ABSTRACT

The habilitation thesis with the title **Obtaining cultivars of white lupine (*Lupinus albus* L.) and the use of molecular markers in the determination of genetic diversity** tries to present, in synthesis, part of my practical, scientific and academic activity in the field of Agronomy. The period in question is the one after the defense of the doctoral thesis at the University of Agricultural Sciences and Veterinary Medicine in Cluj-Napoca (2002), the thesis entitled **Studies and researches of genetics and breeding in white lupine (*Lupinus albus* L.)**, the scientific co-ordinator being Mr. Prof. Dr. Doc. St. Costică Panfil.

The thesis is structured in three sections, in accordance with the current legislation and the regulation of the USV Iași regarding the organization and development of the process of obtaining the habilitation certificate. The sections are organized as follows: the first section presents the scientific, professional and academic achievements, the second section is focused on the evolution and development of the professional career, and the third section includes the bibliographic references used for the thesis.

The results selected to present the evolution of my scientific career are presented in chapter I in the form of two research directions, namely: (1) The use of molecular markers in the determination of genetic diversity and (2) Obtaining some varieties of white lupine. The results are presented in the context of the current state of scientific research in the field of Plant Breeding, trying to emphasize the original contributions and their relevance to the mentioned field. The thesis includes 25 figures and 17 tables and, for each topic addressed within a research direction, I presented the following structure: introduction; material and method; results and discussion; conclusions.

At the end of each subchapter, the elements of novelty and/or originality of the two targeted research directions were highlighted.

(1) The first direction of research was realized, over the years, by the publication of own studies or in which I collaborated, regarding the use of molecular markers (**RAPD** - Random Amplified Polymorphic DNA, **AFLP** - Amplified Fragment Length Polymorphism and **SSR** - Simple Sequence Repeats) in order to determine the existing genetic diversity between the cultivars of some species (peas – *Pisum sativum* L., autumn rape – *Brassica napus* L., barley – *Hordeum vulgare* L., maize – *Zea mays* L., oats – *Avena sativa* L., linden – *Tilia tomentosa* Moench and white lupine - *L. albus* L.). In this paper, only the research on the first three mentioned species is addressed.

The conclusions of these studies showed different degrees of relatedness between the analyzed germplasm forms, information that is or can be useful in the characterization their genetics, establishing the opportunity to use them as parental forms in the breeding process, determining or certifying the provenance, the existence in their genetic structure of some mutations that differentiate them from the cultivar of origin etc.

(2) The second research direction presents activities and studies carried out on the *Lupinus* genus, especially on the white lupine. These were realized through the registration of some cultivars in the Official Catalog and their subsequent patenting. Currently, three varieties are registered and patented, the only ones in Romania. All three current cultivars comes from mutant lines originally obtained as a result of research that began over 30 years ago (in 1993) at the Plant Breeding discipline within the Faculty of Agriculture of USV Iași. For two of the varieties I am the first or single author. The stages of the breeding process and results related to the behavior of the cultivars in the field or in a controlled environment are presented.

A large part of the research carried out was financed by projects with European or national funds. USV Iași, the Justus von Liebig University from Giessen – Germany or our own funds supported the others logistically and/or financialy the others.

In chapter II, Professional and academic achievements, the most important scientific and publishing research results that I obtained after completing my doctoral thesis could be find. Thus, I accumulated 6 publications with ISBN (+1 before the doctorate) in the field of Plant Breeding, of which two as the single author (one after the last graduation), collaborator on three books (+1) published in national publishing houses and co-author of a chapter of a volume published by an international publisher. As the main author/ corresponding author or co-author, I wrote 7 ISI articles plus one ISI proceedings (2 ISI papers were awarded by UEFISCDI, in one of which I was the first author), 4 of which I was the first author/corresponding author, I was the first author or sole author of two cultivar patents, 34 BDI articles, 3 articles published in the volumes of international conferences and more than 10 articles published not indexed specialized journals. The participated in 3 research projects as director/responsible (one international – Horizon 2020) and 11 projects in which I participated as an active member in the research teams (one international).

In section II, the plan for the evolution and development of the professional, scientific and academic career is presented, in which we have included the proposed objectives, as well as different possibilities for their implementation.

Section III includes a list of bibliographic references consulted in the development of this thesis and the articles included in this synthesis.

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