A Case Of Canine Pediculosis Caused By Heterodoxus Spiniger In A 6 Week Old Male Mongrel Breed Of Dog.

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Abstract: A 6 week old male brown Mongrel breed of dog with history of ectoparasites infestation from purchase was presented with clinical manifestation of generalized dry crusty lesions, pruritus, and rough hair coat. Microscopic examination and identification of submitted ectoparasites using Celestron^R LCD digital microscope indicated Canine pediculosis caused by Heterodoxus spiniger. The patient was treated topically using Veterinary insecticides dusting powder containing Carbaryl at 10 days intervals for four consecutive weeks

Keywords: Pediculosis, Heterodoxus spiniger, Mongrel, Canine

I. Introduction

Ectoparasites, also known as external parasites consist of a wide variety of parasitic arthropods which include the acarines (i.e. mites and ticks) and the insects (lice, fleas and flies). They are organisms that live on the surface of bigger animals where they obtain food, shelter and other essential needs to survive (Rechav & Nutall, 2000).

Effects of ectoparasites include anaemia due to their blood sucking activities, production of cutaneous lesions which can lead to secondary infections, induction of immunopathological responses (such as flea allergic dermatitis, seasonal equine dermatitis etc.), transmission of pathogenic organisms – (e.g. Canine babesiosis, Canine erhlichiosis, Blue tongue of sheep, African horse sickness etc.) and also serving as sources of zonootic infection for man (ESCCAP 2015).

Dogs are infested with several species of ectoparasites (ranging from lice, fleas, ticks, mites and adult flies of some species as well as larvae of certain species) that can produce a wide range of pathogenic effects and ectoparasites are a common cause of cutaneous lesions in domestic animals (Curtis, 2012).

Lice are wingless insects and are flattened dorso-ventrally. They are highly host specific and spend their entire life cycle on the host (Emerson and Price, 1985). Lice infesting dogs belong to either sucking or biting lice and the effects produced depend on the type of lice. Heavy lice infestation is called Pediculosis and the two main species of lice causing pediculosis in dogs are *Trichodectes canis* (a biting louse) and *Linognathus setosus* (a biting louse). However, another species of biting louse that parasitizes dogs is *Heterodoxus spiniger* (Price and Graham, 1997).

Heavy infestation with lice causes irritation, inflammation, and pruritis as a result of crawling on the skin and due to their feeding activity (Sosna and Medleau 1992a). In addition to serving as disease vectors, lice are capable of provoking a number of direct host injuries, Hopla (1982). Hopla *et al.*, (1994) stated that lice can cause anaemia, detrimental immune reactions (hypersensitivity, anaphylaxis, etc.), irritability, dermatitis, skin necrosis, weight loss, secondary infections, localized haemorrhages, obstruction of orifices (such as ear canal), inoculation of toxins, and exsanguination.

Heterodoxus spiniger is one of numerous ectoparasites of dogs that serve as an intermediate host of endoparasites of canines harbouring the larval forms (cysticercoids) of a cestode, Dipylidium caninum (Kettle, 1984). The louse ingests the eggs of the cestode which hatch and afterward develop to the cysticercoids in the haemocoel of the louse. The louse serves as the intermediate host and also as the vector. The life cycle is completed when a dog swallows an infected louse and the contained cysticercoid develops into an adult cestode (Voge 1973).

Transmission of lice between hosts is by direct contact. Pediculosis is characterized by rough hair coat, itching/scratching, presence of nits on the hair or adult lice within hair coats, crust formation and hair loss. Biting lice are active ectoparasites that can cause severe itching with secondary bacterial infection (Etinger and Feldman, 2005; Wall, 1997).

Diagnosis is achieved by physical observation of adult lice or nits in the hair of dogs of through microscopic examination of the adult lice of nits (William *et al.*, 1978). Lice show little resistance to treatment and are easily killed with most insecticides, including lime-sulfur, carbamates, pyrethrines, amitraz and pyrethroids as spray, dip, shampoo or powder. Effective treatment results in prompt improvement of clinical

DOI: 10.9790/2380-09217276 www.iosrjournals.org 72 | Page

signs and re-treatment at interval of 10-14 days interval for 4 weeks is required to control further re-infestation due to the fact that these treatments do not eliminate nits.

Despite the fact that a lot of works have been done on other ectoparasites (ticks, fleas and mites) infestation in dogs, there is paucity of information on pediculosis in dogs in Nigeria and this will be the first case report on canine pediculosis due to *Heterodoxus spiniger* in Nigeria.

