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(Homoptera; Coccoidea; Diaspididae; Asterolecaniidae)

SCALE STUDIES—PART XV

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The present article includes the descriptions of six new species of scale insects belonging to the Coccoidea families Diaspididae and Asterolecaniidae. Three of these, *Annulaspis*, *Helaspis* (new genus), and *Pseudoparlatoria* (all belonging to Diaspididae), were collected in Mexico by Dr. S. W. Brown, Geneticist, for chromosomal studies. Two of the new species, one referable to *Diaspis* (Diaspididae), the other to *Sclerosococcus* (Asterolecaniidae), were intercepted in quarantine by the California State Department of Agriculture. The other new form is a *Diaspidiotus* (Diaspididae) collected on pine in Maryland.

This information is published not only to clarify identification problems in this economically important group of insects, but also to provide specific names for two of the species whose chromosomal systems have been rather thoroughly investigated.

The new species described below are arranged alphabetically for the sake of convenience.

The genus *Annulaspis* Ferris

Annulaspis is a monotypic genus described by Professor G. F. Ferris in 1938, and placed in the tribe Odonaspidini. The genotype, *Annulaspis polygona* Ferris, was collected on a perennial grass in the Chisos Mountains, Texas. The description of the following new species from Mexico adds another member to this genus and extends our knowledge of the group.

Annulaspis singularis McKenzie, new species

(Figure 1)

Suggested common name. Unique scale.
Hosts and distribution. Type and paratype adult females of this species were col-

lected on an undetermined species of Chenopodiaceae, Loreto, 100 miles north of La Paz, Baja California, Mexico, October 16, 1958, by S. W. Brown.

Type material. Holotype adult female (1 specimen mounted on 1 slide) and paratypes of the same sex have been deposited in the Museum of the University of California, Department of Entomology, Davis.

Habit. According to the collector, this scale was found in the cracks of bark of its host. The scale of the female and male were quite similar in size and color, and were reported as resembling "little brown seeds."

Recognition characters. Adult female, as mounted, averaging approximately 1.0 mm long and 0.40 mm wide. Body pyriform in outline. Prosoma sclerotized, this more widespread on venter than on dorsum. Pygidium angular, delicately furrowed both dorsally and ventrally, without definite lobes and plates. Dorsal marginal and submarginal macroducts larger than those elsewhere on pygidium, with tendency toward clustering near apex; smaller macroducts scattered in median and outer angles of pygidium, as well as submarginally along prepygidial abdominal segments; all ducts definitely of the two-barred form. Anal opening comparatively large and situated slightly above midpygidium. Median sclerotized spot and furrowed lateral scar evident on anterior pygidium. Perivulvar pores absent. Vulva situated above position of anal opening, this about three-fourths length of pygidium from apex. Ventral ducts similar in size and shape to those of dorsum, scattered mainly along submargin of pygidium and continuing onto prepygidial abdominal segments, a few evident in median area of segments anterior to pygidium. Antennae one-spined.

