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NOTES ON INSECT CONDITIONS IN PUERTO RICO FOR THE FISCAL YEAR, JULY 1931 THRU JUNE 1932

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This constitutes the third annual report by the writer on insect conditions in Puerto Rico. The first, for the fiscal year of 1929-1930, was published as part of the Report of the Division of Entomology in the Rept. Ins. Exp. Sta. P. R. for 1929-30, pp. 110-123, 1931. The second appeared in the Jour. Dept. Agr. P. R. 16(2): 121-144, 1932. These two, together with the present paper, constitute Insect Pest Survey reports for the three years covered by them. During this time the writer was acting as an official Collaborator of the Insect Pest Survey of the United States Bureau of Entomology.

Altho this third and last report by the writer includes notes on the occurrence and status of more insects on more food plants than the others, it still does not pretend to present anything like a complete picture of the activities or occurrence of even all of the more important injurious insects of the leading economic plants of the Island. Desirable as such a record would be, especially if followed out from year to year, it is impossible of accomplishment without the expenditure of much more time and money for travel and a greater number of competent observers than we have so far been able to obtain.

The accumulating, recording and arranging of even so comparatively few observations has necessitated the active help of a number of specialists. Most of the determinations or verifications of species unknown or doubtful to the writer have been made by the several well-known taxonomists at the U. S. Bureau of Entomology. In most cases this is indicated along with the individual records, as are also the names of certain other specialists not officially connected with the Bureau. The writer is indebted to Mr. Richard Faxon and his associates Messrs. Mills, Anderson, Harley and Oakley of the San Juan office of the Federal Plant Quarantine and Control Administration. All of these have obtained many records thru their official observations. The identifications of this material are by the special-

ists in Washington. The names of collectors or observers are indicated for the most part by their initials as follows:

C.G.A. = Anderson	R.G.O. = Oakley
R.F. = Faxon	A.S.M. = Mills
A.G.H. = Harley	F.S. = Seín, Jr.
M.D.L. = Leonard	G.N.W. = Wolcott

Dr. W. T. M. Forbes of Cornell University has assisted in completing the notes on some of the Lepidoptera heretofore little known as far as published records were concerned. Prof. C. R. Crosby also of Cornell, has given much appreciated help in facilitating the preparation of the manuscript for publication.

ALFALFA

Dichomeris piperatus Wlsm., an alfalfa leaf-tyer, was destructively abundant during July at Isabela, rendering the alfalfa unfit for feeding in one patch (G.N.W.). In August the leaf-tyer was found to be rather badly infesting a small experimental patch at Maleza in the municipality of Aguadilla; this is in a rather isolated section containing many hat palms and little farming has been done there; the occurrence of the insect here in injurious numbers at some considerable distance from the only other nearest alfalfa grown at the Isabela Sub-station again raises the question as to what the natural leguminous food-plant really is (G.N.W.).

Prodenia ornithogalli Guen., the velvety cutworm, was abundant during July at Isabela attacking a wide variety of hosts including alfalfa, crotalaria and tomatoes, besides numerous weeds (G.N.W.).

Thermesia gemmatilis Hüb., the velvet bean caterpillar, was abundant on the leaves of alfalfa and sword beans at Isabela during July (G.N.W.).

Reuteroscops uvidus Dist., A Mirid bug (H. G. Barber det.) was reported as infesting in small numbers the leaves and flowers of alfalfa at the Demonstration Farm at Arecibo on June 7 (C.G.A.). It was also collected by sweeping weeds at Santurce, June 29 (C.G.A., H.G.Barber det.).

ALGARROBO (*Hymenaea Courbaril* L.)

Myelois decolor Zell. (Pyralidae, C.Heinrich det.). 4 larvae found in 1 out of 6 pods examined at the Demonstration Farm at Arecibo on Mar. 8 (C.G.A.). Not in Wolcott's "List."

Stephanoderes buscki Hopk. (Scolytidae, M.W.Blackman det.) heavily infesting 6 pods examined at the Demonstration Farm at Arecibo on Mar. 8 (C.G.A.). Not in Wolcott's "List."

ANNONA SPP.

Saissetia hemispherica Targ. (Morrison det.) lightly infesting the leaves of a corazón tree (*A. reticulata*) at Corozál, Feb. 9 (C.G.A.).

Bephrata cubensis Ashm., a Eurytomid, (Muesebeck det.) infesting 1 out of 4 fruits examined at Villalba, Oct. 27 (C.G.A.).

Pseudococcus nipae Mask. (Morrison det.) lightly infesting the foliage of a tree at Corozál, Feb. 9 (C.G.A.).

Pseudoaonidia articulatus Morg. (Morrison det.) 3 out of 14 fruits infested at Ponce, Jan. 8 (R.G.O.).

Empoasca n. sp. related to *minuenda* Ball (P.W.Oman det.) breeding in moderate numbers thruout the year on the foliage of 4 trees of *A. diversifolia* at the Station grounds at Río Piedras (M.D.L.).

Patara albidula Westw. (Fulgoridae, P.W.Oman det.). A few adults on the leaves of the above trees, May 20 (A.S.M.).

?*Hyaliodes* n. sp., (Miridae, H.H.Knight det.) bred more or less continuously thruout the year on the foliage of the 4 *Anona diversifolia* trees at the Station; both adults and nymphs in all stages could always be found in small to moderate numbers upon examination of the leaves; the nymphs are whitish and somewhat powdery in appearance; the eggs are undoubtedly inserted in the leaf petiole or in the mid-rib but a search was not made to determine this point. The insect was also noticed thruout the previous year which was the first time it had been reported from Puerto Rico.

AVOCADO

Pseudococcus nipae Mask. (Morrison det.) so badly infested the leaves and twigs of a small tree at Mayagüez on Dec. 12 that it was practically dead (A.G.H.).

Empoasca minuenda Ball (P.W.Oman det.) A moderate number of adults and nymphs found feeding on the leaves of a tree at Santurce on Mar. 1 (A.S.M.).

BANANA

Cosmopolites sordidus Germ., the banana root-weevil, has apparently been about as injurious as during the past year. It of course also affects plantains to which it often seems to do somewhat more damage than to bananas.

Telephanus pallidulus Chevr., a Cucujid, (W.S.Fisher det.). 1 adult was found in a decayed flower-stalk at Bayamón, May 15 (C.G.A.).

Bothriocera venosa Fowl., (P.W.Oman det.) a Fulgorid; small number of adults found on the leaves of 5 plants at Bayamón, Apr. 8 (C.G.A.).

Homophysa dolotalis Möschler (W. Schaus det.). A small number of adults of this Pyralid on the 5 plants mentioned above. It was also taken at light in Bayamón, May 15 (Schaus det., C.G.A.). Apparently previously recorded only from the type material, but Dr. Forbes found the species common and apparently general in 1930.

BEAN (LIMA & STRING)

Tetranychus sp., a mite (H.E.Ewing det.), was found infesting the leaves in most lima bean fields at Loíza examined during January; a few of the leaves had turned yellowish but the damage was only slight (A.S.Mills).

?*Hyalinodes* n. sp. a Mirid (H.H.Knight det.) generally distributed during the end of August in moderate numbers on the underside of the leaves of a small patch of pole limas at the Station in Río Piedras; no nymphs were present; adults also on a small adjoining patch of okra. Both plants were only 25-30 yards away from 4 *Anona diversifolia* trees on which the bugs were breeding.

Agromyza inaequalis Mall. a bean leaf-miner (C.T.Greene det.) infesting with blotch mines practically all the leaves in a small garden patch of limes in Río Piedras, Jan. 15 (R.F.). Blotch mines in bean leaves have been observed in various places thruout the year in moderate numbers and it is presumed that they are made by this species.

Aphis rumicis L. in considerable numbers on a small patch of pole limas at the Station at Río Piedras early in Sept. (M.D.L.) and lightly infesting a 2-acre patch of limas at Loíza, Nov. 6 (A.S.M.; P.W.Mason det. both records).

Megoura viciae Kalt., an aphid (P.W.Mason det.) lightly infested lima bean pods near Río Piedras Feb. 26 (R.F.). Apparently not previously reported from P. R.

Myzus probably n. sp., an aphid (P.W.Mason det.) moderately infesting a patch of string beans at Adjuntas, Mar. 21 (R.G.O.).

Pseudococcus virgatus Ckll. (Morrison det.) lightly but generally infesting a small patch of pole limas at the Station at Río Piedras Sept. 8 (M.D.L.) and lightly infesting the pods of limas at Loíza, Mar. 14 (A.S.M.).

Agallia albidula Uhler, a leafhopper (P.W.Oman det.) lightly infested the leaves of lima beans, cassava melon and tomatoes at Loíza, Nov. 6 (A.S.M.).

Thyantor perditor Fab., a Pentatomid (H.G. Barber det.). Adults in moderate numbers on the leaves of a 3-acre lima bean patch at Loíza, Feb. 7 (A.S.M.).

Lachnopus curvipes Fab., (L.L.Buchanan det.). Several adults of this weevil found resting on plants in a 1-acre patch of limas at Vega Baja, Nov. 24 (A.S.M.).

Laphygma frugiperda A&S. (W. Schaus det.) lightly infested the pods in a 1-acre patch of limas at the Substation at Isabela, Jan. 12 (C.G.A.).

Phytometra oo Cramer, a Noctuid (W. Schaus det.), lightly infested a small garden patch of limas at Río Piedras, Jan. 15 (C.G.A.).

Nezara viridula L. (H.G.Barber det.) moderately infesting the leaves and pods in an acre of limas at Río Piedras, Dec. 12 (A.S.M.); *Nezara viridula* L. occurred in small numbers of adults on the leaves of a 3-acre patch of lima beans at Loíza, Feb. 7 (A.S.M., H.G.Barber det.).

Ellipes minuta Scudder, a Gryllid, (A.N.Caudell det.) found on a lima bean leaf in a small patch at Vega Baja, Nov. 24 (A.S.M.).

Cycloneda limbifer Csy. (E.A.Chapin det.) on a leaf in a small patch of limas at Río Piedras, Jan. 16 (A.S.M.).

Carpolonchaea pendula Bezzi (Sapromyzidae, Aldrich det.). A few larvae, from which adults were reared, in the pods in a hamper of limas at Isabela, Mar. 24 (C.G.A.). Apparently new to P. R.

Callosobruchus chinensis L. (H.S.Barber det.) found in small numbers in lima beans grown in Ponce, and kept in the office, May 25 (R.G.O.). See also under "Miscellaneous."

Corythucha gossypii Fab. was apparently generally distributed and more or less injurious to lima and string beans as usual thruout the year.

Empoasca fabalis DeL., the common bean leafhopper was generally distributed and present in its usual numbers thruout the year, often doing much damage to plantings during the drier periods, especially where they were unsprayed.

Lamprosema indicata Fab, the bean leaf-webber, was undoubtedly more or less injurious wherever beans were grown; it moderately infested pole limas at the Station during July and August but seemed to increase somewhat so that it was often doing considerably injury to all lima bean fields examined in Nov., Dec. and Jan. at Río Pie-

dras, as well as at Vega Baja, Loíza and Isabela. The moths were fairly common at light Sept. 25-27 at Puerto Real, Vieques Id. (M.D.L.).

Larvae of a Eulophid, *Grotiosmyia nigricans* How. (Muesebeck det.) found feeding on larvae of *Lamprosoma indicata* F. at Río Piedras on Jan. 15 (C.G.S.). Apparently not before recorded from Puerto Rico.

