

## A Case Report on the Human Infestation by a Hard Tick *Ixodes nipponensis* Found in Okayama, Japan (Acarina : Ixodidae)

Akihiro NAKATSUKASA and Ryo HATSUSHIKA\*

Department of Dermatology, Kawasaki Hospital,  
Kawasaki Medical School, Okayama 700, Japan

\*Department of Parasitology, Kawasaki Medical School,  
Kurashiki 701-01, Japan

Accepted for Publication on November 1, 1985

**ABSTRACT.** A case of hard tick infestation to a patient, 75-year-old male living in Wake-Cho, Okayama Prefecture is reported. The patient seemed infested by ticks at his backyard bamboo bush where he had entered every other day for trash dumping.

The tick was found on the skin surface of left axilla region in early June, 1984. On acarological observations the tick was identified as an adult female of *Ixodes nipponensis* Kitaoka and Saito, 1967 based on its body size and the morphological features of scutum, coxae and spiracular plates. This report is the second case of human infestation with hard ticks in Okayama Prefecture, Japan.

**Key words :** Acariasis — Hard tick bite — *Ixodes nipponensis* —  
Ixodidae — Acarina

Although the adult and larval ixodid hard ticks are bloodsucking ectoparasites for wild mammals, avians, reptiles and amphibians, they are occasionally bite man.

Recently, the human infestation with the hard ticks seems increasing, and over 200 cases have been reported in the literature. The first case of human infestation in Japan caused by *Ixodes nipponensis* Kitaoka and Saito, 1967 was described by Yamane *et al.*<sup>1)</sup> on two patients in Shimane Prefecture, followed by 25 cases.

The authors report here human infestation with *I. nipponensis* found in Okayama Prefecture together with bibliographical considerations.

### REPORT

Patient : T. U., 75-year-old male. Wake, Wake-Cho, Wake-Gun, Okayama Prefecture, Japan.

Family history : Not much to be cited.

Major complaint : A hard substance on skin surface of his left axilla region without pain.

Course of illness : On June 8th, 1984 the patient first noted a hard substance on skin surface of his left axilla region without any particular symptom.

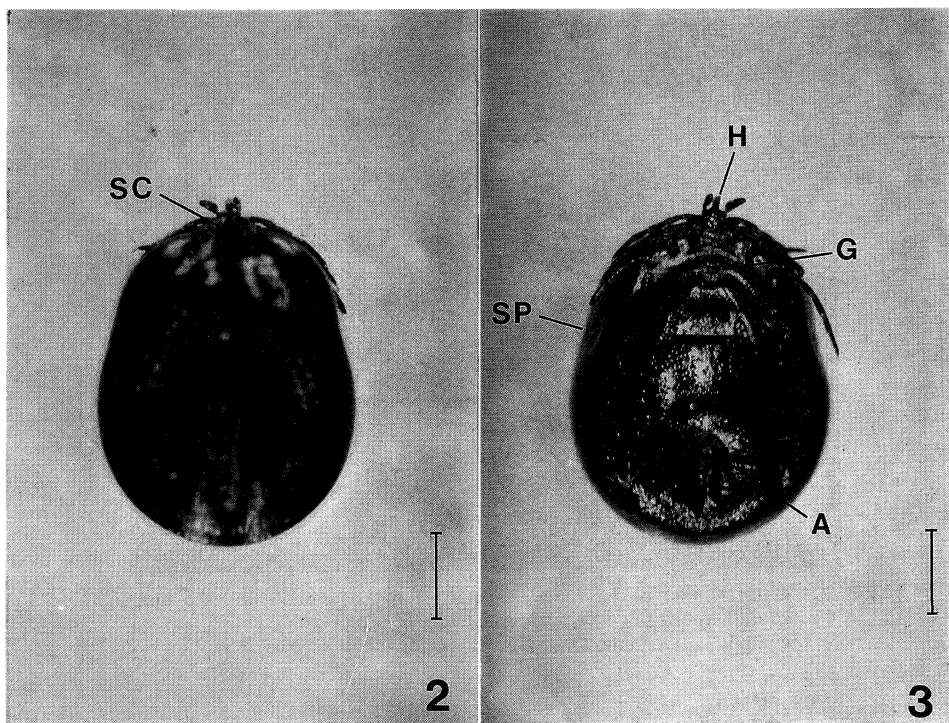


Fig. 1. Clinical photograph of the tick bite, left axilla region of the patient (Scale=5 mm).