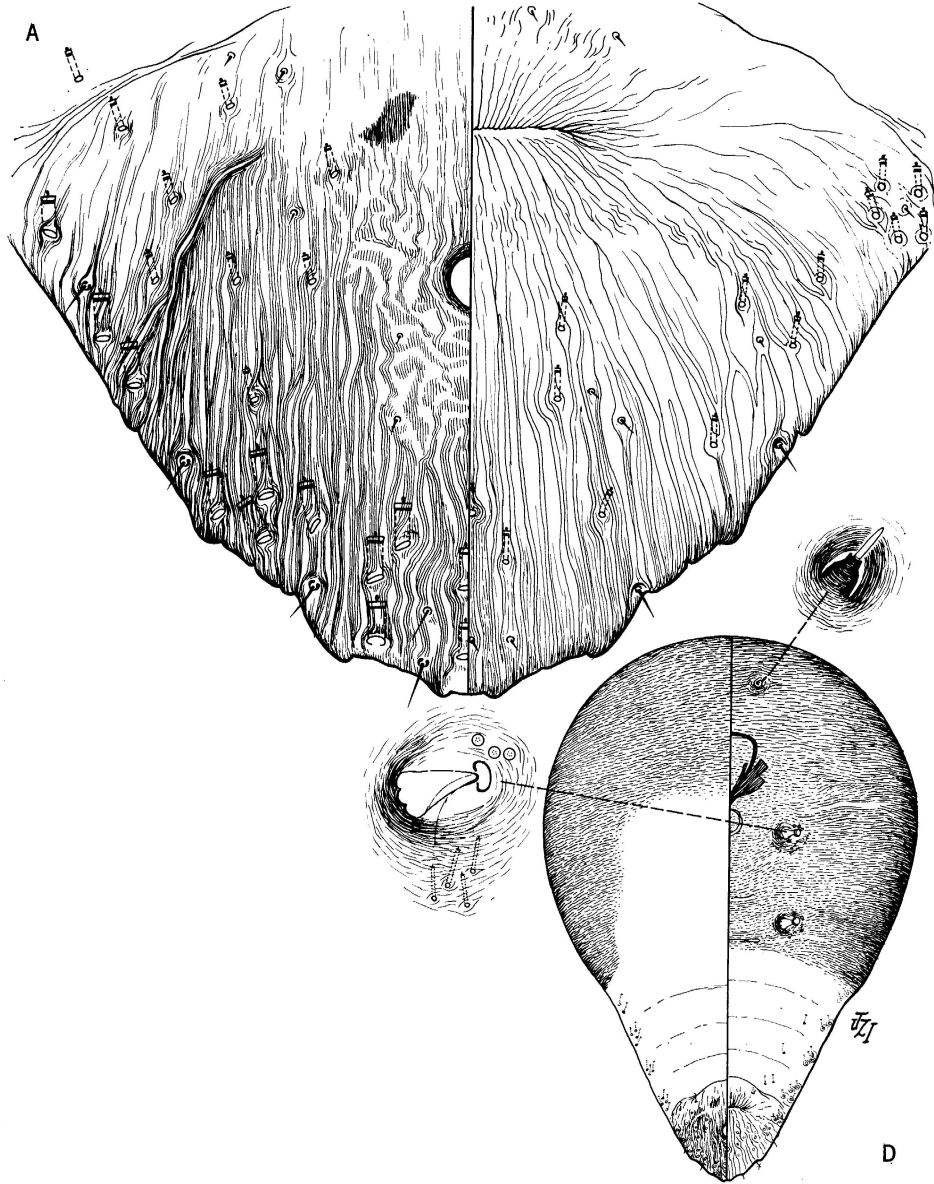


Figure 1. *Annulaspis singularis* McKenzie, new species, collected on bark of undetermined species of Chenapodiaceae, Loreto, 100 miles north La Paz, Baja California, Mexico.

NOTES. Superficially, this species resembles *Annulaspis polygona* Ferris except that the vulva is not borne in a crescentic fold, and the body is not as elongate and annulated. Its pygidium, however, is quite similar to

that of *polygona*, and it is mainly on this basis that it has been assigned to *Annulaspis*. The discovery of other related species may ultimately justify the naming of another genus to properly receive some of them.

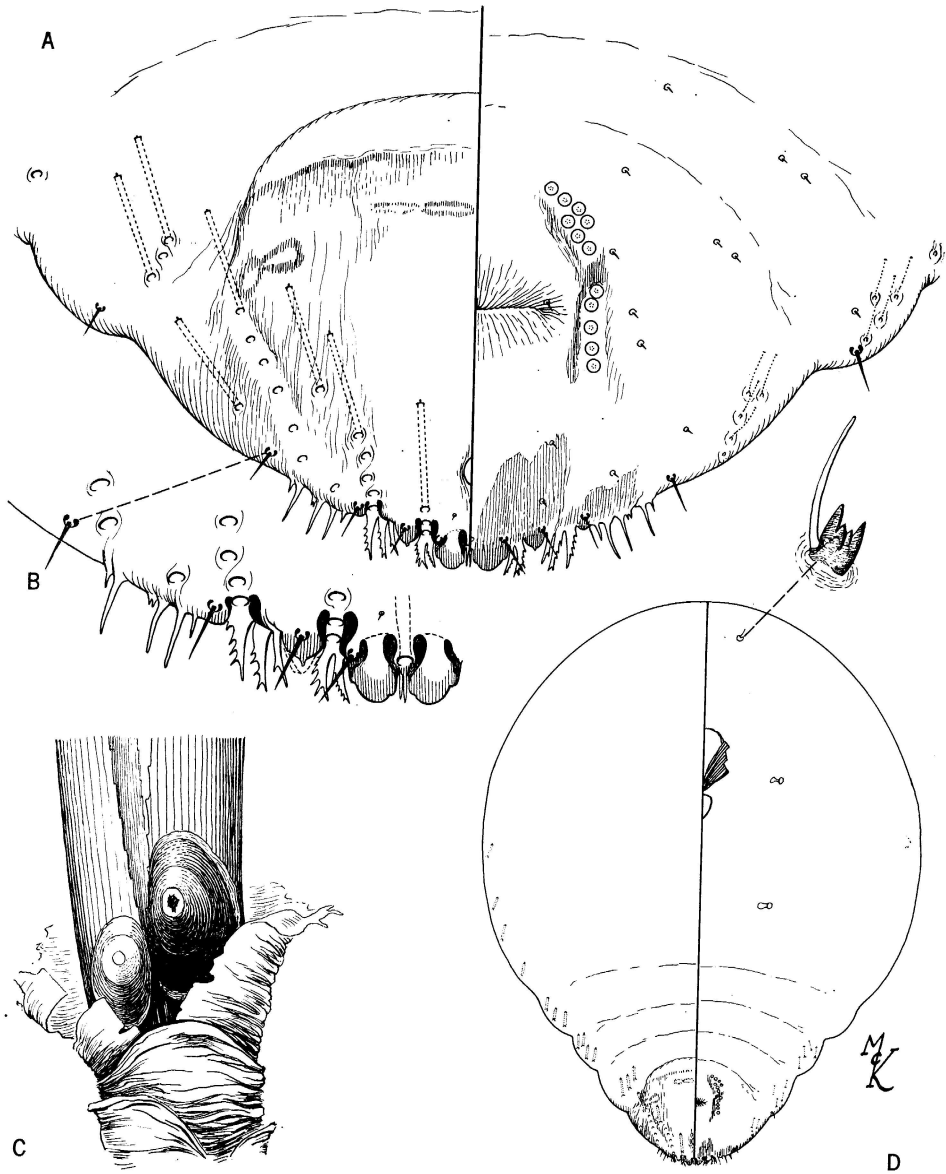


Figure 2. *Diaspidiotus mcombi* McKenzie, new species, collected on the foliage of *Pinus mugo mughus* (Coniferae), College Park, University of Maryland Campus, Prince Georges County, Maryland.

