of a tick not indigenous to the area by a migrating bird (See under 5.2.5.17).

6.8. Remarks on the absence of ticks of the genus *Ixodes*:

*Ixodes petauristae* and *I. ceylonensis* are two common ticks occurring in ground drags in the study area, and as common ecto-parasites, in its immature stages, of small mammals in the area. The immature stages have been found very abundant during the monsoon in ground drags. *I. ceylonensis* larvae and nymphs have a seasonal prevalence immediately after the monsoon. The absence of even a single *Ixodes* tick on any of the large number of birds examined clearly indicates that *Ixodes* species of the area do not parasitize birds.

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7. SUMMARY

A two year study on the Ixodid ticks (*Acarina: Ixodidae*) of wild birds of Shimoga district, Mysore State, was undertaken by the writer as part of the overall program of work of the Virus Research Centre, Poona, on the epidemiology of Kyasanur Forest Disease in Shimoga District, Mysore State, India.

A total of 8,474 birds belonging to 184 species, was collected and examined for ticks during the two year period. Birds of widely differing habits and habitat were taken in every month of the year, to study the seasonal pattern of infestation and also to correlate the tick infestation with the habits and
habitats of the host species. The number of birds found positive for ticks was 1,082 and comprised of 81 species.

In the study area, the post monsoon period (from October to December) corresponds to the tick larval season, the predominant nymphal season following immediately afterwards. The tick adult season is during the monsoon months from June to September. The largest number of birds were found infested during the larval season and the lowest in the monsoon season. The important factor in this pattern is that while the immature stages of most of the tick species do not have any host preference and attack birds freely the adults of most tick species, unless they are specific avian ectoparasites, do not attack birds generally.

Of a total of 9,821 ticks collected on the birds, 99.5% or 9,774 ticks belong to the genus *Haemaphysalis*, comprising 12 of the 14 species recorded in the study area. The remaining 47 ticks (0.5% of the total) belonged to the genera *Dermacentor*, *Amblyomma*, *Boophilus* and *Hyalomma*. Though two species of *Ixodes*, *I. petauristae* and *I. ceylonensis* commonly occur in the study area, these were not encountered on any of the 8,474 birds examined.

Nearly three quarters of all *Haemaphysalis* tick sample (7,244) taken on birds were *Haemaphysalis spinigera*, closely followed by *Haemaphysalis wellingtoni* (1,073 ticks or 10.9%) and *Haemaphysalis turturis* (609 ticks or 6.2%). Small numbers of *H. bispinosa* (389 ticks), *H. intermedi* (155 ticks), *H. papuana kinneari* (136 ticks), *H. kyanurensis* (55 ticks), *H. minuta* (39 ticks),
H. megalaimae (44 ticks), H. aculeata (16 ticks), H. cuspidata (13 ticks) and one H. centropi were also taken. The list includes H. megalaimae a new species of tick described during the course of this study, which is specific only to a tree hole inhabiting arboreal bird, Small green barbet (Megalauma viridis). Only small numbers of ticks belonging to genera other than Haemaphysalis were taken during the study on 35 of the 8,474 birds examined.

The finding of a nymph of Hyalomma marginatum isaaci attached to a migratory wagtail, with the larval skin in situ, is a case of introduction of a tick not indigenous to the study area.

It is interesting to note that all the tick species recorded during this study, are indigenous to India. Although a total of 416 birds belonging to 25 species migrating from outside India were examined, not a single tick species not recorded in India, was collected on any of these birds during the entire study period.

The seasonal variations in the infestation pattern of each tick species, the factors governing the infestation by ticks on different host species as correlated with the habits and habitats, and the host relationships of the different tick species and the ecology of their distribution and prevalence are also discussed.