

limits, a view widely held now. Such an idea, however, requires a thorough study of the ganglionic geometry and pattern of innervation before a final word about the segmental condition in a leech can be said. The present method of studying the Retzius' cells provides a short cut to this neuronal method of determining segmental constitution or composition. A glance at a section, processed accordingly, gives a clear-cut idea about the number of segments involved in the sub-pharyngeal ganglionic architecture, which is otherwise very complex due to cephalization, segmental telescoping and lack of internal septa in adult leeches.



FIG. 1. Horizontal section of the sub-pharyngeal ganglionic mass along with the first pair of segmental ganglia, showing strong activity in the Retzius' cell (R) and their connecting fibres (IF),  $\times 39$ .

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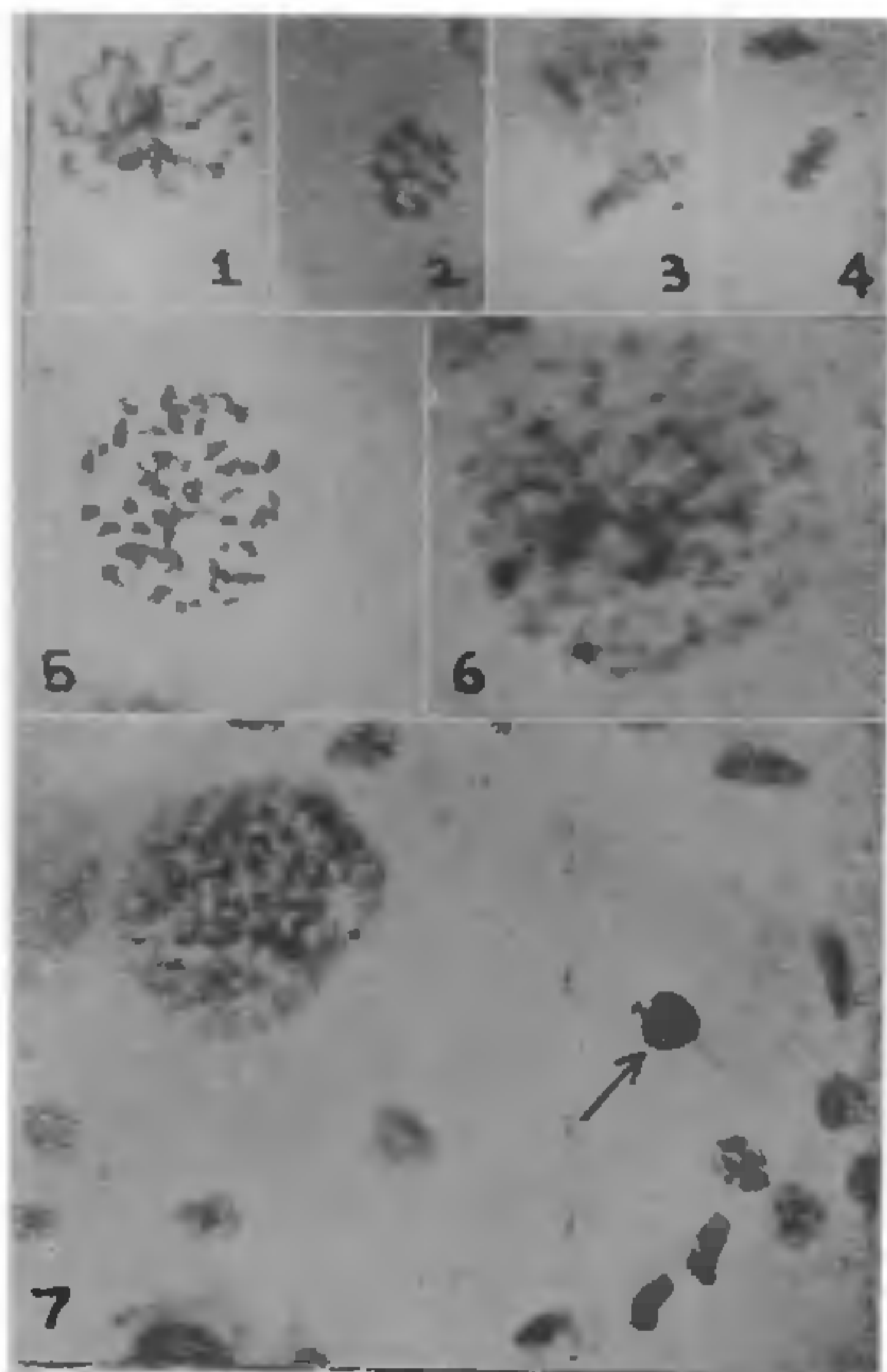
#### OCCURRENCE OF ENDOPOLYPLOIDY IN ABDOMINAL SCENT GLANDS OF *CHRYSOCORIS PURPUREUS* (WESTW.) PENTATOMIDAE—HETEROPTERA

