

D2-H-20/94

ISSN : 0215 - 191 X

# Zoo Indonesia

Nomor 22

1993

Diterbitkan oleh MASYARAKAT ZOOLOGI INDONESIA  
d/a Balitbang Zoologi, Jalan Ir. H. Juanda 9 Bogor 16122

Redaksi : D. I. Hartoto, S. N. Prijono, A. S. Adhikerana

---

## ON A COLLECTION OF IXODID TICKS (ACARINA:IXODOIDEA) FROM LONG ALANGO, KAYAN MENTARANG (EAST KALIMANTAN)

SAMPURNO KADARSAN and AWIT SUWITO\*)

### ABSTRACT

TENTANG SUATU KOLEKSI CAPLAK IXODIDAE DARI LONG ALANGO, KAYAN MENTARANG, KALIMANTAN TIMUR. Suatu koleksi yang diperoleh dari Long Alango, Kayan Mentarang, Kalimantan Timur mencatat adanya sembilan jenis dalam lima suku caplak Ixodidae. Angka ini masih jauh dari jumlah jenis yang pernah dilaporkan sebelumnya dari seluruh pulau. Koleksi tersebut terdiri atas *Amblyomma testudinarium*, *Boophilus microplus*, *Dermacentor auratus*, *Ixodes granulatus*, *Haemaphysalis bispinosa*, *H. hystricis* dan tiga *Haemaphysalis* spp. yang identitasnya harus ditetapkan lebih lanjut. Ketiga jenis ini dipertelakan lebih rinci untuk memudahkan pengenalan semua aspek pertumbuhan lainnya. Dalam koleksi ini terdapat unsur-unsur berharga yang dapat membantu memberikan jawaban atas pertanyaan mengenai konsep keabsyahan identitas jenis, radiasi jenis serta pengenalan bentuk pra-dewasa. Daerah koleksi dan sekitarnya memiliki semua potensi yang diperlukan untuk menjawab tantangan tersebut.

---

\*) Research and Development Center for Biology. Bogor.



## INTRODUCTION

Our knowledge on the ixodid fauna from Kalimantan is surprisingly very poor in spite of the numerous efforts made to study its animal diversity. Anastos (1950) in his monograph on Ixodid ticks of Indonesia could only recognize six species, all belonging to one genus, from this island. From Serawak, Sabah and vicinity on the contrary 23 species have been reported by Kohls (1957).

Being the second largest island in the archipelago, Kalimantan offers the opportunity to unravel the secrets of its rich ticks species diversity. Some new findings on its species composition, host association and distribution may contribute to elucidating the problem of its faunal make up or the underlying process of speciation. The latter is especially true for the genus *Haemaphysalis* postulated as having the entire region of Southeast Asia as its center of species radiation (Hoogstraal, 1965).

Participating in the Kayan Mentarang project from January to March 1992 the junior author enjoyed the opportunity to collect ticks in the study area. This collection, presently housed at the Bogor Zoological Museum (MZB), forms the basis of this account. The area is located at 115° 40' – 115° 45' E and 2° 32' – 2° 55' N at an altitude of 400 M above sea level, adjacent to Kayan Mentarang Nature Reserve. Its topography is hilly covered with secondary and primary forest, somewhat patchy with human habitations.

## MATERIAL AND METHODS

All materials were taken from the indicated host under various condition, engorged, semi engorged and unfed. Small vertebrate animals were collected with life traps while large animals were captured for food with traditional killing devices by local inhabitants. Actual dates of collection of each specimen are available and can be furnished upon request.

## RESULTS

Nine species in five genera could be listed and they are described as follows:

### 1. *Amblyomma testudinarium* Koch

Host : *Sus barbatus*

Material examined : 7 N (MZB 2859)

A common species on large mammals, perisso as well artiodactyls. This species has been reported from 5 others members of Suidae in the archipelago (Anastos, 1950).



**2. *Boophilus microplus* Canestrini**Host : *Cervus unicolor*

Material examined : 21M, 21F, 6N, 2L (MZB 2861)

This is a very common species and widely distributed over the entire archipelago and finds its host on wild and domestic large ruminants. This species has long been incriminated as a vector of babesiosis in domestic cattle.

