

Report on the palm aphid, *Cerataphis brasiliensis* on ‘Kalparaksha’ coconut cultivar

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Abstract Aggregations of palm aphid *Cerataphis brasiliensis* (Hempel) (Aphididae: Hemiptera) on the unfurled spindle leaf of ‘Kalparaksha’ variety of coconut, a selection from Malayan Green Dwarf, is reported for the first time. *C. brasiliensis* has not yet been observed from other coconut varieties, viz., West Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf, and Dwarf x Tall hybrids planted in the research farm of Central Plantation Crops Research Institute, Kayangulam, Kerala, India. Only the apterous form of the palm aphid was noticed in the semi-tall variety and a variety-induced emergence of *C. brasiliensis* is indicated under natural conditions. Due to the presence of two phoretic ant species, no natural predator was observed in the aphid colonies. Two sprays of dimethoate (0.05%) at an interval of 15–20 days were effective in suppression of the pest on Kalparaksha.

Keywords Apterous form · Malayan Green Dwarf · Root (wilt) disease · Spindle leaf

Root (wilt) disease is a major, non-lethal but debilitating malady of coconut palms in Kerala, India. Due to its

phytoplasmal etiology and persistent mode of transmission by insect vectors, viz., the lace bug *Stephanitis typica* (Distant) and the planthopper *Proutista moesta* Westwood, a long lasting solution for the management of the disease is achieved through breeding for resistant/tolerant coconut varieties. ‘Kalparaksha’ is a recently released coconut variety from Central Plantation Crops Research Institute (CPCRI) and recommended for cultivation in the root (wilt) diseased endemic tracts of Kerala owing to its tolerance to the disease. It is a semi-tall coconut variety evolved as a selection from Malayan Green Dwarf (Nair *et al.* 2009). Of late, about 200 open-pollinated seedlings of this variety are being cultivated in a contiguous plot on the CPCRI research farm at Kayangulam, Kerala, that was planted during June 2008 along with other varieties, viz., West Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf, and Dwarf x Tall hybrids in order to record the emerging insect pests of coconut under natural conditions. At this point of time, the plants have attained about 8–10 leaf stage and all agronomic management practices developed by the Institute were judiciously followed and the damage caused by insect pests was recorded periodically.

During October 2010 coinciding with the north-east monsoon period in Kerala, dense aggregations of palm aphid, *Cerataphis brasiliensis* (Hempel) (Aphididae: Hemiptera), were recorded on the unfurled spindle leaf of Kalparaksha variety in approximately 3% of the young plants. The aphid was not reported from any other coconut varieties, viz., West Coast Tall, Chowghat

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Orange Dwarf, Chowghat Green Dwarf, and Dwarf x Tall hybrids planted on the CPCRI research farm. Although similar stages of other coconut varieties are available in the farm the palm aphid was predominantly confined only on the spear leaves of Kalparaksha, indicating the varietal preference of the aphid to accessions under natural conditions belonging to the Malayan Green Dwarf pedigree. In addition, no greater variation in weather factors is recorded in this region during the period. Over a period of three decades, this is the first report on the emergence of *C. brasiliensis* on Malayan Green Dwarf accessions in Kerala, India, probably due to varietal preference. Furthermore, a contiguous cultivation of this variety has been established in the farm only during this period.

In Florida, *C. brasiliensis* was not known to infest native palms, but they seem to prefer selections of Malayan Dwarf coconut palms over the Jamaican Tall

variety (Reinert and Woodiel 1974). This is in corroboration with our observation on Kalparaksha variety. Intensity of infestation was very high, with about one to three aphids recorded on a 1 cm² area of the spear leaf. The population was so high that it led to choking of spindle leaves and stunting of infested young plants. These aphids reduce the plant vigor by continuous desapping and cause yellowing of the feeding area. All these aphids were attended by two species of ants belonging to either *Solenopsis* sp. or *Oecophylla smaragdina* that feed on the honeydew excreted by the aphid (see Plate). The presence of phoretic ant species in an aphid colony normally hinders the establishment of natural predators and hence no natural enemies were recorded in our investigation. Moreover, the photosynthetic efficiency of aphid-infested palms is badly affected and *C. brasiliensis* preferred younger plants than the older palms in our observation.

Palm aphid with attendant ants



Solenopsis sp.



Oecophylla smaragdina

Palm aphid and whitefly puparia



Aphids with smooth dorsum and mid-dorsal ridge



Whitefly puparia with dorsal spines

In southern Florida this aphid develops several generations a year and seems to be more common on exotic ornamental palms than on native palm species (Denmark 1965). However, *C. brasiliensis* colonies were recorded from seven species of palms in Brazil, viz., *Mauritiella armata* (Mart.) Burret, *Mauritia flexuosa* L., *Syagrus flexuosa* (Mart.) Becc., *Desmoncus leptoclonus* (Barb. Rodr.), *Oenocarpus distichus* Mart., *Bactris* sp. A, *Bactris* sp. B (Mews *et al.* 2008). This aphid is known to infest various species of palms in

many tropical areas in the world and is reported from Africa, Puerto Rico, Philippines, Indonesia, Surinam, British Solomon Islands, India, Florida and California (Denmark 1965). *Cerataphis variabilis* was first recorded in South India by Lefroy (1909) on coconut seedlings imported from Sri Lanka to India and later on by David (1958) from Coimbatore, Tamil Nadu, India and by Rajagopal *et al.* (1990) from Karnataka, India. In the recent past, biology of *Cerataphis palmae* was reported on coconut palms from Philippines (Sumalde

and Calilung 1982). *Cerataphis* sp. was previously reported from arecanut palm, but never observed to cause appreciable damage (Nair and Menon 1963; Pillai and Kurian 1959). However, recently it was reported as a pest on arecanut palm causing shedding of both fertilized and unfertilized flowers (Daniel *et al.* 2000). So far, no variety-specific emergence of palm aphid was recorded on coconut/arecanut palms from India. Revision of species under the genus *Cerataphis* was done by Russell (1996) and since then *C. palmae*, *C. variabilis* and *C. fransseni* are considered synonyms of *Cerataphis brasiliensis*.

The insects are semi-sedentary, nymphs and adults retain functional legs and adults resemble arecanut whitefly pupae (*Aleurocanthus arecae*), a common foliage pest of coconut and arecanut seedlings (Chandrika Mohan *et al.* 2007). They are strikingly similar to aleyrodids, sharing with them a circular, slightly convex shape, a fringe of white waxy filaments that circumscribes the body possessing simple rather than compound eyes. In general, whitefly pupae have blackish setae on the body, whereas the aphid body is smooth, shiny, dark brown in color and convex with a pronounced mid-dorsal ridge (see Plate). Siphunculi, the key aphid character, is present in *C. brasiliensis* but reduced to inconspicuous shallow rings (Howard *et al.* 2001). In our study of Kalparaksha coconut variety, we have observed only the apterous forms of palm aphid. They are found to reproduce by parthenogenesis. Chemical control may be a better option for the management of the pest, especially in nurseries (Jalaluddin and Mohanasundaram 1990), and we found two sprays of dimethoate (0.05%) at an interval of 15–20 days to be quite effective in suppression of the pest on Kalparaksha. When ants are prevalent in aphid colonies, spot application of systemic insecticides on a need basis holds the key for improving the vitality of palm. A careful admixture of planting different coconut varieties in a contiguous area and restoring diversity principles, would be more appropriate to avoid such ecotype-induced emergence of *C. brasiliensis*.

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