SHORT COMMUNICATION

In vitro Assessment of Period of Oviposition and Hatching in *Hyalomma anatolicum anatolicum*

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Introduction

Hyalomma anatolicum anatolocum is one of the most important tick species in India (Geeverghese and Dhanda, 1987), which assumed noticeable importance because of its role as the major vector of the hemoprotozoan parasites. Besides, the role of *Hyalomma* species in transmitting the Crimean-Congo hemorrhagic fever (CCHF) virus in humans has been established in different countries (Karti *et al*., 2004). Ticks produce severe economic losses through blood-sucking and acting as vectors of pathogens and toxins. In India alone, the cost of tick and tick-borne diseases (TTBDs) in animals has been estimated to the tune of approx. Two thousand crores (Ghosh *et al.,* 2007). Scanty literature is available pertaining to the life cycle of *H. a. anatolicum* in general and from Madhya Pradesh in particular. Therefore, the present study was designed to record the period of oviposition and hatching of eggs in *H. a. anatolicum.*

Materials and methods

Fully engorged adult female *H. a. anatolicum* ticks were collected from the vicinity of healthy cattle pens in and around Indore. Morphological identification of the *H. a. anatolicum* ticks were carried out as per the method described by Bhatia *et al*. (2010).

Collected ticks were pricked from their back and after boiling in KOH they were washed with water to remove internal organs and tissues. Further, they were dehydrated in ascending grades of alcohol, cleared in Carboxy xylol for 20 minutes each, and mounted permanently using the Canada balsam. *H. a. anatolicum* were identified based on the morphological characters as described by Bhatia *et al.* (2010). Ticks were identified based on the characters like long hypostome and palpi (longirostrate mouthparts). In the case of females, the spiracles were triangular while comma-shaped in males. Males had adrenal glands and accessory adrenal shields.

Further, each fully engorged female tick after identification was placed in a test tube and closed with a piece of cloth and rubber band. These tubes were transferred in a desiccator having a 10% potassium hydroxide solution at the base to maintain 85 ± 5% relative humidity. The desiccator was closed airtight with its lid by applying vaseline on a contact surface of the lid of the desiccator and placed in an incubator at 28 ± 1° C and 85 ± 5% relative humidity (RH). These tubes were examined periodically to check oviposition and subsequent hatching of eggs to larvae.

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Results and discussion

In the present study, the period of oviposition of *H. a. anatolicum* was recorded as 11.1 ± 0.70 days at a temperature of 28 ± 1°C and relative humidity of 85 ± 5%. This observation was in agreement with that of Bagherwal and Sisodia (1989), Ghosh and Azhahianambi (2007) and Anusha (2014), who reported 7–11 days, 10–12.2 and 10–12 days, respectively at a temperature of 28°C and 35-38°C and relative humidity of 85%. On the other hand, Prasad *et al.* (2018) recorded period of oviposition of *H. a. anatolicum* as 9.4 ± 0.54 days, at a temperature of 28 ± 1°C and relative humidity of 85 ± 5%.

Hatching period of eggs in *H. a. anatolicum* was observed as 22.3 ± 0.78 days in the present study at a temperature of 28 ± 1°C and a relative humidity of 85 ± 5%, which is in accordance with the findings of Bagherwal and Sisodia (1989) and Durrani and Shakoori (2009) as 18–29 and 15–25 days,

respectively, during spring season. On the other hand, Prasad *et al.* (2018) recorded it as 21.9 ± 0.69 days at a temperature of 28 ± 1°C and relative humidity of 85 ± 5%.

The variations observed in oviposition and hatching of eggs in different studies could be because of change in climatic conditions, partial and complete engorgement of different stages of ticks and their susceptibility for various species of animals.

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