

## Notes on a small collection of immature *Hyalomma* ticks from migrating birds during their Spring migration in Karan Island, Persian Gulf, Saudi Arabia

by A. FAIN, W. ROGGEMAN, P. SYMENS & A. AL SUHAIBANI

### Summary

A small collection of immature ticks (21 nymphs and 5 larvae) has been collected from 14 migrating birds belonging to 9 species, during their Spring northwards migration (19 April to 10 May 1994) in Karan Island, Saudi Arabia. All these ticks belong to the genus *Hyalomma* and are referred to *Hyalomma marginatum rufipes*.

### Résumé

Une petite collection de tiques immatures (21 nymphes et 5 larves) a été récoltée sur 14 passériformes migrateurs, faisant partie de 9 espèces, au cours de leur migration de printemps vers l'Europe (19 avril au 10 mai 1994) dans l'île de Karan, en Arabie Saoudite. Ces tiques font partie du genre *Hyalomma* et sont rattachées à la sous-espèce *Hyalomma marginatum rufipes*.

### Introduction

Birds migrating from tropical Africa to Europe or Asia transport ticks which may carry a variety of pathogenic agents, especially viruses and rickettsias.

This tick fauna of migrating birds has been carefully studied in Egypt by HOOGSTRAAL *et al.* (1961, 1963, 1964). A brief review and keys of the ticks of Egypt had been provided previously by HOOGSTRAAL and KAISER (1958a and b). In Saudi Arabia the ticks of migrating birds have not been systematically studied, although the endemic tick fauna is well documented (HOOGSTRAAL *et al.* 1981).

During the Spring northwards migration of 1958-1960 the birds trapped in Egypt carried almost exclusively the immature stages of *Hyalomma marginatum rufipes*, also called the "hairy *Hyalomma*"). These ticks are transported from eastern Africa to Europe or Asia (HOOGSTRAAL *et al.*, 1961). This tick is endemic in tropical Africa; it has been introduced in Saudi Arabia and recorded from the camel, the cow and the sheep (HOOGSTRAAL *et al.*, 1961, 1981).

The ticks of migrating birds in Egypt were again studied

during the Spring migration of 1962. About 90% of the ticks taken from these birds were larvae or nymphs of *Hyalomma marginatum rufipes*. Twenty other ticks were also collected, i.e. *Amblyomma variegatum* a very common Afrotropical species (1 nymph reared to adult), and an unidentified *Ixodes* sp. (19 immatures) (HOOGSTRAAL *et al.*, 1964).

Until now, it is not possible, by lack of satisfactory diagnostic criteria, to identify the immature stages of *Hyalomma* to species level (HOOGSTRAAL & KAISER, 1959, p. 305). It still remains necessary to rear the nymphs to adults before a specific identification can be established; however during this molting process about 50% of the nymphs die before to molt in adults.

The immatures of *Hyalomma* ticks attach to the bird's head, on the crown, beside the beak, in and around the ears, or beside the eyes (HOOGSTRAAL & KAISER, 1958a, p. 16).

The birds trapped in Egypt during the Autumnal southwards migration, from Europe and Asia to Africa in 1959-61 carried numerous ticks endemic in Europe and Asia. The most common species found on these birds were *Hyalomma marginatum marginatum*, *Haemaphysalis punctata* and *Ixodes ricinus*. Less common species were *Ixodes frontalis* and *Hyalomma aegyptium*. Rare species were *Haemaphysalis sulcata*, *H. orophila* and *H. pavlovskiyi*. Some of these species are able to complete their entire life cycle on the bird, this is the case for *I. frontalis*, *H. aegyptium* and *H. pavlovskiyi*. All the other species infect the bird only with their immature stages (HOOGSTRAAL *et al.*, 1963).

During the Fall or Autumnal migration in 1962, HOOGSTRAAL *et al.* (1964) collected the same major ticks (especially *Hyalomma marginatum marginatum*) as in 1959-1961. However several other species only represented by immatures, were added to the previous list, i.e. an Asiatic tick, *Ixodes redikorzevi*, found from quails (4 ticks), an European tick *Haemaphysalis inermis* (6 specimens), and 4 specimens reared from adults of *Hyalomma anatolicum anatolicum*, *H. anatolicum excavatum* and *H. dromedarii*.

