Pest alert

Occurrence and rapid spread of an adventive species of soft scale insect, *Fistulococcus pokfulamensis* Hodgson & Martin (Hemiptera: Coccidae) in India

ICAR–NATIONAL BUREAU OF AGRICULTURAL INSECT RESOURCES
Bengaluru - 560 024, India

Issued by

The Director
ICAR–National Bureau of Agricultural Insect Resources
P.O. Box 2491, H.A. Farm post, Hebbal, Bengaluru 560024, India
Phone: +9180 23414220; 23511998; 23417930
E-mail: director.nbair@icar.gov.in
Website: www.nbair.res.in

Citation: Joshi, S., Mohan, M. and Sushil, S.N. 2023. Occurrence and rapid spread of an adventive species of soft scale insect, *Fistulococcus pokfulamensis* Hodgson & Martin (Hemiptera: Coccidae) in India. *Pest alert issued by ICAR-NBAIR in the month of August 2023/1-4 pages*.

Occurrence and rapid spread of an adventive species of soft scale insect, *Fistulococcus pokfulamensis* Hodgson & Martin (Hemiptera: Coccidae) in India

Occurrence: *Fistulococcus pokfulamensis* was described by Hodgson and Martin in 2005 from Hong Kong infesting a gymnosperm, *Gnetum luofuense* (family Gnetaceae). We reported this species for the first time from India infesting umbrella tree - *Heptapleurum actinophyllum* (Endl.) Lowry & G.M. Plunkett (Araliaceae) (Fig. 1a) and jamun - *Syzygium cumini* (L.) (Moraceae) (Fig. 1b) at Kodathi, Bengaluru (Karnataka) (Joshi *et al*., 2022), where the infestation on both these host plants was more than 80 percent.

This insect has been reported on a gymnosperm in Hong Kong and is not known to cause any economic damage there, however, in India, it is spreading fast on many horticultural crops and hence this pest alert is being issued with anticipation of its further spread on mango, jamun and to geographic areas where these crops are grown extensively.

Spread: The infestation is now spreading on economically important host plants viz., mango - *Mangifera indica* (Fig. 1c) and high blueberry - *Vaccinium corymbosum* (Fig. 1d) at HBR layout, Bengaluru (Karnataka), on umbrella tree, *H. actinophyllum* in Kanakapura and J.P. Nagar areas of Bengaluru and heavy infestation on *H. arboricola* and *S. cumini* in Kambipura, Mysore Road. We started receiving complaints about the heavy infestation of mango trees in August 2023 from Chikkaballapur district, Mandibele, Vijayapura villages in Devanahalli taluk of Bengaluru Rural district and Hesaraghatta of Bengaluru North.

Symptoms: The infestation is initially found on the undersurface of leaves and later it spreads to the branches. The scale insect sucks the sap from the plants which lead to the accumulation of sooty mould and eventually the leaves are dropped.

Host range: The pest was reported to cause heavy infestation on the host plants belonging to four unrelated plant families indicating its ability to adapt to a variety of host plants and become polyphagous and spread within a short span of time in different areas.

Associated insects and natural enemies: The ant, *Oecophylla smaragdina* (Fabricius) (Fig. 1e) was found to attend the scale insects. Four species of predators were recorded attacking *F. pokfulamensis* in the field viz., *Chilocorus nigrita* (Fabricius) (Fig. 1f), *Cryptolaemus montrouzieri* Mulsant (Fig. 1g & h) (Coleoptera: Coccinellidae), *Spalgis epius* (Westwood) (Fig. 1i) (Lepidoptera: Lycaenidae) and *Dipha aphidivora* Meyrick (Fig. 1j, k & l) (Lepidoptera: Pyralidae), all feeding on nymphs and adult scales.

Field appearance: Body of an adult female is usually broadly oval but occasionally asymmetric, quite flat but with a slight longitudinal ridge anterior to anal plates. Dorsum covered in a dusting of white wax (Fig. 2a), with white wax threads or filaments appearing to arise from near the margin; after removal of wax (Fig. 2b), the dorsum transparent yellow with brownish alimentary canal clearly visible through the dorsal cuticle.

