



## Research Article

# REPORT OF *Turnip mosaic virus* OCCURRENCE IN BROAD LEAVED MUSTARD (*Brassica juncea* var. *Rugosa*) FROM MANIPUR, INDIA

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**Abstract-** The occurrence of *Turnip mosaic virus* (TuMV) in broad leaved mustard (*Brassica juncea* var. *Rugosa*) grown in Manipur, India was confirmed by symptomatology and reverse transcription- polymerase chain reaction (RT-PCR). Symptoms showing mosaic, mottling, interveinal chlorosis, irregular chlorotic patches and puckering were observed on broad leaved mustard with maximum mean disease incidence of 42.12%. RT-PCR assay was carried out using potyvirus-specific degenerate primers Nlb2F and Nlb3R, targeting the core region of the Nlb. The RT-PCR assays using Nlb specific primers produced amplicon of 350bp, only in the symptomatic leaf samples. This is the first molecular evidence of TuMV infection in broad leaved mustard from Manipur, India.

**Keywords-** Broad leaved mustard, *Turnip mosaic virus*, Symptomatology, Disease incidence, RT-PCR

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## Introduction

Broad leaved mustard (*B. juncea* var. *Rugosa*) belongs to the family *Brassicaceae* (*Cruciferae*) is an important vegetable crop in Manipur. This crop is widely cultivated as winter season crop as backyard home vegetables in most of the district of Manipur, India. The crop is mainly grown from October to November and harvesting started from January to March. However, raising of mustard as pure crop is rare in-home gardens. Virus-like leaf symptoms including mosaic, mottling, interveinal chlorosis, irregular chlorotic patches and puckering were observed on broad leaved mustard (*B. juncea* var. *Rugosa*) [Fig-1a] grown as backyard vegetable crop in Manipur, India with maximum mean disease incidence of 42.12%. Severely affected plants showed stunted growth. The symptomatic leaf samples were collected from different vegetable field crop of Manipur and an attempt was made to identify and characterize the virus species applying reverse transcription-polymerase chain reaction (RT-PCR) based method. Total RNA extracts (RNeasy Plant Mini Kit, Qiagen Inc., Valencia, CA) from symptomatic leaf and non-symptomatic leaf of *B. juncea* sample were subjected to reverse transcription (RT)-PCR assays using one-Step RT-PCR kit (Qiagen Inc., Valencia, CA). RT-PCR assay was carried out using potyvirus-specific degenerate primers Nlb2F and Nlb3R, targeting the core region of the Nlb. The RT-PCR assays using Nlb specific primers produced amplicons of 350 bp, only in the symptomatic leaf samples. In India, incidence of TuMV infection has been reported in various cole crops from different locations [1-4]. It is also reported that the RT-PCR assays using the Nlb specific primers produced amplicons 350 bp in the symptomatic leaf samples of *B. Carinata* in the United States [5]. These results revealed the association of TuMV with symptomatic broad-leaved mustard (*B. juncea* var. *Rugosa*) leaf samples. There is also report of TuMV occurrence in cole crops (*Brassica* spp.) from Arunachal Pradesh, India [6]. This is the first report of its occurrence on *B. juncea* var. *Rugosa* in the Manipur, India. Considering the importance of *B. Juncea* as an important vegetable daily diet in Manipur.

Broad leaved mustard



Symptomatic Leaf

Non-Symptomatic Leaf

Fig-1a Leaf symptom of *Turnip mosaic virus* (TuMV) infection in broad leaved mustard along with non-symptomatic healthy leaf.

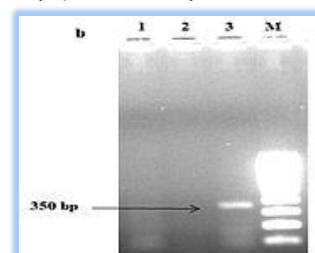


Fig-1b RT-PCR detection of Potyvirus using degenerate primer revalidation of TuMV infection through RT-PCR using TuMV CP specific primer; M = 100bp DNA ladder; lanes 1 and 2 template from non-symptomatic broad leaved mustard; lane 3 template from symptomatic broad leaved mustard.

This report underscores the need for developing effective virus management strategies for the crop.

**Application of research:** The findings in Research were valuable in identifying and characterizing the *Turnip mosaic virus* (TuMV) infection in broad leaved mustard and its development of effective management strategies for the crop

**Research Category:** Molecular detection of plant virus

**Abbreviations:**

TuMV-Turnip mosaic virus

RT-PCR- Reverse transcription- polymerase chain reaction

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**Conflict of Interest:** None declared

**Ethical approval:** This article does not contain any studies with human participants or animals performed by any of the authors.

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