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Studies on rice bran lipase to investigate its potential to use as an additive in detergent formulation

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Rice bran lipase which has shown its potential to remove lipid stains in laundry cleaning was further characterized to evaluate its potential for use as an additive in detergent formulation. Its stability in alkaline pH was tested for two hours. The enzyme retained 95% residual activity up to 1 ½ hours in the range of pH 8 – 10. Studies of its hydrolytic activity towards different fats and oils indicated that the enzyme possesses variable hydrolytic activity for a wide range of vegetable and animal fats and oils. The highest hydrolytic activity was seen with soybean oil. Lipolytic activity towards sunflower oil and olive oil is higher compared to that in coconut oil and butter. Studies with divalent cations such as Ca²⁺ and Mg²⁺ showed that the enzyme possesses a higher stability towards these divalent cations even up to 0.4% concentration. Since the surfactants are part of the detergent activity, the activity of the enzyme in the presence of different surfactants such as Tween 80, Tween 20 and sodium dodecyl sulphate (SDS) was investigated. Surfactants such as Tween 80 and Tween 20 showed increasing activity up to 0.1% concentration and beyond that the level of enzyme activity remains constant. Experiments with SDS indicated that the activity of the enzyme remained constant up to the 2.5% level and above that enzyme activity declined. These properties of the enzyme, resistance towards divalent cations and tolerance towards surfactants indicated that the enzyme is a suitable candidate as an additive in detergent formulation.

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