

AMPHISTOME FAUNA OF RUMINANTS IN HIMACHAL PRADESH

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The amphistome digenetic trematode group of helminth parasites has gained considerable importance from the veterinary point of view because of the reason that a high incidence of the immature worms causes gastroenteritis with high mortality rates amongst the livestock. The disease, paramphistomiasis, has been reported from various states of India (Chhabra, Gill and Dutt, 1978) and also from different parts of the world (Horak, 1964 ; Orlovskii and Zharikov, 1974 ; Erbolatov, 1975 ; Schillhorn and Bida, 1975 ; Bida and Schillhorn, 1977 ; Graubmann, Grafuer and Odening, 1978).

The occurrence of these parasites in the livestock and the extent of losses caused by them are not properly understood in Himachal Pradesh. The present study deals with amphistome fauna of ruminants in Himachal Pradesh.

The flukes were collected from November, 1978 to December, 1979 from the rumen of the sheep, *Ovis aries*, and goat, *Capra hircus*, slaughtered at various abattoirs of mainly the district headquarters in Himachal Pradesh representing an altitudinal range of 1,000—4,000 meters. Since these abattoirs receive the animals from all over the districts, the material collected at one place represents the collection from the various altitudinal zones within that district. Simla district headquarters receive animals for slaughtering from down the plains also. Therefore, the amphistome types recovered from this locality do not exclusively represent Simla region alone, but also those from Punjab and Haryana. The animals from Kinnaur district are brought to Rampur, and those from Una and Bilaspur districts to Hamirpur, for slaughtering. Similarly, those from Mandi are slaughtered in Kulu district. In Lahul and Spiti no organized slaughtering is done at Keylong (district headquarters). Therefore, the examination of the host animals in this area was confined to a few local spots only.

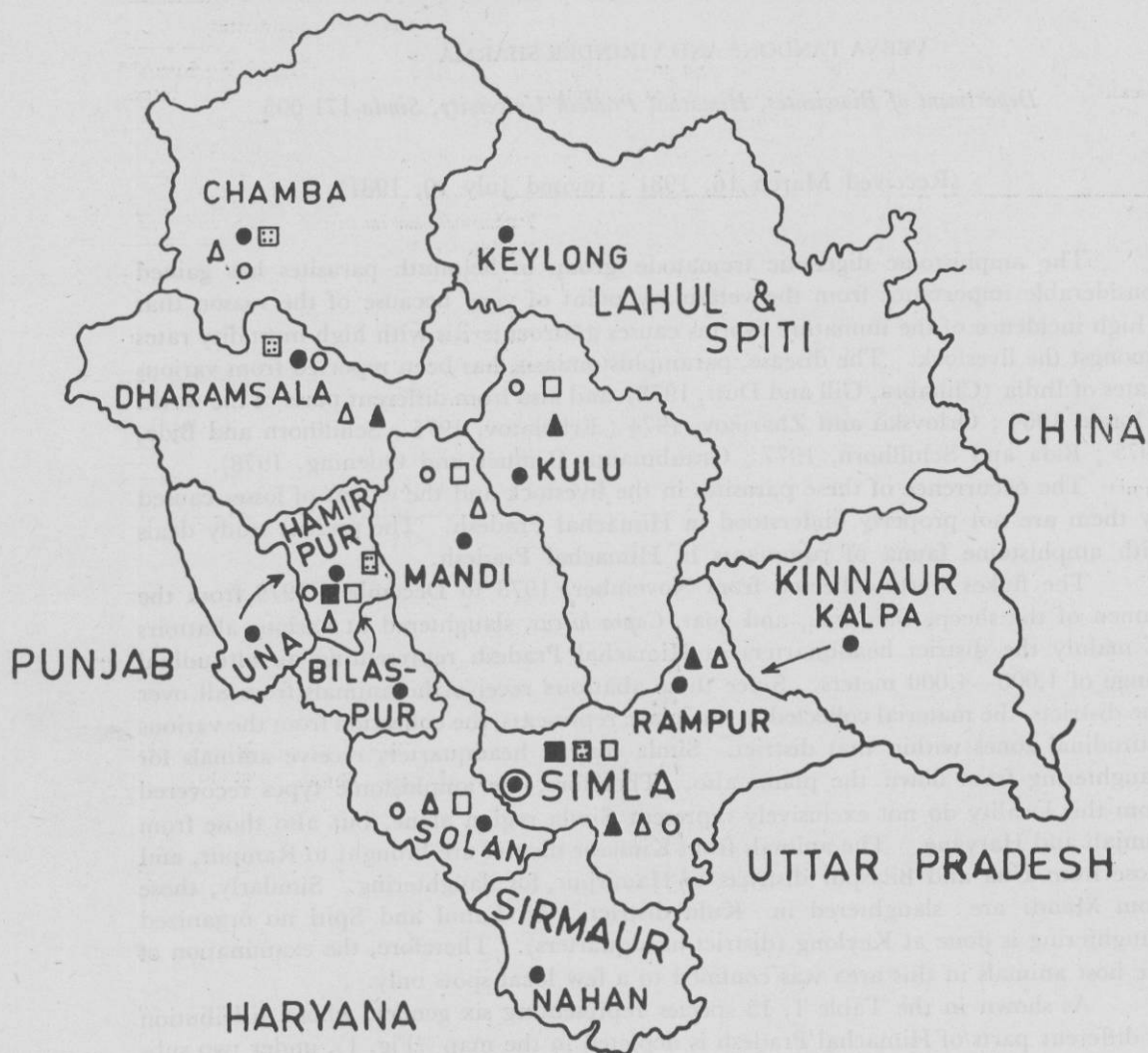
As shown in the Table 1, 15 species representing six genera, whose distribution in different parts of Himachal Pradesh is depicted in the map (Fig. 1), under two sub-families, namely Paramphistominae Fiscoeder, 1901 and Gastrothylacinae Stiles et Goldberger, 1910, of the family Paramphistomidae Fiscoeder, 1901, constituted the collection**. Except for *Paramphistomum epiclitum* and *Calicophoron calicophorum*, which have been reported from Simla (Vaidya, 1976), all other species are new record from Himachal Pradesh.

