

Short communication

New record of a scale insect pest from the genus *Ceroplastes* (Hemiptera, Coccoomorpha, Coccidae) on *Aglaonema commutatum* (Araceae) from Iran

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گزارش جدید یک شپشک گیاهی آفت از جنس *Ceroplastes* (Hemiptera, Coccoomorpha, Coccidae) روی *Aglaonema commutatum* (Araceae) از ایران

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چکیده

تاکنون از ایران سه گونه از شپشک‌های جنس *Ceroplastes* Gray (Hemiptera, Coccoomorpha, Coccidae) با نام علمی *C. floridensis* Comstock، *C. rusci* (Linnaeus) و *C. sinensis* Del-Guercio گزارش شده بود. برای اولین بار گونه *Ceroplastes rubens* Maskell از ایران روی *Aglaonema commutatum* (Araceae) گزارش می‌شود. احتمالاً این گونه توسط گیاهان زینتی بدون رعایت قوانین قرنطینه وارد کشور شده است. صفات تشخیصی و ترسیم گونه بر اساس حشره ماده اسلاید شده و تصاویر رنگی آن ارائه می‌شود. افزون بر آن، کلید شناسایی گونه‌های جنس *Ceroplastes* در ایران تهیه شده است.

واژه‌های کلیدی: کنترل *Ceroplastes rubens*، تاکسونومی، کلید شناسایی، ایران

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Scale insects (Hemiptera: Coccoomorpha) are often cryptic in habit and can escape detection during plant quarantine inspections. When scale insects are introduced to the new geographical region, they can become established and economically important pests, without their natural enemies. In past decades, several species of economically important scale insects have been introduced into Iran. For example: *Phenacoccus solani* Ferris (Moghaddam *et al.*, 2004), *Phenacoccus solenopsis* Tinsley (Moghaddam & Bagheri, 2011), *Icerya aegyptiaca* (Douglas) (Moghaddam *et al.*, 2015a), *Saissetia miranda* (Cockerell & Parrott) (Moghaddam *et al.*, 2015b), *Vryburgia succulentarum* Williams (Moghaddam, 2015), *Planococcus kraunhiae* (Kuwana) and *Aspidiotus hedericola* Leonardi (Moghaddam & Nematian, 2020).

The genus *Ceroplastes* Gray belongs to the subfamily Ceroplastinae of family Coccidae, infraorder Coccoomorpha, and order Hemiptera (Hodgson, 1994). Members of the genus are characterized by the adult female covered by a thick wax test and by the presence of stigmatic

setae in groups of more than three in each stigmatic cleft. Species of *Ceroplastes* are found in all zoogeographic regions but with their greatest diversity in tropical and subtropical areas (Hodgson & Peronti, 2012). This genus includes 144 described species worldwide (García Morales *et al.*, 2016). Three species were known so far in Iran: *C. floridensis* Comstock (Fig. 1A), *C. rusci* (Linnaeus) (Fig 1C, D, F), and *C. sinensis* Del Guercio (Moghaddam, 2013); all are major pests of agricultural crops (Moghaddam, 2017). These species are polyphagous and have a wide and often overlapping range of cultivated plant hosts (Pellizzari & Camporese, 1994). *C. floridensis* and *C. sinensis* have been recorded in the north of Iran, mainly on citrus trees; whilst, *C. rusci* is widely distributed and causes great damage in south of Iran, especially to *Ficus carica* (Moraceae). Another, previously unrecorded species, *C. rubens* Maskell, has been discovered recently in Iran. The aim of this work is to provide an identification key of the *Ceroplastes* species known in Iran.

The description below is based on slide-mounted specimens using the method described by Williams & Kosztarab (1972). Morphological terms follow those of Gimpel *et al.* (1974). The illustration shows the dorsum on the left and the venter on the right, with enlargements of important characters around the edges, not drawn to scale. In the material examined section, data written on the slide labels are given, using / to indicate the line breaks, as required by International Code of Zoological Nomenclature. All material is deposited at the Hayk Mirzayans Insects Museum (HMIM), Tehran, Iran.