Goniurus proteus L., the bean leaf-roller, was also general but observations would indicate only light to moderate damage to limas at Río Piedras, Cidra (1 larva out of 100 plants examined by Mills) and Loíza.

Ceratoma ruficornis Oliv., a bean leaf-beetle, was present to some extent in a number of fields examined; it was reported as moderately infesting a 2-acre field of limas at Loíza on Jan. 8 and lightly infesting a 1-acre field at Río Piedras on Jan. 1 (A.S.M.).

Diabrotica graminea Baly, was undoubtedly general thruout the year as has been the case the past few years; it did considerable damage to the blossoms and leaves of pole limas at the Station and was reported as doing considerable damage also to snap beans at Orocovis on Feb. 2 by Mills.

Bean pod-borers. The comparative abundance of the 3 lepidopterous pod-borers most commonly found in lima and string beans was somewhat different than during the previous year. A report prepared by Messrs Faxon and Mills of the P.Q. & C.A. office in San Juan, altho it covers primarily the shipping season for green beans to the States—Nov. 1 to Mar. 31—fairly well summarizes the situation for the period of the whole fiscal year; it is as follows:

“*Fundella cistipennis* was usually present in small numbers in lima beans that were being shipped to the States. In previous seasons *Etiella zinckenella* Treit. appeared to be more prevalent than *Fundella*, but this season the situation was reversed as *Fundella* larvae were found to be more frequently in the pods of lima beans than either *Maruca testulalis* Geyer or *Etiella zinckenella*. The infestations of *Fundella cistipennis* were light, the highest being 3 per cent found in a hamper from Isabela. It was found to be present in shipments from Loíza, Vega Baja, Arecibo, Isabela and Adjuntas. Fifteen collections were forwarded to Washington for determination and many more could have been sent from other shipments. *Etiella zinckenella* was found only in 3 shipments of lima beans and 4 of gandules (pigeon peas).”

“*Maruca testulalis* was difficult to find until January, 1932 and the later infestations in lima and string beans and gandules were

usually light. This was particularly true of gandules as only one interception was made in cull pods at Arecibo, altho hundreds of boxes were shipped to the States. Practically the only serious infestation in lima beans was found at Cidra, Feb. 26, where 11 per cent of the pods in a 3-acre field of bush limas were infested with *Maruca* larvae. Sixteen collections were sent to Washington for determination from beans grown at Loíza, Río Piedras, Vega Baja, Arecibo, Isabela, Cidra and Cayey."

It is interesting to note that only 1 moth of *Etiella zinckenella* was taken by the writer during three nights of collecting at light at Puerto Real, Vieques Id., Sept. 25-26, year.

An adult of *Microbracon thurberiphagae* Mues. (Muesebeck det.) reared from a larva found on a larva of *Maruca testulalis* Geyer in a hamper of lima bean pods from Vega Baja, Mar. 24 (C.G.A.). Three larvae of this parasite were also found infesting 1 out of 20 larvae of *Maruca testulalis* in lima bean pods at Cidra, Feb. 2 (A.S.M.). The first record for Puerto Rico; Bruner has recently recorded it from Cuba from the same host.

BEEET

Disomycha laevigata Jacoby was observed lightly infesting a small patch of beets at Jayuya on June 14 (R.G.O.) but was undoubtedly generally distributed and injurious as usual to beets, swiss chard and related crops. (See also "Micellaneous").

BIDENS PILOSA RADIATA

Thrips abdominalis in moderate numbers in the flowers at Río Piedras on May 31 (A.S.M.; J.R. Watson det.).

Protalebra brasiliensis DeL., known to be a minor pest of sugar cane, continued to be abundant thruout this past year as during the previous one on all patches of the weed at El Morro in San Juan. It seemed to be very scarce if at all present at the Station in Río Piedras on the same food-plant.

BOOKS

Rhizophortha dominica Fab. (*R. pusilla* Fab. is a synonym, A.J. Mutchler det.) according to Dr. Wm. A. Hoffman has done considerable damage to the books in the library of the School of Tropical Medicine thruout the year and for a couple of years previous. It is a cosmopolitan Bostrychid beetle injurious to lumber.

BOUGAINVILLIA

Orthesia insignis Douglas was reported as badly infesting a large vine at a home in Santurce on Apr. 20 and on Apr. 22 specimens were received from Bayamón with the statement that an unidentified tropical ornamental was rather badly infested.

CABBAGE

Plutella maculipennis Curtis, the diamond-back moth, was observed in a number of places and was presumably as common and injurious as formerly.

A slug, *Veronicella occidentalis* Guilding, reported as doing considerable damage to cabbage, but also eating holes in green tomato fruits in a 1-acre garden planting at Trujillo during April.

Corythaica planaris Uhl., the eggplant lace-bug, was found in small numbers, adults, in a planting at Ponce on May 14 (R.G.O., H.G.Barber det.).

CACARA TUBEROSA (Lam.) Britton

Alysia analis Cress. was found on several plants at Ponce on June 28 (R.G.O., Muesebeck det.).

CANNA

Calpododes ethlius Cramer, the canna leaf-roller, became destructively abundant during July on a number of plants at Isabela, averaging 1 or 2 larvae per plant (G.N.W.); it was observed in several other localities also.

Frankliniella insularis Franklin. See under "Rose" for note on damage to canna blooms.

CARROT

Systema basalis Duv. was observed in large numbers on the leaves in a 1/10-acre planting at Jayuya on June 14 (R.G.O., H.S.Barber det.).

CASHEW NUT (*Anacardium occidentale* L.)

Selenothrips rubrocinctus Giard, the red-banded thrips, defoliated several trees at Río Piedras in September and was again observed infesting the new foliage on the same trees the following February; in April a tree in another place near Río Piedras was badly infested (F.S.).

CASSAVA

Saissetia oleae Bernard so badly infested several considerable sized plantings from 6 months to 1 year old at the Manicomio near Río Piedras the latter part of July that many of the plants were entirely devoid of leaves and in a dying condition; several branches submitted for identification were badly encrusted with the scales in all stages of growth (S.Molinary).

An unidentified *whitish scale* was also present in the above infestation but apparently not as abundant as the other altho one of the branches brought in was badly infested.

Lonchaea chalybea Weid., the cassava shoot-borer, was received under date of Oct. 2 from the Agricultural Agent at Bayamón who stated that for some little time the insect had been very common in all the plantings in the district and had considerably reduced the yield.

Cryptosephalus tristiculus Weise, a Chrysomelid, (H.S.Barber det.), was found, 1 adult, on a leaf of one plant Apr. 29 (C.G.A.) at Lares.

Aphodius lividus Oliv. was found, 2 adults, on a plant at Santurce on June 29 (C.G.A., H.S.Barber det.).

Red-spiders, *Tetranychus* sp., were more or less injurious as usual, especially during the drier periods.

CASSIA SIAMEA

Asterolecanium pustulans Ckll. was observed to be badly infesting several ornamental trees at the Director's home on the Station grounds on May 6 at Río Piedras (F.S.).

CASTOR BEAN

Corythucha gossypii Fab. was more or less abundant on nearly all plants observed in various parts of the Island thruout the year as is usual.

CASUARINA EUISETIFOLIA Forst

This tree which is widely grown in Puerto Rico as an ornamental and as a wind-break for citrus had heretofore been considered as practically if not entirely immune from insect attack in the Island. Continued obseration has finally disclosed the following insect pests:

Icerya purchasi Mask., the cottony cushion—scale was first found in very small numbers in Santurce in October but during the late winter and spring and early summer it became generally distributed

and often injurious on ornamental casuarina trees and hedges thruout San Juan and Santurce south to at least Martín Peña and also infested wind-breaks in several citrus groves in Palo Seco, Bayamón and Dorado.

Icerya monserratis R.&H., another mealy bug which has been long known to infest *Ficus nitida* or West Indian Laurel (which see) in Puerto Rico was brought in on April 10 by Edumudo Martínez of the Insular Forest Service as moderately infesting all the casuarina trees in the Plaza at Cayey. He stated that there had been some rain there recently and that the insects were apparently somewhat less numerous than at a previous inspection about 3 weeks or a month ago.

Howardia biclavis Comstk. (Morrison det.) was found infesting a number of trees at the Scoville place on the Carolina road near Río Piedras (G.N.W.); it was also collected in moderate abundance on several small trees at the Forest Service Station at Río Piedras on Mar. 29 (M.D.L.).

Hemichionaspis minor strachani Cooley (Morrison det.) was also collected from one tree lightly infested at the Forest Service Station on Mar. 29 (M.D.L.).

Diaprepes spengleri L. adults were observed in considerable numbers in copula and apparently feeding to a slight extent on a hedge near San Juan on May 7 (M.D.L.).

CEDRO HEMBRA (*Turpinia paniculata* Vent.)

Hypsiphila grandella Zell., a lepidopterous shoot-borer (Heinrich det.), was reported on June 11 as injuring to a considerable extent about 4,000 trees planted among coffee for shade at Jayuya and on June 29, 1931, 1,000 young trees recently planted in a coffee finca at Adjuntas. In mid-July F. Seín Jr. reported that a number of young trees were moderately infested in the Rural School planting in Lares. This pest was also generally present and badly skeletonizing these shade trees in another large coffee finca (Hacienda Carmelita) in the general vicinity of Adjuntas in September.

CELERY

A mealy-bug, presumably *Pseudococcus citri* Risso, was found on July 2 to be moderately infesting several plants (one badly infested) at the Station grounds in Río Piedras. The bugs were clustered at the base of the plants just above the ground and a few were on the roots. There is only one previous record for celery in Puerto Rico—collected by T. H. Jones, July 3, 1912, Río Piedras, Morrison det.

CHALCAS EXOTICA

Coccus viridis Green, the green scale, was observed on the leaves and twigs of one bush at Vega Baja on Dec. 29 (R.F.).

CHAYOTE

Margaronia nitidalis Cr. 2 larvae in a crate on Feb. 26 for shipment to the States (C.G.A., Schaus det.).

CHICK PEA

Rhizopertha dominicana Fab., a Bostrychid beetle, was found infesting about 10 per cent of the peas in a small package in Santurce on Nov. 11 (R.G.O., W.S.Fisher det.).

Cephalonomyia gallicola Ashm., (Muesebeck det.) was lightly infesting a package the same package (R.G.O.). Not in Wolcott's "List".

CHOCOLATE

Oryzaephilus surinamensis L., the saw-toothed grain beetle, was found, several adults, larvae and pupae, in the chocolate coating of candies from Switzerland via New York about a year previous (A. S.M., Fisher & Boving det.).

Laemophlaeus minutus Oliv. (Fisher det.). An adult on chocolate cake in a restaurant in San Juan, June (C.G.A.).

CHRYSOBALANUS ICACO L.

Nessorhinus vulpes A. & S. (Membracidae, P.W.Oman det.). A few adults on the stems of hicaco at Arecibo, May 20 (C.G.A.) Not in Wolcott's "List".

CITRUS

Icerya purchasi Mask., the cottony cushion-scale, was first discovered in considerable abundance on a number of grapefruit trees in a large grove at Palo Seco on April 2. Continued search from then on to the end of June discovered infestation in grapefruit groves in Bayamón and Dorado, 6 in all, and on many ornamental citrus trees thruout San Juan and Santurce south to at least Martin Peña. In 3 or 4 of these groves the infestation developed rapidly to considerable proportions but it was largely checked by the end of the year by spraying, native natural enemies and the prompt introduction of the Australian or *Vedalia* ladybeetles. The most efficient and widespread parasite was a Phorid fly, *Syneura cocciphila* Coq.,

which was present in nearly every infestation found on all food-plants, often killing as high as 50 per cent of the insects in large individual colonies. Other natural enemies were the lace-wing fly, *Chrysopa collaris* Schneider, the common Coccinellid, *Cycloneda sanguinea* L. and often where well-established dense colonies were present the scavenger and scale-feeding caterpillar, *Ereuntis minuscula* Wlsm. Food-plants other than citrus were: Australian pine, *Casuarina equisetifolia*; rose; gallego, *Polsias guilfoylei*; gallito, *Agati grandiflora*; pigeon pea; María, *Callophyllum antillanum*; and *Acalypha* sp.