District Kangra exhibited the highest prevalence of infection followed by Kinnaur, Chamba and Simla, in receding order, the minimum being in district Hamirpur. The prevalence of infection seems to be related to the altitude zones of the concerned locality, as the snails, the intermediate hosts required for the completion of the life cycle of the flukes, would be abundant and have better chances of survival in the areas where

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**The taxonomic characters used for identification of the various forms are following Näsmark (1937).

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△ PARAMPHISTOMUM
FISCHÖEDER, 1901

▲ CALICOPHORON
NÄSMARK, 1937

□ COTYLOPHORON
STILES ET GOLDBERGER, 1910

■ CEYLONOCOTYLE
NÄSMARK, 1937

○ GASTROTHYLAX
POIRIER, 1883

▣ FISCHÖEDERIUS
STILES ET GOLDBERGER, 1910

Fig. 1. Distribution of amphistome genera in Himachal Pradesh.

TABLE 1. *Amphistome digenetic flukes from sheep and goats from different localities in Himachal Pradesh*

Locality	Altitude (meters)	Time of collection	No. of animals examin- ed	No. in- fected	% infection	Recovery of parasites		
						Type	Total No. of worms collect- ed*	Mean** intensity
Simla	2,000- 3,500	Nov. '78- Mar. '79; Jul.-Sept. '79	226	44	19.46	<i>Paramphistomum epiclitum</i> Fischöeder, 1904	312 (26)	12
						<i>P. inchikawai</i> Fukui, 1922	48 (4)	12
						<i>Calicophoron calicophorum</i> (Fischöeder, 1901) Näsmark, 1937	46 (2)	23
						<i>C. crassum</i> (Stiles et Gold- berger, 1910) Näsmark, 1937	24 (2)	12
						<i>C. cauliorchis</i> (Stiles et Goldberger, 1910) Näsmark, 1937	33 (3)	11
						<i>Cotylophoron cotylophorum</i> (Fischöeder, 1901) Näsmark, 1937	44 (2)	22
						<i>C. chauhani</i> Gupta et Gupta, 1972	36 (3)	12
						<i>C. indicum</i> Stiles et Goldberger, 1910	22 (2)	11
						<i>Ceylonocotyle dawesi</i> Gupta, 1958	98 (14)	7
						<i>C. scoliocoelium</i> (Fischöeder, 1904) Näsmark, 1937	32 (8)	4
						<i>C. streptocoelium</i> (Fischöeder, 1901) Näsmark, 1937	28 (1)	28
						<i>C. tamilensis</i> Gupta et Bakhshi, 1977	2 (1)	2
						<i>Gastrothylax crumenifer</i> (Creplin, 1847) Poirier 1883	91 (13)	7
						<i>Fischöderius elongatus</i> (Poirier, 1883) Stiles et Goldberger, 1910	36 (12)	3
Solan	1,000- 2,000	Sept. '79	12	2	16.66	<i>P. epiclitum</i>	38 (2)	19
						<i>C. chauhani</i>	16 (1)	16
Kinnaur	2,000- 3,500 and above	Jul. '79; Dec. '79	18	4	22.22	<i>P. epiclitum</i>	45 (3)	15
						<i>C. cauliorchis</i>	36 (1)	36

TABLE 1 (Continued)

Chamba	1,000-3,500	Aug. '79	14	3	21.42	<i>P. epiclitum</i>	36 (3)	12
						<i>G. crumenifer</i>	36 (2)	18
						<i>F. elongatus</i>	22 (2)	11
Kangra	Below 2,000	Aug. '79	30	8	26.66	<i>P. epiclitum</i>	78 (6)	13
						<i>F. elongatus</i>	30 (5)	6
						<i>Calicophoron papillosum</i> (Stiles et Goldberger, 1910) Näsmark, 1937	24 (3)	8
Hamirpur	Below 2,000	Aug. '79 Dec. '79	27	3	11.11	<i>P. epiclitum</i>	36 (3)	12
						<i>C. streptocoelium</i>	25 (1)	25
						<i>F. elongatus</i>	26 (2)	13
						<i>C. cotylophorum</i>	22 (1)	12
Kulu	1,000-3,500	Mar.-Apr. '79; 36 Jul. '79	36	5	13.88	<i>C. indicum</i>	24 (2)	12
						<i>C. papillosum</i>	23 (1)	23
						<i>C. calicophorum</i>	17 (1)	17
						<i>G. crumenifer</i>	28 (4)	7
Nahan	Below 2,000	Jul. '79	16	Nil	—	—	—	—
Lahul and Spiti	2,000-5,000	June '79	79	6	Nil	—	—	—

*The figures in parenthesis refer to the number of hosts harbouring infection of the particular amphistome type.

**Mean intensity refers to the average number of worms per infected host.

relatively warm weather conditions prevail. However, the total absence of any infection of amphistomes in Sirmaur district seems surprising. It would be desirable to examine more animals during different times of the year from this area and also from Lahul and Spiti before the non-occurrence of amphistome infection in these localities is established.

P. epiclitum has been found to be the most widespread species. Its infection, having been recorded from all the districts where any amphistome infection occurred, except Kulu, is followed by *F. elongatus* (from 4 districts), *G. crumenifer* and *C. papillosum* (from 3 districts). Simla region, which exhibited maximum variation in infection with a collection of 14 out of 15 species, also included *P. ichikawai*, *C. tamilensis*, *C. dawesi* and *C. scoliocoelium*, all of which have not been recovered from any other locality in Himachal Pradesh. This is probably because the sheep and goats examined at Simla abattoir represent a mixed population of ruminants including those from the nearby plains also. In Hamirpur and Kulu no overlapping of infection occurred with regard to the amphistome types. In view of this, it would be of interest to study the snail fauna in those regions, since the occurrence of a specific snail species in a particular area would be a determining factor in the distribution of these digenetic flukes.

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