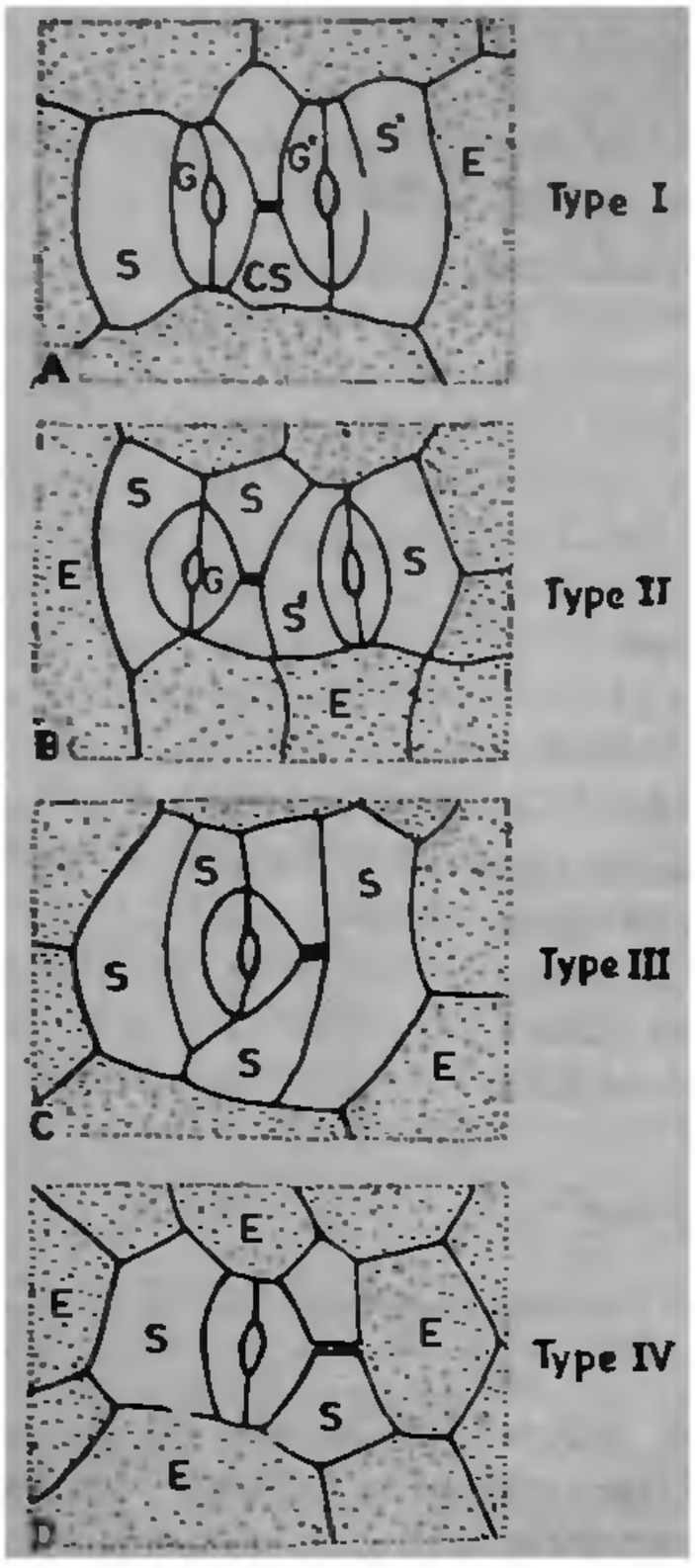

Figure 1. Diagrammatic representation of macro-plasmodesmata in the Euphorbiales. (E–Epidermal cell; G,G′–Guard cells; S,S′–Subsidiary cells; CS–Common subsidiary cell.)

difficult to prove. The present authors also agree with this view point after the present study.

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1. Cronquist, A., *The evolution and classification of flowering plants*, Nelson, London, 1968.
2. Rao, P. N. and Raju, V. S., *Curr. Sci.*, 1975, **44**, 750.
3. Carr, D. J., In *Intercellular communications in plants: studies on plasmodesmata*, (eds.) B. E. S. Gunning and A. W. Robards, Springer-Verlag, Heidelberg, 1976, 243.
4. Pallas, J. E. Jr and Mollenhauer, H. H., *Science*, 1972, **175**, 1275.
5. Litz, R. E. and Kimmins, W. C., *Can. J. Bot.*, 1968, **46**, 1603.
6. Clowes, F. A. L. and Juniper, B. E., *Plant cells*, Blackwell Scientific Publications, Oxford, 1968, 263.
7. Newcomb, E. H., *Annu. Rev. Plant Physiol.*, 1963, **14**, 47.
8. Martin, J. T. and Juniper, B. E., *The Cuticles of Plants*, Edward Arnold, Edinburgh, 1970, 75.
9. Raju, V. S., *Ph.D. Thesis*, Nagarjuna University, A.P., India, 1981.
10. Robards, A. W., In *Intercellular communications in plants: Studies in plasmodesmata*, (eds.) B.E.S. Gunning, A.W. Robards, Springer-Verlag, Heidelberg, 1976, 15.

