Bioassay-Guided Fractionation through the Cytotoxic Activity of *Sorbaria tomentosa*

Shabnam Javed,[1*,2] Fyaz Ismail[2], Andrew Evans[2], Lutfun Nahar[2] and Satyajit D. Sarker[2]

[1]**Centre for Undergraduate Studies, University of the Punjab, Quaid-e-Azam Campus, Lahore-54590, Pakistan*

[2]*Medicinal Chemistry and Natural Products Research Group, School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, James Parsons Building, Byrom Street, Liverpool L3 3AF, United Kingdom*

*E-mail: shabnam.hons@pu.edu.pk

Present studies was focussed in the field of natural products chemistry for cancer chemotherapy by cytotoxic studies through fractions and natural compounds after isolation and structural elucidation from the selected medicinal plant of Pakistan with special emphasis on genus Sorbaria. *Sorbaria tomentosa* belongs to the Genus *Sorbaria* of the family Rosaceae, is a medicinal, ornamental large, woody shrub", native to Pakistan. Cytotoxicity evaluation of *S. tomentosa* fractions showed EtOAc fraction (ST-EtOAc) being the most potent against all test cancer cell lines (lung A-549, hepatocellular HepG2 and urinary bladder EI-138). Solid phase extraction (SPE) of the most cytotoxic fraction (ST-EtOAc) led to isolation of four sub-fractions (SPE-1−SPE-4) where SPE-2 evaluated to be the most cytotoxic sub-fraction. Cytotoxic guided fractionation of SPE-2 was proceeded by reversed–phase semi-preperative HPLC and bioactive compounds were identified. Isolated compounds were identified using LC-MS. To date, only a handful of studies have ever been carried out involving *S. tomentosa.* Now in detail, for the first time the potential cytotoxic activity by MTT assay against the tested human cancer cell lines and identification of compounds from *S. tomentosa* is reported. Finally, the present phytochemical and cytotoxic investigation in present studies has demonstrated that the selected medicinal Pakistani plant is a rich source of bioactive compounds and an exciting source for cytotoxic compounds. After further cytotoxicity studies against human cells and toxicity studies (*in vitro* and *in vivo*) on *Sorbaria tomentosa* can be confirmed as novel source in drug discovery research against human cancer in the future.