

ID 113

## Extracts of local medical plants as an alternative organic fungicide for pathogens causing cinnamon rough bark and leaf blight

V.S.P. Dayarathne<sup>1</sup>, A.A. Wijeweera<sup>2\*</sup>, D.S. Manamgoda<sup>1</sup>, G.G. Jayasinghe<sup>2</sup> and C.U. Widanapathirana<sup>2\*</sup>

<sup>1</sup>Department of Botany, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>2</sup>National Cinnamon Research and Training Centre, Palolpitiya, Thihagoda, Matara, Sri Lanka

### Abstract

Cinnamon is a major export spice crop in Sri Lanka. Rough bark and leaf blight diseases are fungal infections that threaten most of the cinnamon cultivation in Sri Lanka. The common practice of management of these diseases is the fungicide application. Food products grown under agrochemical use rapidly losing favor with consumers, due to their known detrimental residue effects on human health. Furthermore, studies shows that pesticide usage might irreversibly harm the environment. As a result, organic food is becoming more popular in Sri Lanka, necessitating the development of plant-based fungicides. Secondary metabolized phytochemicals with antibacterial and antifungal properties are produced by plants. The antifungal activity of plant extracts against the rough bark and leaf blight disease was evaluated in vitro in this study. Pathogenic fungi were isolated from rough bark and leaf blight symptomatic cinnamon plants. The screening of antifungal activity of ten different plant extracts prepared in aqueous and methanol extracts of five plant species namely, *Zingiber officinale* (Ginger), *Allium sativum* (Garlic), *Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem), and *Tithonia diversifolia* (Wild sunflower) were assessed against *Colletotrichum aenigma*, *Pestalotiopsis papuana* and *Colletotrichum* sp. isolated from rough bark infected cinnamon stems and fungi from leaf blight infected leaves. The three isolated causative agents were identified based on ITS sequence similarity. The antifungal activity of the ten different plant extracts was compared using the poison plate method. The results of this study revealed that the growth of *Colletotrichum* sp. was completely inhibited by *Z. officinale* and *A. sativum*. *A. sativum* and *A. indica* completely inhibited *C. aenigma* among other crude plant extracts. Five crude plants extracts failed in completely inhibiting the *P. papuana*. All methanol plant extracts showed 100% antifungal activity at 0.2 gmL<sup>-1</sup> concentration, except *O. sanctum* against *C. aenigma*. The value of minimum inhibitory concentration (MIC) of plant extracts was determined and values ranged from 0.001- 0.3 gmL<sup>-1</sup>. This finding of the study concluded that methanol extracts of *Z. officinale*, *A. sativum*, *O. sanctum*, *A. indica*, and *T. diversifolia* have an antifungal effect over their fresh crude extract. This study makes the way for developing organic fungicide with the added benefits of an environmentally safe and economically viable product.

**Keywords:** Cinnamon rough bark disease, *Colletotrichum aenigma*, Minimum inhibitory concentration, *Pestalotiopsis papuana*, Plant extracts

\*Corresponding Author: achiniawije@gmail.com, chinthakauw@gmail.com