Genus *Ceroplastes* Gray

Coccus (Ceroplastes) Gray 1828: 7. Type species: *Coccus (Ceroplastes) janeirensis* Gray by subsequent designation Fernald, 1903:147.

Main characters: In the field, adult female covered with dense thick wax, usually white, which may or may not be divided into plates. Slide mounted specimens round, oval, or irregular in outline, usually highly convex; normally with a heavily sclerotized caudal process, with a pair of anal plates present at center or tip of process. Dorsal setae variable in size, shape and distribution. Dorsal pores each with 2–4 loculi, rarely with more. Marginal setae variable in size, shape, and distribution but usually setose. Spiracular setae spinose, usually numerous and conical, hemispherical, or bullet-shaped. Ventrally with quinquelocular pores present in spiracular furrows. Multilocular pores almost always with 10 loculi, present in vulvar area and often more widely in abdomen. Tubular ducts generally present. Interantennal setae, long, in 1 or 2 pairs. Cruciform pores, microducts and filamentous ducts often present. Antennae 6 to 8-segmented. Legs usually well developed, each with or without a tibiotarsal sclerosis.

Key to adult female of *Ceroplastes* recorded from Iran

1. Inner filament of each ventral tubular duct short, but as wide as or wider than outer duct *floridensis* Comstock
- Inner filament of each ventral tubular duct, if present, not short, much more slender than outer duct 2
2. Legs well developed. Tibio-tarsal articulatory scleroses present 3
- Legs much reduced. Tibio-tarsal articulatory scleroses absent *rubens* Maskell
3. Antennae normally with 6 segments. Dorsal pores predominantly bilocular *rusci* (Linnaeus)
- Antennae normally with 7 segments. Dorsal pores predominantly trilocular *sinensis* Del Guercio

***Ceroplastes rubens* Maskell** (Figs. 1B and 2)

Ceroplastes rubens Maskell, 1893: 214. *Ceroplastes rubens minor* Maskell, 1897: 309.

Material examined: 8 Adult females: IRAN, left label: 3007 / Tehran province: / Tehran, / Babaii Flower Market / 26.v.2021 / N35°46'39.6" / E51°31'47.3"; right label: *Ceroplastes rubens* / Maskell / on *Aglaonema / commutatum* Schott / (Araceae) / coll. M.R. Nematian (8 slides HMIM).

Field characters (Fig. 1B): Body convex, covered with pink brown wax. In dorsal view, the waxy test appears sub-rectangular or oval and they may grow to over 3.1 mm in diameter. The pink eggs are laid under the female body, protected by the waxy test. Adult males do not have a waxy test, are much smaller, have wings but no mouthparts.

Adult female diagnosis (Fig. 2): Slide-mounted specimens broadly oval. Antennae (A) quite short, each with 6 segments. Legs (F) much reduced in size with trochanter and femur occasionally appearing fused; tibia and tarsus fused; tarsal digitules dissimilar, 1 slightly thicker and longer than other; each claw small, claw denticles obscure or absent; claw digitules both narrow but dissimilar. With distinct, quite deep, stigmatic clefts. Lateral and dorsal clear areas (M) distinct. Caudal process (K) short and stout.

Dorsum: with very short setae and spinose (H), subequal in length to or shorter than width of basal socket, all with a truncate apex; present sparsely throughout. Dorsal pores (J) present of two types: (i) loculate microducts of the intermediate/*rusci* type, each with 1 or 2 satellite loculi, those with 1 satellite loculus much more abundant than those with 2 satellite loculi, and (ii) simple microducts, each smaller than (i) but perhaps of 2 sizes, both with a sclerotized orifice: (a) larger with an oval orifice only slightly smaller than smallest loculate microduct, fairly frequent throughout, and (b) a much smaller round pore. Tubular ducts (I) present throughout. Preopercular pores (L) present in a group of about 9–12 pores just

anterior to anal plates. Anal plates each with 3 long flagellate dorsal setae. Anogenital fold with 3 pairs of setae on anterior margin plus 1–3 pairs of shorter hypopygial setae.

