

PREFACE

Arid regions harbor a unique variety of bacterial, plant and animal species that are very important in terms of diversity, conservation and biotechnology. Having to tolerate extreme environmental conditions, these species have developed unique adaptation strategies that can be utilized for biotechnology and their conservation poses a serious challenge. Research on plant and animal species from arid environments have received scant attention in most major biotechnology books precisely due to the difficulties in applying biotechnological approaches to their improvements. This book is designed to bring together articles from biotechnology scientists from universities, government research institutes and private sector laboratories as well as policy makers and industry leaders who are interested in exploring biotechnological application of species from arid regions. The articles in this book encompass reviews and current progress and explore potential biotech applications. The contents are divided into three main tracks; each includes topics related to microbes, animals and plants, respectively. The bacterial track focuses on the diversity and adaptation strategies of microbial species under halophilic, thermophilic and desiccation conditions and their wide applications in biotechnology including bioremediation, biofuel production, oil recovery and production of different biomolecules. The animal section includes articles on current attempts to conserve endangered species, stem cell generation, differentiation and cryobanking. The chapters will discuss advancements in human assisted reproductive technologies; emphasize latest research on animals from arid regions such as camels that include reproduction, semen characterization, freezing, IVF and ET. The ethics of using stem cells, tissues and embryos in different religions will be discussed as well. The plant track will include topics such as micropropagation and plant tissue culture, genetic transformation for salinity and stress tolerance as well as the discovery of drugs and secondary metabolites from plants.

This book will provide a platform to acquire the reviews on current state of the art of biotechnology and conservation of species in arid regions and discusses how science in this field can contribute to finding solutions to the challenges we face. Stalwarts in the concerned discipline are identified and are invited to contribute reviews on programmatic topics. The book will benefit scientists with similar interests, research students, regulatory agencies, industry representatives, and public interest groups especially those working with arid environments.

Sardar A. Farooq
Raeid M. M. Abed
Senan Baqir