

**FIRST RECORD OF *CHROMAPHIS JUGLANDICOLA* (KALTENBACH) (HEMIPTERA: APHIDIDAE) OVERWINTERING EGGS IN COMMERCIAL WALNUT ORCHARDS IN THE COQUIMBO REGION WITH BIOLOGICAL NOTES**

**PRIMER REGISTRO DE HUEVOS INVERNANTES DE *CHROMAPHIS JUGLANDICOLA* (KALTENBACH) (HEMIPTERA: APHIDIDAE) EN NOCEDALES COMERCIALES DE LA REGIÓN DE COQUIMBO, CON NOTAS BIOLÓGICAS**

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ABSTRACT

Overwintering eggs of the walnut aphid *Chromaphis juglandicola* (Kaltenbach, 1843) were recorded for the first time in Chile. Although this aphid has been reported in the country since 2008, overwintering eggs had not been reported under field conditions. Biological notes are also presented.

**Key words:** Autoecious, holocyclic, walnut, aphid.

RESUMEN

Se registra por primera vez para Chile huevos invernantes de *Chromaphis juglandicola* (Kaltenbach, 1843) y se presentan notas biológicas de esta especie. Aunque citada para Chile desde 2008, hasta la fecha no habían sido registrados huevos invernantes en condiciones de campo.

**Palabras clave:** Autoica, holocíclica, nogales, pulgones.

*Chromaphis juglandicola* (Kaltenbach, 1843) is an aphid of Asian origin (Hougardy & Mills 2009) cited for the first time in Chile in 2008 in walnut orchards of the Valparaíso Region (Luppichini & Ripa 2011). Since then, *C. juglandicola* has spread throughout the country and is currently found from the Coquimbo Region to the Biobío Region (Rodríguez 2016). It is important for walnut production because high populations can reduce tree vigor, walnut size, and fruit yield and quality (Quiroz & Luengo 2016). This aphid is characterized as an autoecious holocyclic species that exhibits

a parthenogenetic phase during spring and summer and an oviparous sexual stage in late summer and autumn; individuals are morphologically different (Fig. 1). Given the lack of alternative hosts, *C. juglandicola* overwinters in the egg phase on walnut trees. Luppichini & Ripa (2011) did not observe any overwintering eggs in orchards attacked by this aphid, and subsequent citations did not mention this stage of development in the country.

*Chromaphis juglandicola* is light yellow with reddish eyes; its antennae are shorter than the head and thorax and the distal end of the antenna is black. Cornicles and cauda are barely present; wingless individuals have a black spot on the femur of the third pair of legs. There are two longitudinal rows of

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black spots on the back, which are especially noticeable in sexed females (Fig. 1C); these are absent in the first nymphal stages but slightly present in alaroid parthenogenetic females (Fig. 1A). Unlike most aphids, this species has no wingless viviparous females in the parthenogenetic stage, but when individuals reach adulthood, they are all winged females producing offsprings (Quiroz & Luengo 2016) (Fig. 1B). In late summer and autumn appears the sexual generation with males and wingless females giving origin to the overwintering eggs (Fig. 1D).

The presence of overwintering *C. juglandicola* eggs is reported for the first time in Chile. Some biological notes are also

included. Oviparous females were observed during April 2016 in a commercial walnut orchard located in Camarico, Commune of Ovalle (30°42'48.49"S and 71°19'11.28"W). They were wandering on the branches and twigs searching for oviposition sites such as cracks or branch interstices. The ovipositing behavior of females was observed during 1 hour between 10:00 and 11:00. Searching for cracks, especially at the base of the branches, implies a displacement of the insects from the leaves to the wood (Fig. 2A). This activity is characterized by the rapid movement of the females. On several occasions more than one female was seen ovipositing at the same site. Eggs are oviposited in clusters.

