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**INCIDENCE OF INTERNAL AND EXTERNAL
PARASITES IN SHEEP IN KOVAK VALLEY
(KALAT DISTRICT) UPLAND BALUCHISTAN**

by

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INCIDENCE OF INTERNAL AND EXTERNAL PARASITES IN SHEEP IN
KOVAK VALLEY (KALAT DISTRICT) UPLAND BALUCHISTAN.

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A B S T R A C T

Seven flocks totaling 900 animals were examined for internal and external parasites in Kovak Valley of upland Baluchistan. One hundred percent of the animals were found to be infested with internal parasites. The relative rate of incidence of different parasites was Nematodirus sp. 85.7%, Haemonchus contortus 62.8%, Strongyloides papillosus 48.5%, Trichostrongylus sp. 42.4%, Marshallagia marshalli 41.4%, and Fasciola hepatica 32.8%. The incidence rate for tick infestation (Ixodes ricinus) was 34.5% and for sheep scab (Psoroptes ovis) 22.7%. This level of infestation is likely to be causing substantial losses in the productivity of small ruminants in Kovak Valley.

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I N T R O D U C T I O N

The rangelands of upland Baluchistan Province are located in a diagonal band southwest to northwest between 28 and 31 30 N and between 66 and 70 E. Climatic conditions are variable both in space and time throughout the province. In this rangeland area temperatures are extremely low in winter, with minimum air temperature usually being below freezing at night between December and February. Average rainfall is 200-30mm per annum and a variable proportion of this falls in winter/spring or in summer.

The livestock sector of Baluchistan contributes an estimated 25% of the gross agricultural product of Pakistan. Sheep and goats are the major types of livestock and total 48.3% and 42.3% of all livestock in Baluchistan. Sheep and goat production contributes directly or indirectly to the incomes of about 80% of the population of Baluchistan (Nagy et al., 1987)

Rangelands are the major source of feed for livestock; less than 10% of these livestock receive supplementary feed, which usually consists of lucerne and barley (Nagy et al., 1987). Most of the farmers migrate from temperate regions to subtropical regions of the province during winter in search of feed for their livestock (Ahmad, 1984).

Among various factors responsible for economic losses in the sheep and goat industry, parasitic diseases seem to be of potential importance in Baluchistan. These inflict

losses in the form of lack of thriftiness, retarded growth, anemia and subsequent loss of milk, meat and wool productivity.

The present study was designed to determine the different types of endo-and ecto-parasites prevalent in the sheep flocks of Kovak Valley (Kalat District) and to assess whether further research into anti-parasitic control measures would be justified at this location.

M A T E R I A L S A N D M E T H O D S

The study was carried out in Kovak Valley (Kalat District) of upland Baluchistan located approximately at 29 24 N and 66 45 E in March 1988. Seven flocks totaling 900 Baluchi sheep were randomly selected from fifty flocks which came to receive prophylactic treatment against internal parasites at a mobile veterinary dispensary organized by the Provincial Livestock Department of the Government of Baluchistan in collaboration with the Arid Zone Research Institute (AZRI) Quetta. Most of the animals were between 1-4 years of age. They are not usually given any supplementary feed. Farmers usually migrate from Kovak Valley to the Sibi and Kacchi areas in the periods of acute scarcity of feed for their livestock.

Ten fecal samples were collected from each flock directly from the rectum. The samples were collected in plastic bags and refrigerated overnight. The centrifugal

flotation method, as described by Solsby (1975) was used for the detection of parasite eggs in the feces. In brief, a sample of 5 grams of feces was mixed in 50 ml water and strained through a sieve (1mm mesh) to remove coarse fecal material. The mixture was sedimented for 10-15 minutes until the supernatant was clear. The sediment was then mixed with a saturated solution of zinc sulfate (33%) in a centrifuge tube and centrifuged for 5 minutes at 500 g. The centrifuge tubes were filled to the top and covered with a coverslip for 2-3 minutes. The coverslip was placed on a glass slide for examination under the microscope.

All animals were closely examined for the presence of ticks and sheep scab.

R E S U L T S

CLIMATIC SUMMARY

The 1987-88 season was cold with minimum air temperatures falling as low as -18 C during the months of December and January in upland Baluchistan.

Rainfall in Kovak Valley from November 1986 to June 1987 was 172 mm. In the period from July 1987 to February 1988 a further 53 mm had been recorded.

GASTROINTESTINAL PARASITES

All sheep (one hundred percent) were found to be infected with internal parasites. Each sheep was parasitized with at least one species and as many as six different types of ova were recorded from one animal.

The relative rate of incidence of different parasites is given in Fig.i. Twelve species of parasite were prevalent in Kovak Valley. Among nematodes, *Nematodirus* sp. (85.7%) was found to be most prevalent followed by *Haemonchus contortus* (62.85%), *Strongyloides papillosus* (48.57%), *Trichostrongylus* spp. (42.45%), and *Marshallagia marshalli* (41.47%). Among trematodes, *Fasciola hepatica* (32.85%) and among cestodes, *Moniezia benedeni* (14.28%) and *Avitellina centripulata* (12.85%) were found to be most prevalent in the valley (Table.i).