The genus *Diaspidiotus* Berlese and Leonardi

On October 9, 1961, the writer received correspondence from Professor Charles W. McComb of the University of Maryland,

State Board of Agriculture, College Park, Maryland, indicating that he had a new diaspidid (*Diaspidiotus*) infesting pine in that State as well as in South Carolina. He implied the scale had been present for sev-

eral years and that it was on the increase. Professor McComb suggested I describe the species, and upon receiving my willingness to do so, immediately forwarded to me all the slide and other material available in their collection. The species had been previously submitted for determination to the late Dr. Harold Morrison, Coccidologist, at Washington, D.C., by Professor H. S. McConnell, Coccidologist, University of Maryland. A technical description of the species is here presented.

***Diaspidiotus mcombi* McKenzie,
new species (Figure 2)**

Suggested common name. McComb pine scale.

Hosts and distribution. Type and paratype adult females of this species were collected on *Pinus mugo mughus* (Coniferae), College Park, University of Maryland Campus, Prince Georges County, Maryland, November 1, 1961, by C. W. McComb; on *Pinus* sp., College Park, University of Maryland Campus, Maryland, March 11, 1946, by H. S. McConnell (Lot No. 809); on *Pinus resinosa*, Baltimore, Baltimore County, Maryland, September 29, 1948, by H. S. McConnell (Lot No. 859); on *Pinus* sp., Easton, Talbot County, Maryland, December 1, 1953, by E. S. Linthicum (Lot No. 1045); on *Pinus virginiana*, Anderson, Anderson County, South Carolina, October 7, 1955, by H. S. McConnell (Lot No. 55-28); on *Pinus mugo mughus*, College Park, University of Maryland Campus, July 28, 1958, by J. Davidson; and on *Pinus nigra*, College Park, University of Maryland Campus, Maryland, January and February 1962, by T. L. Bissel.

Habit. Occurring on the needles, usually hidden at base within the needle sheath. Scale of the female blackish and with somewhat lightened, central exuviae, appearing rather elongate, probably due to contour of needle upon which the insect is feeding; scale of the male lighter, elongate oval, exuvia central.

Type material. Holotype adult female (1 specimen mounted on 1 slide) and paratypes of the same sex have been deposited in the museum of the University of California, Department of Entomology, Davis. Additional paratypes have been sent to the University of Maryland, and others placed in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento.

Recognition characters. Scale of the adult female as mounted approximately 1.00 mm long, 0.95 mm wide; prosomatic region membranous. Antennae one-spined. Pygidium relatively broad and bearing two pairs of sclerotized lobes; median lobes rather short and broad, set close together but with a slender pair of plates between; second lobes variable, represented by a rounded prominence which often terminates in a point, sometimes flattened at apex; third lobes undeveloped. Pygidial plates present almost as far as seta which marks position of fifth segment, those beyond third lobe seta slender, others broader, moderately large and variously fimbriate. Intersegmental marginal scleroses moderately developed, slender, also scleroses extending in from base of each median lobe on dorsal side. Dorsal macroducts comparatively few, short and slender, with from 1-4 present in outer angle of fourth segment of pygidium, and a few small ducts on other segments at the margin. Anal opening small, slightly less in diameter than length of median lobes and removed by about two times the diameter from bases of these lobes. Perivulvar pores present in four groups. A few ventral microducts present along submargin of pygidium and continuing onto prepygidial abdominal segments.

NOTES. This species is closely related to *Diaspidiotus ancyclus* (Putnam), but differs mainly in the possession of from 1-4 dorsal pygidial macroducts on the fourth segment, whereas in the species last mentioned, these structures are absent in this area. Other differences which appear to separate *mcombi* from *ancyclus* include an unsclerotized prosoma; an anal opening situated nearer to apex of pygidium; and only *Pinus* as its host. *D. ancyclus*, on the other hand, shows evidence of a quite heavily sclerotized cephalothoracic region at maturity; an anal opening removed from apex of pygidium by approximately five times length of median lobes; and a long list of recorded hosts.

This species was made available for study and description through the efforts of Professor Charles W. McComb, University of Maryland. I take pleasure in naming this diaspidid after Professor McComb.

Genus *Diaspis* Costa

During March, 1960, specimens of a species of *Diaspis*, intercepted in quarantine from Mexico, were submitted for identification to the California Department of Agri-

culture, Bureau of Entomology, Sacramento. Subsequently, these specimens were handed to the author who identified them as a new species of this genus. A technical description of the species follows:

***Diaspis gilloglyi* McKenzie,
new species (Figure 3)**

Suggested common name. Gillogly scale.
Hosts and distribution. Type and paratype adult females of this species were taken on