Asynapta citrinae Felt an Itonid cambium miner found in July in grapefruit twigs at Isabela; the pink maggots formed cocoons in the soil on July 11 and 2 adults emerged on July 15 (G.N.W.).

A snail, as yet undetermined, of small size, skeletonized the leaves in a seed-bed of several thousand grapefruits at the experimental plantings at Trujillo Alto the end of August; the seedlings were not more than 6 ins. high and were generally infested, about 5 per cent being killed before control measures could be applied (E.H. Twight).

A mite, *Uropoda* sp. (H.E.Ewing det.) found infesting the skin of 1 out of 50 grapefruits examined at Mayagüez on Jan. 22 (A.G.H.).

Catyclysta miralis Möschler (Wm. Schaus det.) a Pyralid moth taken on a kumquat leaf at Río Piedras Mar. 15 (A.S.M.).

Lachnopus curvipes Fab., a weevil, was reported by Dr. Wolcott to be locally more abundant around Isabela during July than the common "vaquita", *Diaprepes spengleri*, which causes the bulk of the injury to citrus foliage. A small number of adults were found on grapefruit leaves at Barceloneta on May 10 and a few eating the leaves in a grove at Vega Alta on May 15 (C.G.A.).

Diaprepes spengleri L. and its varieties was about as abundant, with local variations, as usual thruout the citrus section, doing considerable damage to foliage and often causing very young fruits to drop by cutting them off at the stem attachment. In general the season of greatest abundance of adults was apparently April or May into June or July. Dr. Wolcott reported that in September adults were less abundant at Isabela and only 1 or 2 egg-clusters could be found after several hours search on a certain day, whereas many were found toward the end of August in the same place in a much shorter time.

Exopthalmodes roseipes Chev., the "vaquita verde" beetles were present during the spring and early summer as usual doing injury

to citrus foliage; they were observed as especially abundant in May in several grapefruit groves in Palo Seco, Manatí and Vega Alta.

Blossom thrips were common in various parts of the citrus section during a considerable blossoming period from April into May. Specimens were identified by J.R. Watson as *Frankliniella difficilis* Hood and *F. insularis* Fkln. The latter is the common black blossom thrips thruout the West Indies. *F. cubensis* Hood, a yellow species, was also apparently involved. It should be here noted that the writer overlooked in a note on citrus thrips in Puerto Rico (Jour. Econ. Ent. 25(4):934-935, 1932) that Dozier had listed *F. tritici* Fitch as taken in grapefruit blossoms at Trujillo Alto (Jour. Dept. Agr. P. R. 10(3&4):280, 1926, issued 1927).

Papilio androgeus Cr., the orange dog, was reared to adult on July 12 from a caterpillar found on grapefruit foliage sometime previous in Isabela; 2 other caterpillars brought in on the 12th (G.N.W.).

Corythucha gossypii Fab. was observed in several places from time to time infesting both grapefruit and lime and citron foliage but more abundant and actively breeding on the last especially at Palo Seco and Río Piedras.

Fecelia minor Voll. (Pentatomidae, H.G.Barber det.) adults found in small numbers on the fruit in an orange grove near Ponce and in two groves near Peñuelas on Jan. 25 and on March 8 (R.G.O.). Adults were very prevalent during January and February in the Ponce district on wild oranges causing about an 8 per cent loss of fruit. Not in Wolcott's "List."

Dialeurodes citrifolii Morg., the cloudy winged whitefly, heavily infesting the leaves of two lime trees at Ponce on April 8 (R.G.O., Morrison det.).

Pseudococcus citri Risso, the citrus mealybug, was observed to be fairly common on the larger branches of grapefruit trees in several groves in the eastern part of the citrus section.

Piezosternum subulatum Thunb. (Pentatomidae, H.G.Barber det.). 1 adult on a grapefruit leaf at Bayamón on June 12 (C.G.A.).

Toxoptera aurantii Boyer was moderate to abundant on new growth during the spring in grapefruit in several sections, being especially noted at Arecibo, Bayamón and Manatí.

Aphis gossypii Glov., the melon aphid, heavily infested the tender shoots and leaves of many young grapefruit trees at Añasco on Jan. 27 (A.G.H., P.W.Mason det.). Apparently the first record of injury to citrus in Puerto Rico.

Aleurothrixus howardi Quaint. (G.B.Merrill det.) was observed in moderate numbers on grapefruit leaves on several trees in a large grove in Palo Seco during April and on one tree in a grove at Toa Baja in May (A.S.M., M.D.L.).

Eugnathodus guajanae DeL. (Cicadellidae, P.W.Oman det.) an adult on a grapefruit leaf at Bayamón, May 15 (C.G.A.).

Dikraneura (Hyloidea) depressa McAtee (Cicadellidae, P. W. Oman det.) in small numbers, adults, on several grapefruit trees at Arecibo, Apr. 5 (R.F.). Not in Wolcott's "List."

Empoasca minuenda Ball (Cicadellidae, P.W.Oman det.) present in small numbers as adults on grapefruit leaves in a grove at Arecibo on Apr. 5 (C.G.A.). Not in Wolcott's "List."

Ormenis infuscata Stål (Fulgoridae, P.W.Oman det.). Several adults on grapefruit leaves at Arecibo, Apr. 5 (C.G.S.).

Ormenis quadripunctata Fab. (Fulgoridae, P.W.Oman det.) a few adults on grapefruit leaves at Bayamón on Apr. 8 (A.S.M.).

Delphacodes sp. probably new (Fulgoridae, P.W.Oman det.)—an adult on a grapefruit leaf, Bayamón May 15 (C.G.A.).

Ecpanteria icasia Cram. (Arectidae, Schaus det.)—an adult reared from a larva on a grapefruit leaf, Bayamón, May 15 (C.G.A.).

Edessa cornuta Burm. (Pentatomidae, H.G.Barber det.) in small numbers as adults on grapefruit leaves on several trees at Bayamón on Apr. 15 (C.G.A.).

Rhaptinus torquatus Oliv. (Curculionidae, L.L.Buchanan det.) in small numbers on grapefruit leaves at Las Marías, May 3 (C.G.A.).

Brentus volvulus Fab. (Brentidae, L.L.Buchanan det.) adults found on grapefruit blossoms at Mayagüez, May 17 (A.G.H.).

Chionaspis citri Comstock, was common to abundant on the trunks and larger branches of many grapefruit trees examined during April and May in groves at both Palo Seco and Bayamón; a considerable percentage of the male scales had parasite emergence holes.

Ceroplastes floridensis Comstock, the wax scale, was present in small numbers on a few grapefruit trees in a grove at Palo Seco and was also observed in one or two other places in the eastern part of the citrus section.

Anastrepha sp. the west Indian fruit-fly was found lightly infesting a few grapefruits in one grove near Mayagüez and in two groves near Arecibo in April.

COCONUT

Aspidiotus destructor Sign., the coconut scale, was reported by F. Méndez, Coconut Specialist at the Station, as being not nearly so

abundant at Cabo Rojo in September as it had been 5 or 6 months previously. On Sept. 26, as far as could be observed practically every coconut palm on Vieques Island was more or less infested, those towards the eastern and drier end of the Island especially so, many palms having a sickly and yellow appearance and in some cases even the fruits were encrusted with the scales.

COFFEE

Leucoptera coffeella Staint., the coffee leaf-miner, was generally distributed and quite abundant thru the whole of the Hacienda Carmelita, a large coffee farm in the vicinity of Jayuya, visited Sept. 9-10 but apparently not much damage was being done to bearing trees. According to Vicente Medina, Coffee Specialist at the Insular Experiment Station, the leafminer was more abundant during Dec. and Jan. than the two previous months due to generally dry weather thruout the coffee growing regions.

Coccus viridis Green, the green scale, was general tho not very abundant thruout the Hacienda Carmelita on the visit referred to above, the younger shoots and leaves being more infested than older parts, as is usual.

Psychonoctua personalis Grote, a Coffee stem-borer was received under date of Sept. 29 in injured branches from the Agr. Agent at Corozal with the statement that considerable damage was being done by the hollowed-out branches being broken off when they were bent down by the pickers.

Apate francisca Fab., a coffee stem-borer, was reported by Vicente Medina of the Station staff as damaging some trees on a farm at Adjuntas on April 18.

Psyllia minuticonica Cwfd. present in small numbers as adults on coffee leaves at Adjuntas April 14 (R.G.O., P.W. Oman det.).

Bothriocera venosa Fowl. (Fulgoridae, P.W. Oman det.), in small numbers as adults on coffee leaves at Adjuntas, April 14 (R.G.O.).

Scymnillodes gilvifrons Chpn. (Nitidulidae, E.A. Chapin det.) on coffee leaves at the Torres finca at Adjuntas, April 14 (R.G.O.). Not in Wolcott's "List."

Psorolyma maxillosa Sic. (Coccinellidae, E.A. Chapin det.) in small numbers on the leaves out of 30 plants examined at Utuado on May 17 (R.G.O.).

CORN

Heliothis obsoleta Fab, the corn earworm, infested practically every ear of sweet corn at Isabela during September (G.N.W.); the

ears in 4 boxes of corn from Añasco examined Mar. 7 were heavily infested (A.G.H.).

Diabrotica graminea Baly was abundant and injurious to corn at Isabela during July (G.N.W.).

Disonycha laevigata Jacoby present in large numbers on corn leaf-sheaths at Loíza on April 11 (C.G.A.).

Peregrinus maidis Ashm. adults common on leaf-sheaths of several plants at Loíza Apr. 11 (C.G.A.).

Solubea pugnax Fab., (H.G.Barber det.) in small numbers as adults on corn leaves at Jayuya on May 14 (R.G.O.).

Orius (Triphleps) insidiosus Say (Anthocoridae, H.G.Barber det.) adults common on leaf-sheaths of several plants at Loíza, Apr. 14 (C.G.A.).

Laphygma frugiperda A. & S. moderately infesting corn ears at Loíza, Apr. 11 (C.G.A.).

Oscinella coxendix Fitch. (J.M.A.Ildrich det.) common on leaf-sheaths of several plants at Loíza, Apr. 11 (C.G.A.). This species is little-known in Puerto Rico.

COTTON

Pectinophora gossypiella Saund., the pink bollworm, was much less injurious to this past year's crop than to that of the previous year; the explanation for this is not clear. The clean-up, altho not carried out as thoroly as had been hoped for on the crop remnants from the previous season, might have been responsible for some reduction in the pink bollworm population. The acreage in cotton was greatly reduced, however, especially in the South Coast and theoretically there should have been a greater infestation. As an example of the reduced infestation it may be stated that as late as Jan. 20 J. Pastor Rodríguez, Cotton Specialist at the Station, reported a 1-acre field in the South Coast, which last year had been very badly infested, to show less than 1 per cent of the bolls infested and a nearby field only about 5 per cent. (For a more complete account of conditions covering the infestation of the previous crop thru picking into the fall of 1931 on the North Coast see Leonard in Jour. Dept. Agr. P. R. 16(1) : 65-73, 1932).

