PUBLICATION REPORT

1410

22/85

ACARINA OF SAUDI ARABIA ORNITHODOROS (ALVEONASUS) LAHORENSIS
IN SAUDI ARABIA BIOLOGICAL, VETERINARY, AND MEDICAL IMPLICATIONS

BY

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Acarina of Saudi Arabia

Ornithodoros (Alveonasus) lahorensis
(Fam. Argasidae) in Saudi Arabia

Biological, Veterinary, and Medical Implications

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Abstract: A third-instar nymph of *Ornithodoros (Alveonasus) lahorensis* taken from an indigenous goat at Al Sharayi, Makkah, provides the first evidence for the presence in Saudi Arabia of this widely distributed Palearctic parasite. *O. (A.) lahorensis* has been incriminated in the epidemiology of a variety of agents causing diseases in man and livestock in Eurasia.
Fig. 1-3 Ornithodoros (Athene) labrosus 8 (sheep and goat stable, Van, Van, Turkey, 17 July 1954, H. Hoogstraal and M. N. Kaser, H115,647), dorsal, ventral, and lateral views (NAMRU-3 illustration by Roman Strekalovský)
INTRODUCTION

The discovery of Ornithodoros (Avicularia) laborenensis Neumann (figs 1-3) in Saudi Arabia has significant biological, veterinary, and medical implications.

An engorged third-instar nymph of this species (HH16, 794) was taken from a domestic goat at Al Sharayi (altitude 1000 m), Makkah, on 16 February 1984, by Ithri M. Diab, Nasr A. Al-Asgah, and Mohamed S. Al-Khalita (The nymph died six days afterward and is preserved in the Hoogstraal Tick Collection.) The infected goat was part of a flock which has grazed up to 1340 meters altitude in the hills surrounding Al Sharayi for ten years and is kept in pens in the wadi at night (fig. 4). The chief vegetation in the wadi is Euphorbia spp., Calotropis procera, Citrus colocynthis, and Acoma spp. The collecting site is in the Al Sarawat mountain range which extends, parallel to the Red Sea, from Al Haz in the north to Asir in the south and reaches its highest peak (3960 m) at Sana'a, the Yemen. At Al Sharayi in winter, precipitation is about 76 mm, mean relative humidity range 35% to 83%, and mean temperature range 6.8°C to 25.2°C. In summer, these figures are 0 mm, 14% to 35%, and 22°C to 39.2°C, respectively (data from Hydrology Division, Ministry of Agriculture and Water, Riyadh).

The goats were also infested by ixodid ticks, Hyalomma (Hyalomma) arabica Pegram, Hoogstraal & Wassef, and Rhipicephalus (R.) turanicus Pomerantsev & Matikashvili, and by ked flies (Diptera. Hippoboscidae; probably Meleagris oviput, see Bittker, 1980). Except for rodents, the only other mammal known near Al Sharayi is the Arabian (Sacred) Baboon, Papio hamadryas arabicus Thomas, which comes during the night and early morning to eat food provided for the goats.

The collecting site was revisited on 15-16 March and 20 April 1984, but no additional specimens of O (A.) laborenensis were found on the goats, in the pens, or under debris and trees. The search for this parasite in this locality and elsewhere in Saudi Arabia will be intensified as time permits.

IDENTITY

Adult Ornithodoros (Avicularia) laborenensis (figs 1-3) are easily differentiated from those of the other Ornithodoros species recorded from Saudi Arabia [O (O.) savignyi and O (Powleshielda) erratics (Hoxova et al., 1981) and O (Alectorobius) muscebecki (Hoxova and Bafort, 1982)] by the distinctive stellate integumental pattern, formed by concentric ridges and small pits, which replace the regular integumental mammillae of the other three species. The tarsi are flat (unhumped) dorsally and taper apically in O (P.) erratics and O (A.) muscebecki. All tars and metatarsi of O (O.) savignyi are conspicuously humped dorsally. In O (A.) laborenensis, each tarsus bears a distinctive dorsoapical projection but dorsal humps are less conspicuous and confined to tarsus and metatarsus. Later-instar nymphs of each species are much the same as adults in these characters.

