

## DISCOVERY OF EGGS AND FUNDATRIX OF *APHIS* SP. FROM INDIA (HOMOPTERA: APHIDIDAE)

B. K. AGARWALA

Department of Life Science, Calcutta University  
Post Graduate Centre, Agartala 799 004, India.

OVER 700 aphid species are so far known from India<sup>1</sup> but not a single species was known producing eggs although sexuales of 80 species were recorded from this country<sup>2</sup>. True holocyclic life cycle *i.e.* sexual reproduction followed by parthenogenetic generations in aphids is largely unknown from India excepting a few aphid species<sup>3,4</sup> of which fundatrices have been recorded. Fundatrix is hatched out from the egg and is a definite proof of holocyclic life cycle in aphids.

In the course of aphid exploration in Kumaon Range during December 1979 some very short woody plants (represented only by stem and a few dried leaves of *Cestrum* Sp.) supporting egg masses (figure 1) were found in the hills of Nainital. Each egg was brown in colour, oval in shape and about 1 mm in length and 0.55 mm in width (figure 2). It remained glued to the stem surface by a kind of transparent fluid. This fluid was, perhaps, secreted by the oviparous female from its accessory gland for glueing eggs to the substrate or providing them with a protective covering, a common phenomenon in insects<sup>5</sup>.

