

A new species of *Ceroplastes* from Florida (Hemiptera: Coccoidea: Coccidae)

Greg Hodges

Florida State Collection of Arthropods
Florida Department of Agriculture and Consumer Services
P.O. Box 147100
Gainesville, FL 32614-7100
hodgesg@doacs.state.fl.us

Abstract. Previous literature recognized twenty species of wax scales occurring in the Nearctic region with nine of those occurring in Florida. This number has grown recently with the establishment of the *Ceroplastes rusci* and the discovery of *C. feltyii* (new species). A description and illustration of *C. feltyii* is provided along with a key to all of the wax scales currently found in Florida.

Introduction

Wax scales are members of the subfamily Ceroplastinae of the soft scale family (Coccidae) (Hodgson 1994). Wax scales are distributed throughout the world, but most species are native to either Africa or South America (Qin et al. 1998). The common name is derived from the thick wax covering secreted by the adult females. There are approximately 154 described species of wax scales worldwide and 20 species are found in the Nearctic region (Ben-Dov 1993). Many of the wax scale species are polyphagous and are significant economic pests in different crops or settings around the world. Importation of plant material from various regions of the world could unintentionally introduce exotic *Ceroplastes* species to Florida. The potential threat posed by the introduction of new pests necessitates the documentation, identification and development of taxonomic keys to species currently found in Florida. Previous taxonomic works and faunal lists (Gimpel et al. 1973, Hamon and Williams 1984, Ben-Dov et al. 2001) recognized nine wax scale species as occurring in Florida. These include *Vinsonia stellifera* (Westwood) and eight species of the genus *Ceroplastes*: *C. ceriferus* (Fabricius), *C. cirripediformis* (Comstock), *C. dugesii* Lichtenstein, *C. floridensis* Comstock, *C. nakaharai* Gimpel, *C. rubens* Maskell and *C. utilis* Cockerell. The number of wax scales in Florida has increased with the establishment of *C. rusci* (L.) introduced most likely from the Oriental or Palearctic region, and the identification of a new species collected from *Ligustrum lucidum* Ait. and *Psychotria nervosa* Sw., in Manatee Co., Florida. A description of this wax scale and a revised key (including *C. rusci*) of the *Ceroplastes* species found in Florida follow.

All measurements in the following description are given in microns and/or millimeters and were made using a Leitz Laborlux phase contrast microscope with magnification ranging from 100 X to 500 X. The measurements in the text show the average length followed by the ranges in parentheses. Ten slide mounted specimens were measured for this description. For a detailed description of *Ceroplastes* morphology and terminology see Hodgson (1994).

Ceroplastes feltyi, n.sp. Adult Female

Field description: Very similar to *C. cirripediformis* with wet wax, rectangular to oval in dorsal view (Fig. 1), without dorsal horn, beige to white, divided into one dorsal and six lateral plates with nuclei, body length 5-8 mm and body width 3-6 mm. Lateral wax filamentous rays present and attaching to host.

Dorsum: Slide mounted adult female (Fig. 2-A) 4.5-7.0 mm long and 2.5-5.0 mm wide. Derm membranous in young females but becoming sclerotized in older females. Six clear areas around submargin and one subdorsal clear area. Dorsal setae (Fig. 2-I) sparse (ca. 20-30), variable in shape with pointed or blunt apices. Dorsal pore pattern (Fig. 2-K) with simple, bilocular, trilocular and quadralocular pores scattered across derm. Each pore 4-7 μ m wide, with short inner filament. Anal plates (Fig. 2-H) with 3 ventral and 4 dorsal setae.

Margin: Marginal setae (Fig. 2-L) bristle-like, each 13-16 μ m long, distributed as follows: 10-12 between eyes, 2 between eye and anterior spiracular furrow, 3-4 between spiracular furrows, 10 between posterior spiracle and anal cleft. Spiracular setae (Fig. 2-J) conical, rounded to slightly pointed, ca. 30 in four irregular rows.

