

## OBSERVATIONS ON THE BIOLOGY OF AMBLYOMMA INTEGRUM TICKS UNDER LABORATORY CONDITIONS

T.J. Harikrishnan<sup>1</sup> and S.A. Joseph<sup>2</sup>

Department of Parasitology,  
Madras Veterinary College, Chennai, India.

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Majority of the species of *Amblyomma* ticks are parasitic on wild animals. Nine species of *Amblyomma* viz., *A. crenatum*, *A. clypeatum*, *A. integrum*, *A. supinoi*, *A. helvolum*, *A. nitidum*, *A. sublaeve*, *A. testudinarium* and *A. hebraeum* have been reported to occur in India (Patton and Craig, 1913). All these species excepting *A. integrum* and *A. testudinarium* have been reported from animals other than the domestic stock. Although *A. integrum* has been reported to occur in domestic animals, there is only one report on the incidence of *A. integrum* in Tamil Nadu. Neither there is a record on its prevalence in domestic animals in plains nor records on its bionomics and biology. Hence the present report, which focuses attention on its life history, is the first of its kind for *A. integrum*.

### Materials and Methods

One fully engorged adult female, collected from a bullock in the abattoir at Perambur, Chennai was used to establish a colony in the laboratory. Crossbred calves were used as experimental hosts for the engorgement of the parasitic stages of the tick. The different stages of the tick were allowed to engorge on the ears of calves

within car bags that were secured with adhesive tape. Engorged stages that were collected in the ear bags were allowed to moult at room temperature. The ranges of temperature and relative and relative humidity during the period of study were 20-28°C and 70-80%.

### Results and Discussion

The fully engorged adult female tick recovered from a bullock at Chennai was initially identified as *Amblyomma* species on the basis of long hypostome and ornate scutum. After emergence of unfed adult ticks in the laboratory, the ticks were identified as *A. integrum* as per keys furnished (Sharif, 1928). The ticks were dark reddish brown in colour with long, slender palps and hypostome (Figs. 1 and 2). The scutum had dark reddish brown markings with prominent marginal grooves in males.

On the ventral surface, broad comma shaped spiracles were observed. In males the fourth coxa had a blunt spur twice as long as broad and anal shields were absent. In females the posterior angle was narrow and the first coxa had two unequal spurs. The morphology of the tick was in general

1. Associate Professor and Head, Department of Parasitology, Veterinary College and Research Institute, Namakkal-1.

2. Professor (Retired), Madras Veterinary College, Chennai - 7.

Biology of *Amblyomma integrum*

Fig. 1 - Male



Fig. 2 - Female

*Amblyomma Integrum*

agreement with that given by Sharif (*loc. cit.*) for *A. integrum*. Earlier, examination of *Amblyomma* spp. of ticks received from the field staff of Animal Husbandry Department was observed to be a new species that was named as *Amblyomma mudaliari* (Rao *et al.*, 1964). In the present study, the fourth coxa showed a blunt spur in males while in females two unequal spurs were seen in the first coxa, which agree with *A. integrum* as against a pointed spur in the fourth coxa in males in *A. mudaliari*.

*A. integrum* is reported to be present in the western hilly terrain and plains adjacent to hills. The prevalence of *Amblyomma* species in the metropolis is very unusual and appears to be of rare occurrence. Since the tick was recovered from a bullock at the local abattoir, it is probable that the animal might have come from an area bordering forest or hills.

The pre-oviposition period was 26 days and oviposition occurred between 7 and 10 days. It took 74-80 days for the eggs to

hatch, which was long and protracted. Since, ranges of temperature during the period of egg hatch were around 20-22°C (October-December), temperature could have presumably influenced the period of egg hatch. However, the egg incubation period of other ixodid ticks such as *Hyalomma anatolicum anatolicum* and *Rhipicephalus haemaphysaloides* was 21-28 days 28-30 respectively during the same period. According to Soulsby (1982), the period of egg hatch for *Amblyomma hebraeum* which occurs in the warmer parts of South and Central Africa and *Amblyomma variegatum* which is distributed throughout south-western Africa and Southern Africa is 30-91 days and 53-86 days respectively.

