

PREFACE

Sea vegetables are rich in soluble dietary fibers, proteins, minerals, vitamins, antioxidants, phytochemicals, and polyunsaturated fatty acids, with low caloric value. Polysaccharides from sea vegetables have been reported to possess biological activities with potential medicinal values in addition to their current status as a source of dietary fibers and prebiotics. Generally, sea vegetables are used as gelling agent and stabilizers in the food and pharmaceutical industries, but current research has proved their potential medicinal value against various diseases such as allergy, cancer, diabetes, hypertension, oxidative stress, inflammation, thrombosis, obesity, lipidemia, and other degenerative disorders. The human consumption of algal fiber promotes the growth and protection of the beneficial intestinal flora, greatly increases stool volume, and reduces the risk of colon cancer. Moreover, phytochemicals produced by algal species may potentially be bioactive compounds of interests in the food and nutraceutical industries. Thus, the value of sea vegetables as a new functional and health ingredient is gaining popularity. Further, they have the potential to provide the cosmetics and food market with valuable biomolecules such as highly unsaturated fatty acids, tannins, carotenoids, and sulfated polysaccharides. Hence, a large numbers of sea vegetable bioactives have been identified with potential uses in various areas including functional food, pharmaceutical, and cosmeceutical.

Sea vegetables are lower plants living attached to rocks or sand, contain pigments such as green chlorophyll, yellow carotenoids, and red phycobilins, and are classified as green, red, and brown algae depending on the pigments. Edible sea vegetables consist of 0.4% of green algae, 33% of red algae, and 66.5% of brown algae and are consumed primarily in East Asian countries including South Korea, Japan, and China. Sea vegetables are the most consumed food ingredient in South Korea and Japan occupying 75% and 45%, respectively of each country's whole sea vegetable consumption. Sea vegetables that have ash content of 25% are alkaline food containing rich minerals such as calcium, potassium, phosphorous, copper, manganese, iron, iodine, etc. Recent research in natural products chemistry reveals a vast abundance of marine organisms, macro and micro, that contain novel compounds of interest to human health and industry. Among the marine organisms, marine macroalgae represent one of the richest sources of natural antioxidants and antimicrobials. They are also an excellent source of vitamins such as A, B1, B12, C, D, and E;

riboflavin; niacin; pantothenic acid; and folic acid as well as minerals such as Ca, P, Na, K, and I.

Dried organisms consist of 32–60% water soluble carbohydrates and 4–12% fiber, and when decomposing sticky viscous substances, they produce glucose and fructose. Moreover, they have lot of dietary fiber to lower blood cholesterol that they are effective in preventing hypertension, heart disease, arteriosclerosis, and iodine that improves metabolism—the smooth vascular and cardiac action, the body temperature and perspiration regulation.

This book is completed with the help of many invaluable contributors around the world. Therefore, I would like to thank them all for their valuable time and effort invested in this book. This book is an attempt to describe the present and future prospects of marine algae as medicinal food as the remedies containing natural ingredients from marine algae goes back to the ancient era. This book describes the nutritional elements, special ingredients (secondary metabolites), and biological activities centering around the reported information on marine algae may help to the personnel in academia and also for general public. This volume covers the use of marine algal based materials in terms of human health and personal care. Since the synthetically derived materials show some side effects, huge attention from general public and academia on the products from natural-based materials including marine macro- and microalgae has been gained due to their prominent biological activities and abundance. Hence, this book discusses the importance of biologically active compounds from algae under four sections.

The first section, which includes Chapters 1 and 2, familiarizes the readers with the prospects of marine-derived foods in relation to medicinal value. It covers the present and future prospects of marine algae. Second section (Chapters 3–16) looks at the medicinal foods from variety of marine sources. Individual chapters cover the importance and values of some frequently use marine algal species. The third section, containing Chapters 17–24 covers the biological implications of marine algae. Finally, the fourth section, containing Chapters 25–34, discusses the applications of marine algae-derived materials in medicinal and nutraceutical industries in relation to human health.

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