

An Additional Case Study of Child Infestation with the Hard Tick *Haemophysalis flava* (Acarina : Ixodidae) Found in Okayama, Japan

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ABSTRACT. An additional case of child infestation with the hard tick (Acarina : Ixodidae) is reported. On June 30th, 1987, the hard tick bite was found on the skin surface of left vertex region of a healthy 4-year-old boy residing in Kuse-cho, Okayama, Japan. The removed tick body measured about 6.0 mm in length and 4.5 mm in maximum width including capitulum. On acarological observations the tick was identified as an adult female of *Haemophysalis flava* Neumann, 1897 based on morphological characteristics of scutum, coxae, internal spurs and spiracular plates.

Although detailed route of infestation is not clear, this is the fourth case of human infestation with hard tick in Okayama Prefecture, Japan.

Key words : child ixodiasis — hard tick bite — *Haemophysalis flava* — Ixodidae — Acarina

Although the ixodid hard ticks (adults and larvae) are bloodsucking ectoparasites for vertebrates excepting fishes, they occasionally attack man. In Japan, over 200 cases of the human infestation with the hard tick have so far been reported, among them child infestation is extremely limited. Many of infestations with the hard tick were frequently found during vacation season from April to October, and especially child infestation tends to occur in between May and June.¹⁾

The authors report here an additional new 1 case of child infestation with the hard tick *Haemophysalis flava* found in Okayama Prefecture adding to the previous publication.²⁾

CASE REPORT

Patient (H. H.) was a quite healthy 4-year-old boy living in Kuse-cho, Maniwa-gun, Okayama, Japan. On June 29th, 1987, his mother first noted the presence of a hard substance like a watermelon stone on the skin surface of his left vertex region when she was shampooing his hair. Then she tried to eliminate it but she failed to do because that was very hard to pull out. On the following day, she again attempted to remove since it looked like a kind of insect. She was finally able to remove it though it was hard. Then the victim and his mother carrying the removed foreign body visited us

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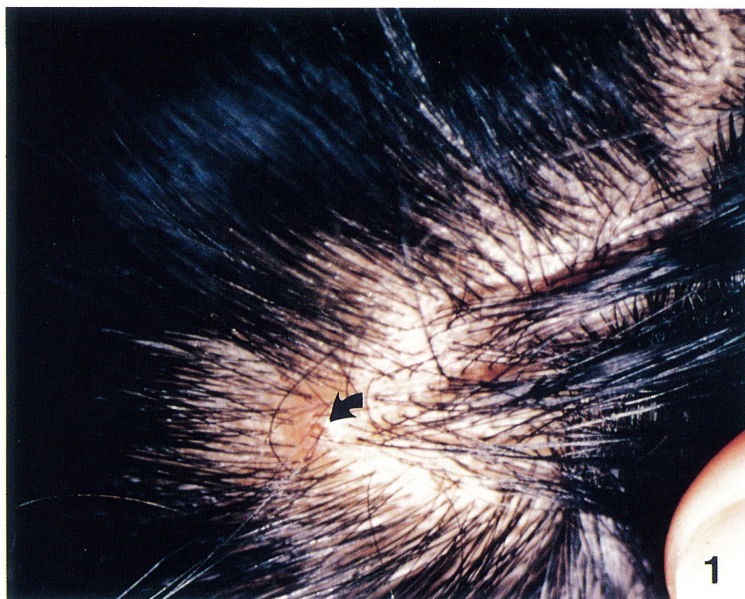
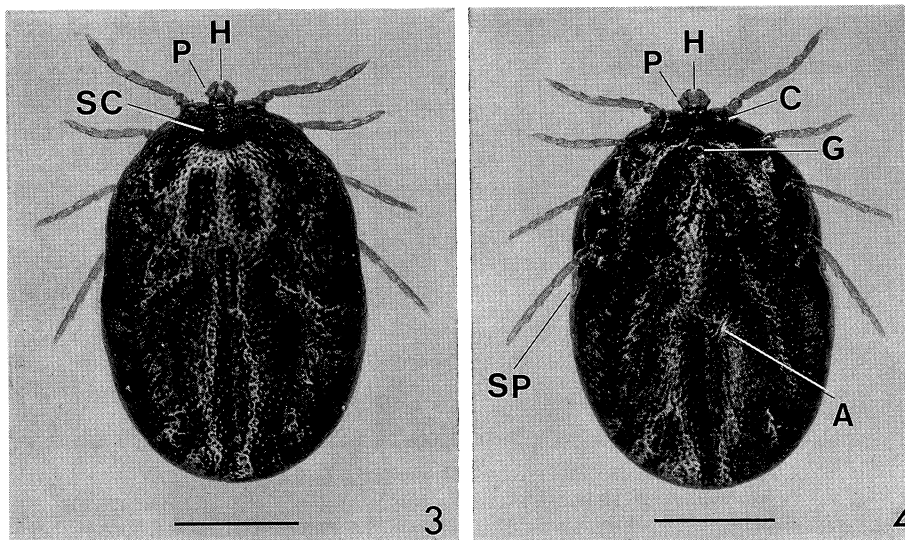