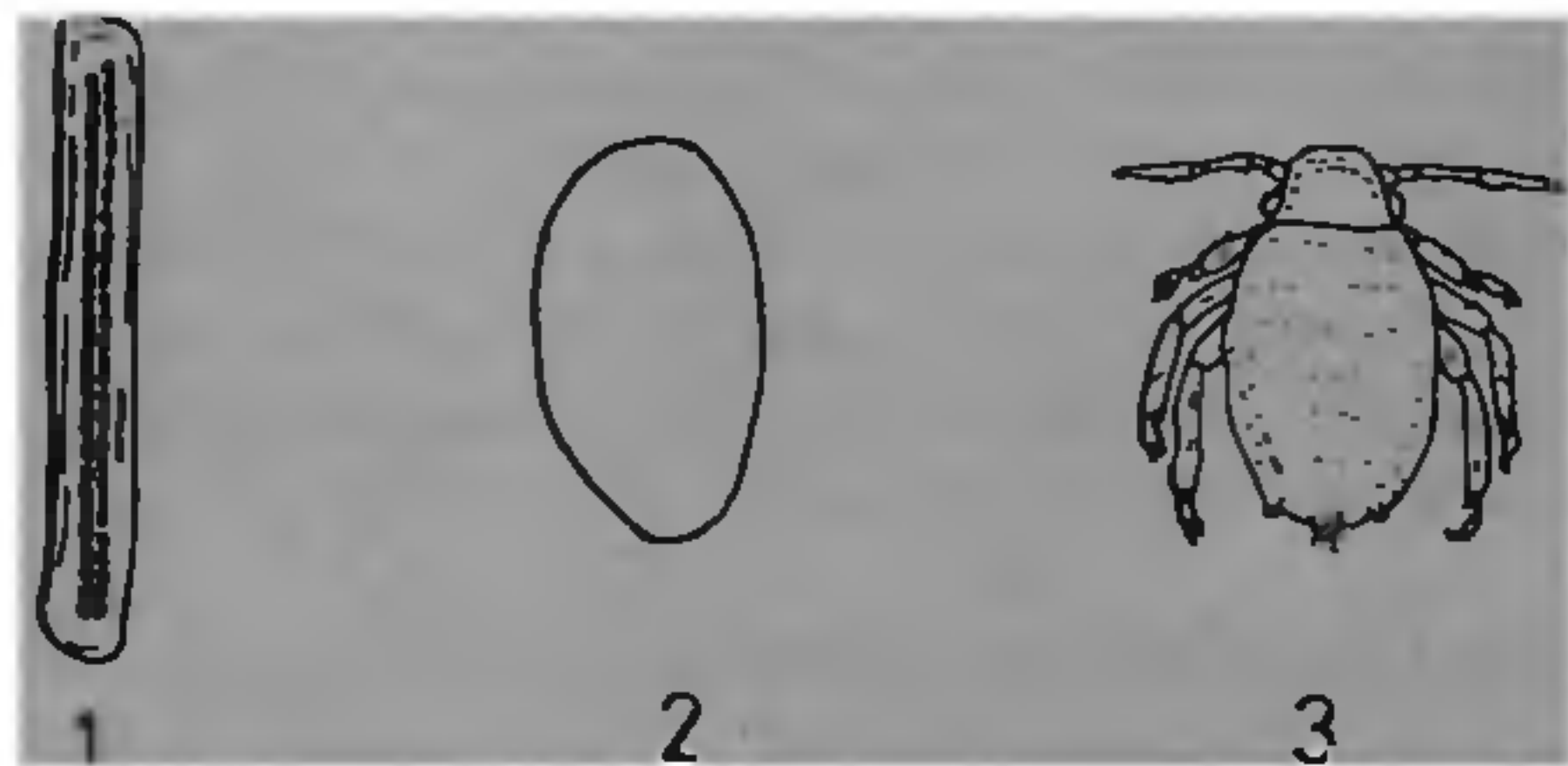


Figure 1. Egg masses (natural size) 2. A single egg ( $\times 30$ ) 3. Fundatrix ( $\times 30$ ).

Further search on the same plants during March 1980 revealed the occurrence of fundatrices feeding on the plant. Empty cases of eggs were also seen attached to the plant. Each fundatrix was brown in colour about 1 mm in length and 0.6 mm in width (figure-3) and remained stationary on the plant. At this stage the plants bear more leaves.

Subsequent search on the same plants in the following months did not lead to any finding of aphids which suggests that aphid leads a diocious type of holocyclic life cycle. It is presumed that emigrant forms which

emerged from the fundatrices left for some secondary hosts which could not be located.

The microscopic examinations of the fundatrix revealed it, to be a species of *Aphis* sp. The plant could not be definitely identified because the specimens were without healthy leaves and no flower. The present record of eggs of an aphid species is the first from India. This finding, together with earlier findings of fundatrices of some aphids suggests that at least some aphid species leads holocyclic life cycle under Indian climatic conditions. These findings have important bearings on the taxonomic and biological studies on aphids.

This study was conducted at the instance of the late Prof. D. N. Raychaudhuri, Entomology Laboratory, Department of Zoology, University of Calcutta to whom the author is indebted. Thanks are also due to Mr. D. Ghosh for his help in the collection of aphid materials.

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## BURSA KINETICS DURING EXPERIMENTAL ANCYLOSTOMIASIS IN CHICKENS

D. DEY, R. K. AGARWAL AND S. M. AGARWAL  
Department of Bioscience, Ravishankar University,  
Raipur 492010, India.

THE migration and the distribution of *Ancylostoma caninum* larvae have been studied<sup>1,2</sup> in various organs and muscles of mice after oral infection with various doses. The migration and distribution of larvae in various organs of chickens have also been studied<sup>3,4</sup>. Goyal *et al*<sup>5</sup> found the weight gain in bursa and spleen during experimental ancylostomiasis in WLH chickens. This paper presents an account of bursa kinetics, *i.e.* changes in absolute and relative weights of bursa in control and challenged chickens (given a dose of 2000 filariform larvae of *A. caninum*).

