New Disease Reports

First report of *Colletogloeum* sp. as the causal agent of marginal leaf blight on *Heliconia rostrata* in India

A. Banerjee [1,2]*, S. Islam [2,3], B.N. Panja [2] and P.S. Nath [2]

[1] Plant Quarantine Station, Haldia, Purba Medinipore-721604, West Bengal, India ; [2] Department of Plant Pathology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia-741252, West Bengal, India; [3] Nadia KrishiVigyan Kendra, BCKV, Gayeshpur, Nadia- 741234, West Bengal, India

*E-mail: arghyabanerjee18@gmail.com

Received: *19 Nov 2019.* ***Published:*** *08 Jun 2020.* ***Keywords:*** *conidiomata, Heliconiaceae, ITS, LSU, Mycosphaerella*

Heliconia rostrata (false bird of paradise, Heliconiaceae) is native to South America but is an important herbaceous perennial ornamental plant in India and globally. In December 2016, a foliar blight was observed on six ten-month-old *H. rostrata* plants growing outdoors in Kolkata, West Bengal. Symptoms included a marginal blight, light brown to ash in colour, with a yellow halo (Fig. 1), and disease incidence ranged from 20-50%.

Blighted areas of the leaves were viewed under a microscope (×200) and acervuli were found in a concentric orientation around the diseased tissue. Conidiophores from the acervuli were pale brown, smooth, branched and simple, up to 13 µm long and 4 µm wide, with 1-2 percurrent proliferations. Conidia (n=30) were straight, irregular, sigmoid, tapered markedly to the apex, smooth, thick walled, 5-8 euseptate and 38 × 5 µm in size. Affected parts of ten diseased leaves were kept in a plastic box with wet filter paper and absorbent cotton to induce conidiation. Conidial masses were suspended in 250 µl sterilised distilled water on sterile glass slides and dropped onto 2% (w/v) water agar containing 0.5 mg/l of chloramphenicol. After 24 hours incubation at 25°C, individual germinating conidia were selected and transferred directly to potato dextrose agar and subcultured on peptone salt agar (10 g peptone, 5 g sodium chloride, 0.1 g calcium chloride, 20 g agar per litre). In both media, conidia and conidiophore sizes were similar to those observed on infected leaf tissues. Based on these morphological features the fungus was identified initially as a member of the genus *Colletogloeum* (Sutton & Mehrotra, 1982).

Genomic DNA was extracted from mycelia of the isolated fungus using the CTAB method (Doyle & Doyle, 1990) and the internal transcribed spacer (ITS) region and LSU ribosomal genes of rDNA were amplified using ITS1-F/ ITS4 (White *et al.*, 1990) and LR1/ LR4 (Vilgalys *et al.*, 1994) primers and sequenced (GenBank Accession Nos. MN644508 and MN644486 for ITS and LSU, respectively). BLAST analyses revealed that sequences from the present study had 99-100% identity with the type species of *Colletogloeum* sp. FG2.2 (FJ425194 and FJ031987). Based on the morphological characteristics and the molecular data, the causal agent was identified as *Colletogloeum* sp. (Hemnani *et al.*, 2008).

The pathogenicity of the fungus was tested on six leaves (disinfected by spraying 90% ethanol followed by three rinses with sterile distilled water) from a single five-month-old *H. rostrata* plant grown in the greenhouse at 25°C with a 12/12-hr photoperiod and 100% relative humidity. Ten millilitres of a 3×10^6 conidial suspension per ml was applied to each leaf. Another set of six leaves were sprayed with sterile distilled water as non-inoculated controls. After seven days, only the inoculated leaves showed leaf blight symptoms resembling those observed on naturally infected *H. rostrata* leaves. The pathogen was consistently re-isolated from the infected leaves thereby completing Koch's postulates.

To our knowledge, this is the first report of *Colletogloeum* sp. causing *H. rostrata* leaf blight in India and worldwide (Farr & Rossman 2019). The pathogen may pose a threat to *H. rostrata* production. These findings will be useful for the development of effective control strategies and further research.

References

1. Doyle JJ, Doyle JL, 1990. A rapid total DNA preparation procedure for fresh plant tissue. *Focus* **12**, 13-15.
2. Farr DF, Rossman AY, 2020. Fungal Databases, U.S. National Fungus Collections, ARS, USDA. http://nt.arsgrin.gov/fungaldatabases. Accessed 23 October 2019.
3. Hemnani K, O'Malley PJ, Tanović B, Batzer JC, Gleason ML, 2008, First report of seven species of sooty blotch and flyspeck fungi on *Asimina triloba* in Iowa. *Plant Disease* **92,** 1366. http://dx.doi.org/10.1094/PDIS-92-9-1366C
4. Sutton BC, Mehrotra MD, 1982. *Colletogloeum protii* sp. nov., a leaf spot pathogen of *Protium serratum. Transaction of the British Mycological Society* **78,** 188-190. http://dx.doi.org/10.1016/S0007-1536(82)80097-1
5. Vilgalys RJS, Hopple JS, Hibbett DS, 1994. Phylogenetic implications of generic concepts in fungal taxonomy: The impact of molecular systematic studies. *Mycologia Helvetica* **6,** 73-91.
6. White TJ, Bruns T, Lee S, Taylor J, 1990. Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: Innis MA, Gelfand DH, Sninsky JJ, White TJ, eds. *PCR Protocols: A Guide to Methods and Applications*. San Diego, CA, USA: Academic Press, 315-322. http://dx.doi.org/10.1016/B978-0-12-372180-8.50042-1

Figure 1

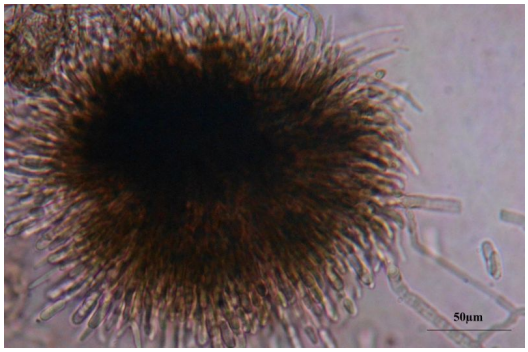

Figure 2

To cite this report: Banerjee A, Islam S, Panja BN, Nath PS, 2020. First report of *Colletogloeum* sp. as the causal agent of marginal leaf blight on *Heliconia rostrata* in India. *New Disease Reports* **41**, 31. http://dx.doi.org/10.5197/j.2044-0588.2020.041.031

This report was published on-line at www.ndrs.org.uk where high quality versions of the figures can be found.