PENGARUH VARIETAS DAN FASE PERKEMBANGAN TANAMAN SORGUM MANIS (*Sorghum bicolor* (L.) Moench) TERHADAP KUALITAS NIRA DI KAWASAN HUTAN RAKYAT GUNUNGKIDUL

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INTISARI

Peran sorgum manis sebagai sumber bahan baku bioetanol dan pemanis alami semakin meningkat, tetapi studi mengenai pengaruh varietas dan fase perkembangan tanaman terhadap kualitas nira di kawasan Hutan Rakyat Gunungkidul masih terbatas. Penelitian ini bertujuan mengetahui pengaruh enam varietas sorgum manis (Samurai, Kawali, Bioguma, KD 4, Ketan Merah, dan Ketan Hitam) serta tiga fase perkembangan tanaman (daun bendera, berbunga, dan masak fisiologis) terhadap parameter kualitas nira, yaitu kadar °Brix, pH, densitas, kadar air, dan rendemen.

Penelitian menggunakan Rancangan Acak Lengkap faktorial 6 × 3 dengan tiga ulangan. Sampel nira diperoleh melalui penggilingan batang sorgum pada setiap fase perkembangan. Pengukuran kualitas nira dilakukan menggunakan portabel refraktometer (kadar °Brix), pH-meter, piknometer (densitas), oven kering (kadar air), dan perhitungan rendemen volume nira terhadap berat batang. Data dianalisis melalui ANOVA dua arah, dilanjutkan uji lanjut Tukey HSD pada taraf signifikansi 1% dan 5% serta analisis korelasi Pearson.

Hasil penelitian menunjukkan bahwa varietas dan fase perkembangan berpengaruh signifikan terhadap kadar °Brix , pH, densitas, dan kadar air nira, sedangkan rendemen tidak berbeda nyata. Nilai pH yang baik untuk nira sorgum manis berada pada kisaran 4,5-5,5 dan densitas nira pada kisaran 1,05-1,10 g/cm³. Varietas Samurai dan Bioguma pada fase berbunga menunjukkan kualitas nira terbaik, ditandai dengan kadar °Brix tertinggi masing-masing sebesar 12,67% dan 11,00%, kadar air terendah sebesar 65,24% dan 69,28%, nilai pH (5,36 dan 5,41) dan densitas (1,071 dan 1,087) yang keduanya berada dalam kisaran optimal. Temuan ini menegaskan pentingnya pemilihan varietas dan waktu panen untuk optimalisasi kualitas nira sorgum manis di Hutan Rakyat Gunungkidul.

Kata Kunci: Bioetanol, °Brix, Fase Perkembangan, Sorgum manis, Varietas.

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EFFECTS OF CULTIVAR AND GROWTH STAGE OF SWEET SORGHUM (*Sorghum bicolor* (L.) Moench) ON JUICE QUALITY IN THE GUNUNGKIDUL COMMUNITY FOREST

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ABSTRACT

Sweet sorghum has become an increasingly important source of bioethanol and natural sweetener feedstock, yet studies on how cultivar and growth stage affect juice quality in the Gunungkidul community forest are still limited. This study aims to evaluate the effects of six sweet sorghum cultivars (Samurai, Kawali, Bioguma, KD 4, Ketan Merah, and Ketan Hitam) and three growth stages (flag leaf, flowering, and physiological maturity) on juice quality parameters, namely °Brix, pH, density, moisture content, and juice yield.

A 6 × 3 factorial completely randomized design with three replicates was used. Juice samples were obtained by milling sorghum stalks at each growth stage. Quality measurements were carried out with a portable refractometer for °Brix, a pH meter for pH, a pycnometer for density, oven drying for moisture content, and juice yield calculated as the ratio of juice volume to stalk weight. Data were analyzed by two-way ANOVA, followed by Tukey's HSD test at the 1% and 5% significance level and Pearson correlation analysis.

The results showed that variety and developmental stage significantly affected the °Brix, pH, density, and moisture content of the juice, while yield didn't differ significantly. The optimal pH value for sweet sorghum juice ranges from 4.5 to 5.5, and juice density ranges from 1.05 to 1.10 g/cm³. Samurai and Bioguma varieties at the flowering stage showed the best juice quality, indicated by the highest °Brix values of 12.67% and 11.00%, the lowest moisture contents of 65.24% and 69.28%, and pH values (5.36 and 5.41) and densities (1.071 and 1.087) that fall within the optimal range. These findings emphasize the importance of variety selection and harvest timing for optimizing the quality of sweet sorghum juice in the Gunungkidul Community Forest.

Keywords: *Bioethanol, °Brix, Cultivar, Growth stage, Sweet sorghum.*

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