Eco-biological and phytochemical study of valuable medicinal plants of genus *Alchemilla* L. (Lady's mantle) in Bulgaria.

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The presented PhD thesis covers two diverse scienthyphic areas – ecology and distribution *vs.* plants cultivation. This attempts a complex research on the poorly studies genus *Alchemilla* in Bulgaria which can contribute to the conservation and sustainable use of its resources.

The aim of this thesis was to determine patterns in the distribution and abundance of some medicinal plants of genus *Alchemilla* (Rosaceae) in selected regions in Bulgaria as well as to study the influence of the ecological conditions on the biological characteristics and the content of biologically active substances of two protected *Alchemilla* species.

The investigated territories cover part of West and Centrala Balkan Mt., Sredna gora Mt., Osogovo Mt., West Rhodope Mts. and Rila (the watershed of Lakaticza River). In the cource of the study was found that these regions harbour high diversity of *Alchemilla* species which sums up to 63% of the species from this genera enlisted for Bulgaria. One taxonomic novelty was reported – the species *Alchemilla serbica* (Pawlin) Pawł. should be considered as widely distributed in the country instead of the species *A. erythropoda* Juz., formerly wrongly appointed for the territory of Bulgaria. A few *Alchemilla* species with conservative status were found out of the borders of the protected areas. Their main clone-populations appear to be well protected inside these areas. The species *A. acutiloba, A. crinita, A. glabra, A. monticola* and *A. serbica* can be assumed as most common in the best part of the investigated areas. For determination of the habitat affiliations of the Bulgarian *Alchemilla* species was applied the hierarchical habitat classification of EUNIS. As original habitats for the *Alchemilla* species can be appointed E2.33 Mountain hay meadows, E5.41 Screens or veils of perennial tall herbs lining watercources and E5.572 Moesian tall-herb communities. The localities of the rare and protected species *A. mollis* and *A. achtarowii* was found to be exposed on significant negative antropogenic impact which requires certain protective masures to be undertaken.

The investigations in *ex situ* conditions revealed that *A. mollis* and *A. achtarowii* are stable and morphologically descrete. An evidence for this is the low level of variability of the morphometrical parameters both in the nature and in controlled conditions. The seeds of *A. mollis* and *A. achtarowii* have the natural ability to germinate in laboratory conditions on the contrary to the common notion of their infertility as a result of their apomictic origin. The introduction of *A. mollis* and *A. achtarowii* at lower altitude than their natural range of distribution resulted in extension of the growing season but earlier onset and shorter flowering period. The phenological stages differ in their tolerance to average monthly and annual temperatures. Most sensitive in this respect appear inflorescence emergence, flowering and

ripening of fruit. The number of flowering shoots per plant also shows similar dependence. At lower altitude the content of galotannins in the aerial parts of *A. mollis* and *A. achtarowii* increases. In the same conditions the timing of the peak content of these substances in the basal leaves and the flowering stems differs significantly. The phaenological stage of flowering should be associated with the highest level of tannins in both species. The flavonoid content decreses in *A. achtarowii* at lower altitude while in *A. mollis* it is comparable to the level in the nature. In controlled conditions *A. mollis* exhibits good adaptive capacity and stable growth unlike *A. achtarowii* whoch shows some signs of water and temperature stress.