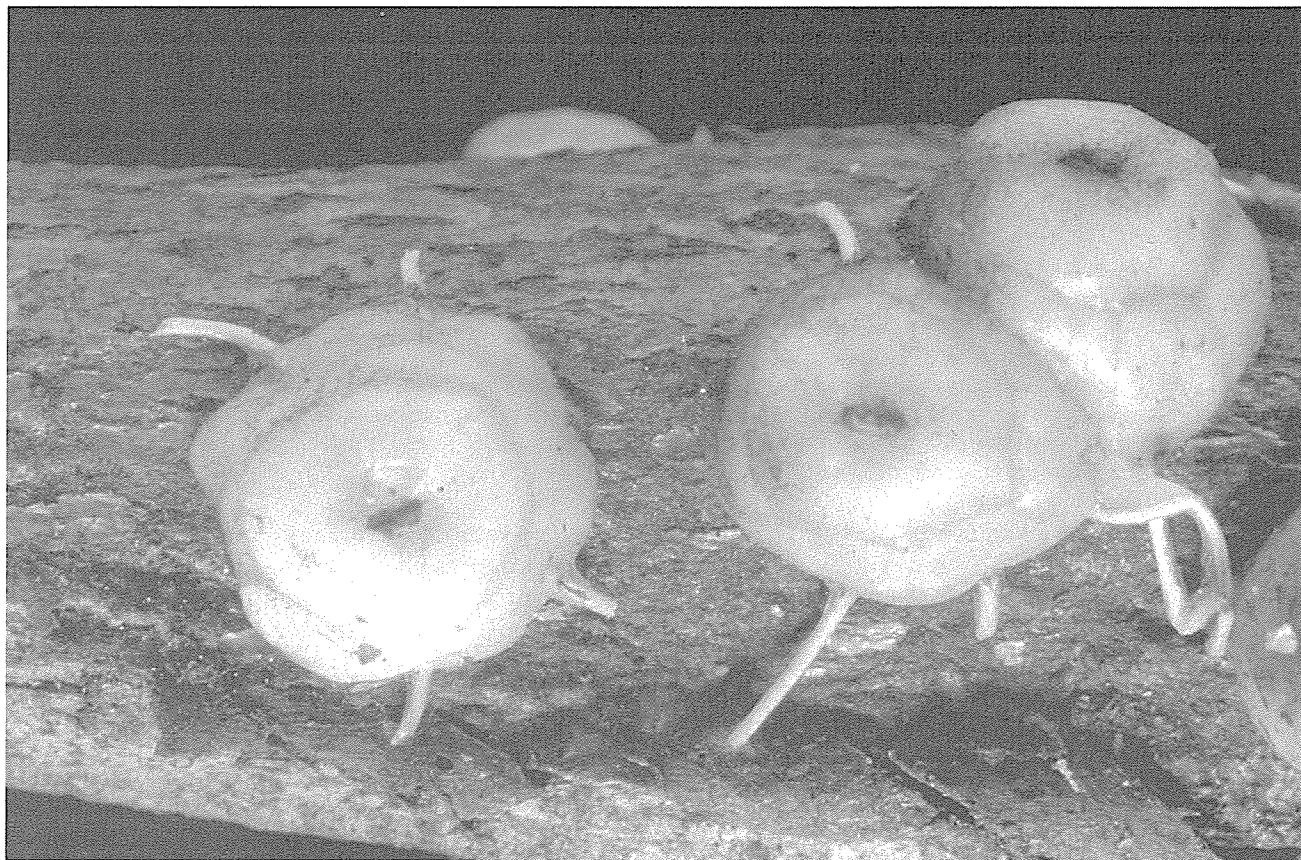


Figure 1. *Ceroplastes feltyi* n. sp. on *Psychotria nervosa* Sw.

Venter: Membranous with numerous cruciform pores (4 (2-7) μm long) scattered on venter. Antennae (Fig. 2-B) six segmented, 191 (178-208) μm long. Two pair of interantennal setae present, longer pair 65 (50-84) μm long, shorter pair 18 (13-32) μm long. Legs well developed without tibiotarsal sclerosis (Fig. 2-F); claw without denticle, tarsal digitules equal. Leg lengths as in Table 1.

Submarginal setae bristle-like, sparsely distributed, each 3-6 μm long. One pair of prevulvar setae, filamentous, 89 (74-105) μm long. Spiracular pores

(Fig. 2-C) (5-6 μm in diameter) generally quinquelocular, occasionally quadralocular. Between 75-100 pores within each spiracular pore band. Several bands of multilocular disc pores (Fig. 2-G) surrounding vulva and in band across preceding segment. Numerous cribiform pores (Fig. 2-D) scattered across venter. Ventral tubular ducts (Fig. 2-E) sparse on margin. Ventral microspines present on abdominal segments.

Type-material: The holotype (collected December 3, 1982 by Jack Felty in Palmetto, Manatee County,

Table 1. Leg lengths of *Ceroplastes feltyi* n. sp.

