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GREENIDEA FICICOLA: IS IT AN EXAMPLE OF RAPID COLONIZATION DUE TO CLIMATIC CHANGES?

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Bella S., Mifsud D., Pérez Hidalgo N., Barbagallo S. – *Greenidea ficicola*: is it an example of rapid colonization due to climatic changes?

In recent years, several species of aphids of tropical or subtropical origins are being found outside their native range. The reasons for the accidental introduction and subsequent establishment of these aphids in new territories remain obscure. In most cases the accidental introduction of these rather small and cryptic species are often linked to human activities (such as international trade of plants and plant products) but other factors such as global warming may aid in the dispersal of such organisms.

In the present work, the rapid colonization of *Greenidea ficicola* Takahashi, an aphid native to the Oriental Region, in different regions of the world (Afrotropics, Nearctic, Neotropics and Southern Europe) is documented.

KEY WORDS: *Greenidea ficicola*, aphid, alien species, Mediterranean, climate change.

The Greenideine (Aphididae: Greenideinae) represent a small group of aphids mainly of Oriental origins, with expansion in the eastern Palaearctic, Australian, Afrotropical and Neotropical Regions. The group is represented by about 130 described species and are mainly characterised by conical or long and tubular siphunculi bearing either numerous hairs, or an apical ring of hairs. They are found on dicotyledonous trees and shrubs, without host alternation.

The genus *Greenidea* Schouteden is represented by about 45 described species distributed in the tropical and subtropical regions of Eastern Asia. Species of this genus are mainly found on plants belonging to the families Moraceae and Fagaceae but also Betulaceae, Juglandaceae and less commonly on members of more recently evolved families such as Myrtaceae and Theaceae (GHOSH, 1987; BLACKMAN and EASTOP, 1994; 2000; SUGIMOTO, 2008).

One of these species, *Greenidea ficicola* Takahashi, 1921, has been recently reported from the West Palaearctic, namely in Southern Italy (BARBAGALLO, BELLA and COCUZZA, 2005), Southern Spain (BARBAGALLO *et al.*, 2005; PÉREZ HIDALGO *et al.*, 2009) and Malta (MIFSUD, 2008). The species has been also reported from the Afrotropical Region (Burundi) (REMAUDIÈRE *et al.*, 1992), the Nearctic Region (Florida) (HALBERT, 2004), and the Neotropics (Brasil and Chile) (SOUSA-SILVA *et al.*, 2005; RUBÍN DE CELIS *et al.*, 2006).

In its native range, *G. ficicola* feeds on different plants of the families Moraceae, Myrtaceae and Lytraceae (BLACKMAN and EASTOP, 2000) whereas in Europe the species has been found on several species of mainly ornamental *Ficus* L. (such as *F. microcarpa* L. f. (= *retusa* auct. nec L.), *F. rubiginosa* Desf., *F. australis* Willd. (= *F. rubiginosa* f. "Australis"), *F. sycomorus* L., *F. glomerata* Roxb., *F. benjamina* L. and *F. carica* L.).

Ficus carica, a widely cultivated tree in the Mediterranean Region, has been mentioned in the literature as a host plant of *G. ficicola* both in natural and under laboratory conditions. However, the presence of this aphid in very small colonies on the mentioned host plant has been rarely observed in Sicily (BELLA and MAZZEO, 2009).

Greenidea ficicola is a termophilous anholocyclic species and its rapid spreading in Mediterranean countries and other temperate areas is also possibly favoured by global warming. The modality of the accidental introduction of this species in Europe remain unknown, but the international trade of its ornamental host plants and flight capabilities of alate morphs may have played a significant role in the establishment of this aphid in new geographical areas. However, it needs to be pointed out that *Ficus* spp. have been traded and cultivated in the Mediterranean Region since the nineteenth century and *G. ficicola* was never recorded out of its native range. Thus recent climate changes may have played an important role in the introduction and establishment of this aphid in new widely separated territories.

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Fig. I – Geographical distribution of *G. ficicola*: countries encircled in black represent native areas of distribution; round markings show areas more recently acquired by the aphid.

