

Pharmacognostic study of *Bryonia alba* root tincture according to the pharmacopoeial requirements

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Plant-based drugs have been used against various diseases since a long time. The nature has provided abundant plants which possess medicinal virtues. Therefore, there is a necessity to explore their uses and to conduct pharmacognostic and pharmacological studies to ascertain their therapeutic properties.

Bryony is a member of the *Cucurbitaceae* family, which climbs with tendrils curled round nearby objects for support. Bryony is a tendril vine found in hedges and in borders of woods that have calcareous soils. It is native to Eurasia. It is vulgarly known as snakeweed, devil's turnip, parsnip turnip, and bastard turnip.

The plant contains biologically active compounds which make it toxic. The plant material contains glycosides, including cucurbitacins B, D, E, I, J, K, L, tetrahydrocucurbitacin I; bryonin; polyhydroxy unsaturated fatty acids; trihydroxy octa-decadienic acids; essential oil; wax; tannins; carbohydrates; amino acids.

The fresh root of bryonia is extremely irritating, occasioning blisters when bruised and kept in contact with the skin, and causing serious gastro-intestinal inflammation when taken internally. Nevertheless, the plant is widely used in homeopathic medicine for centuries. It has such types of activity as anodyne, anti-inflammatory, anti-rheumatic, cathartic, diaphoretic, hypotensive, smooth muscle relaxant. Bryonia is given to the patients suffering from constipation, stiffness of joints due to rheumatism, headache, bronchitis, pneumonia and in measles. Bryonia seems to be a valuable heart tonic in weak and delicate individuals, who, by overwork and nervous excitation bring on a depressed and irregular heartaction (heart-strain); and even in organic heart troubles when exposure and rheumatic twinges bring on the cardiac paroxysm, bryonia, with rest in bed, is asserted to powerfully and rapidly influence the condition for good. Bryony is a promising anti-inflammatory and urate lowering drug with xanthine oxidase inhibitory activity which could be useful in gouty arthritis therapy.

Tinctures comprise an important medicinal form which allows to extract certain groups of biologically active compounds from the medicinal plant material. The concentration of ethanol plays a great role in obtaining the compounds of interest. The aim of our research was to obtain the bryony root tincture and carry out its phytochemical study.

60% ethanol was chosen as an extragent since it was determined that bryony root contained mainly lipophilic to slightly hydrophilic compounds so the 60 % ethanol would give the highest yield of biologically active compounds. The plant material-solvent ratio was chosen to be 1:10. The infusion term was 3 days.

The tincture obtained appeared to be a transparent liquid, slightly whitish, without extraneous inclusions. The taste was slightly bitter, smell was absent.

Pharmacopoeias of different countries have some common quality requirements which must be met by the tinctures produced. These are the relative density, ethanol percentage and the dry residue value. We have determined these parameters in the tincture obtained. The relative density was not higher than 1.0 g/cm³. The dry residue was 0.0255 g/ml. The ethanol content was not lower than 55 %.

With the purpose of a more profound phytochemical study of bryony root tincture we have carried out the identification tests to detect the main groups of biologically active compounds. Thus, the test with Fehling's solution has shown the presence of glycosides. Moreover, the precipitate after acid hydrolysis was more abundant than without it which lets us confirm the presence of glycosides in the tincture. Tests with 10 % sodium hydroxide solution, iron (III) chloride solution, 2 % aluminium chloride alcohol solution and cyanidin formation have confirmed the presence of flavonoids. The froth test has allowed to detect saponins in the bryony root tincture.

Using the spectrophotometric method we have determined the quantitative content of hydroxycinnamic acids, flavonoids and polyphenols calculated on gallic acid in the bryony root tincture.

Therefore, the research carried out will be taken into account during further pharmacognostic and pharmacological study of the bryony root tincture and working out of its quality parameters.

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