Alabama argillacea Hübner, the cotton leaf-worm, was also much less numerous and injurious than during the previous crop; it was, in fact, practically negligible; two small outbreaks were reported from the South Coast during the latter part of December and the middle of January but these were easily controlled by two applications of poison. During July (on the previous crop) it was destruc-

tive thruout the whole North Coast but most injurious around Isabela and Camuy; during August the attacks naturally abated on the North coast due largely to the fact that most of the plants by that time were old and no longer succulent. According to F.E.Rorke of the San Juan Ginnery at least 80-85 per cent of the crop had been picked by the end of August in the North Coast but the leaf-worm continued active until at least the middle of the month around Manatí and apparently there was a certain amount of leaf-worm feeding in several other localities.

Dysdercus spp., mostly *D. andreae* L, the common cotton stainer, with occasionally undoubtedly a slight intermixture of *D. neglectus* Uhl. were more or less abundant on cotton bolls as usual, especially during the end of the crop, but altho they are responsible for some staining of the lint no attempt has been made to estimate how much damage is done.

Empoasca sp. leafhoppers were always to be found as usual in small to moderate numbers in all stages on the plants. Altho the Puerto Rican specimens have never as yet been specifically determined they probably belong to *E. gossypii* DeL described from Haiti in the April 1932 number of this Journal.

Nepticula gossypii Fbs. & Leon., the cotton leaf-miner, was present apparently in about the same numbers on the South Coast as during the previous year but as before was not observed to occur in the North Coast.

Ephestia cautella Wlk. (Pyralidae, Heinrich det.). A few adults observed on several tons of cotton seed cake at the Ginnery at Hato Rey on Mar. 9 (A.S.M.); an adult was also taken on a sword-bean leaf at Arecibo on Mar. 8 (C.G.A.).

CROTALARIA

Utethesia ornatrix L., the rattlebox moth, was reported as very abundant by Dr. Wolcott the middle of Oct., the caterpillars searching for food in great numbers on the beaches at Isabela; the moths were also common at lights at Isabela. This species was more or less injurious as usual to Crotalaria grown for seed thruout the Island.

Nezara viridula L. was present in large numbers, both as nymphs and adults, on the leaves and pods on the Preston farm at Naguabo on June 3 (C.G.A., H.G.Barber det.).

Nezara marginata P. de B. Many specimens clustered on a single pod at Isabela in July (G.N.W.).

Delphacodes teapae Fowl. (Fulgoridae, P.W.Oman det.). A few adults on the leaves at the Preston farm at Naguabo on June 3 (C.G.A.).

CUCUMBER AND MELON

Aphis gossypii Glov. was troublesome to cucumbers at the Station during July necessitating frequent spraying. It also heavily infested a 2-acre planting of cassava melons at Loíza in January (A.S.M., P.W.Mason det.). It was undoubtedly general and injurious as usual.

Diabrotica graminea Baly (H.G.Barber det.) was doing light damage on a 2-acre planting of squash at Vega Alta on Nov. 24 (A.S.M.).

Diabrotica innuba Fab., a leaf-beetle, was quite abundant on cantaloupes at Isabela in July (G.N.W.).

Diaphania hyalinata L., the melon worm, was observed the end of July to be considerably injuring the leaves and blossom-buds of a fair-sized patch of cucumbers at the Station at Río Piedras; the vines were just beginning to run and no fruit had set as yet. It necessitated spraying almost every other day during August. On Jan. 4 it was observed doing considerable damage to young cassava melon vines at Loíza; moderate damage observed on squash vines at Vega Alta in Nov. and to cucumber at Manatí in January; in a well sprayed field of cucumbers, however, at Barceloneta only slight damage was being done (A.S.M.).

Nezara viridula L. lightly infested squash leaves in a 2-acre field at Vega Alta, Nov. 24 (A.S.M.).

Margaronia nitidalis Cr., the pickle worm,—a single larva found in a fruit while examining a crate offered for shipment; the adult was reared (A.S.M., Schaus det.).

Agallia albidula Uhl. (P.W.Oman det.) lightly infested cassava melon at Loíza, Nov. 6 (A.S.M.).

Argyria diplomachalis Dyar (Pyrilidae, Wm. Schaus det.) one adult resting on a cucumber leaf at Loíza, Mar. 14 (A.S.M.). Only one previous published record—"on weeds and at light" Río Piedras, 1916.

DASHEEN

Atherigona orientalis Schiner (Anthomyidae, Aldrich det.) maggots were found infesting 1 root out of 10 examined in the Public Market in San Juan on Mar. 30 (C.G.A.). Apparently not previously listed from P. R.

EGGPLANT

Epitrix parvula Fab., the tobacco flea beetle, heavily infesting 20 plants examined at Loíza on Mar. 14 (A.S.M.; H.S.Barber det.).

Myzus persicae Sulz. moderately infesting 20 plants at Loíza in March but it was injurious in other places also during the year as usual.

Lysiphlebus testaceipes Cress. Adults were numerous on eggplant leaves at Loíza, Mar. 14 where they were undoubtedly parasitizing aphids which were numerous on the plants (C.G.A.) Musebeck det.).

Coyrthaica planaris Uhl. (= *C. monacha* Stal.) was observed moderately infesting the foliage of about 10 out of 40 plants examined at Juncos on Jan. 25 (R.F., H.G.Barber det.). Altho few definite observations were made other than this it was undoubtedly present and more or less injurious as usual.

Aleurotrachelus trachoides Back, badly infesting a number of experimental potted plants in the Station greenhouses during April.

Argyria opposita Zell. (Pyralidae, Schaus det.). 5 moths collected on eggplant leaves at Juncos, Jan. 25 (R.F.). Not in Wolcott's "List."

Kaloterme marginipennis intercepted in a shipment of egg-plants from Puerto Rico (S.R.A., P.Q. & C.A., issued March, 1932, p, 347). Not in Wolcott's "List."

FICUS SP.

Diaprepes spengleri L., adults were present in fair numbers (but less so than on the same trees last June) on several trees of a *Ficus* probably *laevigata* near Santa Isabel on August 20-22, 1931. 35 egg masses were collected with Dr. J. G. Myers during several hours careful search in an effort to obtain Trichogrammatid egg-parasites for introduction into Barbados. The percentage of parasitism could not to determined at the time.

GALLEGO (*Polysias Guilfoylei*)

Icerya purchasi Mask., the cottony-cushion scale, was first found infesting this plant on Feb. 26 in Santurce. During the spring gallego trees were found infested at Palo Seco and in one or two other localities.

GOMPHRENA DISPERSA Standley

Hymenia fascialis Cramer continued to be abundant on this weed at El Morro in San Juan, the larvae webbing together and skeletonizing the leaves.

GRAPE

Aphis illinoisensis Shimer, the black grape aphid, was present in small numbers on several vines in an arbor at Ponce early in March. It was also abundant on the tender shoots of a fairly large arbor at Puerto Real, Vieques Island, Sept. 8.

GRASSES

Scapteriscus didactylus Scudder, the changa, did considerable damage to the St. Augustine grass in the fairways on the golf course at San Juan during dry weather in the spring of 1932.

Cicadella similis Walker (P.W.Oman det.) adults were very abundant on mallojillo or Para grass, *Panicum barbinode*, at Bayamón, May 15 (C.G.A.).

Collaris oleosa Dist. (Miridae, H.G.Barber det.) adults numerous on Para grass at Bayamón, May 15 (C.G.A.). Not in Wolcott's "List."

Zelus subimpressus Stal (H.G.Barber det.) adults numerous on Para grass at Bayamón, May 15 (C.G.A.). Not in Wolcott's "List."

Catorhintha guttula Fab. (H.G.Barber det.) a small number of adults on grass at Ponce, June 8 (R.G.O.).

Mormidea cubrosa Dallas (H.G.Barber det.) present in moderate numbers on grass at Ponce, May 13 (R.G.O.). Not in Wolcott's "List."

Psara phaeopteralis Guen. was reported on July 8 as injurious to "gramma" grass (St. Augustine grass) at Isabela. The grass on a large lawn was worse affected in the shade than in the sun (G.N.W.).

GUAVA

Leptomastix dactylopii Howard (Encyrtidae, Muesebeck det.). A pupa found in a guava fruit infested with *Anastrepha* sp. larvae (C.G.H.). Not in Wolcott's "List."

Coccus viridis Green, the green scale, moderately infesting the leaves of two bushes at Arecibo, Feb. 23 (A.S.M.).

Lechriops psidii Marshall (Curculionidae, Buchanan & Boving det.) larvae in mummied fruits at the Atlas Fruit Co. in Bayamón, Jan. 11 (C.G.A.). Apparently the second record from P. R., the type being the first.

Ormenis infusata Stal (P.W.Oman det.) one adult on a guava leaf at Arecibo, Jan. 26 (R.F.).

Xyleborus sacchari Hopk. (Blackman det.) reported as infesting 2 out of 10 fruits examined at Cabo Rojo, Sept. 16 (A.G.H.).

Leptoglossus stigma Hbst. (H.G.Barber det.) abundant on the leaves of 3 guava bushes at Cidra, Nov. 13 and many adults on a bush at Trujillo Alto, Oct. 23 (A.S.M.).

Argyria diplomachalis Dyar (Pyrilidae, Schaus det.) adults common on several bushes at Corozal, Mar. 18 (C.G.A.).

Heterothrips sericatus Hood (J.R.Watson det.) numerous in all of the blossoms on one bush at Barceloneta, June 14 (A.S.M.)

Metachroma sp., new to U.S.N.M. (H.S.Barber det.) found in small numbers on the leaves at Río Piedras, May 31 (C.G.A.).

Pulvinaria psidii Mask. (Morrison det.) moderately infesting the leaves at Lares, April 15 (R.G.O.).

Anthonomus inovatus Dietz (Buchanan det.) one adult on a fruit at Adjuntas, Apr. 11 (R.G.O.). Not in Wolcott's "List."

Aleurodicus (Metaleurodicus) minimus Quaintance (G.B.Merrill det.) moderately infesting the leaves of 2 guava trees on the Denton Farm at Arecibo, Feb. 23 (C.G.A.).

Ormenis pygmaea Fab. (P.W.Oman det.). Adults in small numbers on the above trees (A.S.M.) and a moderate number of adults on a coffee tree at Arecibo on Mar. 8 (C.G.A.).

HIBISCUS

Frankliniella cubensis Hood and *insularis* Franklin (J.R.Watson det.) adults in flowers at Mayagüez, March 20 (A.G.H.).

Haplothrips n. sp. (Watson det.) adults in flowers at Mayagüez, Mar. 20, (A.G.H.)

INGA SPP.

Tanaostigmodes portoricensis Cwfd. (Muesebeck det.) Heavily infesting pods of Guamá, *Inga laurina*, at Mayagüez, March 24. (A.G.H.) Previously known in P. R. only from the type.

Brenthia pavonacella Clem. A leaf-skeletonizer, badly infested the Inga shade trees thruout the coffee growing regions from fall to spring.

Carpolonchaea pendula Bezzi (Aldrich det.) adults reared from *Inga laurina* fruits, 25 per cent infested, at Jayuya, Jan. 18 (R.G.O.)

JOBO (*Spondias dulcis* Frost)

Haptoncus luteolus Er. and *Urophorus humeralis* Fab. (E.A. Chapin det.). All the fruits in a small package infested at Arecibo, Oct. 29 (R.G.O.). The latter not in Wolcott's "List."