One-day old, Ranishaver male chickens (canadian star-cross 288), obtained from Sarkure Hatcheries,

Hirapur (Tatiband, Raipur) were used throughout for experimental infection. Chickens of group A were not given any larval dose and were used as controls, while those of group B were administered, per os, uniformly 2000 filariform larvae of *A. caninum*. Changes in absolute and relative weights of bursa (mg per 10 g of body weight) were recorded in both groups of control and challenged chickens, 4 hourly until 12 hr, 6 hourly until 24 hr, 12 hourly until 48 hr, at 72 hr and subsequently at every 4 days interval until 120 days, when chickens attained sexual maturity. Three sets of these experiments (38 in each group of control and challenged chickens) were performed and mean values of absolute and relative weights of bursa in control and challenged chickens of different ages were calculated.

Absolute weight increases of bursa with growth from 43.7 mg (one day-old) to 1018 mg (120 days old) in control and from 47.7 mg (one day-old) to 1048 mg (120 days old) in challenged chickens. This increase in bursal weight is noticeable from 3rd to 14th week in both the groups. Comparatively, this increase is more in challenged group than in control group of chickens (figures 1 and 2). There is neither plateau period nor any regression period. Relative weight of bursa (mg

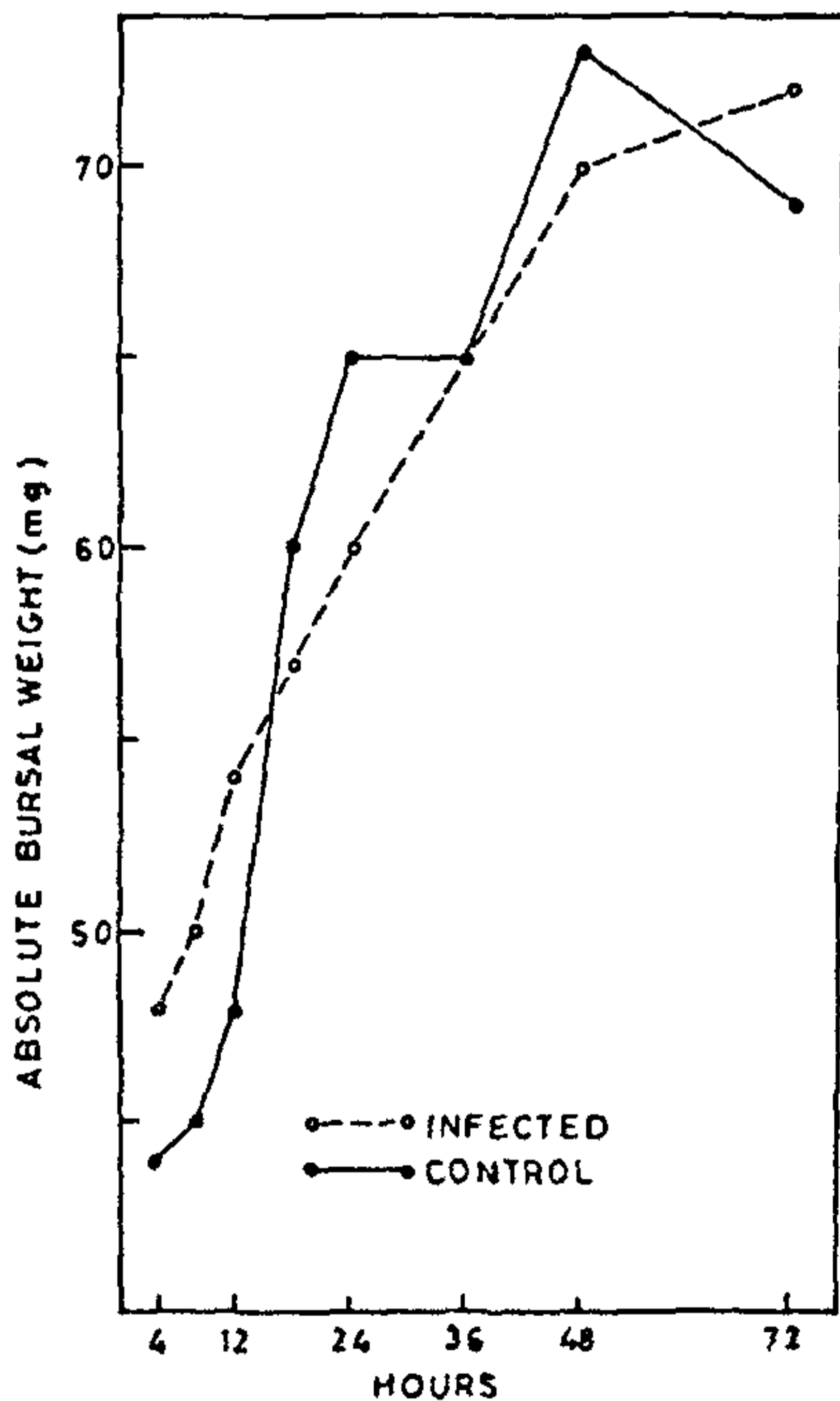


Figure 1. Absolute weight of bursa at different intervals until 72 hr.

