

ORIGINAL ARTICLE

Stem rot of jute (*Corchorus* spp.): New insight on its causal organisms

Kunal Mandal¹  | Dipankar Ghosh¹ | Chandan S. Kar²

¹Division of Crop Protection, ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, West Bengal, India

²Division of Crop Improvement, ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, West Bengal, India

Correspondence

Kunal Mandal, Division of Crop Protection, ICAR-Central Research Institute for Jute and Allied Fibres, Nilgunj, Barrackpore, West Bengal 700121, India.
Email: mandal_kunal@yahoo.co.in

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Abstract

Stem rot disease is a major threat to the successful cultivation of jute (*Corchorus* spp.). Although *Macrophomina phaseolina* is the causal agent attributed to this disease, in the present study we documented the involvement of several pathogens. Disease samples were collected from West Bengal, a major jute-growing state in India and six different types of symptoms were observed under field conditions. Isolated pathogens ($n = 387$) produced four types of colonies resembling growth patterns of *Colletotrichum*, *Diaporthe*, *Lasiodiplodia* and *Macrophomina*. Based on pigmentation on the reverse side of plates, *Diaporthe*- and *Lasiodiplodia*-type colonies formed two subgroups each. However, no correlation could be established between types of disease symptoms and the associated pathogens. While *Colletotrichum* was prevalent in the Coochbehar district, the spatial distribution of the other pathogens was random. Internal transcribed spacer (ITS) of rDNA and translation elongation factor 1- α (*TEF*) genes from two representative isolates from each of six morphogroups were amplified and sequenced. Phylogenetic trees were generated based on these sequences, which suggested that seven fungal pathogens belonging to four genera (*Colletotrichum*, *Diaporthe*, *Lasiodiplodia* and *Macrophomina*) were involved with stem lesions of jute. Three recommended fungicides (carbendazim, hexaconazole and tebuconazole) were tested against the selected fungal pathogens and all were found effective in suppressing their growth in vitro.

KEYWORDS

Botryosphaeriaceae, charcoal rot, Diaporthaceae, Glomerellaceae

1 | INTRODUCTION

Jute (*Corchorus* spp.) is an important fibre crop, second to cotton in terms of area and production. It is a major commercial crop grown in south Asian countries (Bangladesh, India, Nepal, China, Indonesia, Thailand and Myanmar) and India ranks second in the world for jute production. This crop is grown on 0.64 million ha in India and produces 9.17 million bales of fibre (Anonymous, 2020b). However, most of the jute growers belong to the small and marginal categories (Singh et al., 2019). Consequently, they have limited ability to take risks by deviating from traditional cultivation practices. Yield

reduction or crop failure due to erratic environmental conditions, diseases and insect attacks jeopardize jute growers' income. Stem rot disease is one such major constraint in the successful cultivation of jute.

Although many *Corchorus* species are found in Africa, south-east Asian countries and Australia, the two cultivated species *C. olitorius* and *C. capsularis* are adapted as fibre crops due to their specific climatic requirement and agronomic practices. High plant density (c.600,000 per ha), high rainfall and high humidity during early and mid-vegetative phases result in taller jute plants with scarce branching, thereby ensuring the production of long jute fibres suitable for