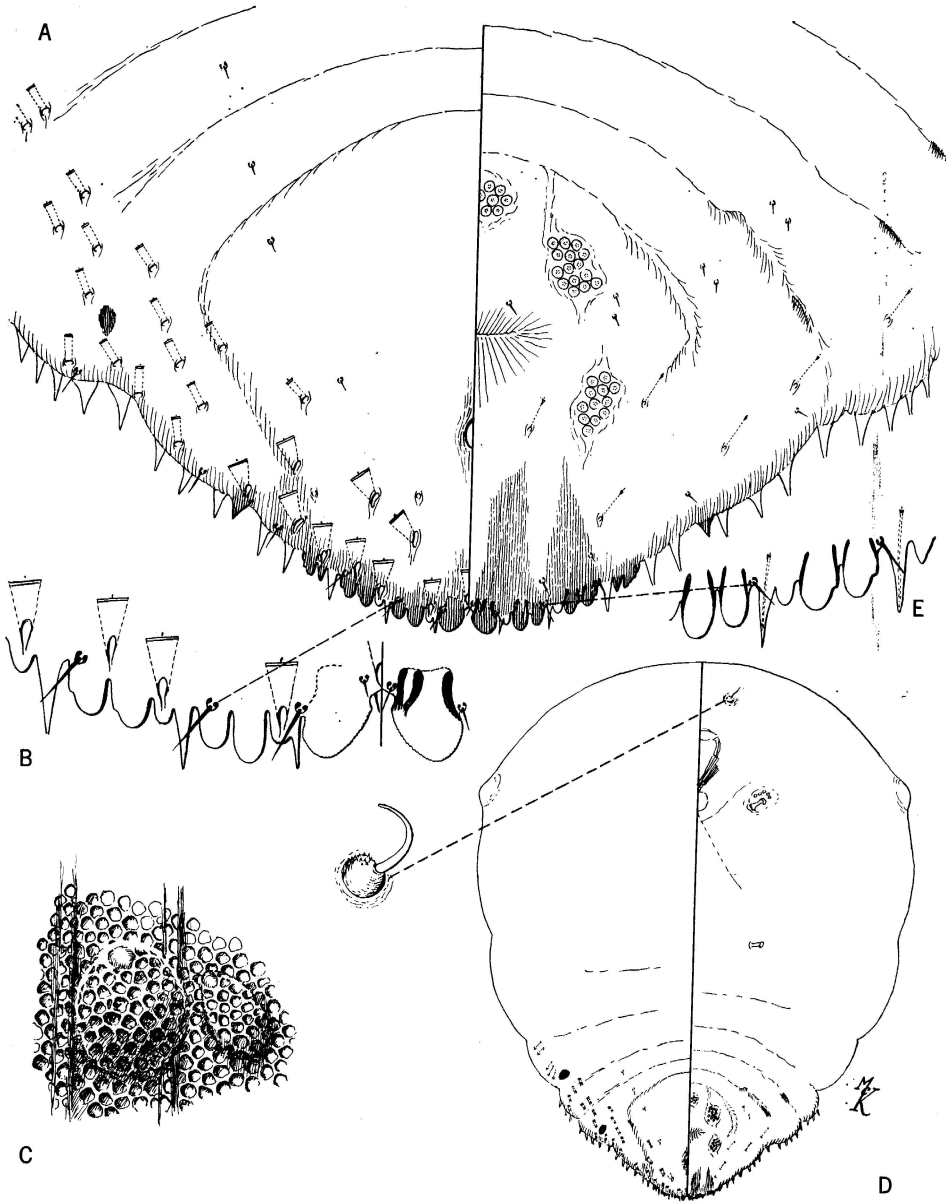


Figure 3. *Diaspis gilloglyi* McKenzie, new species, collected on the leaves of *Tillandsia* (Bromeliaceae), in quarantine from Mexico at Culver City, Los Angeles County, California.

Tillandsia sp. (Bromeliaceae), in quarantine from Mexico at Culver City, Los Angeles County, California, March 16, 1960, by L. R. Gilgoly and A. Beresford (CSDA No. 60C29-30).

Type material. Holotype adult female (1 specimen mounted on 1 slide) has been deposited in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento, and paratypes of the same sex have been placed in the museum of the University of California, Department of Entomology, Davis.

Habit. According to the collectors, this scale insect was found infesting the leaves of its host. The scale of the adult female is whitish, circular, flat, transparent, exuviae situated central or subcentral, and almost completely concealed under the epidermis of the leaf. Male scale elongate, whitish, exuvium at anterior extremity and, like the female scale, mostly concealed beneath leaf epidermis.

Recognition characters. Adult female, as mounted, averaging approximately 1.0 mm long and 0.90 mm wide. Body of the usual somewhat turbinate form; prosoma with weakly developed lateral lobes. Median pygidial lobes not sunken into the body and with no suggestion of being yoked together internally, rounded, not especially large or prominent, finely serrate along margin; first and second lobes smaller than the median, deeply bilobed, second pair each with a slight notch on outer margin; third lobes bilobed, the inner most lobe pointed, outer lobe notched on lateral margin; pygidial spur sharp, acute. Dorsal pygidial macroducts few, arranged in a submarginal series extending to second abdominal segment, noticeably smaller than the marginal macroducts of pygidium; and with no submedian ducts. Noticeable submarginal sclerotized boss evident on second and fourth abdominal segments. Anal opening moderately large, set caudad of the center of pygidium. Gland spines present, quite small, normal for genus. On the venter, vulva situated about mid-pygidium. Perivulva pores present in five groups. A few microducts scattered in a broad submarginal band.

