Occurrence of *Schistosoma nasale* infection in bullocks of Puducherry

A. Latchumikanthan · P. Pothiappan ·
D. Ilayabharathi · S. S. Das ·
D. Kumar · C. Ilangoan

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Abstract Nasal schistosomiasis is caused by the blood fluke *Schistosoma nasale* (*S. nasalis*) adversely affects the health and production of domestic livestock in various parts of India. The present report describes the occurrence of *S. nasale* infection in two Hallikar breed bullocks of Union Territory of Puducherry. Eggs of *S. nasale* were noticed in nasal washings/scrapings of animals and identified as per the standard taxonomical keys.

A. Latchumikanthan (✉) · S. S. Das · D. Kumar · C. Ilangoan
Department of Veterinary Parasitology, Rajiv Gandhi College
of Veterinary and Animal Sciences (RAGACOVAS),
Kurumbapet, Puducherry 605 009, India
e-mail: latchupara2010@gmail.com

Present Address:

A. Latchumikanthan
Division of Parasitology, Indian Veterinary Research Institute,
Izatnagar, Bareilly 243 122, Uttar Pradesh, India

P. Pothiappan
Department of Veterinary Clinical Medicine, Ethics and
Jurisprudence, Teaching Clinical Complex, Rajiv Gandhi
College of Veterinary and Animal Sciences (RAGACOVAS),
Mettupalayam, Kurumbapet, Puducherry 605 009, India

Present Address:

P. Pothiappan
Department of Veterinary Medicine, Madras Veterinary College,
Vepery, Chennai 600 007, Tamil Nadu, India

D. Ilayabharathi
Department of APM, Rajiv Gandhi College of Veterinary
and Animal Sciences (RAGACOVAS), Kurumbapet,
Puducherry 605 009, India

Present Address:

D. Ilayabharathi
Central Avian Research Institute, Izatnagar, Bareilly 243 122,
Uttar Pradesh, India

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Introduction

Schistosomiasis is a snail-borne trematode infection of man, domestic animals and wild animals in different parts of Asia and Africa. The species which commonly occur in India are *Schistosoma nasale* and *S. spindale* in cattle, *S. indicum* in equines and sheep and *S. incognitum* in pigs.

Nasal schistosomiasis (snoring disease) is caused by *Schistosoma nasale* (*S. nasalis*) which resides in nasal veins of cattle, buffaloes and also in sheep, goat, and horses in Indian subcontinent. *S. nasale* is a species of digenetic trematode in the family Schistosomatidae. It was identified first in 1933 by Dr. M. Anant Narayanan Rao at Madras Veterinary College, Tamil Nadu, India. The freshwater snail *Indoplanorbis exustus* acts as intermediate host (Liu 2010). This blood fluke adversely affect health and production of cattle and serious outbreaks of disease caused by this species have been reported. Snoring disease was reported from Tamil Nadu, Karnataka, Andhra Pradesh, West Bengal, Assam, Bihar, Orissa and Maharashtra (Ramachandra Rao and Indira Devi 1971; Agrawal and Alwar 1992).

The pathology of infection and clinical signs are less severe in buffalo than in cattle. Affected cattle shows rhinitis, profuse mucopurulent nasal discharge manifested clinically by sneezing, dyspnoea and snoring. Chronic infections show proliferation of nasal epithelium as granuloma and small abscesses containing eggs. Buffaloes are not much affected by the disease and show only pin-head sized eruptions and congestion of nasal mucosa (Rajamohan and Peter 1975). The present communication reports the

Fig. 1 Egg of *Schistosoma nasale* in nasal washings ($\times 100$)

presence of *S. nasale* infection in Hallikar bullocks of Puducherry, a southern Union Territory of India.

Materials and methods

Clinical history

4 and 12 years old Hallikar bullocks having signs of sneezing and bilateral nasal discharge of thick mucus nature were brought to RAGACOVAS Teaching Clinical Complex, Puducherry during March 2010 and May 2011, respectively. Both the animals were having difficulty in breathing.

Clinical observation and sample collection

Examination of nasal mucosa showed a small peanut size granuloma like growth in 12 years old bullock. Nasal swab/scrapings and washings of nasal mucosa were collected in normal saline solution and tested in Veterinary Laboratory Diagnosis, Department of Veterinary Parasitology, RAGACOVAS, Puducherry.

Microscopic examination of nasal washings

The samples were examined as per Sumanth et al. (2004) with slight modifications. The nasal washings/nasal scrapings were taken in a test tube and 5 ml of 10 % potassium hydroxide was added. The contents were boiled for 3–5 min over flame for lysis of mucus. It was cooled and centrifuged at 2000 rpm for 3 min. After centrifugation, supernatant was discarded and the sediment was examined under low power of microscope.

