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Extraction and characterization of phytochemicals from white seringa (*Kirkia acuminata*) bark extracts

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The intention of this study was to extract and characterize phytochemicals with analgesic effect from *Kirkia acuminata* bark extracts. Soxhlet extraction and steam distillation were used for the extraction of compounds. Methanol, dichloromethane and hexane were used as solvents. Classes of phytochemicals were identified by qualitative tests and thin layer Chromatography using UV light. The qualitative tests of the phytochemical screening indicated the presence of alkaloids, anthraquinones, glycosides, flavonoids, phenols, tannins to name a few. Alkaloids, flavonoids, phenols and tannins were also observed on thin layer chromatography. Menthol, catechol, 1,2 benzenediol-4-methyl, nitro phenyl salicylate, phenol dimethoxy, tau-cadinol, isopropenyl-8-dimethyl, menthone and levomenthone were identified using gas chromatography-mass spectrometer. The hexane fraction which is highly a non-polar solvent showed that very few phytochemicals were taken up in it. The polar solvents showed compatibility with the various chemical classes. The presence of these compounds gives *Kirkia acuminata* its characteristic property of being an analgesic. It thus finds application in the field of medicine.

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Indication of vascular endothelial growth factor binding components from herbal extracts by HerboChip: A platform for drug screening on a chip

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HerboChip is an array of different fractions deriving from herbal extracts, which could be applied in drug screening. Here, we aimed to identify effective components from traditional Chinese medicines (TCMs) that interact with vascular endothelial growth factor (VEGF) as a target using HerboChip. The extracts of TCMs were chemical standardized and fractionated by a standard HPLC profiling. The biotinylated-VEGF was hybridized with chips coated with different HPLC-separated fractions from the herbal extracts. Straptavidin-Cy5 was used to identify the VEGF-bound fractions. Over 100 chips were screened, and 8 positive hits were identified. The interaction of identified herbal extracts/phyto-compounds with VEGF was further confirmed in cultured human umbilical endothelial cells. As a result, the identified herbal extracts/compounds interfered (i.e. binding) with VEGF-induced cell proliferation and cell migration. The amounts of phosphorylated eNOS, phosphorylated Akt and phosphorylated ERK 1/2 were markedly altered in the co-application of the herbal extracts/compounds with VEGF. In addition, the phosphorylation of eNOS, Akt and ERK 1/2 could be modulated by the identified extracts/compounds. Six compounds from TCMs showed activating activities on the VEGF response, and two TCM compounds showed inhibiting activities. In conclusion, the current result supported the applicability of HerboChip for screening VEGF binding components from herbal extracts.

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