

SHORT COMMUNICATION

## First report of Phoma Blight of Beans in Kashmir

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**First report of Phoma Blight of Beans in Kashmir**

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Fungal blight has been seen as an emerging disease in common bean in the valley of Kashmir for the last few years and during survey of important bean growing areas viz. Sopore, Pattan, Baramulla, Chadura, Mazhama, Khansahib, Newa, Pampore and Tral during 2017, the intensity of Ascochyta blight was devastating varying from 10.82 to 25.37 per cent around flowering. The blight symptoms manifested by the crop revealed light to dark brown lesions on leaves with concentric zones (Fig.1). Morphology of the pathogen (Table1) revealed that it produced pycnidia (88x122 µ), usually irregularly scattered, and occasionally arranged concentrically (Fig.2). Conidia were generally one septate, hyaline, oval to oblong and 8-11.8 µ (10.12 µ) x 3.2 µ (Fig.3). Blight symptoms in bean are reportedly caused by *Phoma exiguadesmaz. var. exiguadesmaz* (syn. *Ascochyta phaseolorum* Sacc.), *P. exigua desmazvar. diversispora* (Bubak) (syn. *P. diversispora* Bubak) and *A. boltshauseri* Sacc. Petr. (Boerema *et al.*, 1981; Schmit and Baudoin, 1992). Crossan (1958) and Alcorn (1968) found that most two-celled conidia of *A. phaseolorum* (*P. exigua* var. *exigua*) were within the range of 7-12 x 2.5-5 µ. Boerema (2004) reported that *P. exigua*

var *exigua* produced 75–200 µ pycnidia, 4-7 x 2-3.5 µ aseptate and 7-10 x 2.5-3.5 µ septate conidia. Bardas *et al.* (2008) found that bean isolate of *P. exigua* var. *exigua* produced one septate conidia of 2-3 x 5-10µ dimensions. Earlier, Boerema (1981) reported that it produced 150 µ pycnidia and 5-7 x 2.5-3 µ conidia. While as the conidial dimensions of *P. exigua* var. *diversispora* were 5-9.8 (6.8) x 2.3-3.2 (2.7) µ. According to Boerema (2004), *A. Boltshauseri* produced 30-70 µ micro-pycnidia, 3.5-9 x 1.5-2.5 µ aseptate conidia and 11 x 3.5 µ septate conidia.

**Table 2:** Growth and sporulation of *Phoma exigua* on various solid media

Media	Radial Mycelial growth (mm)*	Sporulation (x10 <sup>6</sup> mm <sup>-2</sup> )**
Czapax-Dox agar	39.80	0.60
Bean seed extract agar	40.20	5.16
Malt extract agar	45.00	7.43
Oat meal agar	51.60	1.73
Potato dextrose agar	39.00	8.26
V8 agar	28.80	0.16
Water agar	35.20	0.79
CD (p= 0.05)	9.71	1.06

\*After one week \*\* After 2 weeks

**Table 1:** Morphological characters of bean isolate *Phoma exigua*

Fungal structure	Colour	Size (µm)	Shape	Septation
Hyphae	Light brown	*3.2-4.5 (Av.3.95) diameter 9.08-13.62x3.25-4.54 (Av.10.14x 3.8)	Smooth and branched	3-10 (100 µ <sup>-1</sup> length)
Conidia	Hyaline	*[8-11.8 x3.2-4.3 µ. (Av.10.12 x3.4 µ)]	Oval to oblong, guttulated	1-2
Pycnidia	Brown	88x122 µ	Globose to sub globose	-

\*on PDA

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Fig. 1 : Phoma leaf blight symptoms



