

## A Case of *Contraecum* sp. (Ascaridida: Anisakidae) Infection in Dalmatian Pelican (*Pelecanus crispus*)

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### Summary

*Contraecum* genus (Ascaridida: Anisakidae) is a nematode parasite of the fish-eating birds throughout the world. A heavy infection of *Contraecum* sp. was detected at the necropsy of a Dalmatian pelican (*Pelecanus crispus*) that had been referred to an animal hospital due to trauma and died before the initiation of any treatment. Intense parasitic infection was seen in the proventriculus and within the lumen of oesophagus to duodenum. This is the first case of intense adult *Contraecum* sp. infection in a piscivorous bird in Turkey.

**Keywords:** *Contraecum* sp, Infection, Pelican, Turkey

## Tepeli Pelikanda (*Pelecanus crispus*) *Contraecum* sp. (Ascaridida: Anisakidae) Enfeksiyonu Olgusu

### Özet

*Contraecum* cinsi (Ascaridida: Anisakidae), dünyanın birçok bölgesindeki balık yiyen su kuşlarının nematod parazitidir. Hayvan hastanesine travma teşhisi ile getirilen ve herhangi bir tedaviye başlamadan ölen bir tepeli pelikanın (*Pelecanus crispus*) nekropsisinde yoğun miktarda *Contraecum* sp. görülmüştür. Kuşun proventrikülüsünün bu parazitlerle dolu olduğu, hatta özefagusun son bölümüne ve duodenuma kadar uzandığı gözlenmiştir. Bu olgu parazitin yoğunluğu bakımından ilginç bulunmuş olup, Türkiye'de bir su kuşunda olgun *Contraecum* sp.'nin ilk bildirimidir.

**Anahtar sözcükler:** *Contraecum* sp, enfeksiyon, pelikan, Türkiye

### INTRODUCTION

The *Contraecum* (Railliet & Henry, 1912) genus contains approximately 50 nematode species of which the mature ones parasitize fish-eating birds and mammals. Their complex life cycle consists of four larval stages and involves copepods, aquatic vertebrates and fish as intermediate and/or paratenic hosts. The high prevalence of *Contraecum* in freshwater or marine fish may affect their health. When in the stomach of the definitive host, L3 moults to become L4 and both the larvae and the adults may affect the host health negatively <sup>1,2</sup>. If the larvae are accidentally taken by humans by consuming raw or undercooked fish meat, they may cause anisakiasis, a zoonotic infection characterized by stomach pains, fever, diarrhea and vomiting <sup>3,4</sup>.

Adult nematodes of the genus *Contraecum* have been reported in fish-eating birds throughout the world. Morphological characterization and molecular techniques are used to differentiate species <sup>2,5</sup>.

This case presents intensive parasitism in a Dalmatian pelican; the parasites were identified with their morphological characteristics.

### CASE HISTORY

A wounded Dalmatian pelican (*Pelecanus crispus*) was referred to the Animal Hospital of Uludağ University and



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the animal died before any intervention. At necropsy, severe haemorrhage was observed in regio sterno-abdominalis and from scapula to carpometacarpus. There was a complete oblique fracture at the ulnar bone with a haematoma formation around the fracture site. The venous congestion of the liver and lungs were thought to be related with haemorrhagic shock and was considered to be the cause of death. Numerous worms, approximately 4 cm in length, were found in the alimentary tract lumen, from the oesophagus to duodenum. A large number of nematodes were lying freely in the lumen of proventriculus and some of them were attached to the wall (Fig. 1.A). Parasites were observed also at the cut surface of liver. Organs were fixed in 10% buffered formalin and were embedded in paraffin for pathological examination. Sections were cut at 5 µm and stained with haematoxylin and eosin (H&E) stain.

Approximately 400 parasites were counted in the lumen of the alimentary tract. The lengths of the parasites were 2-4 cm and they had body shapes similar to nematodes. All parasites were immersed into 70% ethanol and kept a few days in alcohol before identification.

Parasites were put in lactophenol solution to obtain optimum transparency and identification. Upon examination, they were identified as *Contracaecum sp.* (Ascaridida: Anisakidae)<sup>5-7</sup> (Fig. 1.B and 1.D). Some larval nematode forms were also found.

Histopathologically, the surface epithelium of proventriculus and the epithelium of submucosal glands were desquamated in some areas. Multifocal eosinophilic homogenous material was found in the affected mucosa sites (Fig. 1.C). These dead parasite materials were surrounded

by mononuclear inflammatory cell infiltrations, particularly macrophages and foreign body giant cells. Colonies of bacteria were present around hyaline substances in the mucosa accompanied by heterophile leukocyte infiltration. The villi of duodenum and lamina epithelialis were lost. Severe cryptal damage was observed; proprial mucosa was thin and eroded, with marked mononuclear cell infiltration throughout the mucosa of the duodenum. Diffuse congestion, haemorrhage and emphysema were seen in the lungs, and haemorrhage in subepicardium was observed in the heart. Vacuolar degeneration of hepatocytes, congestion in sinusoids, accumulation of mononuclear cells in Kiernan's spaces (especially around the bile ducts) and hyperplasia of bile ductules were seen in the liver.

## DISCUSSION

Different species of adult *Contracaecum* have been reported as a parasite of fish-eating birds belonging to the Pelicanidae from Central/South Americas and Mediterranean area<sup>5</sup>. Up to now, three species of parasite; *C. multipapillatum*, *C. gibsoni* and *C. overstreeti* have been detected from *Pelecanus crispus*. However, some other *Contracaecum* species have been reported from other genus of Pelicanidae<sup>6,8</sup>.

