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Short communication

Bacterial leaf and fruit spot : A major constraint in pomegranate orchards

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Pomegranate (*Punica granatum* L.) belongs to the family *Punicaceae*. It has wider application in both Ayurvedic and Unani traditional medicinal systems of medicine (Anonymous, 1989). Owing to different alkaloids particularly tannins, constituted in pomegranate leaves and fruits, there is no occurrence of much disease in this crop. But the leaf and fruit spots are the major diseases in humid regions of India, which indirectly affects the yield, and economic value of fruits in India. It is popularly known as oily spots in Maharastra area and nodal blight in Karnaraka. Ramesh *et al.* (1991) have reported that pomegranate bacterial blight appeared as an epidemic in Bangalore, Karnataka, India, causing 60-80% yield losses.

There was a severe out break of this particular disease and consequently, an expert committee constituted by ICAR has surveyed pomegranate orchards in the area of Chik-Mahud, Kadlas, Jadhavwadi, Sangola in Solapur district and Jalihal, Umdi abd Tikondi in Sangali district of Maharastra. Appearance of this disease in different orchards of these locations was seen by the experts. Incidence, intensity and diversified symptoms on different cultivars were also assessed by random sampling method. The ooze test from different infected parts collected from different orchards were observed under microscope in the Plant pathology laboratory in Agriculture college, Pune. Subsequently, casual organism of this disease was confirmed and identified as *Xathomonas axonopodis* pv. *punicae* Vautern by standard culture technique. and further Bacterial leaf spot was first reported from Delhi in 1952 and now became prime disease occurring in almost all commercial varieties of pomegranate. Disease intensity varied in different locations of the country. *X.axonopodis* pv. *punicae* produced typical black spot symptoms when inoculated on different parts of pomegranate plants. Cent per cent lesion formation was recorded both under artificial as well as field conditions in Indian Punjab in 1997 (Rani *et al.*, 2002a). In present surveys, this particular disease has posed a major threat on pomegranate orchards and could infect most of the commercial varieties like Mirdula, Bhagava, Ganesh in the areas of Chik-Mahud, Kadlas, Jadhavwadi and Sangola in Solapur district of Maharastra. Though, the average incidence intensity was ranging from 0.33 to 2.5%, quality of fruits was completely lost in most of the places visited.

In present investigations, different types of symptoms were observed in most of the commercial cultivars like Ganesh, Mirdula and Bhagava. In leaves, almost similar kind of symptoms were seen except in case of cv Mirdula. dark spots surrounded by yellowish green halo and in other cases the spots are surrounded with yellow halo. The bacteria could migrate from the spots to stems through leaf petioles to central veins and slowly enters in to stem forming dark lesions. Bark tissues are severely distorted by bacterium in advanced stage of infection. In cv. Ganesh, water soaked lesions were prominent and subsequently appeared as necrotic spots without much halos on young fruits. In severe cases, many spots coalesced to form necrotic lesions and progress to the extent of epidermal cells of rind. When the infection occurs on matured fruits, the rinds are cracked easily and such fruits are congenial for colonization of saprophytic fungi and insects damage. In flower buds also, deep-seated necrotic lesions were seen. In contrast to necrotic and water soaked spots on rind, initially dark brown spots with sunken lesions appeared on cv. Mirdula. In advanced stages, fruits cracking were severe as compared to other varieties. Systemic migration of the pathogen was seen as symptoms expressed by the bacterium in vascular tissues. The bacteria colonized in the inter-cellular spaces in mesophyll cells before moving to the petiole and finally down to the node. Invaded cells were killed resulting in blight and therefore, it is also known as nodal blight disease of pomegranate which is very common in Bangalore area. The pathogen infected the leaves, nodes, flowers and fruits of pomegranate plants (Ramesh *et al.*,1991). Rani *et al.* (2001a) reported that *X. axonopodis* pv. *punicae* produced typical black spot

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symptoms on different parts of pomegranate. Water-soaked turn dark brown which are raised and oily in appearance (Rani *et al.*, 2001b) and these results are in agreement with present results.

Isolates of bacterium from different parts of various commercial cultivars were grouped based on the cultural and chemostatic parameters and the causal organism was isolated and identified as *Xanthomonas campestris* pv. *punicae* and its pathogenicity was also confirmed. Rani *et al.* (2002) reported that based on the morphology of the bacterium isolated from infected fruits, leaves, and twigs, the pathogen was identified as *Xanthomonas axonopodis* pv. *punicae*. Ramesh *et al.* (1993) also reported different isolates of pathogenic bacteria from various parts of pomegranate cultivars and their variability in growth rate under the exposure of different antibiotics. It is concluded from present studies that leaf and fruit spots caused by *X.axonopodis* pv. *punicae* is the major disease in pomegranate orchards not only in Maharastra state but also in rest of the southern states and it can cause heavy loss in near future, if proper management strategies are not worked out.

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