical composition and the possibilities of raspberry breeding were carried out by a group of researchers from: The Research and Development Institute for Pitești-Mărăcineni, the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, the Research and Development Station for Plant Culture on the Sands of Călărași and the Ion Vodă cel Viteaz Fruit Research Station, Iași.

Subchapter 2.2.2. The establishment of blueberry crops (Vaccinium myrtillus) with valuable varieties, with fruits rich in bioactive compounds - the research was carried out together by specialists from the Research Station for Plant Culture on Nispuri Dăbuleni, Calarași, Mehedinți, the analysis and the experimental part were started at Pitesti-Mărăcineni Research and Development Institute for Pomiculture. Eight varieties of blueberry were tested, of which six varieties are created at the Pitești Mărăcineni Research Institute for Pomiculture (ICDP Pitesti-Mărăcineni), one variety is originaly from the USA (Blueray), as well as blueberry from the spontaneous flora, as regards their productivity and physico-chemical properties, this research was conducted in order to create future ecological blueberry plantations based on Romanian varieties rich in nutrients.

Subchapter 2.2.3. Research on the biochemistry and morphology of different varieties of Rosa

canina from Transylvania - were carried out on 8 varieties of *Rosa canina* from the Transylvania area, in the period 2012-2015, they focused on morphological analyzes and biochemical determinations, in order to select some valuable varieties from judging by chemical composition, resistance to pests, the possibility of harvesting as easily as possible (thornless varieties), which can be used in the creation of a plantation, respectively for pharmaceutical or food purposes.

Chapter 2.3. Studies on the characteristics of apple varieties important for juice production - these studies continued research from the PhD, they present data on the physico-chemical properties of apple varieties suitable for juice extraction and the technology transfer of research data to apple breeding programs and to the food industry. Thus, it was possible to identify apple varieties valuable for the improvement process and which also have a large amount of juice, good productivity and valuable content of nutrients, such as high content in Vitamin C.

Chapter 2.4. The analysis of the organoleptic, physico-chemical parameters of tomatoes important for the creation of hybrids with semi-determinate growth and for the cultivation of quality tomatoes - research undertaken together with groups of researchers from the USAMVCN, Agrosel Câmpia Turzii Research Station, Institute for Conservation and Improvement of Valencian Agrodiversity, Universitat Politècnica de València in Spain, aimed to analyze the physico-chemical and organoleptic parameters of tomato fruits relevant to their quality. Since processing by-products appear after the processing of tomatoes, it was considered important to recover carotenoids from them using sustainable chemistry (green chemistry), which implies the utilization chemical substances, products and synthesis processes in order to minimize the production of dangerous substances. The influence of arbuscular mycorrhizal fungi and fertilization on root growth of different tomato genotypes was also studied. Obtaining quality, nutrient-rich tomatoes is important for breeding, fresh consumption, and processing.

Chapter 3 presents Future directions of research, development plans and probable ways of action for their implementation following the defense of the habilitation thesis. In order to develop and improve academic activities, the proposals aim at the following aspects: continuous development of teaching skills, application of interactive didactic methods based on creativity and modernity, continuous updating of the didactic material in accordance with the latest developments in the field, participation in international training courses. Scientific research-development-innovation activities will be continued in the horticultural field, with the perspective of setting up research partnerships both in the academic environment and with horticultural research institutes and with the economic environment. The research in the field of horticulture, carried out after the conferment of the PhD title, demonstrates the ability to continue in this direction by collaborating with collectives of specialists in the field. I will also involve the students in the documentation and research activity necessary for the elaboration of doctoral theses and I will contribute to attracting new graduates that wish to continue their studies through the doctoral program. I will be involved in the coordination and training of future PhD students in scientific research projects, participation in workshops, conferences, symposia and other forms of dissemination of results. The results of scientific research will be published in prestigious journals. I will also apply for new development and research projects at national and international competitions.