Figures 1A, B. A. Infected *Barilius bendelisis* Ham. with *Achlya orion* (note decaying tail); **B.** infected *Tor tor* Ham. with *Achlya flagellata* (note patches of fungal hyphae).

identified as *Achlya flagellata* Coker and from *B. bendelsis* as *Achlya orion* Coker.

To confirm the parasitic ability of these two pathogens, pathogenicity experiments were also conducted in the laboratory by inoculation method on the lines of Scott & O'Warren[4]. Both the pathogens were able to parasitize the healthy individuals of fish, producing the same symptoms as in the natural condition *i.e.* white cottony mass of fungal hyphae appeared in small patches on the body surface of fish and the host also ceased their activeness gradually. Infected fish died within 48 hr of infection.

A perusal of literature reveals that *Tor tor* and *Barilius bendelisis* are the new hosts of the fungal pathogens *Achlya flagellata* and *A. orion* respectively. This study also proved that the infection of these pathogens was fatal to the hosts (fish).

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NEURONAL DISTRIBUTION IN THE GANGLIA OF THE CERVICO-THORACIC SEGMENT OF THE VENTRAL NERVE CORD OF THE LARVA OF WAXMOTH, *GALLERIA MELLONELLA* AS REVEALED BY COBALT-FILLING TECHNIQUE

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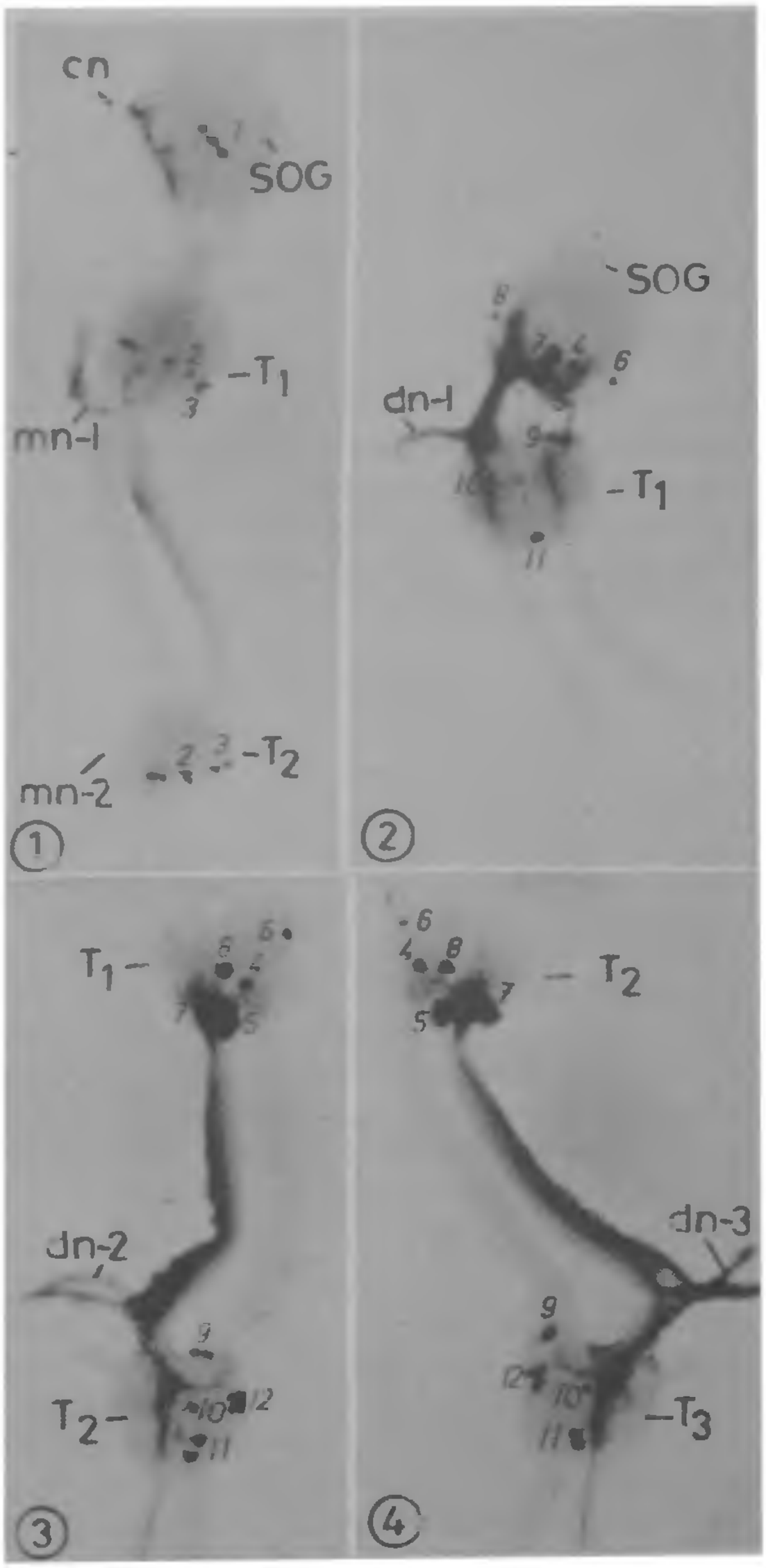
A NUMBER of techniques are now available for the *in situ* study of the neurons of the insect nervous system[1]. We have employed the cobalt (back) filling technique to map out the neurons in the ganglia of the cervico-thoracic segment of the ventral nerve cord of the ultimate instar larva of *Galleria mellonella* by the method described earlier[2]. Since some of these ganglia also send nerves to the prothoracic glands (PTG), the underlying idea of the present investigation was to determine if these glands have any specific group(s) of neurons devoted exclusively to their own innervation.