Margin with setose setae (D). Stigmatic clefts quite deep, each with about 15–18 stigmatic setae (B) along margin of each stigmatic cleft, each seta bollard-like and fairly uniform in size plus 2 significantly larger bollard-like setae, set more dorsally and a much larger, bluntly pointed, spinose seta at apex of each group.

Venter. Pregenital disc-pores (G), each with 10 loculi, restricted to around genital opening (segment VII). Spiracular disc-pores (C), each generally also with 5 loculi, present in broad bands of about 29–41 pores between margin and each spiracle, and with 2–7 extending medially past spiracular apodeme towards prothoracic coxa. Ventral tubular ducts absent. Cruciform pores (E) present at margins.

Comments: *Ceroplastes rubens* has been collected in almost all zoogeographic areas. This species was an important pest of citrus in Australia, Hawaii and Japan (Ben-Dov, 1993), and it has been recorded on host plants of 192 genera belonging to 84 families (García Morales *et al.*, 2016). *C. rubens* is closely related to *C. reunionensis* Ben-Dov & Matile-Ferrero; these two species differ from each other in the wax test colour, body colour, morphological, biological and molecular characters (RAPD) (Ben-Dov *et al.*, 2000). *C. rubens* is here recorded for the first time from Iran, where it was found on *Aglaonema commutatum* Schot (Araceae) in an ornamental market in Tehran. It is highly probable that this species was introduced on plants that had not been properly inspected.

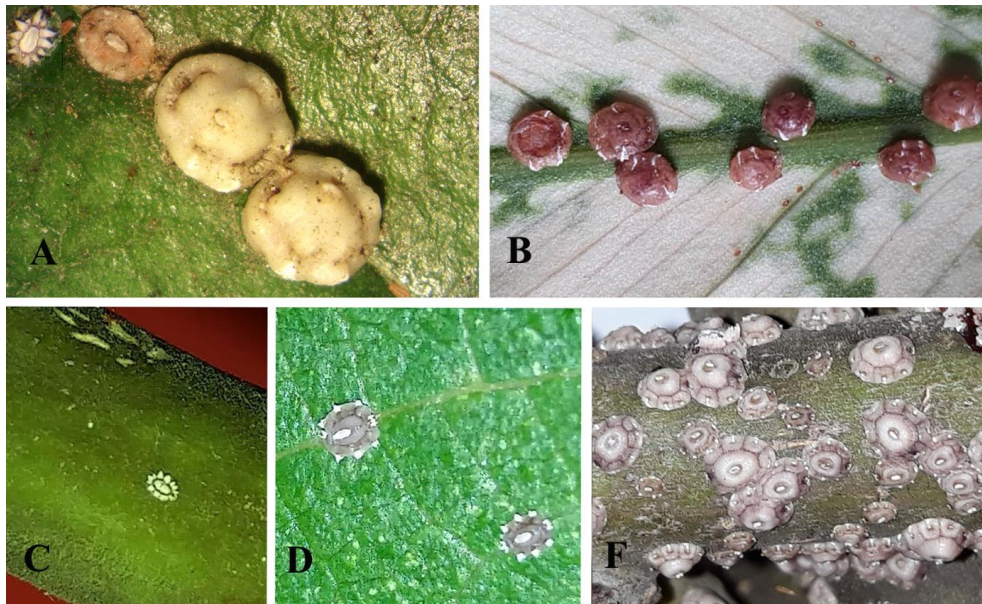


Fig. 1. **A.** Second and third instars, and adult females of *Ceroplastes floridensis* Comstock, on *Citrus* sp. (Rutaceae); **B.** Adult females of *C. rubens* Maskell, on *Aglaonema commutatum* (Araceae); **C.**, **D.** and **F.** Second and third instars, and adult females of *C. rusci* (Linnaeus), on *Ficus carica* (Moraceae).

