# INCIDENCE AND SEASONAL DISTRIBUTION OF ANOPLOCEPHALID INFECTION IN INTESTINAL TRACT OF SHEEP AND GOATS IN HYDERABAD DIVISION (SIND)

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A total of 1,160 guts of sheep and goats were examined during 1964-65 to find out the incidence and seasonal distribution of various parasitic cestodes in the intestinal tract. Three anoplocephalid genera, viz., *Moniezia*, *Stilesia* and *Avitellina* were found to be most commonly occurring throughout the year. The highest incidence of anoplocephalids was recorded in fall (September-October) and the lowest in late summer (July-August). Environmental conditions which seemed to influence their seasonal incidence, are discussed.

## INTRODUCTION

Studies on anoplocephalid tapeworms presented in this paper comprise a part of the work carried out on the most common helminths infecting the gastro-intestinal tract of sheep and goats in Hyderabad Division. The aim is to make a tentative assessment of their incidence and seasonal distribution. Main abattoir of Hyderabad city receives about 300 animals (sheep and goats) daily which are randomly brought from different parts of the Hyderabad Division. All the observations recorded are confined to this random selection representing the population of sheep and goats of more or less the entire Hyderabad Division.

It is established that sheep and goats have similar host specificity for almost all the gastro-intestinal helminths. Variations in susceptibility and rate of transmission of such infections are effected by multiple factors like environment, nutritional level and genetical characters of the host. Due to lack of practice in scientific animal husbandry, both nutritional level and breed quality are poor under local conditions, which could therefore be held as constant allowing environment to play a dominant role in the epizootiology of parasitic infections. A summary of climate and topography of Hyderabad Division is given with this end in view.

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## CLIMATE AND TOPOGRAPHY

In general Hyderabad Division is hot in summer and comparatively cool in winter. Maximum temperature is reached in May and June with a rapid fall in August. In September and October there is gentle rise in temperature and then a sudden fall again for the winter months of November, December and January. Humidity is maximum in July and August when monsoon brings rain. Skies are generally cloudy during the monsoon and in January and December. Average rainfall in Hyderabad Division rarely exceeds 10 inches (Pithawala, 1959).

Most of the areas of Tharparkar and Sanghar districts in Hyderabad Division are arid and sandy plains. Due to the development of irrigation system some of the areas on the eastern borders of these districts have been brought under cultivation. plains. The climate of these districts is harsh, particularly in summer. Hyderabad and Thatta districts are mostly deltoid, characterized by the presence of lakes (locally called 'dhands'), where the climate is mild due to the influence of sea breeze. Most of the soil in Dadu and Thatta districts is rocky and calcareous. The northwestern areas of these districts adjacent to Kalat Division (Baluchistan) are dry and arid, with traces of palearctic topography.

## MATERIALS AND METHODS

The present study was conducted from October, 1964 to September, 1965. The main slaughter house in Hyderabad city was visited twice a week. During the first month of the study, the work was confined to identification of helminth parasites and their location in the gastro-intestinal tract. To accomplish this, complete intestines were brought to the laboratory for close scrutiny. Bhalerao (1935) and Ransom's (1911) method of transversely cutting the intestine into small portions was found to be hazardous for the cestodes, which might occupy a meter or more of the length of the intestine. In order to obtain the worm intact, a longitudinal cut was first given to a small portion of the intestine and its contents were strained in a basin, and then the cut portion was severed before proceeding further. This proved to be a satisfactory method. After gaining thorough acquaintance with the parasites and their niches, the intestinal contents squeezed out from individual intestines, which were being prepared for commercial use, were examined. A total of 1,160 intestines were examined in this way.

Before being fixed the cestodes were flattened following Megitt's (1924) method. After removing formalin from the specimens, they were preserved in 70% alcohol and then stained in Semichon's carmine solution.

The average age structure of the animals slaughtered daily was as follows.

| *Animal* | *Age in months* | *Percentage* |
|---|---|---|
| Lamb | ⩽ six | 11.2 |
| Sheep | > six | 3.5 |
| Kid | ⩽ six | 22.5 |
| Goat | > six | 62.5 |

## RESULTS

Table 1 and Fig. 1 show monthly changes in the incidence of anoplocephalid worms namely, *Moniezia* spp., *Stilesia* spp., and Avitellina sp. found in the intestine of sheep and goats slaughtered in Hyderabad city main abattoir. A survey of the curves reveal that monthly fluctuations in the incidence of these cestodes is more or less similar. In late summer (July and August), incidence of all the three parasites is the lowest. Past August there is a rather sudden increase and peak of incidence is reached in October in all the three cases. There is a sharp decline in *Avitellina* and *Stilesia* incidence in November and December respectively. After the October peak, a decline in *Moniezia* incidence is gradual and it continues until August. *Stilesia* and *Avitellina* exhibit a similar trend respectively.

It should also be noted that *Stilesia* infection in sheep and goats is greater throughout the year than those of the other two cestodes except in September and October. During these months, *Avitellina* infection is greatest whereas *Moniezia* and *Avitellina* incidence level is more or less the throughout same the year.

It was also observed that generally heavy infection and greater incidence occurred in sheep and goats of younger age group.

Species identified are as follows :

| | | | |
|---|---|---|---|
| 1. | *Moniezia expansa* | Rudolphi, | 1810 |
| 2. | *Moniezia benedeni* | Moniez, | 1879 |
| 3. | *Stilesia globipunctata* | Rivolta, | 1874 |
| 4. | *Stilesia vittata* | Railliet, | 1896 |
| 5. | *Avitellina centripunctata* | Rivolta, | 1874 |

## DISCUSSION

Anoplocephalid tapeworms pass a part of their life-cycle in a number of oribatid mites which live in the soil and on the herbage. The eggs of anoplocephalids after being swallowed by the mite undergo development upto

cysticercoid stage. Further development into adult tapeworm takes place in the small intestine after a sheep or goat happens to swallow the mite while grazing the herbage very close to the soil.

Heavy infection of anoplocephalids in sheep and goats in Hyderabad Division is decidedly related to the presence of a large number of oribatid mites in pastures. In Scotland (Rayski, 1949) and U.S.S.R. (Ershov, 1956) forests, uncultivated old pastures and grasslands carry more oribatid mites than open cultivated lands. Large tracts of wasteland are abundant in the province of Sind. Uncultivated lands around lakes and creeks in Hyderabad Division are favourite habitats for oribatid mites and thus they constitute important foci for the transmission of the anoplocephalids. These areas are regularly visited by migratory herdsmen alongwith their livestock.

The peak of incidence of these anoplocephalids is reached in fall (September-October). This seems to be correlated with favourable conditions brought in the wake of monsoon rains in July and August. During monsoon months, abundant humus and suitable microclimatic conditions favour the propagation of the intermediate host. These conditions also favour development and maximum availability of infective stages of parasites. In temperate regions, the incidence of *Monlezia* spp. is high during May, June and July, reaching a maximum in August (Soulsby, 1965). Mild temperature and relatively high moisture accelerate the rate of transmission in summers. In Hyderabad Division which is climatically tropical, the weather remains hot and dry during early and mid-summer bringing the transmission and consequent incidence at the lowest level until the onset of monsoon rains in late summer (July-August).

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