EFFECTS OF COOKED OIL ON BIOCONVERSION OF KITCHEN WASTE BY HOUSEFLY LARVAE

Haofeng Gao¹, Xiaoxian Fan², Wanyi Wang², Wenna Long¹, Nan Hu¹∗

¹College of Biotechnology and Pharmaceutical Engineering, Nanjing Tech University, Nanjing, Jiangsu 211816, China
²School of Chemistry and Molecular Biosciences, The University of Queensland, Brisbane 4072, Australia

Abstract

Housefly larvae can bioconvert organic wastes to produce sustainable proteins. This study investigated the effect of the cooked oil as a part of kitchen waste on the growth of housefly larvae and the microbial community structure in the rearing residue. After adding 2% (W/W) oil to the substrate, housefly larvae exhibited the highest bioconversion (14.91%) and substrate consumption rate (40.82%), with the highest reduction rate of ~ 52.39% and ~ 70.46% for total organic carbon (TOC) and total nitrogen (TN), respectively. With the increase of oil concentration, the larval crude fat content and crude protein content showed an increase and decrease, respectively, coupled with a slight increase in the ratio of oleate acid (C18:1) and linoleate acid (C18:2) among fatty acids. Additionally, an increase and decrease were also found in the relative abundance of phylum Proteobacteria and Bacteroidota, respectively, with the presumable migration of most of the microbes from larval gut to residue, and the possible colonization of Helcococcus and Globicatella from the environment.

Key words: bioconversion, cooked oil, housefly larvae, kitchen waste, microbial community structure

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∗ Author to whom all correspondence should be addressed: e-mail: hunan@njtech.edu.cn; Phone: +86 15996496923