# Communication

## Notes on the biology of the tick *Rhipicephalus bursa* (Canestrini and Fanzago, 1877) in Israel

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**YERUHAM (I.), HADANI (A.), GALKER (F.), ROSEN (Sh.).** Note sur la biologie de la tique *Rhipicephalus bursa* (Canestrini et Fanzago, 1877) en Israël. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (2) : 233-235.

La distribution saisonnière de *Rhipicephalus bursa* a été étudiée pendant un an sur 2 troupeaux de moutons voisins de race Awassi qui se trouvaient dans un foyer enzootique de babésiose ovine. Les taux d'infestation des deux troupeaux par les tiques ont été très différents. Les stades pré-imaginaux de *R.b.* ont été trouvés pendant les mois d'hiver (novembre-mars) alors que les adultes sont apparus en avril et ont persisté jusqu'au début de juillet. Les premiers cas cliniques de babésiose ovine ont été décelés 2 semaines après la découverte des premières tiques adultes. Les stades pré-imaginaux ont été trouvés principalement sur le pavillon des oreilles tandis que les sites préférentiels des tiques adultes sont, par ordre décroissant, la queue, le corps et la tête. Peu de tiques adultes ont été trouvées sur les membres. *Mots clés* : *Rhipicephalus bursa* - Distribution saisonnière - Lieux de prédilection - Israël.

*Rhipicephalus bursa* (Canestrini and Fanzago, 1877) (*R.b.*) is considered a major parasite of sheep in the Mediterranean basin and southern part of the Palaearctis mainly due to the transmission of ovine babesias (*B. ovis* and *B. motasi*) (13). Despite its economic importance *R.b.* has been incompletely studied. Like other two host ticks, *R.b.* has been considered adapted to a habitat characterized by a low average precipitation and a long dry summer (7). The distribution of this tick species in Israel is largely limited to the Mediterranean phytogeographical zone, between 400-600 mm isohyets in hilly areas with terra rossa and rendzinas types of soil (16). The seasonal distribution of *R.b.* in Israel and its predilection sites on the sheep body have been studied in 2 flocks of sheep during one year. The results are described in the present communication.

The observations were carried out during the period October, 1982-October, 1983.

**Animals :** Two flocks of 120 local Awassi sheep each, B.N. and K.Z., were checked in this study. One of the flocks (K.Z.) included about 30 local black goats as well.

**Locality :** The flocks are on permanent grazing throughout the whole year, at the foot of the Shomron hills at a distance of 4 km from each other. The area, known to be infested by *R.b.*, is located about 100-200 m above sea level with a Mediterranean climate, characterized by a short winter and a long dry summer. Annual rainfall ranges around 500 mm with 60-70 per cent relative humidity and an average annual temperature of 17-20 °C. Climatic conditions during the observation period are given in figure 1.

Numbers and species of ticks collected in the 2 flocks of sheep during the observation period are detailed in table I.

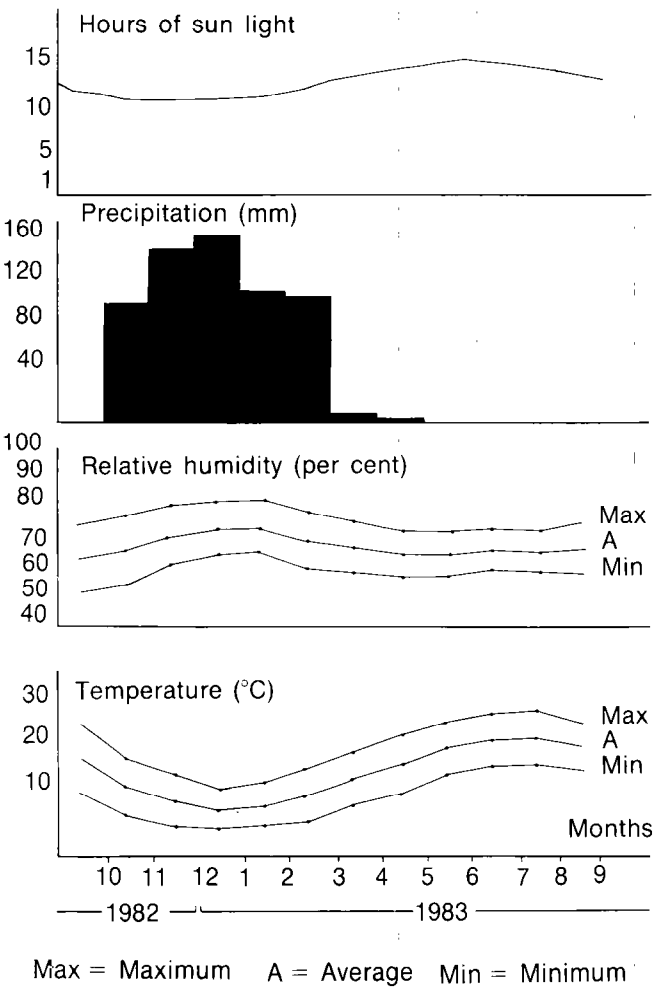


*Fig 1 : Monthly precipitation and monthly average of temperature, relative humidity and light hours (october 1982-october 1983) (kindly supplied by the Institute of Meteorology, Beit-Dagan, Israel).*

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Reçu le 07.04.88, accepté le 14.06.88.

