The lateral group of peptidergic neurosecretory neurons in *Morimus funereus* consists of L₁ and L₂ neurons present in the dorsolateral region of the protocerebrum. Their axons innervate contralateral corpora cardiaca allata (Ivanović et al. 1975a, b; Nenadović, 1992). The L₁ neurons are the smallest peptidergic neurons of the *M. funereus* protocerebrum and are located above the neuropila. Their large nucleus with a large nucleolus is surrounded by a thin level of cytoplasm where large agglomerations of neurosecretory granules are visible. An array of five to seven large L₂ neurons has been noticed above L₁ neurosecretory neurons. In shape, size and basophilia, they are similar to medial A₂ neurosecretory neurons (Nenadović, 1992).

By using monoclonal antibodies it has been shown that L₂ neurons synthesize big form of prothoracicotropic hormone (Agui et al. 1979; Kawakami et al. 1990; Dai et al. 1994). Depending on insect species, its molecular weight varies from 11-15kD in *Lymantria dispar* (Kelly et al. 1995) to 28-30kD in *Manduca sexta* (Westbrook and Bollenbacher, 1990).

It has been found in some insect species that dorsolateral neurons synthesize allatostatins (Veelaert et al. 1995), neurohormones that inhibit biosynthesis of juvenile hormones in corpora allata (Bhascaran et al. 1990).

The aim of the present work was to investigate activity of dorsolateral neurosecretory neurons of the protocerebrum in *M. funereus* larvae (6th larval instar) during the intermolt period.

*Morimus funereus* larvae were reared individually under constant laboratory conditions: temperature of 23°C, artificial diet for *Drosophila* (Roberts, 1989), relative humidity of 70%, and absence of light. Under such conditions, the 6th instar lasts for 14 days. The larvae were sacrificed immediately after molting into the 6th instar (0h) and 6h and 1, 2, 3, 4, 6, 9, 10, 11, 12, 13 and 14 days after molting into the 6th instar. After decapsulation, heads were fixed in Bouin’s solution. The chitinized surface and muscles were removed and protocerebra were excised. Common histological techniques were employed for embedding in paraffin (Merck 57-59°C). Serial paraffin sections of 5 µm were stained using Alcian Blue Phloxine and Paraldehyde Thionine Phloxine (Pанов, 1980). Analysis of dorsolateral L₁ and L₂ neurons was performed using a Leitz DMRB light microscope. Three protocerebra were analyzed for each time of the intermolt period.

The activity of L₁ neurosecretory neurons was quite low immediately after molting into the 6th larval instar. Maximal activity was recorded on the 1st day of the intermolt period and was succeeded by a decrease in activity on the 2nd and 3rd days.

**Fig. 1.** Size of L₁ (a) and L₂ (b) neurosecretory neurons and their nuclei in the *Morimus funereus* protocerebrum during the intermolt period.
Activity was moderate from the 3rd to 9th day, when it began to
decline lower again until the 12th day. Before the next molting
(from the 12th to 14th day), the activity of L1 neurons rose and
showed a maximum on the 14th day of the intermolt period (Fig.
1a). With respect to their morphological and physiological
attributes, L1 neurons of the M. funereus protocerebrum most
resemble medial A1 neurons. Periods of high activity of L1 neu-
rons correspond to periods of low activity of A1 neurons and
vice versa (Nenadović, 1992).

It was suggested earlier that L1 neurons of M. funereus possi-
bly synthesized prothoracicotropic hormone (PTTH) (Ivanović et al. 1988). The responses of protocerebral neu-
rons to different temperatures (0°C and 23°C) were shown to
depend on the season when M. funereus larvae were collected
(spring or autumn). In addition the titer of ecdysteroid in the
hemolymph correlated with the activity of L1 neurons.
(Ivanović et al. 1980). The same authors pointed to a possi-
ble indirect role for A1 neurons in the synthesis of PTTH.

Fluctuations in activity during the intermolt period were
also expressed for L2 neurons (Fig. 1b). Periods of high activi-
ty, i.e., were high synthesis and fast release of neurosecretory
material, were noticed on the 1st, 6th, 11th and 14th day. They
were followed by periods of low activity on the 2nd and espe-
cially on the 3rd and 12th day after molting into the 6th instar.

Along with seasonal changes in the level of activity of L2
neurons, changes in the quality of neurosecretory material were
also noticed. Synthesis of AZ+ instead of PF+ material was
detected at the beginning of autumn (Ivanović et al. 1980),
which could have a role in metabolic changes during the
acclimatization to temperature decrease in autumn. Data on some
metabolic factors confirmed this suggestion (Ivanović et al.
1979, 1980). Synthesis of AZ+ material was also observed dur-
ing metamorphosis of M. funereus whereas PF+ material was
synthesized in adults (Nenadović, 1992).

According to some authors, L2 neurons synthesize neuro-
hormones that regulate the activity of corpora allata (Buys
and Gibbs, 1981; Janković-Hladni et al. 1983; Panov,
1985; Melnikova, 1985). Inervation of corpora allata by L2
neurons was shown using the axonal diffusion technique with
horseradish peroxidase (Khan et al. 1984).

Results of the present work indicate a difference in dynam-
ics of activities of L1 and L2 neurons pointing to the synthesis
of different neurohormones.

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