

## Research Note

### The dog louse *Heterodoxus spiniger* from stray cats in Penang, Malaysia

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Received 20 August 2011; received in revised form 29 December 2011; accepted 3 January 2012

**Abstract.** Stray cats collected from Georgetown, Penang from 2008 to 2010 were screened for ectoparasites via fine-tooth combing. Two cats from a total 102 examined were infested with the dog louse, *Heterodoxus spiniger*. Both cats, a juvenile male and female were found in close contact with each other prior to capture. The number of lice ranged from 5 and 14 in the male and female cat respectively. Other ectoparasites recovered included the common cat flea, *Ctenocephalides felis*, one louse species *Felicola subrostratus*, one tick species *Haemaphysalis bispinosa* and one mite species of Lirophoridae. The present study reports for the first time the finding of *H. spiniger* on cats from peninsular Malaysia.

Ectoparasitic infestation is a common problem in cats but the transmission of parasite species from canid pets such as the dog has rarely been reported. The dog louse, *Heterodoxus spiniger* is host specific and is capable of feeding on blood from dogs and occasionally from other members of the family Canidae from all regions worldwide except for, Antarctica and Europe (Amin & Madbouly, 1973; Price & Graham, 1997). The dog louse is also an intermediate host for several helminth species, including the tapeworm, *Dipylidium caninum*, and the filarid nematode, *Dipetalonema reconditum* (Price & Graham, 1997).

*Heterodoxus spiniger* is an obligate ectoparasite, and hence is unable to live outside of the host's body for a long period of time. Multiple species infestations with ectoparasites are common in both cats and dogs especially in developing countries and

amongst poor populations due to the financial implications and hence an inability to maintain better animal care (Jittapalapong *et al.*, 2008).

The occurrence of *H. spiniger* on a feline host was first reported by Colless (1959) from a litter of kittens in Singapore indicates that any close relationship between cats and dogs can influence parasite transmission (Jittapalapong *et al.*, 2008). The present study reports for the first time the finding of *H. spiniger* on cats from peninsular Malaysia.

A total of 102 stray cats were collected from food courts and markets around Georgetown, Penang from March 2008 to August 2010. Stray cats were screened with a fine tooth-comb for ectoparasites and all samples were collected, counted, fixed in 70% ethanol and examined microscopically at 40x magnification. All specimens were cleared in polyvinyl lactophenol and

temporarily mounted for identification using the morphological characteristics described by Price & Graham (1997).

Two of 102 cats examined, a juvenile male and female, were found to be infested with *H. spiniger*. Both cats were found to be in close contact prior to capture. Up to 5 and 14 lice were recovered in each male and female cat respectively with twice as many female lice being recovered than male lice.

The head of *H. spiniger* is subtriangular, with an amber to black colour (Fig. 1a). The post palpal processes, characteristic of the family Boopiidae are present on the ventral side of the head immediately behind the maxillary palps (Fig. 1b). The sexes can be easily separated. In the male, the end of the abdomen is rounded (Fig. 1c) and in the female the end of the abdomen is lobed (Fig. 1d). The presence of prominent male genitalia incorporating the chitinised copulatory appendages further distinguishes the sexes.

Other ectoparasites recovered from both cats included the common cat flea *Ctenocephalides felis*, one louse species *Felicola subrostratus*, one tick species *Haemaphysalis bispinosa* and one mite species of Listrophoridae. Infestations with lice, ticks, mites and fleas did not appear to adversely affect the health of the stray cats in the present investigation.

*Heterodoxus spiniger* is generally host specific to dogs. Colless (1959) previously reported a case of *H. spiniger* infesting a litter of kittens in Singapore and concluded that cross transmission of *H. spiniger* took place due to close contact between dogs and cats. Although the kittens were infested with up to 50 lice of both sexes and at various stages of growth, it is unlikely that infestation of cats with these lice would be commonplace and clearly, the second time the lice reported after more than 5 decades attest to it. Close contact between dogs and cats in the environment or in the laboratory animal house can allow cross-infection to take place between the canine and feline species. The poor physical condition of the kittens, together with inadequate maintenance, may also have contributed to the infestation.

