

## **Variation in the phytotoxic activity of *Tinospora tuberculata* extracts as influenced by solvent type and chemical profile**

### **ABSTRACT**

A study was conducted to evaluate the role of secondary metabolites on the allelopathic activity of methanol and water extracts obtained from aerial parts of *Tinospora tuberculata* on seed germination and the radicle and hypocotyl lengths of barnyard grass. The higher suppressive effects were observed on germination and seedling growth of barnyard grass, when the methanol extracts of *Tinospora tuberculata* stem or leaf were applied in comparison to the water extracts. Ultra-fast liquid chromatography analysis confirmed that methanol extracts and leaf extracts contained higher number and amount of chemical compounds than did those of the water extracts and stem extracts respectively. Moreover, the concentrations of 11 identified compounds of the extracts and an equimolar mixture of the chemicals required for 50% growth inhibition on barnyard grass germination, radicle and hypocotyle were determined. Trans-cinnamic acid and benzoic acid had the highest allelopathic activity, while chlorogenic acid and orientin had the lowest on the basis of the rank values. Benzoic acid was found in the highest concentration in the methanol leaf extract, while this compound was not identified in the water leaf extract. On the other hand, the predominant compound was orientin for stem extracts. These results suggest that these compounds may be involved in the allelopathy activity of *Tinospora tuberculata* depending on their number, concentration, combination and inhibitory activity. *Tinospora tuberculata* could be a potential source of natural inhibitor compounds employable for eco-friendly agriculture.