

Xanthomonas axonopodis pv. *Punicae* - A New Threat to Pomegranate Plants in Assam

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Received 11.2.2014, Revised 16.5.2014, Accepted 23.5.2014

Pomegranate (*Punica granatum* L.) also known as “Fruit of Paradise” is one among the major fruit crops grown extensively in subtropics. The fruit is very much favoured for its cool and refreshing juice and other processed products such as concentrate, syrup, jelly, *Anardana*, Wine etc. Pomegranate is a rich source of carbohydrates, vitamin-C and minerals such as calcium, iron and sulphur. The main sugar constituents present in pomegranate fruits are glucose (5.46%) and fructose (6.14%) but no sucrose. The fruits of pomegranate also carry a number of medicinal and therapeutic properties. In *Ayurveda*, the flower buds are used for managing bronchitis; bark, root and rind of the fruit is used for curing of dysentery, diarrhoea and killing of tape worms. Besides this, the crop residues of pomegranate, got some importance in dye and tanning industries also.

In a recent investigation in summer of 2013, a new type bacterial disease was observed in several pomegranate fruit plants of Jorhat region of Assam. The disease suspected as a new disease in this region was seen to infect different aerial parts like leaves, stems, flowers and fruits of pomegranate plants. The disease initially appears as irregular to circular translucent, small, dark water soaked spots on leaves. Later they become necrotic at the centre. Severely infected leaves shed off prematurely. Stem infection also observed in some cases where the pathogen produces girdling and cracking symptoms. Spots on fruits were somewhat dark brown in colour, irregular, slightly raised with oily appearance, which split open with L or Y-shaped cracks under severe stages of the disease. These symptoms are resembles with the typical bacterial blight disease symptoms of Pomegranate (Rangaswamy 1962; Kishun 1993). Hence, the

present investigation was undertaken with the objective to isolate and identify the actual causal organism of the disease.

Infected leaves and fruits samples showing typical symptom were collected from a number of bacterial blight disease suspected pomegranate plants. After collection of samples, isolation of the pathogen was made within 48 hours on Nutrient agar medium using streak plate method. All the diseased samples yielded yellow pigmented mucoid, circular, convex, rounded, glistening and raised colonies, after 3 days of incubation at 27±1°C temperature (Chand and Kishun 1991; Manjula 2002). Pure cultures were confirmed by repeated single colony transfer method. The pathogen in pure culture was identified as *Xanthomonas axonopodis* pv. *Punicae* based on its morphological, cultural, biochemical and physiological characters (Hingorani and Mehta 1952; Chand and Kishun 1991). Under oil immersion, the bacterial blight pathogen of pomegranate was seen in single pairs and also in chains; rod shaped with single polar flagellum, measured (0.75-3.0 x 0.45) µm in size, Gram negative, no capsules or endospores were seen.



Fig. 1: Symptom caused by the pathogen *Xanthomonas axonopodis* pv. *Punicae*. on pomegranate fruit and leaves

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Pathogenicity test was established by spraying 48 hour old bacterial culture suspension (2×10^8 cfu/ml) on pinpricked 40 days old healthy pomegranate leaves (Chand and Kishun 1991). Infection occurred within 23 days of inoculation and produced identical symptoms observed on original pomegranate plant. The organism re-isolated from artificially inoculated plant yielded an organism similar to one used in the inoculation experiments. This satisfied all the conditions required to establish that the disease was a bacterial borne disease which was caused by the pathogen *Xanthomonas axonopodis* pv. *Punicae*.

To our knowledge this is the first report of bacterial blight disease on pomegranate plants in Assam. At present the disease is of minor economic importance in this region, but it may pose serious

threat to pomegranate as symptoms are now prevalent in many orchards of pomegranate.

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