SHEEP SCAB AND TICK INFESTATION

The rate of incidence of tick infestation and sheep scab is shown in Fig.ii. Approximately 35% of the animals were found infested with *Ixodes ricinus* ticks. The predilection sites for the attachment of ticks were neck, axillary and perineal regions.

About 23% animals had sheep scab caused by *Psoroptes ovis*. The affected animals had loss of wool and matted fleece in the regions of neck, axilla and groin.

The general body condition of all flocks was very poor. They had stunted growth and prominent bone extremities. The

animals with tick infestation had skin injuries because of rubbing the affected areas against hard objects, to obtain relief from the skin irritation from tick activity.

D I S C U S S I O N

INTERNAL PARASITES

Though sheep, like other farm animals, suffer from various infectious and non-infectious diseases, the most serious losses, especially in farm flocks, are often due to internal parasites (Martin, 1983). *Nematodirus* sp. (85.7%), *Haemonchus contortus* (62.85%), *Strongyloides papillosus* (48.57%), *Trichostrongylus* sp. (42.45%), *Marshallagia marshalli* (41.47%) and *Fasciola hepatica* (32.85%) were the major parasites prevalent in Kovak Valley. Durrani *et. al.* (1981) reported the incidence of similar parasites to that found in Kovak, to be 26%, 66%, 40%, 50%, 0% and 35% respectively in the Jhelum valley in Punjab Province.. There was a considerable difference in the rate of incidence of *Nematodirus* sp. and *Marshallagia marshalli* between the two valleys. This may possibly be attributed to differences in environmental conditions. In Jhelum Valley the climate is warmer, being arid sub-tropical. Gray and Kennedy (1981) also reported higher incidence of *Nematodirus* sp., *Haemonchus contortus* and *Strongyloides papillosus* in an arid environment (Fowlers Gap Research Station, New South Wales, Australia). In direct contrast to Haque and Shaikh (1968), Hiregondar (1970) and Shah *et al.* (1980), only 1.4 %

of sheep in the present study were parasitized by *Trichuris globulosa*, is a common problem parasite in the plain areas of the Indian subcontinent.

Fasciola hepatica (liver fluke) is the most important trematode of sheep and can cause great economic losses (Chaudhary *et al.* 1984). The incidence of this parasite was 33% in Kovak Valley and 35% in Jhelum Valley (Durrani *et al.*, 1981) and 50% in Punjab Province (Ajmal, 1982). Thus there is not substantial variation in the reports of liver fluke infestation from different areas of Pakistan.

Little published information is available on the prevalence of *Marshallagia marshalli* in Pakistan. However, it was reported in an Afghan sheep flock in a refugee camp near Peshawar (Yousuf *et al.*, 1984), so it may be surmised that either the parasite is naturally more prevalent in and around the upland Kovak Valley or Kovak sheep are in contact with infected sheep from Afghanistan.

EXTERNAL PARASITES

In general, the productivity of sheep and goats is less reduced by external parasites than by internal parasites. On the other hand, a heavy infestation of the common external parasites may result in severe irritation, restlessness, rubbing, loss of wool and poor body condition.

The timing of the study favoured observation of the incidence of ticks (Martin, 1983). Tick activity is highly dependent on climatic conditions, being negligible during

winter, but rapidly reaching a peak in the spring, with a second smaller peak occurring during autumn.

Although incidence of sheep scab was found to be about 23%, its greater incidence in following months would be expected because of its contagious nature and because of the rapid rate of reproduction of parasites promoting further development of sheep scab. Martin (1983) stated that each female tick can deposit up to 100 eggs and the emerging larvae take only eleven days to develop into fully reproductive individuals. Furthermore, on a full fleeced sheep this rate of increase can occur throughout the summer.

A common feature of internal and external parasitism in sheep is a significant drop in the productivity of the flock. The economic losses to the farmers result from inefficient utilization of feed, slow growth rate, damaged wool, diminished meat and wool production, cost of medication, predisposition to other diseases and finally deaths of the parasite infested animals (Martin, 1983, Chaudhary & Khan, 1978 and Chaudhary et al. 1984).

Proper control and preventive measures are of the utmost importance in the valley for healthy and profitable sheep rearing. It has been shown experimentally that financial returns on funds invested in parasite control could be as high as 1200% (Morris et al., 1977).

It is therefore suggested that from the evidence of Kovak Valley, extensive studies on the prevalence of internal and external parasites should be undertaken in

different seasons throughout the Province. This would help to formulate effective deworming schedules for the different agroecological areas of Baluchistan. Furthermore, there is a need for a comprehensive study assessing the importance of economic losses from parasitic diseases in the ruminant industry of Baluchistan.

