Screening the potential anti-inflammatory activity of plant extracts by in vitro inhibition of TNF-α production

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Introduction: Several plant species are traditionally used to treat inflammatory disorders. The tumor necrosis factor-α (TNF-α) plays a pivotal role in inflammation, representing a target for drug development, especially for chronic diseases like arthritis. The present study aimed to assay 18 plant extracts against this molecular target.

Experimental part: The extracts were prepared by exhaustive percolation with EtOH 96%. The assays were performed on 96-wells plates, using THP-1 cells cultivated in complete RPMI medium, incubated at 37 °C in CO₂ atmosphere. The cells were stimulated by LPS and TNF-α production was quantified by commercial ELISA kits. The extracts were assayed at three different concentrations (500, 250 and 125 µg/mL), in triplicates and the results were analyzed by ANOVA test (P< 0.05).

Results/Discussion: Among the assayed extracts, those from Lippia sidoides Cham. leaves (“alecrim pimenta”), Casearia sylvestris Swartz leaves (“guacatonga”) and Caryocar brasiliense Cham. leaves and barks (“pequi”) elicited a significant inhibition of TNF-α production, in a dose-response manner. The extracts of L. sidoides and C. sylvestris produced respectively 51.0 ± 0.1% and 76.9 ± 0.5% of inhibition at the highest concentration, whereas C. brasiliense inhibited TNF-α production by 61.4 ± 0.1% (leaves) and 62.4 ± 6.0% (barks) at the same concentration. Polyphenolic compounds are constituents of these species and may be regarded as responsible for the TNF-α inhibition elicited by their extracts.

Conclusion: The ethanolic extracts of L. sidoides, C. sylvestris and C. brasiliense are promising sources of new TNF-α inhibitors, potentially useful to treat inflammatory conditions.

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