Chapter - 5

CONCLUSIONS
AND
FUTURE PROSPECTS
Phototrophic purple bacteria are widely distributed in the most of the habitats tested.

Thirty five (35) strains of phototrophic purple nonsulfur bacteria and 24 strains of purple sulfur bacteria were isolated.

Strains of the genus Marichromatium of purple sulfur bacteria, and Rhodobacter and Rhodopseudomonas of purple nonsulfur bacteria could be cultured abundantly from marine and fresh water habitats respectively.

First report of strains of the genera Rhodomicrobium, Blastochloris and Rhodothalassium from India

Eight (8) strains of purple nonsulfur bacteria and 1 strain of purple sulfur bacteria were subjected to detailed characterization using polyphasic taxonomy.

Description of novel species, Rhodobacter maris JA276\textsuperscript{T} sp. nov., Rhodobacter megalophilus JA194\textsuperscript{T} sp. nov., Rhodobacter aestuarii JA296\textsuperscript{T} sp. nov., Blastochloris gulmargensis JA248\textsuperscript{T} and Ectothiorhodospira salini JA430\textsuperscript{T} sp. nov. is validly published.

Description of two novel species, Rhodopseudomonas parapalustris JA310\textsuperscript{T} and Rhodopseudomonas harwoodiae JA531\textsuperscript{T} is under revision.

Geographical mapping of isolates was done.

Most of the strains isolated were preserved by lyophilization, while the 16S rRNA gene sequences are deposited with EMBL.

The type strains are available at DSMZ/ATCC/JCM/KCTC/NBRC/ABRC and are accessible to public.
FUTURE PROSPECTS

Recommendations for utilization of species/strains isolated from the present study

- Metabolic enzymes active at low temperatures can be isolated from the psychrotrophic *Rhodobacter megalophilus* JA194$^\top$ and *Blastochloris gulmargensis* JA248$^\top$ as these species grow well at low temperatures.

- *Rhodobacter megalophilus* JA194$^\top$ is a candidate for carbon sequestration, because it has photoautotrophic growth mode by which inorganic carbon can be fixed during the process of photosynthesis.

- Exopolysaccharides can be extracted from the *Rhodobacter megalophilus* JA194$^\top$ which has a property of high amount of thick slime production.

- *Ectothiorhodospira salini* JA430$^\top$ can be used in treating the polluted aquatic bodies containing H$_2$S, because it can tolerate and grow well by using high concentrations of H$_2$S (6 mM).

- Production of indoles and its derivatives (used for phytohormonal activity) from tryptophan and toxic compounds like aniline was observed in *Rhodobacter maris* JA276$^\top$ and *Rhodobacter aestuarii* JA296$^\top$ (Mujahid et al., 2010).

- *Rhodopseudomonas harwoodiae* JA531$^\top$ can be used for benzoate degradation at even high salt concentrations.

- Apart from the above primary potentials, all the isolated purple bacterial strains can commonly be used to extract carotenoides which can be used as colouring agents and antioxidants. These bacteria are efficient nitrogen fixatures and can be used as biofertilizers. Purple bacteria are also used for waste water treatment and hydrogen photoproduction.