7. Recommendations and Future Directions

To our knowledge, this is the first study on the microbial diversity of halophilic bacteria in the hill state of Himachal Pradesh. Culturing of microbes and their molecular analysis provides an opportunity to have wide range of cultured microorganisms, from the extreme environments. The microbial diversity of extremophiles can prove to be a valuable future resource in various industrial and biotechnological processes requiring specialised features. Halophilic bacterial isolates of Lunsu soil sediment are potential source of halozymes like proteases, amylases, lipases and L-glutaminase which are capable of functioning under high concentrations of salt. Haloenzyme are also useful for enzyme catalysis in the presence of organic solvents. These enzymes could be commercialized in various industries including food, baking, feed, chemical and pharmaceutical, paper and pulp, detergents. These halophiles can also be explored for bioremediation of saline soils and waters.

The STC isolated from *Halobacillus trueperi* SS1 can be used as source of gene(s) that can increase salt tolerance in different crops through genetic engineering techniques. The salt-tolerance gene (Putative multidrug export ATP binding/permease protein) isolated from *Halobacillus trueperi* SS1 will be used for engineering salt tolerance in agricultural crop plants like rice, the major crop grown in coastal regions suffering salinity stress. Thus, the halophiles isolated from Lunsu water body of Himachal Pradesh offer an important potential for application in microbial, enzyme and agricultural biotechnology.