diameter with vertically elongated locules whereas in the type they are 500–800 $\mu$m in diameter with spherical locules. *Rosa* sp. is a new host record for the fungus and is being reported for the first time from India.

The author thanks Prof. C. V. Subramanian, former Director, CAS in Botany, University of Madras for encouragement.

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## FIRST RECORD OF THE WHITEFLY SUBFAMILY ALEURODICINAE (ALEYRODIDAE: HOMOPTERA) FROM INDIA

B. V. DAVID

*Fredrick Institute of Plant Protection and Toxicology, Padappai 601 301, India.*

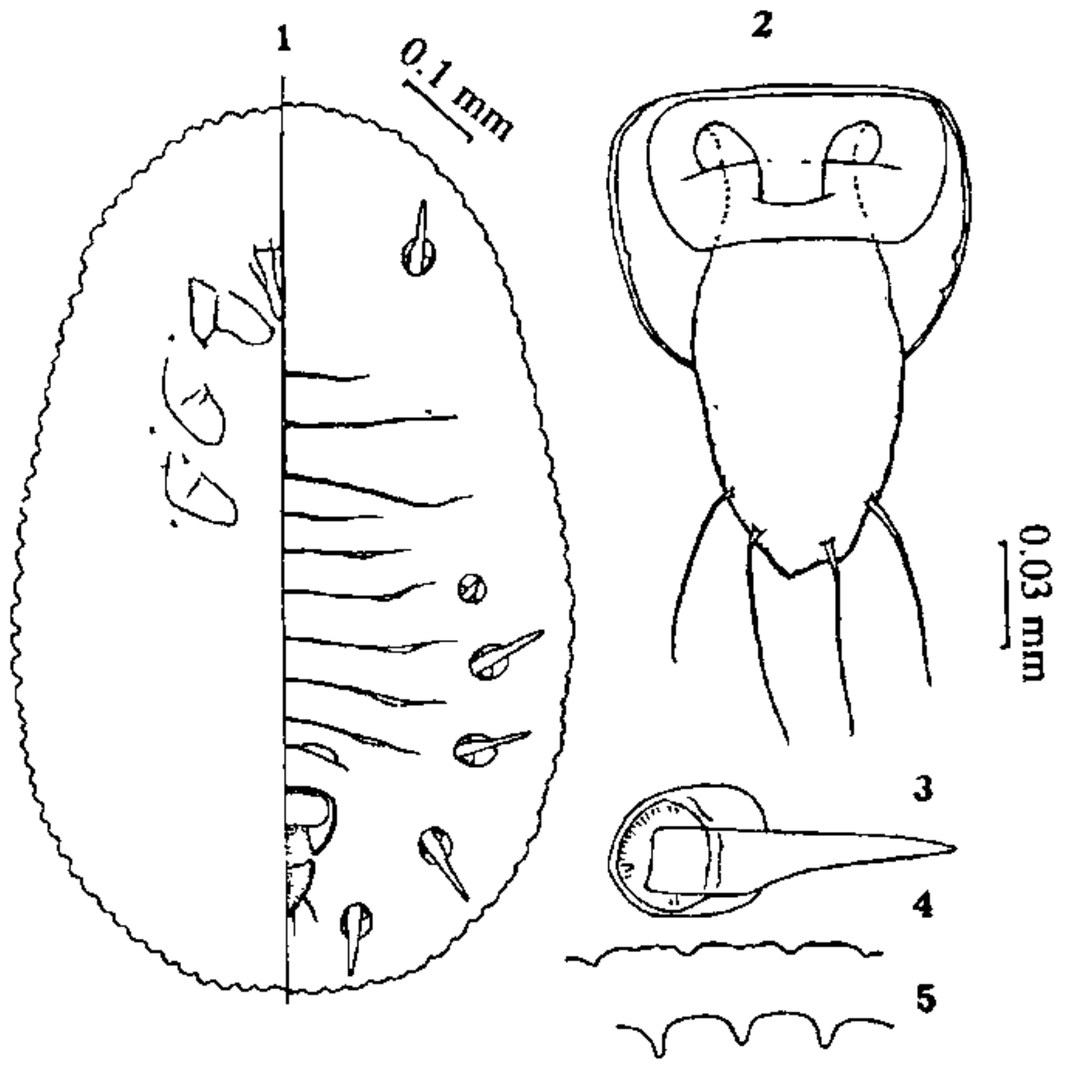
THE family Aleyrodidae is classified into three subfamilies viz Aleyrodinae, Aleurodicinae and Udamoselinae, the last one being based on a single specimen. In India the whiteflies known so far are assignable to the subfamily Aleyrodinae. On 28 March 1987 the author collected an interesting species of whitefly from a shrub *Persea macrantha* (Nees) Kosterm (Lauraceae) at Mahabaleshwar, a hill resort near Pune. This was found to be a new species of *Aleurodicus* Douglas[1] of the subfamily Aleurodicinae recorded for the first time in India and the same is described here.