Fig. 1. Clinical photograph showing the tick bite wound (arrow), left vertex region of the patient.



Fig. 2. Photomicrograph of HE-stained section of the skin lesion. Edema, erosion, infiltration by inflammatory cells and eosinophilia are recognized in the dermis (Scale = 0.2 mm).



Figs. 3, 4. An adult female of *Haemophysalis flava* removed from the skin surface of left vertex region of the patient, dorsal view (3) and ventral view (4) (Scales = 2.0 mm).

A : anus, C : coxa, G : genital aperture, H : hypostome, P : palp, SC : scutum, SP : spiracular plate

on June 30th. On gross inspection, the foreign body turned out to be an adult tick with four pairs of legs.

By cutaneous finding, the lesion was found on the skin surface of left vertex region showing red papule with mild tenderness, size of a rice grain. Recognizable swelling and redness around a bite wound were noted (Fig. 1), thus this case was diagnosed as hard tick bite. An extremely small piece of cutaneous tissue, adjacent of the wound, was cut for microscopy in order to confirm because of the remaining hypostome of tick body in the host skin.

Histopathological study revealed that the edema and erosion of upper stratum, the infiltration by inflammatory cells and eosinophilia of reticular layer in the dermis and the tissue defect were found only at certain parts of corium, but no the remaining part of tick body was quite recognized (Fig. 2).

The removed tick body was grossy and light-blue in color, and the body had been slightly swollen with blood of the patient. The tick body measured about 6.0 mm in length including capitulum and 4.5 mm in maximum width (Figs. 3, 4). The capitulum was comparable to the characteristics of the genus *Haemophysalis* type (Fig. 5). No damaged portion was observed in a hypostome and palps composing the capitulum which is supposed to be introduced into the host skin. The scutum on the back was ellipsoidal in shape, and measures about 0.8 mm longitudinally and 0.9 mm transversally. Eyes were not presented on the periphery of scutum. The spiracular plates located on each side just behind the fourth coxae, measuring about 0.28 mm in dorso-ventral direction and 0.26 mm in antero-posterior direction (Fig. 6). Genital aperture and anal opening were recognized on the ventral surface, and the festoons were clearly recognized at the posterior periphery. The internal spurs on coxae are almost unnoticeable but the spur of coxa IV is longer than the others. As