CHOLINESTERASE SYSTEM DURING 5TH INSTAR OF THE SILK-WORM, *BOMBYX MORI*, L

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INDIVIDUAL tissues are of vital physiological significance, particularly in relation to cocoon formation in silk-worms[1,2]. Investigations were made on the biochemical alterations of proteins[3], fibroin[4], glucose-trehalose[5], total free amino acids, RNA and DNA[6] in the silk-worm to understand the metabolic processes associated with the preparation for spinning of the cocoon. The present investigation deals with changes in the acetylcholine (ACh) content and acetylcholinesterase (AChE) activity in the silk-gland and central nervous system (CNS) of 5th instar larvae of the silk-worm, *Bombyx mori*.

The eggs of silk-worm, *Bombyx mori* were incubated (28 ± 2° C) for about 9 days after which the first instar larvae hatched out. The larvae were reared in the laboratory and fed with fresh mulberry leaves. The lifespan for 5th instar larvae was 6 days after which the spinning of the cocoon started. The ACh content and AChE activity were estimated in the silk-gland and the CNS of these 5th instar larvae daily from the first to the last day of the instar. ACh content was estimated by the method of Augustinsson[7] and AChE activity by the method of Metcalf as given by Glick[8].

The levels of ACh content and AChE activity of the silk-gland (figure 1A) and nervous system (figure 1B) of the silk-worm presented interesting correlation during the development of 5th instar larvae. A sharp rise in the level of ACh content was observed in silk-gland (from 12.6 to 29.7 μmol) and CNS (from 13.1 to 34.7 μmol) towards the end of 5th instar. In contrast to ACh content, AChE activity presented a sudden

fall in the silk-gland (from 30.1 to 1.6 μmol) and CNS (from 37.4 to 8.5 μmol) during the same period. Thus, prior to spinning of the cocoon the silk-gland and CNS enhance their ACh content while concomitantly decreasing their AChE activity. It clearly indicates an inverse relation between the ACh content and AChE activity. Grzelak *et al*[8,10] showed that the ACh content in abdominal tissues is inversely related to their total AChE activity during the development of the moth, *Celerio euphorbiae*. They have also observed continuous synthesis of ACh after the larval-pupal ecdysis and its level seems to be regulated mainly by the activity of its splitting enzyme AChE. In 1971, they again reported the lack of AChE activity during deep diapause.

Several workers have mentioned a tendency for continuous enhancement in the levels of various biochemical components such as glucose-trehalose levels[5], and protein, total free amino acid, RNA and DNA[6] levels throughout the growth and development of the 5th instar. Thus there is an increased biosynthetic activity which parallels the enhancement of ACh content in the present study. In insects two different pools of ACh were reported, a small pool of 'True' ACh engaged in the functioning of the nervous system and another pool of ACh partaking in lipid and carbohydrate metabolism and unrelated to the nervous system[9,10]. Such functional differentiation perhaps may also be envisaged in the present study in CNS and silk-gland respectively.

