

Orchid Pests in Puerto Rico¹

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INTRODUCTION

Orchids are members of the second largest family of the flowering plants, the Orchidaceae, with more than 600 genera and probably more than 12,000 species of perennial, erect, prostrate or climbing herbs, which occur more abundantly in tropical areas. Like most plants, they are susceptible to attack by countless species of insects, arachnids, mollusks and nematodes, as well as damages of economic importance caused by phyto-diseases produced by fungi, bacteria and viruses.

A preliminary report was published on the orchid pests present in Puerto Rico by the senior author in 1959 (8). Surveys³ were conducted in different areas⁴ of Puerto Rico during 1961 and 1963 to ascertain the orchid-infesting pests present, the degree of their infestation, and the species of orchid involved. This paper is based on the results of these and investigations undertaken more recently.

We in Puerto Rico are indeed fortunate in having a limited number of orchid pest species, at least thus far recorded, as compared with those present in some of the other parts of the world. Swezey (18), for instance, recorded 29 species of scale insects of which orchids of one species or another were the favorite hosts, and in most instances probably their specific food plants. He also listed 78 additional species of scale insects having diverse food plants for hosts, including orchids. Swezey mentioned 12 different orders of the Class Insecta, comprising 61 families, all associated with orchids in one way or another. This large number of insect species recorded on orchids also includes, of course, those found attacking wild species and does not necessarily mean they occur exclusively on cultivated species such as the *Cattleyas*, *Vandas*, *Dendrobiums*, *Oncidiums*, etc., growing in greenhouses, orchidariums, etc. Riddick (12) reported 32 species of scale insects

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⁴ The areas covered in these investigations include the San Juan Metropolitan area, Arecibo, Mayagüez, Ponce, Fajardo, Caguas, Doña Juana Forest at the Toro Negro Unit (north of Villalba), Cayey-Guayama, Sabana Grande-Maricao State Forest, Adjuntas, and El Yunque in the Caribbean National Forest.

attacking orchids in Florida, and 23 of these also occur in Puerto Rico. With the exception of the 6 species *Furcaspis biformis*, *Diaspis boisduvalli*, *Vinsonia stellifera*, *Leucaspis cockerelli*, *Pseudococcus adonidum*, and *Asterolecanium epidendri* which have been recorded on Island orchids, the other 20 attack host plants other than orchids.

LIST OF ORCHID PESTS

The following list of orchid pests recorded thus far from Puerto Rico has been compiled from published data and from field survey data tabulated by the authors June 8, 14, and 15, 1961; February 12, June 27, and September 19, 1963; and on various dates throughout 1973.

PHYLLUM ARTHROPODA

CLASS INSECTA

Order Collembola

FAMILY ENTOMOBRYIDAE

Cyphoderus inaequalis Folsom. A collembolan or springtail collected in moss around orchid roots at Mayagüez (I. No. 5728) as reported by Wolcott (19,20).

Order Coleoptera

FAMILY SCOLYTIDAE

Xylosandrus compactus (Eichhoff). This so-called "Dendrobium beetle," was found in 1970 attacking *Cattleya* pseudobulbs in a large greenhouse at Barranquitas. The species has been recorded in Florida attacking particularly orchids of the genus *Dendrobium*, also *Cattleya*. *Xylosandrus* is a small dark brown beetle about $\frac{1}{18}$ inch in length. It bores into the canes of *Dendrobium* and into the pseudobulbs of *Cattleya* and its hybrids. The damage it causes is noticeable by the minute shot-holes in affected parts and by rotting of pseudobulbs. The beetle has not been recorded since the initial outbreak at Barranquitas. The presence of this scolytid in Puerto Rico constitutes a new insect record for the Island.

Order Dermaptera

FAMILY FORFICULIDAE

Doru albipes (Fabr.). Intercepted on orchids in Puerto Rico by plant quarantine officers (11). This earwig is one of the largest and possibly one of the most common species in the family present in Puerto Rico. It can be recognized by its light-colored legs, by a light-colored spot at the base of

each tegmen (or elytron) and by light-colored hindwings which protrude for nearly half their length from beneath the covering tegmina giving a very distinctive 4-spotted appearance. The species is of no economic importance to orchid culture in Puerto Rico.

Order Homoptera

FAMILY APHIDIDAE

Aphis gossypii Glover, cotton aphid. This common species is of no economic importance to cultivated orchids but has been collected from wild orchid species. This aphid is highly variable in size and color. The apterous forms are pale-yellow to pale yellowish-green, while the alates are yellowish to greenish-black on the abdomen. Smith, Martorell and Pérez-Escolar (16) found the species attacking 61 different wild and cultivated host plants. Two of these were orchid species. The aphid was collected on *Epidendrum secundum* (= *Amphiglottis secunda*)⁵ a wild species common in the Toro Negro Forest Unit north of Villalba at 2,660 feet altitude, and on *Dilomilis montana* (= *Octadesmia montana*), El Yunque Mountains on Mt. Britton Trail at 3,600 feet altitude.

Aphis spiraecola Patch, spirea aphid, so-called citrus aphid. Recognized easily by its yellowish-green to greenish-yellow color, "bushy" cauda (9-14 hairs) and black cornicles and cauda. Recorded by Smith et al. (16,17) on *Dilomilis montana* at El Yunque Peak on March 13, 1969, collected by C. F. Smith, L. F. Martorell, and R. Woodbury, and by C. F. Smith and L. F. Martorell on *Epidendrum prismatocarpum* and *E. secundum* at Río Piedras, April 15, 1967.

Aulacorthum (Neomyzus) circumflexum (Buckton). Another interesting aphid the apterous forms of which are of a yellowish-green color with a blackish U-shaped area on the dorsum of the abdomen and a pair of dorsolateral patches on the thoracic segments. Found by Smith et al. (16, 17) on 18 different wild host plants including three orchid species: *E. secundum*, at the Toro Negro Mountains north of Villalba at 2,660 feet altitude; on *Habenaria monorrhiza*, a terrestrial orchid at El Yunque Mountains on the Mt. Britton Trail at 1,500 feet altitude and on *Dilomilis montana* at the same locality. This aphid has not been collected thus far on cultivated orchids.