Most of these ticks, especially the most common are vectors and generally also reservoirs of important pathogenic agents such as viruses and rickettsias.

### Transport and establishment of tick populations in new areas by migrating birds

HOOGSTRAAL (1956, p. 480) collected about 500 immatures of *Hyalomma* ticks (larvae and nymphs) from 77 passerine birds originating from eastern Africa and trapped in the environs of Cairo during their Spring northwards migration. Among them 220 adults of *Hyalomma marginatum rufipes* were reared from nymphs and 284 immatures died before molting but were supposed to belong to the same species. According to this author the populations of *H. rufipes* outside of the Afrotropical region. "Result largely or entirely from introduction by migrating birds. The destinations of these ticks-infested birds include much of Europe, the Near East, Russia and southeastern Asia. Many parasites probably remain attached until their host reach Europe or Asia. Although nymphs feed for 7 to 10 days in the laboratory there is no reason to suspect that a certain proportion of nymphs remain attached for longer periods in nature." (HOOGSTRAAL & KAISER, 1958a).

The small and sporadic populations of *H. marginatum rufipes* occurring in Egypt, Libya, Palestine, Anatolia and southern Russia probably result from introductions by migratory birds (POMERANTZEV, 1950). HOOGSTRAAL *et al.* (1981) reported the presence of *H. m. rufipes* in Saudi Arabia considering it as an "introduced species". The ticks were collected from camel, cow and sheep.

*Hyalomma marginatum marginatum* (the mediterranean *Hyalomma*) occurs in southern Europe from the Caspian Sea to Ukraine and Bulgaria and also Spain, Portugal, northern Africa, Egypt. HOOGSTRAAL (1956) reported 2 specimens from the Sudan. PAPADOPOULOS *et al.* (1991) reported this tick for the first time from the Arabic peninsula; a single female specimen was found on a dromedary at Dhu'ay, Oman.

*H. marginatum marginatum* is a two-host tick, the immatures mainly feed on birds, hares and hedgehogs, whilst the adults infest ungulates, especially cattle and horses.

### Medical importance of ticks transported by migrating birds

*Hyalomma marginatum rufipes* is a vector of *Rickettsia conori*, the causative agent of tick typhus, widely distributed in Africa, from South Africa to the Mediterranean region. This tick is also a reservoir for *Coxiella burnetti*, the agent of the Q-fever.

*Hyalomma marginatum marginatum* is a vector and a reservoir of several viruses pathogenic for man and specially the Crimean-Congo haemorrhagic fever (CCHF). It also is a transmitter of the Tamdy-virus and the Bhanja-virus (Bunyaviruses), the tick-borne encephalitis and the West Nile virus (Flaviviruses) etc... This tick is also a reservoir of *Coxiella burnetti* (PAPADOPOULOS *et al.*, 1991) and a vector of *Babesia caballi*, the agent of the horse piroplasmiasis (HOOGSTRAAL, 1956).

The *Haemaphysalis* spp., transmit several rickettsiosis to man and bacterial (tularemia, brucellosis) or protozoal diseases (babesiosis etc..) to domestic animals (HOOGSTRAAL *et al.*, 1961 and 1963).

*Ixodes ricinus* is an important reservoir and vector of encephalitis viruses to man in Europe and a vector of several other pathogenic agents to man, such as rickettsiosis, borreliosis (Lyme disease) and to domestic animals virus (louping-ill, babesiosis, anaplasmosis (HOOGSTRAAL *et al.*, 1961).

### Ticks collected from birds in Karan Island

During the study period (19 April - 10 May 1994), 2,402 birds belonging to 65 species were trapped, ringed and released. Most of them were passeriform birds that landed on the island during their northwards spring migration. Karan is a small uninhabited island situated in the Persian Gulf (27°-42'N, 49°-50'E) at about 80 km from the coast of Saudi Arabia. As the island has only a very limited breeding population of passeriform birds (*Calandrella rufescens*, *Galerida cristata*), almost all the trapped birds were migrants, staying only some hours on the island. They come from wintering grounds in Eastern and Southern Africa and migrate towards breeding grounds in Northern Europe and Asia. All the birds were checked for the presence of ticks, which were collected from 14 birds belonging to 9 species and 6 genera (list No 1). Going through this list, it is obvious that the majority (though not all) of the infested birds belong to species that spend much of their activity on the ground (*Oenanthe*, *Motacilla*, *Anthus*, *Cercotrichas*).

