Matchbox sign: Look before you label!

Sir,

In a typical clinical vignette, patients of delusion of parasitosis or delusional infestation present with "evidence of parasites" collected in a container. This "matchbox sign" or "specimen sign" is useful to make the diagnosis, with a proviso that the material presented to the physician has been carefully examined and found to be normal skin pieces or extraneous material.[1]

A 26-year-old, unmarried female presented with a 20 days history of pruritus over legs, arms, and abdomen and a feeling of insects crawling all over her body. Except for a few excoriation marks, she had no other signs on the skin. She had consulted two dermatologists previously, where she was diagnosed as a case of delusion of parasitosis and put on antidepressants. Further, she took out a matchbox from her purse to show us the "insects." Grossly, they looked like tea particles in the match box. Hand lens examination made us suspicious and microscopic examination revealed reddish brown creatures with eyes, head, thorax, laterally compressed abdomen and bristles on legs. [Figure 1]. On further detailed study we identified them as cat-fleas, that is *Ctenocephalides felis*. The patient had a pet cat which ran away about a month back for 5 days and she correlated her symptoms to the cat's return. She was treated with antihistamines and calamine and advised to take her cat to a veterinary physician and contact a pest control agency for flea control at home. After 1 week, her symptoms had subsided completely.

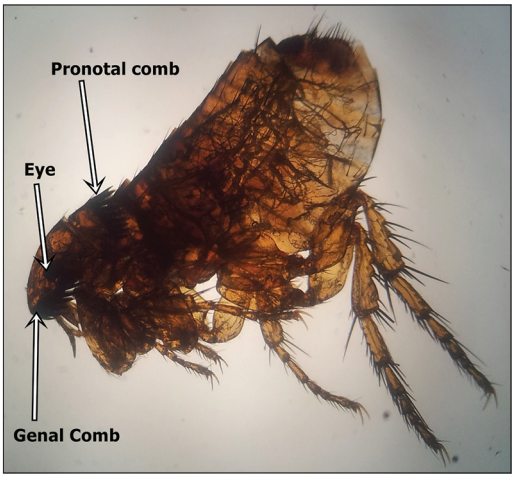

Figure 1: Cat flea (*Ctenocephalides felis*) with its characteristic pronotal and genal combs (×400)

The "matchbox sign" is typical of delusional infestation.[1] However, as our case underlines, we should not be in a hurry to label the patient delusional, unless the "evidence" presented in the matchbox has been meticulously examined. The history of pets in the house or contact with animals must be considered in all cases of idiopathic pruritus. There is a paucity of articles on fleas in Indian dermatology journals, reflecting the low awareness.

Important fleas and their identifying characteristics are summarized in Table 1.[2] Fleas are small (about 1–8 mm), hard, wingless insects of order *Siphonaptera*. These avian and mammalian ectoparasites are attracted to the host in response to carbon dioxide, vibrations and temperature. The life cycle evolves through stages of egg, larvae, pupae and the adult flea.[3,4]

On the skin, they cause papular urticaria preferentially on the lower limbs. Hypersensitivity

Table 1: Important fleas and their identifying characteristics

Main characteristics of pronotal (like a mane) and genal combs (like a moustache)			Additional differentiating characteristics
Both present			
Catflea (*Ctenocephalides felis*)	Genal comb of 5 or more spines, eyes present	Genal comb horizontal, spines pointed	Head sloping, first and second genal spine of equal length, six hair-bearing notches on dorsal hind tibia
Dog flea (*Ctenocephalides canis*)	Genal comb of 5 or more spines, eyes present	Genal comb horizontal, spines pointed	Head round, first genal spine shorter than second spine, eight hair-bearing notches on dorsal hind tibia
Rabbit flea (*Cediopsylla simplex*)	Genal comb of 5 or more spines, eyes present	Genal comb vertical, spines blunt	
Mouse flea (*Leptopsylla segnis*)	Genal comb of 4 spines, eyes absent		
Pronotal comb present, genal comb absent	Identified on the basis of other characteristics like length of labial palp, number and location of plantar bristles		
Ground squirrel flea, northern rat flea, squirrel flea etc.			
Both absent			
Human flea (*Pulex irritans*)	Round frons, thorax normal (three thoracic tergites together longer than the first abdominal tergite)	Pleural rod absent, ocular bristle beneath eye; single pair of hairs behind the antennae	
Oriental rat flea (*Xenopsylla cheopis)*	Round frons, thorax normal (three thoracic tergites together longer than the first abdominal tergite)	Pleural rod present, ocular bristle in front of eye, several pairs of hairs behind the antennae, dark-colored spermatheca in females	
Stick-tight flea (*Echidnophaga gallinacea*)	Angular frons, thorax contracted (three thoracic tergites together shorter than the first abdominal tergite)		

