CASE REPORT

INFESTATION WITH THE CAT FLEA, *CTENOCEPHALIDES FELIS FELIS* (SIPHONAPTERA: PULICIDAE) AMONG STUDENTS IN KUALA LUMPUR, MALAYSIA

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Abstract. This paper reports six male undergraduate students living at a local university hostel who were infested with cat fleas (Siphonaptera: Pulicidae: *Ctenocephalides felis felis*) in February 2009. All of them suffered from maculopapular rashes and severe pruritus after the bites. Investigation revealed the presence of a stray cat in the hostel building; five of the students had a history of contact with the cat. Six cat fleas were collected at the hostel and identified as *C. felis felis*. Most of the students were not aware of this infestation and did not seek medical treatment.

Key words: *Ctenocephalides felis felis*, cat flea, infestation, Malaysia

INTRODUCTION

Fleas belong to the order Siphonaptera, and consist of 2,500 species and subspecies in 230 genera. Only a small number are important pests in humans. About 94% of known species bite mammals, the remainder are parasitic to birds (Lehane, 2005; Service, 2008). Fleas have a cosmopolitan distribution and are vectors of several important zoonoses, including plague and murine typhus (Perry and Fetherston, 1997).

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The cat flea, *Ctenocephalides felis* (Bouché), is the most abundance ectoparasite in cats and dogs. It is associated with allergic dermatitis (Rust, 2005) and acts as an intermediate host for the tapeworm *Dipylidium caninum* and filarid nematode *Dipetalonema reconditum* (Georgi, 1985). Studies in France found *Bartonella quintana, B. koehlerae, B. henselae, B. clarridgeiae, Rickettsia felis* and *Wolbachia pipientis* in cat fleas, indicating cat fleas may be more important vectors of human disease than previously thought (Rolain *et al*, 2003). Shaw *et al* (2004) isolated *R. felis, B. hensalae* and hemoplasma from cat fleas in the United Kingdom.

Noor Hayati *et al* (2002) reported cases of cat flea bites in a university student in

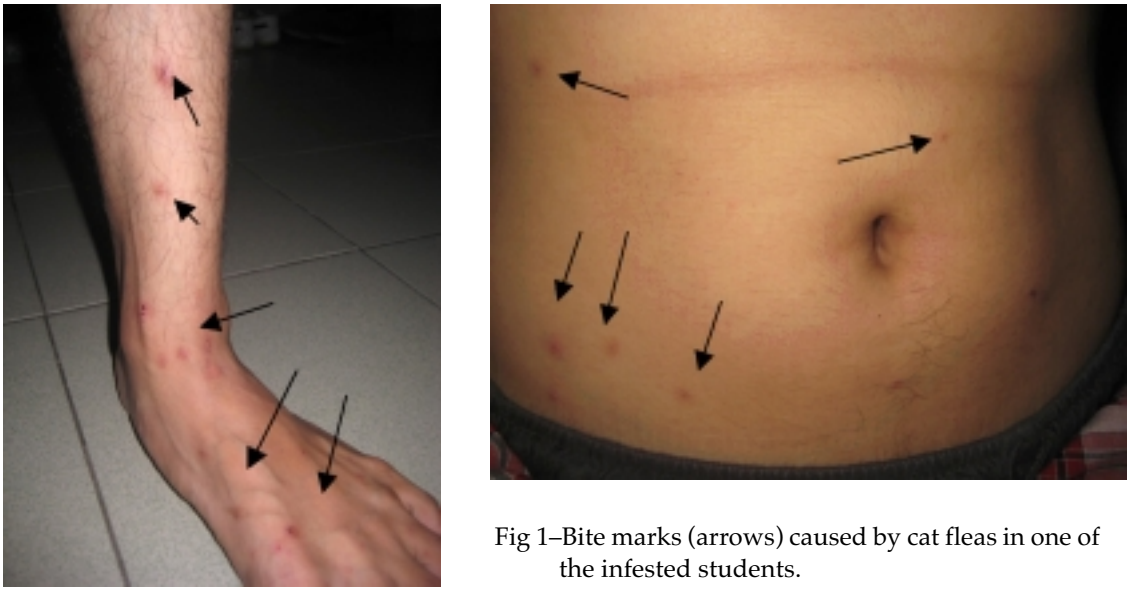

Fig 1–Bite marks (arrows) caused by cat fleas in one of the infested students.

Malaysia. Lee *et al* (2006) reported ectoparasite specimens received by the Medical Entomology Unit, Institute for Medical Research included the rat flea, *Xenopsylla cheopis*, and the cat flea, *Ctenocephalides felis*; the cat flea has been known to attack people. This paper reports the infestation and maculopapular rashes caused by bite of the cat flea, *Ctenocephalides felis felis* (Siphonaptera: Pulicidae: Archaeopsyllinae) among 6 university students.

