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BROCHOSOMES ON CERTAIN SPECIES OF INSECTS OF WESTERN NORTH AMERICA

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Some unusual sponge-like bodies of insect origin were noted and photographed by Cochran in 1948 while he was making electron-microscope examinations of leafhopper body fluids. Tulloch, Shapiro, and Cochran (1) published the first description of these bodies. Tulloch and Shapiro (2) named them brochosomes, extended the known geographic and species range of insects known to have brochosomes, and described what they considered to be developmental forms.

Brochosomes appear as hollow spheroids with perforated external surfaces, varying in diameter from 240 to 600 millimicrons. Apparently non-living, they may be found singly or joined together in large masses by what appear as single or double strands. The chemical composition and function of brochosomes are unknown.

In studies at the Utah State Agricultural College brochosomes were found on the external surfaces of several species of Western North American insects. The specimens were placed in drops of ten per cent alcohol, and gentle manipulation of external surfaces of the insects usually dislodged an abundance of brochosomes which were readily observed when portions of the drops were transferred with micropipettes to standard specimen screens covered with Formvar membranes.

Brochosomes were found on external surfaces of adults of the following species of leafhoppers: *Circulifer tenellus* (Baker), *Dikraneura absenta* DeL. and Cl., and *Macrosteles fascifrons* (Stal.). Specimens of *M. fascifrons* and *D. absenta* tested were collected in two widely separated areas, Logan, Utah, and Creston, British Columbia. All specimens of *C. tenellus* tested were collected in Logan, Utah.

An attempt was made to obtain samples of internal body fluids free

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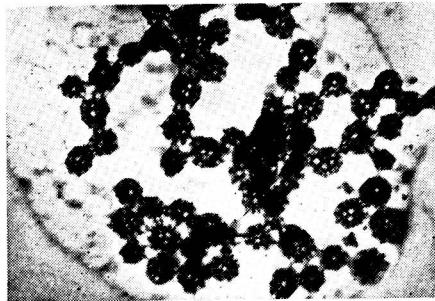


Fig. 1.—Unshadowed electron micrograph of brochosomes, approximately X8,000.

of contamination from the external surfaces of the insects. Capillary tubes drawn to extremely fine diameters were used to penetrate the exoskeleton of abdominal areas, and the body fluids that entered the tubes were then applied to the membrane-covered copper screens for electron microscope examination.

Studies were made of all stages of *C. tenellus*, the beet leafhopper. No brochosomes were found within the egg although they occurred on external surfaces of the egg. Some

were found in internal body fluids and on external surfaces of the first, second, third, and fourth instars.

Brochosomes were also found on external surfaces of *Drosophila melanogaster* Mg. and *Musca domestica* L. None were found in the body fluids of these species, nor were they found externally on or internally in *Apis mellifera* L., *Vespula arenaria* (Fab.), *Leptocoris trivittatus* (Say), or *Myzus persicae* (Sulz.). Specimens of the last six species tested were collected near Logan, Utah.

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Inversion of a fly pupa in a puparium

Early in June 1956 a few score maggots were picked up off the floor outside a preparation room where a number of heads of sea lions from the Queen Charlotte Islands were awaiting preparation for the departmental collection of skulls. The maggots were placed over clean sand in a rearing cage, and in from 10 to 12 days large blow flies *Cynomyopsis cadaverinus* (R. D.), emerged. In my limited experience, this is a northern fly or one of higher altitudes which rarely or never occurs as far south as Vancouver.

When the sand was sifted for pupae for pinning, one puparium was found with the two halves of the capitulum slit open a little way but still adherent and four actively kicking fly legs protruding. The puparium was chipped open very carefully, revealing an active but very malformed fly lying

completely reversed, its head lying in the rounded spiracular caudal end of the puparium. The head was swollen, with the ptilinum extruded, rounded and dried; the antennae were depressed into the antennal grooves: only the eyes were completely formed; the first pair of legs was squeezed up against the thorax and the second and third pairs were sticking out behind; the wings were dried in the folded pupal condition.

The fly *C. cadaverinus* is remarkably large in proportion to its mature maggot, and the pupa normally occupies the whole of the coarctate puparium with little room for movement, let alone turning. How then did the fly become reversed end for end in the puparium and when did the reversal take place?—G. J. Spencer, University of B.C.

Patrobus lecontei Chd.

Patrobus lecontei Chd. (Coleoptera: Carabidae). In the summer of 1956 Prof. Carl Lindroth and Dr. Geo. Ball collected through the Crows Nest Pass, B.C., ending up at Creston, where they spent a few days with me. At Cranbrook they had taken several *Patrobus lecontei*, a new record for the Province. They gave me directions to the exact spot of their captures, so I took the first opportunity (12-VIII) to visit it, and in two hours collected 23 specimens. The exact

spot is a patch of bulrushes to the left of the main highway on the western approach of the town, and a few yards from the sign: "Entering Cranbrook", and the beetles were on the muddy margins of the bulrushes. With their bright reddish legs *lecontei* stand out sharply beside our other species of *Patrobus*. In his revision, *The American Patrobini*, 1938, Darlington lists the species from Newfoundland, Manitoba, Alberta and Colorado.—G. Stace Smith, Creston, B.C.