**3. *Dermacentor auratus* Koch**Host : *Sus barbatus*

Material examined : 14M, 13F (MZB 2860)

Hoogstraal *et al.* (1972) considered this species being a member of a species complex. This species complex is considered to consist of three closely related species, differing slightly in adult morphology and altitudinal distribution. *Dermacentor auratus* s.s. does not exist in this archipelago as this species is confined to the Himalayan subregion. Using larval morphology as differentiating criteria, Kadarsan *et al.* (1976) also came up with the same opinion. They could recognize three distinct forms, clearly separable from each other, among the reared larval progeny.

The limited number of specimens available is insufficient to determine their species kinship and a larger series of specimens, including its laboratory reared progeny are in need to justify or refute this species complex.

**4. *Ixodes granulatus* Supino**Host : *Maxomys whiteheadi*, *Niviventer rapit*, *Sundamys muelleri*

Material examined : 1F (MZB 2854); 1F (MZB 2857); 1M, 1F (MZB 2856)

Studied specimens agreed in all aspects with previous descriptions, morphological as well as host association. Failure in thorough screening of this nidicolous species has been the primary cause why this species has not been recorded before. Its association with *Niviventer rapit* is also a new record.

**5. *Haemaphysalis bispinosa* Neumann**

Host : Man

Material examined : 1M (MZB 2859)

Collected while crawling on man in an unfed condition. Elsewhere in the region this species is being reported from large wild and domestic mammals. Hoogstraal *et al.* (1969) considered this species being native to mainland Asia and is presently confined to Peninsula Malaysia and Northern Borneo. Any record from the south of these regions should be considered doubtful.

#### 6. *Haemaphysalis hystricis* Supino

Host : *Sundamys muelleri*

Material examined : 1M (MZB 2856)

This species was collected together with *Ixodes granulatus* and one female *Haemaphysalis* sp. whose features are described elsewhere in this report (see 7.3). Having usually large mammals as hosts of the adult ticks, it is rather unusual to have this species being recorded from its present host. It is not indicative to its predilection to rodents either.

#### 7. *Haemaphysalis* spp.

This section deals with an aggregate of species whose identities have yet to be determined when more specimens become available. Presently they are inadequate in terms of sexual representation as well as developmental stages. Nevertheless their presence is worth being recorded to guide future inventories. For easy reference a description of its diagnostic feature accompanies the illustration of each species.

7.1. Host : *Niviventer rapit*

Material examined : 6L (MZB 2851) Figs. 1.a - d

No body measurements can be given in view of the distended condition of the specimens because of engorgement.

**Scutum** : subcordate, wider than long.

**Capitulum** : basis capituli dorsally subrectangular, about as wide as long, cornuae weak, with horizontal ridge over entire posterior margin; ventrally subrectangular about twice as wide as long, with ridges at postero-lateral margin. Palpi compact, bluntly rounded distally, external margin slightly concave at about midlength, sutures between articles weak. Article I as a pedicel; article II slightly shorter than III, rounded distally; article subtriangular, mildly salient, with ridges along entire posterior margin. Hypostome clavate, extending beyond palpal apices, corona mild; dentition 2/2 with around 7 denticles per file.

**Legs** : coxa I with strong triangular spur; coxa II with shallow broadly rounded spur; coxa III with only traces of spur.

**Remarks** :

The specimens were recovered from the host together with nymphs of *Haemaphysalis* sp. described in the following section. Kadarsan (1971) described field caught larvae from Java whose identity was not known. Studied specimens agreed in all aspects with his description. Under present circumstance one can only correlate their morphological similarity, but to which species they belong still to be solved. One can only ascertain that they are the larvae of a species which is known to occur in Java as well as Kalimantan.

