Introduction
Manipur is situated in the north eastern border of India. The state covers an area of 22,327 sq.kms. of which the hilly region cover about 91.75 %, while the remaining 8.25 % of the total geographical area constitutes the central valley region. It lies between 23° 51'N and 25°41'N latitudes and 93°2'E to 94°47'E longitudes. Generally, two types of climatic conditions are found in this state according to altitude, topography and direction of the prevailing wind system. Tropical monsoon types of climate prevails in the valley area whereas the cool temperate climate prevails in the hilly areas. The average maximum temperature of this state is 31°C, the minimum temperature is 5°C and the rainfall is about 2077 mm per annum. The type of soil found in the hilly area is red, stony, gravelly or heavy soil with a soil pH ranging from 5-6 i.e., acidic in nature and in the plain areas, it ranges from sandy loam to clay loam with soil pH varying from 6.5 - 8.1.

According to 1991 census, the total population of the state is 18,37,149, out of which 9,38,359 are males and 8,98,790 are females. Out of the total population nearly two-thirds are concentrated in the valley proper and about one third is
spread over the surrounding hills. 13,31,504 constitute rural population; while 5,05,645 constitute urban population. Of the total population, scheduled tribes constitute about 6,32,173. The valley is inhabited by various ethnic groups of which Meetei, constitute the main group in the valley proper while the hills are inhabited by as many as 29 tribes, which may be broadly divided into Nagas & Kukis.

Intestinal parasitic infection are distributed throughout the world with high prevalence rates in many region and particularly in the underdeveloped and developing countries. Pathogenic intestinal parasites cause some of the most wide spread diseases of mankind more especially so in a tropical climate. Parasites can affect the human host adversely in many different ways though mainly affecting the nutrition but not uncommonly being the sole cause of many different gastrointestinal symptoms even simulating acute medical catastrophe and surgical emergencies. Of all the various intestinal parasitic infections - ascariasis, amoebiasis, trichuriasis and hookworm infection are among the ten most common infections in the world (WHO, 1987).

Some infections in particular are known to affect the host most adversely than the others. *Ascaris lumbricoides* infection ranks close to malaria in producing malnutrition (Chandler, 1957). Hookworms are known to produce severe anaemia and sometimes produce a severe duodenitis, *Entamoeba histolytica* is responsible for causing diarrhoea, however, their clinical manifestation may range from chronic amoebiasis or acute dysentery to amoebic hepatitis and invasion of skin and other body organs. The pin worm - *Enterobius vermicularis*, although do not cause much pathological effects are responsible for causing physical discomfort including pruritus at the perianal region particularly during the night. In some rare
cases, these pin worm may get accumulated in the appendix, causing obstructive appendicitis in which condition, the removal of appendix is the only resort.

Besides these classical parasites, which are more or less prevalent among the general population, at present, a group of parasites and particularly protozoans, generally referred to as the opportunistic parasites have emerged and these are mainly found to be prevalent among the HIV/AIDS community.

Thus, visualizing the importance of the impact of the gastrointestinal parasites, on the health of the general public, as well as its vital role on the growth and development of people, by & large in the developing countries and particularly in the state of Manipur, the present work has been taken up.


In the north eastern states of India, isolated works are reported by various workers. In Assam, studies were done by investigators like Mahanta & Laskar (1983), Mahanta et al., (1995), Mahanta et al., (1996), etc., in Tripura by Das et al., (1980), in Arunachal Pradesh by Paul et al., (1982), Saha et al., (1993), in Mizoram by Saha et al., (1994). As far as the states of Nagaland & Meghalaya are concerned, up to our knowledge, no published data or paper are available.


The first chapter deals with the prevalence of intestinal parasitic infection in 10 different areas of the Imphal district. During the present study, it has been revealed that the parasites that were prevalent among the general population in these areas included - *Ascaris lumbricoides*, *Enterobius vermicularis*, *Trichuris trichiura* and *Entamoeba histolytica*. In the present study, it was also revealed that in almost all of the areas that were under study, children were the most heavily infected group. During the study, the sexwise distribution of the parasitic infections and statistical analysis were also done.

The second chapter deals with the seasonal prevalence of parasitic infections in the Imphal district of Manipur. During this study, which was spread over two years’ period, it was revealed that, in 1996, *Ascaris lumbricoides* and *Trichuris trichiura* were detected but in 1997, an additional parasite *Enterobius*
vermicularis was recorded. Correlational analysis between these diseases and certain meteorological data was also analyzed.

The third chapter deals with the prevalence of intestinal parasitic infections in the seven districts of Manipur. The study was based on a two years’ hospital analysis. During this study, the parasite prevalence rate observed during 1996 & 1997 were reported and statistical analysis between some common parasitic diseases & certain environmental factors like rainfall, humidity & temperature were also studied.

The fourth chapter deals with the intestinal parasitic infections associated with the HIV/AIDS patients in Manipur. During this study it was revealed that a number of opportunistic and non opportunistic intestinal parasitic infection were observed to be associated with these group of patients. The prevalence of the opportunistic protozoan parasite - Cryptosporidium sp. was more in winter seasons, while less prevalence was observed during summer.

The fifth chapter deals with the variations in the haemoglobin level and the blood groups of the parasite infected patients.

The sixth chapter deals with the epidemiology and symptomatology of some common parasitic infections, which are occasionally encountered amongst the population of Manipur and a comparative study on the prevalence of the various intestinal parasitic infections in the seven north eastern states of India.