Citrus Blackfly, *Aleurocanthus woglumi* Ashby (Homoptera:Aleyrodidae)[1]

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INTRODUCTION: Citrus blackfly, *Aleurocanthus woglumi* Ashby, a serious citrus pest of Asian origin (Dietz and Zetek 1920), was discovered in the western hemisphere, in 1913 in Jamaica. It spread to Cuba in 1916, Mexico in 1935 (Smith *et al.* 1964) and was detected in Key West, Florida in 1934. It was eradicated from Key West in 1937 (Newell and Brown 1939). Rediscovered in Ft. Lauderdale, Florida in 1976 (Dowell *et al.* 1981), citrus blackfly was detected in Palm Beach and Dade counties in 1977; Lee, Highlands and Brevard counties in 1979; Manatee County in 1986; Polk County in 1989; Marion and Volusia counties in 1991; and Alachua County in 1992 (Nguyen, unpublished data). At present, it is widely spread over central and south Florida from Cross Creek to Key West.

ECONOMIC IMPORTANCE: Citrus blackfly infests over 300 host plants, but citrus is the most suitable for large population development (Fig. 1). It damages citrus by sucking nutrients from foliage which weakens the plants. Citrus blackflies excrete honeydew on which sooty molds develop. Sooty molds coat citrus leaves, causing them to appear black. Sooty molds can severely impair leaf respiration and photosynthesis.

DESCRIPTION AND LIFE HISTORY: Eggs are laid in a spiral pattern on the underside of the leaf (Fig. 2). Each female lays 2-3 egg spirals during her 10-14 day life span. Eggs hatch within 7-10 days (Dowell *et al.* 1981). The first instar (Fig. 2) is elongate-oval, averaging 0.30 mm long x 0.15 mm wide and is brown in color, with two glassy filaments curving over the body. The first instar lasts 7-16 days. The second instar is more ovate and convex than the first instar, averaging 0.40 mm long x 0.20 mm wide, and is dark brown in color with numerous spines covering the body. The second instar lasts 7-30 days. The third instar is more convex and much longer than the second, averaging 0.87 mm long x 0.74 mm wide. The body is shiny black with spines stouter and more numerous than those in the second instar. The third instar lasts 6-20 days (Dietz and Zetek 1920, Smith *et al.* 1964). The fourth instar, or so-called pupal case (Fig. 3), is ovate and shiny black with a marginal fringe of white wax. The sex is readily distinguishable. Females average 1.24 mm long x 0.71 mm wide; males are 0.99 mm long x 0.61 mm wide. The pupal stage lasts 16-50 days (Dietz and Zetek 1920, Dowell *et al.* 1981). The life cycle from egg to adult ranges from 45 to 133 days depending on the temperature (Dietz and Zetek 1920). Six generations per year are produced in south Florida (Nguyen *et al.* 1983). The adult (Fig. 4) emerges from a T-shaped split appearing in the anterior end of the pupal case. At emergence the head is pale yellow, legs are whitish, and eyes are reddish brown. Within 24 hours after emergence the insect is covered with a fine wax powder which gives it a slate-blue appearance (Dietz and Zetek 1920).

BIOLOGICAL CONTROL: Citrus blackfly has several natural enemies. In Florida, the most effective agents for controlling citrus blackfly are the parasitic wasps *Encarsia opulenta* Silvestri and *Amitus hesperidum* Silvestri (Hart *et al.* 1978). Female *A. hesperidum* (Fig. 5) lay eggs in all three larval stages of citrus blackfly with a preference for the first stage. A female citrus blackfly larva will support two and occasionally three or four parasites while a male citrus blackfly larva will support only one parasite. Development of *A. hesperidum* is synchronized with its host—adult female parasites are ready to lay eggs when the susceptible larval stages of citrus blackfly are present. Each female parasite can produce up to 70 offspring in 4-5 days with adequate hosts available. However, this parasite has poor searching ability and a short life span. *A. hesperidum* is most effective with high density citrus blackfly populations, especially during cool temperature and high humidity seasons. An *A. hesperidum* population will expire soon after suppression of the citrus blackfly population (Nguyen *et al.* 1983). *E. opulenta* (Fig. 6) has a lower rate of reproduction than *A hesperidum*, but has better searching ability.

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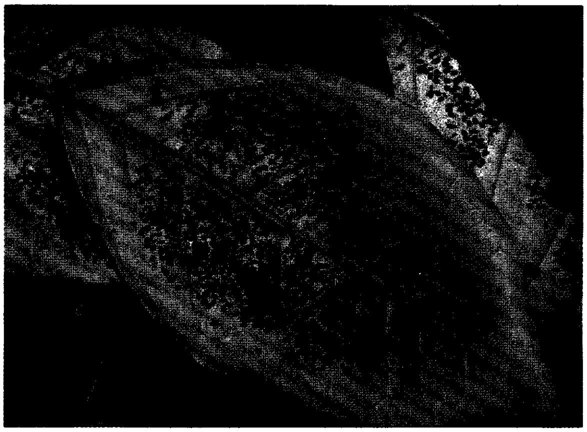

Fig. 1. Heavy infestation of citrus blackfly, *Aleurocanthus woglumi* Ashby on citrus leaves.

