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## Essential oils of *Anethum graveolens* L: Chemical composition and their antimicrobial activities at vegetative, flowering and fruiting stages of development

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Antimicrobial activity of the essential oils obtained from vegetative herb, flowering herb and the seeds of *Anethum graveolens* was determined against eight microorganisms using the disk diffusion assay test as well as measuring Minimum Inhibitory Concentrations (MIC) against diverse type of microorganisms including gram-positive bacteria, gram-negative bacteria and fungi. The results showed that the tested dill oils exhibited strong and a variable degree of antimicrobial activity against all of the tested microorganisms. The essential oils compositions were analyzed and determined by GC. The main components of the vegetative herb essential oils were  $\alpha$ -phellandrene (46.33%), limonene (13.72%),  $\beta$ -phellandrene (11.01%) and p-cymene (17.88%). p-cymene (33.42%), carvone (13.10%) and dill ether (19.63%) were the main components of the flowering herb, whereas, carvone (62.48%), dillapiolene (19.51%) and limonene (14.61%) were identified as the major compounds in seed essential oil.

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## Micropropagation of *Swietenia humilis* Zucc by somatic embryogenesis and determination of anti-diabetic activity

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*Swietenia humilis* Zucc, a timber species that traditionally has been used to treat diabetes mellitus (seed and bark) in Mexico. *S. humilis* is considered an endangered species due to its overexploitation for commercial use, slow growth rate and scattered population. *In vitro* culture techniques such as somatic embryogenesis will allow the mass propagation of abundant plant material and could be the basis to establish a micropropagation protocol potentially useful in conservation programs and the study of bioactive compounds. The main objective of this project was the induction of somatic embryos of *S. humilis* and to compare the antidiabetic activity between *in vitro* propagated and wild plant. The effect of phytohormones 2,4-dichlorophenoxyacetic acid (2,4-D) and kinetin were evaluated in the morphogenesis of *S. humilis* in different explants. It was used as primary explants immature zygotic embryos, immature and mature seeds. These explants were cultured in Murashige & Skoog medium supplemented with nutrients to promote the formation of somatic embryos and were incubated in darkness at a temperature of 25±2 °C. Our results showed that the treatments of 2,4-D (1 mg.L<sup>-1</sup> or 4 mg.L<sup>-1</sup>)-kinetin (0.5 mg.L<sup>-1</sup>) promoted the formation of somatic embryos. A preliminary phytochemical screening of dichloromethane and methanolic extracts indicated the presence of the following compounds: Alkaloids, coumarins, cardiotonic and flavonoids in all extracts; also the presence of saponins, terpenes and tannins in some extracts. Pharmacological studies of these extracts in mouse model of Non-Insulin-Dependent-Diabetes Mellitus (NIDDM) showed an anti-diabetic activity compared with glibenclamide.

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