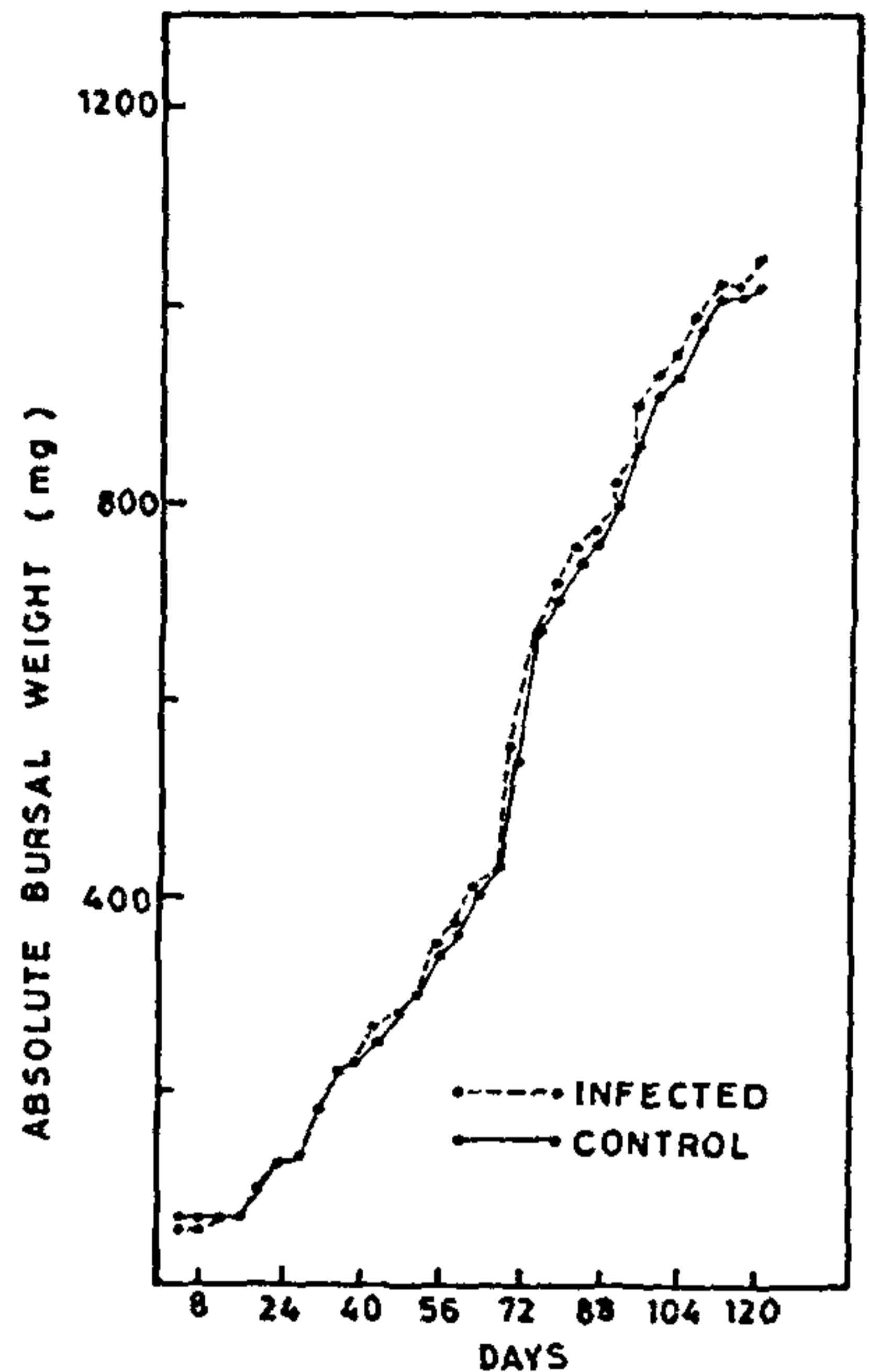


Figure 2. Absolute weight of bursa at every 4 days interval until 120 days.

