



Original Research

Occurrence of *Ctenocephalides orientis* (Jordan 1925 Siphonaptera: Pulicidae) in Goats and Dogs from Mhow, Madhya Pradesh

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Abstract

Flea infestation is the common ectoparasitic infestation causing dermatitis in domestic and companion animals. Heavy infestation in young animals is responsible for severe anaemia and sometimes may result in to death. In the present study, fleas were collected from the body of goats and dogs in 70% alcohol from Mhow, Madhya Pradesh. For detailed morphological examination, collected fleas were initially dehydrated by using ascending grades of alcohol (30, 50, 70, 90% and absolute alcohol) and were kept for 20 minutes in each grade of alcohol. For clearing, they were transferred to a cavity block containing carboxylol for 20 minutes. After clearing fleas were mounted on a glass slide using the phenol balsam. On detailed microscopic examination, fleas were identified as *Ctenocephalides orientis* which were collected from goats and dogs, indicating goat and dogs are acting as a host for *C. orientis* which appears to be a first report from Madhya Pradesh.

Key words: *Ctenocephalides orientis*, Dog, Goat, India, Mhow, Madhya Pradesh, Oriental Cat Flea

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Introduction

Being a vector for several pathogens including zoonotic pathogens (*Rickettsia felis* and *Bartonella*, (Lawrence, 2014), fleas have got great economic significance. Both their sexes are obligate hematophagous ectoparasites of mammals and birds. About 2574 species belonging to 16 families and 238 genera have been described so far and *Ctenocephalides* is known to cause dermatitis, severe anaemia and sometimes death in young animals in tropical and subtropical countries like India. But as per Urquhart (1996) small ruminants like sheep and goats do not have their own species of the flea. The cat flea, *Ctenocephalides felis*



has a wide host range including small ruminants and formerly consisted of four subspecies, viz. *C. f. felis*, *C. f. orientis*, *C. f. strongylus* and *C. f. damarensis* (Dryden and Rust, 1994). Although *C. orientis* was earlier considered as a subspecies of *C. felis*, a revision of morphology of male reproductive organ, the phallosome and molecular studies proved *C. orientis* (Oriental cat flea) as a separate species (Lawrence *et al.*, 2014). Among different fleas infesting domestic animals, according to Taylor *et al.* (2007), *C. orientis* is the widely distributed flea species in India on ruminants and less commonly on dogs and cats. But the reports are not available from Madhya Pradesh regarding the occurrence of this flea in any species of the animal; hence the present communication reports the occurrence of *C. orientis* in goats and dogs from this region.

Materials and Methods

Fleas were collected in 70% alcohol from goats and dogs with the help of fine-toothed flea comb. For the detailed morphological examination, collected fleas were boiled in 10% potassium hydroxide and were dehydrated by using ascending grades of alcohol (30, 50, 70, 90% and absolute alcohol) by keeping them for 20 minutes in each grade of alcohol. For clearing, they were transferred to a cavity block containing carboxylol for 20 minutes. After clearing fleas were mounted on a glass slide using the phenol balsam. Fleas were identified based on the morphology and morphometry described by Taylor *et al.* (2007) and Ashwini *et al.* (2017a).

Result and Discussion

Fleas collected from goat and dogs were identified as *C. orientis* based on the morphological characters, like the adult parasite showed both genal and pronotal combs, the first genal spine was shorter than rest of the spines, length of the head was nearly double than its height, frons were elongate and broadly rounded at anterior end (Fig. 1).



Fig. 1. Micro-photograph showing genal (a) and pronotal comb (b) of *C. orientis* (100x)

Two bristles were evident on metepisternum or lateral metanotal area (LMA) (Fig. 2). Dorsal margin of hind tibia evinced seven notches, 3rd and 6th notches were having single bristle and 7th was having 3 bristles

while rest of the notches had double bristles with 2-2-1-2-2-1-3 as a chaetotaxy formula of metatibial bristles (Fig. 3).



