

D71: Occurrence of Bacterial Wilt Disease of Solanaceous Crops Caused by *Ralstonia solanacearum* in India and Its Management

Dinesh Singh, D. K. Yadav and Garima Chaudhary

Division of Plant Pathology, Indian Agricultural Research Institute, New Delhi – 110012

E-mail: dinesh_iari@rediffmail.com

Bacterial wilt caused by *Ralstonia solanacearum* is a very serious disease of solanaceous crops including tomato, potato, chilli and brinjal and occurs across the country mainly coastal areas, foot hills and lower altitude of hills. The damage caused by this disease to the crop was > 60% depends on environmental conditions and variety of crops. 61 isolates of *R. solanacearum* were isolated from these crops from different agro-climatic regions belonging to states of India as Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Jharkhand, Orissa and West Bengal. The culture was characterized by using classical methods such as morphological, biochemical, physiological and pathogenicity. Race 1 biovar 3 were found most prominent (90.2%) in all the states and belong to solanaceous crops, whereas biovar 4 was found only 9.8 per cent. Management of *R. solanacearum* by planting resistant cultivars has been ineffective for potato, since resistance in this host plant may vary with location and temperature. Similarly, antibiotics (streptomycin, ampicillin, tetracycline and penicillin) have shown little efficiency for suppression of *R. solanacearum* in the field and are also expensive. As a consequence, cultural methods are the best option for control of *R. solanacearum*. In the regions where the disease is endemic, cultural practices have proven to be effective in some conditions; these practices include use of disease-free seed tubers, crop rotation with non-host plants, intercropping, control of weeds and root-knot nematode populations, planting in uninfected fields, removal of long-term survival sites, selection of appropriate planting time, deep plowing of crop residues and satisfactory soil drainage or early- and late-season irrigation management. Besides these, bio-control agents such as *Pseudomonas fluorescens*, *P. glumae*, *Bacillus* sp., *Bacillus licheniformis*, *B. cereus*, *B. subtilis*, *Stenotrophomonas maltophilia* and a Hrp-mutant of *R. solanacearum*, *Trichoderma harzianum*, *Candida ethanolica* and mycorrhiza are found to be relatively effective in the control of *R. solanacearum* populations under natural conditions.

D72: Record of the Small Salmon Arab, *Colotis amata* F. on Pilu (*Salvadora persica* L.) in Arid Region of Rajasthan: Incidence and Morphometric analysis

S. M. Haldhar, R Bhargava, R S Singh, Hare Krishna and S K Sharma

Central Institute for Arid Horticulture, Bikaner-334006 (Rajasthan)

Pilu or Jaal (*Salvadora persica*) is a medium tree or shrub with a crooked trunk, seldom more than one foot in diameter. It has a pleasant fragrance, as well as a warm and pungent taste. Fruits have a sweet, agreeable, aromatic, slightly sour in taste. The small salmon arab, *Colotis amata* F. was recorded on pilu (*S. Persica*) at experimental farm of Central Institute for Arid Horticulture, Bikaner. The average incidence of larvae on plant ranged between 16.67 to 80.00 per cent. The incidence and the numbers were higher in the month of December than during other months and

the minimum in September. Thus the highest mean number of this butterfly species per 3 leaves was recorded in December (22.30) followed by January (16.77) and the lowest was in September (7.63). The larvae were found to be aggregated on the leaves of the plants. The newly sprouting tender shoots and leaves are attacked by larvae of butterfly. Due to its attack, the leaves dried up and tender shoots do not grow properly. Larvae feed on sprouting tender shoots, leaves and flower buds. An infested leaf gives whitish look due to chlorophyll feeding. It is a small butterfly of the family Pieridae, that is the yellows and whites, which is found in Asia. Eggs are laid singly on leaves or young shoots. They are 0.58 mm to 0.72 mm in length; 0.38 mm to 0.43 mm width and white when first laid, later developing red blotches. First larval instar is greenish yellow with black head. The length of Ist instar larvae is 1.98 mm to 2.29 mm and width is 0.36 mm to 0.48. The length of IInd, IIIrd and IVth larvae are 5.04 mm, 9.77 mm and 14.27 mm, respectively. Final instar is light greenish with white strip on dorsal surface of body. The fifth instar larva is 19.30 mm length and 3.33 mm width. Pupa is 14.10 mm length and 5.73 mm width with laterally compressed, strongly keeled and moderately high dorso-thoracic keel; pointed but short cephalic projection, slightly up curved distally. Adult has a salmon-pink ground colour with female body length 9.71 mm and width 33.62 with wing expansion. The male body length is 7.59 mm and width 25.67 mm with wing expansion. The costa on the forewing is black and thickly overlaid with greyish or pinkish scales. The length of male and female antenna is 4.63 mm and 5.46 mm.

D73: Distribution of *Gyanoderma lucidum* (W. Curt. Fr)Karst. in Dareeling Himalayas and its Ethenomedicinal and Phyto-Parasitic importance

Siddhartha S. Dikshit¹ Sajeed Ali², Rakesh Roy² and T. S. Ghimiray³

¹Scottish Universities' Mission Institution, Kalimpong, District Darjeeling, 734301

²Darjeeling Krishi Vigyan Kendra, Uttar Banga Krishi Viswavidyalaya, Kalimpong, Darjeeling, 734301, West-Bengal, India

³Regional Research Station, Uttar Banga Krishi Viswavidyalaya, Kalimpong, Darjeeling, 734301, West-Bengal, India

The study deals with the ethnomedicinal and phyto-parasitic importance of *Gyanoderma lucidum* in the Darjeeling Himalayas. An extensive survey on occurrence of *Gyanoderma lucidum* in Darjeeling Himalayas revealed that fungus is causing diseases in plants viz *Citrus reticulata*, *Dalbergia sissoo*, *Schima wallichii*, *Shorea robusta*, *Tsuga dumosa* etc. It was found that the fungus was distributed all over the areas under survey. Besides its phytoparasitic nature, this fungus has a tremendous medicinal value. In Darjeeling, the fungus harvested from the trunk of *Chilane* is finely grounded and soaked in pure coconut oil overnight. Next morning it is strained with fine muslin cloth and the formulation is instilled 2-3 drops daily into the infected ear(s), thrice daily for 7-10 days. The treatment is found effective remedy for the ears infected with oozing pus and blood. But, the ethnomedicinal value of *Gyanoderma lucidum* in relation to ear infection needs to be further validation with pharmacological properties.