

March 11-12, 2019
London, UKMarcin Stocki et al., Am J Ethnomed 2019, Volume 6
DOI: 10.21767/2348-9502-C1-008

Perspectives of white birch bud extracts for therapy of tumors

Marcin Stocki¹, Valery Isidorov¹, Łukasz Szoka² and Jakub Strawa²¹Bialystok University of Technology, Poland²Medical University of Bialystok, Poland

Birch buds (*Gemmae Betulae*) are widely used in traditional medicine mainly as a diuretic and diaphoretic agent but also as an antiseptic, anti-inflammatory and analgesic. Despite the long history of therapeutic use of birch buds in folk medicine, the existing information on their chemical composition and pharmacological effects is insufficient. This circumstance warrants further study of the chemistry and pharmacology of birch buds. The present study was designed to investigate (a) the chemical composition of buds from two species of white birch and (b) the *in vitro* cytotoxic effect of extracts from these sources on selected tumour cells. Extracts from *Betula pubescens* Ehrh. and *Betula pendula* Roth buds were obtained using three different methods: carbon dioxide supercritical fluid extraction (SFE), washing of exudate covering whole buds, and extraction of milled buds with diethyl ether. Chemical composition of the buds of these extracts was examined with chromatographic methods. Twenty three pure compounds were isolated and some were identified in mixtures with GC-MS method. The major components of both sources were terpenoids and methoxylated flavonoid aglycones, derivatives of flavane, flavone and flavonol. For the first time were isolated glycosides (+)-catechin 7-O-glucopyranoside, hyperoside and avicularin and identified procyanidins in butanol extracts. The comparative quantitative examinations showed that buds from *B. pubescens* are richer in flavonoids and phenolic acids than from *B. pendula*. Cytotoxicity was determined by MTT assay, and cell proliferation was determined by [3H] thymidine

uptake in cancer cells and normal skin fibroblasts. The highest cytotoxic activity demonstrated bud exudates and SFE extracts obtained from both *Betula* species. The rich chemical composition of birch buds suggests the possibility of a wider spectrum of biological activity than previously thought. Birch bud extracts could be a promising source of compounds with cytotoxic activity against various cancers.



Recent Publications

1. Isidorov V A, Szoka Ł and Nazaruk J (2018) Cytotoxicity of white birch bud extracts: perspectives for therapy of tumours. PLoS One 13:e02201949.
2. Isidorov V A, Bagan R, Szczepaniak L and Święcicka I (2015) Chemical profile and antimicrobial activity of extractable compounds of *Betula litwinowii* (Betulaceae) buds. Open Chemistry 13(1):125-137.

Pharmacognosy and Medicinal Plants

March 11-12, 2019
London, UK

3. Isidorov V, Szczepaniak L, Wróblewska A, Pirożnikow E and Vetchinnikova L (2014) **Gas chromatographic-mass spectrometric examination of chemical composition of two Eurasian birch (*Betula L.*) bud exudates and its taxonomical implication. *Biochemical Systematics and Ecology* 52:41–48.**
4. Stocki M, Zapora E, Rój E and Bakier S (2018) **Obtaining of valuable biologically active compounds from logging residue of birch (*Betula* spp.) using supercritical carbon dioxide. *Przemysł Chemiczny* 97:774-778..**

Biography

Marcin Stocki is a PhD student from the Faculty of Biology and Chemistry at the University of Białystok in the field of chemistry. In 2013, he completed Postgraduate studies in Analytics in environmental protection - chromatography and separation techniques in various variants of trace determinations at the Faculty of Chemistry of the Nicolaus Copernicus University in Torun. He is Assistant at Faculty of Forestry of Białystok University of Technology.