Aulacorthum solani (Kaltenbach). The apterous forms, of a dirty yellowish-green color with indications of dark dashes on the sides, were collected above 1,200 feet altitude on numerous wild plant species. The species

⁵ The scientific names of plants enclosed in parentheses and preceded by an = sign indicate the plant name recorded by Britton and Wilson (1). These have been changed to conform to modern nomenclature.

is considered to be a mountain one as it has not been collected thus far in the lowlands. Smith et al. (16) recorded it on *Habenaria monorrhiza* at El Yunque Mountains on the Mt. Britton Trail at 3,500 feet above sea level, also on *Dilomilis montana* at high elevations on El Yunque Range. It has not been found thus far on cultivated orchids.

Cerataphis orchidearum (Westwood). An aphid which attacks plants specifically of the family Orchidaceae. This insect was recorded by Wolcott (19,20) as *Cerataphis lataniae* Boisduval (a species which has not been found in Puerto Rico) "as intercepted on orchids from Venezuela by Federal Plant Quarantine inspectors and firmly established in the Island on cultivated vanilla, dwarf coconut palms from Malaya, and other ornamental palms such as *Livistonia*, was well as on the orchid species, *Cyrtopodium woodfordii* Sims." In 1953, Hillie Ris Lambers (5) revised the genus *Cerataphis* and clarified the status of the several species. The species attacking palms and other ornamentals is *Cerataphis variabilis* Hillie Ris Lambers, a species that does not attack orchidaceous plants. The apterous form of *C. orchidearum* much resembles a scale insect or a whitefly puparia, and is very small, oval-elongated, and black with a conspicuous white halo around its body. It has been recorded on *Epidendrum secundum* on the Cayey-Guayama road, Km 17.5, March 17, 1961; at El Peñón del Collao between Cayey and Salinas, March 17, 1963, at 2,700 feet altitude; in the Toro Negro Mountains and the Maricao State Forest at altitudes ranging from 1,890 to 3,000 feet as recorded by Smith et al. (16). On *Epidendrum cochleatum* (= *Anacheilium cochleatum*) on the Cayey-Guayama road, Km 17.5, March 17, 1963; at El Peñón del Collao, March 17, 1963, at 2,700 feet altitude; at Jájome Alto, Cayey, April 23, 1965; at Maricao State Forest, June 5, 1965 at 2,040 feet altitude. On *Polystachia extintoria* (= *P. minuta*) on the Cayey-Guayama road, Km. 17.5, March 17, 1963. On *Oncidium baueri* (= *O. altissimum*) at Jájome Alto, Cayey, April 23, 1965. On *Eulophya alta* (= *Platypus altus*) at El Yunque Mountains, June 5, 1965. On *Maxillaria coccinea* (= *Ornithidium coccineum*) foliage in the El Verde area, El Yunque Mountains, March 11, 1971 (Coll: Martorell and Woodbury). Also on *Vanilla dilloniana* (= *V. eggersii*), on foliage and tender stems, southern slopes of Piedras Chiquitas, Barrio Cuyón, Coamo (coll: Martorell). On *Pleurothallis pruinosa* in the Maricao State Forest, June 5, 1965. Slide-mounted material in the U.S. National Museum at Washington, D.C., shows this aphid to have been collected on *Vanilla planifolia* in Mayagüez and Adjuntas in 1930 and 1932, respectively.

Macrosiphum (Sitobion) luteum (Buckton) (fig. 1). Mentioned by Wolcott (19) as a plant louse or aphid found on *Cattleya* and other cultivated orchids at a location in Pueblo Viejo (west of Cataño), collected in November 1949 by Ferdinand Méndez. The species is in Mexico, Central

