Primaspis: A New Genus of Diaspididae (Homoptera: Coccoidea) from the Southwestern United States[1]

James O. Howell

Department of Entomology
The University of Georgia
Athens, GA 30602-2603 USA

J. Entomol. Sci. 30(2): 202-207 (April 1995)

ABSTRACT A new genus and species of armored scale close to *Rugaspidiotus* is described and illustrated. In *Primaspis* gen. nov., from New Mexico, the adult females are separable from *Rugaspidiotus* in having gland spines on the pygidial margin, well defined median lobes, and a bilobed second lobe. In the first instars, the antennae are 6 segmented, there is no row of ventral submedian abdominal setae, and no elongate setae on the tarsi.

KEY WORDS Coccoidea, Insecta, Diaspididae, Coccoidae, *Primaspis, Rugaspidiotus, Rugaspidiotinus,* armored scale, scale insect.

The genus *Rugaspidiotus* was established by MacGillivray in 1921, with *Diaspis arizonicus* as its type. Ferris (1938) added four new species – *R. circumdatus, R. nebulosis, R. sculpturatus,* and *R. fuscitatis* – to this genus while concomitantly expressing concern that they were not congeneric with the type. Balachowsky (1953) erected the new genus *Rugaspidiotinus,* designating *Rugaspidiotus fuscitatis* as its type, and additionally including *Rugaspidiotus heimi* Balachowsky. Both Balachowsky (1953) and Takagi (1969) considered *Rugaspidiotus* to be allied with the Odonaspidinae, and I concur with that hypothesis. Ferris collected the species described in this paper in 1947, and tentatively placed it in *Rugaspidiotus*. But his reservations regarding the placement of the other three would indicate that he had similar uncertainty about this one as well. Recent studies on the first instars of species in *Rugaspidiotus* and *Rugaspidiotinus* (Howell 1992) revealed significant differences between them and this new species, and it is here described as a new genus.

Primaspis Gen. Nov.

Type species: *Primaspis tippinsi* n. sp.

Diagnosis: Diaspididae referable to the Diaspidini. Body of adult female subcircular to turbinate. Macroducts two-barred, those on dorsum and pygidial margin essentially the same size. With two pairs of median lobes (third pair indicated by slight sclerosis), second pair bilobed. Small gland spines present between median lobes, and between lobes 1 and 2. Antennae with 2 fleshy setae. First Instar with submedian abdominal seta on segment 7. Other submedian ventral setae conspicuously absent. Tarsi with campaniform sensillum at base in both sexes; tarsi without setae.

[1] Accepted for publication 05 December 1994.

Primaspis tippinsi, n. sp.

TYPE DATA: Labeled *Rugaspidiotus* sp., on unident. ? grass, about a mile above the school in the mouth of the Gullmas Canyon, N. W. of Las Vegas, New Mexico, July 13, 1947, Coll. G. F. Ferris, (JOH-06-82). First Instar Holotype, 3 first instar paratypes, and 4 adult female paratypes deposited in the University of California Collection (Hobart Museum) at Davis, CA; 4 first instar paratypes and 2 adult female paratypes deposited in the United States National Museum in Beltsville, MD.

ETYMOLOGY: The generic name *Primaspis* is derived from the Greek "prima", meaning first, and the Latin "aspis", meaning shield. To the author's knowledge, this is the first time in which an immature stage has been intentionally chosen as the holotype of an armored scale species. It is significant because the species is named in honor of Dr. H. H. Tippins, for his immeasurable contributions to the systematics of the immature stages of the Diaspididae.

ADULT FEMALE: (Fig. 1): Body form subcircular to broadly turbinate, length 710-1030, width 526-769. Derm lightly sclerotized except for margins of pygidial lobes. Prosoma with scattered dorsal and ventral macroducts. Antenna a small tubercle with 2 large setae and 2 invaginated setae. Anterior spiracle with approximately 5-6 associated trilocular pores, posterior spiracle with approximately 2-3. Prepygidial abdominal segments with approximately a dozen scattered dorsal submarginal macroducts, these appearing as a continuous narrow marginal band anteriorly to region just posterior to metathoracic spiracle. Ventral margin with a few macroducts and microducts in that same band. Pygidium broadly rounded, with 3 pairs of lobes. Lobes 1 and 2 fairly well developed, lobe 2 biolobed. Lob 3 only slightly developed, indicated by marginal sclerosis. A pair of gland spines present between median lobes and between lobes 1 and 2. Ventral microducts scattered over posterior of pygidium. Perivulvar pores absent.