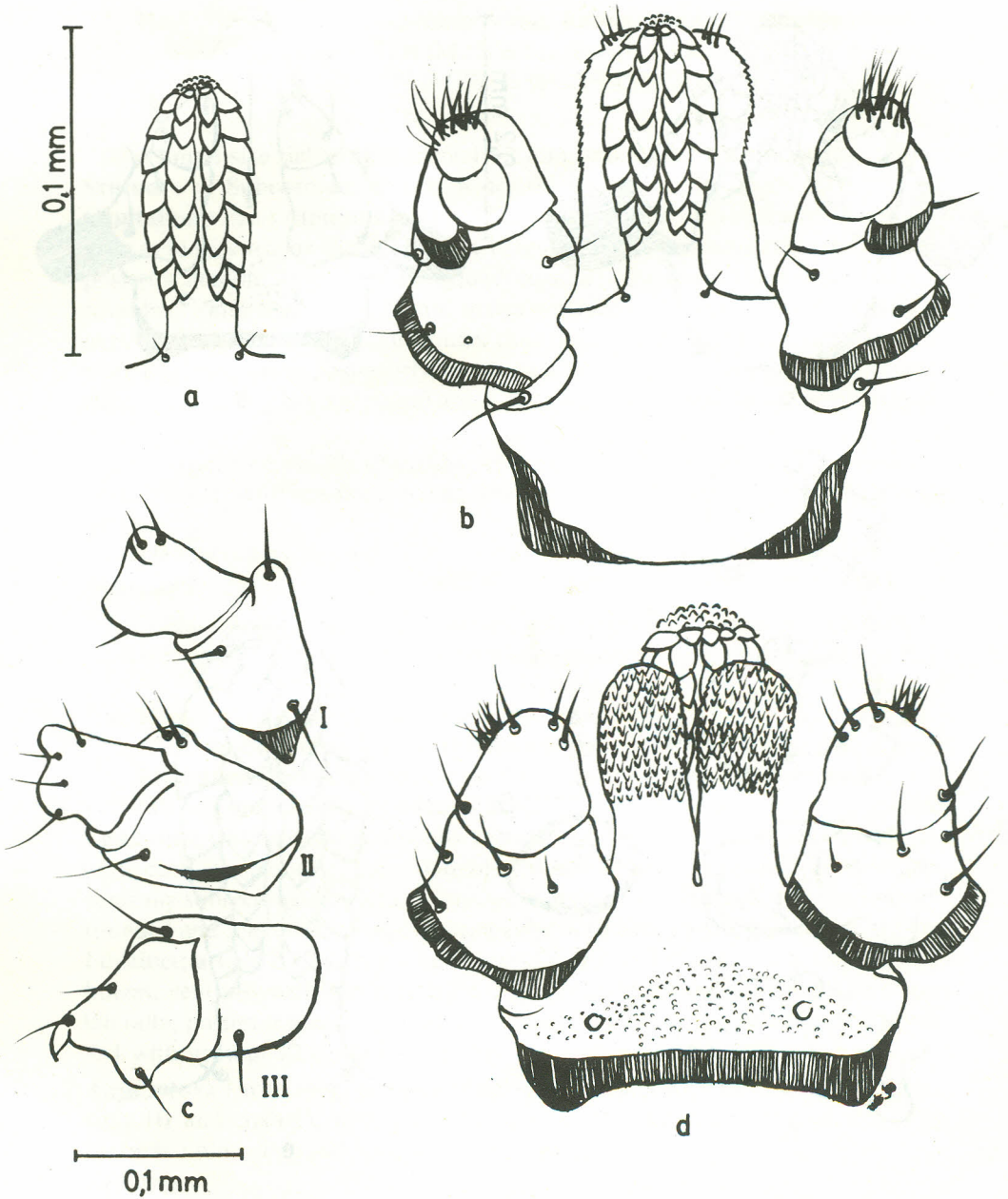


Figure 1. *Haemaphysalis* sp. larva : a. hypostome, b. capitulum (ventral view), c. capitulum (dorsal view), d. coxal spurs I - III.