NOTES. This species appears related to *Diaspis fraxini* Ferris, but differs in the absence of dorsal submedian groups of ducts on fifth abdominal segment, and presence of well-developed first, second and third pygidial lobes. *D. fraxini*, on the other hand, pos-

sesses dorsal submedian groups of ducts on fifth abdominal segment, and the first to third pygidial lobes are greatly reduced in size. Furthermore, the host plants are quite different for both species.

Two other *Diaspis* species of somewhat uncertain identity have also been collected on *Tillandsia* in quarantine from Mexico. Since they appear to vary only slightly from certain described species, they are not included in this paper.

Genus *Helaspis* McKenzie, new genus

Genotype. This genus is here established for the reception of a single species, *Helaspis mexicana* McKenzie, described as new in this paper.

Recognition characters. Diaspididae referable to the tribe Aspidiotini of the subfamily Diaspidinae, that is with one-barred tubular ducts, without gland spines, and second pygidial lobe not bilobed. Adult female scale as mounted turbinate in form; the derm of the cephalothoracic region quite definitely sclerotized. Perivulvar pores absent in the genotype. Pygidium with three pairs of lobes, all well developed, the third pair bilobed. Plates quite narrow, "peg-like" in appearance, tapering toward tip, with little or no fimbriation. Intersegmental marginal scleroses absent. Anal opening relatively large, removed from the apex of body by about one-third length of pygidium.

Scale covering of adult female and male not available for description.

NOTES. *Helaspis* appears to suggest *Aspidiotus* Bouché more strongly than any other known genus, although this relationship may be merely superficial. The shorter length of the dorsal pygidial macroducts resemble certain *Aspidiotus* species, while the peculiar "peg-like" plates, with little or no fimbriation, and the bilobing of the third pygidial lobes, show wide divergence from this group. The exact classificatory status of *Helaspis* will, no doubt, remain somewhat obscure until intermediate links show up which will connect it definitely with one of the already known groups.

***Helaspis mexicana* McKenzie, new species (Figure 4)**

Suggested common name. Mexican *helaspis* scale.

Hosts and distribution. Type and paratype adult female specimens of this scale were collected on a species of *Roupala* (Proteaceae), at Mazatlan, State of Sinaloa,

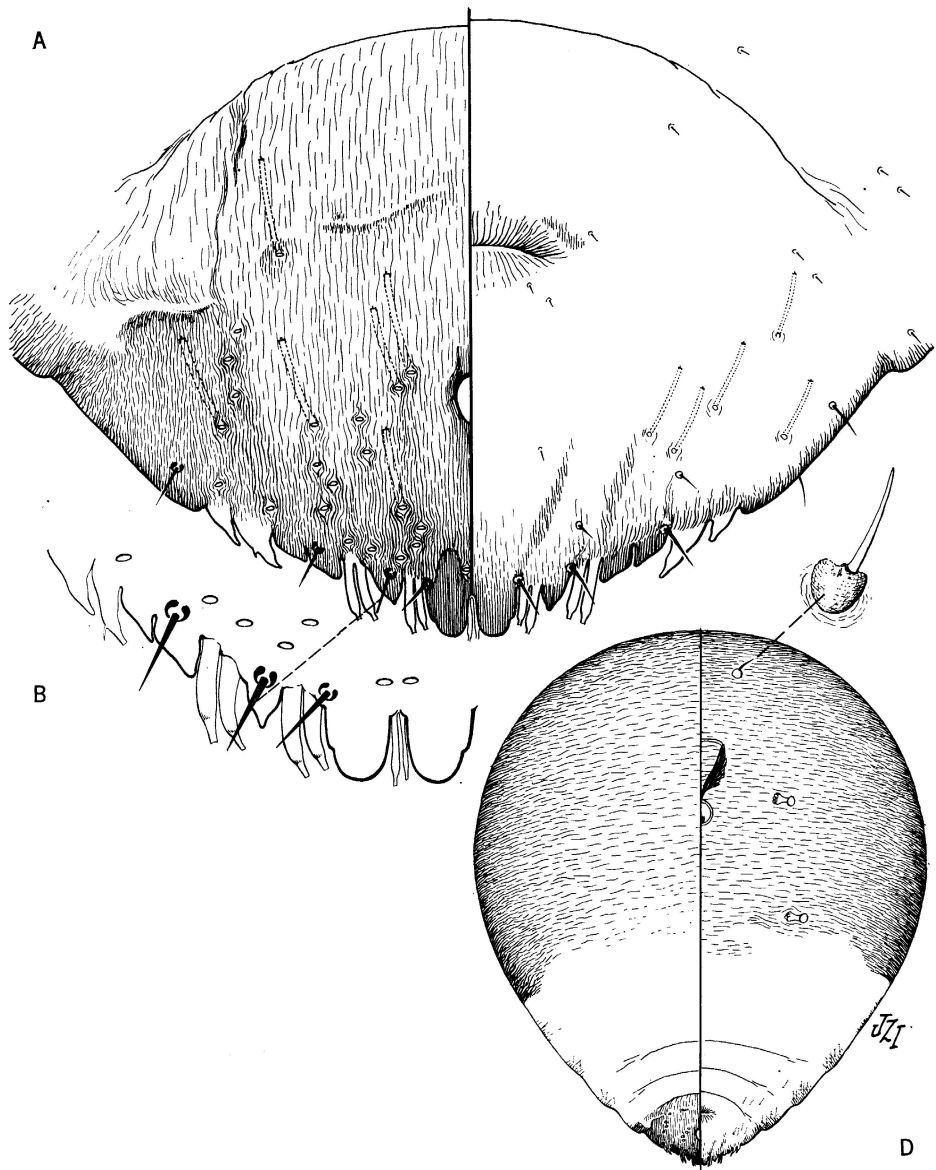


Figure 4. *Helaspis mexicana* McKenzie, new genus and species, collected on fruit of *Roupala* sp. (Proteaceae), Mazatlan, State of Sinaloa, Mexico.