Fig. 2: Micro-photograph showing two bristles on lateral metanotal area (LMA) of *C. orientis* (100x)

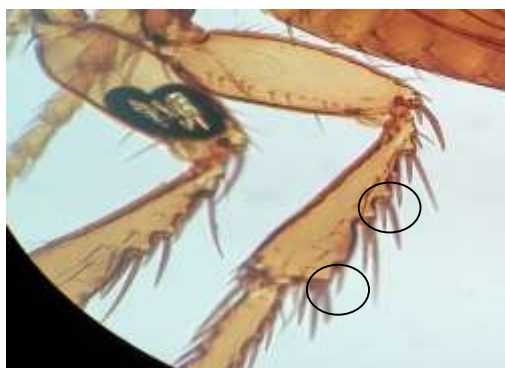


Fig. 3: Micro-photograph showing seven notches with 3rd and 6th notches having single and stout bristles of *C. orientis* (100x)

Identification of Male and Female

Female

Size of the females was (3.00 x 1.25 mm); row of 1 - 12 short spiniform bristles behind the antennal groove (Fig. 4); dorsal and ventral surfaces of the abdomen were convex; C shaped spermatheca was evident on the abdominal segment (Fig. 5).



Fig. 4. Micro-photograph showing row of 1 - 12 short spiniform bristles behind antennal groove in female *C. orientis* (100x)



Fig. 5. Micro-photograph showing convex dorsal and ventral surfaces of abdomen and C shaped spermatheca in female *C. orientis* (100x)

Male

Size of the males was smaller (1.9 x 1 mm) than the females; dorsal surface was not convex and was more or less flat whereas ventral surface was greatly curved; movable process of clasper; widened manubrium of the clasper at the apex; penis plate and spring of penis were evident (Fig. 6).

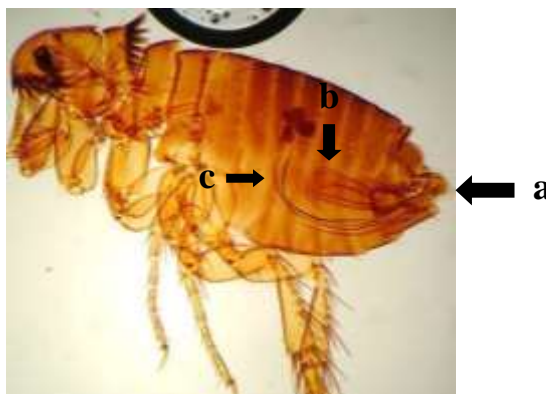


Fig. 6. Micro-photograph showing flat dorsal surface and convex ventral surface in male *C. orientis*; a. movable process of clasper; b. penis plate; c. spring of penis (100x)

Morphological and morphometrical characters of *C. orientis* recorded in the present study were also reported by Taylor *et al.* (2007), Bitam *et al.* (2010), Dobler and Pfeffer (2011) and Ashwini *et al.* (2017a). The current study witnessed goat as the host for this flea which is in agreement with the findings of Joseph (1981) who has recorded *C. orientis* in sheep and goats from Tamil Nadu; Jeya Thilakan and Karunanithi (2001) who reported this infection in sheep and goats from Tamil Nadu; Muraleedharan and Sahadev (2012) by recording the flea in goats from Karnataka; Ashwini *et al.* (2017b) by observing the parasites in sheep and goats from Karnataka. The present study also experienced dog as a host for this flea which is in consonance with the findings of Joseph (1981) who recorded *C. orientis* in dogs from Tamil Nadu; Changbunjong *et al.* (2009) and Kernif *et al.* (2012) observed *C. orientis* as the most predominant flea of dogs from Thailand and Malaysia, respectively; Hii *et al.* (2015) reported the flea in dogs from Mumbai

(Maharashtra), Delhi and Rajasthan. The present investigation witnessed *C. orientis* as a dominant flea in Mhow, Madhya Pradesh which was also experienced by Joseph (1981), Muraleedharan and Sahadev (2012) and Ashwini *et al.* (2017b) and they opined *C. orientis* as a predominant flea in India. Further, Lawrence *et al.* (2014) and Changbunjong *et al.* (2009) observed *C. orientis* as a most prevalent flea in dogs in Asian countries like India, Malaysia and Thailand.

Conclusion

The *C. orientis* recorded in goats and dogs from Mhow appears to be a first report from Madhya Pradesh, further, other species of animals needs to be screened for this flea from this region.

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