Taxonomic characters: The soft scale insects in this genus have a unique character of having pipe-like ducts arranged on the periphery of the body and hence named *Fistulococcus* (derived from the Latin word *Fistulosus*, meaning full of pipes). The diagnostic characters of this species are as follows.

Body membranous, narrow at anterior and broadest at the abdomen (Fig. 3a), usually broadly oval but occasionally asymmetric; anal cleft about 1/10th of total body length. Marginal setae each with a blunt apex (Fig. 3b) and highly sclerotized basal socket. Stigmatic clefts each highly sclerotized with constriction at the body edge, without any stigmatic setae (Fig. 3c).

Dermal areolations restricted to margin and submarginal areas (Fig. 3d). Dorsal setae (Fig. 3e) abundant in groups of 3–6 (occasionally groups of 2 or 3) between submarginal chambered ducts, usually arranged in a crescent. Pores of 3 types: small pores associated with microducts, frequent on submarginal areas (Fig. 3f); concave pores larger than pores associated with dorsal microduct (Fig. 3g), present submedially and submarginally; and preopercular pores (Fig. 3h), abundant in 2 bands arising from anal plates and extending to head. Submarginal pipe like chambered ducts (Fig. 3i), each consisting of one large tubular duct with about 8–12 satellites (funnel-shaped pores forming a U-shaped area of sclerotization by the opening of the main duct) plus 3–9 setae, restricted to submargin. Legs much reduced (Fig. 3j), segmentation between tibia and tarsus unclear; setal distribution: coxa 3; trochanter 2; femur 1; tibia 2; tarsus 4. Spiracle (Fig. 3k) normal, without sclerotic plate. Antennae each 6 segmented (Fig. 3l), segmentation obscure. Multilocular pores very few (Fig. 3m). Anal plates with 4 strong lateral margin setae and two anterior margin setae (Fig. 3n & o); 4 apical setae (Fig. 3p). Anal plate quadrate (Fig. 3q).

Strategies for avoiding the spread of *F. pokfulamensis*

- The main objective should be to evade the further spread of this scale insect to other areas of India by the destruction of the infested parts of the plants/trees in the specific areas
- Constant exhaustive monitoring and inspection for its infestation in new areas and on alternate host plants and weeds through surveys
- Biological control using parasitoids is known to be very effective against any invasive pest, but no parasitoids were found in India and unfortunately, no parasitoids have so far been reported from Hong Kong, where the pest was originally collected and described. However, we have reported four species of predators that need to be conserved. The first priority in India should therefore be screening for the occurrence of indigenous parasitoids.
- Since there is no label claim of insecticides to be used against this pest, temporary label claims for some insecticides based on global experience may be sought from CIB & RC, the government of India.

Reference:

Joshi, S., Gupta, A., Shashank, P.R., Pai, S.G., Mohan, M., Rachana, R.R., Dubey, V.K., Sandeep, A. and Deepthy, K.B. (2022) Recent adventive soft scale insects (Hemiptera: Coccomorpha: Coccidae) and mealybugs (Hemiptera: Coccomorpha: Pseudococcidae) in India. *Zootaxa*, 5194 (2): 213–232.