REVIEW of the literature shows that there is a paucity of knowledge on the differentiation and nuclear changes undergone by the first pair of abdominal scent glands of *Chrysocoris purpureus*. However, scent glands in certain other Heteroptera and their role in defence or pheromone secreting activity have been well demonstrated<sup>1</sup>. The first pair of abdominal scent glands in *C. purpureus* are of developing non-functional type in all the instars whereas the 2nd and 3rd pairs are fully functional in all the nymphs. After the final instar the 2nd and 3rd pairs of nymphal glands degenerate and the first pair of developing nymphal glands become functional in 2–3 days old adult bugs of both sexes. The present study was undertaken to investigate the occurrence of endopolyploid nuclei in the first pair of abdominal scent glands of adults and nymphs of both sexes of a pentatomid bug, *C. purpureus*.

In adult bugs, the abdominal scent glands are situated dorsolaterally just above the third abdominal air sac. The abdominal scent glands were dissected out and fixed in Carnoy's solution. The fixed glands were hydrated and hydrolysed in  $\text{NHCl}$  at  $60^\circ \text{C}$  for 8 min, and stained in feulgen solution for 2 hours. Some glands were also stained by the haematoxylin technique. The endopolyploid gland cells can easily be found in squash preparations due to their enormous size.

Post-embryonic developmental study of the gland cells clearly exhibits mitotic stages with diploid number (Figs. 1–4;  $n = 6 + \text{XY}$ )<sup>2,3</sup>. In the differentiating cells of the gland, endopolyploidy regularly succeeds mitosis. The nuclear division was usually not observed after third instar stage. Different degrees of ploidy were also encountered during post-embryonic development (Figs. 5 and 6). Abdominal scent gland of the adult is characterised by the enlarged secretory cell (Fig. 7), has a relatively clear boundary with characteristic giant nucleus. Each secretory cell has an exocuticular complex end-apparatus with an elongated canaliculus to drain out the cellular secretion into a reservoir<sup>4</sup>.

The giant nuclei of both sexes exhibit different structures, either the chromatin is uniformly distributed or it is organised in the form of chromatin bundles. However, it is not possible to make accurate counts or descriptions of the chromosomes. Further, cytophotometric (i.e., DNA content) measurements are essential to enunciate the degree of ploidy. A change in the gene activity may be the cause for the abrupt transition from the mitotic to the endomitotic cycle during development. The continuous activity of the chromosomes appears to be one of the advantages of endomitotic growth as it permits high synthesis of nucleic acids. Ecdysone and juvenile hormones of insects were believed to cause gene activation<sup>11</sup>. Probably, the synthetically active cells of the abdominal scent glands require an enlargement of nuclear surface.



FIGS. 1-7. Abdominal scent gland squashes of *C. purpureus*. Figs. 1-4. Mitotic stages from 3rd instar showing Pro, Meta, Ana and Telophases,  $\times$  ca 1,100. Figs. 5 and 6. Degree of ploidy during 3rd instar, note variation in nuclear size,  $\times$  ca 1,100. Fig. 7. Adult endopolyploid cell, its giant nucleus and end-apparatus. Arrow indicates exocuticular end-apparatus. Small interstitial nuclei adjacent to cell boundary are also seen,  $\times$  ca 950.

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#### ON MONOGENETIC TREMATODES FROM *UPENEUS VITTATUS* (FORSKAL) AND *UPENEUS* *SULPHUREUS* (CUVIER) OF WALT AIR COAST, BAY OF BENGAL

THE recovery from the gills of the Waltair coast fishes *Upeneus vittatus* and *U. sulphureus* of a diclidophorid monogenean which appears to be new to science has allowed us to comment on monogenea of these fishes. It is well known that considerable host specificity is displayed by monogeneans and species of *Upeneus* harbour characteristic parasites. This is the first time that a comprehensive survey of Monogenea of Waltair coast fishes has been undertaken.

In the pedunculate nature of the clamps, the specimens collected from Waltair resemble the genus *Diclidophora* (Diesing, 1850) but in the limited number of testes and genital hooks as well as in the general morphology, it comes close to the genus *Upenicola* Unnithan 1966.

Unnithan<sup>1</sup> described *Upenicola upeneoides* from *U. vittatus* of the South-West Coast of India. Although work has been done on Monogenea of fishes of East Coast by Chauhan<sup>2</sup>, especially in the north-eastern parts of Bay of Bengal and Monogenea in the more southern region have been studied chiefly by Ramalingam<sup>3</sup>, no information is available on the Monogenea of fishes in the neighbourhood of Waltair coast. In view of the fact that Mamaev<sup>4</sup> recently described two more species, *Upenicola digitata* and *U. capheni* from *Upeneus* spp. from the gulf of Tonkin, North Vietnam, it appeared well worth reporting on the Monogenea of Waltair coast fishes *U. vittatus* and *U. sulphureus*.

The specimens obtained by us from the fishes *U. vittatus* and *U. sulphureus* are definitely different from the genus *Upenicola*. It is proposed to erect