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## Asynchronous Emergence Mechanisms of *Anatatus orientalis* (Hymenoptera: Eupelmidae), an Egg Parasitoid of Lantern-fly *Lycorma delicatula* (Hemiptera: Fulgoridae)

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*Anatatus orientalis* is an important natural enemy parasitizing eggs of lantern-fly *Lycorma delicatula* White. In order to effectively utilize this parasitoid, the parasitism rates of lantern-fly and emergence of its parasitoid were surveyed in different areas. Results showed that the emergences of wasp *Anatatus orientalis* from different areas had significant differences. Those parasitoids emerged from lantern-fly eggs collected from Yangling of Shaanxi province, Qinhuangdao of Hebei province, and Dagang District of Tianjin City came out focus on May only, while wasps from Yantai of Shandong province showed 2 obvious emergence peaks in May and September respectively. Wasp populations with emergence asynchrony in Yantai area were analyzed by different periods. Results revealed that the emergence percentages in spring (May) were significantly lower than that in fall (September), but the sex ratios did not differ significantly between the two seasons. The emergence asynchrony of parasitoid may be induced by the diapause of species, which is a long-term coevolutional outcome of parasitoid with host for maintaining its population. These findings provided some scientific bases for the rational utilization of this parasitoid in practice.

**Key words:** *Lycorma delicatula*; *Anatatus orientalis*; emergence asynchrony; diapause; parasitoid-host relations