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RESEARCH NOTE

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World's first report of *Erysiphe hyperici* causing powdery mildew on fenugreek

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INTRODUCTION

Powdery mildew disease was observed on fenugreek (*Trigonella foenum-groecum* L.) in the farm of Navsari Agricultural University, Navsari, Gujarat during the year 2015. Subsequently, disease has been observed covering wide area in the winter of year 2016 and 2017. Infection starts on the leaves as a small round to irregular powdery mycelia which gradually increases in the size and merge covering the entire leave (Fig. 1). All the above ground parts of the plant including petiole, stem and pod were covered with the white colored powdery mass of the mycelium and conidia within 15-20 days (Fig. 2). Early infected plant remained dwarf bearing very few pods either empty of bearing few small size shriveled grains of no significance. Infection occurs on both the surface of the leaf, however, higher colonization was seen on adaxial surface. Pathogenicity test was proved by gently pressing the adaxial surface of an infected leaf with abundant sporulation onto the adaxial surface of a healthy leaf of 45 days old fenugreek (cv. LOCAL) plants grown at 25°C. Inoculated and control plants were covered with *50 micron* clear polyethylene bags for 48 h after inoculation. Symptoms observed after a week was consistent with the originally infected field plants, while no symptoms were observed on the control plants. Microscopic observation revealed that the pathogen growing on the inoculated plants was consistent with the morphology of the original fungus.

The conidiophores were 13.80-18.37 µm long, whereas the width from the widest part of conidiophores was 4.96-7.04 µm. Hyaline conidia developed in acropetal succession were ellipsoid in shape with 29.25-39.92 µm length and 11.74-19.37 µm width. Fibrosin bodies in conidia were not found. Conidial cell wall showed evidence of faint reticulation (Fig. 3). Similar conidial morphology of the conidiophores with conidia was

Fig. 1: Initial symptoms showing white powdery mass on leaves

Fig. 3: Light microphotograph of conidiophores and conidia of *E. hyperici*

Fig. 2: White powdery mass of pathogen on entire plant

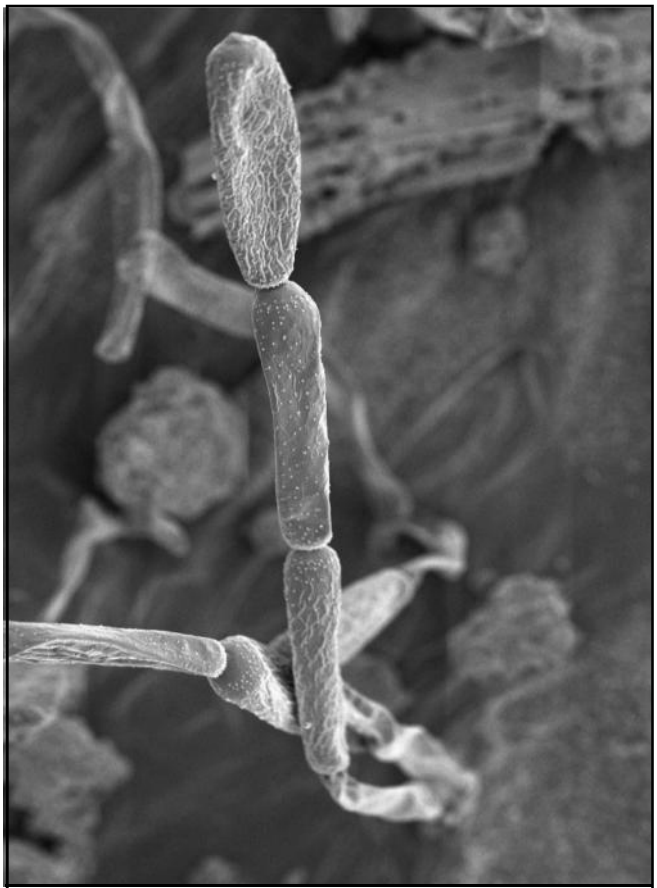

Fig. 4: Scanning electron microphotograph of conidiophore and conidia of *E. hyperici*

observed on Scanning Electron Microscopy at 1.61 KX magnifications (Fig. 4). Based on the symptoms and conidial morphology, the pathogen was identified as *Erysiphe hyperici* (Glawe, 2004). Teleomorphic state of fungus was not observed.

To confirm the identification, the internal transcribed spacer (ITS) region of rDNA of the pathogen was amplified with the universal primers ITS1/ITS4. The length of the ITS fragment was 992 bp and the sequence (KY695255) showed 99 per cent homology with *E. hyperici* (LC010027)

E. hyperici has been found to infect only the member of *Hypericum* species in the Poland and other temperate regions of Europe (Salata, 1985; Braun, 1995; Radaitiene *et al*., 2002; Glawe, 2004). Pathogen has never been found to infect fenugreek in any of the country. This is the first report of the *E. hyperici* infecting any other crop in the world as well as the first report of the pathogen from any of the tropical country. Fenugreek (*Trigonella foenum-groecum* L.), a member of *Fabaceae* family is one of the important spice crops grown in winters for the culinary as well as medicinal purposes. Introduction of new pathogen in the area and on crop pose serious threatening.

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