Mexico, August 29, 1960, by S. W. Brown and W. A. Nelson-Rees.

Type material. Holotype adult female (1 specimen mounted on 1 slide) and paratypes of the same sex have been deposited in the

museum of the University of California, Department of Entomology, Davis.

Habit. According to the collectors this scale was observed mostly on the fruits of its host. The specimens were preserved in

alcohol, without their coverings, for chromosomal studies, thus a description of the external features is not possible.

Recognition characters. Scale of the adult female as mounted approximately 1.00 mm long, width 0.85 mm; prosomatic region sclerotized. Antennae one-spined. Pygidium relatively broad and bearing three pairs of sclerotized lobes, median lobes large and prominent, rounded apically, notched on outer margin, with conspicuous basal sclerosis; second lobes represented as a sclerotized point; third lobes bilobed, mesal margins pointed, lateral margins sloping and smooth. Pygidial plates quite narrow, "peg-like" in appearance, tapering toward tip, with little or no fimbriation, two situated between pygidial lobes, two beyond position of third lobe, none present beyond this point. Dorsal macroducts comparatively short and relatively numerous, situated in irregular rows, 2 or 3 usually on each side of anal opening (see figure 4). Anal opening about as large as length of second lobe, and removed from pygidial apex by about one-third length of pygidium. Perivulvar pores absent. Ventral microducts present in a series extending along the margin from pygidium to, and including, the prepigidial abdominal segments and posterior prosoma. Intersegmental paraphyses absent. Vulva situated above mid-pygidium.

NOTES. This species only remotely suggests certain species of *Aspidiotus*, and differs drastically from them in the character of the "peg-like" pygidial plates and the presence of a bilobed third pygidial lobe.

Genus *Pseudoparlatoria* Cockerell

Specimens of this species were collected by Dr. S. W. Brown, Geneticist, especially for chromosomal studies. The material was subsequently submitted to the writer who identified it as an undescribed species of *Pseudoparlatoria*. A technical description of the species follows:

***Pseudoparlatoria browni* McKenzie, new species (Figure 5)**

Suggested common name. Brown pseudoparlatoria scale.

Hosts and distribution. Type and paratype adult female specimens of the species were collected on an unidentified shrub, La Paz, Baja California, Mexico, October 29, 1958, by S. W. Brown.

Type material. Holotype adult female (1 specimen mounted on 1 slide) and paratypes of the same sex have been deposited in the collection of the University of California, Department of Entomology, Davis, California.

Habit. According to the collector, this scale insect was found on the underside of leaves, rarely on the stems of its host. The scale is reported as being very thin, transparent, and quite flat; distributed somewhat irregularly among the leaf hairs, very similar to other members of this group. No male specimens were observed.

Recognition characters. Adult female, as mounted, averaging approximately 1.0 mm long and 0.80 mm wide. Body of the ordinary somewhat turbinate form. Prosoma membranous at maturity. Pygidium with median lobes well developed, once-notched on each side, widely separated, and with the usual paired gland spines between them which present a forked appearance; second and third lobes smaller than the median ones, but well developed and distinctly bilobulate. Gland spines very few, small and inconspicuous. Marginal macroducts larger than submarginal ones, situated in the usual arrangement for members of this genus. Dorsal pygidial macroducts comparatively few, arranged in a quite definite pattern, there being 2 or 3 large-sized ones extending forward from between the median and second lobes; another group of approximately the same size anterior to the area between second and third lobes; and a scattered group of smaller ducts in a submarginal zone anterior to fourth segment which extends forward to first or second abdominal segments. Anal opening large, vertically oval, removed from pygidial margin by approximately one-fourth length of pygidium. Vulva broad, conspicuous, situated slightly above mid-pygidium. Perivulvar pores in five groups, median group with from 1-4 pores present; the anterior and posterior groups with numerous pores.

NOTES. This species is not recognized on paper; i.e., by known technical description. Superficially, it seems nearest to *Pseudoparlatoria occulata* (Hempel) (See re-description of *occulata* by Lepage and Gianotti, Arquivos do Instituto Biologico, 14 (24):334-335, illus., 1943). It differs from *occulata* principally in the larger size, number, and arrangement of the dorsal macro-

