2. Summary

Techniques to maintain and preserve microorganisms have become increasingly important in recent years. It is equally important that the preserved species be available for research and application. Any culture collection has little value if the preserved strains are not well authenticated, tested for desirable characteristics and if not available for distribution. There were no data available on resources, personnel & preservation methods and maintenance of microbial cultures in our universities, research institutes, industries etc. In some institutes microbial cultures are maintained due to enthusiasm of individuals but not as a permanent programme of the institute. Therefore, it was felt that a preserved collection of microbial cultures should be established in the Department of Microbiology, Faculty of Science, University of Kelaniya. As a preliminary step, this was restricted to bacteria of general and industrial importance. This programme was carried out in two parts: (i) isolation & identification of bacteria of general and industrial importance and (ii) establishment of preserved collection of microbial cultures.

Under the first stage of this programme isolation and identification of bacteria of general and industrial importance were carried out selecting six different sources. These six sources were coir retting pits, metal contaminated soil, commercially available mineral water, fruit drinks and soft drinks, various bio-formulations imported to the country, diseased ornamental fish and different types of food samples collected from retail market. The aerobic or facultative anaerobic bacteria were isolated and identified from these sources using standard microbiological techniques and identification of bacteria was based on the morphological, physiological and biochemical characters. Various species of *Chromobacterium, Pseudomonas, Alcaligenes, Micrococcus* and *Bacillus* were isolated and identified from the samples collected from coir retting pits while large number of *Bacillus* species were identified as Zn, Cu and Ni tolerant bacteria.

Aeromonas sp, Aerococcus sp. Staphylococcus sp together with *Bacillus sp.* were present in the commercially available mineral water and fruit drinks. One of the dominant bacterial genera present in the tested bio-formulations was *Bacillus. Vibrio alginolyticus, Plesiomonas shgelloides* and *Cytophaga sp.* were isolated from diseased ornamental fish.

Different types of food samples such as raw meat, sausages, curd, yogurt etc. were tested for Lactic acid bacteria. MRS medium, L-S differential agar & actidion agar were used to isolate lactic acid bacteria. During this study 35 isolates were identified as Lactic acid bacteria; among these isolates, 25 belong to the genus. *Lactobacillus*, 06 represented the genus *Pediococcus* and others belong to genera *Streptococcus & Leuconostoc.*

During the second stage of this project initial steps were taken to preserve the bacterial cultures. The techniques were selected for both short-term preservation and long-term preservation. Continued sub-culturing was selected as short-term preservation technique while Lyophilization was selected as long-term preservation technique. Freeze-drying equipment was purchased for lyophilization and documentation of cultures was also commenced. Approximately 145 bacterial cultures were lyophilized and stored in the collection and all these were documented. Except Lactic acid bacteria the survivability of lyophilized, cultures were very high. Since the growth of Lactic acid bacteria was very poor on all the selected media it was felt that initial lower number of cells might have affected the survivability of these bacteria. This culture collection also provided cultures to some institutes & industries for a nominal fee. Approximately 15 fungal cultures were also preserved and documented during this project period.