

REKAYASA AIR KONDENSAT AC DAN AIR PDAM PADA HIDROPONIK *WICK SYSTEM*

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ABSTRAK

Air kondensat AC dan air PDAM berpotensi menjadi sumber air alternatif bagi hidroponik di wilayah perkotaan, namun kualitas awalnya perlu disesuaikan agar memenuhi standar air baku hidroponik. Penelitian ini bertujuan Merekayasa air kondensat AC dan air PDAM untuk dapat digunakan sebagai sumber air baku pada sistem hidroponik. Penelitian dilaksanakan menggunakan metode eksperimental dengan tiga perlakuan sumber air, yaitu air kondensat AC, air PDAM teraerasi, dan air tanah sebagai kontrol, masing-masing dengan tiga ulangan. Sebelum digunakan, kualitas air baku diukur meliputi pH, klorin bebas, total padatan terlarut, daya hantar listrik, dan suhu, kemudian direkayasa untuk memenuhi standar hidroponik, yaitu penurunan pH air kondensat AC menggunakan larutan asam fosfat serta eliminasi klorin air PDAM melalui aerasi terbuka. Pertumbuhan tanaman diamati melalui tinggi tanaman, jumlah daun, dan bobot segar hingga panen pada 25 hari setelah tanam, kemudian dianalisis menggunakan ANOVA satu arah. Hasil penelitian menunjukkan bahwa rekayasa kualitas air berhasil menyesuaikan pH air kondensat AC dan menghilangkan klorin air PDAM sehingga memenuhi standar air baku hidroponik. Pertumbuhan kangkung pada ketiga perlakuan tidak berbeda nyata, dengan tinggi tanaman berkisar 68,40–70,47 cm, jumlah daun 11,63–11,74 helai, dan bobot segar 4,72–4,95 gram per tanaman. Dengan demikian, air kondensat AC dan air PDAM dapat dijadikan sumber air alternatif hidroponik perkotaan.

Kata kunci: air kondensat AC, air PDAM, hidroponik, kangkung air, *wick system*

ENGINEERING OF AIR CONDITIONER CONDENSATE AND TAP WATER FOR WICK SYSTEM HYDROPONICS

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ABSTRACT

Air-conditioner condensate water and municipal tap water have the potential to serve as alternative water sources for hydroponics in urban areas; however, their initial quality needs to be adjusted to meet hydroponic water quality standards. This study aimed to engineer AC condensate water and tap water for use as raw water sources in a hydroponic system. The research employed an experimental method with three water source treatments AC condensate water, aerated tap water, and groundwater as a control each with three replications. Prior to use, the raw water quality parameters, including pH, free chlorine, total dissolved solids, electrical conductivity, and temperature, were measured and subsequently adjusted to meet hydroponic standards. The adjustments included lowering the pH of AC condensate water using phosphoric acid solution and eliminating chlorine from tap water through open aeration. Plant growth was monitored based on plant height, leaf number, and fresh weight until harvest at 25 days after planting, and the data were analyzed using one-way ANOVA. The results showed that the water quality engineering successfully adjusted the pH of AC condensate water and eliminated chlorine from tap water, bringing both into compliance with hydroponic raw water standards. The growth of water spinach across the three treatments did not differ significantly, with plant heights ranging from 68.40–70.47 cm, leaf numbers of 11.63–11.74 leaves, and fresh weights of 4.72–4.95 g per plant. Therefore, AC condensate water and tap water can be utilized as alternative water sources for urban hydroponic systems.

Keywords: AC condensate water, tap water, hydroponics, water spinach, wick system