N-04

(21)

Bioved 4(2) : 269-272, 1993

OVIPOSITION IN GOAT BITING LOUSE BOVICOLA CAPRAE GURLT (PHTHIRAPTERA : ISCHNOCERA)

B.S. Rawat, Adesh Kumar and A.K. Saxena

Department of Zoology, Pt. L.M.S. Government, Post Graduate College, Rishikesh (Dehradun) – 249 201 (India)

ABSTRACT : The average lifespan of adult males and females of goat biting louse, *Bovicola caprae,* has been found to be 15.2. 8.0 (range 1-29) and 22.18 8.19 days respectively under *in-vitro* condition (35 1°C, 75% RH and goatskin diet). The adult female produced 13.58 eggs during lifespan at an average rate of 0.72 egg/day. The rate of egg production lowers after 15th day and maximum egg laying occurs during 11th to 15th day of lifespan.

Key words **:** Phthiraptera, Mallophaga, goat louse, oviposition, *in vitro* biology.

In vitro studies on certain phthirapteran species infesting domestic ungulates have been performed from time to time. For instance, optimum conditions for rearing cattle biting louse, *Bovicola bovis* (Matthysse, 1946), sheep biting louse, *B. ovis* (Scott, 1952; Murray ,1957; Hopkins, 1970 and Hopkins and Chamberlain, 1972) and two goat biting lice, *B. limbata* and *B. crassipes* (Hopkins and Chamberlain, 1969; Rodriguez *et al.* ,1986 and 87 and Cruz *et al.* ,1987) have been worked out. Attempt to rear the third goat louse, *B. caprae* have also been made (Rodriguez *et al.*, 1985a and b). In the present study an attempt has been made to record the rate of egg produciton at different stages of life span of female *B. caprae*, under *in-vitro* condition.

The success of *in-vitro* rearing of lice depend mainly upon the fulfilment of temperature, humidity, dietary requirements and on availability of suitable site for the oviposition. The information relating to such requirements of lice has already been reviewed (Saxena and Agarwal, 1983). For present studies lice were obtained from infested goatskins (fresh) purchased from butchers and reared at 35 ± 1°C and 75% R.H. Food was prepared from goatskin scrappings (Hopkins and Chamberlain, 1969 and Rodriguez *et al.* ,1985 a). Colonies of lice were reared in glass vials in desiccators. Three sets of experiments were performed for the purpose. Colony 'A' contained 10 males, 10 females colony 'B' had to 10 males, 25 females while colony 'C' consisted of 20 males and 30 females. The lice used in present study were fresh healthier looking third instar nymphs likely to undergo the final moult. The colonies were examined daily to record the number of lice surviving and the number of eggs laid. The dead lice, excreta and moulted skin were removed as far as possible. Furthermore, hairs containing the eggs were replaced by fresh ones.

The average lifespan of an adult male has been found to be 11.5 ± 7.65 days (range, 1-22) in colony 'A', 14.4 ± 6.49 (range, 5-24) days in colony 'B' and 16.55 ± 9.27 (range, 1-29) days in

colony 'C'. Thus, the average lifespan of male *B. caprae* seems to be 15.2 ± 8.0 (range 1-29) under provided *in-vitro* conditions. Similarly, the lifespan of an adult female has been found to be 18.2 ± 8.76 (range, 2-30) in colony 'A'. The value remained slightly higher i.e. 23.44 ± 6.41 (range, 4-31) in colony 'B' while it remained 22.03 ± 5.36 (range 4-31) in colony 'C'. Thus, the overall female longevity seem to be 22.18 ± 8.19 days (range, 2-31) under the given conditions (35 ± 1°C, 75% R.H. and hostskin scrappings). In other words, males seem to possess shorter lifespan than females.

A total of 113 eggs have been obtained from colony 'A', 379 from colony 'B' and 429 from colony 'C'. Thus the average egg production during lifespan has been found to be 11.3 in colony 'A' 15.16 in colony 'B' and 14.3 in colony 'C'. The overall egg production by a fecund female remained 13.58. The daily egg production per fecund female (obtained by dividing total numbers of eggs collected every day by total number of surviving females) has also been recorded. the rate of egg production remained 0.78 egg/female/day in colony 'A', 0.70 egg/female/day in colony 'B' and 0.68 egg/female/day in colony 'C'. Thus the overall rate of egg production remained 0.72 egg/day in three colonies. Furthermore, attempt has been made to compare the rate of egg production at every five days interval in the three colonies (Fig. 1). The rate of egg production remained remarkably similar in three colonies (except minor differences which may be circumstancial).

