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INPLASY

Systematic Review and Meta-analysis of Sclerocarya birrea on Metabolic Health: Evidence from Preclinical Studies

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 October 2024 and was last updated on 8 October 2024.

INTRODUCTION

Review question / Objective In animal models, what are the effects of Sclerocarya birrea administration compared to a placebo or no treatment on metabolic health parameters?

Condition being studied Metabolic disorders such as diabetes and prediabetes are increasing at an alarming rate worldwide, significantly impacting human health and contributing to a rise in cardiovascular diseases, obesity, and other comorbidities. Traditional pharmacological treatments for these conditions, while effective, often come with undesirable side effects and long-term health risks. This has driven a growing interest in alternative, plant-based therapies that can improve metabolic health with fewer side effects. Sclerocarya birrea, commonly known as marula, is a plant native to Africa, renowned for its rich nutritional profile and potential medicinal properties. Preliminary studies suggest that Sclerocarya birrea extracts may have antidiabetic and antihypertensive effects, possibly due to their antioxidant, anti-inflammatory, and glucose-lowering properties.
This systematic review and meta-analysis aim to evaluate the effects of Sclerocarya birrea on metabolic health parameters in animal models, focusing on its impact on blood glucose levels and insulin sensitivity. By synthesizing data from preclinical studies, this review seeks to provide a comprehensive understanding of the potential mechanisms and efficacy of Sclerocarya birrea as a nutraceutical intervention.

METHODS

Participant or population Animals.

Intervention Administration of Sclerocarya birrea extract in all animal species, irrespective of strain, age, or sex. All doses and durations of Sclerocarya birrea extract administration are eligible for inclusion.

Comparator Animals not receiving Sclerocarya birrea extract or receiving a placebo/control treatment.

Study designs to be included Full publication with original data.

Eligibility criteria Inclusion criteria:
Full publication with original data. Administration of Sclerocarya birrea extract in all animal species, irrespective of strain, age, or sex. All doses and durations of Sclerocarya birrea extract administration are eligible for inclusion.
Exclusion criteria:
Conference abstract, letters to the editor, editorials and reviews. In vitro, ex vivo, and clinical studies; animals with pre-existing comorbidities, genetically modified animals, or those receiving co-interventions (e.g., other compounds or solvents, except for physiological saline solution). Studies involving methods other than Sclerocarya birrea administration to induce metabolic changes or using alternative interventions for comparison.

Information sources PubMed, Cochrane, Web of Science and Scopus.

Main outcome(s) Studies reporting blood glucose levels, including fasting blood glucose and oral glucose tolerance test (OGTT) results, as primary outcome measures. Other relevant metabolic health markers such as insulin sensitivity and lipid profiles may also be considered.

Quality assessment / Risk of bias analysis By use of SYRCLE's risk of bias tool adapted as follows:
- Reporting of randomisation

- Reporting of blinding

- Reporting of sample size calculation

- Compliance with Animal welfare regulations.

Strategy of data synthesis Descriptive summary for outcomes reported in less than five articles.
Meta-analysis for outcomes reported in five or more articles.

Subgroup analysis Animal species, sex and strain.

Sensitivity analysis Odds ratio instead of risk ratio.

Country(ies) involved Faculty of Pharmacy and Nutrition, UCAM Universidad Católica de Murcia, 30107 Murcia, Spain.

Keywords Sclerocarya birrea; Nutraceutical; Preclinical study; Diabetes; Metabolic health.

Contributions of each author
Author 1 - Desirée Victoria-Montesinos - Author 1 drafted the manuscript.
Email: dvictoria@ucam.edu
Author 2 - Pura Ballester - The author contributed to the development of the selection criteria, and the risk of bias assessment strategy.
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