MAHOGANY

Saissetia oleae Bern. and *Chrysomphalus dictyospermi* Morg. (Morrison det.) Very bad on a number of young trees at Forestry Station, Río Piedras, Mar. 29.

MALAY APPLE (*Jambos malaccensis*)

Coccus mangiferae Green, *C. acuminatus* Sign. and *Diaspis boisduvalii* Sign. (Morrison det.). Moderately infesting the leaves of two trees near Río Piedras, Jan. 11. (A.S.M.) The last not in Wolcott's "List."

Eucalymnatus tessellatus Sign. (G.B.Merrill det.). Same as above.

MAMEY (*Mammea americana* L.)

Toxoptera aurantiae Boyer (P.W.Mason det.) Young leaves heavily infested on small trees at Las Marías, Mar. 17 (A.G.H.)

Patara albidula Westw. (P.W.Oman det.) Adults common on one tree at Barceloneta, Mar. 22 (C.G.A.). Not in Wolcott's "List."

MANGO

Selenothrips rubrocinctus Giard did considerable damage to the foliage of 1,000 nursery trees at the Station in August.

Asterolecanium pustulans Ckll. badly infested 3 trees at Río Piedras, Feb. 23.

MANGROVE

Psychonoctua personalis Grote badly infested a large area of mangrove swamp at Pt. Cangrejos near San Juan in April. The trunks and branches down to ground level were badly tunneled in nearly all the plants. Larvae of all sizes, pupae, and empty pupal skins were present. It was cut before maturity, causing a considerable loss in the yield of charcoal.

MARÍA (*Calophyllum antillarum* Britt.)

Eucalymnatus tessellatus Sign. (Morrison det.) lightly infested one tree near Río Piedras, Feb. 17 (C.G.A.)

Pseudococcus adonidum L. (Morrison det.) heavily infested the leaves of a tree near Río Piedras, Feb. 17. Not in Wolcott's "List."

Oxacis sp. probably new (H.S.Barber det.) Adults numerous on the leaves of several trees in Santurce, May (A.S.M.)

Toxoptera aurantiae Boyer and *Aspidiotus cocotiphagus* Marl. lightly infesting the young shoots on several trees in Santurce in May. First record for this host in P. R.

Icerya purchasi Mask. was abundant during the spring and early summer on a number of trees in Santurce.

OKRA

Pectinophora gossypiella Saund. was found on July 10 infesting 10 out of 16 pods examined in a 1-acre planting at Trujillo Alto. The okra adjoined a field of about $1\frac{1}{2}$ acres of cotton which showed about 85 per cent infested bolls. The okra plants examined were situated near the edge of the field next to the cotton. The infested pods were all mature, at least 3 or 4 inches in length, and each contained 1 or 2 larvae and several pupae were found within the pods. The cotton was an old field which had been infested for some time. In July (A.S.M.) okra planted experimentally at Isabela with cotton was also infested.

Diabrotica gramina Baly did considerable damage at the Station during August and moderate damage in a 1-acre planting in Trujillo Alto in July.

Aphis gossypii Glover was generally present but not very injurious at the Station during July.

Corythucha gossypii Fab. was found towards the end of the month in small numbers on the okra at the Station. The okra adjoins the pole limas on which the insects were breeding very abundantly. Only adults could be found but these were feeding to a noticeable extent, causing the characteristic yellowish stippled areas on the leaves.

Hyaliodes n. sp. (H.H.Knight det.) was present in some numbers in the same planting.

OLEANDER

Asterolecanium pustulans Ckll., was very abundant on a number of oleanders at Guánica on March 12. A plant was also heavily infested at Old Loíza, April 29 (A.S.M.).

PALM

Pinnaspis buxi Bouché, heavily infesting a palm at Pennock's nursery near Río Piedras, Feb. 17 (R.F.; Morrison det.). Not in Wolcott's "List."

Eucalymnatus tessellatus Sign. (Morrison det.) heavily infested a palm in a nursery near Río Piedras, Feb. 17 (C.G.A.)

Pseudococcus nipae Mask. moderately infested a palm in Santurce, May 23.

PANAMA POTATO TREE

(*Solanum grandiflorum leiocarpum*)

Pseudococcus citri Risso (Morrison det.) lightly infested the leaves of 6 large trees at the Station at Río Piedras, Feb.; also 30 trees near Juncos, Jan. 25 (C. G. A.)

Pseudoparlatoria ostreata Ckll. A heavy infestation on the bark on one of the trees at Juncos.

PAPAYA

Toxotrypana curvicauda Gerst. Three medium sized fruits sent in by the Agricultural Agent at Jayuya with letter of June 1 stating that they came from a planting of about 50 trees just coming into production on the farm of Dr. Manuel Megías, Barrio Collores. All were fairly green, the 2 smaller moderate sized ones had been badly infested but the larger one was clean—only 1 or 2 dead larvae present. The papaya fruit fly was also sent in under date of July 8 by F. B. McClelland from the Mayagüez Experiment Station in a rather small and rather green fruit which contained 14 newly formed puparia and 1 full grown larvae (M. D. L.) One fruit was found infested at the substation at Isabela on July 3 and sometime during the month all of the fruit on several plants in a farm near Aguadilla were infested (G. N. W.) It was also found to be infesting the fruit of a number of plants on a farm near Ponce on Aug. 5. One fruit small and green and about 2½ inches long contained 20 larvae and another somewhat more mature and about 5 or 6 in. long contained 24 larvae; in both fruits the maggots were nearly to full-grown. The owner, Mr. Heraclio Girón, stated that during May and June nearly all of the fruits on his trees were infested, many so badly that they had to be thrown away. It was not found in several fruits cut open at the farm of Heraclio Girón near Ponce on Sept. 9. Mr. Girón stated that no infested fruits had been noticed for several weeks whereas formerly they had been heavily infested. As previously reported many infested fruits had been destroyed and I suspect that this resulted in greatly reducing the infestation in his planting.

Pseudoparlatoria ostreata Ckll. Heavily infested the fruits and stems of a papaya in San Juan, Jan. 13 (A. S. M.) It was abundant also on a number of trees in the Girón farm near Ponce, September.

Aulacaspis pentagona Targ. moderately infested the trees on the Girón farm. There was also a heavy infestation at the Isabela Substation in March.

Saissetia hemisphaerica Targ. also heavily infested the trees at Isabela.

Corythucha gossypii Fab. heavily infested the trees at Isabela during March and as is usual was observed in other places thruout the season.

Epitomiptera orneadalis Guer. (Schaus det.) A larva was found feeding on a papaya leaf, Mar. 8 (C. G. A.) Not in Wolcott's "List."

Nezara viridula L. (H. G. Barber det.). A light infestation of nymphs on papaya leaves near Río Piedras, Mar. 9 (C. G. A.).

PEAS

Illinoia solarifolia Ashm (P. W. Mason det.). One winged adult was on a pea leaf at Cidra, Feb. 26 (A. S. M.) Not in Wolcott's "List."

Piezosternum subulatum Thumb. (H.G.Barber det) a small number of adults on garden pea leaves in a small patch on the Vivell farm at Trujillo Alto, Feb. 5 (A.S.Mills).

Agromyza pusilla Mg. adults reared from larvae making serpentine mines in pea leaves—a moderate infestation in a 2-acre planting at Cidra, Feb. 26 (A.S.M.; J. M. Aldrich det.). In Wolcott's "List" but without definite food-plant or locality.

PEPPER

Aleurotrachelus trachoides Back (M. D. L. det.) moderately infested a number of plants at the Station at Río Piedras October and was noticed in April. It was also found August 17 to be badly infesting a house plant in Santurce.

Coreocoris batatas Fab. a light infestation on the leaves of a 5 acre pepper field at Vega Alta on Dec. 29 (A. S. M.; H. G. Barber det.)

Myzus persicae Sulz., was found to be lightly infesting the leaves of a 5 acre pepper field at Río Piedras on Feb. 8 (R. F.; P. W. Mason det.).

Disonycha laevigata Jacoby (H. S. Barber det.) lightly infesting the foliage and fruit of peppers and a moderate infestation on cucumber at Loiza on Feb. 7. There were 5 acres of peppers and 1 acre of cucumbers. (A. S. M.)

Chrysocharis parksi Cwfd. adults reared from pupae of *Agromyza pusilla* Mg. mining in pea leaves at Cidra, Feb. 26. 30 per cent of the dipterous pupae parasitized with this or another species. Not in Wolcott's "List."

Saissetia hemisphaerica Targ. (Morrison det.) lightly infesting the stems of 3 plants at the Experimental Farm at Trujillo Alto, Mar. 9 (C. G. A.).

PIGEON PEA

Etiella zinckenella Tr. (Heinrich det.) larvae were found in hampers of pigeon peas from Aguadilla, Lajas and Isabela for shipment to the States (A. G. Harley).

Heliothis virescens Fab. (Heinrich det.) larvae lightly infested hampers of pigeon peas to be shipped to the States from Lajas in March, Aguas Buenas and San Sebastián in January and from Aguadilla and Isabela (A. G. H.)

Icerya purchasi Mask. was found from April on, lightly to moderately infesting pigeon peas grown near infested citrus in Palo Seco and Bayamón.

Saissetia oleae Bern. (Morrison det.) so badly infested 4 bushes at Lajas on Feb. 13 that they were nearly dead (A. G. H.)

PINEAPPLE

Phyllophaga spp. larvae were reported on Apr. 13 by Eugenio Rivera, Agr. Agt. at Manatí, as having badly injured a number of pineapple fields at Vega Baja and Corozal during November and December.

Solenopsis geminatum Fab. also did considerable damage in the same place.

Cutworms (Noctuidae). J. E. Raymer reported (specimens submitted) on Feb. 15 that cutworms had been at that time working for about 3 weeks on 10 acres of his pineapples at Arecibo, causing a loss of about $\frac{1}{3}$ of the plants by eating out large holes and destroying any market value of these plants.

POMARROSA (*Jambos Jambos* L.)

Coccus acuminatus Sign. (Morrison det.) infesting many leaves of a pomarrosa tree at Corozal Feb. 9 (C. G. A.).

Saissetia oleae Bern. (Morrison det.) Infested many leaves of one tree at Corozal, Feb. 9 (A. S. M.)

Colpoptera maculifrons Muir (P. W. Oman det.) adults numerous on the leaves and stems at Bayamón, June 6 (A. S. M.)

Ormenis pygmaea Fab. (P. W. Oman det.) Many adults on the leaves of several trees at Corozal, Apr. 12. (C. G. A.)

Philaenus fuscovarius Stal. one adult on a pomarrosa twig at Bayamón, June 6 (C. G. A.)

POTATO, IRISH

Xylomyges eridania Cr. (Schaus det.) larvae were found to be eating many of the leaves in a 25 acre field of Irish potatoes on the Ellsworth farm at Cidra, Feb. 5 and a light infestation of the larvae was found on foliage on a 5-acre field of peppers on the Cabrera farm at Loíza on Feb. 8 (A. S. M.)

Cutworms (*Noctuidae*) had destroyed about 5 per cent of one-month old Irish potato plants on $\frac{1}{2}$ acre at Aibonito by Feb. 3 altho many of the injured plants were sending up new shoots; Severo Págan, Agr. Agt. at Aibonito, reported that 4 or 5 plantings in the vicinity were similarly affected (F. Chardón).

Diabrotica graminea Baly, was reported on Feb. 2 as doing considerable damage to both snap beans and Irish potatoes at Orocovis.

Aleurotrachelus trachoides Buck, badly infested a number of experimental Irish potato plants in the station greenhouses during April.

