PENGARUH UMUR TANAMAN RUMPUT GAJAH GAMA UMAMI (*Pennisetum purpureum* cv. (GU)) DAN LAMA INKUBASI JAMUR *Phanerochaete chrysosporium* TERHADAP SIFAT KIMIA DAN GULA PEREDUKSI

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INTISARI

Pengembangan energi baru terbarukan dari biomassa dapat menjadi alternatif sebagai bahan baku bioetanol. Salah satu biomasa dengan produktivitas yang tinggi adalah rumput gajah Gama Umami (*Pennisetum purpureum* cv. (GU)) yang merupakan tanaman hasil pemuliaan oleh Fakultas Peternakan UGM. Keunggulan rumput gajah gama umami adalah produktivitasnya yang tinggi dibandingkan rumput gajah biasa. Dalam pembuatan bioetanol, lignin bagian daun rumput gajah gama umami perlu didegradasi (delignifikasi) untuk mendapatkan selulosa. Salah satu metode delignifikasi adalah menggunakan jamur *Phanerochaete chrysosporium*. Penelitian ini bertujuan untuk mengetahui pengaruh umur rumput gajah gama umami dan lama inkubasi jamur *P. chrysosporium* terhadap sifat kimia dan gula pereduksi daun rumput gajah gama umami sebagai bahan baku produksi bioetanol.

Penelitian ini menggunakan bagian daun rumput gajah gama umami dengan dua faktor, yaitu umur tanaman (60, 100, dan 140 hari) dan lama inkubasi jamur (10, 20, dan 30 hari). Daun rumput gajah gama umami dijadikan serbuk dengan ukuran lolos 40 dan 60 mesh untuk diuji sifat kimia yang meliputi derajat keasaman (pH), abu, ekstraktif larut etanol-toluen, ekstraktif larut air panas, holoselulosa, α-selulosa, hemiselulosa, klason-lignin, dan lignin terlarut asam serta pengujian gula pereduksi yang meliputi kadar gula pereduksi dan laju hidrolisis. Hasil pengujian sifat kimia dan gula pereduksi dianalisis dengan metode analisis keragaman (ANOVA), kemudian dilanjut uji Tukey HSD (*Honestly Significant Difference*).

Hasil penelitian menunjukan bahwa interaksi antara umur rumput dan inkubasi jamur terhadap sifat kimia dan gula pereduksi daun rumput gajah gama umami berpengaruh signifikan pada kadar ekstraktif larut etanol-toluen, holoselulosa, lignin terlarut asam, dan gula pereduksi. Perlakuan terbaik yang diperoleh pada penelitian ini adalah umur rumput gajah 140 hari dan lama inkubasi jamur 30 hari dengan hasil gula pereduksi sebesar 8,99 mg/ml.

Kata Kunci: daun rumput gajah gama umami, umur, *Phanerochaete chrysosporium*, gula pereduksi, bioetanol

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THE EFFECT OF PLANT AGE GAMA UMAMI ELEPHANT GRASS (*Pennisetum purpureum* cv. (GU)) AGE AND *Phanerochaete chrysosporium* FUNGUS INCUBATION PERIOD ON CHEMICAL PROPERTIES AND REDUCING SUGAR

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ABSTRACT

The development of new renewable energy from biomass can be an alternative as a raw material for bioethanol. One of the biomass with high productivity is Gama Umami elephant grass (*Pennisetum purpureum* cv. (GU)) which is the result of breeding by the Faculty of Animal Science UGM. The advantage of gama umami elephant grass is its high productivity compared to ordinary elephant grass. In making bioethanol, the lignin in the leaves of gama umami elephant grass needs to be degraded (delignification) to obtain cellulose. One of the delignification methods is using *Phanerochaete chrysosporium* fungus. This study aims to determine the effect of the age of umami elephant grass and the incubation time of *P. chrysosporium* fungus on the chemical properties and reducing sugars of umami elephant grass leaves as raw material for bioethanol production.

This study used the leaves of umami gama elephant grass with two factors, namely plant age (60, 100, and 140 days) and the length of fungal incubation (10, 20, and 30 days). The leaves of umami gama elephant grass were made into powders with a passing size of 40 and 60 mesh to be tested for chemical properties including degree of acidity (pH), ash, ethanol-toluene soluble extractives, hot water soluble extractives, holocellulose, α-cellulose, hemicellulose, clason-lignin, and acid soluble lignin and reducing sugar testing which includes reducing sugar content and hydrolysis rate. The test results of chemical properties and reducing sugar were analyzed by analysis of variance (ANOVA) method, then continued with Tukey HSD (*Honestly Significant Difference*) test.

The results showed that the interaction between grass age and fungal incubation on the chemical properties and reducing sugar of elephant grass leaves gama umami had a significant effect on ethanol-toluene soluble extractive content, holocellulose, acid soluble lignin, and reducing sugar. The best treatment obtained in this study was 140 days of elephant grass age and 30 days of fungal incubation with a reducing sugar yield of 8.99 mg/ml.

Keyword: leaves of gama umami elephant grass, age, *Phanerochaete chrysosporium*, reducing sugars, bioethanol

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