



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; SP-10(9): 719-721  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 22-07-2021  
Accepted: 24-08-2021

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## Concurrent infections of *Subulura brumpti* and pasteurella in Japanese quails (*Coturnix coturnix japonica*) and their management

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### Abstract

Six numbers of twenty-eight weeks old Japanese quails were brought for post mortem examination with a history of lethargy, sinusitis, enteritis production loss and moderate persistent mortality from a flock of 500 birds. A detailed necropsy was conducted, gross lesions were recorded, worms from caecum were collected in normal saline and intestinal contents were collected for microscopic examination. Tissue impression smears from heart and liver were taken for Leishman's and Gram's staining for presence of bacteria. Morphological characters of the worm confirmed that it is *Subulura brumpti*. Impression smears confirmed the bipolar Gram negative organism pasteurella. The flock health was improved after the treatment.

**Keywords:** Japanese quails, pasteurella, *Subulura brumpti*, treatment

### Introduction

In India, Japanese quails (*Coturnix japonica*) have been gained importance as commercial poultry in recent years and have become the third largest commercially reared avian species in number next to chicken and ducks. Being a hardy bird, it can adapt very well to Indian climatic conditions and is resistant to most of the poultry disease conditions (Lakshotra and Khanna, 2020) <sup>[1]</sup>. According to Ponnudurai *et al.*, (2015) <sup>[2]</sup> *Subulura brumpti* is a non-pathogenic caecal worm of quails. But severe pathogenic effects of *Subulura brumpti* were reported in Japanese quails by authors Nagarajan *et al.*, (2012) <sup>[3]</sup> and Arulmozhi *et al.*, (2018) <sup>[4]</sup>. Mortality due to acute pasteurellosis in quails has been reported previously by Prasad *et al.*, (2018) <sup>[5]</sup>. Pathological observations and treatment of concurrent infection of *Subulura brumpti* and pasteurella has not been reported from Kerala so far.

### Materials and Methods

Carcasses of six numbers (n=6) 28 weeks old Japanese quails were brought for post mortem examination from a flock of 500 birds with a history of lethargy, sinusitis, enteritis, production loss and moderate persistent mortality. A detailed necropsy was conducted, gross lesions were recorded, representative nematode samples were collected in normal saline and intestinal samples were collected for microscopic examination. Tissue impression smears from heart and liver were taken for Leishman's and Gram's staining for presence of bacteria.

### Results and Discussion

Detailed post mortem examination revealed sinusitis, pulmonary congestion, hepatitis and severe catarrhal enteritis. Caecum was distended catarrhal inflammatory contents and hundreds of worms. The worms were visible through transparent caecum. Impression smears from heart stained with Leishman's stain and Gram staining revealed the presence of bipolar Gram negative organisms. Worms collected from the caecum measured 10-12 mm in length. Morphology of worms was studied under microscope. Anterior region showed buccal capsule oesophagus showed a posterior bulb which is separated from rest of the oesophagus by a well marked constriction (Fig 1). Posterior extremity of female worms was pointed with a vulvar opening (Fig 2). In male worm posterior end was curved ventrally with a precloacal ventral sucker and two long spicules (Fig 3). Intestinal contents of the birds revealed the presence of spherical thin shelled embryonated eggs of *Subulura brumpti* (Fig 4). Based on morphological studies the worms were identified as *Subulura brumpti* which is in accordance with the morphological description of *Subulura brumpti* by Asour *et al.* (2013) <sup>[6]</sup>.

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**Fig 1:** Posterior bulb separated from rest of the oesophagus by a well marked constriction



**Fig 4:** Spherical thin shelled embryonated eggs of *Subulura brumpti*



**Fig 2:** Pointed anterior end of female worms



**Fig 3:** Posterior end of male worms curved ventrally with a preloacal ventral sucker and two long spicules

In the present study the pathological change observed in caeca was catarrhal inflammation which is due to the irritation to caecal mucosa by the worms. Nagarajan *et al.*, (2012) <sup>[3]</sup> and Arulmozhi *et al.*, (2018) <sup>[4]</sup> also observed haemorrhagic typhilitis in *Subulura brumpti* infections in Japanese quails. But these observations are contradicting to the observations of Ponnudurai *et al.*, (2015) <sup>[2]</sup> whom observed that in quails experimental infection with *Subulura brumpti* not affected the feed intake and health status of birds. Caeca was also found to be normal. But he suggested that extremely heavy infections or concurrent infections with other pathogens can elicit pathologic infection in case of *Subulura brumpti*. In the present case study, there was concurrent infection of *Pasteurella* along with *Subulura brumpti*. Lesions such as sinusitis, pulmonary congestion, hepatosis and congestion of various visceral organs were caused by *Pasteurella* which was observed in impression smears as bipolar Gram negative organisms. Prasad *et al.*, (2018) <sup>[5]</sup> also observed similar lesions such as congestion of visceral organs such as liver, duodenum, hepatosis and broncho pneumonia in quails experimentally infected with *Pasteurella multocida*. But they observed no caecal lesions. Caecal lesions in this case were due to high number of *Subulura brumpti* worms, which is in accordance with the findings of Nagarajan *et al.*, (2012) <sup>[3]</sup> and Arulmozhi *et al.*, (2018) <sup>[4]</sup>.

The flock health was improved and mortality was reduced to zero by administration of sulphamethoxazole trimethoprim at a dose rate of 30 mg/kg body weight for five days, albendazole at a dose rate 10 mg/kg body weight and multivitamin vitamin A, D3, E supplementation. Control of beetles and cockroaches was advised since these are the intermediate hosts of *Subulura brumpti*. Faecal samples from birds on sixth day of post therapy were found to be negative for the parasitic ova.

### Summary

*Subulura brumpti* can produce significantly affect health status and production performances. Pathological lesion observed in affected birds is catarrhal typhilitis and with concurrent infection of *Pasteurella* it can increase the mortality rate. Infection can be easily controlled by albendazole and control of intermediate hosts.

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