Chemical Constituents and Cytotoxic Effect of the Main Compounds of *Lythrum salicaria* L.

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Z. Naturforsch. **68 c**, 367–375 (2013); received September 11, 2012/August 28, 2013

Lythrum salicaria L. (Lythraceae), a herbaceous plant growing widely in Iran, has been well known for many centuries for its astringent and styptic properties. A phytochemical investigation of this plant, based on spectroscopic analysis, identified fourteen compounds: 5-hydroxypyrrolidin-2-one (**1**), umbelliferone-6-carboxylic acid (**2**), 3,3',4'-tri-*O*-methylellagic acid-4-*O*-*b*-D-(2"-acetyl)-glucopyranoside (**3**), 3,3',4'-tri-*O*-methylellagic acid-4-*O*-*b*-D-glucopyranoside (**4**), daucosterol (**5**), phytol (**6**), dodecanoic acid (**7**), oleanolic acid (**8**), 3,3',4'-tri-*O*-methylellagic acid (**9**), corosolic acid (**10**), *b*-sitosterol (**11**), peucedanin (**12**), buntansin (**13**), and erythrodiol (**14**). All compounds, except for **8** and **11**, have been isolated from *L. salicaria* for the first time. Cytotoxic activities of the compounds were examined against three cancerous cell lines, colon carcinoma (HT-29), leukemia (K-562), and breast ductal carcinoma (T47D), and Swiss mouse embryo fibroblast (NIH-3T3) cells using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay and methotrexate as positive control. Compounds **5**, **10**, **11**, and **14** were the most active against the HT-29 cell line with IC_{50} values of 192.7, 36.8, 38.2, and 12.8 μg/mL, respectively. Compounds **14**, **11**, **5**, and **10** were 6.4, 2.8, 2.6, and 1.4 times, respectively, more selective than methotrexate. Compound **5** was the most active against the K-562 cell line (IC_{50} = 50.2 μg/mL), with a selectivity exceeding that of methotrexate 13.3 times. The results of the cytotoxic assay confirmed that growth and proliferation of the cancer cell lines are predominantly influenced by triterpene derivatives and sterols of this plant.

Key words: Lythrum salicaria, Phytochemistry, Cytotoxic Effect