SOME ASPECTS OF THE LIFE CYCLE OF THE TICK *IXODES PILOSUS* UNDER LABORATORY CONDITIONS

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ABSTRACT

Some aspects of the life cycle of the tick *Ixodes pilosus* were studied under laboratory conditions. The preoviposition period was 7,2 ± 0,6 d. Maximum egg production was on Day 4 after oviposition commenced, with total egg production of 2 395 ± 128,7 eggs per female. The mean feeding time of larvae was 3,3 ± 0,1 d. The life cycle could not be completed due to the specific requirements of this species.

Key words: *Ixodes pilosus,* laboratory conditions, life cycle.

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Ixodes pilosus Koch is a tick that occurs in the coastal strip of South Africa and Mocambique and in some areas in the northern Transvaal[9]. This tick is common only in areas which have sufficient rainfall to support the growth of long grass[9] and, as in most other African species of the genus *Ixodes,* is restricted to specific humid habitats[3]. *I. pilosus* is of little economic importance, which may account for the absence of any studies on the biology of this species. This report describes some aspects of the life cycle of *I. pilosus* under controlled laboratory conditions.

I. pilosus adults used in this study were collected from cattle in the eastern Cape Province and maintained in a dark incubator at 26 ± 1°C and 80 ± 5% R.H. Preoviposition periods and daily egg production were monitored. Larvae were fed on the backs of naive Himalayan Giant rabbits inside glued containers. Samples of 10 larvae were removed daily from the hosts and weighed.

Engorged larvae were further exposed to relative humidities of 97,5%, 92,5%, 87,0%, 85,0% and 75,0% to stimulate development of nymphs.

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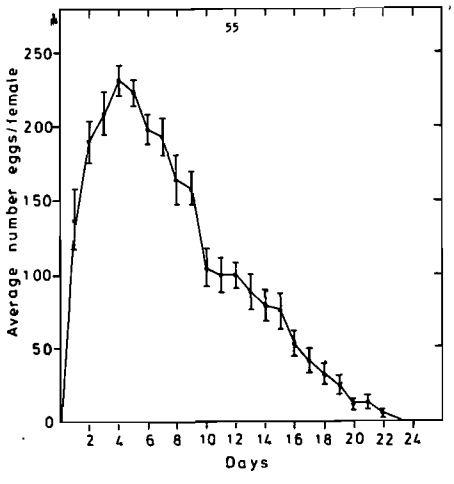

Fig. 1: **Average daily oviposition of *Ixodes pilosus*. Vertical lines represent standard error of the mean**

The mean (±SE) preoviposition period of 20 *I. pilosus* engorged females was 7,2 ± 0,6 d. Maximum egg production was on Day 4 after the commencement of oviposition, with most of the eggs being laid during the first week (Fig. 1). The mean (±SE) daily production was 232 ± 10,3 eggs per female (range 136-314 eggs). The mean (±SE) total egg production (based on 20 females) was 2 345 ± 128,7 eggs per female (range 989 - 2 978). As in many other tick species, a significant positive correlation ($p < 0,01$) was found between the weight of eggs and the weight of engorged females (Fig. 2).

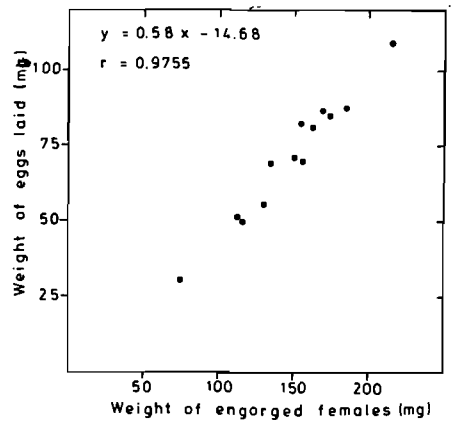

Fig. 2: **Relationship between weight of eggs laid and weight of engorged females of *Ixodes pilosus***

The mean (±SE) incubation period of the eggs was 30,2±3,7 d. The mean (±SE) feeding period of the larvae was 3,3±0,1 d. Weight changes during the feeding period are presented in Fig. 3. Exposure of the engorged larvae to the various relative humidities was unsuccessful because they died of desiccation.

The results from the present study agree

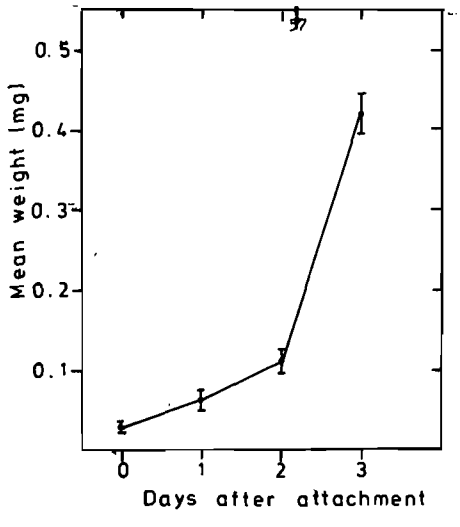

Fig. 3: **The changes in weight of larvae of *ixodes pilosus* during feeding**

with those reported for other African ticks of the genus *Ixodus*[4 5 6 8].

It is necessary to emphasise that *I. pilosus* is very sensitive to desiccation, and found to be abundant mainly in coastal areas with a high rainfall, particularly along densely vegetated riverbanks[9]. This setting provides a very humid microenvironment and enables the development of eggs to larvae to take place. *I. pilosus* laid more eggs than any of the African species of the genus *Ixodes*, with the exception of *I. aulacodi*[6]. Perhaps this is to ensure their survival in such habitats. The requirement of the larvae (and probably also of the other stages) for a very high humidity, may also be the reason for the unsuccessful attempts at breeding *I. pilosus* in the laboratory.

Although the duration of the life cycle of *I. pilosus* could not be completed, it appears that the life cycles of African ticks of the genus *Ixodes*, are generally longer than those of species from temperate zones[1 2 6 7 8 10]. The long life cycle of ticks such as *I. matopi, I. pilosus* and *I. rubicundus,* might regulate the development of these ticks and ensure that the desiccation - sensitive stages of the life cycle occur at favourable times of the year.

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