II. Case Report

- **2.1 Signalment and history:** A 6 week old male Mongrel breed of dog weighing 3 kg was presented to the Veterinary Teaching Hospital (VTH) University of Agriculture Makurdi on the 11th of December, 2015, the owner requested for a routine check-up stating that, he recently acquired the puppy and had noticed some insects on the body since the time of purchase. Further history also revealed that the dog has been neither vaccinated nor de-wormed.
- **2.2 Physical and clinical examination:** Clinical signs observed include rough hair coat, dry muzzle, generalized dry crusty lesions on the body and presence of adult lice and nits on the dog's body, the puppy was also noticed to be scratching and biting itself leading to self inflicting injuries. Other findings revealed a rectal temperature of 38.5°C while the heart, pulse and the respiratory rates were 176 beats/minute, 168 beats/minute and 64 cycles/minute respectively.



Figure 1: A 6-week old puppy with heavy lice infestation

- **2.3 Diagnostic plan**: Collection and submission of faecal and ectoparasite samples for faecal examination and ectoparasites identification.
- **2.4 Differential diagnoses:** Pediculosis, flea infestation/flea allergic dermatitis, sarcoptic mange and helminthosis were considered as our differentials. Pediculosis and flea infestation were considered because of the wingless insects and their nits on the body as well as pruritus. Sarcoptic mange was considered because of dry crusty lesions and pruritus while helminthosis was considered because of rough hair coat or unhealthy appearance and the history that the puppy had not been de-wormed.
- **2.5 Tentative diagnosis:** We decided on Pediculosis and helminthosis as our tentative diagnosis. We out ruled sarcoptic mange because of absence of alopecia while flea infestation was also out ruled because the ectoparasites on the puppy were seen crawling rather than jumping as would be noticed with fleas and they appeared to be dorso-ventrally flattened as opposed the bilaterally compressed shape of fleas.
- **2.6 Confirmatory diagnosis:** This was based on microscopic identification of ectoparasite as *Heterodoxus spiniger* (a biting louse). Helminthosis was further ruled out due to negative laboratory results following coprological examination of the faecal sample.
- **2.7 Treatment:** Topical application of a Veterinary insecticide dusting powder preparation containing Carbaryl, applied once per week for four consecutive weeks.

III. Discussion

There is paucity of information on canine pediculosis in Nigeria as earlier mentioned above. In this case report, parasitological examination and identification of the submitted ectoparasites, revealed *Heterodoxus spiniger* with characteristic features. The clinical presentation (generalized dry crusty lesions, rough hair coat, pruritus and presence of adult lice) was in agreement with previous work by Filipe and Luciana (2005) and

Linardi (2001) reported that *Heterodoxus spiniger* is a common louse infesting dogs in the tropical and subtropical regions. The findings in this case report are also consistent with several other works carried out in various cities of Brazil (Rodriguez *et al.*, 2001; Lustosa *et al.*, 1973; Dantas *et al.*, 2003a; Dantas *et al.*, 2003b).

Characteristic features peculiar to *Heterodoxus spiniger* as discussed by Filipe and Luciana (2005) were also observed from the lice submitted and these include: sub-triangular head (Figure 2a), two post-palpal processes growing immediately behind the maxillary palps when viewed ventrally (Figure 2b, red arrows) as well as the relatively short antennae (Figure 2b, black arrows).

In addition, our findings are also in line with previous study carried out by Norhidayu *et al.*, (2012) who reported that the sexes can be easily separated. In the male (Figure 3), the end of the abdomen is rounded while in the female (Figure 4) the end of the abdomen is lobed. Figure 5 in this report revealed the presence of two claws on the legs of *Heterodoxus spiniger* supporting another previous study by Kettle (1984), who reported that Boopiidae (genus *Heterodoxus* species) have two claws at the end of the tarsus whereas the Trichodectidae (*Trichodectes* species) which also infest domestic animals-have only one claw.



Figure 2: Heads of *Heterodoxus spiniger* (a) Subtriangular in shape and (b) Two post-palpal processes (red arrows) characteristic of slightly rounded anteri *Heterodoxus spiniger* below the relatively short antennae (black arrows) (**Ventral view**)

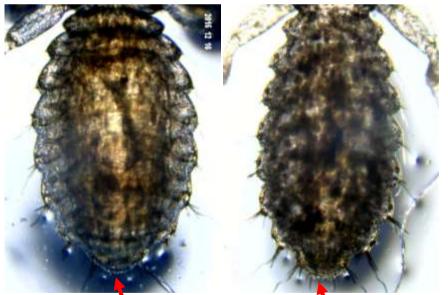


Figure 3: Male *Heterodoxus spiniger* with rounded end of abdomen (red arrows)



Figure 4: Female *Heterodoxus spiniger* with lobed end of abdomen (red arrows)



Figure 5: Hind limbs of Heterodoxus spiniger showing characteristic two claws

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A Case Of Canine Pediculosis Caused By Heterodoxus Spiniger In A 6 Week Old Male Mong...

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DOI: 10.9790/2380-09217276 www.iosrjournals.org 76 | Page