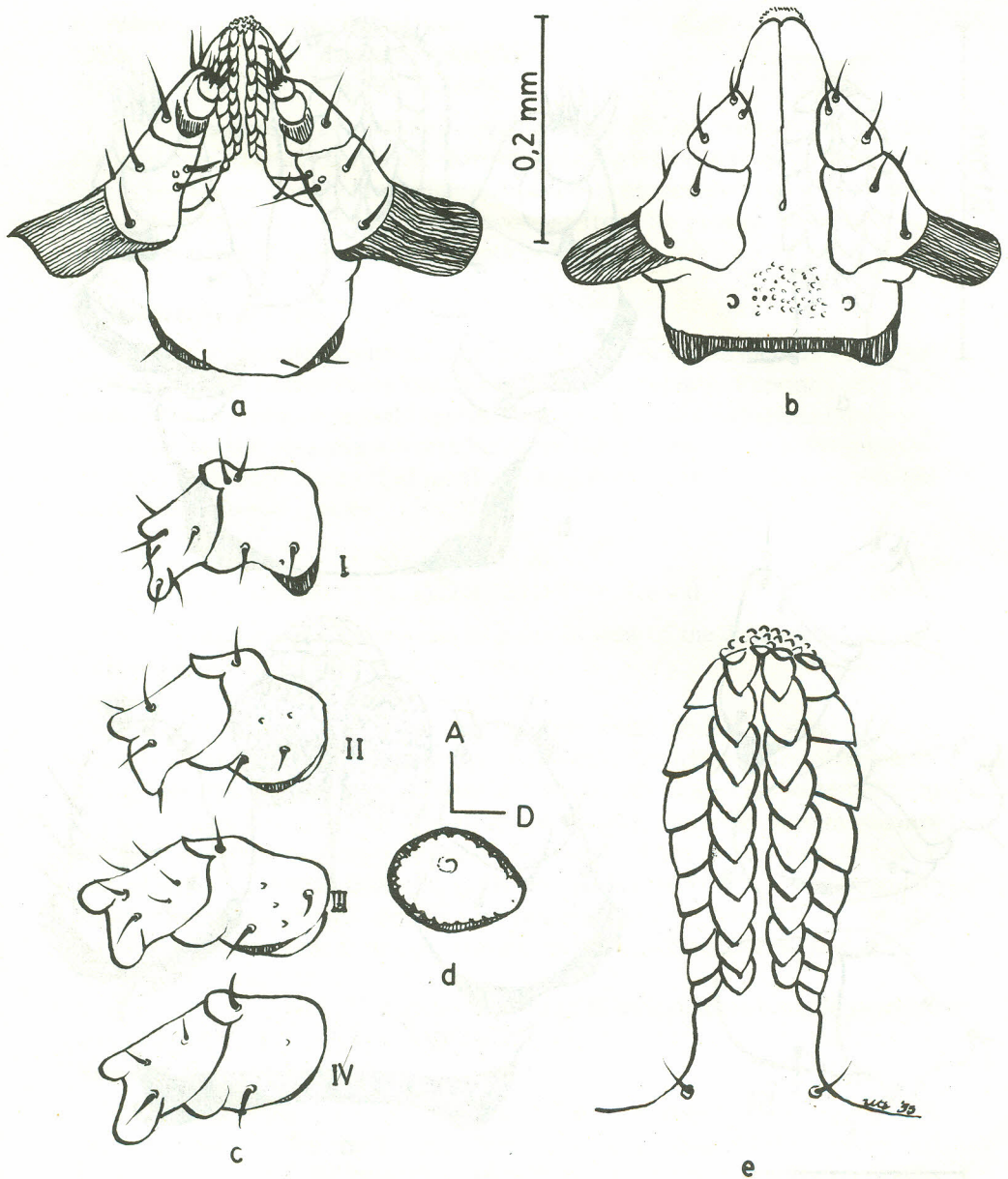


Figure 2. *Haemaphysalis* sp. nymph : a. capitulum (ventral view), b. capitulum (dorsal view), c. coxal spurs I - IV, d. spiracle, e. hypostome.

- 7.2. Host : *Niviventer rapit*, *Rattus exulans*, *Sundamys muelleri*  
Material examined : 11N (MZB 2851); 2N (MZB 2852); 3N (MZB 2853);  
7N (MZB 2856); 2N (MZB 2889)  
Figs. 2.a - e

Small size ticks, measuring 1.62 mm long and 1.43 mm wide.

**Scutum** : Subcordate, slightly wider than long.

**Capitulum** : basis capituli dorsally rectangular, almost two and a half times as wide as long, cornuae weak, bluntly triangular, with horizontal ridge over entire posterior margin; ventrally almost quadrangular, postero-lateral margins bluntly rounded. Palpi triangular, lateral margins straight, strongly salient. Article I as pedicel; article II triangular, longer than wide, widest at base; article III with wing-like projection posteriorly, reaching coxa-trochanteral joint. Hypostome clavate, extending beyond palpal apices, corona mild; dentition 2/2 with around 9 denticles per file.

**Legs** : coxa I with bluntly triangular spur; coxa II with broadly rounded shallow spur; coxa III with less pronounced spur than coxa II; coxa IV with only traces of spur.

**Spiracle** : ovoid as figured

**Remarks** :

This species closely resembles *Haemaphysalis asiatica*, but differs markedly in hypostomal length and the wing like projection of palpal article III.

