

**First report of *Pythium coloratum* causing root rot on hydroponically grown lettuce
(*Lactuca sativa* L.) in Malaysia**

ABSTRACT

In April 2019, green coral lettuce (*Lactuca sativa* L.) showing root rot symptoms (approximately 20% disease incidence) were observed in a hydroponic commercial greenhouse located at Genting Highland, Pahang, Malaysia. Symptoms appeared as necrotic lesions on the tap and lateral roots, and affected lettuce appeared stunted and wilted. Symptomatic roots were surface-sterilized by 70% ethanol, rinsed with sterile distilled water, cut into 0.5 cm pieces, and plated on PARP-V8 selective medium (Moorman et al. 2002). The colonies produced filamentous sporangia, 20 µm yellowish and subglobose oogonia, and antheridia developed on branched stalks. Six isolates with similar morphological characteristics to *Pythium coloratum* (Van der Plaats-Niterink 1981) were obtained from tissue samples. The primer pair OomCoxI-Levup/OomCoxI-Levlo for cytochrome oxidase subunit 1 (COI) (Robideau et al. 2011) and ITS5/ITS4 for rDNA (White et al. 1990) were used for sequencing three representative isolates (PA, PB, and PC). The resulting sequences were deposited in the GenBank (COI Accession No. MW316679, MT996498, MW316680; ITS Accession No. MT659403, MT659403, MW316680). BLAST analysis of COI and ITS sequences showed 100% identity to *P. coloratum* strain BR621 (HQ708550 and HQ643504, respectively), and *P. coloratum* voucher BR621 (HQ708550.1 and HQ643504.1, respectively). Isolates PA, PB and PC grouped in a strongly supported clade (100% bootstrap) with reference strains of *P. coloratum*. Pathogenicity test were conducted on ten 4-week-old green coral lettuce seedlings grown hydroponically at 23 °C, 95% relative humidity with a photoperiod of 12-h. The roots were inoculated by a suspension (10⁶ zoospores/ml) of the PB strain. Control roots were placed in sterile deionised water. After 14 days, similar symptoms to those observed in the greenhouse appeared on inoculated roots, while control plants were asymptomatic. The pathogen was reisolated from symptomatic roots and morphologically and molecularly identified as *P. coloratum*. The reference isolate PB was deposited in the Microbial Collection Unit, Institute of Biosciences, University Putra Malaysia, with accession number UPMC 1451. To our knowledge, this is the first report of *P. coloratum* causing root rot of lettuce in Malaysia.

Keyword: *Pythium coloratum*; Root rot; Lettuce