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Title: Importance of the methyl-citrate cycle on glycerol metabolism in the yeast *Yarrowia lipolytica***Author(s):** Papanikolaou, S (Papanikolaou, Seraphim); Beopoulos, A (Beopoulos, Athanasios); Koletti, A (Koletti, Anna); Thevenieau, F (Thevenieau, France); Koutinas, AA (Koutinas, Apostolis A.); Nicaud, JM (Nicaud, Jean-Marc); Aggelis, G (Aggelis, George)**Source:** JOURNAL OF BIOTECHNOLOGY **Volume:** 168 **Issue:** 4 **Pages:** 303-314 **DOI:** 10.1016/j.jbiotec.2013.10.025 **Published:** DEC 2013**Times Cited in Web of Science Core Collection:** 26**Total Times Cited:** 27**Usage Count (Last 180 days):** 1**Usage Count (Since 2013):** 29**Cited Reference Count:** 56

Abstract: A novel approach to trigger lipid accumulation and/or citrate production in vivo through the inactivation of the 2-methyl-citrate dehydratase in *Yarrowia lipolytica* was developed. In nitrogen-limited cultures with biodiesel-derived glycerol utilized as substrate, the Delta phd1 mutant (JMY1203) produced 57.7 g/L of total citrate, 1.6-fold more than the wild-type strain, with a concomitant glycerol to citrate yield of 0.91 g/g. Storage lipid in cells increased at the early growth stages, suggesting that inactivation of the 2-methyl-citrate dehydratase would mimic nitrogen limitation. Thus, a trial of JMY1203 strain was performed with glycerol under nitrogen-excess conditions. Compared with the equivalent nitrogen-limited culture, significant quantities of lipid (up to similar to 31% w/w in dry weight, 1.6-fold higher than the nitrogen-limited experiment) were produced. Also, non-negligible quantities of citric acid (up to similar to 26 g/L, though 0.57-fold lower than the nitrogen-limited experiment) were produced, despite remarkable nitrogen presence into the medium, indicating the construction of phenotype that constitutively accumulated lipid and secreted citrate in *Y. lipolytica* during growth on waste glycerol utilized as substrate. (C) 2013 Elsevier B.V. All rights reserved.

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