CHAPTER - 1

INTRODUCTION
Chapter - 1

INTRODUCTION

The earthworm (*Perionyx excavatus*) belongs to the family Megascolecidae. It is a small, that has an average length of about 1.2 to 2.7 inches, with a deep purple anterior and brown posterior. It has an iridescent blue to violet sheen on its skin for visible in bright light. In the mature *Perionyx excavatus* the clitellum begins from 12th to 17th segment.

The bacterial infections affect humans throughout their life. The infection depends on the nature of microorganisms and their interaction of the cells (O' Cirady *et al*., 1970). Determination of an appropriate treatment for a disease requires both the isolation of the pathogens and determination of susceptibility or resistance to the antibacterial agents. The appropriate antibacterial agent have the following features:

i. Based on activity against the pathogen,

ii. The least toxicity to the host,

iii. The least impact on normal flora,

iv. Appropriate pharmacological characteristics and

v. Most economical drug.

In India so far no work has been done in the coelomic fluid of the earthworm. In the present investigation an attempt has been made to investigate the antibacterial activity in the coelomic fluid of the *Perionyx*
excavates and the coelomic fluid antibacterial activity was compared with the antibiotic amikacin.

In coelomic cavity the cellular functions of innate and adaptive immunity are effected by the different coelomocytes. The coelomic fluid have biologically active molecules and leukocytes which involved in the phagocytosis and encapsulation. It synthesizes and secretes the antibacterial molecules and cytotoxic proteins.

The earthworm possesses a number of highly developed organs and organ-systems for performing various vital functions, such as nutrition, transport and excretion. It possesses a true body or coelom which lies between the body wall and the tubular alimentary canal.

The coelomic fluid communicates with the outer environment, directly by the dorsal pores, which is paired with nephridial tubules. The dorsal pores responsible for the elimination of bacteria and defending themselves from the pathogens and recognizing the degenerated self tissue of the immune mechanisms by the proteins and cellular reaction. The phagocytosis to distinguish the components of the organism and alien substances.

The antibiotic amikacin is an aminoglycoside for treating different types of bacterial infections. It binds to the 30s ribosomal subunit, inhibiting the translocation of the peptidyl - tRNA from the A-site to the P-site and also causing misreading of mRNA, leaving the bacterial cells and to stops the protein synthesis. The most frequent use of amikacin is empiric therapy
for serious infections such as septicemia, complicated intraabdominal infections, complicated urinary tract infections, and nosocomial respiratory tract infections. Amikacin is quite toxic and causes the kidney damage and loss of hearing.

Therefore the present investigation is undertaken with the antibacterial activity in the coelomic fluid of the earthworm in order:

- to collect the pus samples from wound patients and identify the specific pathogens,
- to assess the cellular components of coelomic fluid by staining techniques,
- to determine the disc-diffusion method for coelomic fluid and amikacin against the pathogens,
- to evaluate the minimum inhibitory concentrations of the coelomic fluid and amikacin by tube dilution and microtitre plate methods against the pathogens,
- to find out the minimum inhibitory concentrations of coelomic fluid and amikacin by the agar dilution method,
- to compare the coelomic fluid with amikacin by microtitre plate and agar dilution methods.
- Coelomic fluid proteins were analysed by SDS-PAGE.
The experimental data have been analysed by George and Cochran (1994), the antibacterial activity in the coelomic fluid of the earthworm and the significant research findings are presented in the thesis.