Human dermatitis caused by the house-martin flea, *Ceratophyllus farreni chaoi* (Siphonaptera: Ceratophyllidae) in Shimane Prefecture, Japan

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**Abstract:** This report describes human dermatitis that is probably caused by the bite of the house-martin flea, *Ceratophyllus farreni chaoi*, from a nest of barn swallows. This case represents the first described case of human dermatitis caused by the bite of *C. farreni chaoi* in Japan, and the first distributional record of the flea in the Chugoku District.

Key words: human dermatitis, *Ceratophyllus farreni chaoi*, Siphonaptera, barn swallow, Shimane Prefecture, Japan

**INTRODUCTION**

The house-martin flea, *Ceratophyllus farreni chaoi* Smit and Allan, 1955, is distributed in Japan and China (Sakaguti, 1962). In Japan, the flea has so far been recorded from swallows’ nests of the following species and localities: barn swallow *Hirundo rustica* in Kyoto City (Jameson, 1953; Sakaguti, 1962; Smit and Allan, 1955); red-rumped swallow *Hirundo dauricia* in Kyoto and Takarazuka (Sakaguti, 1962; Sakaguti and Jameson, 1962); house-martin *Delichon urbica* in Hokkaido (Ono, 1963, 1964), Tohoku District (Ono, 1966; Sakaguti and Jameson, 1962), Tottori Prefecture (Nakamura, 2003; Sakaguti and Jameson, 1962; Sonobe, 1999), and Nagano Prefecture (Sakaguti and Jameson, 1962; Uchikawa, 1970).

This report describes human dermatitis that is probably caused by the bite of *C. farreni chaoi* in Shimane Prefecture, Chugoku District, Japan. This case represents the first described case of human dermatitis caused by the bite of *C. farreni chaoi* in Japan, and the first distributional record of the flea in the Chugoku District.

**CASE REPORT**

The patients were a 63-year-old husband and a 61-year-old wife. They lived alone with no other family members or pets in a one-storied home in an old residential area of Taki, Shimane Prefecture, Japan.

From April 2002, they felt itchiness with reddish eruptions on their arms and necks; they sometimes found fleas on the clothes they were wearing inside their home. A couple of barn swallows had fledged in their nest along the eaves of the ground floor, a Japanese old-style kitchen which was not used, of the house at that time. Since the place where dermatitis generated was near the nest, the patients suspected that the nest might have been the source of flea infestation. Thereupon, they placed a sheet of white paper just under the nest, and verified that less than...
Figs. 1–4. *Ceratophyllus farreni* chaoi Smit and Allan, 1955 collected from a barn swallow's nest in Taki, Shimane Prefecture. 1: Head and coxa I. 2: Male terminalia. 3: Sternum VIII of male terminalia. 4: Female terminalia. Abbreviations: lp, labial palp; p1, fixed process of clasper; p2, movable finger of clasper; sp, spermatheca; st, sternum.

Ten fleas had fallen there almost every day. Because the swallows abandoned the nest on July 4, the author removed the empty nest (255.3 mm in maximum width) on July 10, 2002.

Three hours after removing the nest, it was brought to the Hoshizaki Institute for Wildlife Protection (Hirata City), and divided into two parts. One was put on a Tullgren funnel for about 70 hours to extract organisms. Consequently, many adult and larval fleas were collected from that portion. The other portion was put in an airtight container to contain the fleas that still resided in it. As a consequence, adult fleas were collected in the container until the beginning of November.

All fleas (28 males and 55 females) that were collected from the nest were identified as *C. farreni* chaoi by the following morphological characteristics: labial palp not extending to apex of fore-coxa or beyond it (Fig. 1); fixed process of clasper rather long, narrow (Fig. 2); movable finger lozenge or rhombic in shape (Fig. 2); male sternum VIII long, parallel in side, with a slender membranous process in dorso-apical edge and long apical setae (Fig. 3); female sternum VII without sinus (Fig. 4); body of spermatheca cylindrical (Fig. 4).
DISCUSSION

Human dermatitis caused by bird fleas has been reported infrequently throughout the world (e.g. Allen and Clarkson, 1971; Lewis and Galloway, 2001). In Japan, there are few reports of dermatitis caused by bird fleas: Ceratophyllum gallinae dilatus Dudolkina, 1946 (Fukami et al., 1999; Hattori and Takahashi, 1985; Miyamoto, 1993; Miyamoto and Hashimoto, 2000; Ueno et al., 1987) and Ceratophyllum garei Rothschild, 1902 (Takahashi et al., 2000). The present study presents the first case description of the bite of C. farreni chaoi in Japan. The flea species was found in nests of the barn swallow, H. rustica, in Japan (Jameson, 1953; Sakaguti, 1962; Smit and Allan, 1955), thereby presenting the possibility of occurrence of such cases in the future. Careful attention should be paid to fleas from nests of swallows as well as to fleas from nests of sparrows to guard against these insanitary pests.

This paper presents the first record of C. farreni chaoi from the Chugoku District. Although Sakaguti (1962) and Sakaguti and Jameson (1962) have summarized flea fauna in Japan, little information has been available regarding the Chugoku District. Further faunal surveys on fleas should be made in the Chugoku District.

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