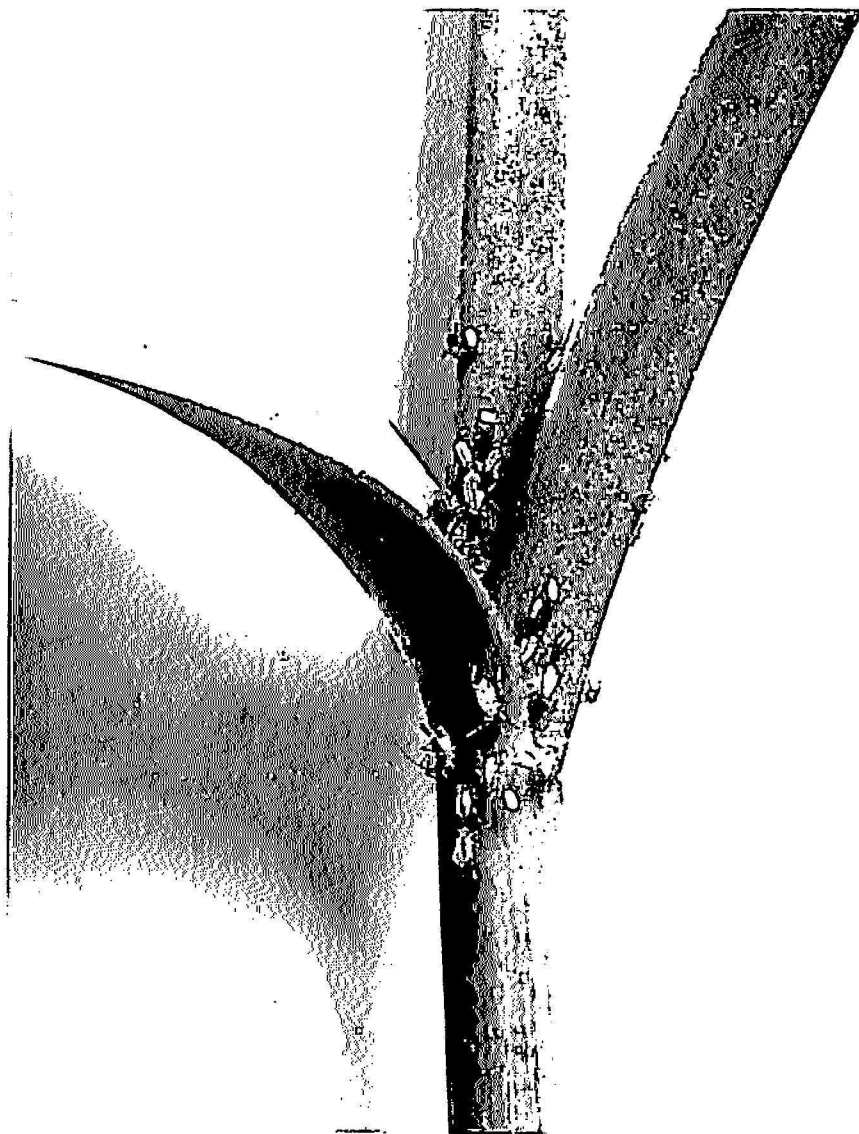


FIG. 1.—*Macrosiphum (Sitobion) luteum* (Buckton), orchid aphid; young aptera forms on a young wild orchid shoot.

and South America and discovered in Hawaii in late 1948. This is a very distinctive species. It can be easily recognized in the field by its bright yellow color and by the circular black spot on the abdomen of the aptera. Although quite unusual to find male aphids in the Tropics and Subtropics, two alate males of this species have been collected in Puerto Rico. The species was recorded by Smith et al. (16) on *Epidendrum cochleatum*. On *Epidendrum* sp., *Dilomilis montana* and *Pleurothallis* sp. near *ruscifolia*, in a greenhouse on the Río Piedras Agricultural Experiment Station grounds where infested material collected at altitudes ranging from 3,000 to 3,600 feet was brought in from the El Yunque Mountains; on *Polystachia extincoria* (= *P. minuta*) on the Cayey-Guayama road, Km 17.5, March 17, 1963; on *Pleurothallis coriacea* at El Toro Negro Unit, Villalba, June 21,

1964 and on *Jacquiniella globosa* in El Verde Mountains, Luquillo National Forest, August 8, 1964 (coll: R. Woodbury). This aphid species also has been recorded from slide mounted material at the U.S. National Museum, Washington, D.C. on *Dendrobium moschatum*, at Santurce, Puerto Rico, July 20, 1932 and on unidentified orchids at Río Piedras and Mayagüez in January and March 1950, respectively.

Myzus (Nectarosiphon) persicae Sulzer, green peach aphid. The apterous forms are pale greenish, the alates are yellowish-green with dark areas on the dorsum of the abdomen. It was recorded on many different host plants by Smith et al. (15) in 1958, later by the same investigators in 1963 (16) on other host plants not previously mentioned. Among these later records, it was reported collected on the wild orchid, *E. secundum*, on the Cayey-Guayama road, April 28, 1960, 2,240 feet above sea level. This is the sole record for this species on orchids in Puerto Rico. It has not been found on cultivated orchids here thus far. *M. persicae* is reported to be a vector of viruses causing flower-breaking disease in *Cattleya* by Jensen (7).

Toxoptera aurantiae (Boyer de Fonscolombe). Another aphid species of economic importance which occurs on host plants such as coffee, citrus, and numerous ornamental plant species. Both apterous and alate forms are black and the alates have clear wings. The species is characterized by the saw-toothed reticulations on the venter beneath the bases of the siphunculi (small spine or horn-like projections at the end of the abdomen on the dorsal side). It has been recorded by Smith et al. (16,17) on *Cattleya lundemania* in Santurce and on *E. secundum* at Maricao. The aphid is not of economic importance in the culture of orchids in Puerto Rico.

FAMILY CONCHASPIDAE

Conchaspis angraeci Cockerell. This striking white scale has been recorded from Jamaica, Trinidad, Mexico and in greenhouses at England and California, U.S.A. *C. angraeci* was recorded by Wolcott (20) as a pest of vanilla at Mayagüez. It has been recorded very recently at Guaynabo on *Angraecum* spp., Oct. 10, 1973 by J. Casso.

FAMILY ASTEROLECANIIDAE

Asterolecanium epidendri (Bouché) (fig. 2). A very strikingly golden and interesting scale insect. It is briefly described as follows: Covering of female broadly elliptical or nearly circular, length 1–1.5 mm, width 0.75–1.25 mm, color yellowish-green to golden-yellow, shiny. According to Merrill (10) its golden to salmon colored marginal fringe is arranged in about 25 groups. This species has been recorded from greenhouses in New York, England, France, and Italy; Brazil, British Guiana, Panama (Canal Zone), Ceylon, Colombia, Costa Rica, Guatemala, Mexico, Portugal,