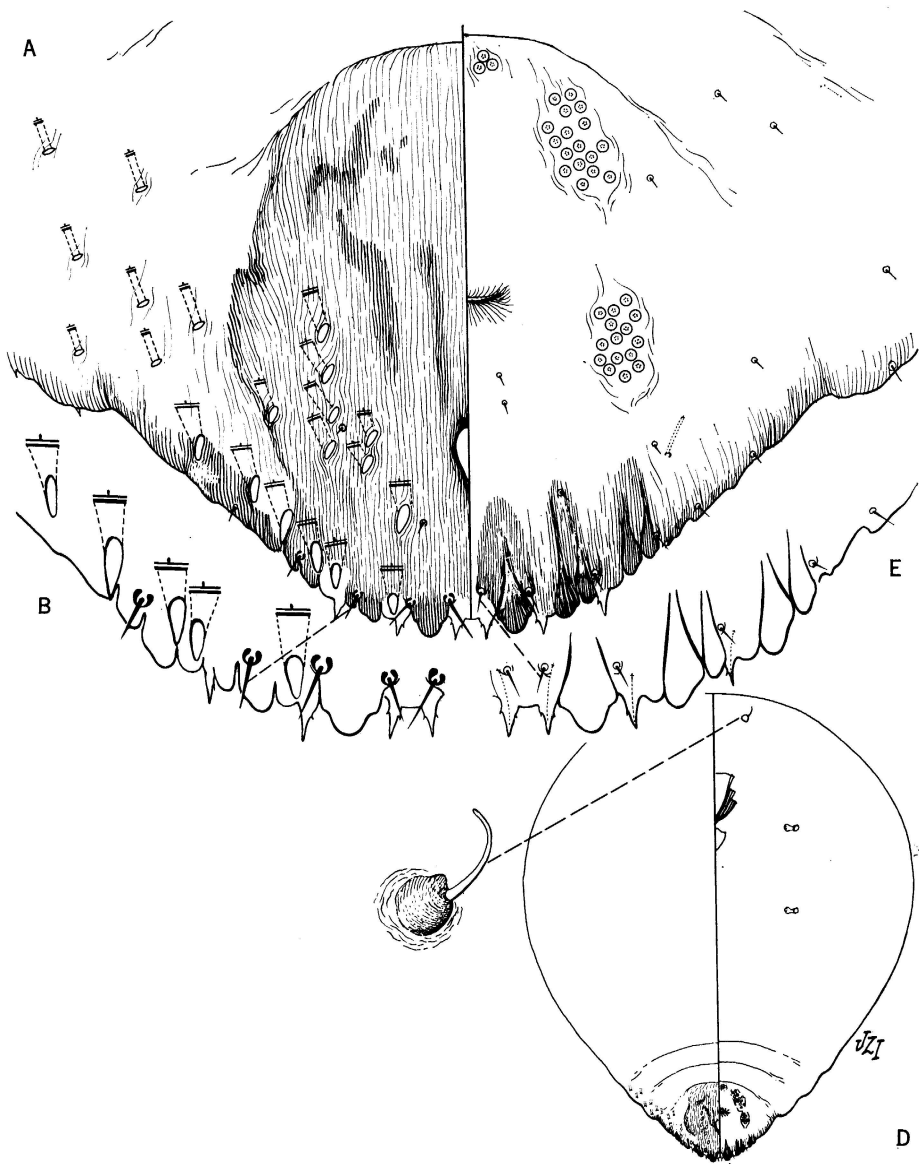


Figure 5. *Pseudoparlatoria browni* McKenzie, new species, collected on leaves of an unidentified shrub, La Paz, Baja California, Mexico.

ducts on pygidium, and in position of anal opening which appears much nearer to pygidial margin than is characteristic of *occulata*.

The species is named for Dr. S. W. Brown, who not only collected the scale,

but has made interesting chromosomal observations on it as well as on another diaspidid described in this paper. The names of these scale insects will be used by Dr. Brown when research on his subject is published.

Genus *Sclerosococcus* McKenzie

Sclerosococcus (Asterolecaniidae) is a monotypic genus described by the writer in 1958 (see Pan-Pacific Ent. 34(3):169-172, illus.) The genotype *Sclerosococcus ferrisi* McKenzie, was collected on "succulents" in quarantine from Mexico at Los Angeles, California. The new species taken in quarantine from Miami, Florida, and described below, adds another component to the genus and increases our knowledge of this group.

Sclerosococcus bromeliae McKenzie, new species (Figure 6)

Suggested common name. Bromelia pit-making scale.

Hosts and distribution. Type and paratype adult female specimens of this species were collected on Bromeliaceae in quarantine from Miami, Florida, at Temple City, Los Angeles County, California, May 22, 1961, by B. W. Kemper. (CSDA No. 61E 23-33).

Type material. Holotype adult female (1 specimen mounted on 1 slide) has been deposited in the collection of the California Department of Agriculture, Bureau of Entomology, Sacramento. Paratypes of the same sex have been placed in the museum of the University of California, Department of Entomology, Davis.

Habit. According to the information included on the identification slip accompanying this quarantine shipment, this scale was found feeding in the leaf tissues of its host. This would suggest a rather normal feeding habit for the insect which belongs to the "pit-making" scale family Asterolecaniidae. The infestation was reported as light.

Recognition characters. Adult female, as mounted, averaging approximately 0.90 mm long and 0.60 mm wide. This species is assigned to the family Asterolecaniidae by reason of its possession of geminate (8-shaped) pores. Body of adult female elongate oval, entirely membranous. Dorsum with two sizes of tubular ducts which terminate at their inner end in a germinate (8-shaped) pore, the smaller sized ones present over most of dorsum, appearing segmentally arranged, the large ones few and confined to the last two abdominal segments. The dorsal third and fourth abdominal segments

from posterior end of body bear each a transverse series of quite large circular pores which present a quinquelocular appearance. A few of these pores are also present along margin and submargin of the fifth abdominal segment counting from posterior end of body. Anal opening represented as a sclerotized ring situated at apex of body. Venter with tubular ducts similar in size and shape to those of dorsum, the smaller sized ones more numerous, arranged segmentally on abdominal segments, continuing along submargin of body to antenna, and a few scattered in thoracic region. Quinquelocular pores like those discussed above are present on same segments as on dorsum. Antennae present, reduced to a single segment which is deeply invaginated at its apex and bearing 4 or 5 quite stout setae. Spiracles each with a crescent of quinquelocular pores smaller than those on abdomen.

