Ethnopharmaceuticals for the Treatment of New World Cutaneous Leishmaniasis: A Systematic Review of Topical Application of Pepper and Allium

Anjola Ogunsina¹, Ruwandi Kariyawasam², Olamide Egbeumi³, Sonia Igboanugo⁴, Shveta Bhasker⁵, Shareese Clarke⁶, Paul Dunn⁶, Avinash Mikkala², David Harris⁷, Andrea K. Boggild²,⁷

¹Department of Life Science, Queen’s University, Kingston, ON, Canada, ²Institute of Medical Science, University of Toronto, Toronto, ON, Canada, ³Faculty of Science, McMaster University, Hamilton, ON, Canada, ⁴Biomedical Discovery & Commercialization, McMaster University, Hamilton, ON, Canada ⁵Department of Psychology, University of Toronto Mississauga, Mississauga, ON, Canada, ⁶Faculty of Health Sciences, University of Ontario Institute of Technology, Toronto, ON, Canada, ⁷Tropical Disease Unit, UHN-Toronto General Hospital, Toronto, ON, Canada

Introduction

- **New World Cutaneous Leishmaniasis (NWCL):** neglected parasitic disease caused by members of the genus *Leishmania*, located primarily in Central and South America¹
- Better drugs needed due to the toxicity, accessibility limits, and expense of first-line treatment options
- **Ethnopharmaceuticals:** plant-based compounds with potential anti- leishmanial effects found in and around local endemic communities²
- Potential to overcome the aforementioned therapeutic challenges using ethnopharmaceuticals, are supported by anecdotal evidence of efficacy

**Objective:** Aim to synthesize existing evidence around available ethnopharmaceuticals, pepper and allium to promote drug discovery for the prevention and treatment of NWCL.

Methods

- PubMed (NCBI), Medline (OVID), Embase (OVID), Web of Science (BioSIS) and LILACS (VHL) were searched using combinations of the search terms "cutaneous leishmaniasis" and "ethnopharmaceuticals"
- Inclusion and exclusion of search terms was employed to maximize relevant article extraction
- Inclusion criteria: observational studies, case reports, case series, cohort studies, and clinical trials reporting therapeutic outcomes, if possible
- GRADE approach used to assess the quality of studies reporting therapeutic interventions
- LILACS articles screened by native Spanish speaking individuals to ensure proper adherence to inclusion and exclusion criteria
- Data grouped and summarized by Leishmania spp. and plant species

Discussion & Conclusions

- 550 abstracts included for full-text review of NWCL using the GRADE approach from 1957-present (Figure 1 & 2)
- Focus of systematic review will be on the effects of ethnopharmaceuticals *Piper* spp. “Pepper” (2.0%), and *Allium* spp. “Garlic” (0.67) (Figure 2)
- Increased human and vector migrations, climate change and travel, and the incidence of CL may increase in non-endemic areas
- Synthesizing current evidence surrounding ethnopharmaceuticals for the treatment of NWCL may contribute to drug discovery pipelines and potentially lead to novel therapeutics

Results

- **New world Species = 176 (32%)**
  - *L. amazonensis* = 166 (66.0%)
  - Vianna subgenus = 33 (18.7%)
  - Other unidentified New world species = 27 (15.3%)
- **Piper spp. “Pepper” = 25 (4.5%) (15.6%)**
- **Allium spp. “Garlic” = 4 (0.6%)**

Contact: Dr. Andrea K. Boggild | andrea.boggild@utoronto.ca | @BoggildLab | www.boggildlab.ca

References