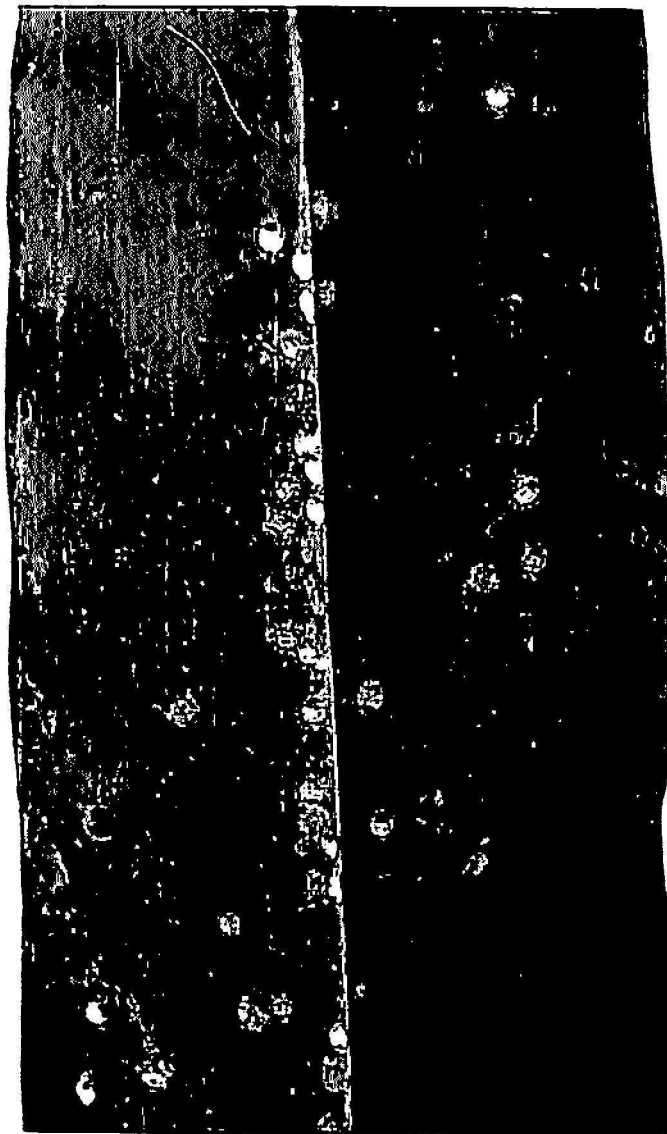


FIG. 2.—*Asterolecanium epidendri* (Bouché). Note the marginal fringe on the light colored scale specimens; the dark colored scales are the females (circular form) and males (elongate, slender) of the scale, *Furcaspis biformis*.

Venezuela, and the West Indies. It has been found only on orchids in Florida. *A. epidendri* was recorded in Metropolitan San Juan on *Oncidium baueri* in 1963, a wild orchid species collected in the Aibonito area. It was observed on the same host at Barranquitas in 1966.

FAMILY COCCIDAE

Saissetia coffeae (Walker), the hemispherical scale. Noted also in the literature under the name *S. hemisphaerica* (Targioni-Tozzetti), this insect has been collected locally on various orchid species. The adult female is recognized by its more or less hemispherical form, oval elongate, very convex with a very smooth shiny surface, brown to dark-brown in color. The width

of the outer covering varies from 1.5 to 3.5 mm and is about 1.75 mm in height. The upper surface has many circular areas readily seen under a hand lens. It has been collected many times by the authors on the *Cattleya* hybrids *Epidendrum brittonianum* (= *Encyclia papilionacea*) and *Oncidium baueri*, the *Phalaenopsis* hybrids *Polystachia extinctoria*, on an unidentified *Bletia*-like orchid in the Metropolitan Area, on *Cattleya* sp. and *Epidendrum*

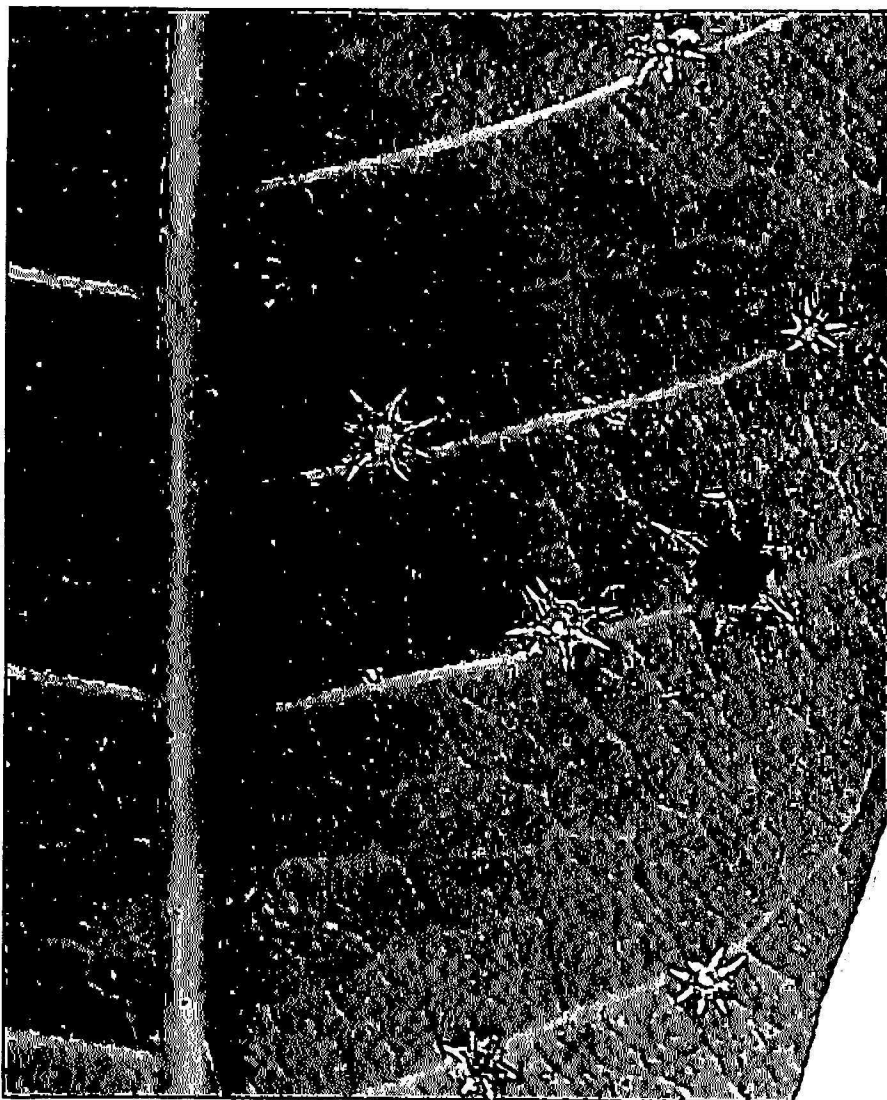


FIG. 3.—*Vinsonia stellifera* (Westwood), the star scale, young and adult forms.

cochleatum prob. var. *triandra* from Panama, at Arecibo, Puerto Rico, and on *E. cochleatum* and *Oncidium variegatum* on the Cayey-Guayama road, Km 17.5, March 17, 1963 at the same date and locality.