The cervico-thoracic segment of the ventral nerve cord comprises the suboesophageal ganglion (SOG), three thoracic ganglia (T_1 to T_3) and their nerves (figure 5). The latter include a pair of cervical nerves (cn) from the SOG, an unpaired median nerve (mn-1 to mn-3) from each thoracic ganglion and a pair of dorsal nerves (dn-1 to dn-3) from each interganglionic connective of this region. Of these, the cn, mn-1 and dn-1 send branches also to the PTG in addition to other structures they innervate in their respective segments[2]. All the four ganglia with portions of their nerves were dissected out in *Galleria* saline[2] and one each of the paired (cn and dn) and all the three unpaired (mn-1 to mn-3) nerves were subjected to cobalt-filling technique. The filling reveals a total of 12 neuronal groups each comprising a number of cells in these ganglia with the following break-up: The cn filling reveals neuronal



Figures 1–4. Neuronal groups and their cells as revealed by cn, mn-1 and mn-2 filling **1.** by dn-1 filling **2.** by dn-2 filling **3.** and by dn-3 by filling **4.**

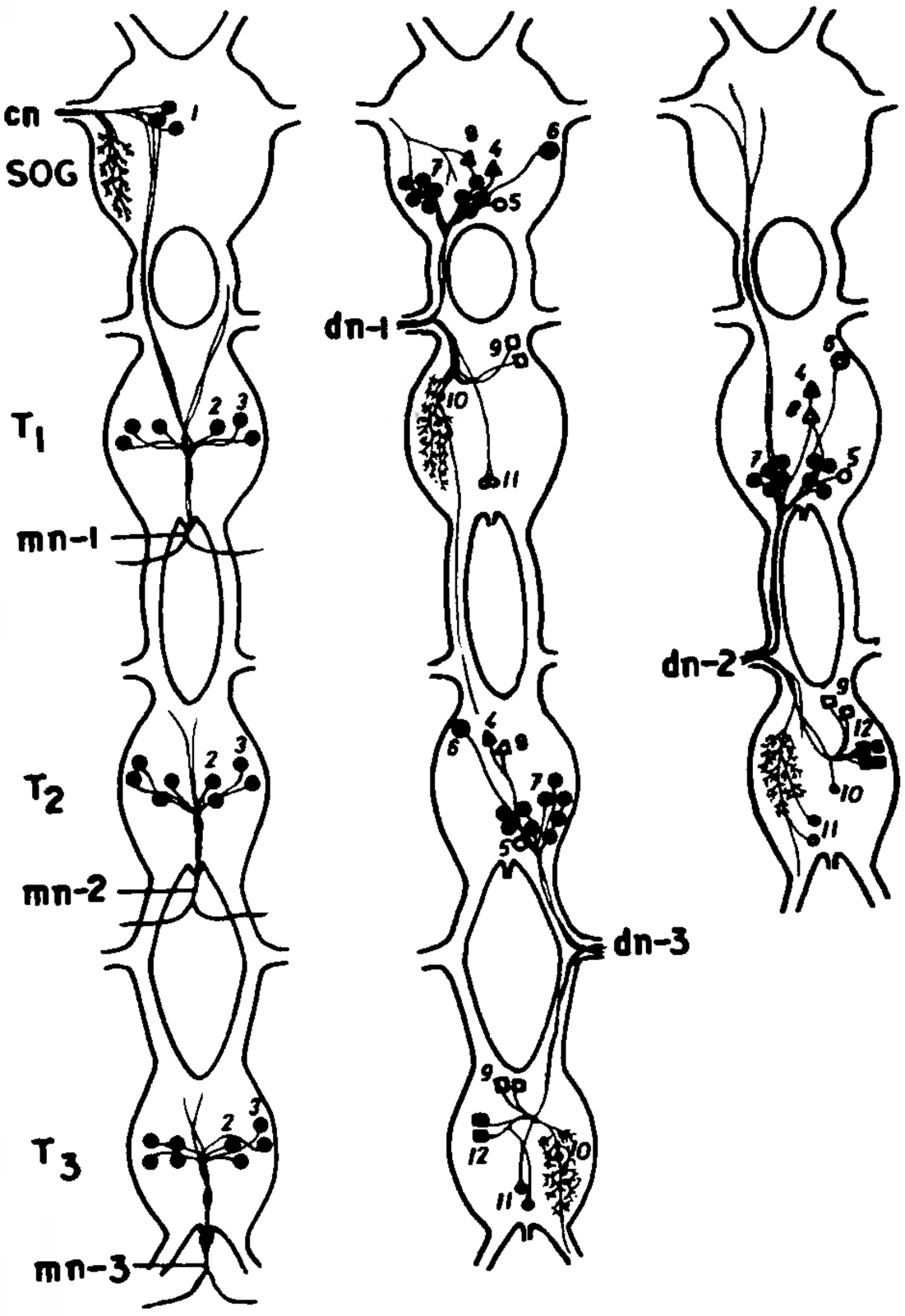


Figure 5. A composite diagram showing the distribution of neuronal groups in the ganglia of the cervico-thoracic segment of the ventral nerve cord.

group 1 comprising 3 cells in the SOG (figures 1, 5) while mn-1 to mn-3 reveal neuronal groups 2 and 3 which comprise 2 cells in each of their respective ganglia (T_1 to T_3) with the exception of T_1 which has only 1 cell in group 2 (figure 1). The dn-1 filling reveals neuronal groups 4–8 in the ganglion preceding it (*i.e.* SOG) and groups 9–11 in the ganglion succeeding it (*i.e.*, T_1) with 1, 1, 1, 9, 1 and 2, 1, 2 cells in the respective groups (figure 2). This pattern is repeated in T_2 and T_3 filled through dn-2 and dn-3 respectively except for the fact that an additional group 12 having 4 cells in T_2 and 2 cells in T_3 is added to these ganglia (figures 3,4). The distribution of the neuronal groups and their cell numbers is summarised in table 1.

The pattern of neuronal distribution as described above reveals a serial homology throughout the four ganglia studied albeit with minor variations in the cell numbers as indicated by asterisks in table 1. These variations could be real but more likely seems to be due to the failure of cobalt-filling in the missing cells. The precision with which the homologous neuronal groups and their cell numbers are repeated in different ganglia should not only extend to the abdominal ganglia too, but should also be a reliable taxonomic feature worth checking by a follow-up study in other orders and families of insects. Another important feature that our study reveals is the fact that the number of cells