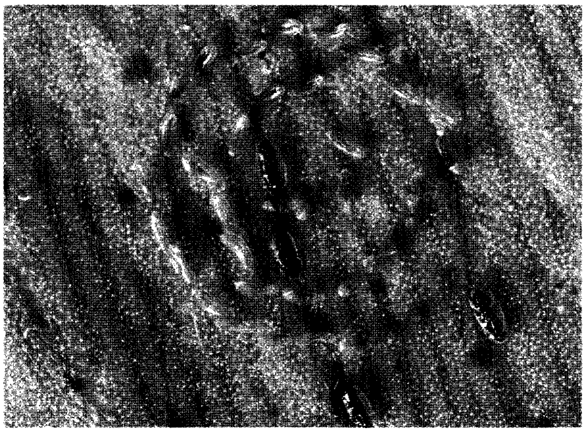

Fig. 2. Citrus blackfly: (A) egg spiral; (B) first instar.

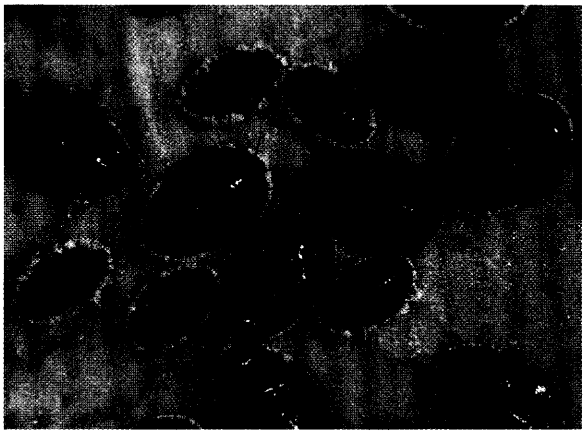

Fig. 3. Citrus blackfly pupae.

Fig. 4. Citrus blackfly adult.

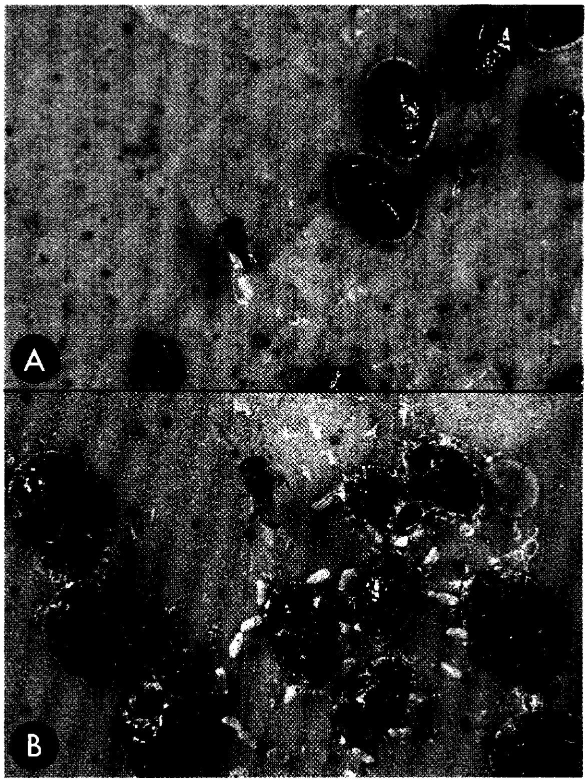

Fig. 5. *Amitus hesperidum:* (A) adult; (B) empty pupal case of *Aleurocanthus woglumi* after *A. hesperidum* emergence.

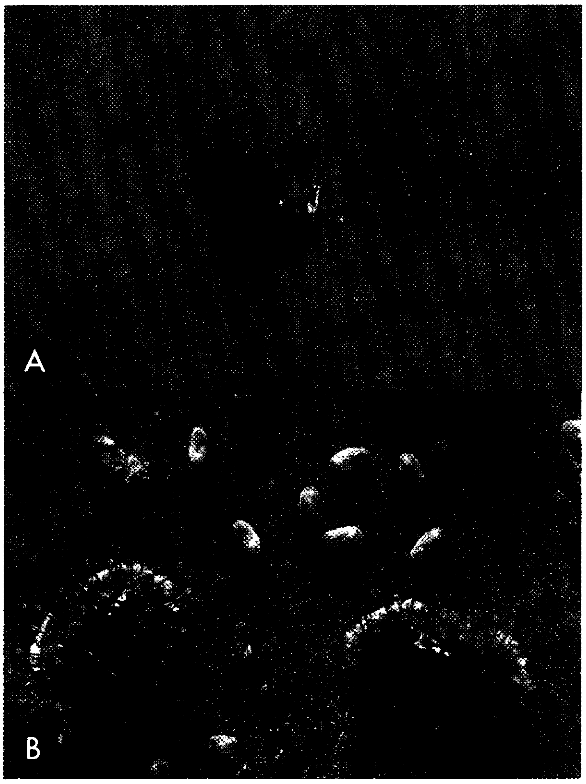

Fig. 6. *Encarsia opulenta:* (A) adult; (B) empty pupal case of *Aleurocanthus woglumi* after *E. opulenta* emergence.

Females may survive up to 6 weeks. Generally, *E. opulenta* can maintain a citrus blackfly population at a lower level than *A. hesperidum.* Mated females of *E. opulenta* lay a single diploid egg in any larval stage of the host, although the second stage appears preferable. This egg will produce a female parasite. Virgin female *E. opulenta* may deposit a haploid egg in a fully-developed female larva of *E. opulenta* (her own species) and this egg will produce a male parasite (adelphoparasite). The sex ratio in the field is 1:7 (male:female) (Smith *et al.* 1964, Nguyen 1987).

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