Saissetia oleae (Bernard), black scale. This is another of the common coccids infesting a long series of host plants in Puerto Rico. It has been recorded on *Eulophya* sp. in the El Yunque Mountains, June 10, 1964 and on *Epidendrum sintenisii*, on road No. 143 west of Cerro de Punta, Jayuya, June 21, 1964, both collections by R. Woodbury.

Vinsonia stellifera (Westwood), (fig. 3), so-called "star scale." Recorded on *Oncidium baueri* in greenhouses in Metropolitan San Juan, at Arecibo, Mayagüez, and Ponce, on the Cayey-Aibonito road, Km 17.1, March 17, 1963, and at Piedras Chiquitas, Barrio Cuyón, Coamo, 1,800 feet above sea level (coll: Martorell). On *Epidendrum cochleatum* in greenhouses in Metropolitan San Juan and at Ponce; on the Cayey-Guayama road, Km 17.5, March 17, 1963, at Susua State Forest, Sabana Grande, June 4, 1964 and at Maricao State Forest, June 5, 1964. On *Epidendrum ciliare* (= *Auliza ciliaris*) in greenhouses in Metropolitan San Juan, Arecibo, Mayagüez, and Ponce; at the top of a limestone hill on road No. 2, Km. 15.2 west of Bayamón, April 29, 1964 (coll: R. Woodbury). On *Epidendrum brittonianum* at Bayamón, April 29, 1964, on road No. 2 west of Bayamón (coll: R. Woodbury). On *Epidendrum nocturnum* (= *Amphiglottis nocturna*) in a greenhouse at Ponce. On *Maxillaria coccinea* in the El Yunque Mountains, June 10, 1964; abundant on foliage in the El Verde area, Luquillo National Forest, March 11, 1971 (coll: Martorell and Woodbury). On *Pleurothallis pruinosa* at the Maricao State Forest, June 5, 1964. On *Stanhopea wardii*, *Stanhopea* sp., *Cattleya bowringiana*, *Peristeria alata* and *Phaius tankervilleae* in the Metropolitan San Juan area, on *Calanthes* sp., *Epidendrum atropurpureum*, at Mayagüez; on *Cattleya* sp. and *Oncidium variegatum* at Ponce and on *Cattleya* sp. at Fajardo, all in greenhouses. *Vinsonia* attacks *Cattleya* orchids only in greenhouses in which *Cattleya* and susceptible wild species are grown together with touching leaves.

FAMILY DIASPIDIDAE

Diaspis boisduvalli Signoret (fig. 4), commonly known as the "Boisduval scale." Recorded in our preliminary 1959 (8) orchid pest report as "not very abundant here". Further collecting by the authors have proven quite the contrary; this scale insect is quite abundant and pestiferous particularly on cultivated orchid species. Signoret (14) described the species in 1869 and it is listed later in the literature as *Aulacaspis boisduvalli*, *A. cattleyae*, *Diaspis cattleyae* and *D. tentaculatus* according to Fernald (3) and Ferris (4). This scale species has a cosmopolitan distribution in the temperate zones of the world and is known as a greenhouse pest of palms, orchids and cacti in Europe, New Zealand, Australia, Hawaii, Brazil, West Indies, Mexico and Canada, and in the United States in New York, Ohio and Washington, D.C. The adult female scale is almost white, transparent, thin, flat, circular, with the exuviae subcentral. The adult male is white, elongate, and tricarinate. It has been collected locally in greenhouses on *Cattleya forbesii*, *C. gigas*, *C. labiata*, *C. percivaliana*, *C. trianaei*, *Epidendrum cochleatum*, *Brassocattleya* sp., *Ionopsis utricularoides*, *Laeliocattleya* sp., *Schomburgkia humboldti*, *S. tibicinis*, *Oncidium papilio*, *Vanda* spp. var.

Miss Agnes Joaquim and *Vanilla planifolia*. Also on *Epidendrum brittonianum*, west of Bayamón, on road No. 2, Km 15.2, April 25, 1964 (R. Woodbury).

Furcaspis biformis (Cockerell) (fig. 5), brown orchid scale. The adult female is dark, red-brown, circular, moderately convex, and with a subcentral exuviae. The adult male is similar in color to the female, elongate, slender, with the exuviae close to one end. This noxious armored scale, listed in older literature as *Targionia biformis*, is typically a pest of sisal in Puerto Rico, but it also has been collected from "maya," *Bromelia pinguin*, the cycad *Cycas revoluta*, "azucenas" or tuberoses, mango, avocado, and the euphorbiaceous plant *Pedilanthus tithymaloides*, according to Wolcott (19,20). It was first recorded on *Cattleya* orchids in Puerto Rico in 1948 (19).



FIG. 4.—*Diaspis boisduvalli* Signoret, the Boisduval scale on orchid. Note female scale almost white, flat circular, exuviae subcentral; male (white mass in center) elongate and tricarinate.

