Harnessing nature: a systematic exploration of *in vitro* antileishmanial and antihuman African trypanosomal properties in traditional medicinal plants and their active principles

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Source PHARMACEUTICAL BIOLOGY

View Journal Impact

Volume: 64 Issue: 1 Page: 398-413

DOI: 10.1080/13880209.2026.2635206

Published DEC 31 2026

Indexed 2026-03-10

Document Type Review

Abstract Context: Current treatments for leishmaniasis and Human African Trypanosomiasis (HAT) are constrained by toxicity, high costs, and the growing threat of parasite resistance. In this context, natural products have emerged as promising alternatives, offering the potential for safer and more cost-effective therapeutic interventions. Objective: This review assesses the antileishmanial and antitrypanosomal activities of medicinal plants, underscoring their significance in addressing parasitic diseases and identifying promising candidates for future drug discovery and development. Methods: Following the PRISMA 2020 guidelines, a systematic search was conducted for literature published between 2003 and 2023. Studies were considered eligible if they reported in vitro activities of extracts or compounds against Leishmania spp. or Trypanosoma brucei with IC50 < 10 & micro;g/mL. Data included plant species, extraction methods, parasite strains, active compound(s), cytotoxicity profiles, and traditional uses. The quality of each study was evaluated based on the reproducibility of experimental procedures. Results and conclusions: A total of fifty eligible articles were included. 217 plants demonstrated potent activity (IC50 < 10 & micro;g/mL) against Leishmania spp. and/or T. brucei. Among these, 41 species had documented traditional use in the treatment of leishmaniasis or HAT, whereas 76 were traditionally employed for unrelated ailments yet exhibited scientific evidence of antiparasitic efficacy. Notably, 67 species were active against both parasites, 120 displayed selective antitrypanosomal, and 30 showed selective antileishmanial activities. Exemplary candidates include Achillea ptarmica L. (pellitorine), Allium sativum L. (allicin, ajoene), Strychnos spinosa Lam. (triterpenoids), Tridax procumbens L. (oxylipin), and Marrubium incanum Desr. (salvigenin). More studies should define mechanisms and in vivo efficacy.

Keywords

Author Keywords: Leishmanicidal; trypanocidal; medicinal plants; natural products; antiparasitic compounds

Keywords Plus: ANTITRYPANOSOMAL ACTIVITY; ESSENTIAL OIL; ANTIPLASMODIAL ACTIVITY; ANTIPROTOZOAL ACTIVITY; CHEMICAL-COMPOSITION; EXTRACTS; FRACTIONS; CYTOTOXICITY; REGION; LEAVES

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Data availability statement

Data sharing is not applicable to this article as no data were created or analyzed in this study. We also state that a review protocol was not prepared.

Categories/ Classification	Research Areas: Plant Sciences; Medical Laboratory Technology; Pharmacology & Pharmacy
Web of Science Categories	Plant Sciences; Medical Laboratory Technology; Pharmacology & Pharmacy

Funding

View funding text

Funding agency	Grant number
CRIGS UKM-IIUM-UiTM-UPM Research Collaboration Grant	C-RIGS24-017-0023

Language	English
Accession Number	WOS:001707200500001
PubMed ID	41777027
ISSN	1388-0209
eISSN	1744-5116
IDS Number	EQ3HM
Citation Subset From MEDLINE®	Index Medicus

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