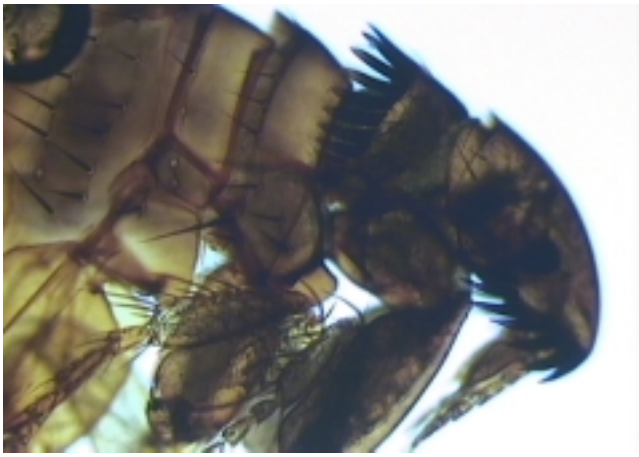

Fig 2–Cat flea, *Ctenocephalides felis felis* (Bouché) with genal and pronotal combs.

CASE REPORT

On 17 February 2009 six male university students living in a university hostel in Kuala Lumpur age 20-25 years complained of being bitten by a number of small jumping insects which resulted in itching and rashes all over the body for seven days (Fig 1). They stated a stray cat had wandered into the hostel building in early February. Five of the six students had a history of close contact with the cat. One student went for medical treatment at a clinic complaining of intense pruritus for one week. Another student self-medicated with topical anti-fungal cream and a traditional herbal ointment. He claimed it was effective in preventing flea bites. The

rest ignored the symptoms and did not seek medical treatment. One student had no contact with the infested cat but suffered from flea bites. He was a frequent visitor to his friend's room who suffered from flea bites. He believed the cat fleas were hiding in the patient's room and fed on the inhabitant.

Three of the students had seen tiny insects hopping in their room and the surrounding environment. Six fleas were collected by one student in his room (using his hands) and placed in a plastic container and sent to the first author for identification.

The insects were preserved in 70% alcohol and processed as follows. The fleas were impaled in the thorax or abdomen using a fine needle; then the specimens were cleared in 10% aqueous potassium hydroxide for 4 hours. The specimens were then rinsed several times in distilled water to remove all traces of caustic solution. The specimens were then dehydrated in increasing concentrations of alcohol, cleared in xylene and mounted in Canada Balsam on a glass slide.

Microscopic examination of the fleas identified them as the cat flea, *Ctenocephalides felisfelis* (Bouché, 1835) (Fig 2). Identification was made based on the reference of pictorial keys to common fleas, Medical Entomology Unit, Institute for Medical Research (IMR), Kuala Lumpur. The morphological features were: genal and pronotal combs present, eyes present, 8 to 9 horizontal spines on the genal comb, spines i and ii of the genal comb were nearly equal in length, and there was only one short stout bristle between the postmedian and apical long bristles on dorsal margin of the hind tibia. The frons was elongated and pointed anteriorly. Minute bristles above the antennal fossa were absent in females. Subspecies of cat fleas included *Ctenocephalides felis felis* and *Ctenocephalides felis orientis*. The later has a shorter, broader, rounded anterior frons compared to *C. felis felis*.

DISCUSSION

Fleas frequently bite people on their ankles and legs and subsequently cause dermatitis and allergies in hypersensitive individuals (Service, 2008).

The flea bite patients should be treated with local and oral antihistamines to relieve pruritus. Application of benzyl benzoate emulsion over the whole body is useful in treating lesions and stopping pruritus (Noor Hayati *et al*, 2002). Repellents, such as DEET, benzyl benzoate or permethrin-impregnated clothing, may provide personal protection against flea bites. Insecticide powders, sprays and shampoos containing insecticides (such as malathion or permethrin) can be applied to the animal's fur, beds, kennels or other places where pets sleep (Service, 2008). Insect Growth Regulators (IGRs), such as methoprene, fenoxycarb, pyriproxyfen and lufenuron, have been used to inhibit cat flea larval development (Rust, 2005).

Resistance has been reported in cat fleas, human fleas and rat fleas in various parts of the world to insecticide, such as cyclodienes, carbamates, organophosphates and pyrethroids (Rust, 2005). The cat flea is resistant to the greatest number of different groups of insecticides (Rust and Dryden, 1997). Effective insecticides in combination with IGR, mechanical and biological approaches may provide effective flea control (Dryden *et al*, 2000).

In this paper, we reported cat flea infestation among students living in a hostel. We hope this report enhances the awareness of medical officers and derma-

tologists about cat flea infestations in patients living in community-type accommodations (such as hostels) who have a history of contact with cats, especially stray cats, in their environment.

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