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Isolation and molecular identification of lipase-producing yeasts isolated from natural sources

Labrani Fatima-Zohra Kenza^{1*}, Daffri Amel², Azzoug Radia¹, Kerboua Fayçal¹

¹Assia Djebar Teachers Training School of Constantine, University Town Ali Mendjeli, Constantine 25000, Algeria

²Department of Microbiology, Faculty of Natural and Life Sciences, University of Frères Mentouri Constantine 1, Algeria

* labrani.fatimazohra@ensc.dz

Abstract

Microbial lipases (EC 3.1.1.3) catalyze the hydrolysis of long chain triglycerides. The microbial origins of lipase enzymes are logically dynamic and proficient also have an extensive range of industrial uses with the manufacturing of altered molecules. Yeasts have been used for the production of lipases, due to advantages like wider substrate range, lower sensitivity to low dissolved oxygen concentrations and heavy metals, higher product yield, rapid growth and ease of genetic manipulation. Hence, it is important to isolate yeast strains that produce lipolytic enzymes of potential biotechnological interest. Being sugar-loving microorganisms, they are usually isolated from sugar rich materials. Yeasts from this environment may yield valuable products such as extracellular hydrolytic enzymes.

In this study, 29 yeasts strains were isolated from peel samples of sugar-containing crops including apples, oranges and beets, purchased from local markets in Constantine (Algeria). The isolates were also subjected to morphological, physiological and biochemical studies (phenotypic studies) as well as to D1/D2 26S ribosomal RNA gene (D1/D2 26S rRNA) sequencing.

The potential lipolytic yeasts was assayed on tween 80 agar which has been previously proved as a rapid method for estimating of lipase production. The plates were incubated at 25°C for 5 days. Among the isolated strains, four of them (A4, A5, B1 and O5) have the ability to produce lipolytic activity. These strains were identified as members of the species *Areobasidium pullulans*, *Vishniacozyma tephrensensis* and *Rhodotorula diobovata*. To our knowledge, this is the first report of lipolytic yeasts associated with peels of apple, beet and orange in Algeria. In addition, no report has been published on lipase production by *R. diobovata* and *V. tephrensensis*. Thus, our isolates of *R. diobovata* and *V. tephrensensis* could be assumed as the new lipolytic yeasts.

In conclusion, our study demonstrated the potential for yeast isolated from fruit and beet peels as sources for enzymes of biotechnological interest and will add importance in the field of enzyme technology for the lipase production.

Keywords: Yeast isolation, Fruit peels, Beet peels, Lipase, Biotechnological interest.