

ABSTRAK

Mochamad Ghilman, 2021. Penggunaan Ekstrak Daun Kelor sebagai Desinfektan Alami dalam Penurunan *Total Coli* dan *E. Coli* pada Air Sumur. Program Studi: Teknik Lingkungan Fakultas Teknik Universitas PGRI Adi Buana Surabaya, Dosen Pembimbing: Drs. Pungut, S. T.,M.T.

Meningkatnya jumlah penduduk yang sangat pesat di perkotaan mengakibatkan pembuatan dan penggunaan *Septictank* yang semakin banyak. Kurangnya jarak antara *Septictank* yang berada di permukiman sekitar kawasan wisata religi Sunan Ampel dengan sumber air sumur menyebabkan kerusakan pada kandungan air, sehingga kualitas air tidak lagi memenuhi syarat baku mutu dimana sumber air sumur digunakan langsung untuk diminum oleh para peziarah. Berdasarkan penelitian didapat kandungan *Total Coli* dan *E. Coli* dengan nilai 23 MPN/100 ml yang melebihi standart persyaratan air minum. Umumnya dalam pengolahan air untuk menghilangkan *Coli* dibutuhkan proses desinfeksi menggunakan *Klorin*. Namun *Klorin* menghasilkan suatu kandungan *Disinfection by – Products* (DBP's) yang memiliki sifat karsinogenik. Maka diperlukan bahan alternative yaitu menggunakan bahan-bahan alami seperti kelor (*Moringa Oleifera* L.). Kelor mengandung tiga komponen penting yaitu sifat antiseptik terhadap senyawa bakteriolitik, bakteriostatik dan bakteriosidal seperti zat aktif (*Activated Agent 4-(A-L-Rhamnosyloxy Benzyl Isothiocyanate)*) yang bisa menghentikan pertumbuhan atau aktivitas metabolisme bakteri. Dalam penelitian ini dilakukan penambahan ekstrak daun kelor dengan variasi dosis pemberian 30 mg, 60 mg, dan 90 mg pada 1 liter air sumur dengan waktu pengadukan 15 menit dan 30 menit. Penyisihan terbaik didapat pada penambahan 90 mg dengan waktu pengadukan 30 menit dengan hasil penurunan nilai *Total Coli* 65%, dan penurunan nilai *E. Coli* 69.6%. Dalam batas pemberian desinfektan dengan dosis ekstrak daun kelor 30 mg, 60 mg, dan 90 mg, diketahui bahwa jumlah desinfektan yang ditambahkan sangat berpengaruh dalam proses desinfeksi, semakin banyak ekstrak daun kelor yang ditambahkan semakin besar penurunan kandungan *Coli* dalam air. Dalam proses desinfeksi menggunakan ekstrak daun kelor didapatkan efek samping yaitu perubahan warna air yang semula jernih menjadi kuning kehijau-hijaun akibat terlarutnya ekstrak daun kelor yang berwarna hijau pekat di dalam air saat proses pengadukan.

Kata Kunci: Air Sumur, Desinfektan, Ekstrak Daun Kelor, *E. Coli*, dan *Total Coli*

ABSTRACT

Mochamad Ghilman, 2021. Use of Moringa Leaf Extract as a Natural Disinfectant in Reducing Total Coli and E. Coli in Well Water. Study Program: Environmental Engineering Faculty of Engineering PGRI Adi Buana University Surabaya, Advisor: Drs. Pungut, S. T., M.T.

*The rapid increase in population in urban areas has resulted in the manufacture and use of more and more septic tanks. The lack of distance between the septic tank located in the settlements around the religious tourism area of Sunan Ampel and the well water source causes damage to the water content, so that the water quality no longer meets the quality standard requirements where the well water is used directly for drinking by pilgrims. Based on the research, it was found that the total coli and E. coli contents were 23 MPN/100 ml which exceeded the standard drinking water requirements. Generally, in water treatment to remove Coli, a disinfection process using chlorine is needed. However, Chlorine produces a Disinfection by - Products (DBP's) content which has carcinogenic properties. Therefore, alternative materials are needed, namely using natural ingredients such as Moringa (*Moringa Oleifera L.*). Moringa contains three important components, namely antiseptic properties against bacteriolytic, bacteriostatic and bactericidal compounds such as the active substance (Activated Agent 4-(AL-Rhamnosyloxy Benzyl Isothiocyanate) which can stop the growth or metabolic activity of bacteria. In this study, Moringa leaf extract was added with various doses. administration of 30 mg, 60 mg, and 90 mg in 1 liter of well water with a stirring time of 15 minutes and 30 minutes. The best removal was obtained at the addition of 90 mg with a stirring time of 30 minutes with the results of a decrease in the value of Total Coli 65%, and a decrease in the value of E. Coli 69.6% Within the limit of disinfectant with doses of Moringa leaf extract 30 mg, 60 mg, and 90 mg, it is known that the amount of disinfectant added is very influential in the disinfection process, the more Moringa leaf extract is added, the greater the decrease in Coli content in the water. In the disinfection process using Moringa leaf extract, side effects are obtained, namely per changes in the color of the water which was originally clear to yellow-green due to the dissolving of dark green Moringa leaf extract in the water during the stirring process.*

Keywords: Well Water, Disinfectant, Moringa Leaf Extract, E. Coli, and Total Coli