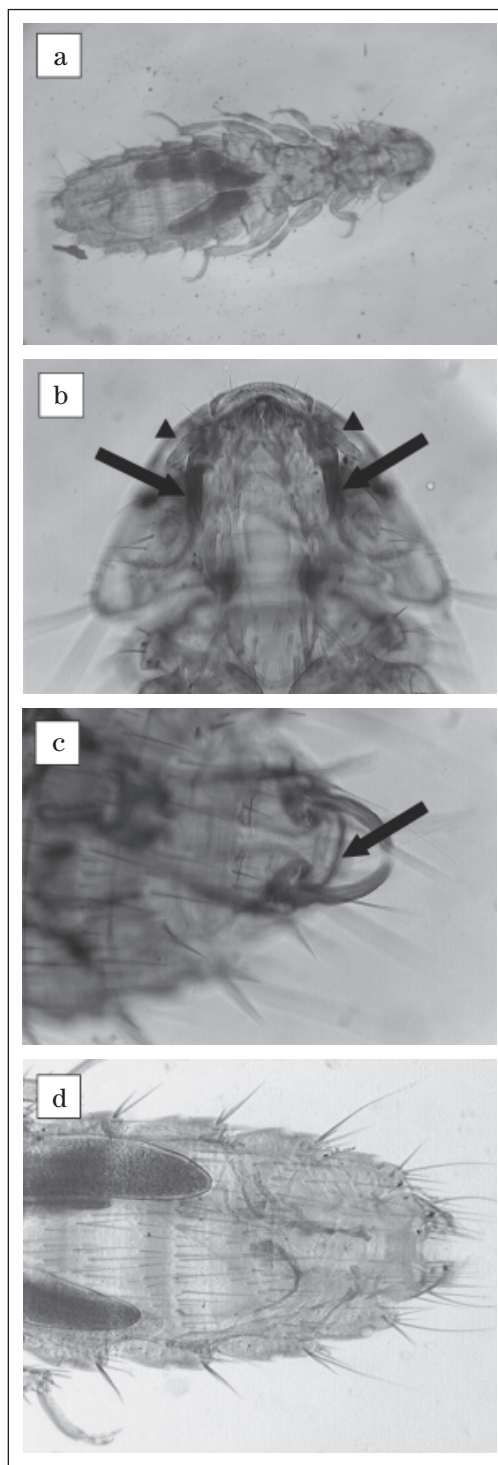


Figure 1. a) *Heterodoxus spiniger* b) ventral view sub triangular head with two post palpal processes (arrows) behind the maxillary palps (arrowheads) c) End of male abdomen with male genitalia (arrow) d) End of female abdomen

*Heterodoxus spiniger* is also the intermediate host for the tapeworm, *Dipylidium caninum*. This tapeworm infects both domestic dogs and humans by accidental ingestion of lice after petting their dogs (Roberts & Janovy, 2000). Human infected with *D. caninum* present digestive disorders such as diarrhoea, colic, irritability, an erratic appetite and insomnia. *Heterodoxus spiniger* also acts as the intermediate host for the filarid nematode *D. reconditum*, which can parasitize domestic dogs (Price & Graham, 1997). This nematode is a non-pathogenic nematode and can be found in either subcutaneous tissues or the peripheral blood of dogs (Torres & Figueredo, 2007).

In conclusion, the public population and pet owners must therefore be aware of the potential transmission of ectoparasites from dogs to cats and vice versa and also the potential transmission of zoonotic parasites.

*Acknowledgements.* The authors wish to thank The Society for Prevention of Cruelty to Animals (SPCA) Penang and School of Biological Sciences, University of Science Malaysia for their assistance. This study was funded by a research grant (PS174/2009A) from University of Malaya, Kuala Lumpur, Malaysia.

## REFERENCES

- Amin, O. & Madbouly, M. (1973). Distribution and seasonal dynamics of a tick, a louse fly, and a louse infesting dogs in the Nile valley and delta of Egypt. *Journal of Medical Entomology* **10**: 295-298.
- Colless, D. (1959). *Heterodoxus spiniger* (Mallophaga: Boopidae) from cats in Singapore. *Journal of Parasitology* **45**: 248.
- Jittapalapong, S., Sangvaranond, A., Inpankaew, T., Pinyopanuwat, N., Chimnoi, W., Kengradomkij, C. & Wongnakphet, S. (2008). Ectoparasites of stray cats in Bangkok metropolitan areas, Thailand. *Kasetsart Journal (Natural Science)* **42**: 71-75.
- Price, M. & Graham, O. (1997). Chewing and Sucking Lice as Parasites of Mammals and Birds. *USDA Agricultural Research Service Technical Bulletin* **1849**: 7-11.
- Roberts, L. & Janovy, J. Jr. (2000). *Foundations of Parasitology, Sixth Edition*. Boston: McGraw-Hill Inc.
- Torres, F.D. & Figueredo, L.A. (2007). *Heterodoxus spiniger* (Enderlein, 1909) on domestic dogs (*Canis familiaris*, L. 1758) from the city of Recife, Pernambuco State, Brazil. *Brazilian Journal of Veterinary Research and Animal Science, Sao Paulo* **44**(2): 77-80.