On June 18th, the patient visited Department of Dermatology, the Kawasaki Hospital, because the wound gradually increased to the size of red bean.

The wound was then diagnosed as hard tick bite. The tick body found on skin surface of left axilla region was glossy and dark gray in color and the body had been fully swollen by bloodsucking.

The edematous erythema was found around the skin surface centered by the tick body (Fig. 1). The tick body was removed together with surrounding cutaneous tissue because of a hypostome situated on the anterior end of tick body was engulfed deeply into the host skin. The tick body became black when it was soaked in 70% alcohol. The ideosoma of the tick body measured 8.0 mm in length and 6.0 mm in maximum width, and about 4.0 mm in thickness (Figs. 2 and 3). The scutum on the back was ellipsoidal in shape, and measures 1.5 mm in length and 1.4 mm in transverse diameter (Fig. 4). The spiracular plates located on each lateral side just behind the fourth coxae (Fig. 3), measuring about 0.4 mm in length and 0.3 mm in width (Fig. 6). Coxa I has an internal spur of spinelike form and coxae II, III and IV were observed only with each external spur. Furthermore, the genital aperture on the ventro-anterior surface (Fig. 5) and anal groove on the ventro-posterior end of the body were recognized clearly. Judging from the morphological features, the



Figs. 2-3. An adult female of *Ixodes nipponensis* removed from the skin surface of left axilla region of the patient, dorsal view (2) and ventral view (3) (Scale=2 mm).

A : anus, H : hypostome, G : genital aperture, SC : scutum, SP : spiracular plate.

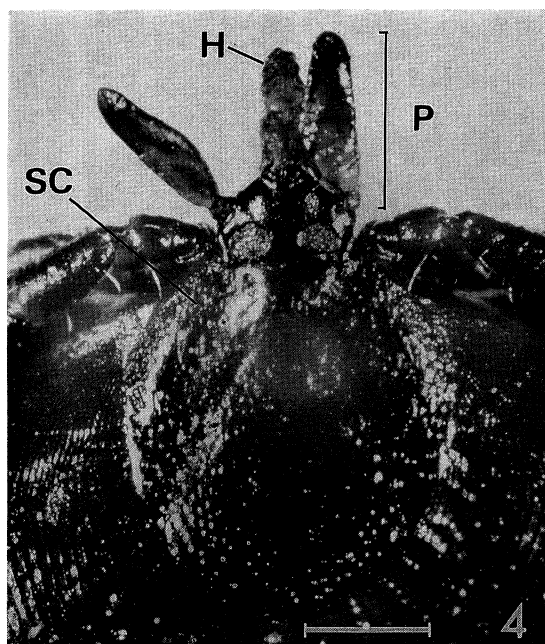


Fig. 4.  
Anterior end of *Ixodes nipponensis*, dorsal view (Scale=0.5 mm).  
H : hypostome, P : palp, SC : scutum.

