World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:15, No:10, 2021

In vitro Modulation of Cytokine Expression by an Aqueous Licorice Extract in Canine

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Abstract : Objective: We investigated the immunomodulatory ability of licorice (Glycyrrhiza glabra). Such activities could have value for the management of common immunological diseases in dogs, such as environmental allergy. This study investigated the potential of a Licorice root extract (LRE) to influence the relative expression of Th-1, Th-2, and Th-17 cytokines in canine peripheral blood mononuclear cells (PBMC). Methods: A LRE was prepared using an alcoholic-aqueous-based solvent method. The extract was tested in three in vitro assays using canine leukocytes to determine its toxicity and immunoregulatory profile. Extract toxicity was assessed using the human T-lymphocyte cell line, Jurkat E6.1. The impact of the extract on the proliferation of concanavalin-activated canine PBMC was also determined. Finally, the extract was assessed for its ability to influence cytokine release in activated PBMC, measuring culture medium concentrations of interleukin-17, interferon gamma, and interleukin-4. One-way ANOVA followed by Dunnett's post-test was used for statistics using concanavalin positive control as reference ($p \leq 0.05$). Results: There was evidence that the LRE had specific immunomodulatory properties, causing significant inhibition of IL4 expression over a non-toxic/non-cytostatic concentration range ($p < 0.001$). In the same cell incubations, there was no significant impact on IL17 nor IFNg over the same non-toxic/non-cytostatic concentration range. Conclusion: The study provides in vitro evidence that LRE preferentially reduces the expression of a Th-2-type cytokine, IL4. The dog population, as with humans, is prone to conditions associated with a Th-2 bias of the immune system, such as environmental allergy. Based on these results, licorice merits further evaluation as a useful immune modulator for such allergic diseases.

Keywords : cytokine, Glycyrrhiza glabra, peripheral blood mononuclear cells, T-cell activation
Conference Title : ICMPHS 2021 : International Conference on Medicinal Plants and Herbal Supplements
Conference Location : London, United Kingdom
Conference Dates : October 21-22, 2021