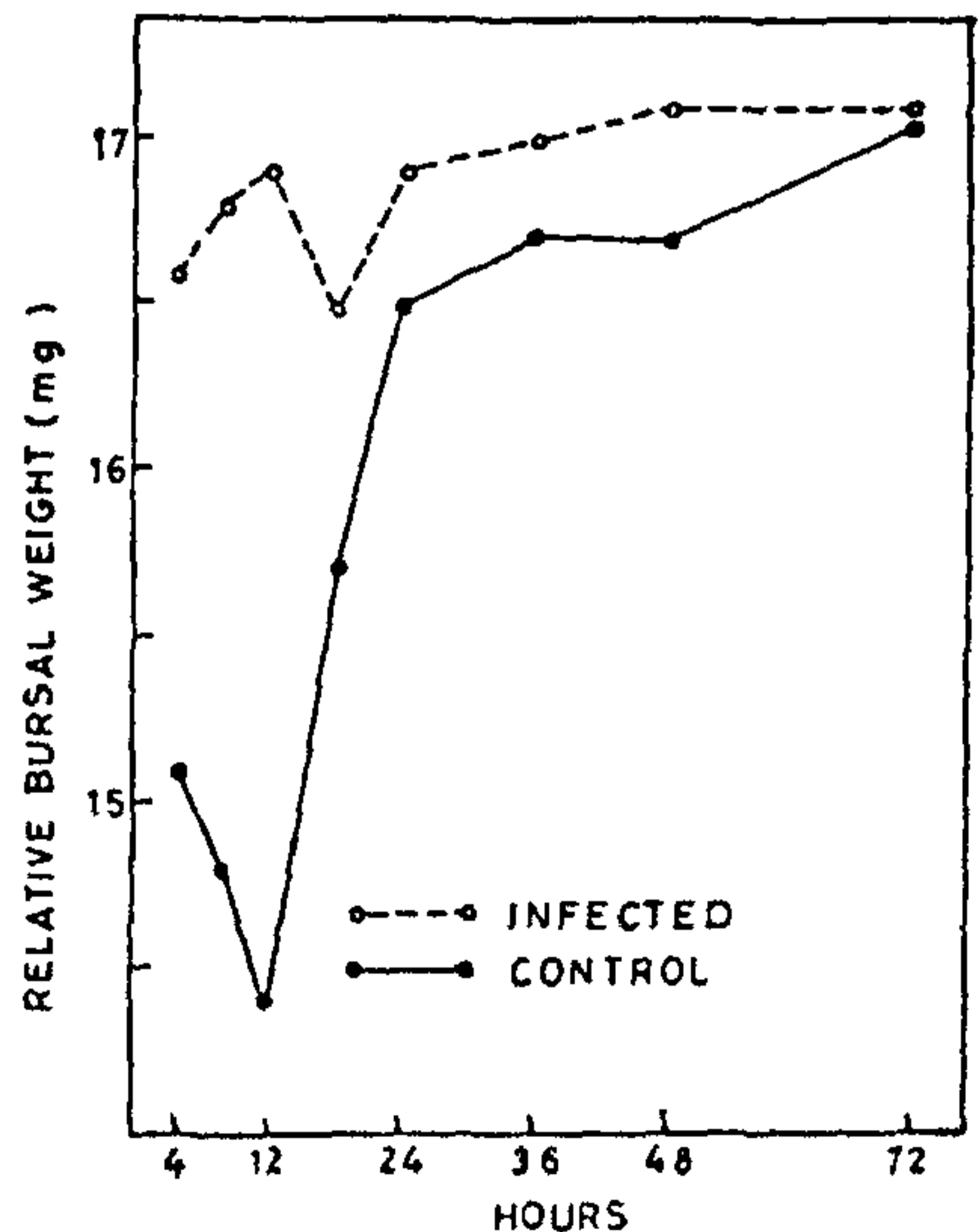


Figure 3. Relative weight of bursa at different intervals until 72 hr.