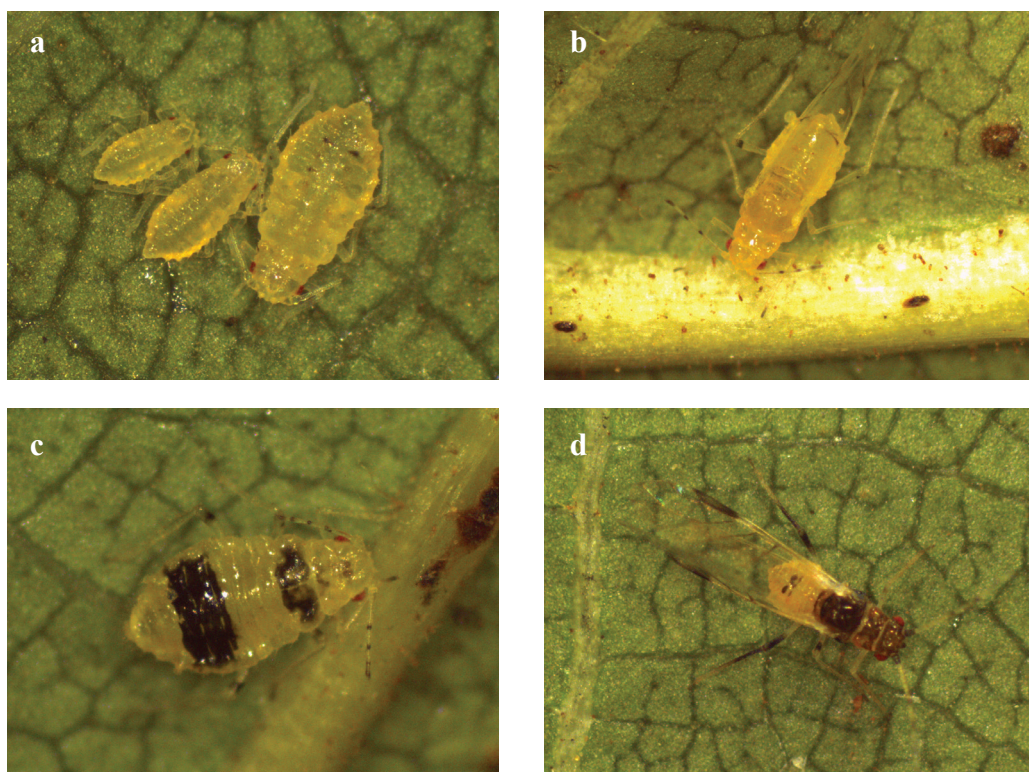


Figura 1. Formas vivíparas y ovíparas de *Chromaphis juglandicola*. a) Ninfas vivíparas; b) Hembra vivípara adulta; c) Hembra ovípara; d) Macho alado.

Figure 1. Viviparous and oviparous forms of *Chromaphis juglandicola*. a) Viviparous nymphs; b) Adult viviparous female; c) Oviparous female; d) Winged male.



Figura 2. a) Hembra ovípara durante oviposición; b) Huevos de *C. juglandicola* recién puestos (amarillos) y de varios días (negros) en grietas de corteza de nogal.

Figure 2. a) Oviparous female during oviposition; b) *Chromaphis juglandicola* eggs recently laid (yellow) and after several days (black) in cracks of the walnut bark.

Recently deposited eggs are light yellow (Fig. 2B), oval-shaped, and with average dimensions of 0.5 mm by 0.3 mm as reported by Davison (1914). Black-colored eggs were also recorded (Fig. 2 B), which acquired this coloration 2 or 3 days after oviposition (Davison 1914).

*C. juglandicola* is a holocyclic species with a sexual phase which favors the appearance of resistance to insecticides due to the additive genetic variability, as already described in California (Michelbacher *et al.* 1954). Since 2012 the braconid *Trioxys pallidus* (Haliday, 1833) (Hymenoptera: Braconidae), a specific parasitoid of this aphid, has been released proving to be highly effective as biological control of this pest worldwide. Its establishment has been confirmed in the Choapa valley after three seasons of release reducing the aphid populations at levels below its economic injury level. By consequence, the use of insecticides is not required any longer to control this aphid (Quiroz & Luengo 2016).

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