FIRST INSTAR: (Fig. 2) Slide-mounted specimens elongate oval. Length 285-367, width 185-235. Derm membranous. Anal opening small, removed approximately 2X its diameter from pygidial apex. On the venter, a roughened slightly sclerotized area is present on the derm between the metathoracic coxa and the margin of the body. In position, it is similar to the unnamed sclerite on *Rugaspidiotinus,* to the cruciform pores of *Haliaspis,* and to Stickney's "undetermined sclerite" of *Parlatoria.*

PYGIDIAL MARGIN: Two pairs of pygidial lobes present, lobe 2 bilobed, lobe 3 indicated by a sclerotized point. Segment 9 apparently indicated by a minute ventral seta. Marginal setae as illustrated, approximately 9.0 long, on pygidium, slightly longer anteriorly. Caudal seta approximately 1/3 body length.

DORSAL SURFACE

Setae. - Submedian, one on head near large duct, one on each thoracic segment, and on abdominal segments 1-7. Marginal, 2 on segments 1-8; submarginal one on abdominal segment 9. **Ducts.** - Large submedial one on head.

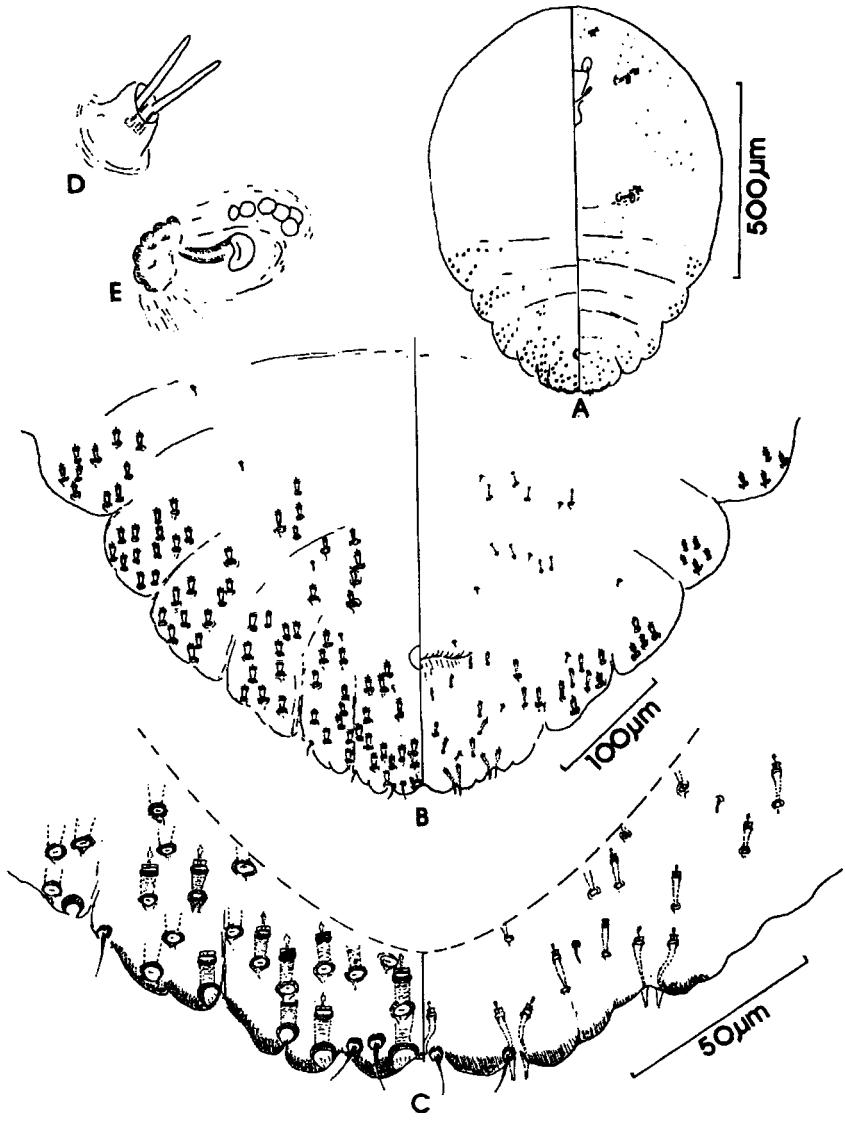

Fig. 1. Adult female, *Primaspis tippinsi*, n. sp. A, general features and body outline. B, pygidium. C, enlargement of pygidial margin. D, antenna. E, anterior spiracle.

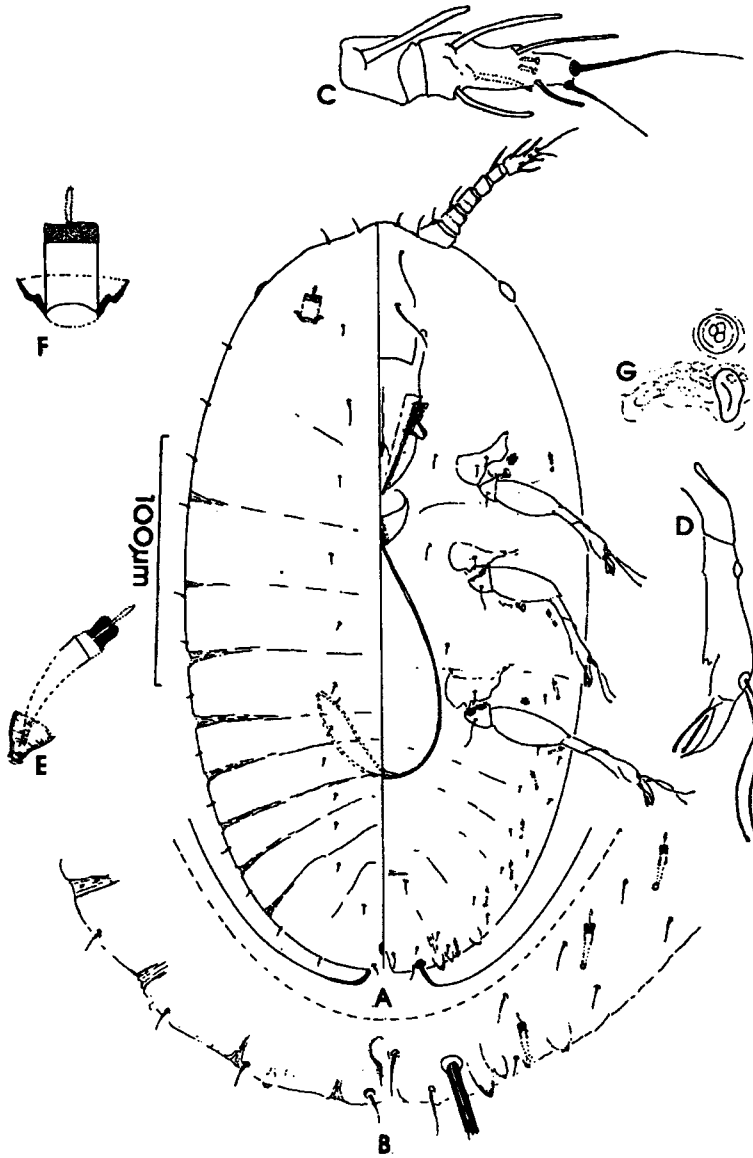

Fig. 2. First instar, *P. tippinsi,* n. sp. A, general features and body outline. B, pygidial margin. C, antenna. D, metathoracic leg. E, ventral submarginal gland tubercle. F, dorsal head duct. G, anterior spiracle.

