



RESEARCH ARTICLE

**GASTROINTESTINAL NEMATODIASIS IN A CAPTIVE BRED CRITICALLY
ENDANGERED PYGMY HOG (PORCULA SALVANIA)**

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ARTICLE INFO

Article History:

Received 2nd, April, 2015
Received in revised form 10th,
April, 2015
Accepted 4th, May, 2015
Published online 28th,
May, 2015

Key words:

Pygmy Hog, Pygmy Hog
Research and Breeding Centre,
India, *Ascarops strongylina*,
Ascarops dentata, *Globocephalus*
urosubulatus, *Capillaria* sp.

ABSTRACT

Parasitological investigation at post mortem in a carcass of a critically endangered captive bred Pygmy hog (*Porcula salvania*). Post-mortem examination was conducted in the carcass and morphological study of the nematode parasites recovered were carried out using available keys. Post mortem examination revealed four nematode species, two each in the stomach and the small intestine. Based on morphological study, the parasites recovered from the stomach were found indistinguishable from *Ascarops strongylina* and *Ascarops dentata*, while the other two found in the small intestine were identified as *Globocephalus urosululatus* and *Capillaria* sp. There was presence of several small nodules resembling pimply gut throughout the small intestine presumed to be caused by *G. urosululatus*. Findings of the present study form the first record of gastro-intestinal nematode parasites in critically endangered Pygmy hog. Further investigation to prepare a complete inventory of the parasites of this endangered pygmy hog similar to the documentations already made available for closely related domestic pigs and wild boars is suggested.

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INTRODUCTION

The pygmy hog (*Porcula salvania*), a small wild mammal belonging to the family Suidae is closely related to the Eurasian pig (*Sus scrofa*) and is historically known from the Himalayan foothills of the Northeast India, Nepal and Bhutan. Today, this smallest and rarest wild suid is under severe threat of extinction and its population is now found only in and around the Manas National Park situated in the North-Western Assam, India. The International Union for Conservation of Nature (IUCN) has listed Pygmy hog as critically endangered species.

The Durrell Wildlife Conservation Trust and IUCN/SSC Wild Pig Specialist Group in collaboration with the Ministry of Environment and Forest, Government of India and the Government of Assam established a pygmy hog research and captive breeding centre in 1995 at Guwahati in Assam with an objective to breed the animal and reintroduce in protected wild habitats in Assam, thus ensuring their survival (Narayan *et al.*,

1999). The conservation recovery programme started with breeding of six wild caught hogs managed under locally devised methods similar to their living habits under natural conditions.

Occurrence of few infectious diseases like Salmonellosis (Narayan *et al.*, 1999; Rahman *et al.*, 2005) and Classical Swine Fever (Barman *et al.*, 2012) has been reported from pygmy hog. However, the parasite fauna remain unexplored. Therefore, in an attempt to list the parasites found in pygmy hog, this communication reports the parasitological findings of post mortem examination conducted in a pygmy hog.

MATERIALS AND METHODS

A carcass of four and a half months old female captive bred pygmy hog from the Pygmy Hog Research and Breeding Centre, Guwahati, Assam was brought to the College of Veterinary Science, Khanapara for post mortem examination.

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Before death, the hoglet was found depressed with rough body coat but feeding normally for a few days. Suddenly the animal developed inco-ordination followed by lateral recumbency and paddling of legs just before death within 24 hours of detectable illness. After careful visual examination of the carcass at PM, its visceral organs including the gastrointestinal tract were collected and brought to the parasitological laboratory for further investigation. Faecal contents collected from the large intestine were first examined by routine sedimentation and floatation method to determine the presence of any ova of parasite. Lumen contents and the mucosal scrapings were obtained subsequently from different regions of the gastrointestinal tract and examined under stereoscopic microscope. Parasites recovered from the stomach and small intestine were washed in normal saline and preserved in 70 % alcohol. Later on, the worms were measured and put in lactophenol for clearing. Morphological study was carried out for identification of the parasites in consultation with available literature (Soulsby, 1982; Yamaguti, 1961).