Nezara viridula L. (H. G. Barber det.). A small number of adults on the leaves of a 25-acre planting of potatoes on the Ellsworth farm at Cidra on Feb. 5 (A. S. M.).

Epitrix cucumeris Harr., the potato flea-beetle, was observed in moderate numbers in several places but not sufficient observations were not made to determine how much damage was done to the various plantings thruout the growing season.

POTATO, SWEET

Agromyza ipomeae Frost was present thruout the year as usual in moderate numbers in all patches observed.

Eusepeles batatae Waterhouse, was found lightly infesting one tuber in the public market at Puerta de Tierra, San Juan (R. F. & R. G. O.) Specimen sent in for determination on Apr. 6 by F. A. Velasco, Agr. Agent at Guayanilla, as badly infesting a small piece of sweet potatoes.

Spartocera batatae Fab. was abundant in all stages on a small patch of sweet potatoes in Hato Rey the end of April (F. Chardon). It was also reported as fairly abundant in all stages on several plants in Carolina on Nov. 2.

Cylas formicarius Fab. adults were not uncommon during 3 nights of collecting at light at Puerto Real, Vieques Island Sept. 25-27. Arturo Riollano, the local Agricultural Agent, stated that he had observed the insect as generally distributed and very injurious since he had been on the Island from Sept. 1930. It was generally distributed and as injurious as usual in P. R. thruout the year.

Cyrtocapsus caliginus Stal (Miridae, H. G. Barber det.) was found abundant on March 16 on a small patch of sweet potatoes in the Governor's garden in Río Piedras (C. G. A.). Not in Wolcott's "List".

Bemisia inconspicua. What is undoubtedly this whitefly was received from Miguel Díaz, Agr. Agt. at Arecibo under date of Mar. 26 on sweet potato leaves for identification.

PUMPKIN

Margaronia hyalinata L. (Schaus det.) was feeding on pumpkin leaves in a small garden at Juncos on Jan. 25 (R. F.).

ROSE

Icerga purchasi Mask., the cottony cushion scale, was found moderately infesting a number of large rose-bushes in a home garden in Santurce where Mr. Luciano of the Insular Plant Quarantine Office said it had been present for at least two years; this was the first record for the Island.

Metachroma antennalis Weise, a leaf-beetle, was received under date of Sept. 4 for determination from the Aguirre Sugar Co. The beetles were said to be present in enormous numbers and doing great damage to rose bushes. Out of over 1000 good sized rose bushes over 400 had been killed, the beetles first eating the flowers, next the leaves and finally gnawing off the bark of the woody parts. The beetles first appeared in the spring of 1929 and were present the following year and this, from April into September. It was stated that when disturbed the beetles drop readily. This species was originally described from Puerto Rico in 1885 by J. Weise in "Beitrag zur Chrysomeliden und Coccinelliden Fauna von Puerto Rico" Archiv. fur Naturgeschichte 51(1):155 and has apparently not been reported outside of the Island. Here it has been reported as rather badly attacking cotton at Quebradillas in June 1922 and was found between leaves and in spider nests on various plants on the beach at Arecibo in May 1923.

Cryptocephalus nigrocinctus Suff. was reported as lightly infesting about 200 rose bushes on the farm of Pedro Osuna in the Barrio of Quebrada Arenas near Río Piedras. The beetles eat the leaves but especially the buds.

Conotelus fuscipennis Er. (E. A. Chapin det.). A moderate number of the beetles on the flowers of 3 bushes at Adjuntas, June 19 (R. G. O.).

Frankliniella insularis Franklin (J. R. Watson det.) reported on June 1 by the local Agr. Agt. in Vieques Id. as doing great damage in 5 different farms and trouble is apparently general; it was the first the growers have noticed trouble in Vieques but stated that it had been previously noted in Mayagüez and other towns but was never reported. Buds attacked never open and flowers are totally spoiled, withered ones being full of thrips when opened especially at base of petals. Some gardens were 100 per cent infested and not a sound rose could be picked. Canna blooms were also attacked but not much damage done.

SILK OAK (*Grevillea robusta* Cunn.)

Asterolecanium pustulans Ckll., was found infesting badly a fair-sized silk oak near Bayamón on Apr. 10; a number of twigs and smaller branches had been killed by the attack.

SPIDER LILY (*Hymenocallis declinata*)

Xanthopastis timais Cramer (Heinrich det.). From Oct. thru Jan. the larvae were very abundant and doing considerable damage to the leaves on about 10 ornamental plants in a large nursery near Río Piedras on Oct. 10 (M. D. L. & A. S. M.)

SQUASH (See cucumber and melon)

SUGAR CANE

Diatraea saccharalis Fab. was reported in Sept. by I. Flores Lugo, Agr. Agt. of Carolina as causing a large percentage of "dead hearts" on about 4 acres out of about 200 acres of cane in the barrio Cangrejos Arriba of Carolina. The cane had been planted in April or May; this worse affected part had to be plowed up and replanted. The insect was not very abundant on Vieques Island during an inspection trip on March 23 due probably to the unduly high rainfall for the Island (72 ins.) of last year. (M. D. L.) The moth-borer however was worse according to S. C. McCall on the 1931 crop in

Vieques Island than on the 2 previous years' crops under his observation (a total of about 3,500 acres). He stated that Japanese cane, usually supposed to be somewhat less infested than other varieties was however the worst infested of all during this past year.

Pseudococcus boninsis Mask. (= *calceolariae* of authors) was not uncommon on sugar cane in several localities examined in company with C. E. Pemberton on Vieques Island on March 23. (M. D. L.; Pemberton det.)

Pseudococcus sacchari Ckll. was moderately common on both Uba and Crystalina (a little more so on latter apparently) in several sections examined on Vieques Island on an inspection trip on March 23. (M. D. L.)

Aspidiotus sacchari Ckll. was moderately common on a large lot of Uba cane being loaded at the dock on Vieques Island, examined on March 23. (M. D. L.)

Dyscinetus barbatus Fab. adults of a species known to injure cane were absent at lights at Isabela during the whole of July but began appearing again at lights on Sept. 2 at Isabela (G. N. W.)

Ligyris tumulosus Burm. were abundant at light during July at Isabela and many were being eaten by the imported toad, *Bufo marinus* L. (G. N. W.) An adult was taken at a light in Santurce, Mar. 27 (A. S. M.; E. A. Chapin det.)

Phyllophaga vandinei Smyth. Scattering male adults were collected on Aug. 11 and 12 at Isabela but by the end of the month they were even yet not common there (G. N. W.)

Strataegus quadrioveatus P. de B. Two adults of the coconut rhinoceros beetle were received under date of July 16 from Alberto Correa from Utuado with the statement that they were found eating the shoots of young cane plants; the injury was noted in several places near Utuado (M. D. L. & F. S.).

Dyscinetus barbatus Fab. Adults of this Scarabeid beetle, an occasional minor enemy of cane were observed in small numbers at lights at Hato Rey on Aug. 31 (M. D. L.). At Isabela adults were not observed at lights thruout August and had not been seen at lights since June 8 (G. N. W.).

Remigia (Mocis) repanda Fab., the sugar cane looper, defoliated a small area of Para or malojillo grass (*Panicum barbinode*), young plant cane and half grown elephant grass (*Panicetum glaucum*) during July at Isabela (G. N. W.)

Sipha flava Forbes, the yellow cane aphid, was observed doing considerable damage in a number of large plantings of young to fairly large cane near both Aguirre and Santa Isabel on Aug. 22. Mr. Foss,

Ass't. Field Manager of the Aguirre Sugar Co. stated on that date that during all of July and Aug. there had been a rather general tho fairly light infestation thruout nearly all of the Company's extensive plantings—this in spite of the fact that the rainfall had been greatly in excess of normal. The insect was present to some extent on Vieques Island on Sept. 27 but S. C. McCall, local Mgr. of the United Porto Rican Sugar Co. on Vieques said it had been absent during the past year as far as he could observe. Its absence or at least scarcity was probably due to much more than normal rainfall on that Island. It was reported on Oct. 7 by Dr. T. Bregger of the Ins. Exp. Station to be fairly abundant on about 2 acres of 3 or 4 months' cane (old ratoons of POJ 2878) on the Station grounds; this in spite of recent abundant rains. He also reported on Oct. 1 that a field of Uba cane, ratooned 4 or 5 months previously, was conspicuously yellow from the road at Jayuya despite much recent rain there also. Under date of Oct. 22, a grower, Enrique López Delgado, wrote that especially in the barrio Miradoro of Cabo Rojo the yellow aphid had by then destroyed almost 25 per cent of the plantings and of the remainder about 50 per cent were infested. He reported the infestation as extending into the other cane growing section of Sabana Grande, San Germán, Lajas, Hormigueros and Mayagüez. In Miradoro not only Japanese cane was attacked but also BH 10(12) and POJ 2878. At the Station a 2 acre planting of 2 months' old ratoons POJ 2878 was lightly infested early in June despite 13 ins. rainfall during the previous month and another planting of the same size and variety was considerably infested thruout all of Feb., Mar. and Apr. with only 6 ins. rainfall for the 3 months.

TAMARIND

Sitophilus linearis Hbst., the tamarind pod-borer, adults and larvae, found feeding in one pod in a crate of tamarinds for shipment to the States, Feb. 25 (C. G. A.; Buchanan det.).

Myelois ceratoniae Zell. (Heinrich det.) 20 per cent of about 100 pods examined at Trujillo Alto found infested with larvae; adults were reared (A. S. M.) Not in Wolcott's "List".

TAMARIX SP.

Saissetia hemispherica Targ. (Morrison det.) fairly abundant on a couple of small trees of Tamarix sp. at the Forestry Station at Río Piedras on Mar. 29 (M. D. L.)

TOBACCO

Practically no definite observations were made on tobacco insects during the year but reports would indicate that the more important insects were present in about the usual numbers. Flea beetles were bad on experimental plantings at the Station during the dry spell thruout Feb. Mar. and April.

TOMATO

Scapteriscus didactylus Latr., was doing considerable damage to young tomato plants in a 3-acre field of tomatoes and to a 3-acre planting of eggplants on Nov. 6 at Loíza; grass land adjoined these fields (A. S. M.).

Myzus persicae Sulz. (P. W. Mason det.) was observed very lightly infesting the foliage of a 3-acre field of tomatoes at Loíza on Nov. 6 (A. S. Mills).

Cyrtopeltis varians Dist. (H. G. Barber det., Miridae) was found lightly infesting the foliage of a 3-acre field of tomatoes at Loíza on Nov. 6 (A. S. M.). Not in Wolcott's "List".

Agallia albidula Uhl. (P. W. Oman det.) lightly infested the leaves of tomatoes at Loíza, Nov. 6 (A. S. M.).

Grasshoppers (*Locustidae*) did considerable injury to several large tomato plants grown for experimental purposes in the greenhouse at the Station during the latter of September. The injury was by the young green nymphs.

Xylomyges eridania Cr. (Schaus det.) larvae moderately infesting tomato fruits, which were being eaten out at the Vivell farm at Río Piedras, Feb. 15 (R. F.)

Atherigona excisa Thom., many larvae in a decayed tomato from Isabela on Jan. 19 (C. C. A.; C. T. Greene).

Empoasca fabalis DeL., moderately infested a 3-acre field of tomatoes on Nov. 6 at Loíza (A. S. M.; P. W. Oman det.).

Flea beetles were bad on tomatoes at the Station in Río Piedras during the dry spell thru Feb., Mar. & Apr.

Epitrix cucumeris Harr. (H. S. Barber det.) was reported in large numbers on a number of plants on a farm at Adjuntas in March (R. G. O.)