to allergens in flea saliva may also produce nodular or bullous lesions. Fleas are important vectors of plague, endemic typhus, tularemia, brucellosis, melioidosis and erysipeloid, while they may also serve as intermediate hosts for tapeworms, including *Hymenolepis* and *Dipylidium*.[2,3] Catflea is a vector for *Rickettsia felis* which causes flea-borne spotted fever and endemic typhus.[3] Endemic murine typhus is caused by *Rickettsia typhi* spread by the oriental rat flea (*Xenopsylla cheopis*) and also by catflea in certain geographical locations. Epidemic typhus is caused by *Rickettsia prowazekii* and is typically louse borne. Eastern flying squirrels (*Glaucomys volans*) and their lice and fleas (*Diamanus montanus*) maintain the zoonotic cycle of *R. prowazekii* and these fleas can transmit the infection sporadically to humans.[2-4]

Another *Siphonaptera* species important in dermatology practice is *Tunga penetrans*.[5] It is typically seen in the coastal areas and beaches of Caribbean, equatorial Africa, Central and South America, India and Pakistan. At the site of penetration of the gravid female, a pea - sized, necrotic, itchy and later painful nodule develops that looks like a white pustule with a central black depression. This is classically adjacent to a toenail, though other parts of legs and feet may also be affected.

The management of flea infestations begins with a careful history regarding pets or occupational/accidental exposure to animals. Strong suspicion and close examination of the available material from patient or pet is necessary. The identification of flea species is possible on the basis of information available at the website of Center for Disease Control.[2] However, help of an expert entomologist would be invaluable. Similarly, referral to an experienced veterinary physician would be required. Sanitation of the pets and home is important to reduce the infestation of the pets. Lufenuron (a chitin inhibitor) in oral or injectable forms and fipronil as a topical agent are useful for flea infestation of pets. Other agents used include boric acid and growth regulators such as pyriproxyfen and insecticides.[4] Surgical removal or curettage along with tetanus prophylaxis and topical antibiotics is recommended for tungiasis.[5] For papular urticaria, treatment with camphor and menthol preparations,

topical corticosteroids and oral antihistamines will suffice.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Premanshu Bhushan, Sarvesh S. Thatte, Kashish Kalra

Departments of Dermatology, Venereology and Leprosy, Dr. P. N. Behl Skin Institute and School of Dermatology, New Delhi, India

Address for correspondence: Dr. Sarvesh S. Thatte, Departments of Dermatology, Venereology and Leprosy, Dr. P. N. Behl Skin Institute and School of Dermatology, New Delhi - 110 048, India.
E-mail: sarvesh.thatte@gmail.com

REFERENCES

1. Freudenmann RW, Lepping P, Huber M, Dieckmann S, Bauer-Dubau K, Ignatius R, *et al.* Delusional infestation and the specimen sign: A European multicentre study in 148 consecutive cases. Br J Dermatol 2012;167:247-51.
2. Pratt HD. Fleas: Pictorial keys to some common species in the united states. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/nceh/ehs/Docs/Pictorial_Keys/Fleas.pdf [Last accessed on 2014 Dec 31].
3. Bitam I, Dittmar K, Parola P, Whiting MF, Raoult D. Fleas and flea-borne diseases. Int J Infect Dis 2010;14:e667-76.
4. Siak M, Burrows M. Flea control in cats: New concepts and the current armoury. J Feline Med Surg 2013;15:31-40.
5. Feldmeier H, Heukelbach J, Ugbomoiko US, Sentongo E, Mbabazi P, von Samson-Himmelstjerna G, *et al.* Tungiasis – A neglected disease with many challenges for global public health. PLoS Negl Trop Dis 2014;8:e3133.

Access this article online	
Quick Response Code:	Website: www.ijdvl.com
	DOI: 10.4103/0378-6323.162321

How to cite this article: Bhushan P, Thatte SS, Kalra K. Matchbox sign: Look before you label!. Indian J Dermatol Venereol Leprol 2015;81:507-9.