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Drosophila of Venezuela.

Collections of Drosophila have been made in various parts of Venezuela, and of those positively identified, several are not included in the list of 34 species published by Cova García and Suárez (1962).

In the state of Lara at a region known as Hato Arriba (elevation 1,900 meters) three species of the mesophragmatica group have been found. These are D. viracochi, D. mesophragmatica and D. gasici. Virgins of iso-female lines of each species were crossed with known Colombian lines for identification, and gave fertile F_1. This is the most north-easterly extension of the geographic range of these Drosophila which are endemic species restricted to the Andes. D. dreyfusi and D. araicas were also collected in this site and were identified by comparison with the drawings of genitalia of Breuer and Pavan (1954) and Pavan and Nacrur (1950).

A representative of the sub-genus Sordophila has been found in the Henry Pittier National Park at Rancho Grande, and also in the vicinity of Barquisimeto. This D. acanthoptera is a strikingly different little fly with very broad cheeks, small dark eyes and unusual wings just as described and pictured by Wheeler (1949). The following species were also found in Rancho Grande: D. griseolineata, D. guarumunu, D. setula, D. krugi and D. sucinea. The last two are easily identified by the genitalia which are illustrated in the work of Breuer and Pavan (1954) and Malogolowkin (1952). It is interesting that among iso-female lines of the D. sucinea 20% produced all female offspring and can only be maintained by adding males from other lines.

In the vicinity of Barquisimeto, D. moju, D. fulvimacula, D. paranaesis, D. cardini, D. canalinea and D. campestris have frequently been collected. Dr. Dobzhansky and his collaborators have found the sibling species, D. equinoxialis, D. tropicalis and D. willistoni as well as the D. paulistorum listed by Cova García and Suárez.

References: Breuer, M. and Pavan, C., 1954, Rev. Brasil Biol. 14: 465. Cova García, P. and Suárez, O., 1962, Revista Venezolana de Sanidad y Asistencia Social XXVII: 317. Malogolowkin, C., 1952, Rev. Brasil Biol. 14: 465. Pavan, C. and Nacrur, J., 1950, Dusenia I: 263. Wheeler, M., 1957, U.T.P. 5721: 79.

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Effects of an ecdysone on growth and cuticle formation of D. imaginal discs cultured in vivo.

When the imaginal discs of D. melanogaster are implanted into larvae, they metamorphose when the larvae metamorphose. When they are implanted into adult abdomens, the discs may grow, but they do not metamorphose. The present experiments were designed to see whether injection of an ecdysone into an adult fly will cause implanted imaginal discs to metamorphose.

Whole leg discs from mature third instar larvae were injected into fertilized adult females. The hosts then received single or repeated injections of ecdysterone (=20-hydroxyecdysone) in 10% ethanol in Ringer. In a typical experiment, one group of flies bearing implants received either 7.2 or 720 micrograms of ecdysterone/gm fly weight in a single dose, or in six equal installments over a period of eleven days. In none of the singly injected flies did the discs grow significantly or metamorphose. In contrast, multiply treated implants increased in size more than threefold, and most secreted some cuticle, but failed to metamorphose.

To cause metamorphosis, repeated doses of higher concentrations of ecdysterone were necessary. Thus 3600 micrograms/gm given over an eleven day period in three injections caused metamorphosis in thirteen of thirteen implants. These metamorphosed implants were completely covered with cuticle, and formed bristles, claws, tibial sensory organs, sex combs, and sensilla trichodea.

These results indicate the following: 1) lack of ecdysone in uninjected adult flies accounts for the absence of metamorphosis in implanted discs. 2) Ecdysterone is inactivated rapidly in the adult. 3) To cause either growth or metamorphosis, ecdysone is needed as a sustained stimulant, not merely as a trigger (hence the effectiveness of repeated doses). 4) Low concentrations of ecdysone stimulate the enlargement of discs, whereas, 5) high concentrations stimulate cuticle secretion and metamorphosis.

The discovery of a simple chemical method of regulating the growth and metamorphosis of imaginal discs promises to simplify developmental studies with Drosophila.