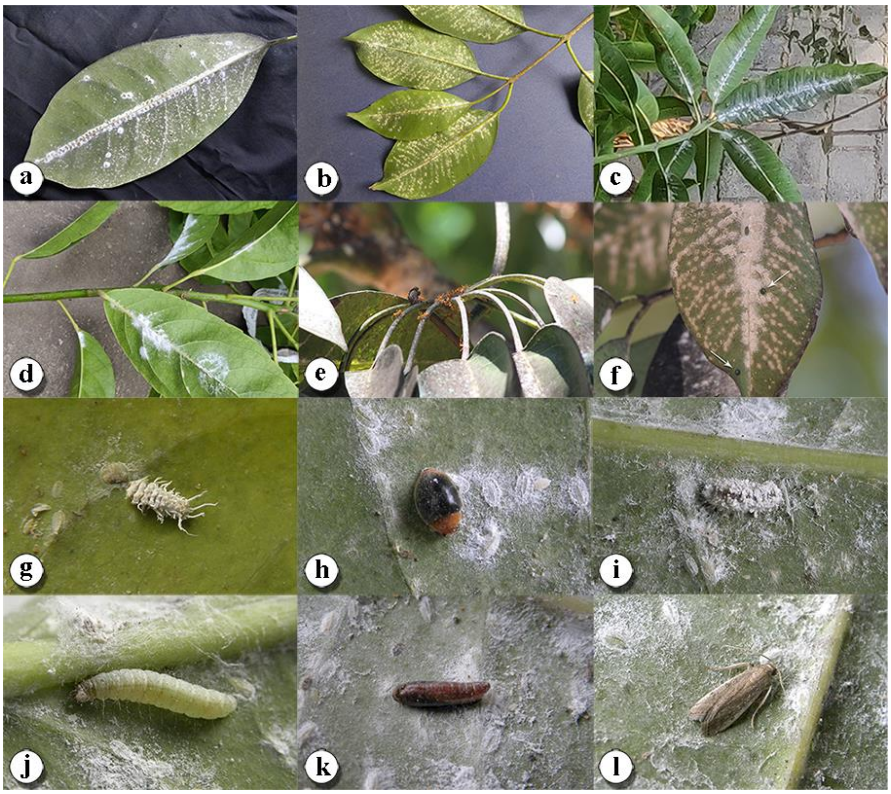

Figure 1. Host plants of *Fistulococcus pokfulamensis*: a. *Heptapleurum actinophyllum*; b. *Syzygium cumini*; c. *Mangifera indica*; d. *Vaccinium corymbosum*. e. Ant, *Oecophylla smaragdina* (Fabricius) attending *F. pokfulamensis*; Natural enemies of *F. pokfulamensis*: f. *Chilocorus nigrita* (Fabricius); g. *Cryptolaemus montrouzieri* Mulsant grub; h. *C. montrouzieri* adult; i. *Spalgis epius* (Westwood) larva; Life stages of the predator *Dipha aphidivora* Meyrick: j. Larva; k. Pupa removed from the cocoon; l. Adult

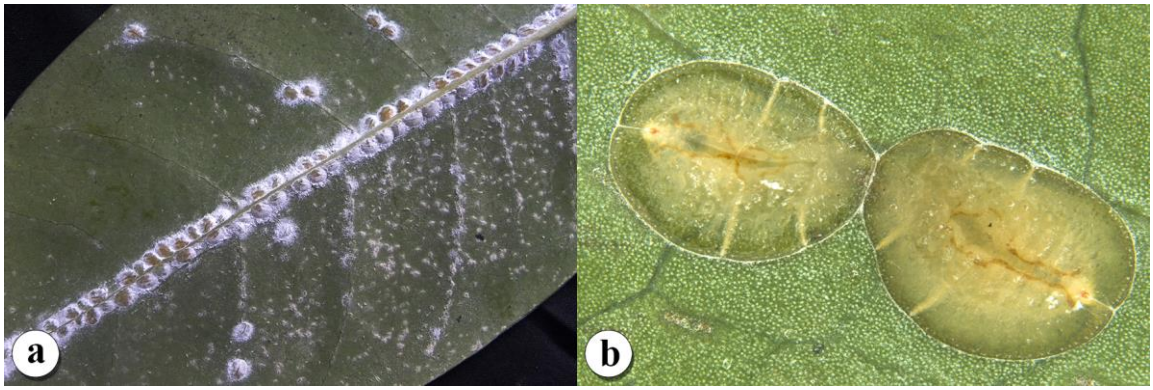

Figure 2. Field appearance of *Fistulococcus pokfulamensis*: a. Females covered in a dusting of white wax; b. Females after removal of wax duct

