Research Note :

Pseudomonas-the causal agent of gummosis of guggal

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SUMMARY

Guggal (*Commiphora wightii* (Arn.) Bhandari) is an important medicinal plant. The gum from this plant has special medicinal value. The plant exudate gum and dies after one or two years. This is the major limitation for successful cultivation of guggal. To known the real cause of plant death after gum oozing, and isolation of gum taken up. Naturally gum oozing of guggal plant's parts was used for isolation. It has been found out for the first time that bacterium are responsible for gum exudation. The pathogenicity of the bacteria was confirmed. It is gram-negative and rod shape. The pathogen was identified as *Pseudomonas*.

Key words : *Commiphora wightii, Pseudomonas* sp., Tapping, Guggal gum

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Guggal (*Commiphora wightii* (Arn.) Bhandari) is an important medicinal plant. The gum from this plant has special medicinal value. Rural people are using guggal gum for Dhup in Puja. Many Guggal's products are available in the market. Guggal plants are naturally grown in forest and waste land areas of Gujarat, Rajasthan and Karnataka. The farmers grow guggal plants as field boundary for the protection of crops against animals. These are propagated through cutting in *Kharif* season. Four to five years old plants are used for tapping to get gums. The plant exudates gum and die slowly after one or two years. This is the major limitation for successful cultivation of guggal. It has been observed for the first time that bacteria are responsible for gum exudation. No other information is traceable in the literatures.

Naturally severe gum oozing guggal branches and barks were collected from the farm of Medicinal Plants Project, Gujarat Agricultural University, Anand for isolation of causal organisms. The main symptom is oozing of gum from affected plant parts. Gummosis is mainly a disease of stems and branches of guggal. Infected stems and branches produce gum. Initially gum off white fluid and letter becomes brown in colour. The gum exuded plants will die slowly and slowly after one year. Isolation of pathogen was done by tissue isolation technique. The selected branch was cut into small bits with sterilized blade. The bits were washed with distilled sterilized water and then surface disinfected with 0.1% mercuric chloride solution for 10 seconds. Then bits were immediately washed thrice subsequently with distilled sterilized water in sterilized Petri plates. After that these bits were transplanted directly on host decocted medium (250 guggal bark, 20g agar, 15g dextrose and 1.0 liter water) in Petri plates and incubated at 30 ± 1^0C for 2 days. Fluidal, gummy and shine bacterial colonies were observed on bits. After getting the growth of the bacterial colony, it was transferred on host decocted medium slants. On observation under compound microscope in 100X with seedar wood oil. The bacterium was found gram negative and rod shape. The pure culture was sent for identification at Indian Type Culture Collection, Division of Plant Pathology, IARI, New Delhi and was identified as *Pseudomonas*.

Pathogenicity test:

The fresh purified bacterial culture was inoculation in the guggal plants. Four loops of bacterial culture was added in 10ml distilled sterilized water. This suspension was used for inoculation in 10 plants of guggal stems by tapping method and others 10 plants, uninoculated served as control. In inoculated guggal branches the bacterial growth was observed. While no bacterial growth was recorded on uninoculated guggal branches.

The inoculated and uninoculated plants were observed everyday for gum oozing expression (Table 1). All bacterial culture inoculated plants started gum exudates after 7 to 9 days, while contrsol plants did not produce

Table 1 : Inoculation of bacteria suspension in guggal plant stem by tapping

Sr. No.	Treatments	Number of guggal plant inoculated	Number of plants produced gum	Percentage of infection
1.	Inoculated with test bacterial suspension	10	10	100
2.	Inoculated with distilled sterile water only (Control)	10	0	0

gum at all. The same bacterium was re-isolated from artificially inoculated plants. Similar results were obtained by Saha (2002) in which the inoculation of young plum and cherry trees with *Pseudomonas syringae* led to the accumulations of gum and the uninoculated stem provided no gum The bacterial gummosis of peach, plum and other stone fruits are caused by *Pseudomonas syringae* Van Hall. *Pseudomonas syringe* has induced bacterial canker and gummosis disease on apricoat and peach tree in Kabul as reported by Ercolani and Graffer (1985). Gardan *et al.* (1972) also reported *P. syringae* is to kill more than a million peach trees in France. This is the first report that *Pseudomonas* is the causal organism of gummosis of guggal.

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