List no 1. Migrating passerine birds found infested by larvae or nymphs of *Hyalomma marginatum rufipes*, in Karan Island (19 April - 10 May 1994).

Nr.	Date	Host	Ring Nr.
1	20 April	<i>Cercotrichas galactotes</i>	B000219
2	21 April	<i>Oenanthe oenanthe</i>	A04100
3	22 April	<i>Oenanthe oenanthe</i>	A00327
4	22 April	<i>Motacilla flava</i>	A00337
5	22 April	<i>Motacilla flava lutea</i>	A00342
6	26 April	<i>Lanius isabellinus</i>	C000638
7	27 April	<i>Oenanthe pleschanka</i>	A00468
8	30 April	<i>Lanius isabellinus</i>	C000148
9	02 May	<i>Anthus trivialis</i>	A04239
10	03 May	<i>Lanius isabellinus</i>	C000217
11	03 May	<i>Acrocephalus schoenobaenus</i>	A04402
12	06 May	<i>Acrocephalus palustris</i>	A04450
13	06 May	<i>Motacilla flava</i>	A04490
14	08 May	<i>Acrocephalus palustris</i>	A04596

All the ticks found are immatures (5 larvae and 21 nymphs). They belong to the genus *Hyalomma*. Because of the absence of technical support on Karan, it was not possible to rear these immatures until the adult stage and to precise the species. However, in conformity with the observations of HOOGSTRAAL *et al.* (1961) in Egypt, we may conclude that all or almost all the immature ticks of the genus *Hyalomma* collected in Egypt or Saudi Arabia during spring migration on birds originating from the Afrotropical region belong to *Hyalomma marginatum rufipes*.

## References

- HOOGSTRAAL, H., 1956. African Ixodoidea. I. Ticks of the Sudan. Washington D.C. U.S.Navy, 1101 pp.
- HOOGSTRAAL, H. & KAISER, M.N., 1958a. Observations on Egyptian *Hyalomma* ticks (Ixodoidea, Ixodidae) 2. Parasitism of Migrating birds by immature *H. rufipes* Koch. Annals of the entomological Society of America, 51: 12-16.
- HOOGSTRAAL, H. & KAISER, M.N., 1958b. The ticks (Ixodoidea) of Egypt. A brief Review and Keys. The Journal of the Egyptian Public Health Association, 33: 51-85.
- HOOGSTRAAL, H. & KAISER, M.N., 1959. Ticks (Ixodoidea) of Arabia, with special reference to the Yemen. Fieldiana-Zoology 39: 297-322.
- HOOGSTRAAL, H., WASSEF, H.Y. & BÜTTIKER, W., 1981. Ticks (Acarina) of Saudi Arabia, Fam. Argasidae, Ixodidae. Fauna of Saudi Arabia, 3: 25-110.
- HOOGSTRAAL, H., KAISER, M.N., TRAYLOR, M.A., GABER, S. & GUINDY, E., 1961. Ticks (Ixodoidea) on birds migrating from Africa to Europe and Asia. Bulletin World Health Organization 24: 197-212.
- HOOGSTRAAL, H., KAISER, M.N., TRAYLOR, M.A., GUINDY, E. & GABER, S., 1963. Ticks (Ixodidae) on birds migrating from Europe and Asia to Africa, 1959-61. Bulletin World Health Organization, 28: 235-262.
- HOOGSTRAAL, H., TRAYLOR, M.A., GABER, S., MALAKATIS, G., GUINDY, E. & HELMY I., 1964. Ticks (Ixodidae) on migrating birds in Egypt, Spring and Fall 1962. Bulletin World Health Organization, 30: 355-367.
- PAPADOPOULOS, B., BÜTTIKER, W., MOREL, P.C. & AESCHLIMANN, A., 1991. Ticks (Acarina, Fam. Argasidae and Ixodidae) of Oman. Fauna of Saudi Arabia, 12: 200-205.
- POMERANTZEV, B.I. Ixodidae. In Fauna of the USSR, 4 (2): 224 pp. (in Russian), Moscou.

Institut royal des Sciences naturelles de Belgique  
Rue Vautier, 29 - B-1040 Bruxelles