Larvae completed their cuticle hardening within 5-7 days and the completion of cuticle hardening and readiness to feed was indicated by the presence of white material on the walls of the vials. The parasitic period of larvae ranged from 5 to 6 days and ecdysis to

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nymphs occurred from day 15 to day 16. The parasitic period of nymphs ranged from 6 to 8 days and the period of ecdysis to adults from 16 to 18 days. Larval feeding took 5-6 days, and after 15-16 days they moulted to nymphs. The adults commenced feeding (prefeeding period) after 10-12 days and engorged adults were seen after 8-10 days. The parasitic period of larvae, nymphs, adults and the period of ecdysis between successive instars were similar to earlier reports with respect to other *Amblyomma* species (Rodrigues *et al.*, 2002; Soulsby, *loc. cit.*).

### Summary

*Amblyomma integrum* was recorded from a bullock at Chennai. The duration of the various parasitic stages of the tick under laboratory conditions is described. The duration of larval emergence was

considerably prolonged in the present study.

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## PATHOMORPHOLOGICAL STUDY OF LUNGS IN CHICKEN\*

A.M. Manjunatha, M.L. Satynarayana, S.K. Vijayasarithi<sup>1</sup>,  
S. Yathiraj<sup>1</sup> and Suguna Rao

Department of Pathology, Veterinary College,  
University of Agricultural Sciences, Hebbal,  
Bangalore – 560 024, India.

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A detailed gross and histopathological study of the lungs of chicken, were taken up and the observations made are presented in this paper.

### Materials and Methods

Two hundred lungs, from 163 broilers and 37 layers showing respiratory signs were collected from 28 poultry farms in and around Bangalore, and were examined in detail for gross lesions. Representative tissue samples were collected in 10 per cent neutral buffered formalin and processed by paraffin embedding technique. The sections of four-micron thickness were cut and stained by haematoxylin and eosin as per the method described by Luna (1968). Special stains *viz.*, PAS-Alcian blue, Masson's trichrome and McManus Method for Glycogen (PAS) were used wherever necessary. The histological changes in the lungs were systematically characterized and documented.

### Results and Discussion

The main gross pathological lesion

observed in the lung was congestion. It was also reported in several diseases *viz.* Avian influenza (Acland *et al.*, 1984 and Saif *et al.*, 2003), *E. coli* infection (Majo *et al.*, 1997 and Saif *et al.*, *loc. cit.*), *Mycoplasma gallisepticum* infection (Saif *et al.*, *loc. cit.*) and formaldehyde and ammonia toxicity (Jayaramu, 1999 and Harish, 2000).

Microscopically, the lesions noticed in the lung included vascular congestion (91.41 and 89.18 per cent), haemorrhage (71.77 and 70.27 per cent) and oedema (33.74 and 59.45 per cent) in broilers and layers, respectively. Similar vascular lesions were recorded in Newcastle disease (Suguna Rao, 1999) and aspergillosis (Pande and Sharma, 1971).

Pneumonia was observed in 39.26 and 21.62 per cent broilers and layers, respectively. The different types of penumonias, observed in the study included suppurative, fibrinous and granulomatus pneumonia. Suppurative pneumonia was characterized by the presence of mucus in the primary, secondary, tertiary bronchi and air capillaries. Fibrinous pneumonia was

\* Part of the M.V.Sc. Thesis of the first author approved by the UAS, Bangalore, Karnataka.  
Present Address : M.V.Sc. Scholar, Department of Veterinary Pathology, Veterinary College, UAS, Hebbal, Bangalore - 560 024.

1. Department of Clinical Medicine, Veterinary College, UAS, Hebbal, Bangalore-560 024.