RESULTS

Microscopic examination of faeces revealed presence of *Capillaria* and Spirurid worm eggs. At post mortem, the gastric mucosa at places showed hyperaemia and presence of parasites covered with thick mucus. The small intestine at the serosal surface showed several thick nodules which were often haemorrhagic (Fig1). Examination of the nodules from the mucosal surface showed presence of minute opening, simple thickening and without having any parasite inside. In all, four different nematode specimens, two each from the stomach and the small intestine were recovered during post mortem.

Of the two different nematode specimens collected from the stomach, the smaller and slender one, 7 in numbers with the males measuring 3 to 4 mm long and females 10 to 12 mm long were morphologically found indistinguishable from *Ascarops strongylina* which was characterized at the anterior end by the presence of unilateral cervical ala and unique spiral cuticular thickenings in the pharynx (Fig 2). The males had in-rolled tail with well developed asymmetrical alae, several pairs of pre and post anal papillae, unequal and dissimilar spicules and the females with vulva situated in the middle region of the body.

Three parasite specimens, longer and stouter than the former species recovered from the stomach measured 45 to 50mm in length and 1 mm in breadth. Anterior end of these worms was also provided with spiral thickenings in the pharynx. The parasites were found indistinguishable from *Ascarops dentata* (Fig 3).

A total of 78 grossly visible slender and milky white parasite specimens were recovered from the small intestine. The males measured 3 to 4 mm long and the females measured 5 to 6 mm in length. These parasites were provided with a simple mouth directed antero-dorsally and a deep funnel shaped buccal capsule with a pair of sub-ventral lancets in it and a well developed dorsal gutter reaching to the mouth opening (Fig 4, 5). In the males, dorsal ray of the copulatory bursa was found divided distally into two tri-digitate branches and the long

slender spicules were equal in size (Fig 6). The females had numerous eggs inside the uterus and the vulva situated in the posterior half of the body. The parasites were found indistinguishable from *Globocephalus urosubulatus*.

Microscopic examination of mucosal scrapings obtained from the small intestine revealed presence of several coiled hair-like white worms. Of the sixteen parasites recovered, twelve were female measuring 20-22 mm long and four males that measured 8-10 mm in length. Uterus of the females contained numerous bipolar eggs (Fig 7). The males had a long spicule enclosed in a spicule sheath (Fig 8). The worms were identified to be *Capillaria* sp.



Fig 1



Fig 2



Fig 3

DISCUSSION

The present study was aimed to ascertain the parasites affecting the critically endangered pygmy hog since the literature search revealed dearth of information except that of a louse

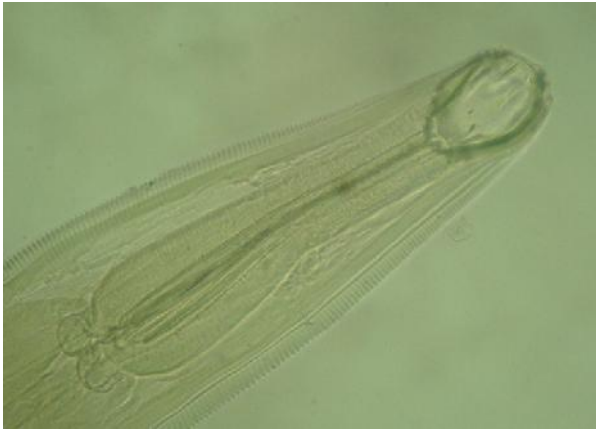


Fig 4



Fig 5



Fig 6

Haematopinus oliveri (Mishra and Singh, 1978; Dunn, 2009). This investigation revealed gastrointestinal parasitism with *A. strongylina*, *A. dentata*, *G. urosubulatus* and *Capillaria* sp. in the Pygmy hog and parasitic gastroenteritis as the cause of death. Morphological descriptions towards identification of the two species of spirurid nematodes (*A. strongylina* and *A.*

dentata) and one strongyle nematode (*G. urosubulatus*) recorded in the pygmy hog were found consistent with previous records made in domestic pigs from the present study regions by Yadav and Tandon (1989) and Dutta *et al.* (2005) who recorded 2- 8.22 % prevalence of these parasites of small intestine. Morphological description of *G. urosubulatus* was also comparable with that of Nanev *et al.* (2007) reported from

