

### **3-1-3. Fine Structure and Immunocytochemical Localization of Glutamic Acid Decarboxylase (GAD) Isoforms in the Central Nervous System of Spiders**

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$\gamma$ -aminobutyric acid (GABA) has long been considered an inhibitory transmitter in the central nervous system (CNS) of both vertebrates and arthropods. Glutamic Acid Decarboxylase (GAD) catalyzes the conversion of L-glutamate to GABA - the principal inhibitory neurotransmitter in the brain. GAD has a restricted tissue distribution, and is highly expressed in the cytoplasm of GABAergic neurons in the CNS. It is also present in other non-neuronal tissues such as testis, oviduct and ovary. Recently, there were reports that a GABA-like immunoreactivity and a ninhydrin-positive GABA derivative, GABamide, exists in the visual ganglia and in the water-soluble fraction of the spider web respectively. So the purpose of this study is to identify exact distribution of GAD isoform immunoreactivity in the CNS of the spider, to reveal the ecophysiological significance of GABA for spider's behavior.