Kajian keanekaragaman bakteri asam laktat di sayur asin (sawi fermentasi) brassica juncea l czern secara molekuler = Study on diversity of lactic acid bacteria in sayur asin fermented mustard brassica juncea l czern based on molecular approaches

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Abstrak

Sayur asin umumnya dikenal sebagai produk fermentasi spontan sawi pahit, Brassica juncea (L.) Czern., oleh bakteri asam laktat (BAL) epifit di Indonesia, khususnya di Jawa. Informasi keanekaragaman BAL di sayur asin lokal Indonesia masih sangat terbatas, oleh karena itu perlu dilakukan penelitian lebih lanjut. Penelitian dilakukan untuk mengetahui keanekaragaman BAL di sayur asin lokal Indonesia. Telah dilakukan isolasi dan identifikasi BAL dari sebelas sampel sayur asin diperoleh dari Tulung Agung, Kediri, Solo,Yogyakarta, Kota Semarang dan Depok. BAL diisolasi dari sayur asin dan larutan fermentasi. Identifikasi BAL dilakukan secara molekuler berdasarkan sekuen 16S rDNA. Sebanyak 631 isolat BAL telah berhasil diisolasi dan diidentifikasi. Hasil identifikasi menunjukkan 20 spesies BAL yang telah diketahui namanya yaitu Lactobacilus farciminis (90 isolat), L. fermentum (106 isolat), L. namurensis (48 isolat), L. plantarum (309 isolat), L. paralimentarius (4 isolat), L. parafarraginis (1 isolat), L. nodensis (1 isolat), L. tucceti (11 isolat), L. acidophilus (1 isolat), L. helveticus (2 isolat), L. brevis (4 isolat), L. parabrevis (3 isolat), L. futsaii (11 isolat), L. versmoldensis (4 isolat), L. coryniformis (16 isolat), L. casei (12 isolat), L. rhamnosus (2 isolat), L. fabifermentans (3 isolat), L. satsumensis (1 isolat), L. zymae (1 isolat) dan 1 kandidat spesies baru Lactobacillus sp. B4 (1 isolat) secara genetik dekat dengan L. composti. Hasil identifikasi menunjukkan keanekaragaman BAL di sayur asin asal Jawa Indonesia cukup tinggi. Analisis intraspesies pada spesies dominan L. plantarum dan L. fermentum asal sayur asin menggunakan tiga teknik molekuler restriction fragment length polymorphism (RFLP) 16S-23S rDNA intergenic spacer region (ISR), random amplified polymorphic DNA-polymerase chain reaction (RAPD-PCR) dan enterobacterial repetitive intergenic consensus (ERIC-PCR) menunjukkan terdapat tiga kelompok genotip L. plantarum dan dua kelompok genotip L. fermentum asal sayur asin.

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Sayur asin is commonly known as a spontaneous fermented mustard Brassica juncea (L.) Czern product by epiphytic lactic acid bacteria (LAB) in Indonesia, in particular Java. The information on LAB diversity in Indonesia was obviously limited. More investigation is required. Therefore, effort on inventory of LAB from sayur asin in Indonesia was carried out to determine its diversity. LAB diversity in eleven samples of sayur asin collected from Tulung Agung, Kediri, Solo, Yogyakarta, Kota Semarang and Depok was studied. LAB was isolated from both of fermented mustards and fermenting liquors. Molecular identification of the isolates was conducted based on 16S rDNA sequence data. A total of 631 isolates of LAB was successfully isolated and identified. The bacteria belong to 20 known species viz, Lactobacilus farciminis (90 isolates), L. fermentum (106 isolates), L. namurensis (48 isolates), L. plantarum (309 isolates), L. paralimentarius (4 isolates), L. parafarraginis (1 isolate), L. nodensis (1 isolate), L. tucceti (11 isolates), L. acidophilus (1 isolate), L. helveticus (2 isolates), L. brevis (4 isolates), L. parabrevis (3 isolates), L. futsaii (11 isolates), L. versmoldensis (4 isolates), L. coryniformis (16 isolates), L. casei (12 isolates), L. rhamnosus (2 isolates), L.

fabifermentans (3 isolates), L. satsumensis (1 isolate), L. zymae (1 isolate) and 1 candidate of novel species Lactobacillus sp. B4 (1 isolate) phylogenetically closed to L. composti. The current study revealed high diversity of LAB present in sayur asin from Java, Indonesia. Study on intraspecies determination of predominant isolates belonging to L. plantarum and L. fermentum in sayur asin using three molecular techniques namely: restriction fragment length polymorphism (RFLP) 16S-23S rDNA intergenic spacer region (ISR), random amplified polymorphic DNA-polymerase chain reaction (RAPD-PCR) and enterobacterial repetitive intergenic consensus (ERIC-PCR) revealed that strains belong to L. plantarum and L. fermentum in sayur asin could be divided into three and two genotypic groups respectively