DESCRIPTION FOR THE GENERAL PUBLIC

Plants from European *Ilex sp.* (holly, mainly *aquifolium* or *meserveae*) were still in the nineteenth century pharmacopoeias, as raw materials with defined biological properties: antipyretic, and antirheumatic cholagogic. However, because of the very high popularity and availability species of South American - *paraguariensis*, they disappeared almost completely Pharmacopoeia or textbooks pharmacognosy. We can determine that they became for natural medicine among the so-called "forgotten plants". Our research team has been very successful in proving significant pharmacological activity (strongly antiglaucoma or cholagogue), another "forgotten plants' proper dogwood, *Cornus mas*, occurring in our geographical region.

Due to the very high popularity of *I. paraguariensis*, both as raw food and pharmacognostic, we have a thorough knowledge of the pharmacological activity. The presence of *I. paraguariensis* biologically active saponins, triterpenoids or polyphenols, a condition well documented antihypertensive properties, hypocholestrolemic, analgesic. But above all, is a plant supporting the fight against obesity. Our preliminary studies have shown the European variety *I. aquifolium* occurrence similar to *I. paraguariensis* groups of secondary metabolites: triterpenoids and saponins identical layout and polyphenols. This premise leads us to undertake detailed studies on the chemical composition and biological activities of European *Ilex sp.*

The project involves a detailed determination of secondary metabolites (techniques LC-MS and NMR) local *Ilex sp*. (eg. *I. aquifolium, I. meserveae).* Taxon richest in saponin-terpenoid fractions will be used to obtain: a) an extract containing all factions; b) the separated fractions terpenoids; c) the separated fractions of saponin; d) the separated polyphenol fraction. The obtained extracts/fractions are administered to rats (Wistar) fed with diet hipercholesterolemic and mutant SD- *ApoE*^{tm1sage} - knockout rats which are research model for obesity, atherosclerosis, insulin resistance, type II diabetes, and hypertension. During the experiment, the test will be the main parameters of physiological and biochemical blood: glucose, free fatty acids, total protein, albumin, creatinine, cholesterol, HDL cholesterol, triglycerides, glucose tolerance, and a number of other key model described. *Post mortem* it will be investigated the histopathology of isolated key tissues (heart, liver, brain arteries) and the expression level model for this type of experiments genes SREBP-1c, FAS, ACC, PPAR⟨, GAPDH. Will be supplemented toxicity tests on the foundations of cell lines (MSCs), bone marrow (BMSCs), body fat (ASCS) and intestinal (Caco-2).

The creation of a multidisciplinary team formed of specialized research groups: chemists, breeders, histologists and molecular biologists allows you to solve the stated problem comprehensively research - correlation between the composition of the pharmacological activity.

The expected outcome of the project will be: specific identification of secondary metabolites of the European varieties *Ilex* and to identify their biological properties. The results will detail the chemical similarity and pharmacological South American and European varieties.