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FRONTAL ORGANS IN *RIVULOGAMMARUS SYRIACUS* CHEVREUX.

THERE has been a considerable amount of debate concerning the nomenclature and function of the frontal organs in crustacea. In Amphipods these organs have been described[1-3] with reservation in *Caprella* but Graber[4] claimed that these organs do not exist in *Gammarus*. During the course of studies on the cephalic neurosecretory system of *Rivulogammarus syriacus* the authors have investigated the frontal organs.

The frontal organs have been studied by using haematoxylin-eosin, Gomori techniques and histochemical tests. With these different methods it has been found that these are paired spherical bodies lying anterior to the protocerebrum. In the dorsal region they are just below the epidermis while in the middle region they are far away. They are connected to the medulla terminalis of the optic lobe by an oblique nerve (Fig. 1). Two kinds of structural elements are observed in the frontal organs. The first kind are the cells without neurosecretory material surrounded by small connective tissue cells ; the second are small round colloidal concretions. The latter seem to be the secretory products of neurosecretory cells and have been transported through the axons (Fig. 2). The neurosecretory material in form of CHP-positive granules are also found along the course of axons which are coming from the medulla terminalis of the optic lobe. These neurosecretory materials have PAS–positive reaction.

There has been a considerable amount of discussion concerning the nomenclature and function of the organs of Bellonci and frontal organs. Claus[5] described the dorsal frontal organs and regarded them as sensory structures. Hanstrom[6] attributed secretory function to the frontal organs in *Tanymastix stagnalis* L. and *Polyartemia forcipata* and regarded them to be precursors of the X-organs of malacostracans. Elofsson[7], working with different decapods, was able to show that the dorsal frontal organ, when present, was always part of the nauplius eye centre of the brain. The organs of Bellonci (sensory pore X-organs) are associated with the medulla terminalis in decapods (Knowles and Carlisle[8]) and have been shown by Dahl[9] to be derived from neuroblasts of the medulla terminalis. Dahl[10] has concluded that the dorsal frontal organs and the organs of Bellonci represent phylogenetically quite independent structures because the dorsal frontal organs in the crustacea investigated so far, when present, are associated with the nauplius eye centre, while the organs of Bellonci are associated with the medulla terminalis. Menon[11], Elofsson[12] and Lake[13] have attributed neurosecretory function to the organs of Bellonci (dorsal frontal organs) in anostraca.