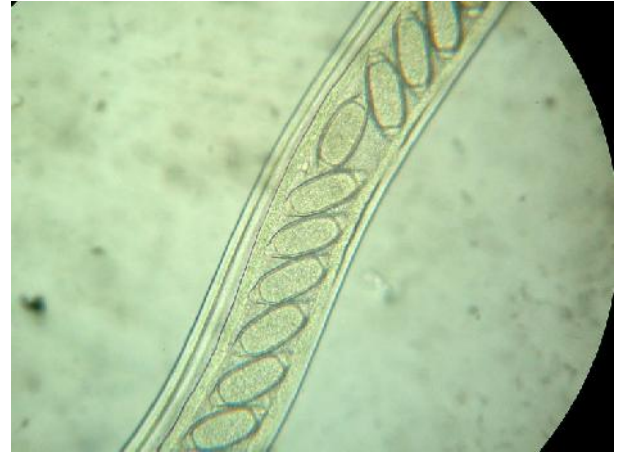


Fig 7



Fig 8

wild boars. Parasitic fauna in domestic pigs and wild boars have been extensively studied in other geographical regions (Jarris *et al.*, 2007; Senlik *et al.*, 2011; Roepstorff *et al.*, 2011) with reports of several helminth parasites including *A. strongylina* and *G. urosubulatus* recorded in the present study. However, record of *A. dentata*, known to be prevalent in pigs of Asian countries (Soulsby 1982) conformed to the report of Yadav and Tandon (1989). There were several prominent nodules visible from the serosal surface of the entire small intestine and these resembled pimply gut condition caused by *Oesophagostomum dentatum* (Soulsby, 1982). However, the nodules with small opening were devoid of caseated greenish material in them. Presence of such nodules in the small intestine without any detectable parasite in the large intestine might indicate the attachment sites of *G. urosubulatus* as reported by Junquera (2014).

Several authors have reported occurrence of *Capillaria* species in domestic and wild boars through faecal examination and autopsy procedures (Yamaguti 1961; Lowenstein and Kutzer

1989; Moretta et al., 2011). *Capillaria* species recovered from the small intestine in the present investigation however did not conform to the descriptions of *C. papuensis* (Copland 1975) and *C. garfiai* (Lowenstein and Kutzer, 1993) in respect of size and their site (tongue) of predilection. Lowenstein and Kutzer (1989) reported a *Capillaria* sp. from the stomach and intestine of wild swine in Austria. Shoho and Machida (1979) also reported *C. riukinensis* in wild boars from Japan. However, no data is available to compare with the present *Capillaria* sp. recorded in Pygmy hog. Further studies would be required to identify the *Capillaria* upto species level.

In conclusion, *A. strongylina*, *A. dentata*, *G. urosubulatus* and *Capillaria* sp. have been recorded for the first time in the world Pygmy hog. Autopsy based report showed a high parasite density in the captive bred Pygmy hog. Further investigation would be required to list other parasites affecting pygmy hog. To the best of our knowledge, there is also no previous report of *Capillaria* sp. affecting both domestic and wild pigs in India.

Acknowledgement: Pygmy Hog Conservation Programme, Indira Nagar, Basistha, Guwahati-781029, Assam, India.

Figure legend

Fig 1: Small intestine showing multiple nodular lesions visible from the serosal surface.

Fig 2: *Ascarops strongylina* (Anterior end) showing spiral thickenings in pharynx.

Fig 3: *Ascarops dentata* covered with thick mucosa in gastric mucosa.

Fig 4: Anterior end of *Globocephalus urosubulatus* showing funnel shaped buccal capsule and sub ventral lancets.

Fig 5: Anterior end of *Globocephalus urosubulatus* showing dorsal gutter.

Fig 6: Posterior end of male *Globocephalus* showing tridigitate dorsal ray and long slender spicules.

Fig 7: Uterus filled with bipolar eggs in the female *Capillaria* sp.

Fig 8: Posterior end of male *Capillaria* spp. showing single sheathed spicule.