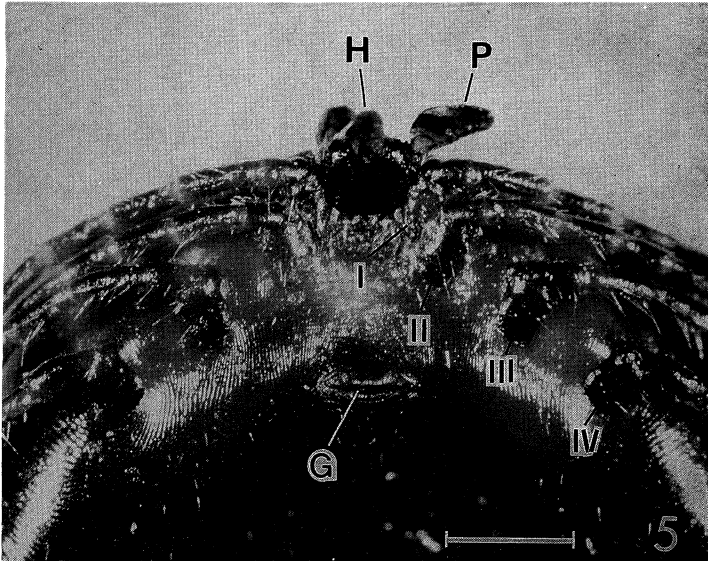


Fig. 5. Anterior end of *Ixodes nipponensis*, ventral view (Scale=0.5 mm).  
 G : genital aperture, H : hypostome, P : palp,  
 I : coxa I, II : coxa II, III : coxa III, IV : coxa IV.

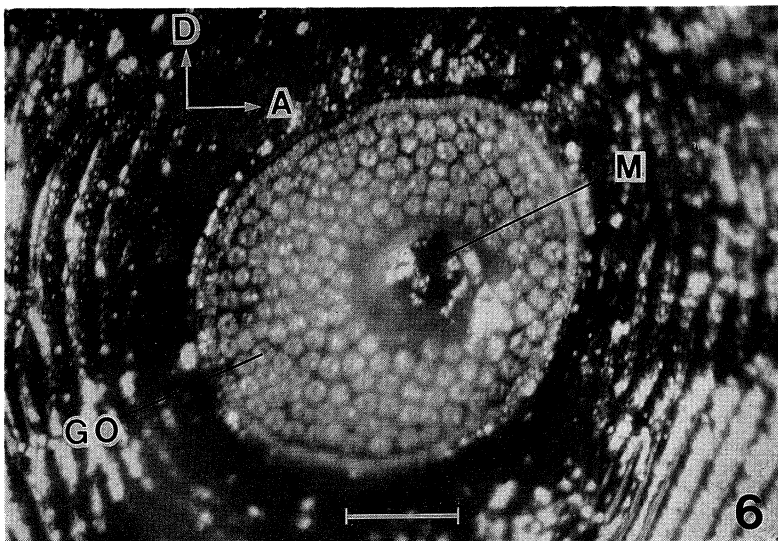


Fig. 6. A left spiracular plate (Scale=0.1 mm).  
 A : anterior, D : dorsal, GO : goblet,  
 M : macula.

present tick is identified as an adult female of *Ixodes nipponensis* Kitaoka and Saito, 1967.

The cutaneous tissue removed tick body was fixed in 10% formalin, embedded in paraffin, sectioned and stained with hematoxylin and eosin.



Fig. 7. Photomicrograph of HE-stained section of skin lesion. A few infiltration by lymphocytes, histocytes and eosinophils are clearly recognizable in the upper dermis (Scale=0.1 mm).

Histopathological study revealed that only small erosion of the epidermis was seen, and the lesion was confined to the papillary and reticular layers of dermis in which is seen several infiltrative cells consists almost entirely of lymphocytes, histocytes and a small number of eosinophils (Fig. 7).

#### DISCUSSION

Hard tick (Ixodidae) infestation has been recently known increase in Japan. About 9 species of the ixodid ticks bite sources have been recorded in Japan respectively, *Amblyomma testudinarium* Koch, 1844, *Boophilus microplus* (Cane-strini, 1888), *Haemaphysalis flava* Neumann, 1897, *H. longicorius* Neumann, 1901, *Ixodes acutitarsus* (Karsch, 1880), *I. monospinosus* Saito, 1967, *I. nipponensis* Kitaoka and Saito, 1967, *I. ovatus* Neumann, 1899 and *I. persulcatus* Schulze, 1930.

From Table 1, the *I. nipponensis* infestation are distributed throughout Japan except of Kyushu and Ryukyu Islands. Relatively high incidence of infestation occurs mainly in Aomori,<sup>2-4)</sup> Shimane,<sup>1,5)</sup> Aichi<sup>6-8)</sup> and Fukushima<sup>4,9)</sup> Prefectures. In fact, the present report is the 6th finding of the tick bites in



TABLE 1. Hard tick (*Ixodes nipponensis*) infestation reported in Japan.

