RINGKASAN

Minuman probiotik merupakan salah satu jenis pangan fungsional, karena manfaatnya terhadap kesehatan pencernaan dan sistem imun. Pada umumnya minuman probiotik berbahan dasar susu, namun tidak semua orang dapat mengonsumsinya karena adanya intoleran laktosa. Oleh karena itu diperlukan inovasi pemanfaatan bahan lokal non-susu, salah satunya kecombrang (*Etlingera elatior*). Minuman probiotik kecombrang merupakan minuman fungsional yang difermentasi oleh bakteri asam laktat seperti *Lactobacillus casei* dengan penambahan ekstrak bunga kecombrang yang memiliki senyawa bioaktif seperti flavonoid, fenol, antosianin dan tanin yang diketahui memiliki aktivitas antioksidan dan antimikroba. Penelitian ini bertujuan untuk 1) mengetahui pengaruh variasi konsentrasi penambahan BAL terhadap karakteristik fisik, kimia, mikrobiologi dan sensoris minuman probiotik kecombrang 2) mengetahui pengaruh lama fermentasi terhadap karakteristik fisikokimia, mikrobiologi dan sensori minuman probiotik kecombrang, dan 3) menentukan kombinasi perlakuan terbaik antara variasi konsentrasi penambahan BAL dan lama fermentasi untuk meningkatkan mutu fisikokimia, mikrobiologi dan sensori minuman probiotik kecombrang.

Metode penelitian yang digunakan yaitu Rancangan Acak Lengkap (RAL) yang terdiri dari 2 faktor yaitu konsentrasi penambahan bakteri asam laktat (1, 3, 5%) dan lama fermentasi (24, 36, 48 jam). Berdasarkan rancangan perlakuan diperoleh 9 kombinasi perlakuan, dilakukan pengulangan sebanyak 3 kali sehingga diperoleh 27 unit percobaan. Analisis yang dilakukan meliputi analisis nilai pH, total padatan terlarut, viskositas, total fenol, aktivitas antioksidan, total bakteri asam laktat, dan sensoris. Data hasil pengamatan yang diperoleh dianalisis menggunakan analisis ragam (ANOVA) pada tingkat kepercayaan 95%, apabila terdapat pengaruh yang nyata maka dilanjutkan dengan DMRT (*Duncan's Multiple Range Test*). Data sensoris yang diperoleh dianalisis menggunakan Uji *Friedman*. Perlakuan terbaik menggunakan indeks efektivitas.

Hasil penelitian menunjukkan bahwa konsentrasi penambahan bakteri asam laktat 1, 3 dan 5% pada minuman probiotik kecombrang berpengaruh terhadap pH dan viskositas, semakin basar konsentrasi bakteri asam laktat maka nilai pH dan viskositas semakin menurun. Lama fermentasi 24, 36 dan 48 jam pada minuman probiotik kecombrang berpengaruh terhadap pH dan viskositas, semakin lama fermentasi yang dilakukan maka nilai pH akan menurun de viskositas akan meningkat. Kombinasi perlakuan terbaik yaitu perlakuan penambahan konsentrasi BAL 1% dengan lama fermentasi 36 jam, yang menghasilkan pH 4,09, total padatan terlarut 12 ºBrix, viskositas 3,66 cP, total fenol 3,35, antioksidan 3,462 ppm, total BAL 7,80 log CFU/mL, sifat sensori yang meliputi warna 5,63 (sedikit merah cerah), homogenitas 4,7 (netral), aroma 7,4 (sangat harum), rasa kecombrang 6,8 (terasa), tingkat keasaman 3 (sedikit tidak asam), tingkat kemanisan 7,9 (sangat manis) serta kesukaan 6,53 (suka).

SUMMARY

Probiotic beverages are a type of functional food due to their benefits for digestive health and the immune system. Generally, probiotic beverages are dairy-based; however, not everyone can consume them due to lactose intolerance. Therefore, innovation in utilizing non-dairy local ingredients is necessary, one of which is torch ginger (Etlingera elatior). Torch ginger probiotic beverage is a functional drink fermented by lactic acid bacteria, such as Lactobacillus casei, with the addition of torch ginger flower extract containing bioactive compounds such as flavonoids, phenols, anthocyanins, and tannins, which are known to possess antioxidant and antimicrobial activities. This study aimed to: (1) determine the effect of varying lactic acid bacteria concentrations on the physical, chemical, microbiological, and sensory characteristics of torch ginger probiotic beverage; (2) determine the effect of fermentation duration on the physicochemical, microbiological, and sensory characteristics of torch ginger probiotic beverage; and (3) identify the optimal combination of lactic acid bacteria concentration and fermentation duration to improve the physicochemical, microbiological, and sensory quality of torch ginger probiotic beverage.

The research employed a Completely Randomized Design (CRD) with two factors: lactic acid bacteria concentration (1, 3, and 5%) and fermentation duration (24, 36, and 48 hours). The experimental design yielded nine treatment combinations, each repeated three times, resulting in 27 experimental units. Analyses included pH, total soluble solids, viscosity, total phenols, antioxidant activity, total lactic acid bacteria count, and sensory evaluation. Data were analyzed using analysis of variance (ANOVA) at a 95% confidence level, and significant differences were further tested using Duncan's Multiple Range Test (DMRT). Sensory data were analyzed using the Friedman test, and the best treatment was determined using the effectiveness index.

The results showed that lactic acid bacteria concentrations of 1, 3, and 5% significantly affected pH and viscosity, with higher concentrations resulting in lower pH and viscosity values. Fermentation durations of 24, 36, and 48 hours significantly affected pH and viscosity, where longer fermentation times decreased pH but increased viscosity. The best treatment was the addition of 1% lactic acid bacteria with a fermentation duration of 36 hours, producing a pH of 4.09, total soluble solids of 12 ºBrix, viscosity of 3.66 cP, total phenols of 3.35, antioxidant activity of 3.462 ppm, lactic acid bacteria count of 7.80 log CFU/mL, and sensory attributes including color (5.63; slightly bright red), homogeneity (4.7; neutral), aroma (5.4; slightly fragrant), torch ginger flavor (5.04; slightly perceived), acidity (3; slightly not sour), sweetness (7.9; very sweet), and overall liking (6.53; like).