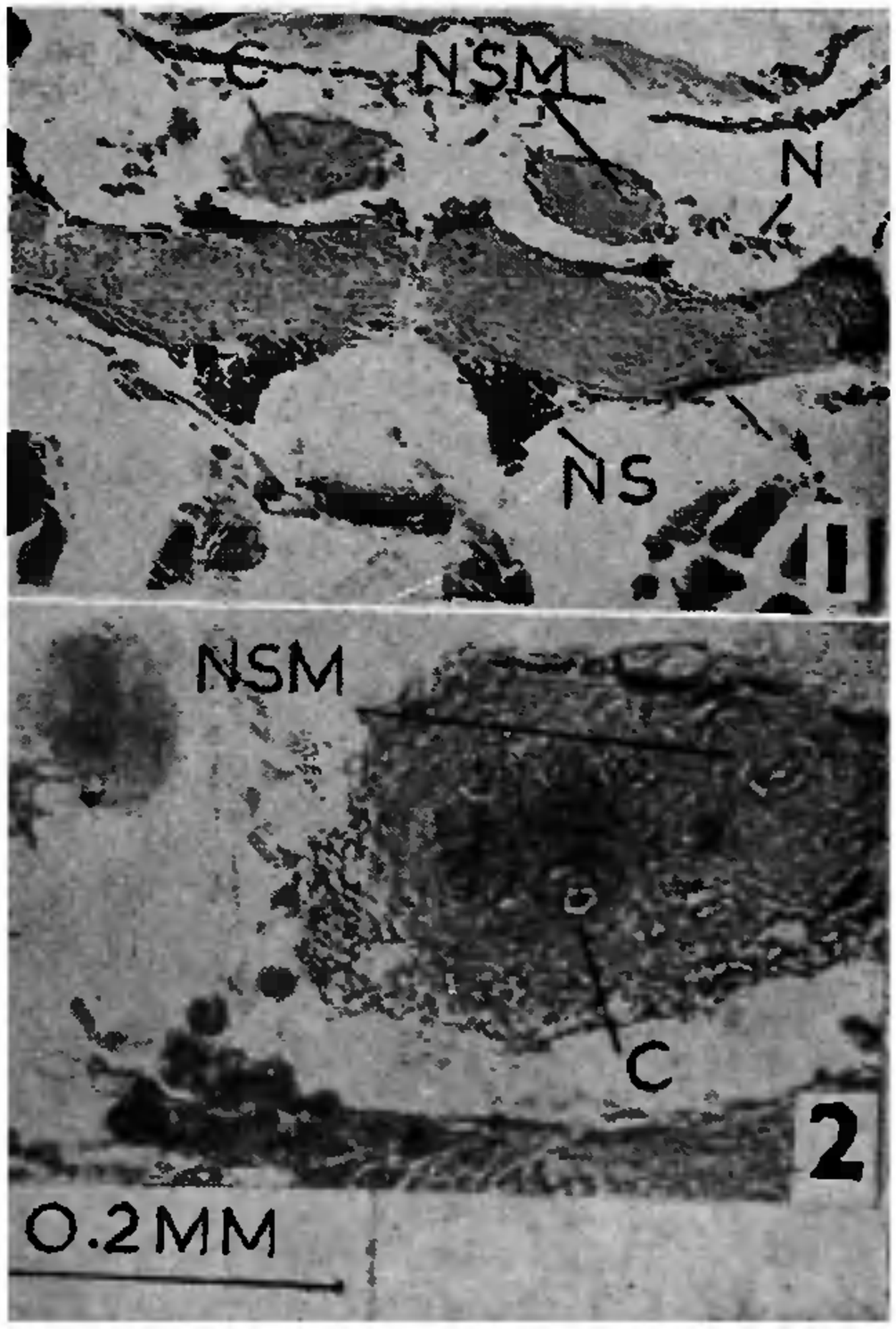

FIG. 1. H.S. of cephalic region of *Rivulogammarus syriacus* showing frontal organs and supraoesophageal ganglion ; Bouin : CHP ; C—Cells ; NSM—Neurosecretory material ; N—Nerve ; NS—Neurosecretory cells of the supraoesophageal ganglion.

FIG. 2. H.S. of frontal organ of *Rivulogammarus syriacus* ; Bouin ; CHP ; C—Cells ; NSM—Neurosecretory material.

In *Rivulogammarus syriacus* the paired frontal organs are quite distinct and are not innervated from the nauplius eye centre but from the medulla terminalis. These paired structures and their axons contain appreciable amount of CHP-positive granules. It appears that these structures are associated with both neurosecretory release, and perhaps, of neurosecretory material synthesis. These

functions are similar to those organs of Bellonci of other malacostracans, the frontal organs of the copepoda[14], the X-organs of the copepods[12], the sensory papilla X-organ of Cirriped larvae[13], and finally to the dorsal frontal organs or X-organs of the Anostraca[11,12,15]. In the phyllopod crustaceans and copepods there is a sensory frontal organ often associated with a large neurosecretory cell. In amphipods it is connected to the medulla terminalis and associated wtih the release of neurosecretory material. In malacostracan crustacea the frontal organ is incorporated into the central nervous system where it forms an X-organ again revealing a connection between a originally epidermal glandular (and sensory) structure and a later neurosecretory centre. It is evident that the condition of frontal organs in *Rivulogammarus* is somewhat intermediate between the phyllopod crustaceans and copepods at one end and the malacostracans crustaceans at the other end.

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BILGRAMIA, A NEW GENUS OF HYPHOMYCETES

The authors collected dead wood pieces bearing black fungal growth from Mount Abu and subsequently from Jodhpur. It was found that the fungus produces Sporodochia and the Conidia are phaeodictyosporous and catenulate. The conidia are connected by isthmi. Any cell of the conidia or isthmi may produce a chain of conidia with isthmi. The fungus resembles *Peyronelia, Alternaria* and *Sirodesmium* in some characters. Although the present fungus is quite close to the genus *Peyronelia*, however, it cannot be accommodated in that genus as the conidia in *Peyronelia* are transversely septate phragmospores. Ciferri and Fragoso[1] had mentioned only transverse septa in their description of the type species of *Peyronelia* and hence Clements and Shear[2] have placed the genus *Peyronelia* in section Phragmosporae of the family Dematiaceae. Our fungus differs from *Alternaria* in having sporodochia, very short hyphae and in producing chains of conidia with isthmi from any cell of conidia or isthmi; and from *Sirodesmium* in the presence of isthmi. In view of these distinct morphological characters the fungus is being described as a new genus of Hyphomycetes. The name *Bilgramia* is proposed in honour of our teacher Prof. K. S. Bilgrami.

Since the fungus produces dark-coloured conidiophores; muriform, catenulate, dark conidia and very short hyphae, this new genus *Bilgramia* is being placed along with the genus *Sirodesmium* in the family Dematiaceae, section Dictyosporae and the group Micronemeae.

Bilgramia gen. nov. Panwar, Purohit and Chouhan

Sporodochia sphaerica, non-stromatica; conidiophora simplicia, brevia, macronemetosa, determinata, brunnea. Conidia acro-murogena, phaeodictiospora; conidia catenata, per cellulam isthmam, concoloratam separata; isthmus elongatus cum 1–9 septis transversatis, conidiorum cellulae, vel isthmorum producentes paene omnes sporogenas cellulas.

Sporodochia spherical, non-stromatic; conidiophores unbranched, short, macronematous, determinate, brown; conidia acro-murogenous, phaeodictyosporus, conidia in a chain, separated by concolorous isthmus cells; isthmus elongated, with 1–9 transverse septa; sporogenous cells produced from almost all the cells of conidia or isthmi.

Bilgramia indicum gen. et sp. nov. Panwar, Purohit and Chouhan.

Fungus in ligno emortuo producit maculas fuscantes, saprophyticas, mycelium in substrato immersum, rarum, brunneum, arte septatum, 4–5·5 μ latum; sporodochia superficialia, sphaerica, nonstromatica; conidiophora non-ramosa, brunnea, arte septata, 20–25 × 5·5 μ; conidia maxime lurida, muriformia cum septis transversalibus 5–11 et 3–8 longitudinalibus, profunde, ad septa transversalia constricta, plerumque, obclavata raro globosa, vel cylindrica, paries verrucosus, catenulatus, conidia septata per isthmos; ulla cellula, isthmorum vel conidiorum producet conidiorum cum isthmis catena, conidia 27–60 × 16–30 μ cellulae isthmi brunneae ad luridas, 1–9 transversales septatae, plerumque 5-septatae, paries laevis vel constrictus apud septum transversale, 8–45 × 5–5·5 μ.