

A LITTLE-KNOWN ROOT-WEEVIL OF CASSAVA

(*COELOSTERNUS SULCATULUS* BOHEMAN)

BY MORTIMER D. LEONARD

INTRODUCTION

Under date of March 5, 1930, roots of cassava, or yuca as it is locally called, infested with a weevil were received from Mr. I. L. Torres, Director of Extension of the Insular Department of Agriculture. These had been sent in by Mr. J. B. Román, Agricultural Agent at Comerío, accompanied by a letter saying that he had personally seen the planting and that appreciable damage had been done to it.

An adult weevil which had been dug out of the roots accompanied the specimens and several larvae were found in the roots. Subsequently two or three more of the adults emerged.

Specimens were submitted to Mr. Chas. W. Leng of the Staten Island (New York) Public Museum who replied that he and Mr. A. B. Mutchler of the American Museum of Natural History were unable to place the species. They therefore submitted it to Dr. Guy A. K. Marshall of the British Museum who determined it as *Coelosternus sulcatulus* Boheman, with the statement that it was originally described from Guadeloupe and had previously been represented in the British Museum by but a single specimen.

On March 21, in company with Messrs. Torres and Román the writer visited the farm where the weevil had been found. It is owned by Don Pedro Tañón in the Barrio of Doña Elena and is at about 1,800 ft. altitude, an hour by horseback up in the mountains. There had been about 2 acres planted in cassava which had been recently dug, the entire plants having been laid aside to dry out. From personal examination and from conversation with the grower we estimated that about 10 per cent of the roots were worthless altho the actual percentage of plants infested was somewhat higher than that. A new planting had been made and the shoots were just beginning to show above ground but we were unable to find any weevils or larvae in or near the "seed" pieces altho they were close to the old planting. The grower stated that he had not previously observed such damage, altho he had grown yuca for several years. We were unable to learn from where he obtained the

“seed” for the original planting on his farm but presumably it was from some nearby plantation, since cassava has been grown in that section for a considerable length of time.

The only reference I have been able to find to a weevil infesting yuca is by R. S. Cunliffe (Yuca, Su Cultivo, Variedades, Contenido en Almidón y Fabricación. Cuba Est. Exp. Agron. Bol. 34: 57-58, 1916) who states that in the island of St. Vincent a species of *Cryptorynchus* has been found as a stem borer [taladrador del tallo]. I have, however, been unable to locate the original in any of the reports of the St. Vincent Department of Agriculture upon which Cunliffe must have based this statement. Furthermore F. W. Ulrich in a paper entitled Cassava Insects in Bul. Dept. Agr. Trinidad and Tobago 14 (2): 38-40, 1915, gives records of cassava insects in other countries but makes no mention of this weevil in referring to the pests of the crop recorded from St. Vincent.

HISTORY AND DISTRIBUTION

Coelosternus sulcatus Boheman was first described in Carl J. Schoenherr's "Genera et Species Curculionidum", IV (I): 220, 1837. The locality is given as Guadeloupe. The number of specimens upon which the original description was based is not stated. With the exception of the specimen in the British Museum it has not since been noticed until found last March in Porto Rico. Altho since that time several plantings of yuca in the vicinity of Río Piedras and to the West along the North Coast to Arecibo have been examined, no further infestations have been found. It is possible that the species has become established in the higher altitudes in the Island but inquiry among the Agricultural Agents has so far failed to bring any further report of its presence.

FOOD-PLANT AND NATURE OF INJURY

Cassava or yuca, *Manihot Manihot* (L.) Cockerell, is generally grown throughout the Island in small patches of usually an acre or two or even less. Altho none is grown for the commercial production of starch it forms an important source of food for the natives who eat the edible storage roots.

Strictly speaking it is not the roots themselves but the underground part of the stem in which the larvae feed. The plants found infested near Comerío had the basal, woody part of the stem which lies immediately underground and usually parallel to its surface, tunneled by the grubs. Altho the larvae do not feed in the storage

roots, injury to the underground part of the stem weakens the whole plant and reduces the size and quality of the storage roots.

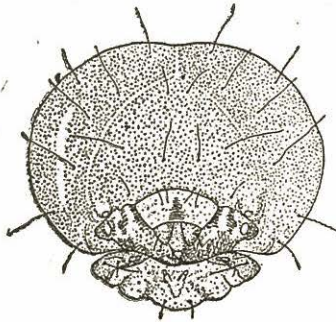
DESCRIPTION OF STAGES

THE LARVA (PL. XIX FIG. 3)

Length about 10 mm., body strongly curved; yellowish-white to pale brownish yellow with head capsule reddish brown, mandibles blackish.

