SHORT COMMUNICATION

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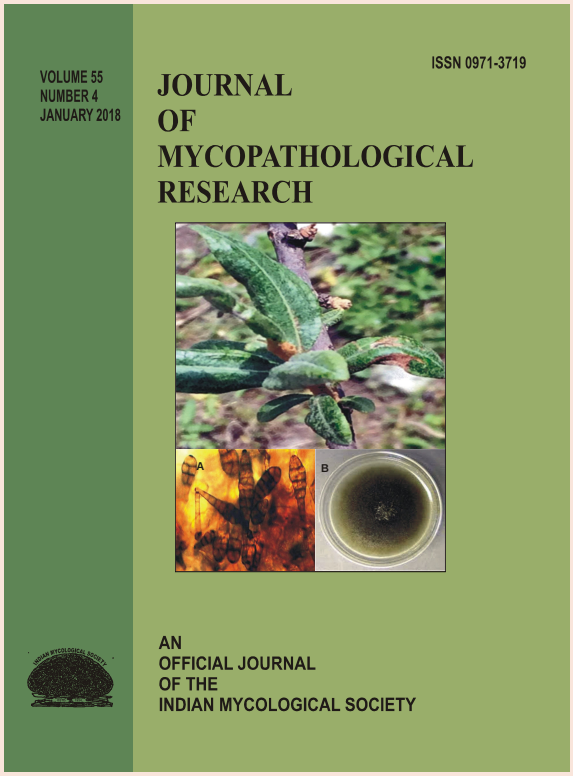

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Rating scales of Jute anthracnose for screening of breeding materials

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Earlier jute anthracnose (*Colletotrichum corchorum* attacking *white* jute and *C.gloeosporioides* attacking *tossa* jute)was considered as minor disease and restricted to Bangladesh and Assam in India. Since 1940, the disease was spread in different jute growing states of India due to exchange of genetic materials as well as national hybridization programme. Wide variation in disease reaction among diverse collection of jute germplasm was noticed during survey (2008-2015) of All India Network Project on Jute and Allied Fibres (AINPJAF) at various centres located in West Bengal, Bihar, Odisha and Assam. So far, no comprehensive disease rating scale exists that describes the resistance/susceptibility of breeding materials. In the present investigation five points rating scale (G0-G4) is developed based on number of spot per plant (1m from base) and their nature which consists of G0= no spot (immune), G1=1-15, isolated spot (resistant), G2= 16-50 spots, isolated with occasional coalesces (moderately susceptible), G3= 51-100 spots, isolated as well as frequent coalesces (susceptible) and G4= >100 spots, isolated as well as frequent coalesces (highly susceptible)]. These rating scales may be useful for screening of breeding materials

Key words: Jute, anthracnose, rating scales

Measuring plant disease is very essential for screening of resistance, epidemiology and assessment of crop loss (Kranz, 1988 ; Large, 1966). Disease measurement can be done either by simply measuring the incidence i.e. proportion of plant diseased or by severity i.e. proportion of plant tissues affected.

Assessing severity is more appropriate in diseases like anthracnose, leaf spot etc. where simple incidence has little relationship to yield or quality loss. Earlier jute anthracnose (*Colletotrichum corchorum* attacking *white* jute and *C. gloeosporioides* attacking *tossa* jute) was considered as minor disease. The anthracnose in white jute was first described and studies by Itaka, 1940 in Japan, Ghosh, 1957, 1983 ; Purakayastha and Sengupta, 1975, in India. Whereas anthracnose in tossa jute was first recorded at Nagaon, Assam on jute varieties namely JRO 514, JRO 878, JRO 524, KT1 (Anon, 1966). During survey (2008-2015) of various trials under network projects at different AINPJAF centres, mild to severe incidence (%) of anthracnose in jute was noticed at Barrackpore and Kalyani (West Bengal), Katihar (Bihar), Nagaon (Assam) and Barhaich (Uttar Pradesh) at harvesting stage (August- September) of fibre crop of diverse genetic background. During last four decades major exploration and exchange of jute germplasm as well as national hybridization programme were made (Table 1) which may be the important reason to spread the disease as forecasted by Ghosh (1999). Thus measurement of severity (expressed as PDI) of jute anthracnose is essentially required to screen breeding materials. To measure the severity, rating scale is required to express the relative proportion of affected tissues which is lacking in jute anthracnose.

Jute crop was sown at various AINPJAF centres - Barrackpore and Kalyani (West Bengal), Naogaon (Assam), Katihar (Bihar), Berhaich (Uttar Pradesh) during the month of April (for fibre purpose) and August (for seed purpose). The fibre crop was monitored at the time of harvest i.e. during end of July to August. Under field condition the incidence

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Table 1: Incidence and severity of anthracnose at various AINPJAF Centres

AINPJAF Centres*	Incidence (%)	Severity (no. of spots/plant)
Barrackpore (West Bengal)	1-30 (fibre crop)	15-30 (fibre crop)
	70 -80 (seed crop)	15-50 (seed crop)
Kalyani (West Bengal)	20-30	10-60 (fibre crop)
Katihar (Bihar)	5-10	15-40 (fibre crop)
Nagaon (Assam)	5-20	40-80 (fibre crop)
Berhaich (Uttar Pradesh)	5-20 in capsularis	30-50 (fibre crop)

*AINPJAF= All India Network Programme on Jute and Allied Fibres

Table 2: Rating scale of jute anthracnose

Rating	No. of spot on stem (upto 1m height) and their nature	Reaction
G0	no spots on the stem	immune
G1	1-15, isolated spot	resistant
G2	16-50 spots, isolated with occasional coalesces	moderately susceptible
G3	51-100 spots, isolated as well as frequent coalesces	susceptible
G4	>100 spots, isolated as well as frequent coalesces	highly susceptible

(%) and severity (no. of spot/plant) of the disease was recorded. Based on the number of spots/plants (i.e. severity), the disease reactions are grouped into five [G0=no spot, immune), G1=1-15 spots/ plant (resistant), G2 16-30 spots /plants (moderately susceptible), G3 = 31-50 spots/ plants (susceptible) and G4 = more than 51 spots/plant and coalesces (highly susceptible)]. The PDI was calculated using the following formulae [(Ó of all disease rating/ total number of plant rated x maximum grade) x100]. The pathogen was isolated (in

Fig.1: Rating of jute anthracnose, G0 = no spot (immune), G1= 1-15 spots/plant (resistant), G2 = 16-30 spots/plant (moderately susceptible),G3=31-50 spots/plant (susceptible) and g4= more than 51 spots/plant and coalesces (highly susceptible)

PDA media) from the infected samples collected from various centres using standard protocol and studied their characteristics.

During survey work, the disease was carefully observed in various trial fields and it was noticed that black coloured, round to irregular, eye to oval shaped spot measuring 3-6mm x 2-5mm on the lower halves i.e. upto 1.0-1.5m of the stem was developed at harvesting time. The central portion of the spot is light brown and ash coloured (Fig.1). Initially the spots are small and isolated which later on increase in size with the crop age, coalesce and exposed the fibre. In severe condition the stem may break. Number of spots per plant and disease reaction varies greatly among breeding materials. Based on the observation under field condition five point rating scale (G0, G1, G2, G3 and G4) are developed which is presented in Table 2 and Fig. 1.

Based on the above rating scale, the severity of disease i.e. PDI (percent disease index) can be calculated using the following formulae [(Ó of all disease rating/ total number of plant rated x maximum grade) x100]. To be more accurate co-efficient of disease index i.e. CODEX value was calculated by using the formulae [(percent incidence x PDI)/100].

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