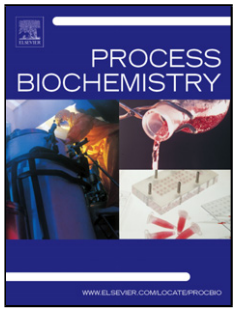

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Production of newfound alkaline phosphatases from marine organisms with potential functions and industrial applications

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Highlights

- A review on alkaline phosphatase enzymes from marine organisms.
- Kinetic and thermodynamic properties of marine alkaline phosphatase enzymes.
- Different purification procedures to isolate marine alkaline phosphatase enzymes.
- Potential applications of marine alkaline phosphatase enzymes and their biochemical activities.

Abstract

The oceans have been shown as an almost entire reserve of novel enzymes. Alkaline phosphatase (AP) is a key-enzyme in the marine environment. This review provides an account of the alkaline phosphatase production of marine organisms and is based on reports of different species of marine origin, from primitive bacteria to vertebrates such as fishes. Purification and enzymatic characterization, investigation of activators and inhibitors, use as biosensor based inhibition activities, ecological roles in sea, and eventually potential application of alkaline phosphatase from different species of marine organisms are overviewed. Recent biotechnological progresses require the researches of new enzymes from marine resources that can be used for various applications. Marine enzyme resources might be of great interest for biotechnological processes because of their safety accompanied with natural origin. The specific features presented by marine enzymes can be advantageously used both for process improvement or to develop new processes and products. This review highlights the potential of marine organism as valuable resources of AP. The overview of AP in different marine organisms showed its use in various fields among biotechnology being increased and can be promising candidate in future.

Keywords: Marine enzymes resources; Alkaline phosphatase; Biochemical features; Potential biotechnological applications

1. Introduction

The importance of enzymes in modern biotechnology and molecular biology has made them a popular subjects for scientific studies and commercial utilities [1-6]. The oceans as aquatic ecosystems that cover 71% of the surface of the earth, contains multiple enzymes sources from plant, animal, bacterial and fungi classes [7-12]. The enzymes contained in marine organisms compared to terrestrial organisms may be found in any terrestrial organisms or appear with a new feature [11, 13-16].