

purgative, and tonic properties. According to our investigations aerial parts of *C. Cyanus* L. are an incontestable source of many phenolic compounds and polysaccharides. Pharmacological studies pointed out strong anti-inflammatory, gastroprotective effect of the *Cyani herba* selective extracts.

**Purpose and objectives** of this study was to test the acute toxicity of polyphenols and polysaccharides extracts from *Cyani herbain* on mice.

**Material and methods:** The polyphenols extract from *Cyani herbawas* obtained by direct extraction with 60% aqueous ethanol and the polysaccharides one – with distilled water at 90°C. The total polyphenols and polysaccharides contents were determined in both extracts. Acute toxicity was evaluated in 84 mice (42 male and 42 female), weighing 18-26 g. Each extract was dissolved in constant volume of NaCl 0.9% (0.4-1 ml by oral route using intragastric syringe, and 0.2-0.5 ml – intraperitoneally). Initially animals were given 50, 250 mg/kg body weight (b.w.) of the extracts respectively, to possibly establish the range of doses producing any toxic effect. The animals were observed continuously for 7 days for any gross change in behavioural, neurological, autonomic profiles and mortality in each group. Subsequently 500, 2000, 4000 mg/kg b.w. of the extracts were administrated. Mice were sampled after mortality for histopathological analyses of the selected tissues. The statistical analyses were carried out using Kurber's and Prozorovschi's methods.

**Results:** The acute lethal study of *Cyani herba* extracts in mice shows that enteral LD<sub>0</sub> was 4000 mg/kg b.w. LD 25%, LD 50%, and LD 100% haven't been established. Using intraperitoneal route LD<sub>0</sub> for both extracts was 250 mg/kg b.w. Intraperitoneal LD 17% for polyphenols extract was determined at 500, 2000, and 4000 mg/kg b.w. Intraperitoneal LD 34% for polysaccharides extract was established at 2000 and 4000 mg/kg b.w.

**Conclusion:** The obtained LD<sub>0</sub> value classifies the studied plant extracts as slightly toxic. The results suggest that the polyphenols and polysaccharides extracts of the aerial parts of *Centaurea cyanus* L. is relatively safe toxicologically when administrated orally and intraperitoneally.

**Keywords:** acute toxicity, *Cyani herba*, extracts, mice

## 19. METHODS OF DOSING FLAVONOIDS IN MEDICAL PLANTS

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**Introduction:** Flavonoids represent a group of useful compounds of vegetal origin that are of great interest for physiotherapy and pharmacology. This is a class of phenolic substances which gives its color to many species of flowers and fruits. Frequently, these pigments can be found in such plants as glycosides, in which one or more of the hydroxy groups of phenols are combined with reducing glucose. Based on the analysis, the effects of flavonoids can be grouped around the following biochemical processes: antioxidant and anti-inflammatory effect, and an important influence for the function of the immune system against asthma and allergies; in general could change the inhibition functioning of enzymes, viruses and bacteria effect. These benefits argue the objective of the study: dosing flavonoids in different part of the plant through spectrophotometric and chromatographic techniques.

**Purpose and objectives:** To assess the methods of dosing flavonoids from various vegetable products: underground part, aerial parts, flowers, leaves and seeds.

**Materials and methods:** Vegetable products containing flavonosids: *Silybi fructus*, *Calendulae flores*, *Menthae piperitae herba*; *Agrimoniae herba*, *Simphyti radices*. Reference Standards - quercetin, rutoside, luteolin, silibinin, hyperoside. The analyzes were performed at perchin Elmer spectrophotometer Lambda 25 UV-VIS and high pressure liquid chromatography Jasco reversed phase.

**Results:** Flavonosids extraction was performed with ethyl alcohol 70%. For spectrophotometric determinations, were obtained extracts from the different part of the plant and analyzed in relation to alcoholic solutions of reference standards: quercetin, rutoside, luteolin, silibinin, hyperoside. The results were recalculated after standard dosage of quercetin at wavelength 375 nm. Following results were

obtained for the total content of flavonoids: *Simphyti radices*-0,08%; *Agrimoniae herba*-1,39%; *Calendulae flores*-0,26% *Silybi fructus*-0,09%; *Menthae piperitae herba*-0,95 %. For chromatographic separation was developed a unique technique for all extracts, based on the use of the solvent system acetonitrile:purified water (80:20). The final results of dosing flavonoids by HPLC method are correlated with those obtained from UV-VIS spectrophotometric determination.

**Conclusion:** The obtained optimized extracts present the total concentrations of flavonoids, as evidenced by HPLC analysis and UV-VIS.

**Keywords:** vegetable products; flavonoid; extracts

## 20. THE STUDY OF COMPATIBILITY OF ECONAZOLE NITRATE AND BETAMETHASONE DIPROPIONATE

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**Introduction:** Econazole nitrate is an antifungal substance of the imidazole class that is successfully used in the treatment of different types of mycosis, especially those caused by agents as *Aspergillus flumigatus* and *Candida albicans*. According to WHO every fifth person is affected by a fungal disease. Mycoses are often associated with secondary infection followed by inflammation, that is why one of the possible drug combinations in the treatment of this disease is the combination between econazole nitrate and betamethasone dipropionate.

**Purpose and objectives:** Studying the compatibility of econazole nitrate and betamethasone dipropionate using different modern methods and analysis of the results from different perspectives.

**Materials and methods:** The research is based on the identification of econazole nitrate and betamethasone using the Infrared Spectrophotometry and the determination of the content of each substance in the mixture using UV-VIS Spectrophotometry and the HPLC chromatography.

**Results:** Infrared spectrums of econazole nitrate, betamethasone dipropionate and the mixture of econazole nitrate and betamethasone dipropionate (prepared from 1,0 g of each substance) show that there are few interactions between them. Infrared Spectrophotometry, as a modern method of analyse, is used only for identification of the substances, so it doesn't reveal any quantitative aspects. According to this, for testing forward the compatibility of the analyzed substances there were recorded UV-VIS spectrums using different solvents such as C<sub>2</sub>H<sub>5</sub>OH 96%, CH<sub>3</sub>OH, HCl 0.1M (according to European Pharmacopoeia). The recorded UV-VIS spectrums show that the substances by themselves correspond by quantitative aspects, but the mixture of them doesn't correspond. The compatibility of econazole nitrate and betamethasone dipropionate was also tested using HPLC chromatography. Chromatograms of econazole nitrate, betamethasone dipropionate taken on their own mobile phase show quantitative correspondence, but chromatograms of the mixture taken on the mobile phase of each substance doesn't reveal any compatibility.

**Conclusion:** The study of compatibility of econazole nitrate and betamethasone dipropionate, based on using different modern methods, revealed that the substances are incompatible.

**Keywords:** econazole, betamethasone, compatibility, spectrums, chromatograms

## 21. MARKETING ACTIVITY IN COMMUNITY PHARMACY

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**Introduction:** Pharmacy Marketing is a modern pharmaceutical management that is based on the orientation of the patient as "customer orientation" marketing concept is considered the foundation of modern marketing management. The value of service oriented marketing activities