NOTES. This species is related to *Sclerosococcus ferrisi* McKenzie, but differs in having fewer dorsal ducts on anterior portion of body, more quinquelocular pores on abdominal segments, and no sclerotization of apical abdominal segments. *S. ferrisi*, on the other hand, possesses numerous tubular ducts of two sizes on anterior portion of body, fewer quinquelocular pores on abdominal segments, and obvious sclerotization of apical segments of abdomen.

The presence or absence of sclerotization at the posterior extremity of abdomen in the known species of *Sclerosococcus*, places less emphasis on the value of this feature as a generic character. On the other hand, the nature and distribution of the various ducts and pores in *Sclerosococcus* easily differentiate the group from all other Asterolecaniidae.

Legends for Figures

A, pygidium of adult female; B, details of the dorsal aspect of the pygidial margin or its equivalent; C, habit; D, body of the adult female; E, details of the ventral aspect of the pygidial margin. Unlettered details are connected to their points of origin by guidelines and should be readily identifiable.

Most of the illustrations were prepared by Mrs. Julia Z. Iltis, the remainder by the writer. They are based upon well-stained examples which emphasize the derm sclerotization.

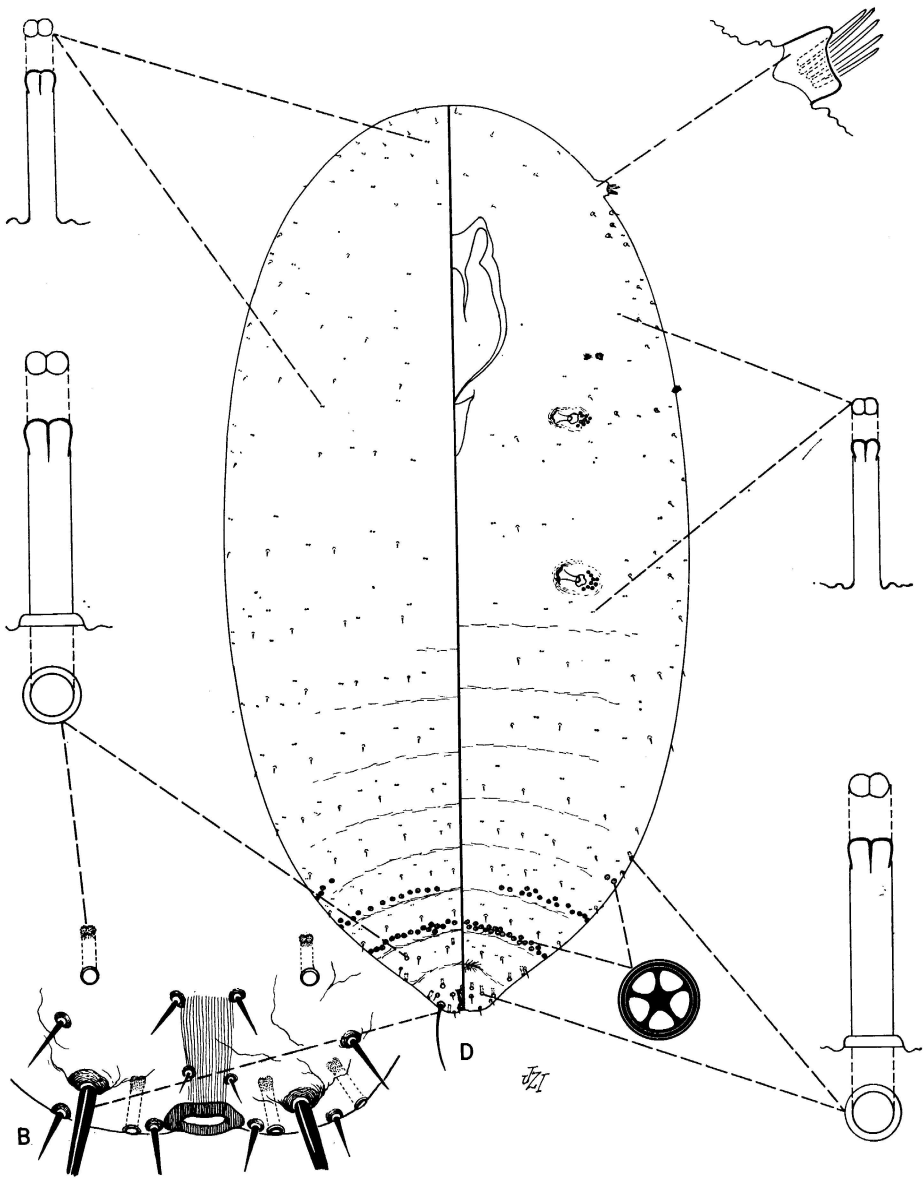


Figure 6. *Sclerosococcus bromeliae* McKenzie, new species, collected in leaf tissue of Bromeliaceae, in quarantine from Miami, Florida, at Temple City, Los Angeles County, California.

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