

**THE REDUCTION OF BOD, COD, AND THE TOTAL COLIFORM
LEVELS WITH THE ADDITION OF
PAPAYA SEED (*Carica papaya L*) BIOCOAGULAN
(Study on Domestic Liquid Waste of Steel Industry in Surabaya 2020)**

Dinda Yully Lestari¹, Darjati², Marlik³

Ministry of Health of the Republic of Indonesia
Health Polytechnic of Ministry of Health Surabaya
Study Program of Diploma IV Department of Environmental Health
Email : dindalestari628@gmail.com

ABSTRACT

Domestic liquid waste is liquid waste originating from residential businesses and or activities, restaurants, offices, businesses, apartments and dormitories. Preliminary test results of BOD, COD, and Total Coliform on the domestic liquid waste of steel industry in Surabaya that do not meet the required procedures by Regulation of the Minister of Environment and Forestry No. 68 of 2016 namely 63 mg / l, 189 mg / l and 13,000 CFU / 100ml. Processing that can be done is coagulation-flocculation with the addition of papaya seed biocoagulan. The objective of this study is to analyze the decrease in levels of BOD, COD, and Total Coliform in domestic liquid waste of steel industrial in Surabaya with the addition of papaya seed biocoagulan (*Carica papaya L*).

The type of this research is pure experiment with pretest-posttest control group design. The object of research is the domestic liquid waste in one of the steel industries located in Surabaya. Dosage variation is 1 gram, 2 grams and 3 grams as well as 0 gram as the control with replication as many as 6 times, therefore obtained a total sample of 24. Data on the results of levels of BOD, COD, and Total Coliform before and after the addition of papaya seed biocoagulan (*Carica papaya L*) was analyzed using statistical paired t test and probit test.

The results showed the levels of BOD, COD and Total Coliform in the domestic liquid waste of steel industry in Surabaya after processing decreased. The highest percentage at a dose of 3 gram / 500 ml can reduce BOD and COD levels by 93% and Total Coliform by 66%. The optimum dose in reducing BOD and COD levels is 3,629 gram / l and 3,109 gram / l.

Liquid waste processing by coagulation-flocculation using papaya seed biocoagulan can reduce levels of BOD, COD and Total Coliform, so for the steel industry it needs pre-treatment processing of coagulation-flocculation against domestic liquid waste using papaya seeds biocoagulan before being discharged into water bodies.

Key words: domestic liquid waste, biocoagulan, papaya seeds (*Carica papaya L*).

**PENURUNAN KADAR BOD, COD, DAN TOTAL COLIFORM DENGAN
PENAMBAHAN BIOKOAGULAN BIJI PEPAYA (*Carica papaya L*)
(Studi pada Limbah Cair Domestik Industri Baja di Surabaya Tahun 2020)**

Dinda Yully Lestari¹, Darjati², Marlik³

Kementerian Kesehatan RI
Politeknik Kesehatan Kemenkes Surabaya
Program Studi Diploma IV Jurusan Kesehatan Lingkungan
Email : dindalestari628@gmail.com

ABSTRAK

Limbah cair domestik adalah limbah cair yang berasal dari usaha dan atau kegiatan pemukiman, rumah makan, perkantoran, perniagaan, apartemen, dan asrama. Hasil uji pendahuluan BOD, COD, dan Total Coliform limbah cair domestik industri baja di Surabaya tidak memenuhi syarat sesuai Peraturan Menteri Lingkungan Hidup dan Kehutanan No. 68 Tahun 2016 yaitu 63 mg/l, 189 mg/l dan 13.000 CFU/100ml. Pengolahan yang dapat dilakukan yaitu koagulasi-flokulasi dengan penambahan biokoagulan biji pepaya. Tujuan penelitian ini untuk menganalisis penurunan kadar BOD, COD, dan Total *Coliform* pada limbah cair domestik industri baja di Surabaya dengan penambahan biokoagulan biji pepaya (*Carica papaya L*).

Jenis penelitian ini adalah eksperimen murni dengan desain *pretest-posttest control group*. Objek penelitian adalah limbah cair domestik salah satu industri baja di Surabaya. Variasi dosis yaitu 1 gram, 2 gram dan 3 gram serta 0 gram sebagai kontrol dengan replikasi sebanyak 6 kali, sehingga didapatkan besar sampel 24. Data hasil kadar BOD, COD, dan Total *Coliform* sebelum dan sesudah penambahan biokoagulan biji pepaya (*Carica papaya L*) dianalisis menggunakan uji statistik *paired t test* dan uji *probit*.

Hasil Penelitian menunjukkan kadar BOD, COD dan Total Coliform pada limbah cair domestik industri baja di Surabaya sesudah pengolahan mengalami penurunan. Presentase tertinggi pada dosis 3 gr/500 ml dapat menurunkan kadar BOD dan COD hingga 93% serta Total Coliform sebesar 66%. Dosis optimum dalam menurunkan kadar BOD dan COD adalah 3,629 gr/l dan 3,109 gr/l.

Pengolahan limbah cair secara koagulasi-flokulasi menggunakan biokoagulan biji pepaya dapat menurunkan kadar BOD, COD, dan Total Coliform, sehingga bagi pihak industri baja perlu adanya pengolahan *pre treatment* koagulasi-flokulasi terhadap limbah cair domestik menggunakan biokoagulan biji pepaya sebelum dibuang ke badan air.

Kata Kunci : limbah cair domestik, biokoagulan, biji pepaya (*Carica papaya L*).