**Supplementary material to “Screening for anti-neoplastic enzyme producing halophilic bacterial extract and their antioxidant activity due to carotenoid synthesis”**

Deepalaxmi Rathakrishnan1, \*Arun Kumar Gopalan2

1&2PG & Research Department of Microbiology, Hindusthan College of Arts and Science, Coimbatore,

Tamil Nadu, India

**\*Corresponding author**

Mailing address: PG & Research Department of Microbiology, Hindusthan College of Arts and Science, Coimbatore, Tamil Nadu, India

Mobile: +919894989909

*E-mail address:* arun0613@gmail.com

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**Fig S1 Phylogenetic tree**



Phylogenetic relationships of both halophilic and halotolerant bacteria isolated from different geographical locations along with their gene accession numbers have been constructed. Based on partial 16S rRNA gene sequences, a phylogenetic tree was generated using the neighbor-joining method using MEGA 11 software, derived from 1,000 resamplings. The bacteria isolated belonged to phylum firmicutes and proteobacteria

**Table S1** *Some molecular structures of carotenoids from LC-MS/MS profile*

|  |  |  |  |
| --- | --- | --- | --- |
| Carotenoids | Molecular formula | Chemical structure | Biological activity |
| Zeaxanthin | C40H5602 |  | Reduces age related macular degenearation, glaucoma and cataracts |
| Neoxanthin | C40H5604 |  | Precursor of phytohormone, Abscisic acid |
| Beta-Carotene | C40H56 |  | Provitamin A supply, correcting growth and sight. |
| Lutein | C40H5602 |  | Light filter, protects eye tissues from sunlight damage. |
| Violaxanthin | C40H5604 |  | Anti-proliferative activity on MCF-7 breast cancer cell lines |
| Astaxanthin | C40H5604 |  | Helps to activate white blood cells, reduces inflammation, protects from UV damage, supports cognitive health. |
| Canthaxanthin | C40H5202 |  | Natural skin tanning agent, prevent liver damage from lipoperoxidation. |

**Image source** : <https://pubchem.ncbi.nlm.nih.gov/compound>

**Table S2***Potential applications of identified compounds using GC-MS analysis*

|  |  |  |  |
| --- | --- | --- | --- |
| **Isolate** | **Compound Name**  | **Potential known Applications** | **References** |
|  | Benzeneethanamine | Neuroprotection | Martin  |
|  | Phthalocyaninato iron | Catalysts in oxidation reaction | Brown |
| AD11 | Thiazolo[4,5-d]pyrimidines | Immune-modulators, Corticotropin Releasing Factor (CRF) receptor antagonists, anti-Parkinson's, anti-oxidant, antiviral, anticancer, antibacterial, antifungal, analgesic, anti-inflammatory agents including COX inhibitors, chemokines antagonists and Fractalkine receptor antagonists, anti-inflammatory and analgesic activities | Kuppast, Blokhina,Singh |
|  | Acetic acid, 2 (2-Phenoxy)-ethyl ester | Anti-inflammatory, Anticancer and analgesic activity | Fokom, Barclay, Nacoba |
|  | Phthalocyanine manganese | Catalyst for water oxidation | Mousazade |
|  | 2-Morpholin-4-yl-1,5-diphenyl-7-p-tolylimino-5- trifluoromethyl-1,5,6,7-tetrahydro- [1,2,4]triazolo[1,5- c]pyrimidine-8-carbonitrile | Antibiotic, Anticancer, Analgesic, Emulsifier, Insecticidal, Fungicide | McGuire |
|  | 1-(2-Benzyloxy-1-phenylethyl)-3,4-piperidinediol | Iminosugar inhibitor |  |
| AD14 | Thiophene, 3-methyl-5-octadecyl-2-pentadecyl  | Anti-inflammatory, Anti-cancer activity, Antimicrobial, Antioxidant | Mishra,Deep, Archna |
|  | 9,10-anthracenedione, 1-amino-4-[(9,10-dihydro- 9,10-dioxo-1-anthracenyl)amino] | Anticancer | Zhang, Hua, |
|  | Pyridine-3-carboxamide, 4-methoxy-N-(3,5- dichlorophenyl) | Anti-inflammatory,Anticancer, Anti Irritant, Collagen reducer, Food additive | Coban |
|  | Benzenaminium, 4-carboxy-N,N,N-trimethyl-, hydroxide, inner salt | Anticancer activity | Fadda |
|  | 2-Methyl-4-phenoxy-5,6-diphenyl-2H-pyridazin-3- one | Anti-feedant, Neuroprotective | Gevorkyan |
| AD23 | Glutaric acid, 2-methylpent-3-yl 2,2,3,4,4,4- hexafluorobutyl ester | Cognition enhancing, Polymer production | Marques |
|  | Estra-1,3,5(10)-trien-17-one, 2,3,4- tris[(trimethylsilyl)oxy] | Anti-Cancer activity | Maltais |
|  | N-Methyl-N-{4-[4-(4-nitro-1,2,5-oxadiazol-3-yl)- 1,2,5-oxadiazol-3-yl]-1,2,5-oxadiazol-3- yl}acetamide | Pesticidal, Pharmaceuticals, Antioxidant | Caruso,Dhanasekaran |
|  | l-Proline, n-heptafluorobutyryl-, isobutyl ester | Anti-Pneumonial, anti-aging | Kaul |
|  | Silane, dimethyl(4-phenylphenoxy)heptadecyloxy | Dental applications | Lung |
| AD28 | Silane, diethylhexadecyloxypentadecyloxy | Dental applications | Matinlinna,Nihei |
|  | 4-Methyl-2,4-bis(p-hydroxyphenyl)pent-1-ene, 2TMS derivative | Estrogenic activity, Hepatocellular carcinoma biomarkers | Bannaga, Stavropoulos |
|  | Phthalazine 1-phenyl | AntiCancer, Anti-cholinesterases, Anti- Alzheimer’s, Antiangiogenic  | El-Helby,Eckroat, El-Sayed |

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