INTRODUCTION

The capacity of microorganism to over produce certain metabolic compounds as a result of sub-normal regulation has been a benevolent happening for the mankind. Such microorganisms represent a very valuable natural biodiversity resource; and are being continually searched for newer biosynthetic potentials among the microbial kingdom. For ages the fermentative microorganisms have been exploited to obtain chemicals and other compounds useful in various
requirements of our modern civilization. In the recent past, some of the microorganisms such as the *Penicillium* and *Streptomyces* had exhibited their biomedicine potential which has revolutionized the modern practice of medical treatment, for pathogenic diseases, through antibiotic therapy.

Cancer is yet another dreaded disease from which a sizable human population suffers. Because of a highly diversified abnormal state of metabolism and cell growth occurring among the different kinds of cancers, their treatment at the generalized or broad spectrum chemotherapy has not so far been possible. Various approaches in the cancer treatment include chemotherapy, radiotherapy, immunotherapy as well as the enzyme therapy. The concept of enzyme therapy, in this regard, is rather an indirect approach since the enzymes used as drugs create difficult or adverse metabolic environment for the survival and proliferation of the cancer tissue in the system.

It has been observed that during the abnormal state of cell growth the normal essentiality of amino acid requirement gets altered. An amino acid, ordinarily, non essential may thus become essential for such cells. Certain tumor cells may lack enzymes that catalyze the synthesis of other
nonessential amino acids. Under normal conditions these differences would also be unapparent because the high concentration of nonessential amino acids in the body fluids would supply their needs. Enzyme therapy that deplete the amino acid would unmask this requirement and selectively kill the tumor cell. This therapeutic strategy depends on the discovery of the hidden amino acid requirement and on the development of suitable amino acid degrading enzymes (Holcenberg 1981).

Studies on amino acid degrading enzymes, for both the essential and nonessential amino acids, represent an important approach in chemotherapy of cancer (Roberts, 1981). The partial success achieved in controlling acute lymphoblastic leukemia and a few other malignant tissues with L-asparaginase therapy in animals and man led to a renewed interest in other amino acid degrading enzymes for the treatment of cancer (Capizzi & Cheng, 1981). Asparaginase is an especially exciting drug because its cytotoxicity is based on a biochemical difference between sensitive and resistant cells. An additional important observation discovered from the experiment with asparaginase was that tumor
cells could have an amino acid requirement that is masked. It has been established that tumour cells develop an increased demand for certain amino acids, and in this respect some of the otherwise nonessential amino acids like the L-glutamine and L-arginine may become essential for these cells (Knox et al., 1969; Weber, 1974; Holcenberg, 1981 and Park et al., 1991). During the last few years, various types of growth inhibitory proteins have also been found in tissue extracts, body fluids and culture media, indicating that negative growth regulators may be involved in the control of cell proliferation (Miyazaki & Horio, 1989). Some of them are recognized as the amino acid metabolizing enzymes like the arginine deaminase which depletes L-arginine and inhibit cell proliferation (Miyazaki et al., 1990). Some of the mammalian arginase enzymes have shown antitumour activity against carcinoma, sarcoma and lymphomas (Holenceberg, 1981; Terayama et al., 1982). Arginase also inhibits virus multiplication (Wildy et al., 1982), and activated macrophages kill tumour cell by releasing arginase in the cellular environment (Currie, 1978). Discovery of new sources capable of producing effective L-
Arginase seem important and imperative in developing a new antitumour drug. With this objective the present study was planned and carried out.