Table 1. *Neuronal groups and their cell numbers in the cervico-thoracic ganglia of the larva of G. mellonella.*

Nerves filled	Neuronal groups				Cell numbers+
	SOG	T_1	T_2	T_3	
cn	1	–	–	–	3
mn-1	–	2,3	–	–	*1,2
mn-2	–	–	2,3	–	2,2
mn-3	–	–	–	2,3	2,2
dn-1	4–8	9–11	–	–	1,1,1,9,1 & 2,1,2
dn-2	–	4–8	9–12	–	1,1,1,9,1 & 2,1,2,4*
dn-3	–	–	4–8	9–12	1,1,1,9,1 & 2,1,2,2

+ each count is an average of 10 fillings
* indicate difference in cell numbers in homologous groups

observed in the ganglia is fewer compared to the number of targets their nerves innervate. This should attribute multiple functions to their neurons. No neuronal group or cells specific to the innervation of the PTG was found which further supports our concept of multiple function for these cells.

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ON THE HYPERGLYCEMIC HORMONE OF THE FRESHWATER CRAB, *BARYTELPHUSA GUERINI* MILNE EDWARDS

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THE hyperglycemic hormone (HGH), regulating the blood sugar level in crustaceans, is separated and its properties are elucidated leading to its substantial purification[1–8]. Separation, characterisation and purification of eyestalk principles such as HGH are important and need greater emphasis, since such studies may clarify a number of possibly related physiological effects[3].

The hyperglycemic hormone is found in the eyestalks of the crab, *Barytelphusa guerini*[9]. A preliminary report on separation and purification of this hormone is made in this paper. Collection, maintenance and choice of animals for experimentation as well as bilateral eyestalk ablation were described earlier[10].

The eyestalks were triturated into a fine paste in a glass homogenizer and suspended in distilled water to make a final concentration of one pair of eyestalks/0.2 ml. After centrifugation, the supernatants were divided into two portions: one constituting the unboiled extract was directly used for injection purposes and the second portion was heated at 100°C for 20 min. The final volume after boiling was adjusted to the original volume by adding distilled water. It was centrifuged for 10 min at 3000 rpm and the clear supernatant constituted the boiled extract. The eyestalks were either frozen in a freeze chamber or air-dried at room temperature for 24 hr and were used for preparing frozen and air-dried eyestalk extracts respectively.

An extract of the required number of eyestalks was prepared using acetone, and it was centrifuged at 3000 rpm for 10 min. The supernatant and residual fractions were taken in two test tubes and allowed to remain at 26–28°C for acetone evaporation. The dried acetone soluble and insoluble fractions were dissolved in suitable amounts of distilled water and again centrifuged. The supernatants were separated and made upto a final volume to make one pair of