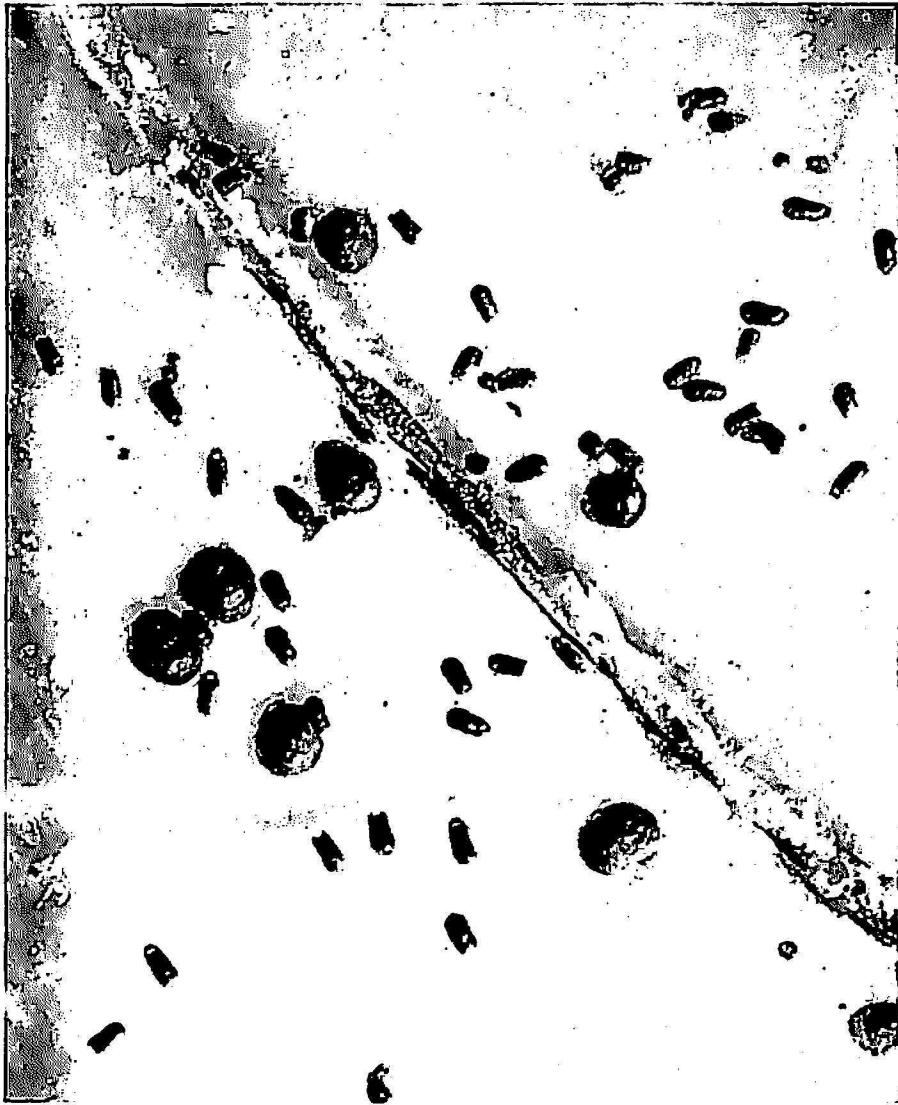


FIG. 5.—*Furcaspis biformis* (Cockerell), the brown orchid scale. The female scale is dark, circular, moderately convex and with a subcentral exuviae; adult male, elongate, slender with exuviae close to one end.

The species has been observed since in many orchidariums in different areas of the Island where it is considered even more abundant and troublesome than *D. boisduvalli*. Host plant records from Island greenhouses are *Brassavola nodosa*, *Brassocattleya flicker*, *Cattleya warneri*, *Cattleya* sp., *Epidendrum altissimum* (Jamaican variety), *Phalaenopsis* sp., *Schomburgkia humboldti*, *Oncidium baueri*, *O. panamensis*, *O. sphacelatum*, and *Vanilla planifolia*. Also on *Epidendrum brittonianum*, west of Bayamón, on road No. 2, Km 15.2, April 25, 1964 (R. Woodbury).

Leucaspis cockerelli (de Charmoy). Described briefly by Merrill (10) as: "Scale of the female long and narrow, with a high rounded central ridge running lengthwise. Length about 2 mm and width about $\frac{1}{3}$ mm, brownish,

sometimes with a purplish tinge on the sides while the ridges and ends are whitish. Scale of male, not observed." This species was collected November 1946 in Florida, U.S.A. Recorded from Puerto Rico for the first time on *Schomburgkia undulata*, in the Metropolitan San Juan area, June 8, 1961. *L. cockerelli* also has been reported from Australia, Brazil, Ceylon, Colombia, Costa Rica, Fiji, Germany, Hawaii, Honduras, Jamaica, Mauritius, Panama, Philippine Islands, Trinidad and Venezuela.

Genaparlatoria pseudaspidiotus (Lindiger). A scale insect of world-wide distribution. The female is oval in shape, slightly to moderately convex, opaque, dark brown with the edges tending to be of a lighter color. The surface is covered with a very light film of waxy or dusty material. Length 1–1.5 mm. Exuviae submarginal, dull green in color. The male scale is smaller and narrower than the female, exuviae marginal. Recorded from Puerto Rico for the first time June 14, 1961; on *Vanda* spp. var. *Miss Agnes Joaquim* in the Metropolitan San Juan area, Arcibo, and Mayagüez. Otherwise recorded from the Canal Zone of Panama, Ceylon, Fiji, Germany, Hawaii, India, Japan, Java, Philippine Islands, Florida, Washington, D.C., and Colorado (in greenhouses in last two localities).

FAMILY PSEUDOCOCCIDAE

Pseudococcus adonidum (L.), long-tailed mealybug. The adult female is recognized by its oval shape, grayish to light yellow in color, covered with a fine powdery, waxy-like, whitish secretion, 2.4–3 mm in length. The species is easily recognized in the field by the unusually long filaments or tassels protruding from its body. Those around the margins are often equal in length to half the width of the body. The four anal tassels give the insect the appearance of having a long tail. The caudal pair are often much longer than the body. This species was collected in the Metropolitan San Juan area on *Sobralia decora* and *Diacrum bicornutum* and in Mayagüez on a *Cattleya* hybrid.

Pseudococcus sp. Collected at Río Piedras on a *Phalaenopsis* hybrid.

FAMILY FULGORIDAE

Ormenis sp. Collected on foliage of *Cattleya* hybrids at Fajardo.

Order Hymenoptera

FAMILY FORMICIDAE

Macromischa isabellae Wheeler. This ant was described from type material collected at an elevation of 3,000 feet at the summit of Monte Morales and Monte Mandíos, selected from colonies found under the roots of epiphytic orchids growing on hollow twigs.

Pheidole megacephala (Fabr.). Intercepted at Hawaii (6) on *Epidendrum ciliare* from Puerto Rico.

Order Isoptera

FAMILY TERMITIDAE

Nasutitermes costalis (Holmgren) and **Nasutitermes nigriceps** (Haldeman). These two common arboreal termite species are found in Puerto Rico and adjacent islands. In several instances they were found infesting orchid roots in greenhouses and orchidariums, particularly those not well cared for in which potted plants were neglected on tables and wooden racks for a long period of time. These infestations resulted in no apparent damage.