Chaectocnema apricaria Suffr. (H. S. Barber det.) in moderate numbers on tomato plants at Jayuya on June 14 (R. G. O.)

TREE FERN

Pseudococcus adonidum L. (Morrison det.) found badly infesting the young fronds of two plants at Mayagüez, Mar. 18 (A.G.H.)

TROPICAL ALMOND (*Terminalia catappa* L.)

Ormenis marginata Brunn. (P. W. Oman det.) 3 adults resting on the leaves of one tree examined on Mar. 15 at Río Piedras (A. S. M.) and a small number of adults on the leaves of one coffee bush at the Demonstration Farm at Arecibo on Mar. 8 (C. G. A.)

Megalopyge krugii Dewitz, the puss-moth, was abundant on a number of trees on Apr. 21 near Arecibo (F. S.)

Monobelus fasciatus Fab. Membracidae—a small number of adults on the flower-stalks of several trees at Bayamón on March 21 (R. F.; P. W. Oman det.)

Attelabus sexmaculatus Chev. (L.L.Buchanan det.) One adult on a flower-stalk in examining several "almiendro" trees at Bayamón on Mar. 21 (C. G. A.)

Urophorus humeralis Fab. and *Stelidota geminata* Say (Nitidulæ, E. A. Chapin det.) feeding in the fruits at Arecibo, Oct. 10 (R. G. O.) and at Añasco, Sept. 29 (A.G.H.) respectively.

Haplothrips gowdeyi Fkln. (J. R. Watson det.) in small numbers on the leaves at Santurce, June 11 (A. S. M.). Apparently the first record for P. R.

Cicadella sirena Stal. (P. W. Oman det.) adults numerous on leaves, Arecibo, May 20 (C. G. A.).

Chalepus sanguinicollis L. (H. S. Barber det.) a small number of adults at base of flower-stalks, Arecibo, May 24 (A. S. M.).

VANILLA

Apodrusus wolcottii Marshall (Curculionidae, L. L. Buchanan det.) A light infestation of adults on flowers and stems found while examining 40 plants at Adjuntas, May 17 (R. G. O.)

VITEX ALTISSIMA

Saissetia oleae Bern. was fairly abundant on a single small tree at the Forest Service Station at Río Piedras on Mar. 28 (M. D. L.)

WATERLILY

Pentalonia nigronervosa Coq., a waterlily aphid, was reported by Dr. N. L. Britton as considerably infesting several plants at San Ger-

mán on Dec. 29 and in March he submitted specimens from the same place (F. Seín det.) In February F. Seín reported several plants killed at Santurce, the leaves being badly infested and curled.

WEST INDIAN LAUREL (*Ficus nitida* Thumb.)

Gynaikothrips uzeli Zimm. was more or less abundant as usual on nearly all trees examined in various places.

Ischnaspis longirostris Sign. (Morrison det.) was found heavily infesting the leaves of several large trees on the Plaza in Caguas during April.

Ceroplastes floridensis Comstk. (Morrison det.). A light infestation on the leaves of the same trees.

Macrotracheliella laevis Champ. (Anthocoridae, H. G. Barber det.) found feeding in moderate numbers on the thrips mentioned above. Not in Wolcott's "List."

Icerya montserratensis R. & H. common on several of the trees in the Plaza at Caguas but they did not seem to be quite as abundant as last year; this may have been because the observations, such as were made, were during the periods of greater rainfall.

CATTLE

Haematobia irritans L. the horn-fly, was observed to be very abundant on all the oxen on the Island of Vieques during a short trip there in September. S. C. McCall, manager of the local Sugar Co. stated that it had been worse this year than usual. One bull was covered with flies and in a greatly weakened condition. It was reported later that this one and several others had died from the effects of the bites. The considerably greater rainfall during some months past could have hardly been responsible for the great increase in numbers of this pest for in Puerto Rico proper it is ordinarily worse on the South Coast where the rainfall is much less than on the North Coast.

For several additional external parasites of animals see the Report of the Veterinarian in Rept. P. R. Agr. Exp. Sta. for 1931.

MAN

Culex nigripalpus. Theo. (Alan Stone det.) adults collected at light in hotel room in Mayagüez on May 1 (C. G. A.).

Chrysops variegatus Deg. was occasionally annoying at Río Piedras and one or two other localities.

MISCELLANEOUS RECORDS

The following species have presumably not heretofore been recorded from Puerto Rico:

Argyria lacteella Fab. (Pyralidae, Schaus det.) An adult caught at light, Bayamón, Apr. 17 (C. G. A.) and another on a lima bean leaf in a field at Loíza, Feb. 7 (A. S. M.).

Psara detritalis Guen. (Pyralidae, Schausdet.). An adult taken on a fruit in a hamper of peppers from Humacao, Feb. 4 (C. G. A.).

Mocis disseverans Wlk. (Noctuidae, Schaus det.). Adults taken at light at Bayamón, Apr. 17 and May 15 (C. G. A.).

Monodes agrotina Guen. (Noctuidae, Schaus det.) at light Bayamón, May 15 (C. G. A.).

Brachymeria ovata Say (Chalcididae, Musebeck det.). An adult reared from a lepidopterous pupa at Mayagüez, June 24 (A. G. H.). It is interesting to note that this species has been recorded from New York State where it has been reared from *Vanessa antiopa* (Cornell Univ. Agr. Exp. Sta. Mem. 101, 1928).

Nasutitermes costalis Holmg. (T. E. Snyder det.) collected at light at Bayamón, June 12 (C. G. A.).

Microbracon hebetor Say (Braconidae, Musebeck det.) in a package of pigeon peas being sent to the States from Ponce, May 18 (R. G. O.).

Chlorion (Ammobia) singularis Smith (Larridae, G. A. Sandhouse det.) collected in the automobile at Guánica No. 13 (A. S. M.).

Colyostichus biannulatus Mayr. (Callimomidae, Musebeck det.) Moderately infesting the fruits of *Piper* sp. at Cidra, Nov. 13, (R. G. O.).

Calliephialtes n. sp. (Ichneumonidae, R. A. Cushman det.) An adult on a grapefruit leaf at Añasco, May 2 (C. G. A.).

Ceratomegilla innotata Muls. (Coccinellidae, E. A. Chapin det.) on a pepper leaf at Vega Alta, Nov. 24 (A. S. M.).

Monanus concinnulus Wlk. (Cucujidae, W. S. Fisher det.) on a window in a dining room, San Juan, Apr. 24 (C. G. A.).

Disonycha spilotrachelus Blake (Chrysomelidae, H. S. Barber det.) adults on an unknown weed, Santurce, June 29 (C. G. A.).

Stephanoderes braziliensis Hopk. (Scolytidae, Blackman det.) 1 adult in a decayed flower-stalk of banana, Bayamón, May 15, (C. G. A.).

Gnathocerus cornutus Fab. (Tenebrionidae, E. A. Chapin det.) An adult on a leaf of watercress in a dining room in San Juan, Feb. 21 (C. G. A.).

Cylindera flava Fab. (Cerambycidae, W. S. Fisher det.). An adult on a lima bean blossom, Loíza, Dec. 1 (A.S.M.).

Sapromyza picticornis Coq. (Sapromyzidae, Aldrich det.) adults common on grapefruit at Arecibo, Mar. 1 (R. F.).

Sapromyza slossonae Coq. (Aldrich det.) resting on orange fruit at Pueblo Viejo, Feb. 13 (C. G. A.)

Conoderus bifoveatus Beauv. (Elateridae, W. S. Fisher det.) 2 adults on a flower-bud of *Terminalia catappa* at Barceloneta, May 10 (A. S. M.)

Sitodrepa panacea L. (W. S. Fisher) collected at light in a hotel room, Mayagüez, May 1 (C. G. A.)

Cactylosternum abdominale Fab. (Hydrophilidae, L. L. Buchanan det.). 1 adult at hotel light Mayagüez, May 1 (C.G.A.).

Siphunculina signata Wollaston (Chloropidae, Aldrich det.). An adult on a dining room window in San Juan, Apr. 1 (C.G.A.)

Leucomelina n. sp. (Anthomyidae, Aldrich det.). One adult on trail up El Yunque Mountain, near Luquillo, Mar. 13 (A.S.M.).

Ceropsilopa n. sp. (Ephydriidae, Aldrich det.). Adults on under side of grapefruit leaves at Arecibo, Apr. 5 (C.G.A.).

Lasiochilus fuscus Reut. (Anthocoridae, H.G.Barber det.) adults on a decayed flower-stalk of banana at Bayamón, May 15 (C.G.A.).

Exitianus obscurinervis Stal. (Cicadellidae, P.W.Oman det.) 3 adults on leaves of an unidentified weed at Arecibo, June 7 (C.G.A.).

Megoura n. sp. (Aphididae, P.W.Mason det.). A moderate infestation on 5 plants (plant unrecorded) examined in Santurce, June 20 (A.S.M.).

Pycnoderes heidemanni Reut. and *Polymerus cuneatus* Dist. (H.G. Barber det.) collected by sweeping weeds in Santurce, June 29 (C.G.A.).

Coreocoris batatas Fab. (Coreidae) and *Engytatus geniculatus* Reut. (Miridae, H.G.Barber det.) 1 adult each at Añasco, May 2 (C.G.A.).

Oncopeltus fasciatus Dall. (Lygaeidae, H.G.Barber det.). 1 adult on a flower at Arecibo, Apr. 22 (C.G.A.).

Anasa scorbatica Fab. (H.G. Barber det.) a squash bug, was observed lightly infesting a 2-acre planting of squash at Vega Alta, Nov. 24 (A.S.M.).

The following records, altho not entirely new to Puerto Rico, are those of insects known heretofore only from the type material from Puerto Rico or for the most part from only one or two previous records:

Xestocephalus maculatus Osb. (Cicadellidae, P.W.Oman det.) collected at light in a hotel in Mayagüez (C.G.A.). Known only from types taken on *Inga* sp. on the Cayey road at about 2,000 ft. elevation.

Cicadella coffeaphila Dozier (P.W.Oman det.). Several adults on an unidentified plant on the trail up El Yunque Mountain (A.S.M.).

Agallia pepino DeL. & Wole. (Cicadellidae, P. W. Oman det.) collected at light in Mayagüez, May 1 (C.G.A.). First record from the West end of the Island.

Thamnotettix colonus Uhl. (Cicadellidae, P.W.Oman det.) collected at light in Mayagüez, May 1 (C.G.A.). Recorded by Osborn from several localities but not from the coast at the west end of the Island.

Deltocephalus nigripennis DeL. (Cicadellidae, P.W.Oman det.) at light in Mayagüez, May 1 (C.G.A.). Known only from type male from Boquerón.

Protalebra lenticula Osb. (Cicadellidae, P.W.Oman det.) 2 adults at light, Bayamón, May 17 (C.G.A.). Known only from type material from Coamo, Jan. 1929.

Psyllia minuticon Cwfd. (Psyllidae, P.W.Oman det.) at light, Bayamón, May 15 (C.G.A.). Only previous records is "common on *Inga vera* at Lares 1922 and thruout the coffee districts. (Wolcott's "List" p. 274).

Colpoptera brunnea Muir (Fulgoridae, P.W.Oman det.) at light, Mayagüez, May 1 (C.G.A.). Osborn says probably one of the forms listed by Wolcott under *Carda* sp. from several other localities; types from Utuado, Toa Alta and Ciales.

Acinopterus angulatus Laws. (P.W.Oman det.). Caught by sweeping weeds, Santurce, June 29 (C.G.A.). Only record for the North Coast.