Fig. 2 : Pycnidial distribution of *Phoma exigua* on leaf



Fig. 3 : Conidia of *Phoma exigua*

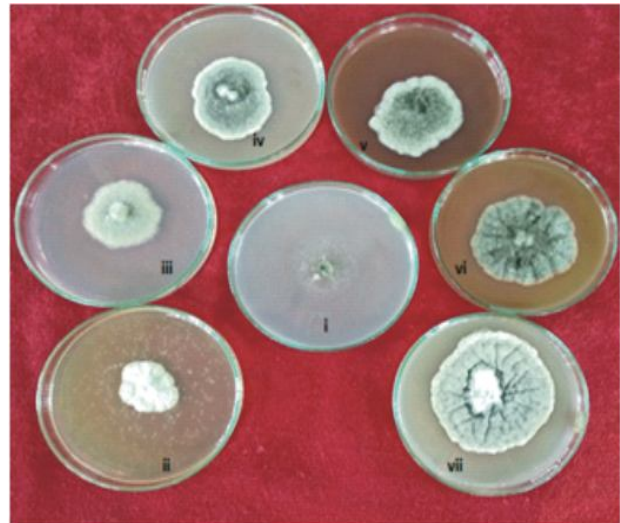


Fig. 4 : *Phoma exigua* colonies on (i) water agar, (ii) V8 agar, (iii) Czapekdox agar, (iv) potato dextrose agar, (v) bean seed extract agar, (vi) malt extract agar and (vii) oat meal agar

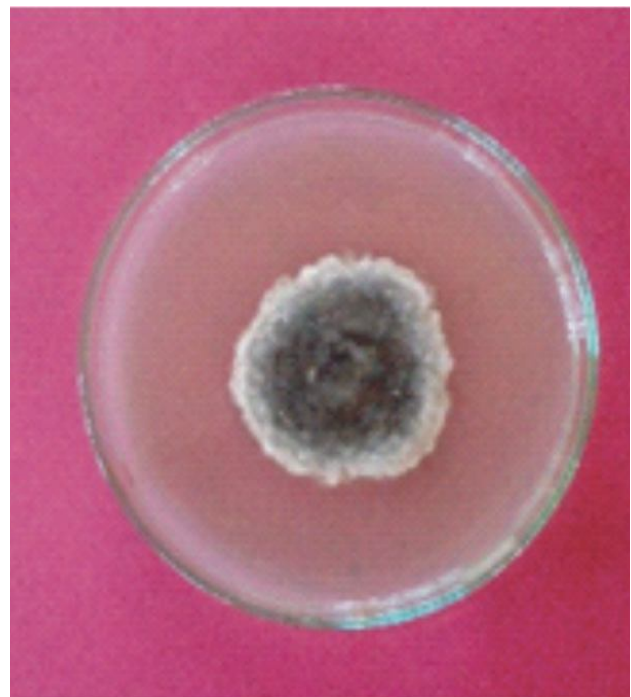


Fig. 5 : *Phoma exigua* colony on PDA

Although, Boerema (1981) reported that the pycnidia of *A. Boltshauseri* were 100-200  $\mu$  with 10-27 x 2.5-6.5  $\mu$  continuous or upto three septate conidia. However, Zaumeyer and Thomas (1957) had found that pycnidia of *A. Boltshauseri* measured 60-150  $\mu$  in diameter. This isolate though varying from all the three reported *Phoma* spp. in one or the other aspects, was close to *A. phaseolorum* (*P. exigua* var. *exigua*), and the identification of the pathogen as *Phoma exigua* was also confirmed by ITCC IARI New Delhi.

Microorganisms differ in their nutritional requirements. In order to ascertain the best solid media for the maximum growth and sporulation of the present isolate, seven different solid media viz. Potato dextrose agar, Oatmeal agar, Malt extract agar, V8 agar, Bean seed extract agar, Czapeks (Dox) agar and Water agar were tested in CRD with three replications. The pathogen produced maximum radial mycelial growth on oatmeal agar (51.60 mm) followed by malt extract agar (45.00 mm), while the least growth was recorded on V8

agar medium (28.80 mm). The fungus, however, sporulated best on potato dextrose agar ( $8.26 \times 10^6$  spores  $\text{mm}^{-2}$ ), followed by malt extract agar ( $7.43 \times 10^6$  spores  $\text{mm}^{-2}$ ), the least sporulation was recorded in V8 agar medium ( $0.16 \times 10^6$  spores  $\text{mm}^{-2}$ ) (Table 2, Fig.4). These results are in agreement with Boerema *et al.* (2004) who found oat meal agar as best media for growth of *Phoma exigua*. Similarly, Singh and Pal (1993) observed Potato dextrose agar as best medium for sporulation of *Ascochyta rabiei*. Week old colonies on Potato Dextrose Agar had produced irregular white periphery, floccose, pale olivaceous centre with an average diameter of 35–45 mm and average growth of 5 mm per day at  $25 \pm 1$  p C and continuous dark period (Fig.5). Aerial mycelium was white to pale olivaceous, which became sparse following fructification.

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