Case no.	Patient age sex	Examined date	Locality (Prefecture)	Lesion sites	Author (year)
1.	69 F	June 1971	Shimane	abdomen	} Yamane <i>et al.</i> (1973)
2.	62 "	July "	"	right chest	
3.	56 M	? 1973	Fukushima	left cheek	Hashimoto (1974)
4.	4 F	May 1974	Shimane	forehead	} Yamane <i>et al.</i> (1975)
5.	74 "	July "	"	abdomen	
6.	75 "	May 1975	Aomori	neck	} Takada <i>et al.</i> (1976)
7.	51 M	June "	"	waist	
8.	72 F	May 1975	"	neck	} Sakai <i>et al.</i> (1976)
9.	58 M	June "	"	waist	
10.	23 "	Sept. 1960	Nagano	penis	Kamimura & Kondo (1977)
11.	76 F	July 1977	Gifu	left neck	Kumada <i>et al.</i> (1978)
12.	64 "	May "	Aichi	vertex	Morita <i>et al.</i> (1978)
13.	2 "	June 1978	?	occiput	Matsubara & Yamada (1979)
14.	22 M	July "	Aichi	abdomen	Shogaki <i>et al.</i> (1979)
15.	46 "	May 1955	"	right chest	Kuno & Fujino (1981)
16.	52 F	? ?	Aomori	"	Sakai & Takada (1981)
17.	56 M	June 1980	Mie	penis	Tochigi <i>et al.</i> (1981)
18.	6 F	May 1979	Aomori	head	} Yamaguchi & Takada (1981)
19.	25 "	" 1980	"	shoulder	
20.	9 M	July "	Fukushima	occiput	
21.	23 F	" "	Ishikawa	groin	} Iwashige (1982)
22.	52 M	Aug. 1981	Hokkaido	forearm	
23.	21 "	? ?	Niigata	vertex	Sekiguchi (1982)
24.	1 "	Apr. 1982	Ibaragi	right ear-lobe	Kato <i>et al.</i> (1983)
25.	66 M	May "	Kochi	abdomen	Suzuki <i>et al.</i> (1983)

\* F=female, M=male.

western Japan, subsequently occurring in Shimane<sup>1,5)</sup> and Kochi<sup>10)</sup> Prefectures.

Age distribution of the infested patients ranged from 1 to 75 years old, and the highest incidence is found in twenties, fifties, and the children under 10 years old. No appreciable difference is found between males and females.

In the past, the lesions caused by tick bite are most pronounced on skin surface of the upper body such as head,<sup>4-6,9,11-13)</sup> neck,<sup>2,14,15)</sup> chest<sup>1,3,8)</sup> and forearm.<sup>16)</sup> It is interesting that in 2 of the 25 cases shown in Table 1 the tick is found on skin surface of genital region.<sup>17,18)</sup> The invading route of the tick is unknown.

In the present case, it is certain that the tick bite of the patient occurred about 10 days prior to consultation. On the evening of the 8th of June the patient went to the bamboo bush for dumping trash wearing only underwears, and the same night the patient first noted the presence of a hard substance on his left axilla region. The patient hardly felt any pain on the affected part except the bitten site. No clinical change of the patient was noticed until the day after the tick removed.

Adults of ixodid ticks are usually bloodsucking parasites on the skin surface of domestic and wild mammals such as cattle, horse, dog, badger, hare and weasel, but they are occasionally parasitic on human skin as well. It is well known that ixodid ticks communicate various kinds of microbiological diseases

to man, mainly tick paralysis, tularemia, Rocky Mountain spotted fever, Q fever, Mediterranean fever, African tick fever, Russian spring-summer encephalitis, Colorado tick fever, epidemic hemorrhagic fever, the tick's bite and others. Although there have been no reliable record showing the tick bite related diseases in Japan, the special attention must be paid for these diseases since existence of ixodid ticks is confirmed.

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