PLANTS OF *ROSA* AND *CRATAEGUS* GENERA AND THEIR ASSOCIATED FUNGI AS BIOTECHNOLOGICAL OBJECTS

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The search of natural resources of medicinal substances and a new drug discovery are actual nowadays. Data analysis and preliminary study of *Rosaceae* plant species and their associated fungi revealed that they could be a potent raw stuff of biopharmaceuticals. Plants of *Rosa* and *Crataegus* and their fungi were selected for more detailed review due to numerous bioactive compounds valuable for human health.

Metabolic formation of important for life chemicals, like vitamin C, phenols and carotenoids, are reported for *Rosa* genus representatives. While plants of *Crataegus* genus serve as the producers of polyphenols, terpenoids, lignans, steroids and organic acids. Being rich in phytoconstituents that provide a wide spectrum of therapeutic activity these plants are frequently used as biotechnological material in pharmaceutical industry [1,2]. The patent analysis has demonstrated that extracts of *Rosa canina* and *Crategus monogyna* are providing a basis for various currently proposed medicinal formulations. *Rosa canina* fruits are used in pharmaceutical preparations and in a tea against helminths, as well as a component of phytocompositions with antimicrobial, anti-inflammatory and diuretic properties. There are patents on application of *Rosa* hips in the anti-inflammatory preparation "Liprozol", diabetic yogurt and tincture named the "Vitagren" [3]. Different aerial parts of *Crataegus* are used in the compositions with immunomodulation properties, for treatment and prevention of cardiovascular and urinary system diseases. Some medicines that include *Crataegus* in manufacturing process are patented in Ukraine: the geriatric preparation “Ginogran”, the “Klimapin” for the treatment of menopausal disorders, the heart drops “Cardiophyt” and the “Tricardin” for cardiovascular system improvement of functioning, the “Krapol” for treatment of pancreatitis, the “Vitokan” for treatment and prevention of mastopathy and well-known “Cholosas” for application during cholecystitis and hepatitis. Oil and extracts of *Rosa* and *Crataegus* plants are also employed in other industries for functional food production, as toothpaste additives, *etc* [3]. *Rosa* essential oils are widely used in technologies of cosmetics and fragrances production, in compositions of such brands as Chanel, Chloe, Lancome and Paco Rabanne.

Plants of *Rosaceae* family are associated with various fungi species, for which endophytic, epiphytic and parasite interactions have been reported. It is worth to mention that more than 90 taxa of mycosphaerelloid fungi are associated with *Rosaceae* family [4]. Leaves of *Rosa* species are usually invaded by *Cladosporium herbarum, Davidiella variabile, Passalora rosae, Phragmidium* sp., *Rosisphaerella rosicola*. For *Rosa* fruits are characteristic the associated fungi of *Botrytis cinerea, Coniothecium chomatosporum, Diplodia rhodocarpa, Melanconium stromaticum, Myxosporium*

rosae, Phoma rhodocarpa, *Seimatosporium caninum* and *Sphaeropsis rhodocarpa*. Among endophytic fungi the species of, *Cystofilobasidium capitatum, Hanseniaspora guilliermondii, Schwanniomyces vanrijiae, Sporobolomyces roseus, Tremella encephala, Yarrowia lipolytica,* as well as *Cryptococcus* sp. and *Rhodoturula* sp. were reported [5,6]. Leaves of *Crataegus* plants are more frequently invaded by such fungi as *Alternaria alternata*, *Ascochyta crataegi, C. herbarum, Coryneum foliicola, Entomosporium thuemenii, Gloeosporium crataeginum, Leptoxyphium fumago,* various species of *Phyllosticta* and *Septoria*. The fruits of *Crataegus* are mainly associated with *Gleosporium crataegi, Hendersonula fructigena, Microdiplodia fructigena, Monilinia johnsonii, Phoma fructigena* and *Venturia crataegi*. As endophytes of this plant genus are known *Cochlonema verrucosum, Gliocladium delequescens, Tharoopama trina,* and *Aureobasidium* sp., *Chaetomium* sp., *Hormonema* sp., *Isaria* sp. [5,6].

Numerous data on *Rosa* and *Crataegus* species application in biotechnologies are presented nowadays, however limited reports are devoted to possibility of usage of their inhabiting associated organisms. Some associated fungi could be biotechnological objects as producers of valuable bioactive compounds that can be applied as starting material for pharmaceutical and agricultural products [7]. Thus, *Rosa* and *Crataegus* samples collected in Kyiv and Brovary district were selected for investigation. For fungi isolation, the basic mycological methods were applied. Several fungi were isolated in pure culture from *Rosa canin*a and *Crataegus monogyna*. Species of *Aspergillus* and *Phoma* were associated with *R. canina,* and *Coniothyrium olivaceum* and *Alternaria alternata* were characteristic for *C. monogyna*. Further analysis of bioactivity and bioactive constituents of fungal isolates, as well as correlation with their hosts is carried out. It was shown that flavonoids and other phenolic compounds are present in host plants and their fungi, besides other types of bioactive metabolites were revealed.

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