*Aleurodicus philomenae* sp. nov. (figures 1–5).

*Pupal case*: Colourless, oval, with a copious amount of white cottony secretion-fluffy, waxy and ribbon-like extending upward and outward from the dorsum, white glass-like waxy rod arising from each compound pore and whitish translucent striated wax extending from ventral submargin to leaf. Measures 1.040–1.148 mm long and 0.673–0.704 mm wide. Found infesting the undersurface of leaves.

*Margin*: Irregularly crenate, 3–4 crenations in 0.1 mm; thoracic and caudal tracheal folds, combs and pores absent; anterior and posterior marginal setae not discernible.

*Dorsal surface*: Six pairs of subdorsal compound pores: one pair each on cephalothorax, abdominal segments 4–6, laterad of vasiform orifice and postero-laterad of vasiform orifice; each pore with a short pointed stout spine slightly swollen at basal part. The diameter of the pore on the cephalothorax 40–45 $\mu$, on the fourth abdominal segment 27.5–35.0 $\mu$ and the rest being almost same, 31.25–40.00 $\mu$. The spine in the fourth pore is smaller (17.5–32.5 $\mu$) than the other spines (50.0–82.5 $\mu$ in the pore on cephalic region, 52.5–77.5 $\mu$ in the pore on fifth abdominal segment, 58.75–80.0 $\mu$ in the pore on sixth abdominal segment, 57.5–87.5 $\mu$ in the pore on laterad of vasiform orifice, 56.25–77.5 $\mu$ in the pore on the postero-laterad of vasiform orifice). Dorsum devoid of setae. Longitudinal moulting suture reaching subdorsum. Abdominal segments six, seven and eight measuring 45–50 $\mu$, 31.25–32.50 $\mu$ and 52.5 $\mu$ respectively. Pockets evident on the seventh abdominal segment. Abdominal segments 3–7 with depressions. Vasiform orifice subcordate, wider than long, 0.090–0.098 mm long and 0.110–0.113 mm wide; operculum rectangular-shaped, 0.040–0.045 mm long and 0.088–0.090 mm wide; lingula large and extruded from vasiform orifice, 0.100 mm long bearing 4 hairs at its tip.




**Figures 1–5.** *Aleurodicus philomenae* sp. nov. **1.** pupal case; **2.** vasiform orifice; **3.** compound pore with spine; **4.** dorsal margin, and **5.** ventral margin.

*Ventral surface*: Antennae and legs very short, pro- and meso-thoracic spiracles evident, anterior and posterior spiracles present. Mouth parts discernible.

*Holotype*: One pupal case on slide, on *Persea macrantha*, Mahableshwar (Pune, Maharashtra), 28.3.1987, B. V. David.

*Paratype*: 7 pupal cases, same data as holotype. Of the 7 paratypes, 4 are being deposited in the collections of the Zoological Survey of India,

Calcutta; the Division of Entomology, Indian Agricultural Research Institute, New Delhi; the Systematic Entomology Laboratory, United States Department of Agriculture, Washington; and the British Museum (Natural History), London.

