OPEN ACCESS Freely available online

ISSN: 2327-5073
Clinical Microbiology: Open Access

Commentary

Aurantiochytrium Species SC145 and its Antimicrobial Capabilities

Jan Zin*

Department of Microbiology, University Hospital of Heraklion, Heraklion, Greece

DESCRIPTION

Microorganisms have long been a source of bioactive compounds with diverse therapeutic potentials. Among them, *Aurantiochytrium* species SC145, a marine protist, has gained significant attention for its unique attributes and antimicrobial activities. This article explores the characteristics of *Aurantiochytrium* species SC145 and highlights its antimicrobial potential, shedding light on its promising role in biomedical applications.

Aurantiochytrium species SC145 is a member of the *Thraustochytriaceae* family, characterized by its ability to produce high levels of Docosahexaenoic Acid (DHA), an omega-3 Polyunsaturated Fatty Acid (PUFA). It is a heterotrophic microorganism that can utilize various organic carbon sources for growth, including sugars, alcohols, and hydrocarbons. Its growth conditions can be easily manipulated, making it an attractive candidate for large-scale cultivation.

Extensively explored *Aurantiochytrium* species SC145 for its potential to produce bioactive compounds with antimicrobial properties. The microorganism synthesizes a diverse range of secondary metabolites, including Polyunsaturated Fatty Acids (PUFAs), pigments, sterols, and polysaccharides. The extraction of these bioactive compounds is typically achieved through solvent extraction, solid-phase extraction, or supercritical fluid extraction.

Aurantiochytrium species SC145 has demonstrated significant antibacterial activity against various pathogenic bacteria. Studies have shown inhibitory effects against both Gram-positive and Gram-negative bacteria, including multidrug-resistant strains such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*. The antibacterial activity is attributed to the presence of bioactive compounds, including PUFAs and other metabolites.

Aurantiochytrium sp. SC145 has also exhibited antifungal properties against a wide range of fungal pathogens. *Candida albicans*, a common human fungal pathogen, has been one of the main targets of investigation. The microorganism has shown inhibitory effects on *Candida* species, including both planktonic cells and biofilm formation, suggesting its potential as an alternative or adjunct therapy for fungal infections.

The antimicrobial mechanisms of *Aurantiochytrium* species SC145 and its bioactive compounds are still under investigation. However, several proposed mechanisms have been postulated: PUFAs present in *Aurantiochytrium* sp. SC145 may disrupt the integrity of bacterial and fungal cell membranes, leading to leakage of intracellular components and subsequent cell death.

Quorum sensing is a significant communication system used by bacteria to coordinate virulence factors and biofilm formation. Some bioactive compounds from *Aurantiochytrium* species SC145 may interfere with quorum sensing, inhibiting bacterial pathogenicity and biofilm development.

Aurantiochytrium species SC145 compounds have shown immunomodulatory effects, enhancing the host immune response against microbial pathogens. This modulation may contribute to the overall antimicrobial activity of the microorganism.

The antimicrobial properties of *Aurantiochytrium* species SC145 and its bioactive compounds open up exciting prospects for various biomedical applications: The bioactive compounds derived from *Aurantiochytrium* sp. SC145 can serve as lead compounds for the development of novel antimicrobial drugs. Their unique mechanisms of action may help combat the emergence of antibiotic-resistant bacteria and fungi.

Aurantiochytrium species SC145 is a rich source of DHA, a valuable omega-3 fatty acid with numerous health benefits. The incorporation of *Aurantiochytrium* species SC145-derived bioactive compounds into functional foods and nutraceuticals can offer enhanced antimicrobial and nutritional value. The ability of *Aurantiochytrium* sp. SC145 to degrade hydrocarbons and utilize diverse carbon sources makes it a potential candidate for bioremediation applications. Its antimicrobial properties can aid in the cleanup of oil spills and contaminated environments.

Aurantiochytrium species SC145, with its unique characteristics and antimicrobial activities, holds great promise for biomedical

Correspondence to: Jan Zin, Department of Microbiology, University Hospital of Heraklion, Heraklion, Greece, E-mail: janzin@gmail.com

Received: 29-May-2023, Manuscript No. CMO-23-21942; **Editor assigned:** 01-Jun-2023, Pre QC No. CMO-23-21942(PQ); **Reviewed:** 16-Jun-2023, QC No. CMO-23-21942; **Revised:** 22-Jun-2023, Manuscript No. CMO-23-21942(R); **Published:** 30-Jun-2023, DOI: 10.35248/2327-5073.23.12.345.

Citation: Zin J (2023) *Aurantiochytrium* Species SC145 and its Antimicrobial Capabilities. Clin Microbiol. 12:345.

applications. Its ability to produce bioactive compounds, including PUFAs and other metabolites, opens up avenues for drug development, nutraceutical formulations, and bioremediation strategies. Exploration of this microorganism are warranted to fully harness its potential and pave the way for innovative solutions in combating microbial infections and environmental challenges.