Antenna. – Six-segmented, segments two and three each with a medial septum which gives antenna the superficial appearance of being 8-segmented. Segment 1 with two slender setae, segment 2 with a slender seta and an apical sensorium, segment 5 with one stout "fleshy" seta, segment 6 with 5 fleshy setae and two elongate apical setae, and with 2 invaginated setae. **Legs.** – Leg I: 75 (75-83) long, tibia almost as long as tarsus; Leg II (80 (80-84) long; Leg III 98 (91-98) long; tibia ca. 1/2 the length of tarsus. Tarsal and ungal digitules slightly knobbed. Tarsus of each leg with proximal campaniform sensillum. Trochanter roughly triangular, with 1 slender seta and 2 basal sensilla. Coxa I with 2 slender median setae ventrally, coxae II and III with 1; all coxae with a minute seta near anterolateral margin.

Spiracles. – Well defined, on pro- and metathorax. Prothoracic spiracle with an associated trilocular pore. **Setae.** – One marginal between antennae and 2 submedial on head; one submarginal between antennae, one anterior to eye and on abdominal segments 1, 8, and 9, and 2 on other abdominal segments. Submedian, 2 on head, 1 on each thoracic segment, 1 on each of abdominal segments 2-7. **Ducts.** – Marginal-submarginal, one on each abdominal segment 1-8. One lateral tubular duct on pro- and metathorax.

Material Studied. – JOH-06-82. *Rugaspidiotus* sp., on unident.? grass, approximately a mile above the school in the mouth of the Gullmas Canyon, N. W. of Las Vegas, New Mexico, July 13, 1947, Coll. G. F. Ferris.

Discussion: At first glance, one might conclude that this species will fit, at least superficially, into the genus *Rugaspidiotus,* and that is where Ferris tentatively placed it. However, because he expressed serious reservations about the generic placement of three rather similar species which he has earlier (1938) described and placed in that genus, he was probably uncertain of the generic placement of this species as well. A closer examination of the adult females reveals the presence of gland spines on the pygidial margin, well-defined median lobes, and a bilobed second lobe. Each of these characteristics will separate this species from both *Rugaspidiotus* (whose placement should probably be in the Odonaspidinae) and *Rugaspidiotinus.* But, it is in the first instars that the greatest morphological differences are evident. In *P. tippinsi,* the antennae are 6 segmented, there is no row of ventral submedian abdominal setae, and no elongate seta is present on the tarsi. These characters clearly place this species in the Diaspidinae (Howell et al. 1986, Howell and Tippins 1989).

Acknowledgments

The author is indebted to R. J. Beshear and the late M. Smith, the University of Georgia, Griffin, Georgia, for graciously providing technical assistance for this study, and to Dr. H. H. Tippins, Professor Emeritus, the University of Georgia for his professional counsel.

References Cited

Balachowsky, A. S. 1953. Les Cochenilles de France, d' Europe, du Nord de l'Afrique et due Bassin Mediterraneen. VII. - Mongoraphe des Coccoidea; Diaspidinae - IV, Odonaspidini-Parlatorini. Actualities Sci. et Indus. Ent. Appl. 1202: 725-929.

Ferris, G. F. 1938. Atlas of the scale insects of North America. Series 2. Stanford Univ. Press.

Howell, J. O. 1992. Descriptions of the first instars of the North American species of *Rugaspidiotus*. J.Entomol. Sci. 27: 301-310.

Howell, J. O., R. J. Beshear and H. H. Tippins. 1986. Descriptions of the first instars of type-species of the nominal genera of three subtribes of the Diaspidini. J. Entomol. Sci. 21: 1-9.

Howell, J. O. and H. H. Tippins. 1989. Immature stages and sexual dimorphism. *In* Armored scale insects. D. Rosen, (ed.), Elsevier Science Publishers. Amsterdam.

MacGillivray, A. D. 1921. The Coccidae. Urbana, Ill. Scarab, 502 p.

Takagi, S. 1969. Diaspididae of Taiwan based on material collected in connection with the Japan-U.S. Cooperative Science Programme, 1965 (Homoptera: Coccoidea). Part I. Insecta Matsumurana 32: 1-110.