So far 28 species are known under this genus[2]. The new species *A. philomenae* is allied to *A. dispersus* Russell[3] in the shape of pupal case and vasiform orifice and lingula exposed with 4 hairs at its tip but differs from it in the number of subdorsal compound pores and absence of different shaped pores.

The species has been named after Dr (Miss) P. A. Philomena, who drew my attention to this species of whitefly.

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1. Douglas, J. W., *Entomol. Mon. Mag.*, 1892, p. 29.
2. Mound, L. A. and Halsey, S. H., *Whitefly of the World*, British Museum (Natural History) John Wiley, New York, 1978, p. 1.
3. Russell, L. M., *The Florida Entomol.*, 1965, p. 47.

## SEMEN ADDITIVES, FREEZABILITY AND FERTILITY IN CROSSBRED BULLS

P. M. BELORKAR, A. J. DHAMI, B. S. BHADASHIYA, J. M. VYAS and S. B. KODAGALI

*Department of Gynaecology and Obstetrics, Gujarat Veterinary College, Gujarat Agricultural University, Anand 388 001, India.*

RECENTLY, enzymes, hormones, tranquilizers and vitamins have been studied for incorporation in the semen diluents to enhance the fertility of semen used for artificial insemination. Kurzrok *et al*[1] reported infertility due to insufficient enzymes associated with low sperm concentration in human which could be successfully treated by the addition of 10–20 $\mu$g hyaluronidase in semen. According to Austin[2] hyaluronidase permits sperms to disperse and penetrate the cumulus oophorus facilitating fertilization.

In the present study, 24 ejaculates with initial motility above 70% were obtained from 4 crossbred bulls (K × J and K × HF) at weekly intervals to study the effect of semen additives on freezability and fertility. Three extenders viz., tris fructose yolk[3] (TFY), egg yolk citrate[4] (EYC), and lactose yolk[5] (LY) at 6% glycerol level were used. Three additives tried under split ejaculate technique in these extenders were histamine phosphate (BDH, 2.5, 5 and 10 m$\mu$), acetylcholine chloride (BDH, 2.5, 5 and 10 $\mu$g) and hyalase (Rallis India, 100, 150 and 200 IU/ml of dilutor). The dilution rate was adjusted keeping 50–60 millions live sperms/ml before freezing and straw freezing was done in liquid nitrogen vapour after 5 hr of equilibration[6] at 5°C. Spermatozoal motility was assessed thrice, immediately after dilution, and then on equilibration and freezing. For fertility trials, the lowest level of each additives was used. A total of 696 and 496 inseminations were performed and followed under field conditions using semen frozen in three diluents with and without additives, respectively. The data were analysed statistically[7].

Spermatozoal motility was found to be significantly ($P < 0.01$) depressed at all the three levels of histamine and acetylcholine addition in each of the dilutors and bulls. However, hyalase did not show depressing effect on sperm motility after initial dilution, equilibration or freezing when compared with nonadditive control samples. The lowest concentration of each additives showed less depression in sperm motility. A comparison of post-thaw motility and fertility among histamine, hyalase and acetylcholine added and nonadded controls, and between dilutors with and without additives presented in table 1 shows that the addition of histamine showed significantly low post-thaw motility and fertility than the hyalase, acetylcholine or nonadditive control. The improvement in fertility was significant with the addition of hyalase and acetylcholine (48.17 and 51.96%) when compared with control (41.53%). Overall, additives depressed post-thaw motility from 52.80% to 42.91%, but improved fertility from 41.53% to 50.07%, the differences being significant. Additives in TFYG and LYG diluents significantly improved fertility as compared to nonadditive controls or in EYCG with or without additives.

Additives were found to improve fertility markedly in poor freezability group of bulls as compared to nonadditive control (46.05 vs 34.47%). But no significant difference was observed in fertility for added and nonadded control in bulls of good freezability group (52.03 vs 47.89%). Low sperm motility in acetylcholine and histamine added samples may be attributed to more effective membrane-