Results

The microscopic examination of nasal washings/scrapings after 10 % potassium hydroxide processing revealed boomerang shaped/palanquin shaped egg with terminal spine and fully developed miracidium inside (Fig. 1). Eggs measured 340 μ m length and 60 μ m width. The eggs belong to *S. nasale* as per the standard taxonomical keys given by Soulsby (1982).

Discussion

The presence of boomerang shaped eggs in nasal scrapings of cattle was also reported by Banerjee and Agrawal (1992), Sumanth et al. (2004) in Karnataka, Ravindran and Kumar (2012) in Kerala.

Prevalence rates of 10–15 % infection for *S. nasale* in cattle in Karnataka have been reported by Muraleedharan et al. (1976) based on detection of palanquin shaped eggs in nasal washings and clinical signs such as snoring sound, cauliflower-like growths. The study in slaughter house cattle in Karnataka revealed a high incidence of 69.16 % *S. nasale* infection including subclinical and carrier animals (Sumanth et al. 2004). Prevalence of 12.6 % infection of *S. nasale* was reported from Sri Lanka by De Bont et al. (1989) based on the detection of eggs, cauliflower-like growths and lesions at the time of slaughter of cattle.

Physical examination of animals revealed sneezing, bilateral thick mucus nasal discharge, congestion of nasal mucosa. The above findings are in conformation with Soulsby (1982). Detection of subclinical schistosomiasis in live animals is difficult, since the affected animals do not show obvious signs of disease and animals act as carriers and continue the chain of transmission. Nevertheless, it is important to detect schistosomiasis in live animals so that they can be treated in order to minimize morbidity and economic losses (Sumanth et al. 2004).

Epizootiological studies on nasal schistosomiasis in bovines in the Bangalore and Mandya districts of Karnataka state indicated that old and female animals were more affected (Muraleedharan et al. 1976). High incidence of schistosomiasis was seen in older animals as reported by Banerjee and Agrawal (1992) and Sumanth et al. (2004). The incidence of 60.3 % in nondescript bullocks and 68.87 % in Hallikar bullocks of *S. nasale* infection in Andhra Pradesh was reported by Sreeramulu (1994) based on the detection of eggs in nasal washings. Also 11.1 % of cattle and 23.4 % of buffaloes were positive for *S. nasale* infection among large ruminants in Wayanad, Kerala (Ravindran and Kumar 2012).

A different form of nasal schistosomiasis also occurred where local cattle are negative for *S. nasale* but local

buffaloes carry it without showing any symptoms has been shown to exist at Jabalpur, Madhya Pradesh. Cross bred cattle exhibits snoring disease symptoms with eggs in their nasal discharge (Banerjee and Agrawal 1992).

Transmission of infection occurs by percutaneous penetration of cercaria of *S. nasale* from the infected *Indoplanorbis* sp. snails. The animals should be avoided from grazing near water bodies where infected snails are noticed (Soulsby 1982). Control of snails, avoiding animal grazing near snail infected areas and periodical deworming in bullocks and treatment at the early stage of infection will help in control of schistosomiasis in ruminants.

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References

- Agrawal MC, Alwar VS (1992) Nasal schistosomiasis: a review. *Helm Abstr* 61:373–383
- Banerjee PS, Agrawal MC (1992) Epizootiological studies in bovines on fluke infections with special reference to schistosomiasis. *Indian Vet J* 69:215–220
- De Bont J, Van Aken D, Vercruysse J, Fransen JM, Southgate VR, Rollinson D (1989) The prevalence and pathology of *Schistosoma nasale* Rao, 1933 in cattle in Sri Lanka. *Parasitology* 98:197–202
- Liu L (2010) The phylogeography of *Indoplanorbis exustus* (Gastropoda: planorbidae) in Asia. *Parasites Vectors* 3:57
- Muraleedharan K, Kumar SP, Hegde KS (1976) Studies on the epizootiology of nasal schistosomiasis of bovines. 2. Intensity and severity of infection. *Mysore J Agric Sci* 10(3):463–470
- Rajamohan K, Peter CT (1975) Pathology of nasal schistosomiasis in buffaloes. *Kerala J Vet Sci* 6:94–100
- Ramachandra Rao PV, Indira Devi T (1971) Nasal schistosomiasis in buffaloes. *Indian J Anim Health* 10(2):185–188
- Ravindran R, Kumar A (2012) Nasal schistosomiasis among large ruminants in Wayanad, India. *The Southeast Asian J Trop Med Public Health* 43(3):586
- Soulsby EJJ (1982) Helminths, arthropods and protozoa of domesticated animals, 7th edn. Bailliere Tindall Ltd, London
- Sreeramulu P (1994) Epizootiology of nasal schistosomiasis in bovines in Andhra Pradesh. *Indian Vet J* 71(10):1043–1044
- Sumanth S, D'Souza PE, Jagannath MS (2004) A study of nasal and visceral schistosomiasis in cattle slaughtered at an abattoir in Bangalore, South India. *Rev Sci Tech Off Int Epiz* 23(3): 937–942