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(51)

A SURVEY OF GASTROINTESTINAL PARAMPHISTOMES IN BEEF CATTLE OF SOME NORTH-EAST INDIAN STATES

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SUMMARY

Beef cattle (*Bos indicus* L.) of the north east Indian states, namely Meghalaya, Mizoram, Tripura and South-East Assam harboured 15 species of gastrointestinal paramphistomes.

INTRODUCTION

Surveys carried out in the various parts of the country have revealed trematode parasites among these animals to be mainly gastrointestinal (GI) paramphistomes (Bhalerao, 1952; Thapar, 1956; Kulkarni, 1974; Hafeez and Rao, 1980). However, the spectrum of GI paramphistomes in the dairy or beef cattle in the N. E. region of India is not fully known and the reports so far available pertain to only some parts of Assam (Endrejat, 1964; Borkakoty *et al.*, 1984).

The present survey reported herein was undertaken in conjunction with a screening of the meat giving animals to define the geographical distribution and prevalence of helminth infection in them in the north-eastern states of the country.

MATERIALS AND METHODS

Study area and localities surveyed

The four states studied are a mixture of plains and hilly mountainous area, situated in the north-east part of India which is bordered by Burma and Bangladesh on the east, south and west by China and Bhutan on the north. From December 1985 to September, 1987, explorations of the freshly slaughtered animals were made in several localities of four states of N. E. India, namely Silchar in Assam; Shillong, Tura, Nongstoin and Jowai in Meghalaya; Aizawl in Mizoram; and Agartala and Dharmanagar in Tripura. These are the spots where a majority of cattle are reared for meat consumption in the respective states. Average altitude of the surveyed localities ranges between 12-1524 meters above sea level. Guwahati in Assam was excluded in this study as parasitic spectrum of cattle in and around Guwahati has already been studied (Endrejat, 1964). The cattle slaughtered in Meghalaya comprise a mixed population of locally reared animals and those imported from the neighbouring Assam; likewise the cattle slaughtered in Mizoram also include animals brought from the bordering Assam and Tripura. However, the animals reared in Assam and Tripura are exclusively local in origin.

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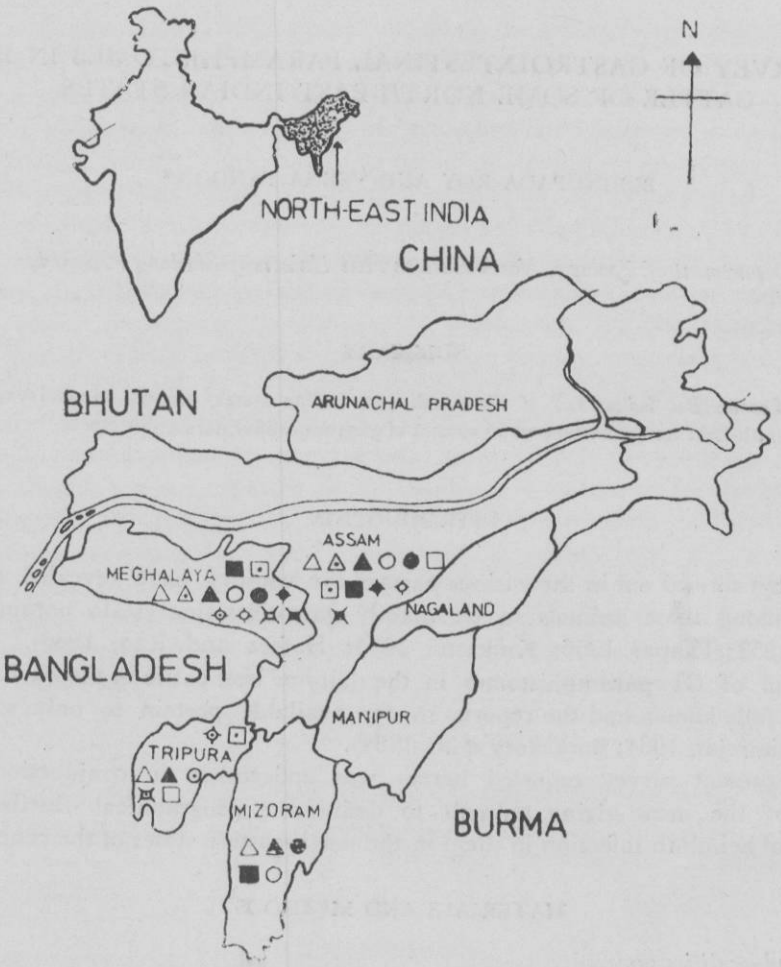

Fig. 1 : Distribution of gastrointestinal trematodes in Assam, Meghalaya, Mizoram and Tripura (△ *Fischoederius elongatus*. △ *F. cobboldi*, ▲ *Gastothylax crumenifer*, ● *Paramphistomum epiclitum*, O *P. ichikawai*, ● *Calicophoron calicophorum*, □ *C. papillosum*, □ *Cotylophoron cotylophorum*, ▬ *Orthocoelium orthocoelium*, ▬ *O. streptocolium*, ▬ *O. dicranocoelium*, ◆ *O. dawesi*, ▬ *Olveria indica*, ▮ *O. bosi*, and ◆ *Homalogaster paloniae*).