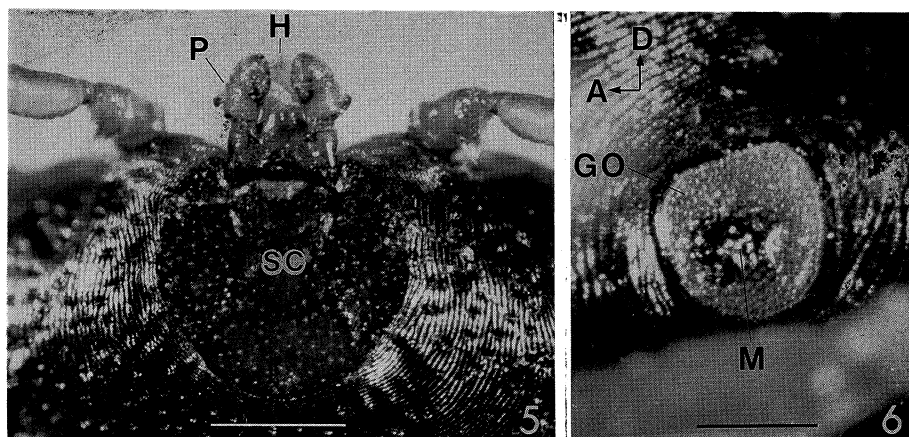


Fig. 5. Anterior end of *H. flava*, dorsal view (Scale = 0.5 mm).

Fig. 6. A left spiracular plate (Scale = 0.2 mm).

A : anterior, D : dorsal, GO : goblet, H : hypostome, M : macula,
P : palp, SC : scutum

a result, the present tick is identified as an adult female of *Haemophysalis flava* Neumann, 1897.

The skin lesion by tick bite is healed within a few days after extraction of the stitches.

DISCUSSION

It is well known that some species of hard tick belonging to the family Argasidae and Ixodidae are very common ectoparasites of mammals, birds, reptiles and amphibians, of which an appreciable number of tick species are rarely parasitic in humans by bloodsucking. The hard tick infestation has been known recently to increase in Japan though a few unreported cases may exist. So far as is known at present, 14 species of the ixodid hard ticks have been reported as human bite source in Japan, namely *Argas japonicus* Yamaguti *et al.*, 1968, *A. vespertilionis* Kishida, 1927, *Amblyomma testudinarium* Koch, 1844, *Boophilus microplus* (Canestrini, 1888), *Haemophysalis companulata* Warburton, 1908, *H.*

TABLE 1. Cases of *Haemophysalis flava* infestation reported in Japan

Case No.	Examined date	Locality (Prefecture)	Patient		Lesion site	Author (year)
			age	sex		
1.	June 1974	Aomori	29	M	forearm	Takada <i>et al.</i> (1978) ³⁾
2.	" 1981	Shimane	3	F	vertex	Tohgi <i>et al.</i> (1982) ⁴⁾
3.	Mar. "	Fukuoka	8	"	occiput	Yoneda <i>et al.</i> (1982) ⁵⁾
4.	Apr. "	Kanagawa	51	M	neck	Ozawa <i>et al.</i> (1982) ⁶⁾
5.	Dec. ?	Aichi	?	?	?	Kumada (1983) ⁷⁾
6.	? ?	Fukuoka	8	F	vertex	Yasukawa <i>et al.</i> (1984) ⁸⁾
7.	Dec. 1984	Okayama	2	M	temple	Mimura <i>et al.</i> (1986) ²⁾
8.	June 1987	"	4	"	vertex	Present authors

* M=male, F=female.

TABLE 2. Cases of hard tick infestation in Okayama Prefecture

Case No.	Examined date	Patient		Lesion site	Hard tick species	Author (year)
		age	sex			
1.	June 1981	59	F	right shoulder	<i>I. ovatus</i>	Hatsushika and Miyoshi (1982) ⁹⁾
2.	" 1984	75	M	left axilla	<i>I. nipponensis</i>	Nakatsukasa and Hatsushika (1985) ¹⁰⁾
3.	Dec. 1986	2	"	right temple	<i>H. flava</i>	Mimura and Hatsushika (1986) ²⁾
4.	June 1987	4	"	left vertex	<i>H. flava</i>	Present authors

* *I.* = *Ixodes*, *H.* = *Haemophysalis*, F=female, M=male.

flava Neumann, 1897, *H. japonica* Warburton, 1908, *H. longicornis* Neumann, 1901, *Ixodes acutitarsus* (Karsch, 1880), *I. monospinosus* Saito, 1967, *I. nipponensis* Kitaoka et Saito, 1967, *I. ovatus* Neumann, 1899, *I. persulcatus* Schulze, 1930 and *I. simplex simplex* Neumann, 1906.