Order Orthoptera

FAMILY BLATTIDAE

Members of this family have been recorded as damaging roots of orchids. Swezey (18) listed four species considered to be minor orchid pests: *Blatta orientalis* L., *Periplaneta americana* (L.), *Pycnoscelus surinamensis* (L.), and *Blaberus discoidalis* Serville. *Graptoblatta noctulata* (Stal) has been reported on orchids in India. Three of these species occur in Puerto Rico; *Pycnoscelus*, *Blaberus* and *Periplaneta*. The American cockroach, *P. americana*, has been reported specifically as damaging orchid roots in Puerto Rico.

Order Thysanoptera

FAMILY THRIPIDAE

Hercinothrips femoralis (Reuter). Specimens collected by S. Medina Gaud at the Río Piedras orchidarium were damaging young orchid leaves Feb. 3, 1971.

Aleurodothrips fasciapennis (Franklin). Reported by Medina Gaud as occurring (9) on foliage of *Cattleya* sp. infested by the scale insect *Furcaspis biformis* at Río Piedras, Feb. 1959.

Dinurothrips hookeri Hood. Collected on leaves of *Eulophya* sp. in the El Yunque Mountains, June 10, 1964.

FAMILY PHLAEOTHIRIPIDAE

Haplothrips (Karynothrips) melaleucus (Bagnall). Specimens recorded by Medina Gaud (9) on leaves of *Cattleya* infested with the scale insect *Furcaspis biformis* on the Agricultural Experiment Station grounds,

Río Piedras, in association with *Aleurodothrips fasciapennis* June 24, 1957 and Feb. 11, 1959.

CLASS ARACHNIDA

Order Acarina

FAMILY TENUIPALPIDAE

Tenuipalpus pacificus Baker (fig. 6). This mite, first observed by Mr. Ferdinand Méndez, injuring the undersides of leaves of *Cattleya* spp. at Río Piedras, Feb. 26, 1951 was determined by Dr. Edward W. Baker, USNM, Washington, D.C. It is a serious pest of orchids in California according to Baker.

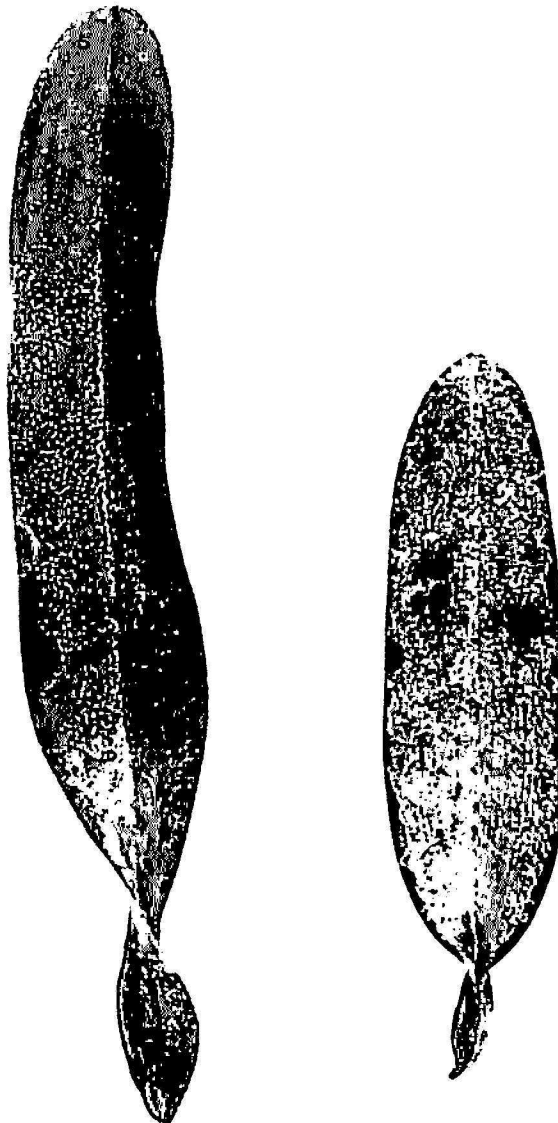


FIG. 6.—Mite damage to *Cattleya* foliage.

PHYLLUM MOLLUSCA

CLASS GASTROPODA⁶

The pests of orchids included here are molluscan gastropods known commonly as snails and slugs with terrestrial habits which when abundant can be very noxious to orchid culture. Most land snails and slugs are nocturnal. They hide during the day in dark areas such as beneath pots, boards, bricks, compost, rotten leaves on the soil, etc. They do most of their feeding at night, late in the afternoon or early in the morning by scraping the leaf epidermis and by eating deep holes in the leaves or flowers. Their primary food, however, consists of organic matter.

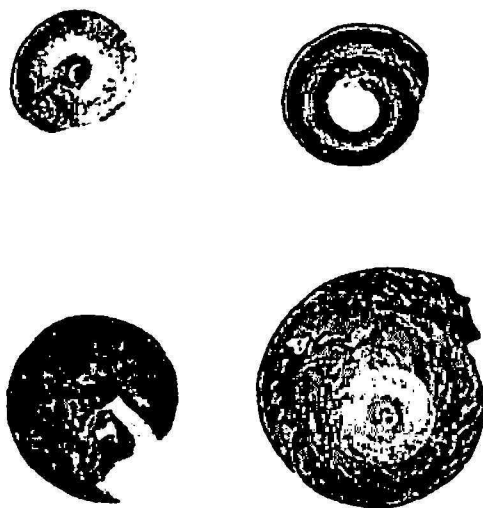


FIG. 7.—From top to bottom: *Caracollus marginella* and *Caracollus caracolla*, large land snails which occur in greenhouses.