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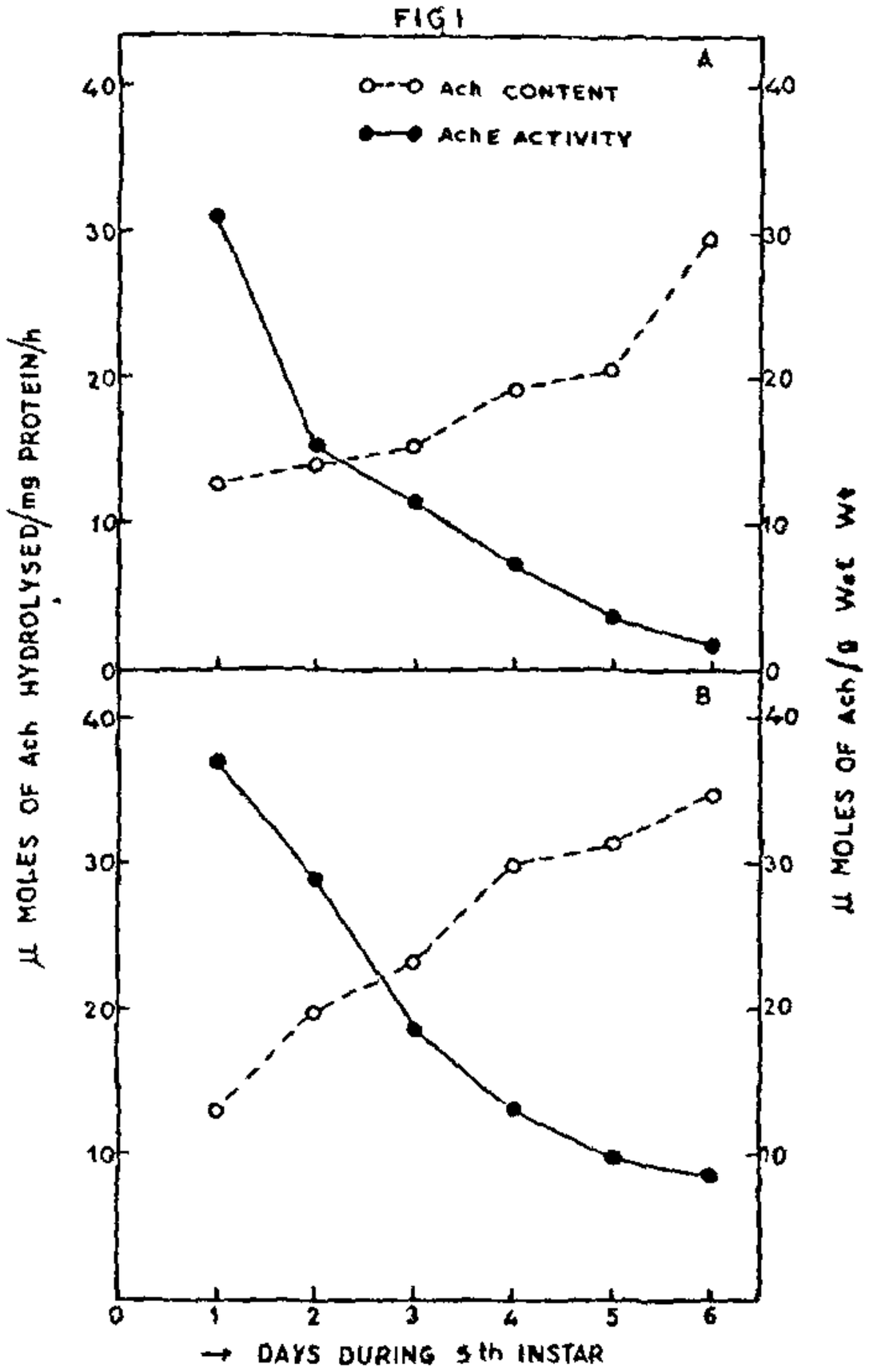
FIG 1



1. Takahashi, S., *J. Insect. Physiol.*, 1966, **12**, 789.
2. Singh, S. P. and Singh, O. P., *Experientia.*, 1978, **34**, 994.
3. van Der Geest, I. P. S. and Borgsteede, F. H. M., *J. Insect. Physiol.*, 1969, **15**, 1687.
4. Shigematsu, H. and Moriyama, H., *J. Insect. Physiol.*, 1970, **16**, 2015.
5. Singh, S. P., Singh, J. and Singh, O. P., *Archs. Int. Physiol.*, 1978, **86**, 1117.
6. Singh, S. P., Singh, O. P. and Singh, J., *Experientia.*, 1979, **35**, 792.
7. Augustinsson, K. B., In *Methods in biochemical analysis* (ed. D.Glick) Interscience publishers, New York 1957.
8. Glick, D., In *Methods in biochemical analysis*, Vol. 5, Interscience Publishers, New York 1957.
9. Grzelak, K., Lassota, Z. and Wroniszewska, A., *J. Insect. Physiol.*, 1970, **16**, 1405.
10. Grzelak, K., Lassota, Z. and Wroniszewska, A., *J. Insect. Physiol.*, 1971, **17**, 1961.

ERRATA

Current Science, Vol. 52, No. 2 (January 20, 1983) page 61 under the Heading; Stock solution IV, the last but one sentence reads: Double glass distilled water ~~to~~ 25 μg should read as 25 ml.

Page 62 under the Heading, Results and Discussion, second line of para 2, 8 to 60 hours should read as 18 to 60 hours.