

SHORT COMMUNICATION

Antifungal Properties of *Elephantopus scaber* L. (Asteraceae) Against Crop Pathogenic Fungi

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ABSTRACT

Harmful effect of synthetic fungicides towards environment and other organisms have become important issues nowadays. Research on the plant product to be developed as an alternative for synthetic fungicides has attracted interest of many scientists. The aim of this study is to determine the effect of antimicrobial properties of *Elephantopus scaber* L. from the family Asteraceae against six crop pathogenic fungi viz., *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk, *Fusarium oxysporum* Schldt., *Pyricularia oryzae* Cavara, *Fusarium solani* (Mart.) Sacc., *Pestalotiopsis* sp., and *Colletotrichum* sp. Three different concentrations of *E. scaber* crude extract- 1%, 5% and 15%, were used in fungal growth inhibition test. At 15% (w/v) concentration, the mycelia growth of *Colletotrichum* sp., *F. solani*, and *P. oryzae* were significantly retarded. It indicates that the extract of *E. scaber* could potentially be used as a biofungicide.

Keywords: *Elephantopus scaber*, biofungicides, crop pathogenic fungi

Losses in crops production due to plant diseases is an important issue. Common pathogens in plants are fungi because they are the most widespread (Alrajhi, 2013). The usage synthetic fungicides such as Thiram and Chlorothalonil are required to reduce the damage on crops (Adaskaveg *et al.*, 2012; El-Khateeb *et al.*, 2013). However, the excessive usage of synthetic fungicides have led to a series of problems: (1) fungi have developed resistance or tolerance to the synthetic fungicides (Luo *et al.*, 2010; Matsumura & Sanada-Morimura, 2010), and (2) risks of high-level of toxic residue in the products that are harmful to human and environment (Kim *et al.*, 2013). Organic compounds that are safe for human and environment are needed as an alternative to synthetic fungicides to control pathogenic fungi.

Plant is a good source for harvesting organic compounds that may be utilized as an alternative to synthetic fungicides because plant produces phytochemicals which involve in defence against predation or infection (Javale & Sabnis, 2010). These phytochemicals are biodegradable and non-toxic (Soylu *et al.*, 2006; Satish *et al.*, 2007).

One example of plant species which has the potential to be exploited is *Elephantopus scaber* L. *E. scaber* is a medicinal plant which is known for its medicinal properties (Kamalakaran *et al.*, 2012). Various kinds of solvents such as ethanol and acetone had been used before to extract the chemical constituents in the *E. scaber* (Ho *et al.*, 2009). The main chemical constituents in *E. scaber* include sesquiterpene lactones, phenolic acids, flavonoids, triterpenoids, steroids, essential oil, salt and minerals (Wang *et al.*, 2004; Ahmad *et al.*, 2009; Ali *et al.*, 2010; Kabeer & Prathapan, 2014; Wu *et al.*, 2014). It has been reported this plant possess phytochemical compounds with antimicrobial activity against crop pathogenic fungi such as *Aspergillus niger* Tiegh. and *A. flavus* Link (Kamalakaran *et al.*, 2012). This study aims to test the methanolic crude extract from *E. scaber* in inhibiting the growth of pathogenic fungi isolated from pepper.

Young plants of *E. scaber* were collected from housing area in Tarat, Serian division, and planted at UNIMAS greenhouse. Soil beds were prepared with soil mixture of top soils, organic soils and sands at the ratio of 3:2:1. Nitrogen – Phosphorus – Potassium (15:15:15)