Collection and Processing of Samples

Observation were made on a sample of 1029 cattle which were older than two years. The gastrointestinal tract of each animal was examined visually. Adult worms of the representative types were thoroughly washed in 0.9 per cent saline and then fixed in Bouins after due flattening.

RESULTS

Species of paramphistomes determined

Fifteen species belonging to eight genera were identified. They are *Fischoederius*

elongatus (Poirier, 1883) Stiles et Goldberger, 1910; *F. cobboldi* (Poirier, 1883) Stiles Goldberger, 1910; *Gastrothylax crumenifer* (Creplin, 1847) Poirier, 1883; *Paramphistomum epiclitum* Fischoeder, 1904; *P. ichikawai* Fukui, 1922; *Cotylophoron cotylophorum* (Fischoeder, 1901). Stiles et Goldberger, 1910; *Calicophoron calicophorum* (Fischoeder, 1901) Nasmark, 1937; *C. papillosum* (Stiles et Goldberger, 1910) Nasmark, 1937; *Orthocoelium orthocoelium* (Fischoeder, 1901) Price et, McIntosh, 1953; *O. streptocoelium* (Fischoeder, 1901) Yamaguti, 1971; *O. dicranocoelium* (Fischoeder, 1901) Yamaguti, 1971; *O. dawesi* (Gupta, 1958) Yamaguti, 1971; *Olveria indica* Thapar and Sinha, 1945; *O. bosi* Tandon, 1951 and *Homalogaster paloniae* Poirier, 1883. Genus wise distribution of the parasites in the different states is depicted in Table 1.

Table 1. Species-wise prevalence of paramphistomes in cattle of the various states of N.E. India

Paramphistome species	Assam	Meghalaya	Mizoram	Tripura	% of infection in total observation
F. elongatus	26.16*	19.81	43.03	24.24	22.54
F. cobboldi	13.08	15.57	—	—	13.11
G. crumenifer	32.71	43.88	55.69	53.03	44.21
P. epiclitum	29.90	35.13	48.10	—	33.33
P. ichikawai	—	—	—	21.21	1.36
C. cotylophorum	23.36	20.97	—	40.90	20.89
C. calicophorum	19.62	22.90	41.77	—	22.45
C. papillosum	10.28	—	—	39.39	3.59
O. orthocoelium	13.08	10.68	30.37	—	11.75
O. streptocoelium	10.28	19.69	—	—	15.93
O. dicranocoelium	16.82	—	—	34.84	3.93
O. dawesi	19.62	14.28	—	—	12.82
O. indica	—	3.73	—	—	2.81
O. bosi	—	—	—	6.00	0.38
H paloniae	11.21	5.53	—	—	5.34

* Percent hosts found infected for a given species.

Most of the cattle were infected with three paramphistomid species. The sequence of infection was with three species (32.94%), two species (25.85%), four species (13.21%), one species (10.30%) and five species (0.19%). Mostly the infection involving a single worm species was due to *G. crumenifer* which comprised 47.16% of such infections (Table 1). The prevalence of infection was higher in plainer areas and showed a decreasing tendency with the increase in altitude.

DISCUSSION

The results obtained in this study provide evidence that the prevalence of paramphistome infection is relatively high in the N. E. Region (an overall percentage

of 82.50) with the highest in Tripura (96.96%) and lowest in Meghalaya (79.40). The range of infection among different localities was from 78.46% (at Shillong in Meghalaya state to 100% (at Agartala in Tripura). Borkakoty *et al.* (1984) had reported a prevalence rate of 31.1% of paramphistomid infection in cattle of Kamrup district (Assam); however their study was based on a coprological survey.

Hafeez and Rao (1980) reported 9 species of paramphistomes from Andhra Pradesh, of which 5 were reported in Assam and Meghalaya and 3 in Mizoram and Tripura. The species which are not reported in A. P. but observed in our study are *P. epiclitum, C. papillosum, O. orthocoelium, O. streptocoelium, O. dicranocoelium, O. dawesi* and *H. paloniae* in Assam; *P. epiclitum, O. orthocoelium, O. streptocoelium, O. dawesi, O. indica* and *H. paloniae* in Meghalaya; *P. epiclitum* and *O. orthocoelium* in Mizoram; and and *P. ichikawai, C. papillosum, O. dicranocoelium* and *O. bosi* in Tripura.

Bali *et al.* (1985) recorded 6 species of paramphistomes from cattle of Punjab, of which 5 were common to Assam and Meghalaya, 2 to Mizoram and 2 to Tripura. The species which are not reported from Punjab but recorded in the present study are *F. elongatus, P. epiclitum, O. orthocoelinm, O. dicranocoelium, O. dawesi C. papillosum* and *H. paloniae* in Assam; *F. elongatus, P. epiclitum, O. orthocoelium, O. dawesi, O. indica* and *H. paloniae* in Meghalaya; *F. elongatus, P. epiclitum* and *O. orthocoelium* in Mizoram; and *F. elongatus, P. ichikawai, C. papillosum, O. dicranocoelium* and *O. bosi* in Tripura.

The prevalence of infection decreasing with the increase in altitude was observed for all the localities.

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