



10th CMAPSEEC: BOOK OF ABSTRACTS

**10th Conference on Medicinal and Aromatic Plants of
Southeast European Countries**

May 20-24, 2018, Split, Croatia

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of Southeast European Countries
May 20-24, 2018, Split, Croatia

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SHORT REVIEW OF THE ANTICANCER AND CYTOTOXIC ACTIVITY OF SOME SPECIES FROM GENUS *EUPHORBIA*

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Euphorbiaceae family is a widely spread family that contains more than 2000 species in the genus *Euphorbia*. The plants of this genus have been used for a long time in traditional medicine. Their main active components alkanes, triterpenes, phytosterols, tannins, polyphenols and flavanoids are supposed to be responsible for different types of activity. *Euphorbia formosana* Hayata is a medicinal plant used to treat rheumatism, liver cirrhosis, herpes zoster, along as tumor suppressor. *Euphorbia tirucalli* L. has been used to obtain methanolic extracts. Their cytotoxic activity has been examined against many different types of cancer cells, as well as colon cancer cell line, liver cancer cell line, ovarian cancer cell line and prostate cancer cell line. Leukemic cell lines, THP-1 and HL-60, have been inhibited dose dependent after 24h of treatment with 400 $\mu\text{g mL}^{-1}$ *Euphorbia formosana* Hayata. *In vitro* anticancer activity assays of *Euphorbia formosana* Hayata suggest potent anticancer effects that cause both cell cycle arrest and apoptosis of leukemic cancer cells. The ethanolic extract of *Euphorbia helioscopia* L. inhibited the growth of only three cancer cell lines, Hep-2 (27%), T-47D (7%) and PC-5 (11%). Cell viability assays were conducted on the pancreatic cancer primary tumor cell line to assess the relative toxicity of the *Euphorbia tirucalli* L. extracts. The toxicity of both extracts was found to be dose dependent, with cell viability decreasing with increasing extract concentration. Both aqueous and methanol extracts demonstrated similar activity at 50 $\mu\text{g mL}^{-1}$ with a viability of 50%, while only the methanol extract exerted a significant decrease in cell viability from 25 $\mu\text{g mL}^{-1}$. The pronounced cytotoxic activity of this very few species from the genus *Euphorbia*, suggest that it could be very interesting to investigate more deeply about their potent anticancer ability. So, the aim of this study was to review the anticancer activity of some of the species examined experimentally by now, using different *in vitro* or *in vivo* assays.

Key words: anticancer effects, cytotoxic effects, genus *Euphorbia*, medicinal plants

IONIC LIQUID-ASSISTED MICELLAR EXTRACTION FOR THE QUANTITATIVE DETERMINATION OF SESQUITERPENIC ACIDS IN *VALERIANA OFFICINALIS* L. (CAPRIFOLIACEAE)

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The performance of aqueous solutions of a series of hydrophilic ionic liquids (ILs) in the extraction of sesquiterpenic acids from roots of *Valeriana officinalis* L. was systematically studied by taking into account the influence of several factors such as anion type (chloride, bromide, acesulfamate, trifluoroacetate, acetate, thiocyanate, saccharinate, and dicianamide), cation type (imidazolium, pyrrolidinium, and ammonium) and substitution pattern, concentration, extraction time, temperature, and plant material/extractant ratio. It was found that specific interactions, such as hydrogen bonding, ion-dipole, hydrophobic or π - π interactions, do not affect the extraction yields (EY) and that the extraction of acetoxyvalerenic and valerenic acids is strongly dependent on the ability of IL to form micelles. The proposed micelle-based mechanism of extraction was confirmed by additional experiments with [C10C1im] Cl at concentrations above and below its critical micelle concentration (CMC). Further optimization of the extraction conditions brought about the development and validation of an alternative method for quantification of sesquiterpenic acids in roots of *V. officinalis* by means of its preliminary extraction with an aqueous solution of [C10C1im] Cl, followed by HPLC quantification. The method developed ensures the same EY as the reference procedures but does not require special equipment; it is easy to perform and excludes the harmful organic solvents from the sample preparation step, the latter being of a great importance from an industrial standpoint.

Key words: ionic liquids, solid-liquid extraction, valerian, sesquiterpenes, acids

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