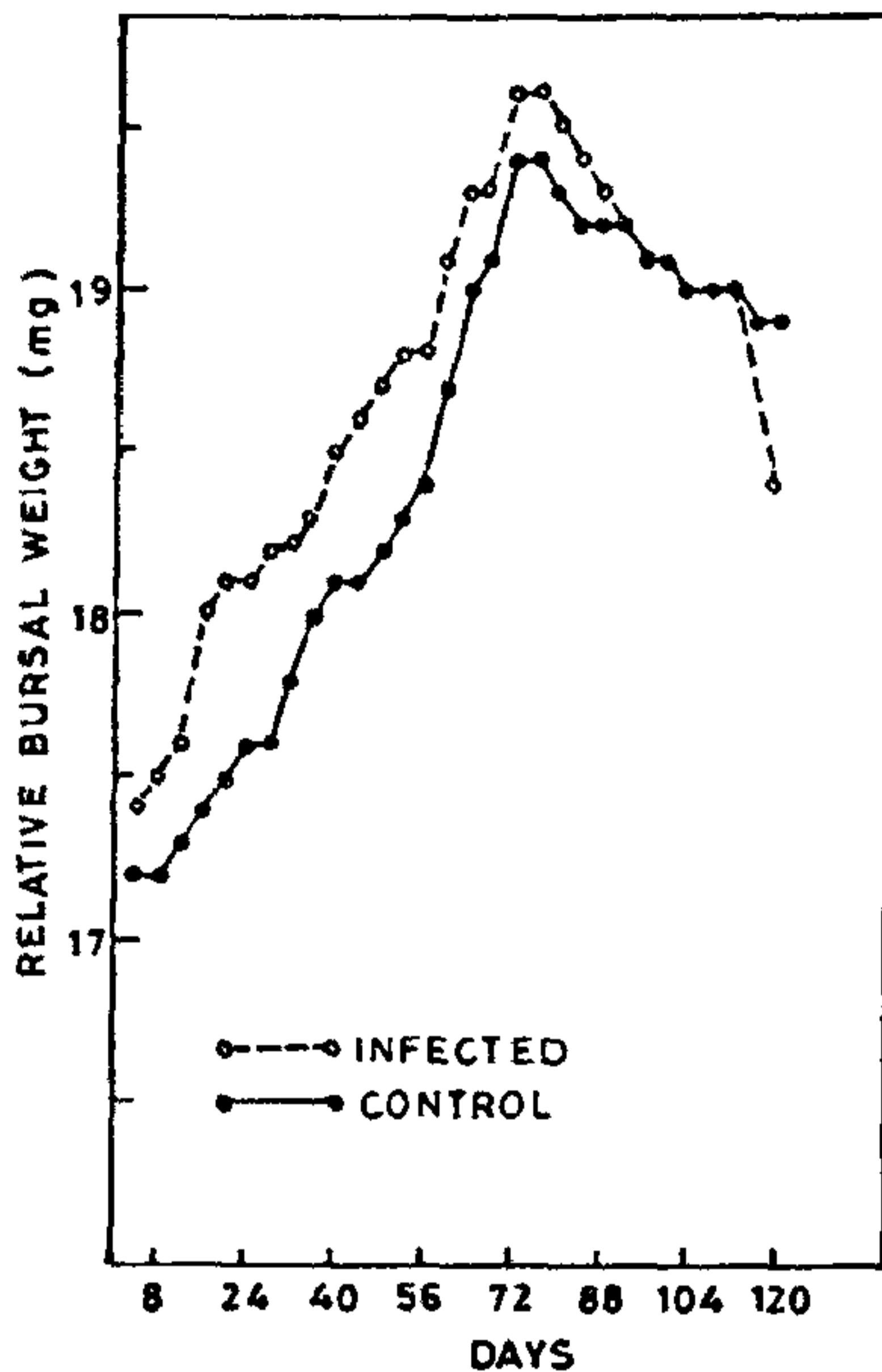


Figure 4. Relative weight of bursa at every 4 days interval until 120 days.

per 10g of body weight) also steadily increases with growth from 15.1 mg (1 day-old) to 19.4 mg (76 days old) in control and from 16.6 mg (1 day-old) to 19.6 mg (72 days old) in challenged group of chickens. Relative weight then tends to decrease steadily after 30 days in control and 76 days in challenged group until sexual maturity at 120 days (figure 3 and 4). Increase in relative weight in challenged group of chickens, however, is more obvious than in control group at each stage of sacrifice.

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## CONTRIBUTIONS TO THE REPRODUCTIVE BIOLOGY OF THE FERN *LYGODIUM FLEXUOSUM* (L.) SW.

NAND LAL AND S. K. ROY

Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi 221 005, India.

*LYGODIUM flexuosum* is a climbing fern and grows in many natural and artificial Teak-Sal forest of India at lower altitudes. In Mirzapur district it is sparingly found in a Sal forest called Hathinallah and in Gorakhpur it is rather abundant in Teak-forest called Kusumhi. The distribution of the fern, though never growing in plenty in any one place throughout India, is interesting and therefore a study of the mating system and distribution of *L. flexuosum* was undertaken.