Some of the more important features of the larva appear to be as follows: body strongly curved, the first, second and third abdominal segments being slightly smaller than the remainder and than the thoracic segments, giving the body a somewhat constricted appearance at the middle. A large, elongate spiracle on the prothorax, about three times the length of the abdominal spiracles which

Fig. A.
Head of Larva



are distinct and of moderate size, that of the eighth segment being uniform in size and shape with the others. Body glabrous except for the pale hairs found on each segment which are very fine, short and sparse. The eighth segment bears a pair of well developed setae towards the median line at about two-thirds of its length caudad when viewed laterally, from which point it slopes sharply to the caudal border; a well developed seta is located on each side on a prominent protruberance caudoventrad of the spiracle. The ninth segment is much smaller than the eighth and only about one-half its width viewed laterally; it bears one set of setae on either side. The tenth segment is very small and glabrous and is neither dorsal nor ventral but more nearly terminal, the tip being just visible in lateral view protruding beyond the border of the ninth.

The details of the mouth-parts (as far as could be determined) and of the arrangement of the setae on the head are as shown in text figure A.

THE PUPA (PL. XVIII FIGS. 1 AND 2 AND PL. XIX, FIGS 1, 2, 4)

(Description drawn up from one specimen nearly ready to change to an adult and therefore brownish yellow with abdomen and parts of head dark brownish.)

Length, about 12 mm. At first whitish, later becoming yellowish to brownish yellow as development advances.

A prominent thoracic spiracle is located at the base of the prothorax. The beak has two transverse depressions just apicad of the antennae. There are seven prominent setae on tubercles on the head one on either side of the median line near the vertex and a transverse row of five just above the eyes, the middle one being just to the left of the median line. The frons bears two median setigerous tubercles. On the beak are setae on tubercles, but somewhat smaller, three on each half (viewed from in front); just above the base of the antennae, and near the tip of the beak are two more, still somewhat smaller.

The prothorax when viewed from above is almost twice as wide as long, rounded in front and about one-third the way caudad swelling laterad to about twice the width. The basal angles are slightly extended backwards and the caudal border is extended caudad at the median line into two small protruberances thus giving the caudal border a sinuous outline. The prothorax bears eight pairs of prominent setigerous tubercles one apical and one subapical, one antero-median and one antero-lateral, three postero-lateral, and one postero-median. There are a number of irregularly scattered spines, somewhat smaller and less numerous towards the middle and hind part of the disc. Mesothorax with two pairs of smaller setigerous tubercles. Metathorax with a median transverse row of three still smaller setigerous tubercles on either side.

The first six abdominal segments viewed dorsally are about equally wide cephalo-caudad, gradually decreasing in width laterally and each with a transverse row of small setigerous tubercles near the caudal margin; the seventh somewhat wider but narrower with a transverse row of larger setigerous tubercles; the eighth still smaller both ways, posterior margin strongly convex and with two prominent median setigerous tubercles; the ninth segment small, transverse, with each postero-lateral angle prolonged into a prominent chitinous process, below each of which is a small setigerous tubercle; the tenth segment is not visible from above but when viewed from below is small and appears to be protruding slightly from the encircling ninth segment; it is apparently glabrous.

Femora each with two prominent subapical setigerous tubercles on outside. Wing-pads extend to about the caudal border of the sixth abdominal segment. Longitudinal ridges on the wings prominent and with numerous small setigerous tubercles.

THE ADULT (PL. XIX FIG. 5)

The adult weevil is 6 to 7 mm. in length. Messrs. Leng and Mutchler have been kind enough to furnish me with a brief diagnosis and with a copy of the original description both of which follow quoted in full:

"Head with a V-shaped raised ridge behind the eyes; coarsely punctate; scaly, scales on basal part smaller than on apical; apical end of the beak smooth shining but beginning on the apical half there are raised ridges, the middle one of which continues back to the base; basal half covered with scales. Scape of antennæ moderately short; funicle seven jointed, second joint longer than the third; club elongate and somewhat thickly pubescent. Pronotum suddenly narrowed at apex and with a prominent raised median ridge on the apical half; coarsely punctate; vestiture consisting of rounded and elongate scales, sides more densely scaly; ocular lobes prominent. Elytra with the alternate striae prominent, intervals coarsely punctate and granulate, vestiture consisting of rounded and elongate scales. Under surface and legs somewhat densely scaly. Femora with two teeth on the apical half the one nearest the apex being the smaller; tibiæ curved and with a curved tooth at the apical end."

"Male, female. 22. *C. Sulcatulus*. Chevrolat.

"Ovalis, niger, dilute fusco-griseo-squamosus; rostro tenui, valde arcuato, basi confertim punctato, carinato; thorace punctatissimo, dorso antico argute carinato; elytris subtiliter bifariam punctato-striatis, interstitis alternis carinatis; femoribus clavatis, omnibus bidentatis.

"*Patria*: Guadeloupe. A Dom. Chevrolat amice communicatus. Mus. Schh.

