Effects of ethanolic extracts of four Ecuadorian plants on porcine Aortic Endothelial Cells (pAEC) stability

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Angiogenesis is defined as sprouting of new capillaries from pre-existing vasculature, and involves proliferation and migration of endothelial cells (Carmeliet et al., 2000). Primary culture of porcine Aortic Endothelial Cells (pAEC) are used in many in vitro models confirming swine as a relevant translational animal model (Botelho et al., 2015). Although in Ecuador about 80 % of the population depends on the traditional medicine, there is a lack of scientific information that support the use of plant extracts (Buitron, 1999). The aim of the present research was to evaluate cytotoxic and angiogenic properties of ethanolic extracts prepared from the dried leaves of four Ecuadorian plant traditionally used to counteract inflammation, common cold, infection, healing or ulcers. pAEC were cultured in the presence of extracts (1-200 ug/ml) for 24 h, then cell viability was evaluated by MTT assay. Campyloneurum amphostenon (Kunze ex Klotzsch) Fée and Aristeguietia glutinosa (Kunth) R.M.King & H.Rob have decreased cellular viability at doses higher than 25 ug/ml. Clinopodium tomentosum (Kunth) Govaerts and Salvia quitensis Benth did not affect the cellular viability at any dose tested. In vitro pro-angiogenic activity of the two extracts that not presented cytotoxicity was tested by scratch test. C. tomentosum increased cell migration by about 73% (25 ug/ml) after 24 hours, while the S. quitensis extract did not increased cell migration. Thereafter, the C. tomentosum extract was tested in a 3D assay to study its ability to induce the formation of a capillary-like tube structure. pAEC were plated on a layer of polymerized extracellular matrix. After 18 hours C. tomentosum induced a complete capillary like network with a dose dependent increase of master junction. In conclusion, we demonstrated “In vitro” the regulation of vascular cells dynamics by plants extracts with C. tomentosum showing clear pro-angiogenetic properties.

Carmeliet et al. (2000). Nature. 407, 249-57.

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