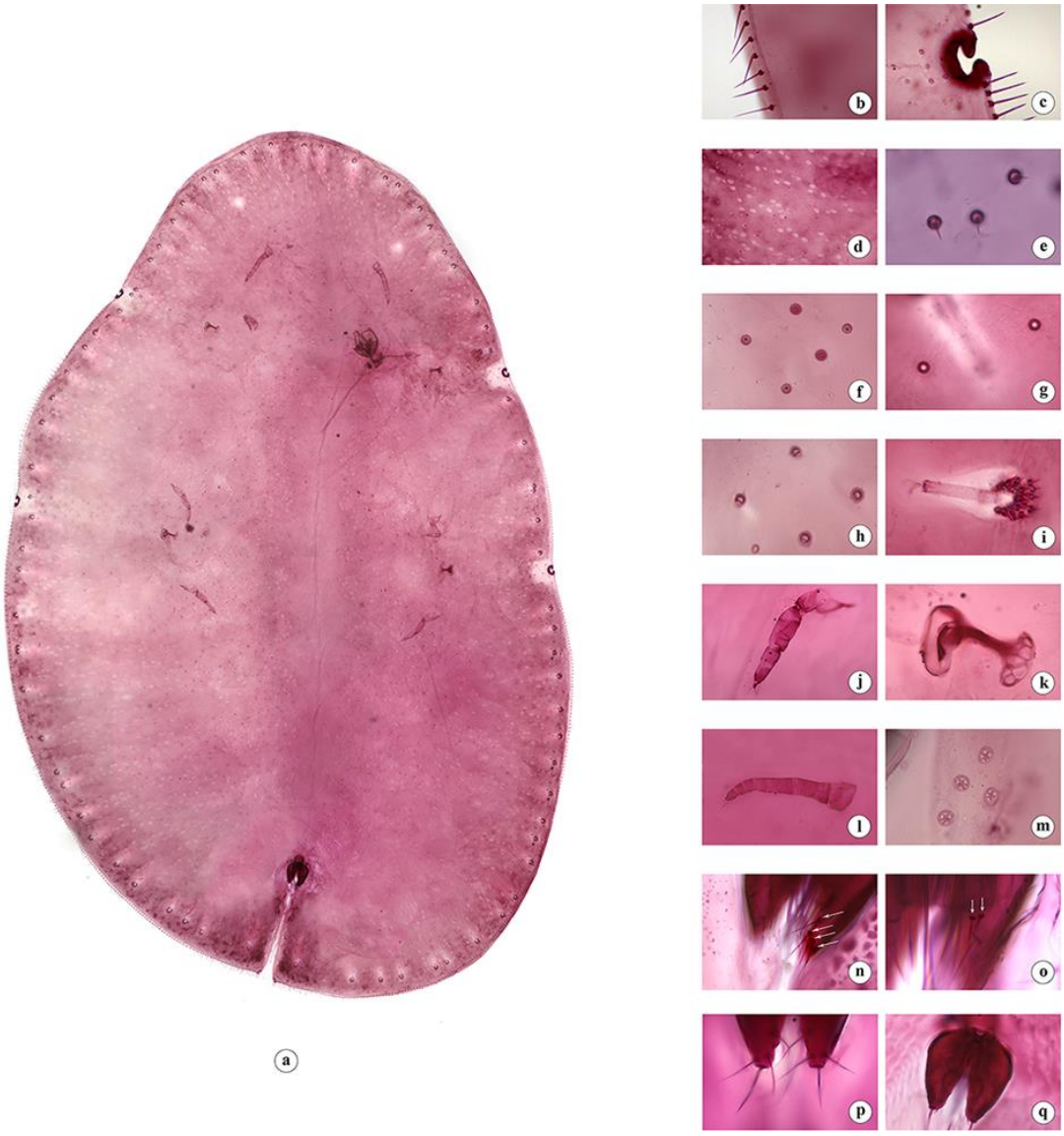

Figure 3. Diagnostic characters of slide mounted adult female of *Fistulococcus pokfulamensis* a. Female habitus, b. Marginal seta; c. Highly sclerotized spiracular cleft without spiracular setae; d. Dermal areolation; e. Dorsal setae; f. Small microductule; g. Concave pores; h. Preopercular pores; i. Submarginal pipe like chambered ducts; j. Leg; k. Spiracle; l. Antenna; m. preanal disc pores; n. Lateral margin setae; o. Anterior margin setae; p. Apical setae; q. Anal plate