- 7.3. Host : *Sundamys muelleri*  
Material examined : 1F (MZB 2856) Figs. 3.a - e  
Moderate sized tick, measuring 3.62 mm long and 2.12 mm wide.

**Scutum** : subcordate, as wide as long.

**Capitulum** : basis capituli dorsally rectangular, almost three times as wide as long, cornuae strong broadly triangular, posterior margin strongly sclerotized; ventrally subrectangular, longer than wide, with postero-lateral margins bluntly rounded and sclerotized. Palpi subtriangular with postero-lateral salience; article I distinct; article II bluntly rounded apically, postero-dorsal margin with small bulges, ventrally with strong retrograde spur; article III broadly salient postero-laterally, posterior margin heavily sclerotized. Hypostome subclavate; dentition 4/4 with around 12 denticles per file.

**Legs** : coxa I with long, pointed sharp spur, coxa II with broad shallow spur, coxa III and coxa IV with even less pronounced spur than coxa II.

**Spiracle** : almost round with one side slightly protruding.

**Remarks** :

This species has the characteristics to be included in *Haemaphysalis papuana* complex, but the long and sharp spur on coxa I and the rather blunt spurs on coxae II - IV make it distinct from other species in the group. The specimen was collected together with one male *H. hystricis*.

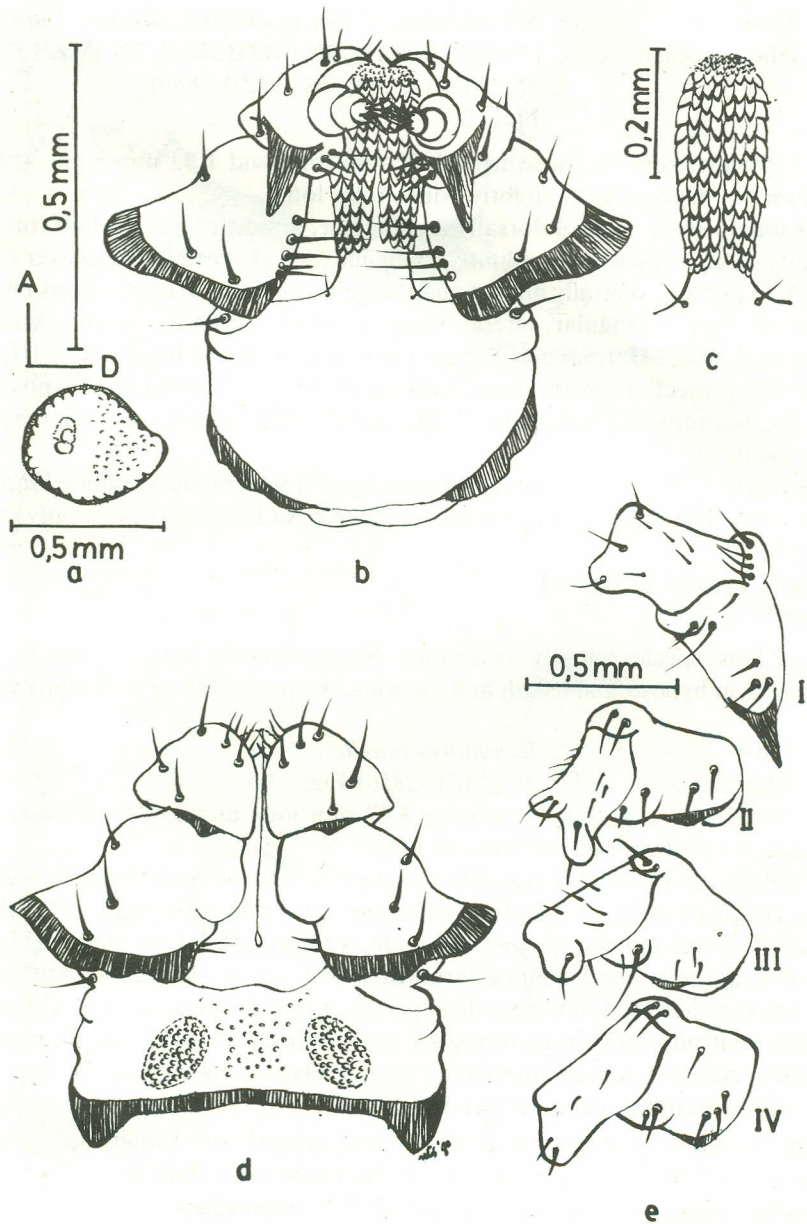


Figure 3. *Haemaphysalis* sp. female : a. spiracle, b. capitulum (ventral view), c. hypostome, d. capitulum (dorsal view), e. coxal spurs I - IV.