References

- Barman, N.N., Bora, D.P., Tiwari, A.K., Kataria, R.S., Desai, D.S. and Deka, P.J. 2012. Classical Swine Fever in the pygmy hog. Rev. Sci. Tech. Off. Int. Epz., 31: 919-930.
- Copland, J.K. 1975. *Capillaria* infection of pigs: Description of *C. papuensis* sp. and the pathology of natural infections. *J. Helminthol.*, 49: 187-190.
- Dutta, S., Ghose, J.D., Sarmah, N.K. and Mukherjee, G.S. 2005. Prevalence of gastrointestinal parasites affecting pig farms of West Bengal, India. *J. Vet. Parasitol.*, 19:23-26.
- Dunn, R.R. 2009. The sixth mass co-extinction: Are most endangered species parasites and mutuals? Proc. R. Soc. B., 276: 3037-3045.
- Jarris, T., Kapel, C.H. and Moks, E. 2007. Helminths of wild boar in the isolated population close to the northern border of its habitat area. Vet. Parasitol., 150: 366-369.
- Lowenstein, M. and Kutzer, E. 1989. *Capillaria* (Nematoda, Trichuridae) of wild swine (*Sus scrofa*) in Austria. *Angewandte Parasitologie.*, 30: 221-237.
- Lowenstein, M. and Kutzer, E. 1993. The distribution and biology of *Capillaria garfiai* from *Sus scrofa*. *Appl. Parasitol.*, 34(1): 51-62.
- Mishra, A.C. and Singh, K.N. 1978. Description of *Haematopinous Oliver* Sp. Nov. (Anoplura: Haematopinidae) parasitising *Sus salvanius*. *Bull. Zool. Surv. India.* 1(2):167-169.
- Moretta, I., Veronesi, F., Paola, R., di Battistacci, L. and Moretti, A. 2011. Parasitological survey on wild boar (*Sus scrofa*) shot in the hunting season 2009-10 in Umbria (Central Italy). *Large Anim. Review.*, 17(5): 187-192.
- Nanev, V., Mutafova, T., Todev, I., Hrusanov, D. and Radev, V. 2007. Morphological characters of nematodes of the *Globocephalus* genus prevalent among wild boars from various regions of Bulgaria. *Bulgarian J. Vet. Med.*, 10: 103-111.
- Narayan, G., Deka, P.J., Chakraborty, A. and Oliver, W.L.R. 1999. Increase in the captive population of Pygmy hogs (*Sus salvanius*): Health problems and husbandry. *DODO.*, 35: 70-86.
- Rahman, H., Chakraborty, A., Deka, P.J., Narayan, G. and Prager, R. 2005. An outbreak of *Salmonella enteritidis* infection in pygmy hogs (*Sus salvanius*). *Trop. Anim. Health Prod.*, 33(2): 95-102.
- Roepstorff, A., Mejer, H., Nejsum, P. and Thamsborg, S.M. 2011. Helminths parasites in pigs: New challenges in pig production and current research highlights. *Vet. Parasitol.*, 180: 72-81.
- Senlik, B., Cirak, V.Y., Girisqin, O. and Akyol, C.V. 2011. Helminths infections of wild boars (*Sus scrofa*) in the Bursa Province of Turkey. *J. Helminthol.*, 85: 404-408.
- Shoho, C. and Machida, M. 1979. Nematodes parasites of wild boar from Irimote island. *Japan Bull. Natl. Sci. Mus. Ser. A. (Zool.)*, 5: 235-247.
- Soulsby, E.J.L. 1982. *Helminths, Arthropods and Protozoa of domesticated animals.* Braille Tindall, London.
- Yadav, A.K. and Tandon, V. 1989. Nematode parasite infection of domestic pigs in a sub-tropical high rainfall area of India. *Vet. Parasitol.*, 31: 133-138.
- Yamaguti, S. 1961. *Systema Helminthum. The nematodes of vertebrates.* 3rd edn. Interscience, New York. pp. 634-646.

How to cite this article:

Kanta Bhattacharjee et al., Gastrointestinal Nematodiasis In A Captive Bred Critically Endangered Pygmy Hog (*Porcula Salvania*). *International Journal of Recent Scientific Research Vol. 6, Issue, 5, pp.4231-4234, May, 2015*