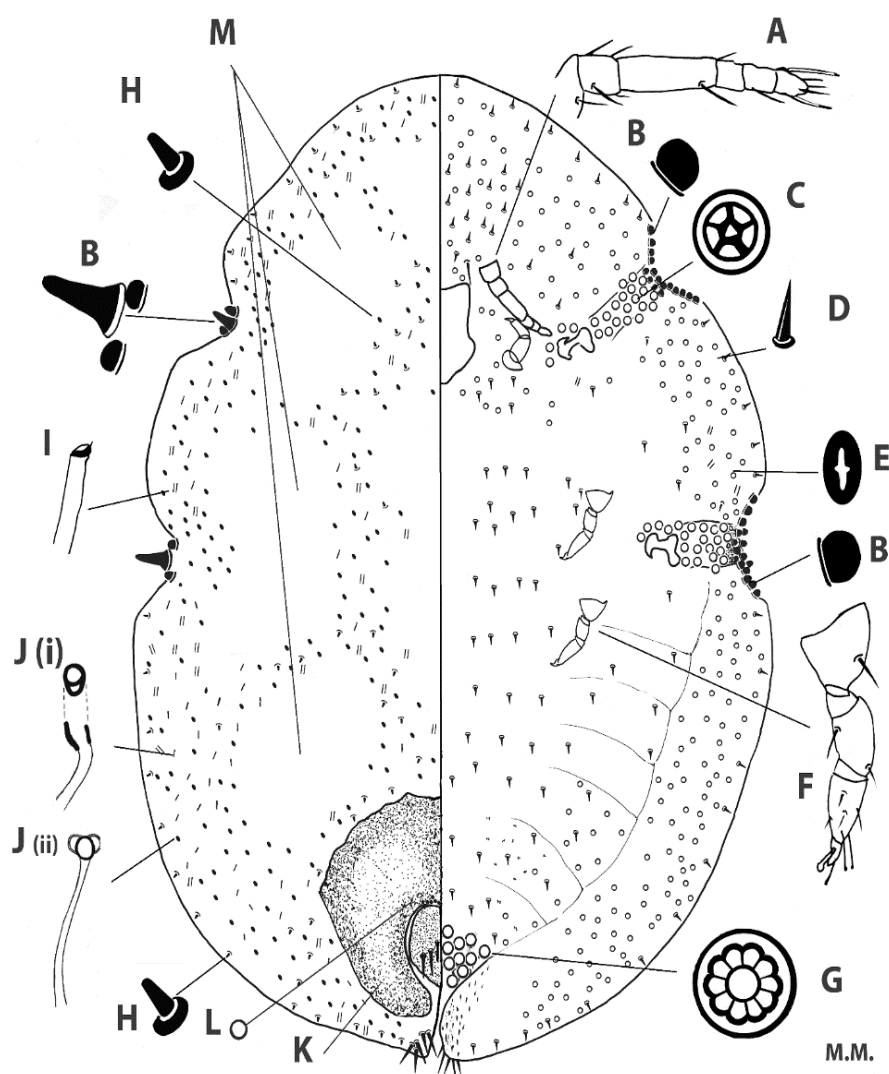


Fig. 2. Adult female of *Ceroplastes rubens* Maskell. **A.** antennae, **B.** stigmatic setae, **C.** spiracular disc-pores, **D.** marginal setae, **E.** cruciform pores, **F.** leg, **G.** pregenital disc-pores, **H.** dorsal setae, **I.** tubular ducts, **J.** loculate microducts, **K.** caudal process, **L.** preopercular pore, **M.** lateral and dorsal clear areas.

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