*Himachal Journal of Agricultural Research 35 (2):239-240, 2009*

***Short Note***

# Biology of pulse beetle, *Callosobruchus chinensis* (Linn.) on black gram, *Vigna mungo* (L.) seeds

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**Abstract**

**Investigations carried out on the biology of pulse beetle, *Callosobruchus chinensis* (Linn.) (Coleoptera: Bruchidae) on stored seeds of black gram during 2008 revealed that the bruchid completed six generations within period of April to October. Total developmental period of bruchid was 31 days during July-August while it was 38.3 days during April-May. On an average the incubation, larval, pupal and total developmental period (egg to adult) was of 8.00, 18.39, 8.11 and 34.50 days, respectively.**

**Key words:** Black gram, *Callosobruchus chinensis*, oviposition and developmental period.

Pulse beetle (*Callosobruchus chinensis* Linn. Coleoptera: Bruchidae) is a major pest of important leguminous stored seeds (Mookherjee *et al.* 1968). The beetle has been known to exhibit a high degree of specificity for its growth and development towards various legumes. The biology of pulse beetle, *C. chinensis* has been studied by many workers on different pulses (Howe and Curie 1964, Raina 1970, Kumari *et al.* 1991, Pandey and Singh 1997, Singh and Kumari 2000, Singh and Borah 2001, Meghwal and Singh 2005 and Suchitra and Amitava 2006). However, so far very little work has been done in India on the biology of *C. chinensis* on black gram seeds. Therefore, an attempt was made to study the biology of *C. chinensis* on black gram seeds under ambient laboratory conditions.

The experiment was conducted in the laboratory of Department of Entomology, College of Agriculture, CSKHPKV, Palampur, Himachal Pradesh during April- October 2008. The test insect was obtained from the separate culture raised from a single pair of *C. chinensis* on green gram seeds. For this experiment, three plastic containers (5 x 5cm) containing 100g seeds were taken in which freshly emerged single pair of *C. chinensis* was released in each of the three containers. Identification of the sexes was made by employing the method of Raina (1970). Mouth of containers was covered by muslin cloth and was tightened with rubber bands and kept under ambient laboratory conditions. The adults were removed from these containers after death and total number of eggs laid by a single female on host grains and life span of male and female adults were recorded. Eggs laid each day were kept in separate containers covered with muslin cloth and observations were recorded on incubation, developmental (larval and pupal) and total developmental period.The observations on incubation, larval and pupal period inside the grain were recorded by breaking the whole grain with the help of needle and observing the stage of insect with the help of magnifying glass. The rearing of beetles was continued till the completion of sixth generation and adult longevity was recorded in respect of each generation. Data thus obtained were analysed statistically in completely randomized design (CRD).

It is evident from Table 1 that the number of eggs laid/female ranged from 85.33 to 99 with an average of 93.89 eggs/female.Egg laying was maximum (99 eggs/female) during July-August. Incubation period of eggs ranged from 6.33 to 10.33 days with an average of 8 days. The egg stage was shorter (6.33 days) during July- August and longer (10.33 days) during April- May. The larval period of *C. chinensis* on black gram grains ranged from 17.33 to 19 days with an average of 18.39 days . Pupal period of the beetle during different generations ranged from 7 to 9.33 days with an average of 8.11 days. This period was shorter (7 days) during August- September and longer (9.33 days) during April-may. Total developmental period (egg to adult) of *C. chinensis* varied from 31 to 38.33 days with an average of 34.50 days during different generations (Table 1). In the present investigations it was found that the fecundity was maximum (99 egg / female), incubation period (6.33 days), larval period (7 days) as well as total developmental period (31 days) was shorter during July- August while during April- May the beetle took longer time to complete its life cycle.

**Table 1. Biology of *Callosobruchus chinensis* Linn. on black gram**

| Generation | Period / duration in days | | | | | | |
|---|---|---|---|---|---|---|---|
| | Egg | Larva | Pupa | Total developmental period | Average egg laying per female | Adult longevity | |
| | | | | | | Male | Female |
| 1(April-May) | 10.33 | 18.67 | 9.33 | 38.33 | 85.33 | 9.00 | 8.00 |
| 2 (May-June) | 8.33 | 19.00 | 9.00 | 36.33 | 89.67 | 10.33 | 9.00 |
| 3 (June-July) | 6.67 | 18.67 | 8.67 | 34.00 | 97.33 | 10.00 | 10.00 |
| 4 (July-Aug) | 6.33 | 17.33 | 7.33 | 31.00 | 99.00 | 11.00 | 10.00 |
| 5 (Aug-Sep) | 7.33 | 18.00 | 7.00 | 32.33 | 98.33 | 10.33 | 9.00 |
| 6 (Sep-Oct) | 9.00 | 18.67 | 7.33 | 35.00 | 93.67 | 9.00 | 8.33 |
| Mean | 8.00 | 18.39 | 8.11 | 34.50 | 93.89 | 9.94 | 9.06 |
| CD (P=0.05) | 1.186 | NS | 1.326 | 3.302 | 8.240 | NS | NS |

Thus, it was clear that, the development of pulse beetle was slower during April because of the prevailing low temperature and low relative humidity while it becomes rapid during the months of July- October. These findings are in agreement with the findings of Kumari *et al.* (1991), Singh and Borah (2001), Singh and Kumari (2000) and Meghwal and Singh (2005). The longevity of male and female adults over six generations was found to be non significant. Thus, in hilly areas prophylactic measures must be taken during July-August to protect the black gram seeds from the attack of pulse beetle (*C. chinensis*).

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