Segments	Prothoracic leg μm	Mesothoracic leg μm	Metathoracic leg μm
Coxa	50-70	50-68	50-62
Trochanter	25-38	25-43	25-38
Femur	63-72	70-82	75-88
Tibia	67-87	70-82	60-78
Tarsus	50-68	50-70	54-66
Claw	15-26	14-25	18-25
Total	298-374	285-355	280-343

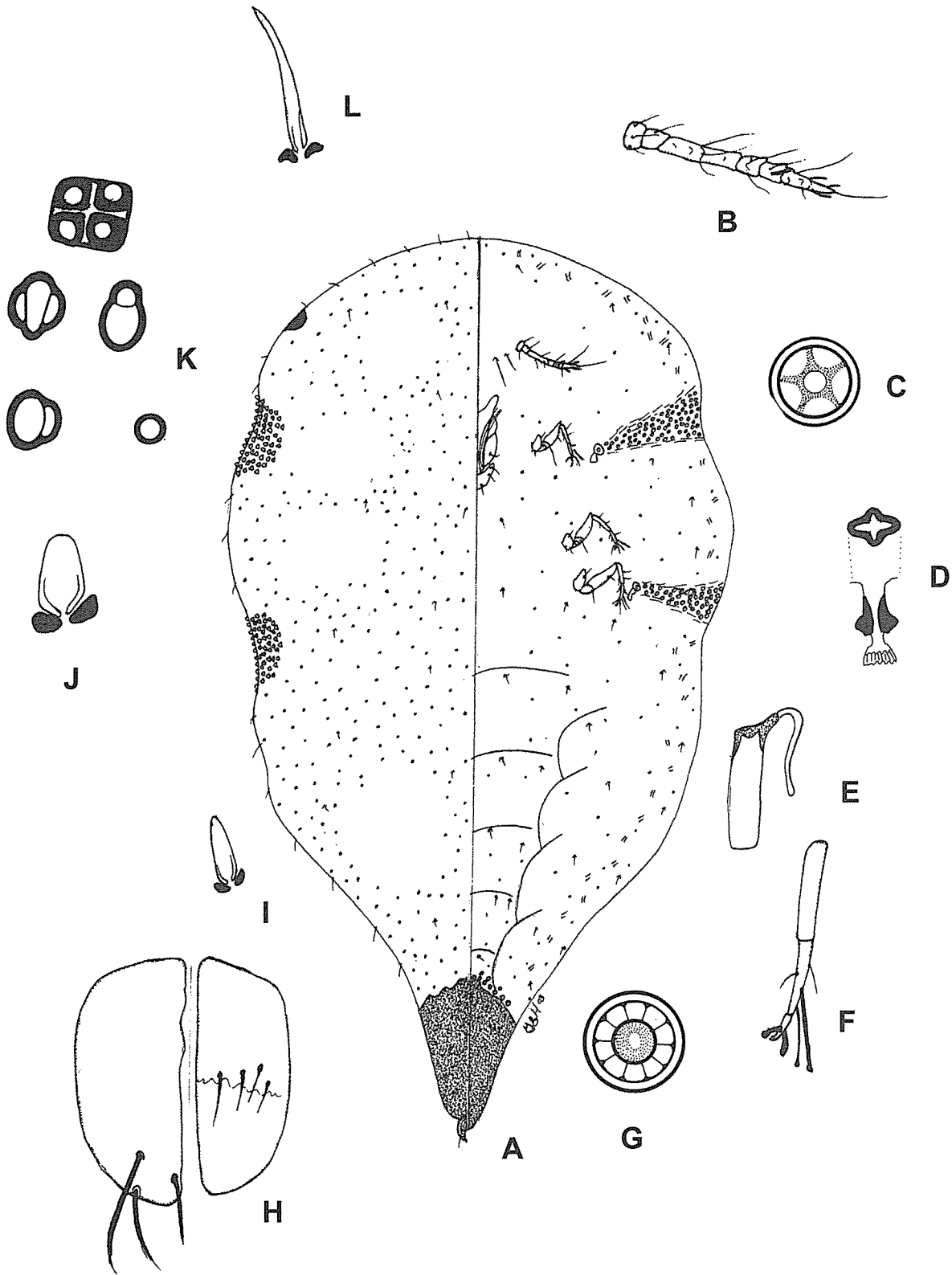


Figure 2. *Ceroplastes feltyi* n. sp. (A) overall view of slide mounted specimen; (B) Antennae; (C) Spiracular pore; (D) Ventral microducts; (E) Ventral tubular ducts; (F) Tibia-tarsus; (G) Ventral pre-opercular pores; (H) Anal plates; (I) Dorsal body setae; (J) Spiracular setae; (K) Dorsal pores; (L) Marginal setae.