DISTRIBUTION AND HOSTS

O (A.) laborenensis, originally a parasite of the Asiatic mouflon, Ovis orientalis arkal, and other wandering artiodactyls resting beside cliffs, is now a notorious parasite of sheep, goats, camels, and cattle, especially in stone stables and dwellings, in steppe and mountain deserts from sea level to 2,900 meters altitude in Tibet, Kashmir, southern USSR and Southwest Asia (northern Pakistan to Syria), and Southeast Europe (Turkey, Bulgaria, Yugoslavia, Greece) (Filippova, 1966; Hoxova, 1985). Makkah Province
of Saudi Arabia is the most southwestern area recorded in the range of this parasite. A greatly engorged nymph was taken in Cairo in August, 1913, by C. Wilcox's legt from a "smel which ha" come from Sinai or Syria (Nuttall 2441; H15, 637). Our tick collection contains O. (A.) laborensis samples from Lebanon, Syria, Iraq, Turkey, Iran, Afghanistan, Pakistan, India (Kashmir), and U.S.S.R. (Armenian SSR, Uzbeck SSR, Kazakh SSR).

BIOLOGY

The 2-host life cycle of O. (A.) laborensis is exceptional among argasids (Hogstrom and Aeschlimann, 1982, Hogstrom, 1984). The larva remains on the host for three to six weeks and detaches as an engorged third-instar nymph which rests in a crevice and molts to an adult. After mounting another host, the adult feeds within an hour or two but can ingest as much as 228 mg of blood. However, third-instar nymphal feeding may be sufficient for an unfed female to deposit two viable egg batches. Typically, the larva attaches during fall or winter; the final nymph molts to an adult in spring. Mated fed or unfed females deposit batches of 300 to 500 eggs during warm months but unfed females require a bloodmeal to produce third and subsequent egg batches. The egg incubation period is two to six weeks. Unfed larvae can survive for a year, unfed adults for 18 years. Tremendous population densities often develop between bricks and stones, under plaster, and in cracks of roof supports of stables. One can rapidly determine whether a stable is heavily infested by searching for nymphal pellets entangled in

Fig 4 Goat herd infested by Ornithodoros (Abrotrucus) laborensis at Al Sharat, Makka (photograph by I. M. Daib)
cobwebs on walls, in corners, and over windows. The contemporary success of *O. (A.) laborenus* in this artificial environment, with a regular supply of hosts, results from its exceptional life-cycle adaptation, originally associated with small flocks or herds of wandering wild ungulates. The presence of even a single nymph parasitizing indigenous domestic animals in Saudi Arabia suggests that dense populations may remain to be discovered in suitable habitats of the Kingdom.

**VETERINARY AND MEDICAL ASSOCIATIONS**

*O. (A.) laborenus* parasitism of domestic animals causes anemia, toxic reactions, and paralysis. This tick also transmits the agents of brucellosis and piroplasmosis. The agents of tularemia (*Francisella tularense*) and Q fever (*Coxiella burnetii*) have been reported to be transmitted among domestic animals, and possibly to man, by *O. (A.) laborenus* in Eurasia. Wherever *O. (A.) laborenus* occurs, its potential role in the epidemiology of vectorborne disease agents of man and domestic animals should be investigated.

**ACKNOWLEDGMENTS**

From Research Projects 3M161102BS10.AD 424 (Naval Medical Research and Development Command, National Naval Medical Center, Bethesda, Maryland, USA) and 21/1404/ZOO (Research Center, College of Science, King Saud University, Saudi Arabia).

The opinions and assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the Department of the Navy or of the naval service at large.

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**Title:** Acarina of Saudi Arabia: Ornithodoros (Alveonasus) lahorensis (Fam. Argasidae) in Saudi Arabia: Biological, Veterinary, and Medical Implications -- (UNCLASSIFIED)

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**Subject Terms:**
- Ticks
- Ornithodoros (Alveonasus) lahorensis
- Biological
- Veterinary
- Medical Implications
- Saudi Arabia

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**Publication:**
Published in: FAUNA of Saudi Arabia, 6:165-169, 1984, Acc. No. 1410.