Order Stylommatophora

FAMILY CAMAENIDAE

Caracollus caracolla (L.), (fig. 7). This snail is one of the largest of the land snails in Puerto Rico, second in size only to its related species *Polydontes acutangula* Burrows. It is common throughout the Island but particularly abundant in the higher mountainous area of the Luquillo National Forest. This species has been observed in greenhouses in the Metropolitan San Juan area and recorded feeding on the foliage of a wild orchid, *Eulophya* sp. in the El Yunque Mountains, June 10, 1964.

Caracollus marginella (Gmelin) (fig. 7). This species also is found throughout the Island but is more abundant on the northern humid coast

⁶ The land snails and slugs were identified by Dr. Carlos G. Aguayo, malacologist at the Department of Biology, Mayagüez Campus, University of Puerto Rico.

and is common in greenhouses at Mayagüez and in the Metropolitan San Juan area. It apparently does not occur at high altitudes.

Polydontes lima (Férussac). This snail was recorded by Prof. J. A. Ramos as attacking *Cattleya* and its hybrids in greenhouses in the Mayagüez area.

FAMILY BULIMULIDAE

Bulimulus guadalupensis (Bruguiere) (fig. 8). Another common land snail found in greenhouses and outdoors usually in moist situations attached to walls, rocks, fences and benches. It is frequently found on orchid foliage in the Metropolitan San Juan area.

FAMILY SUBULINIDAE

Subulina octona (Bruguiere) (fig. 8). This species is one of the most adaptable and distributed of the tropical snails. It is abundant in greenhouses and extremely common in Puerto Rico from coastal areas to foothills and in higher areas of the forested mountains.



FIG. 8.—From top to bottom: *Alcaldia striata*, *Subulina octona*, and *Bulimulus guadalupensis* are among the most common small-sized land snails attacking orchids in Puerto Rico.



FIG. 9.—*Deroceras laeve* Müller, a small, blackish slug, common in greenhouses, damaging *Phalaenopsis* orchid flowers.

FAMILY LIMACIDAE

***Deroceras laeve* Müller**, (fig. 9). A very small, blackish slug found commonly in greenhouses in the Metropolitan San Juan area and at Barranquitas. It usually attacks buds and petals of the flowers.

Order Soleifera

FAMILY VERONICELLIDAE

***Veronicella cubensis* (Pfeiffer)** (fig. 10). This is the common garden slug of Puerto Rico. The correct name for the species is pending future taxonomical studies according to Dr. Carlos Aguayo. It is one of the most noxious mollusks in local orchid culture. The slugs attack the buds and flowers (fig. 11) as well as foliage. The pest is common on *Cattleya*, particularly in greenhouses at Barranquitas and in the Metropolitan San Juan area.

Order Archaeogastropoda

FAMILY HELICINIDAE

Alcadia striata (Lamarck) (fig. 8). This land snail occurs in two forms in Puerto Rico; one is large and the other is smaller with a thin and simple lip. The latter form is the more common and certain authors referred to it as *A. striata subfusca* (Menke). It occurs commonly in greenhouses at Barranquitas, Mayagüez, and in the Metropolitan San Juan area. *A.*

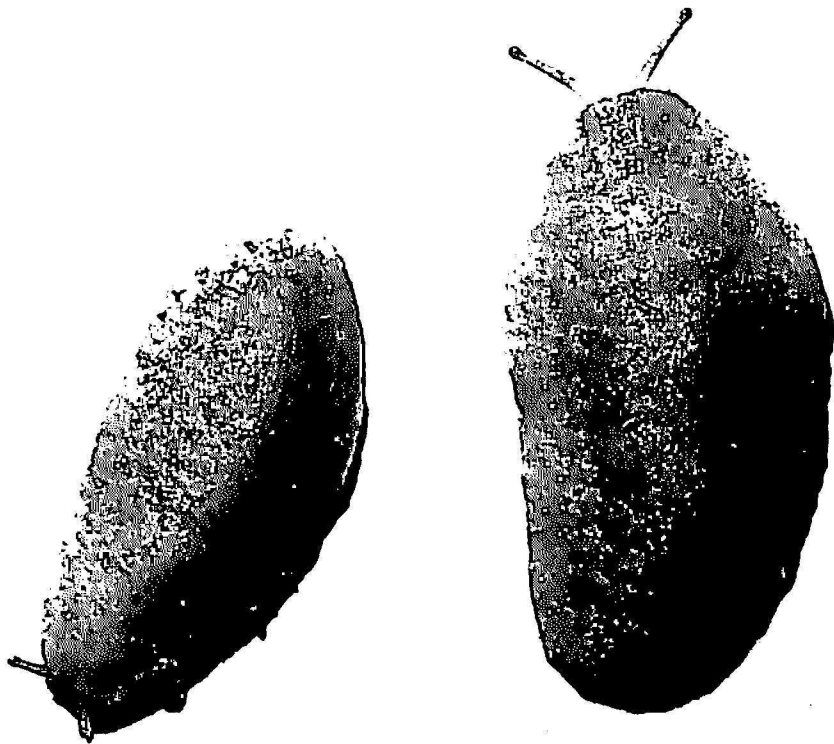


FIG. 10.—*Veronicella cubensis* (Pfeiffer), the common garden slug in Puerto Rico.

striata and *Subulina octona* are the most common land snails in Puerto Rico.

PHYLLUM CHORDATA

CLASS MAMMALIA

Order Rodentia

FAMILY MURIDAE

Mus musculus musculus Linnaeus, common house mouse. This ubiquitous pest has been recorded as damaging the flower buds and young shoots of orchids in greenhouses.



FIG. 11.—*Cattleya* spp. flower damaged by slugs.

SUMMARY

Thirty eight species of animal entities, including insects, mites, snails, slugs and mice are reported as attacking wild and cultivated orchids in Puerto Rico. Brief descriptions, localities, damages caused, and host orchid records are furnished.

RESUMEN

En este trabajo se informan 38 especies de plagas, que incluyen insectos, ácaros, caracoles, lapas y ratones, las cuales se han encontrado atacando orquídeas silvestres y cultivadas en Puerto Rico. En casi todos los casos se informan la localidad en que se encontraron, el daño que ocasionan, las orquídeas afectadas y una breve descripción de las plagas.

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