## DISCUSSIONS

The present collection, though small contains elements which are challenging in nature. Of the nine species reported in this account four require further investigation. Other forms of challenges are the following.

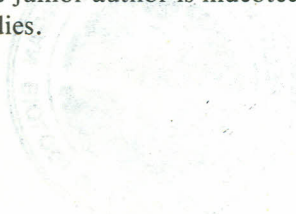
The separation of *Dermacentor auratus* into three distinct species (Hoogstraal *et al.*, 1972) ought to be substantiated with more extensive materials. Wild pigs *Sus* spp. appear to be the chief host of all adult *Dermacentor*. In the absence of wild pigs, this tick would probably be rare in this environment. It is therefore an opportunity to study the evolutionary aspect of this species while the host animal is abundantly found in many places.

To identify immature stages of ticks still remains problematical. Recovery of nymphs and larvae with the adults from the same host animal does not always indicate similar identity with adults. Being opportunistic blood suckers, ticks should be identified individually and not as an agregate. This has important bearing in the interpretation of disease relationship. Lack of appropriate references is the main stumbling block in the progress for Indonesia as well as other parts of the world. Thus, the study of the immature stages is a virgin area for research.

Earlier postulate on species radiation in the genus *Haemaphysalis* in this region finds some supports in this study. Five species in this genus could be recognized in this study, three of which have a doubtful status. However, such problem can be alleviated if better representation in sex and developmental stages can be obtained. In order to arrive at a better understanding of the island's tick fauna, the study area and its surroundings have the potentialities to contribute to the answers.

## ACKNOWLEDGEMENT

The authors wish to thank the Leader of Kayan Mentarang Project for the opportunity given to study the collection. To Worldwide Fund for Nature, Indonesia Programme, the junior author is indebted for the support provided to carry out the field studies.



## REFERENCE

- Anastos, G., 1950. The scutate ticks or Ixodidae of Indonesia. *Entom. Amer.* 30 (1 - 4): 1 - 44.
- Hoogstraal, H., 1965. Phylogeny of *Haemaphysalis* ticks. *Proc. 12th Intern. Congr. Entom. London.* July 1964: 760 - 761.
- Hoogstraal, H., Trapido, H. and G. M. Kohls, 1965. Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae) *H. (Kaiseriana) papuana nadchatrami* spp.n. and redescription of *H. (K.) semermis* Neumann. *J. Parasit.* 51 (3): 433 - 451.
- Hoogstraal, H., Lim, B. L. and G. Anastos., 1969. *Haemaphysalis (Kaiseriana) bispinosa* Neumann (Ixodoidea: Ixodidae): Evidence for consideration as an introduced species in the Malay Peninsula and Borneo. *J. Parasit.* 55 (5): 1075 - 1077.
- Hoogstraal, H., 1971. *Haemaphysalis (Kaiseriana) borneata* sp.n. (Ixodoidea, Ixodidae), a tick of the *H. (K.) aculeata* group parasiting the sambar deer. *J. Parasit.* 57 (5): 1096 - 1098.
- Kadarsan, S., 1971. *Larval Ixodid ticks of Indonesia (Acarina: Ixodidae)*. Ph.D. Dissert, Univ. Maryland, 182 pp.
- Kadarsan, S., Wiroreno, W. and H. B. Munaf, 1976. Morphological variations in the larval progeny of the tick genus *Dermacentor* (Acarina: Ixodidae) in Indonesia. 13th *An. Gen. Meet., Mal. Soc. Parasit. Trop. Med.*: 3-4.
- Kohls, G.M., 1955. Two new species of ticks from North Borneo (Acarina: Ixodidae), *J. Parasit.* 41 (3): 1 - 4.
- Kohls, G. M., 1957. Malaysian Parasites XVIII Ticks (Ixodoidea) of Borneo and Malaya, *Stud. Inst. Med. Re. Malaya.* 28: 65 - 94.