The spores were collected from both the sources mentioned above and stored in a desiccator and then surface sterilized with 2% sodium hypochlorite solution before sowing on 50 ml of autoclaved sterilized inorganic nutrient medium<sup>1</sup> gelled with 1% agar at pH 5.8 in petridishes. The plates were maintained at  $24 \pm 2^\circ\text{C}$  under continuous-white fluorescent illumination at an intensity of 250–300 ft.C. in a culture room. Immature prothalli were randomly selected and were placed in fresh solidified nutrient agar medium in petridishes to give rise to three kinds of population, namely, single, pair and composite. Crossing programme for the gametophytes is mentioned below.

A : Consisted of 21 singly isolated gametophytes from Hathinallah.

B : Consisted of 26 singly isolated gametophyte from Kusumhi.

A × A : Consisted of 24 pairs of gametophytes from Hathinallah.

B × B : Consisted of 20 pairs of gametophytes from Kusumhi.

A × B : Consisted of 20 crosses of gametophytes. Each plate contained two gametophytes, one from Hathinallah and other from Kusumhi.

A' × B' : Consisted of 25 composite cross-cultures. Each plate contained 20 gametophytes, half from Hathinallah and the other half from Kusumhi.

After attaining sexual maturity the cultures were subsequently watered twice weekly with sterilized double distilled water to facilitate fertilization and zygote formation was scored till the termination of experiment. Two sets of stock-culture were left unwatered to serve as apogamous control. At the end of the experiment those gametophytes which failed to produce a sporophyte were examined morphologically for the presence of male, female gametangia and indi-