



IN VITRO AND IN VIVO TOXICOLOGICAL AND ANTI-INFLAMMATORY EFFECTS OF THE PHYTOCHEMICAL MARKER COUMARIN FROM MIKANIA SP (GUACO): A SYSTEMATIC REVIEW

Beatriz Scaramelo¹; Yasmin C. G. da Silva¹; Fabio Coelho Amendoeira¹; Caio Eduardo L. Gomes¹; Fausto Klabund Ferraris¹; Izabela Gimenes Lopes¹

¹Laboratório de Farmacologia, Instituto Nacional de Controle de Qualidade em Saúde – FIOCRUZ, Rio de Janeiro, Brasil.

Introduction: The two species of *Mikania* (*M. glomerata* and *M. levigata*), commonly called "guaco" in Brazil, are used in traditional Brazilian medicine to treat diseases such as asthma, bronchitis, relieve coughs and aid in the healing of wounds and eczema. The Brazilian Pharmacopoeia of Phytotherapeutics determines the analysis of coumarin content as the phytochemical marker linked to the quality control of Guaco and its derived products. **Objective:** The aim of this study was to summarize the current evidence on the anti-inflammatory effects and toxic activity of coumarin in the literature, evaluating the association between therapeutic efficacy concentrations and toxicity threshold. **Methodology:** This systematic review followed the PRISMA 2020 guideline, and the protocol was registered in the Open Science Framework Database (<https://osf.io/4p6y2/>). An electronic search was performed in three databases and grey literature. Studies that conducted *in vitro* techniques (Population) exposed to coumarin (Exposure), and that reported an assessment of toxicological or anti-inflammatory effects (Outcome) were included. The methodological quality was assessed using the ToxRTool. **Results:** From 396 identified studies, 4 were included according to the eligibility criteria. All studies were considered "reliable without restriction" due to good methodological quality. RAW 264.7 cell line was the most used model. MTT was the most common method to assess cell viability, followed by MTS, LDH, and Alamar Blue assays, within a concentration range of 0-500 µg/mL. Two articles determined the anti-inflammatory activity of coumarin through the Nitric Oxide and TNF- α , in addition to IL-6, IL-1 β , and PGE2. **Conclusion:** Comprehensive *in vitro* investigations of isolated coumarin are essential for elucidating the pharmacological mechanisms and ensuring the safety of this phytochemical marker. Such studies may significantly contribute to the enhancement of quality control measures for herbal medicines derived from the *Mikania* (guaco) species.

Palavras-chave: Toxicity Tests; Phytotherapy; traditional medicine

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