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MYCOSIS OF *NILAPARVATA LUGENS* (STAL.) FROM INDIA

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NATURAL mycosis of the rice brown planthopper *Nilaparvata lugens* (Stal.) (Delphacidae: Hemiptera) was noticed in the insectary culture of this Institute. Dead insects were collected, washed in three changes of sterile water and plated in sterile oats-agar medium to isolate the pathogen. The fungus was identified as *Absidia corymbifera* (Cohn) Sacc and A. Trotter (Mucorales: Phycomycetes). Pathogenicity studies in the laboratory revealed that *A. corymbifera* was pathogenic to *N. lugens* and the white backed planthopper, *Sogatella furcifera* (Horvath) at 10^{-6} spores/ml dose, seven days after treatment. It was, however, not pathogenic to the rice grasshoppers, *Hieroglyphus banian* Fabricius, *Oxya nitidula* Walker, yellow hairy caterpillar, *Psalis pennatula* Fabricius, rice bug, *Leptocorisa oratorius* (Fabricius) and leaf folder, *Cnaphalocrocis medinalis* (Guenee) at the same inoculum level.

Regular monitoring in the college farm as well as in a nearby village, Mangalakudi indicated that the maximum natural infection was 60% during January and the minimum incidence was 4% during April–July.

There are numerous reports of fungi infecting *N. lugens*. Pathogens recorded include *Condiobolus coronatus*[1], *Entomophthora delphacis*[2], *Beauveria bassiana*[3], *Hirsutella citriformis*[4], *Metarhizium anisopliae*[5] and *Paecilomyces farinosus*[6].

The occurrence of *A. corymbifera* on *N. lugens* seems to be the first report. However, a few species of this genus were already reported infecting other insects, for instance, *A. coerulea* on subterranean termites[7] and *A. repens* on *Glossina fusca congolensis*[8].

Absidia is mostly a soil fungus[9] which explains its pathogenicity to the planthoppers of rice which are found at the base of the plant close to the soil surface and not to the foliage feeders feeding on the top canopy of the plant. Mass multiplication of *A. corymbifera* has been perfected using moist sterile sorghum grains. However, its use as a mycoinsecticide is subject to safety tests as *A. corymbifera* is reported to be associated with human bronchomyces[10].

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INNERVATION OF THE PROTHORACIC GLANDS AND ITS POSSIBLE SIGNIFICANCE IN THE LARVA OF THE CASTORMOTH, *TRABELA VISHNU* (LEPIDOPTERA)

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INNERVATION of the prothoracic glands (PTG) is known in many insect orders including Lepidoptera[1]. But the role of innervation has been investigated by direct surgical intervention only in one insect[2]. In this communication, we have studied the innervation and examined its role in the castormoth, *T. vishnu*.

Young V (ultimate) instar larvae were dissected in physiological saline and the nerves innervating the PTG stained intravitally with methylene blue. Insects were narcotized by drowning them in water and all the nerves innervating the PTG of both sides were severed collectively and individually through the intersegmental membranes on the thoracic venter. An antibiotic powder was sprinkled on the incisions to prevent infection and the insects were allowed to revive at low temperature in a refrigerator to minimise movement and the accompanying bleeding.

The PTG of *T. vishnu* are paired, tri-radiate and flattened organs situated on the tracheal trunks close to the first thoracic spiracle (figure 1). Each PTG is innervated by 5 nerves designated as N_1 through N_5 given out by the thoracic segment of the ventral nerve cord (VNC). The N_1, arising from the first interganglionic connective (C_1) joins N_2 given out by the prothoracic ganglion (G_1). The composite (fused) nerve thus formed gives out a small branch to the anterior portion of the PTG and runs over the gland to supply the muscles and body wall of this segment. The N_3 which is the transverse branch of the first median nerve (MN_1) receives a branch from

