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**The Responce of Tea Tree Oil as a Biofungicide against Early Blight
Disease in Tomato Crop (*Lycopersicon esculentum* Mill.) in Sudan**

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Abstract

The tomato crop (*Lycopersicon esculentum* Mill.) originated in tropical central and South America. In Sudan, tomato is gaining importance and its consumption has increased, it ranks as the first vegetable crop in Sudan. Tomatoes are subject to a large number of pests and diseases from the time of emergence to harvest. Among these; Early Blight is the most important fungal disease of tomato, induced by *Alternaria* spp. Current research is designed to investigate the potential of Early Blight biocontrol strategy through the use natural alternatives to pesticides with the aim of promoting sustainable agricultural development and economic growth. The antifungal effect of tea tree (*Melaleuca alternifolia*) essential oil against *Alternaria* spp. was studied *in vitro* and *in vivo*. The inhibition effect of four different concentrations (0.5 %, 1 %, 2 % & 3 %) of tea tree oil or melaleuca oil on the linear growth of the pathogen was evaluated in potato dextrose agar. The inhibitory effect of the tea tree oil was examined in the nursery during 2007/2008 winter season using a susceptible open pollinated tomato cultivar Peto 68 and recommended fungicide for early blight disease of tomato Ridomil® Gold MZ 68WP for comparison. The results performed that the antifungal effect of tea tree oil against *Alternaria* spp. was enhanced significantly *in vitro* and *in vivo* with the lease disease intensity of 12.50 % when tomato plants treated with the concentration 3 % of the tea tree oil when compared to the fungicide treatment 17.88 % and the control (untreated plants) 27.08 % disease intensity. Biocontrol methods based on inhibition of the spore germination of causal agents are achieving significance. Some of the advantages of these methods over chemical methods include absence of residual toxicity, the harmlessness to the nature and costless.

Keywords: *Alternaria* spp., early blight disease, *Melaleuca alternifolia*, Sudan, Tomato