Functional Foods in Health and Disease **2012, 2(10):369-378**

Research Article **Open Access**

Optimization of an effective growth medium for culturing probiotic bacteria for applications in strict vegetarian food products

[1]Manju Pathak and [2,3]Danik Martirosyan

[1]Amity Institute of Biotechnology, Amity University, Sector-125, Noida, India; [2]Functional Food Center Inc., Richardson, TX 75080, USA; Department of Internal medicine, UT Southwestern Medical Center, Dallas, TX 75390, USA

Corresponding Author: Manju Pathak, Amity Institute of Biotechnology, Amity University, Sector-125, Noida, India

Submission date: July 24, 2012, Acceptance date: October 26, 2012; Publication date: October 30, 2012

ABSTRACT

Background: This study aimed to modify de Man Rogosa Sharpe culture medium (termed MRS) for selective cultivation of probiotics strain for the consumption by the strictly vegetarian human population. Vegetarian probiotic foods by definition must be free from all animal-derived ingredients. This not only includes the product ingredients but the probiotic inoculum as well. Probiotic starter cultures are traditionally grown and stored in media containing milk or meat-derived ingredients. The presence of these ingredients makes the probiotic cell concentrates unsuitable for use in vegetarian products and thus creates the need for a growth medium which is free from animal-derived ingredients. Present study investigated the growth of a strain of Lactobacillus lactis *in MRS.* The present invention relates in general to a bacterial culture media, and more specifically a complex microbial culture media, based on plant seed powder extract in place of animal extract for probiotic bacterial growth.

Methods: Lactobacillus lactis, a probiotic, was grown in standard MRS culture medium as well as in our various test media (TM) containing various vegetal source in place of beef extract, yeast extract and peptone as in case of MRS. The inoculated culture mediums were incubated at 37°C for 72 hours and growth of probiotic is recorded at regular intervals. The growth was recorded as Colony Forming Units (CFUs).

Results: The best growth of probiotic is observed in TM 2. TM 2 is the leguminous seed extract. Starter culture mediums for probiotics or other bacteria primarily contain protein from animal source. The possibility of using vegetal protein from TM 2 extract in place of peptones and meat extract for the nitrogen supplementation of culture media for the growth of lactic acid bacteria has been demonstrated.

Conclusion: The absolute vegetarian culture medium containing TM 2 is better than standard MRS for the growth of probiotics.

Abbreviations: de Man Rogosa Sharpe (MRS), Colony Forming Units (CFU), test media (TM), National Dairy Research Institute (NDRI), Tamarind seed powder (TSP), solid-state fermentation (SSF), Lactobacillus casei Shirota (LcS)

Keywords: probiotics, lactic acid bacteria, vegetarian.