"Magnitudo, statura et summa similitudo *Cryptorhynchi haemorrhoei*; clava antennarum elongata, rostro basi tantum carinato, thorace antice carinato, femoribus omnibus bi-dentatis, ab illo distinctus. Caput breve, convexum, rugoso-punctatum, nigrum, squamis, depressis, fusco-griseis, tectum, vertice linea arcuata praedito; oculi oblongi, haud prominuli, brunnei; rostrum longitudine thoracis, subtenue, teres, valde arcuatum, obscure ferrugineum, basi crassius, ibique supra carinatum, punctatum, squamulosum, de in ex-

trorsum nudum, nitidum, sub-laeve. Antennae in medio rostri sitae, subtenuae, dilute ferrugineae, clava elongata, cinereo-pubescente. Thorax latitudine baseos brevior, anterieus angustior, apice utrinque emarginatus, leviter constrictus, lateribus valde rotundato-ampliatus, basi bi-sinuatus, supra modice convexus, confertim punctatus, niger, squamulis unicoloribus fusco-griseis dense vestitus, in medio dorsi carinula sat elevata, postice abbreviata, instructus. Scutellum parvum, oblongum, nigrum, punctatum. Elytra antice thoracis basi nonnihil latiora et illi arcte adaequata, humeris obliquis, obtuse sub-rotundatis; a medio apicem versus attenuata, apice ipso conjunctim rotundata, thorace vix triplo longiora, supra valde convexa, postice declivia, punctis parvis, per paria approximatis, squama pallida repletis, striata, interstitiis alternis costatis, alternis planis; nigra, squamulis fuscogriseis dense tecta. Corpus subtus nigrum, crebre punctatum, dense dilute umbrino-squamosum. Pedes longiusculi, validi, nigri, punctati, squamulis dilute umbrinis tecti; femoribus clavatis, omnibus subtus bi-dentatis, dente anteriore valido, posteriore parvo; tibiis nonnihil arcuatis, apice uncinatis; tarsi elongatis, subtus fulvo-spongiosis.—Bhn.”

FURTHER NOTES

In all, eight adults have been collected or reared, seven of which were on March 5, 17, and 21, 1930. The eighth pupated in its tunnel on about March 30 and the beetle emerged about 3 weeks later, although the adult had remained in the pupal cell for several days before actually emerging from its exit hole in the wood.

Of these specimens four are in the Collection of the Insular Experiment Station at Río Piedras, P. R., and four were sent to Messrs. Leng and Mutchler, one of which is presumably in the British Museum.

The entire length of the pupal cell is about 20 mm., each end being plugged with sawdust to a depth of 5-7 mm. in order to hold the pupa securely in place. The diameter of the cell is about 4 to 5 mm. (pl. XIX, figs. 1 and 2.)

A LONGICORN TWIG-BORER

On March 5, when the farm near Comerío was visited for the purpose of observing the root-weevil a number of the cassava twigs were found to contain a coleopterous twig-borer belonging to the family Cerambycidae. Unfortunately only one larva and one pupa were preserved so that the specific identity is in doubt. The larva meas-

ures about 18 mm. and is a dirty yellowish white. The pupa is about 8 mm. in length and of about the same color.

Patricio Cardin (Bul. 20 Est. Exp. Agron. Cuba, 1911, pp. 14-17 and 24, Pls. V and VII) has discussed the injuries of two longicorn twig borers in cassava in Cuba. According to notes on file in the Insular Experiment Station, the more common of the two observed by Cardin in Cuba, *Lagochirus obsoletus* Thomas, was determined by Dr. E. A. Schwarz under this name, from a specimen collected at light by D. L. Van Dine on March 26, 1911, in the Condado section of Santurce, P. R. It is listed, however, in Wolcott's "Insectae Portoricensis" (Jour. Dept. Agr. P. R. 7 (1): 110, 1923) under *L. araeniformis* L. This latter species is recorded (l. c.) also from the Central Mercedita, Yabucoa, P. R., Jan. 29, 1913 and from Río Piedras, Apr. 15, 1912 (Van Dine Coll.) and Apr. 18, 1917 (R. T. Cotton Coll.) each from a single specimen collected at light. Presumably Cardin was really working with *L. araeniformis* in Cuba. The species is undoubtedly a cassava feeder in Porto Rico but the pests of this plant have been little studied here. The Comerío material collected by the writer is undoubtedly however not this species, since according to Cardin the full-grown larva of *L. araeniformis* measures about 29 mm. in length.

The second longicorn discussed by Cardin, as a minor pest of cassava *Leptostylus biustus* Lec., is not recorded in Wolcott's List from Porto Rico. It is possible however, that the Comerío specimens may belong to this species since it is apparently considerably smaller than *L. araeniformis*.

EXPLANATION OF PLATES

PLATE XVII.

Section of part of underground cassava stem cut open longitudinally to show tunnels made by the larvae. About natural size.

PLATE XVIII.

Fig. 1. Ventral view of pupa in its cell, about twice natural size.
Note plug of sawdust at each end.

Fig. 2. Dorsal view of pupa in cell, same size.

PLATE XIX.

Fig. 1. Pupa, ventral view, above $3 \times$ natural size.

Fig. 2. Pupa, dorsal view, about $3 \times$ natural size

Fig. 3. Larva, lateral view, about $3 \times$ natural size.

Fig. 4. Pupa, lateral view, about $3 \times$ natural size.

Fig. 5. Adult, dorsal view, about $2\frac{1}{2} \times$ natural size.

PLATE XVII



PLATE XVIII



1



2



1



2



3



4



5