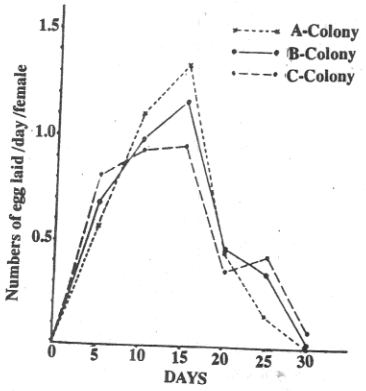

fig.1. Showing average number of eggs of *Bovicola caprae* obtained during every five days interval in three colonies (at 35±1°C, 75% R.H. and Goatskin diet).

The egg rate remained comparatively low (0.68 egg/female/day) during first five days but increased to 1 egg/day during second phase (6th to 10th day) (Fig. 1). Highest rate of egg production has been recorded from 11th to 15th day (1.14 eggs/day) but thereafter (16th to 20th day), the rate of egg production decreased to 0.42 egg/day in three colonies. Next five days (21st to 25th day) witnessed still lowered egg rate (0.31 egg/day) which became negligible (0.03 egg/day) in the last phase of survival (26th to 30th day). Thus the result indicate that egg rate of *B. caprae* becomes reduced after 15th day and maximum egg production occurs during 11th to 15th day (under *in vitro* condition *i.e.* 35 ± 1°C, 75% R.H. and goatskin diet).

ACKNOWLEDGEMENT

Authors are thankful to Principal, Pt. L.M.S. Govt. Post Graduate College, Rishikesh for laboratory facilities; to Dr. K.V. Lakshminarayana (Southern Regional Centre, Z.S.I., Madras) for help in identification of species and to U.G.C. (New Dehli) for financial assistance in form of research Project No. F. 3-51/87 (SRII).

REFERENCES

Cruz, M.D.S.; Rodriguez, R.B.; Sevilla, C.N.; Lopez, M.D. and Jimnez, J.P., 1987. Biologie de *Bovicola limbata* (Mallophaga), Cah. ORSTOM, ser. *Ent. et Parasitol.*, **25** : 17-20.

Hopkins, D.E., 1970. *In-vitro* colonizaton of the sheep biting louse, *Bovicola ovis*. *Ann. Entomol. Soc. Amer.*, **63**(4) : 1196-1197.

Hopkins, D.E., and Chamberlain, W.F., 1969. *In-vitro* colonization of the Goat Biting Lice, *Bovicola crassipes* and *B. limbata*. *Ann. Entomol. Soc. Amer.*, **62**(4) : 826- 828.

Hopkins, D.E. and Chamberlain, W.F., 1972. Sheep biting louse. Notes on the biology of lice reared off the host. *Ann. Entomol. Soc. Amer.*, **65**(5) : 1182-1184.

Matthysse, J.G., 1946. Cattle lice, their biology and Control. *Cornell Univ. Agric. Exp. Sta. Bull.*, **832** : 1-67.

Murray, M.D., 1957. The distribution of eggs of mammalian lice on their hosts. II. Analysis of the oviposition behaviour of *Damalinia ovis* (L). *Aust. J. Zool.*, **5** : 19-29.

Rodriguez, R.B.; Cruz, M.D.S.; Parra, S.M. and Navio, A.M.F., 1985 a. Alimentatino et milieux utilises dans l'elevage au laboratorire des Mallophages de *Capra hircus*. Cah. ORSTOM, ser. *Ent. Med. et Parasitol.*, **23** : 25-29.

Rodriguez, R.B.; Cruz, M.D.S.; Sevilla, C.N.; Parra, S.M. and Navio, A.M.F., 1985 b. Elevage au laboratoire de *Bovicola caprae* Gurlt, 1843 (Mallophaga). Cah. ORSTOM, ser. *Ent. Med. et Parasitol.*, **23** : 285-288.

Rodriguez, R.B.; Cruz, M.D.S.; Navio, A.M.F. and Jimnez, J.P., 1986. *Bovicola caprae* et. *Bovicola limbata* (Mallophaga) parasites de *Capra hircus*. Cah. ORSTOM, ser. *Ent. Med. et Parasitol.*, **24** : 225-228.

Rodriguez, R.B.; Cruz, M.D.S.; Sevilla, C.N.; Jimnez, J.P. and Lopez, M.D., 1987. Biologie de *Bovicola limbata* (Mallophaga), parasite de *Capro hircus*. Cah. ORSTOM, ser. *Ent. Med. et Parasitol.*, **25** : 13-16.

Saxena, A.K., and Agarwal, G.P., 1983. Review article : *In- vitro* rearing of Mallophaga. *Angew. Parasitol.*, **24** : 178-186.

Scott, M.T., 1952. Observation on the bionomics of the sheep body louse (*Damalinia ovis* L.). *Aust. J. Agr. Res.*, **3** : 60-67.