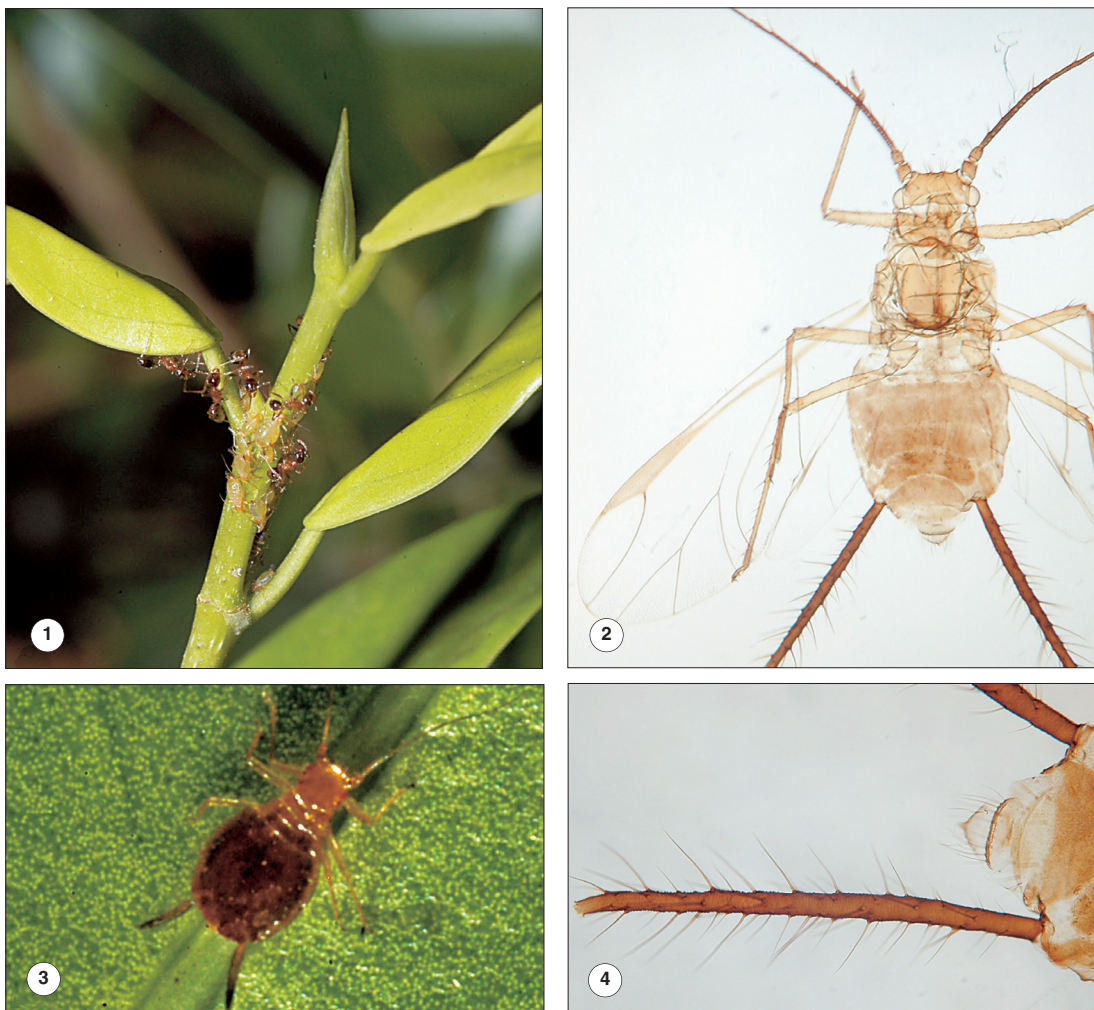


Fig. II – *G. ficicola*: 1) Colony on *Ficus microcarpa*; 2) alate viviparous female mounted on slide; 3) apterous viviparous female; 4) siphunculus of alate morphs.

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