

## Diapause Incidence in *Zygogramma bicolorata* Pallister Coleoptera: Chrysomelidae

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**Abstract :** *Zygogramma bicolorata* Pallister (Coleoptera: Chrysomelidae) is an exotic insect and effective biocontrol agent of *Parthenium hysterophorus* L. (Asteraceae). Our study aimed to determine the induction and termination of diapause, in response to abiotic (temperature and moisture) and biotic factors (age and reproductive status) and the effect of diapause on adult longevity and female fecundity. The adults burrowed into the soil about 1-6 cm below the surface for diapause at any time from July to December with a peak of 70% in the 2nd week of December at Aligarh region, India. The termination of diapause took place in May and June with the commencement of monsoon rains. Non-diapausing adults were also capable of breeding during winter under laboratory conditions. There was a significantly increased in the percentage of diapaused adults in subsequent generation i.e. 4% in F1 generation and 90% in F7 generation. The percentage of diapause was also significantly increased with age of adults. It has a positive effect on female fecundity as compared to the fecundity in pre-diapaused duration. Experiments proved that soil moisture played an important role in providing the conditions for initiation and termination of diapause. The adults which undergone diapause in January and February were continuously exposed to 35<sup>o</sup>, 40<sup>o</sup> and 45<sup>o</sup> C for one week and a daily dose of 10 and 8 hours for 6 and 5 days, respectively resulting in termination of diapause. This method may be used to initiate mass multiplication for carrying out releases early in the season. Exposure of adults to extremely low temperatures i.e. 5<sup>o</sup> and 10<sup>o</sup> C induced 94.3% and 92.5% diapause, respectively with no adult mortality. Therefore, low temperatures can also be used as a medium for the storage of mass reared beetles for a long time without having negative effect on their longevity and fecundity. Thus, our findings are of great utility in the biological suppression of *P. hysterophorus* as it will enhance the effectiveness of this beetle through manipulation of diapause.

**Keywords :** *Zygogramma bicolorata*, environmental factors, age, sex, diapause, *Parthenium hysterophorus*, biocontrol

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