INPLASY

Unlocking Synergistic Potential: Propolis in combination with pharmaceutical drugs in disease treatment and prevention

INPLASY202540095

doi: 10.37766/inplasy2025.4.0095

Received: 27 April 2025

Published: 27 April 2025

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ADMINISTRATIVE INFORMATION

Support - FAPEMIG.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202540095

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 April 2025 and was last updated on 27 April 2025.

INTRODUCTION

Review question / Objective Does the combination of propolis and standard pharmacological treatments promote improved outcomes in preclinical and clinical models across different health conditions compared to isolated treatments?

Background Given the promising biological properties of propolis, it is important to systematically explore its potential synergistic effects when combined with conventional pharmacological treatments. Understanding this interaction may reveal strategies to improve therapeutic efficacy, reduce side effects, or overcome microbial resistance. In this review, we applied a scoping review methodology to examine the preclinical and clinical evidence of the synergistic effects between propolis and standard pharmacological treatments.

METHODS

Strategy of data synthesis Electronic searches were performed in the PubMed, EMBASE, Web of Science, Scopus, and Cochrane Library databases for publications up to June 2024. The search strategies were developed using the Medical Subject Headings (MeSH) and Embase Subject Headings (Emtree). Boolean operators (AND and OR) were used to combine the descriptors, optimizing the search strategy through different combinations and respecting each database syntax rule. No filters were utilized in the search strategy.

Eligibility criteria The following inclusion criteria were established according to the PCC criteria: (P) Population: any population, animal model, or cell type; (C) Concept: synergistic effects between propolis and standard pharmacological treatments; (C) Context: different health conditions. Clinical (including randomized clinical trials [RCT], clinical

studies, cohort studies [prospective or retrospective], case series and case reports) and preclinical studies (in vitro and animal) reporting data about synergistic effects between propolis and standard pharmacological treatments were included. Moreover, only articles in the English language were included. Research articles that did not follow the inclusion criteria were excluded from this scoping review. Additionally, conference proceedings, short communication, letters to the editor, protocol articles, historical reviews, and unpublished articles were also excluded.

Source of evidence screening and selection Two independent researchers selected the studies. Titles and abstracts of retrieved articles were screened for eligibility, considering the inclusion/exclusion criteria described above, and irrelevant studies were excluded. Full texts of the studies that met the eligibility criteria were selected and were accessed by both researchers for inclusion. Any disagreements between the investigators were resolved through consensus or were referred to a third review author for a final decision. Studies that met the selection criteria were processed for data extraction. The articles excluded in the full-text analysis were listed separately, with specified reasons for exclusion.

Data management Two investigators independently read all studies and extracted the data from all included studies. The data extracted from the studies were categorized according to their respective designs: For human studies, the extracted data included: (a) study design; (b) country; (c) studied condition (d) sample size; (e) patients' gender and mean age; (f) groups/doses; (g) propolis type (local) and protocol; (h) chemical analysis (propolis); (i) reference drug (protocol); (j) methods of evaluation; (k) follow-up; (l) main outcomes. For animal studies, the extracted data included: (a) study design; (b) animal type/species; (c) experimental condition induction (d) experimental groups/doses; (e) sample size; (f) propolis type (local) and protocol; (g) chemical analysis (propolis); (h) reference drug (protocol); (i) euthanasia period; (j) methods of evaluation; (k) main outcomes. For in vitro studies, the extracted data included: (a) studied condition; (b) cell/bacteria/model type; (c) experimental condition induction (d) experimental groups/doses; (e) propolis type (local) and protocol; (f) chemical analysis (propolis); (g) reference drug (protocol); (h) methods of evaluation; (i) main outcomes; (j) mechanisms. The extracted data were organized into a table created in Excel. After completing the data extraction, disagreements were discussed and resolved through consensus with the third reviewer.

Reporting results / Analysis of the evidence A logical and descriptive summary of the results will be prepared based on the review objective and research question. The studies will be categorized into in clinical, animal and in vitro groups. A table will be created to outline the characteristics of the included studies and highlight the key information pertinent to the review question.

Language restriction Yes, only English language.

Country(ies) involved Brazil.

Keywords Propolis; Drug Synergism; Anti-Inflammatory.

Dissemination plans The results will be published in an international scientific journal and presented at scientific conferences in the field.

Contributions of each author

Author 1 - Gabriela Silva - Conducted the selection and data extraction process and writing of the manuscript.
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