A K N O W L E D G E M E N T

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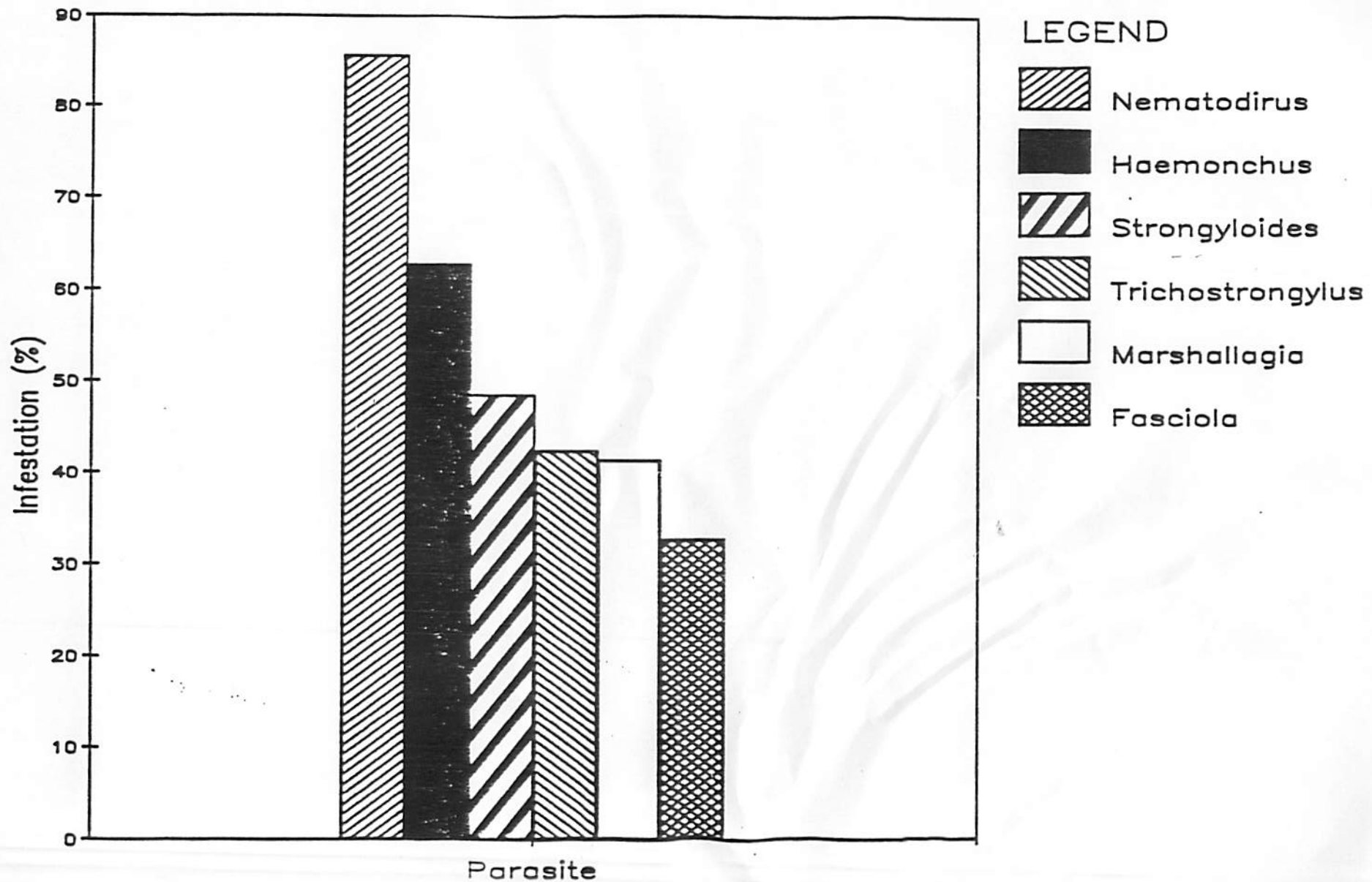
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**TABLE 1: RELATIVE RATE OF INCIDENCE OF DIFFERENT PARASITES
OF SHEEP IN KOVAK VALLEY (KALAT DISTRICT) UPLAND
BALUCHISTAN.**

<u>NAME OF PARASITE</u>	<u>PERCENTAGE OF INFESTATION</u>
NEMATODES	
Nematodirus sp.	85.7
Haemonchus contortus	62.9
Strongyloides papillosus	48.6
Trichostrongylus sp.	42.5
Marshallagia marshalli	41.5
Oesophagostomum sp.	15.7
Ostertagia ostertagi	7.1
Trichuris ovis	2.9
TREMATODES	
Fasciola hepatica	32.9
Chabertia ovina	1.4
CESTODES	
Moniezia benedeni	14.3
Avitellina centripulata	12.9

Figure 1. Relative rate of incidence of major parasites of sheep in Kovak valley.



**FIG.ii. INCIDENCE OF TICK INFESTATION
AND SHEEP SCAB.**

