

Finding valuable biologically active compounds among marine plants for developing effective antiviral treatments

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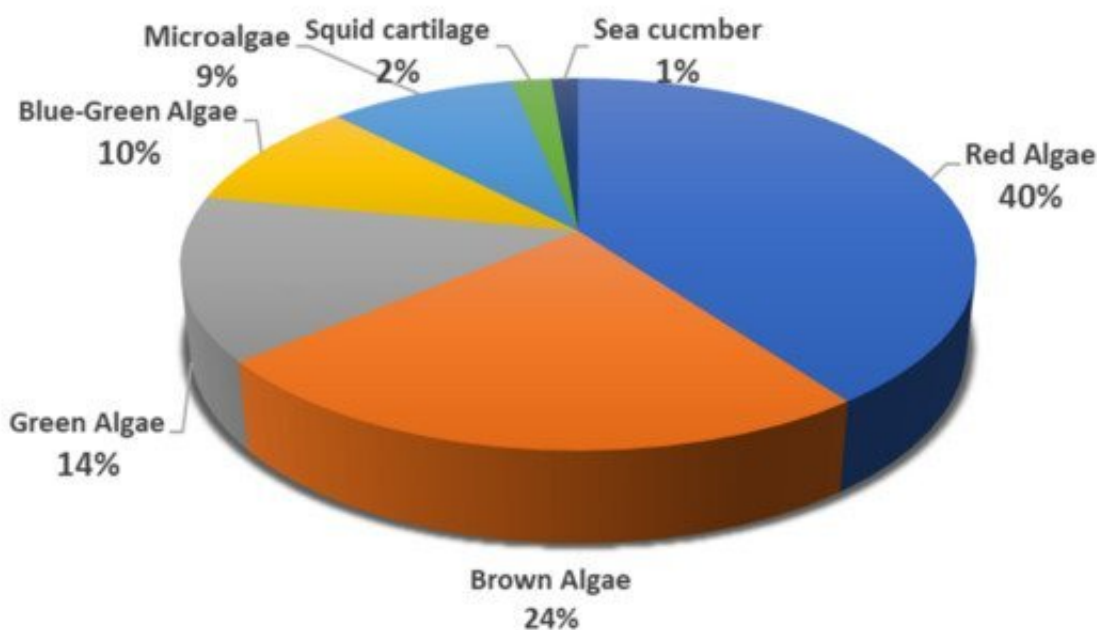


Figure 1. The systematic study of marine sources of MSPs that have shown antiviral activities in the last 25 years. Credit: DOI: 10.3390/md19080406

New antiviral drugs—including COVID treatments—could be developed from previously overlooked substances found in marine plants, University of the West of Scotland (UWS) research has suggested.

The study looked at a set of [substances](#) called marine sulfated

polysaccharides—a type of carbohydrate that contains sulfur—mainly found in the cell walls of marine algae or seaweeds. It revealed nine of the substances examined show promising results against COVID, with five of the substances never reported as effective before.

Finding valuable biologically active compounds among marine plants shines considerable light on the important role that [marine life](#) could play in developing effective antiviral treatments, and a vast amount of these ecosystems are still being discovered.

Professor Milan Radosavljevic, vice-principal of research, innovation and engagement at UWS, said: "Despite the advancement of vaccines as a protective measure, the emergence of newly evolved strains of COVID mean that its threat to public health continues, so finding other suitable treatments remains a priority.

"This is a very exciting discovery and shows great potential for these substances to be developed into effective medicines.

"This study highlights our internationally-renowned research expertise, and I am proud of the commitment from our academics and their research students to find solutions to some of the world's most urgent issues."

Abdalla Mohamedsalih, a Ph.D. student in the University's School of Computing, Engineering and Physical Sciences, added: "I'm pleased to be involved in this research, which shows extremely positive results for the future development of antiviral drugs.

"Scientists often look to nature as a potential source for new [drug](#) discoveries: for example, the natural environment provided us with penicillin—the first naturally occurring antibiotic to be used therapeutically. Thanks to the development of this drug, various diseases

caused by bacteria ceased to be life-threatening.

"I look forward to continuing this research, as we seek to find effective treatments for COVID."

Researchers at UWS looked at past research papers, spanning 25 years, and focussed on those that mentioned marine plant substances having some effect against different viruses. A shortlist was developed, with 45 substances showing potential antiviral effects: these shortlisted substances came from various marine sources, including different types of algae, microalgae, sea cucumbers, and squid cartilage.

Computer-generated versions of these molecules were developed, together with the spike protein—which covers the outside of the coronavirus—and, using these computer models, researchers simulated how well each substance would bind to the spike protein. Using [computer simulations](#) to test binding is known as molecular docking and is widely used by scientists.

Of the shortlist, nine substances showed real promise as avenues for future development of therapeutic drugs.

Dr. Mostafa Rateb, Lecturer in UWS's School of Computing, Engineering and Physical Sciences, said: "Although the ocean has been looked to as a source for biologically active materials for many years, the marine environment is still largely under-investigated as far as medicines are concerned."

"Effective new antiviral drugs are critically needed for treating a wide range of diseases, including COVID, which continues to be a threat globally."

"This is a very interesting discovery and I look forward to seeing where

these initial findings lead."

Finding new medicines suitable for the [treatment](#) of COVID and other viruses remains a priority for scientists worldwide, who are striving to develop drugs that target life-threatening viruses and stop them from developing in the body. So far, limited options are available for the treatment of COVID, with only a handful of existing medicines approved for use against the disease; therefore, finding other suitable treatments remains a focus.

Although further experimental studies are required, initial findings show promise that [marine plants](#) have great potential for use as COVID inhibitors.

More information: Abdalla E. M. Salih et al, Marine Sulfated Polysaccharides as Promising Antiviral Agents: A Comprehensive Report and Modeling Study Focusing on SARS CoV-2, *Marine Drugs* (2021). [DOI: 10.3390/md19080406](https://doi.org/10.3390/md19080406)

Provided by University of the West of Scotland

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