

**Abstract**

Anoxygenic phototrophic bacteria (AnPB) have always fascinated scientists because of their coloration and ability to perform anaerobic anoxygenic photosynthesis. A vast study has been carried out in AnPB for understanding their taxonomy, photosynthesis evolution and also the extraction of different metabolites such as vitamin B<sub>12</sub>, ubiquinone Q<sub>10</sub> etc. Another captivating aspect of AnPB is carotenoids, which are not only responsible for the coloration but also has a major role in light-harvesting, structure and are essential for protection against singlet oxygen and free radicals. In our study, more than 100 purple bacterial strains were isolated from marine habitats of India. Two novel taxa, *Phaeobacterium nitratireducens* AK40<sup>T</sup> gen. nov., sp. nov., and *Rhodovulum mangrovi* AK41<sup>T</sup> sp. nov., were characterized by polyphasic taxonomy, including the identification of carotenoids. There is widely scattered information on carotenoids in literature and databases. Therefore, an attempt has been made to analyze and consolidate the AnPB carotenoid's data. Literature analysis revealed 74 different kind of carotenoids, characterized in 113 species of AnPB. However, carotenoid's characterization are yet to be done in remaining 48 validly published species. Further, carotenoids of entire prokaryotic kingdom have been catalogued at one platform called ProCarDB (Prokaryotic Carotenoid Database) which can be viewed at [bioinfo.imtech.res.in/servers/procardb](http://bioinfo.imtech.res.in/servers/procardb). Literature exploration on carotenoids in AnPB revealed that the carotenoids in purple bacteria share intra-species similarity but may vary among genera. Hence, 9 different genera (11 species) of purple bacteria, including the novel strains, were selected for carotenoid's characterization and were also subjected to antioxidant study. Partially purified carotenoids of the strains *Rhodobacter* sp. DS40 and *Marichromatium* sp. SE31 showed more than 90% quenching of radicals, which is comparable with butylated hydroxytoluene (BHT) standard. Though, carotenoids are known to be very efficient quenchers of free radicals but are susceptible to oxidative degradation upon exposure to oxygen, light and heat, resulting in the loss of their antioxidant activity.