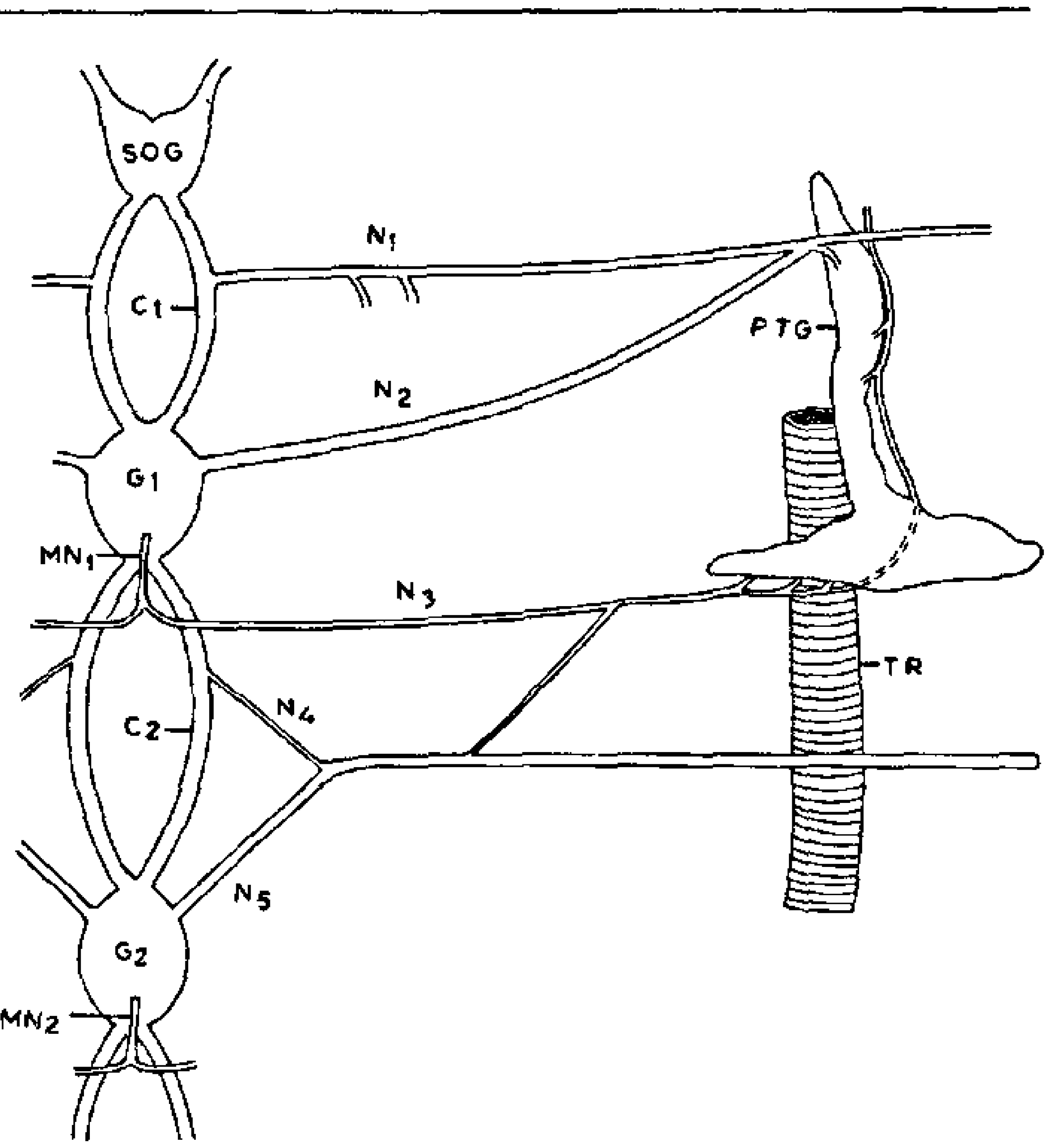

Figure 1. Diagram of the PTG and its nerve supply (for lettering see the text).

the common nerve formed by the fusion of N_4 given out by the second interganglionic connective (C_2) and N_5 given out by the mesothoracic ganglion (G_2). The composite nerve thus formed innervates first, the posterior part of the PTG and then, runs underneath it to innervate the anterior arm and further away, the first thoracic spiracle. The main trunk of the N_5 runs past the PTG supplying the muscles and body wall of this region.

While severance of all the five nerves on the two sides of the VNC produced no effect on the course of development and metamorphosis of the insect, it prevented shortening of C_2 and thus fusion of G_1 and G_2 which normally occurs during metamorphosis. To pinpoint which of the five nerves produced this effect, the nerves were severed individually and it was found that severance of N_4 alone was the cause of the observed phenomenon. The above operation was repeated in 50 larvae and in the 40 larvae that survived, the results were the same.

From the pattern of PTG innervation in this and other Lepidoptera, some generalizations emerge: (i) that there is no ganglion or nerve exclusively devoted to PTG innervation; this is supported by our earlier observation employing cobalt filling technique[3] that the same neurons that supply the PTG also supply other structures of the segment; (ii) that the nerves that innervate the PTG are only the minor branches of major trunks which themselves