Florida) and 5 paratype adult females on *Psychotria nervosa* Sw. and *Ligustrum lucidum* Ait. deposited in the Florida State Collection of Arthropods; 2 paratype adult females on slide deposited in the U.S. National Museum of Natural History (Coccoidea Collection); 2 paratype adult females on slide deposited in the Auburn Collection of Arthropods (Coccoidea Collection).

Etymology: The name of the species is in honor of Mr. Jack Felty, a dedicated field inspector for the Division of Plant Industry, Florida Department of Agriculture and Consumer Services.

Discussion: Based on field characteristics, this species closely resembles *C. cirrepediformis* (barnacle scale) and *C. rusci* (fig wax scale) with the presence of lateral and dorsal wax plates. However, slide-mounted specimens of this species are readily differentiated from *C. cirrepediformis* by having a six segmented antenna and *C. rusci* by the lack of tibiotarsal scleritis (present in *C. rusci*). A new key to the wax scales of Florida depicting the placement of the new species (*C. feltyi*) and the fig wax scale (*C. rusci*) follows:

Key to slide-mounted specimens of the Florida wax scales

- | | | |
|--------|---|------------------------------------|
| 1. | Ten or more long interantennal setae present; dorsal pore pattern consisting solely of simple pores; tibia and tarsus fused | <i>Vinsonia stellifera</i> |
| 1'. | One or occasionally two interantennal setae present; dorsal pore pattern containing simple pores, bilocular pores, trilocular pores and quadrilocular pores; tibia and tarsus not fused | 2 |
| 2(1'). | Tibiotarsal scleritis present | 3 |
| | Tibiotarsal scleritis absent | 5 |
| 3(2). | Antennae six segmented | <i>Ceroplastes rusci</i> |
| 3'. | Antennae seven segmented | 4 |
| 4(3'). | Spiracular setae present around margin of entire body | <i>Ceroplastes dugesii</i> |
| 4'. | Spiracular setae present only laterad of spiracular furrows | <i>Ceroplastes cirrepediformis</i> |
| 5(2'). | Spiracular setae with truncate apices | 6 |
| 5'. | Spiracular setae with rounded or pointed apices | 7 |
| 6(5). | With 6-9 spiracular setae laterad of spiracular furrows; 3 ventral apical setae on each anal plate; | |
| | mediodorsal clear areas with several setae | |
| | | <i>Ceroplastes nakaharai</i> |
| 6'. | With 18-32 spiracular setae laterad of spiracular furrows; 1 ventral apical setae on each anal plate; mediodorsal clear area without setae | |
| | | <i>Ceroplastes utilis</i> |
| 7(5'). | Mediodorsal clear area present | 8 |
| 7'. | Mediodorsal clear area absent | 9 |
| 8(7). | Anal process protruding and well developed; ventral tubular ducts present | |
| | | <i>Ceroplastes feltyi</i> n. sp. |
| 8'. | Anal process not protruding or well developed; ventral tubular ducts absent | |
| | | <i>Ceroplastes rubens</i> |
| 9(7'). | Claw digitules unequal; spiracular setae in 6 irregular rows | <i>Ceroplastes ceriferus</i> |
| 9'. | Claw digitules equal; spiracular setae in 3 irregular rows | <i>Ceroplastes floridensis</i> |

References cited

- Ben-Dov, Y.** 1993. A systematic catalogue of the soft scale insects of the world (Homoptera: Coccoidea: Coccidae) with data on geographical distribution, host plants, biology and economic importance. Flora & Fauna Handbook, No. 9. Sandhill Crane Press, Gainesville, FL. 536 pp.
- Ben-Dov, Y., Miller, D.R. & Gibson, G.A.P.** 2001. ScaleNet, Scales in a Region Query Results. 27 June 2001. <http://www.sel.barc.usda.gov/scalecgi/region.exe>
- Gimpel, W.F., Miller, D.R. and Davidson, J.A.** 1974. A systematic revision of the wax scales, genus *Ceroplastes*, in the United States (Homoptera; Coccoidea; Coccidae). University of Maryland, Agricultural Experiment Station, Miscellaneous Publication 841: 1-85.
- Hamon, A.B. & Williams, M.L.** 1984. The soft scale insects of Florida (Homoptera: Coccoidea: Coccidae). Arthropods of Florida and Neighboring Land Areas 194 pp.
- Hodgson, C.J.** 1994. The scale insect family Coccidae: an identification manual to genera. CAB International, Wallingford, Oxon, UK. 639 pp.
- Qin, T.K., Gullan, P.J. and G.A.C. Beattie.** 1998. Biogeography of the wax scales (Insecta: Hemiptera: Coccidae: Ceroplastinae). Journal of Biogeography, 25: 37-45.