

SUPPRESSION OF PHOTOSYNTHETIC CAPACITY, BIOMASS AND RELATIVE CHLOROPHYLL CONTENT OF SELECTED HOST SPECIES AFFECTED BY PARASITIC PLANT *Cassytha filiformis* L.

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ABSTRACT

Cassytha filiformis infected its host through haustorium to absorb nutrients. Due to its parasitic property and growth habit with extensive coverage, *C. filiformis* has a great potential as cover crops in oil palm plantation. The extensive establishment is able to control weed encroachment and suppress its aggressiveness on crops. A study was conducted to determine the suppression of photosynthetic capacity, biomass and relative chlorophyll content of seven crop species infected by *C. filiformis*. The seven species included *Asystasia intrusa* Bl., *Colocasia esculenta* (L.) Schott, *Ipomoea aquatica* Forsk., *Ischaemum muticum* L., *Manihot esculenta* Crantz, *Merremia umbellata* (L.) Hall, and *Mikania micrantha* H.B.K. The photosynthetic rate of *M. micrantha* was suppressed by 95.62 % while *A. intrusa*, *I. aquatica*, *M. esculenta*, *C. esculenta* and *M. umbellata* were suppressed at 94.29 %, 84.00 %, 80.81 %, 67.55 % and 67.07 %, respectively. The lowest suppression of the photosynthetic rate was for *I. muticum* which was 43.06 %. The rate of suppression of all species by *C. filiformis* could probably be related to the morphological and physiological characteristics of the species. A strong relationship between photosynthesis and stomatal conductance of 0.92 for infected and 0.97 for uninfected species were recorded. Similarly, the biomass and chlorophyll content reduction were positively correlated with photosynthetic rate depending on the level of infection by *C. filiformis* with values of 0.82 and 0.95, respectively. Therefore, *C. filiformis* has the potential to be an effective biological control agent.

Keywords: Parasitic plant, hemiparasite, photosynthetic capacity, biomass, relative chlorophyll content

INTRODUCTION

Cassytha filiformis (L.) is a hemiparasite from the family of Lauraceae with some common names such as laurel dodder, woe and love vine. It is a perennial vine with small scales as a replacement of the leaves (Nelson 2008). The individual stems that are copiously branched have a diameter of 1 to 3 mm in diameter and can attain a maximum length of 10 to 20 m (Mythili et al. 2011). The stems which are filiform and glabrous are green to orange in color with extensive branches which twine around each other or over one to several host plants with haustoria that penetrate the epidermis of the other plants (Prider et al. 2009; Mythili et al. 2011). A haustorium is the bridge of swollen mass of both the host and parasite tissue, which is a specialized hypha that can penetrate the tissues of the hosts (Parker and Riches 1993). When mature, it provides a vascular conduit of water and nutrients from hosts to parasite (Press and Graves 1995).

The purpose of *C. filiformis* connecting with the host plants is to obtain nutrients and water without interfering with their activities. The parasitic plant does not create immediate, fatal damage to host cells and their metabolic processes. Rather, through intimate membrane-to-membrane contact with its host and itself, it extracts what is required for it to grow, flower and produce seeds for its future generations, and the host plants eventually die a long, protracted death by starvation and desiccation. *C. filiformis* clings to woody plants for physical support, nutrition, and water (Nelson 2008). In addition, the parasitic