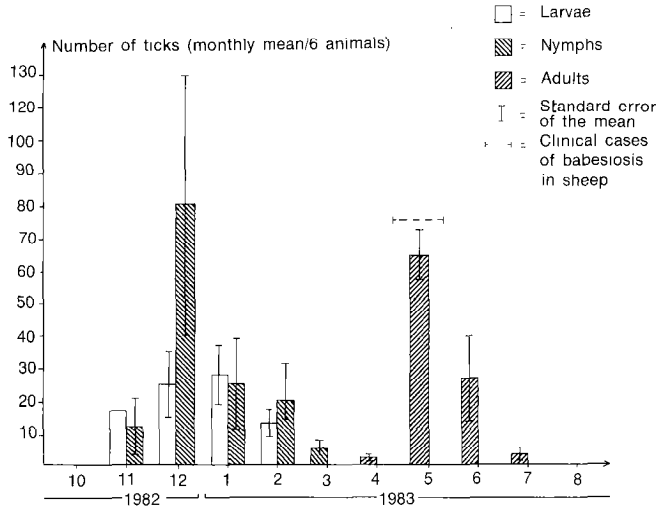
*TABLE I Ticks collected in the B.N. and K.Z. flocks of sheep in the period October, 1982-October, 1983.*

| Species of tick | Rhipicephalus bursa | | | Hyalomma anatolicum excavatum (A) | Haemaphysalis otophila (A) | Haemaphysalis cretica (A) | Rhipicephalus sanguineus (A) |
|---|---|---|---|---|---|---|---|
| | L | N | A | | | | |
| No. of ticks | 344 | 658 | 403 | 1 213 | 1 438 | 842 | 1 820 |

L : larvae. N : nymphs. A : adults.

A total of 5,716 adult ticks were collected in both flocks, 405 (7 per cent) of which were *R.b.*. It seems that *R.b.* is much more abundant in its ecological habitat in Israel than previously suspected (4). Most of the *R.b.* ticks (1,378) were collected in the B.N. flocks whereas only 27 specimens were found during the same period in K.Z. Similar uneven geographical distribution of tick species has been described elsewhere (11) and apparently depends on the specific characters of these two ecological nitches. Out of 403 adult *R.b.* ticks collected, 221 (55 per cent) were males and 182 (45 per cent) females.

The seasonal distribution of *R.b.* in the B.N. flock is presented in Graph 1. The pre-imaginal stages of *R.b.* were found on the animals in the period November, 1982-March, 1983 while the adult ticks appeared firstly in the middle of April, reached a peak in May and persisted on the animals until the end of July. Similar results were described in studies carried out in neighbouring countries (8, 9, 10). In Turkey (5, 6, 15) and in the Balkans (1, 2, 3, 6, 12, 14) appearance of *R.b.* adult ticks is delayed by 1-1.5 months.




*Graph 1 : The seasonal distribution of* Rhipicephalus bursa *in sheep (B.N., 1982-83)*

First clinical cases of babesiosis in sheep were detected about 2 weeks after the appearance of *R.b.* adults. Similar results were reported elsewhere (15). Sporadic cases of sheep babesiosis have been detected outside the adult tick period of activity (YERUHAM, personal communication) and might be attributed to erratic *R.b.* adult ticks or relapses of chronic latent cases due to stress factors such as food shortage and helminthiasis in autumn months.

The predilection sites of *R.b.* on the body of the sheep are described in table II.

*TABLE II Distribution of* **R. bursa** *ticks on the body of the sheep (B.N. and K.Z., 1982/83).*

| Part of the body | Developmental stages of tick | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Larvae | | Nymphs | | Adults | | |
| | No. of ticks | Percent of total | No. of ticks | Percent of total | No. of ticks | Percent of total | |
| Head | 344 | 100 | 652 | 99.0 | 73 | 18.1 | 1,069 |
| Body | — | — | 1 | 0.15 | 113 | 28.0 | 114 |
| Tail | — | — | 5 | 0.75 | 204 | 50.6 | 209 |
| Legs | ND* | | ND* | | 13 | 3.2 | 13 |
| Total | 344 | 100 | 658 | 100 | 403 | 100 | 1,405 |

* Not done - The legs were examined only in the last 6 months of the study.

Larvae and nymphs were mostly found in the pinnas while adult ticks seem to prefer the tail and in decreasing order the body and head. Few adult ticks were found on the legs and in the interdigital space. Similar results were reported elsewhere (8, 9). As mentioned above, legs were checked only in the last 6 months of the study (April-October 1983), well beyond the period of larval and nymphal infestations. In a more recent survey (YERUHAM, personal communication) legs were found to be a predilection site for the attachment of these stages. Corporal distribution of *R.b.* should be considered in control programs of *R.b.* in sheep.

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The seasonal distribution of the tick *Rhipicephalus bursa* in sheep has been studied during one year in two neighbouring flocks of Awassi sheep in an enzootic focus of sheep babesiosis. Rates of tick infestation on the two flocks were very different. Pre-imaginal stages were found on the sheep during the winter months of November-March while adult ticks appeared in the middle of April and persisted until the end of July. First clinical cases of babesiosis in sheep were diagnosed 2 weeks after finding the first adult ticks. The pre-imaginal stages were found mainly in the pinnas while adult ticks preferred in decreasing order the tail, body and head. Few adult ticks were found on the legs. *Key words* : *Rhipicephalus bursa* - Seasonal distribution - Predilection sites - Israel.

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