Diagnosis of *Contracaecum* species from fish-eating birds can be conducted by using morphological characteristics such as the length of the spicules, the morphology of the distal end of the spicule, and the bifurcation of the interlabial tip. However, these features sometimes may exhibit differences, and therefore current



**Fig 1.** Intensive *Contracaecum sp.* infection; A. Worms in lumen of proventriculus, B. Macroscopic view of *Contracaecum sp.*, C. Hyaline materials (arrows) in propria mucosa of proventriculus, H&E, Bar = 200 µm, D. Dorsal view of anterior end, Bar = 2 mm

**Şekil 1.** Yoğun *Contracaecum sp.* enfeksiyonu; A. Proventrikulus lümenindeki parazitler, B. *Contracaecum sp.*'nin makroskopik görünümü, C. Proventrikulusun propria mukozasında görülen hyalin materyaller (oklar), H&E, Bar = 200 µm, D. Ön ucun üstten görünümü, Bar = 2 mm

tendency is to use genetic/molecular techniques for definitive diagnosis<sup>5,6,9</sup>. The accurate identification of species will be conducted at further investigations by detailed measures.

The histopathological findings in the present case were related to pathological changes in proventriculus and small intestines. The cellular reactions caused by these nematodes consist of mononuclear and heterophilic cell infiltrations. Penetration of nematodes causes proventricular and duodenal lesions. The hyaline substance observed in propria mucosa is possibly from the secretions of the larvae mixed with necrotizing cells. Supportively, these findings have been reported in other *Contraecaecum* sp. cases before<sup>10-12</sup>.

The present study revealed an intensive infection of *Contraecaecum* sp. in a Dalmatian pelican and is the first report of mature *Contraecaecum* sp. infection in a piscivorous bird in Turkey.

## REFERENCES

- Martins ML, Onaka EM, Fenerick J:** Larval *Contraecaecum* sp. (Nematoda: Anisakidae) in *Hoplialis malabaricus* and *Hoplerythrinus unitaeniatus* (Osteichthyes: Erythrinidae) of economic importance in occidental marshlands of Maranhao, Brazil. *Vet Parasitol*, 127, 51-59, 2005.
- Kanarek G, Bohdanowicz J:** Larval *Contraecaecum* sp. (Nematoda: Anisakidae) in the Great Cormorant [*Phalacrocorax carbo* (L., 1758)] from north-eastern Poland: A morphological and morphometric analysis. *Vet Parasitol*, 166, 90-97, 2009.
- Sakanari JA, McKerrow JH:** Anisakiasis. *Clin Microbiol Rev*, 2 (3): 278-284, 1989.
- Arslian A, Dinçoğlu A, Güven A:** The zoonoses produced by the sea foods consumption in humans. *Kafkas Univ Vet Fak Derg*, 1 (1-2): 103-107, 1995.
- Mattiucci S, Paoletti M, Solorzano AC, Giuseppe N:** *Contraecaecum gibsoni* n. sp. and *C. overstreeti* n. sp. (Nematoda: Anisakidae) from the Dalmatian pelican *Pelecanus crispus* (L.) in Greek waters: genetic and morphological evidence. *Syst Parasitol*, 75, 207-224, 2010.
- Mattiucci S, Paoletti M, Verbel JO, Baldiris R, Salgado BA, Garbin L, Navone G, Nascetti G:** *Contraecaecum bioccai* n. sp. from the brown pelican *Pelecanus occidentalis* (L.) in Colombia (Nematoda: Anisakidae): morphology, molecular evidence and its genetic relationship with congeners from fish-eating birds. *Syst Parasitol*, 69, 101-121, 2008.
- Shamsi S, Gasser R, Beveridge I, Shabani AA:** *Contraecaecum pyripapillatum* n. sp. (Nematoda: Anisakidae) and a description of *C. multipapillatum* (von Drasche, 1882) from the Australian pelican, *Pelecanus conspicillatus*. *Parasitol Res*, 103, 1031-1039, 2008.
- Dronen NO, Blend CK, Anderson CK:** Endohelminths from the brown pelican, *Pelecanus occidentalis* and the American white pelican, *Pelecanus erythrorhynchus*, from Galveston Bay, Texas, U.S.A., and checklist of pelican parasites. *Comp Parasitol*, 70 (2): 140-154, 2003.
- Li AX, D'amelio S, Paggi L, He F, Gasser RB, Lun ZR, Abollo E, Turchetto M, Zhu XQ:** Genetic evidence for the existence of sibling species within *Contraecaecum rudolphii* (Hartwich, 1964) and the validity of *Contraecaecum septentriole* (Kreis, 1955) (Nematoda: Anisakidae). *Parasitol Res*, 96, 361-366, 2005.
- Liu SK, Edward AG:** Gastric ulcers associated with *Contraecaecum* spp. (Nematoda: Ascaroidea) in a Steller sea lion and a white pelican. *J Wildlife Dis*, 7 (4): 266-271, 1971.
- Ito M, Sato T, Shirai W, Kikuchi S:** Parasites and related pathological lesions in the gastrointestinal tract of a seal (*Phoca vitulina* Linnaeus). *J Vet Med Sci*, 60 (9): 1025-1028, 1998.
- Wilson TM, Stockdale PH:** The Harp seal, *Pagophilus groenlandicus* (Erxleben, 1777) XI. *Contraecaecum* sp. infestation in a Harp seal. *J Wildlife Dis*, 6, 152-154, 1970.