Among these, the infestation with *Ixodes ovatus* is definitely frequent, followed by *I. nipponensis* and *I. persulcatus*, whereas *Haemophysalis flava* infestation is rather rare as shown in Table 1.²⁻⁸⁾ The total number of the patients has not yet reached to two digits. The reason for this is conceivable that *H. flava* can easily be removed from the host skin because a hypostome of *H. flava* is not so elongate as that of other ixodid species. In the present case no remaining part of the capitulum (hypostome and palps) was found in the skin lesion.

As indicated in Table 1, it is apparent that most of the patients infested with *H. flava* are children of 8 years or under, and tick bites often occur on the head region, such as vertex, occiput as well as temple. It is assumed that the location of the human lesion is regarded as being closely correlated with ecological characteristics of *H. flava*. Furthermore, it should be noted that *H. flava* possibly infest the humans even in winter season.^{2,7)}

As shown in Table 2, 3 human cases of the hard tick bite have so far been reported in Okayama Prefecture.^{2,9,10)} Therefore, the present case is the fourth case of hard tick infestation in the prefecture adding to the previous report. It is well known that the ixodid ticks communicate various kinds of microbial disease (such as tick paralysis, tick encephalitis, louping illness, forest disease, hemorrhagic fever, Colorado tick fever, Rocky Mountain spotted fever, tick typhus, Q fever, relapsing fever and tularemia) to man nearly everywhere in foreign countries. To date, none of the marked disease hardly known in Japan but the special attention must always be paid to prevent them.

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REFERENCES

- 1) Yamaguchi, N.: Ixodiasis. Pediatrics Mook 28 : 198-204, 1983 (in Japanese)
- 2) Mimura, S. and Hatsushika, R.: Child infestation with the hard tick *Haemophysalis flava* (Acarina: Ixodidae). Kawasaki Med. J. 12 : 61-66, 1986
- 3) Takada, N., Fujita, H. and Yamaguchi, T.: Studies on ixodid fauna in the northern part of Honshu, Japan. 2. Human cases of tick infestation, especially many cases with a large species *Ixodes acutitarsus* (Karsch, 1880). Jap. J. Sanit. Zool. 29 : 216-218, 1978 (in Japanese)
- 4) Tohgi, K., Yamamoto, S., Makino, U. and Yamane, Y.: A case of human infestation with the hard tick *Haemophysalis flava*. Rinsho Hifu 4 : 1394-1395, 1982 (in Japanese)
- 5) Yoneda, Y., Shirouzu, G., Ueda, H. and Iwashige, K.: Five cases of human infestation by hard tick in Kyushu, Japan. J. Kurume Med. Assoc. 45 : 1309-1316, 1982 (in Japanese)
- 6) Ozawa, A., Yamaguchi, N., Hayakawa, K., Matsuo, I., Niizuma, K. and Ohkido, M.: A case of tick bite (*Haemophysalis flava*) — Consideration of tularemia infection through tick bite. Jpn. J. Dermatol. 92 : 1415-1421, 1982 (in Japanese)
- 7) Kumada, N.: Twenty cases of tick-bite from central Honshu, Japan. Jap. J. Sanit. Zool. 34 : 134, 1983 (in Japanese)
- 8) Yasukawa, K., Fujita, T., Ishii, Y. and Kitaoka, S.: A case of *Haemophysalis flava* infestation. Jap. J. Sanit. Zool. 35 : 219, 1984 (in Japanese)
- 9) Hatsushika, R. and Miyoshi, K.: A case of *Ixodes ovatus* infestation found in Okayama, Japan. Jpn. Med. J. 3012 : 31-34, 1982 (in Japanese)
- 10) Nakatsukasa, A. and Hatsushika, R.: A case report on the human infestation by a hard tick *Ixodes nipponensis* found in Okayama, Japan (Acarina: Ixodidae). Kawasaki Med. J. 11 : 225-231, 1985