Euryopthalmus obovatus Barber (Pyrrhocoridae, H.G.Barber det.) common as adults on branches and trunk of three orange trees at Peñuelas, Jan. 26 (R.G.O.). Apparently known from P. R. only by a female paratype.

Zelus longipes L. (Reduviidae, H.G.Barber det.). An adult resting on a guava leaf at Trujillo Alto, Oct. 23 (A.S.M.). Previously recorded from Trujillo Alto in 1912; elsewhere only in the mountains.

Icerya montserratensis R. & H. reported by Wm. Barbour, Chief Insular Forester, as found moderately infesting on May 4 a small

unknown native tree on the north slope of the Luquillo Mountains about 5 miles south of Luquillo at about 750 feet altitude.

Haptonchus luteolus Er. (Nitidulidae, E.A.Chapin det.) 3 adults in a decayed star apple fruit, Arecibo, Apr. 22 (C.G.A.). Little known in P. R.

Lobiopa insularis Cast. (Nitidulidae, E.A.Chapin det.) A great many adults on the bark of a tree of *Petitia dominguisensis* at Arecibo, Jan. 26 (C.G.A.) Little known in P. R.

Chysobothris megacephala C. & G. (Buprestidae, M.D.L. det.) An adult flew into the car of Raphael Rodríguez of the College of Agriculture while passing thru Isabela, May 18. In Wolcott's "List" as collected in 1922 but "date and locality unknown".

Xyleborous affinis Eichhoff (Scolytidae, M.W.Blackman det.) An adult at light in a hotel, Mayagüez, May 1 (C.G.A.) Listed from P. R. previously only by Leng & Mutchler.

Platypus rugulosus Chapuis. (Scolytidae, M.W.Blackman det.) 2 adults at light in a hotel in Mayagüez, Apr. 30 (C.G.A.). Only previous record is at light at Mameyes in 1913.

Lema dorsalis L. (Chrysomelidae, H.S.Barber det.) Adults numerous on the leaves and flowers of an unknown weed at Arecibo, May 24 (C.G.A.). Previously listed from Aibonito, Coamo, Boquerón and Caguas.

Disonycha laevigata Jacoby (Chrysomilidae, A.J.Mutchler det.) Often very injurious to beets, swiss chard, etc., was reported by S. Molinary, Agr. Agt. at Carolina as very abundant on the common weed "Jamón con huevo" (*Achyranthes Bettzickiana*) at Loíza during October; many adults were submitted for determination. Apparently a new food-plant for P. R.

Panagaeus quadrisignatus Chev. (Carabidae, L.L.Buchanan det.) Adults at light in Bayamón, Apr. 17 (C.G.A.). Previously listed only from Aibonito and Guánica.

Callopsisma borencona L. & M. (Lampyridae, H.S.Barber det.). An adult on a pomarrosa leaf at Bayamón, Mar. 21 (R.F.). Not many locality records.

Callopsisma emarginata L. & M. (Lampyridae, H.S.Barber det.). A small number of adults on orange fruits at Peñuelas, Jan. 26 (R.G.O.). Previously listed only from type material from: Mayagüez, Adjuntas, Río Blanco Valley and Utuado.

Psyllobora nana Muls. (Coccinellidae, E.A.Chapin det.): Two adults on a cashew nut leaf, Santurce, April 6 (A.S.M.). Little known in P. R.

Callosobruchus chinensis L. (Bruchidae, H.S.Barber det.). An adult on a pepper fruit in a crate from Isabela, Apr. 4 (C.G.A.). Apparently not often recorded in P. R. (See also under bean).

Eurema euterpe Mén. (Pieridae, Schaus det.). A small number of adults at Cidra, Feb. 26 (A.S.M.). Apparently little known in P. R. but easily confused with *E. portoricensis* according to Dr. Forbes.

Atrytone vitellius Fab. (Hesperiidae, Schaus det.). Caught in a net at Río Piedras, June 22 (C.G.A.). Apparently not recorded since 1922 but probably common in various localities. The larva is known as a minor pest of sugar cane.

Calisto nubila Lathy (Satyridae, Schaus det.). 3 adults caught on the trail up El Yunque mountain, back of Luquillo Mar. 13 (A.S.M.). Apparently only a few previous records but according to Dr. Forbes undoubtedly common and widely distributed.

Dichomeris manellus Mösch. (Gelechiidae, as *Dichomeris*, Busck det.). An adult on a pomarrosa leaf at Barceloneta, Mar. 22 (A.S.M.). Apparently known heretofore from P. R. only from type material, without definite locality. Forbes, following Meyrick lists this as a *Trichotaphe* (Sci. Surv. P. R. 12: 121, 1930).

Lymire flavicollis Dewitz (Syntomidae, Schaus det.). An adult reared from a pupa on a cucumber leaf at Caguas, Jan. 25 (R.F.). Previously recorded only from Naguabo, Coamo, Lares (Seín) and Palmas Abajas, back of Guayama (Hoffman).

Pseudosphinx tetrio L. (Sphingidae, Heinrich det.). One larva from Mona Id. (A.S.M.) which is apparently the first record for that place.

Epistor lugubris Drury (Sphingidae, Schaus det.). Adult at light in Santurce in December (A.S.M.). Recorded only from Río Piedras and Lares.

Syngrapha egena Guen. (Noctuidae, Schaus det.). An adult on a lima bean leaf, at Cidra, Feb. 5 (A.S.M.). Only previous published record is from Cayey but specimens are in the Ins. Exp. Sta. coll. also from Comerío.

Melipotis januaris Guen. (Noctuidae, Schaus det.) An adult at light in San Juan, June 23 (C.G.A.). Apparently but little known in P. R.

Leucinodes elegantalis Guen. (Pyrilidae, Schaus det.). Adult at light in Bayamón, May 15 (C.G.A.). Previously only recorded from P. R. without definite locality or date but specimens are in the Cornell Univ. coll. (Forbes det.) from 7 different widely separated localities by various collectors.

Lipocosma hebescalis Mösch. (Pyralidae, Schaus det.). An adult at light in Bayamón, Apr. 17 (C.G.A.). Previously recorded only from the type but Dr. Forbes collected several specimens in 1930.

Cataclysta miralis Mösch. (Pyralidae, Schaus det.). An adult at light in Bayamón, Apr. 17 (C.G.A.). Previously recorded only from the type material, without definite date or locality but Dr. Forbes found it common on El Yunque and also collected it at several other localities in 1930.

Crambus fissiradiellus Wlk. (Pyralidae, Schaus det.). An adult at light in Bayamón, Apr. 17 (C.G.A.). Previously recorded only from P. R. without definite date or locality.

Crambus ligonellus Zell. (Pyralidae, Schaus det.). An adult at light in Bayamón, Apr. 17 (C.G.A.). Previously recorded only from "P.R." but Dr. Forbes collected a number of specimens in 1930.

Samia ecclesialis Guen. (Pyralidae, Schaus det.). 2 adults at light in San Juan, Apr. 24 (C.G.A.). Previously recorded from "P.R." but according to Dr. Forbes this is abundant and general and there are many specimens in the Cornell University collection.

Lamprosema ebullialis Guen. (Pyralidae, Schaus det.). An adult at light in Santurce, Dec. 4 (A.S.M.). Not previously recorded from P. R. but there are specimens in the Cornell Univ. coll. from El Yunque (Forbes, 1930) and Lares (Seín, 1930 or 1931).

Hunterellus hookeri Haw. (Encyrtidae, Muesebeck det.), found on a window in a dining room in San Juan, Apr. 2 (C.G.A.). Only 2 previous records from P. R.

Christolimorpha plesius Vier. (Ichneumonidae, R.A.Cushman det.). An adult on a leaf of *Psidium* sp. at Mayagüez, June 12 (A.G.H.). Only previously known from type.

Notogonidea vinulenta Cress. (Sphecidae, S.A.Rohwer det.). Adults numerous on the blossoms of many grapefruit trees at Barceloneta, May 10 (C.G.A.). Only 1 previous record—from Mayagüez (Van Zwaluwenburg's typewritten "List" of 1914).

Polistes crinitus var. *americanus* (Vespidae, G.A.Sandhouse det.). Adults numerous on the blossom of many grapefruit trees at Barceloneta, May 10 (C.G.A.). Apparently not before recorded from the north coast.

Polistes major Beau. and *Sceliphron coementarium* Drury (F. Seín det.). Sent in from Bayamón by F. Joglar Rodríguez from a grapefruit tree, Aug. 6. Both of these species were apparently unknown in the Island until this past year.

Exomalopsis globosa Fab. (Anthophoridae, G.A.Sandhouse det.). 1 adult in an automobile at Arecibo, Apr. 22 (C.G.A.). Previously

known in P. R. from only one record "tunneling in hard clay at Guánica (G.B.Merrill)."

Cycloptilum antillarum Redt. (Gryllidae, A. N. Caudell det.). A small number of nymphs on the leaves of a maga tree, *Montezuma speciosissima*, at Arecibo. May 24 (A.S.M.) an adult found in a house in Santurce, Oct. 20 (A.S.M.). Apparently little known in P. R.

Neorandania chalybaea Wied. (Stratiomidae, C.T.Greene det.). Many adults resting on grapefruits at Arecibo, Apr. 5 (R.F.). Little known in P. R.

Tabanus hookeri Knab. (A.S.M., Alan Stone det.). One adult, at light at Santurce, Feb. Not in Wolcott's "List" but recorded from Vieques Id., P. R. in Curran's First Suppl. to Diptera of Porto Rico. Described from Porto Rico (Ins. Insc. Men. 3(4):48, 1919).

Volucella pallens Wied. (C.T.Greene det.). An adult resting on a *Terminalia catappa* leaf, Arecibo, July 27 (M.Kisliuk) and an adult on an orange at Peñuelas, Feb. 25 (R.G.O.). Little known in P. R.

Chrysotus excavatus VanD. (Dolichopodidae, Aldrich det.). Adults on grapefruit in small numbers at Arecibo, Mar. 1 (C.G.A.). Previously recorded only from Aibonito.

Psilopus diffusus Wied. (Dolichopodidae, C.T.Greene det.) Adults resting on fruits in small numbers on several sour orange trees, Arecibo, Feb. 23 (C.G.A.). In Wolcott's "List" but without definite locality.

Proctacantha rufiventris Macq. (Asilidae, C.T.Greene det.). 1 fly resting on a tropical almond leaf, Arecibo, July 27 (Max Kisliuk). Stated by Wolcott to be "quite common" but only actually recorded from 2 or 3 definite localities.

Sigaloessa bicolor Lw. (Oscinidae, Aldrich det.). A moderate number of adults resting on leaves of several banana plants at Bayamón, Apr. 8 (C.G.A.). Recorded only from Coquillett's original record published in 1900.

Gonia crassicornis Fab. (Tachinidae, Aldrich det.) was reared from a cocoon of the Noctuid *Xylomyges eridania* Cr. Previously recorded by Jones and Wolcott (Jour. Dept. Agr. P. R. 6(1):47, 1922) as a parasite of *Laphygma frugiperda* S. & A.

Archytas antillicola Curran. (Tachinidae, Aldrich det.). One adult on trail up El Yunque mountain, Mar. 13 (A.S.M.). Known only from the types (1927) altho these were from several localities, mostly at the higher elevations also.

Drosophila repleta Woll. (Aldrich det.) Adults on window in dining room in San Juan, Apr. 1 (C.G.A.). Previously recorded only from 2 specimens, Santurce 1914.