A REVIEW OF TWENTY-FIVE YEARS OF ECONOMIC ENTOMOLOGY IN THE ISLAND OF MAURITIUS.

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Introduction.

Mauritius, one of the islands forming the well-known Mascarene Islands, lies in the South Western Indian Ocean between longitude 57° 18′ and 57° 49′ East and latitude 19° 58′ and 20° 32′ South, about 550 miles to the East of Madagascar. The Island is triangular in shape and is 36 miles long and about 23 miles broad with a circumference of 130 miles and an area, including the small islets round the coast, of about 720 square miles. It is of volcanic origin and one can still see the extinct craters near its centre (Grand Basin, Mare aux Vaccas, Trou aux Cerfs). There seem to have been two periods of eruptions of these now extinct volcanoes, the first forming the Black River Mountain Range and the second, mostly composed of basalts and dolerites, the central districts of the Island. There is evidence of a recent elevation of from 40 feet in the South to 12 feet in the North. The rocks are all basic in character and clay slates can be found in the Black River Mountains, while trachyte with platy structure can be found near the centre of the Island (37 : 141).

The soils of Mauritius (74 : 295), although originating from the same basaltic magma, differ considerably in character. They can be classified into (1) mature soils or soils derived from old parent rocks; (2) immature soils or soils of more recent formation characterised by the presence of stones and boulders; and (3) cultivated soils which can further be classified into slightly laterised soils and highly laterised soils. Rainfall has been shown by Craig (8) to be the most important factor in determining the composition of the cultivated soils of Mauritius. Slightly laterised soils are found in the dry districts, while in the wet regions, *i.e.*, in the uplands, the soils are mainly of highly laterised types.

Two well marked seasons usually occur in Mauritius, the summer season extending from December to April and the winter season from May to November. While the summer or hot season is generally accompanied by heavy showers and occasional cyclones, the winter or cool period is characterised by dry or semi-dry conditions. The mean annual temperature varies with the season and altitude. Near the coast the mean temperature ranges from 25·5° to 27·0° C. during December to April and from 21·2° to 22·7° C. from May to November. In the uplands, the mean annual temperature varies from 23·3° to 22·0° C. and from 18·8° to 17·8° C. during the corresponding periods. The same variations occur in the rainfall which ranges from 25-75″ near the coast (mean annual rainfall) to 100-175″ in the uplands. The true rainy season extends from December to April with a maximum average precipitation in March.

The most important industry is that of sugar-cane on which the whole population depends. Sugar-cane is usually planted at the close of the winter season, and harvest takes place the year after in July-August or September. The total acreage under sugar-cane in 1940 amounted to 150,845 acres, and the mean yield of canes per arpent during the same year was 24·55 tons. The total sugar production for 1940 amounted to 316,250 metric tons.

Several contact insecticides have been tried against this pest. Sulphomulsol (49:24), engine-oil emulsion (49:32), and an emulsion of diesel oil and clay (61:31, 40; 30:48) have been used with more or less success. In almost all cases the concentration at which the emulsions should be used was found to be harmful to the tender stems and young leaves of the infested plants.

Control by the local Coccinellid predators, *Rodolia chermesina*, Muls., and *Exochomus laeviusculus*, Wse., together with the use of banding grease, has given good results (50). The object of the banding grease is to prevent the black ant, *Technomyrmex detorquens*, Wlk., from reaching the mealybugs and, in that way, favours considerably the breeding of the Coccinellids. In spite of the presence of the above predators, *I. seychellarum* is not kept under control unless banding grease is applied.

Attempts to introduce the well-known predator, *Rodolia cardinalis*, Muls., from South Africa were made in 1915 by d'Emmerez de Charmoy (45:145) but he reported that this Coccinellid, though breeding on *I. seychellarum* in the laboratory, did not produce further generations when released in the field. Further importations of *R. cardinalis* from South Africa were made in 1937-38 (29:44; 30:48). It is interesting to note that at least three generations of this Coccinellid could be bred in the laboratory on *I. seychellarum*, but it was observed that in-breeding appeared to weaken the stock to such an extent that no further generations could be obtained. Of the individuals obtained from these three generations over 1,000 were released, but again no recovery has resulted.

The inability of *R. cardinalis* to breed successfully on *I. seychellarum* may be due to the fact that young larvae, which feed more readily on eggs than on adults of *Icerya* (1:168), may experience a lack of food when bred on *I. seychellarum* since the ovisac of this species is more or less closed as compared with that of *I. purchasi*, Mask.

Pseudococcus brevipes, Cockerell (Pineapple Mealybug).

P. brevipes was first reported as a major pest of pineapple plants in Mauritius as far back as the year 1933 (69:22; 47:28). The date of introduction of this mealybug is not certain but it probably came in consignments of pineapple suckers received from Hawaii, in or about the year 1931. The first sign of pineapple wilt was noticed in 1932 in the northern part of the Island (69:22). This wilt was definitely proved by Jepson and Wiehe to be due to *P. brevipes* (78:36; 30:45; 34:5, 7). Immediate steps were taken to cope with the pest and, after a series of experiments, Jepson and Wiehe (34:8) recommended that pineapple plantations should be sprayed with a diesel-clay emulsion at a dilution of 1 per cent. oil, using a high pressure sprayer, of the Vermorel Ondine Type. These authors further recommended that four to five applications of the diluted diesel-clay emulsion should be made at six-weekly intervals, in order to eliminate gradually the mealybug population (34:10-11).

Natural enemies of *P. brevipes* are represented in Mauritius by two predacious insects, the Coccinellid, *Scymnus mauritiusi*, Korschf., and the Drosophilid, *Gitonides perspicax*, Knab. The effect of these two predators is in general negligible. Attempts were made in 1938-39 to introduce the cosmopolitan Coccinellid, *Cryptolaemus montrouzieri*, Muls., from South Africa (30:45; 31:19). Three shipments of this predator were received and 1,050 individuals in the larval and adult stages were introduced; of these only 282 were alive. It was subsequently bred in the laboratory on several species of mealybugs, including *P. brevipes* which was readily attacked, but principally on *Phenacoccus insolitus*, Green. A total of 1,940 insects, mostly in the adult stage, were liberated, in 1939-40, in colonies of 50-100 individuals, in 19 localities. In one locality only, Barkly Experimental