

**EKSTRAK DAUN PAKU KAKI KELINCI
(*Davallia denticulata* (Burm.f.) Mett.) SEBAGAI INHIBITOR KOROSI
RAMAH LINGKUNGAN UNTUK BAJA LUNAK DALAM HCI 1 M**

SKRIPSI SARJANA KIMIA

Oleh

ADINDA PERMATA SARI

2210413015



**PROGRAM SARJANA
DEPARTEMEN KIMIA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
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INTISARI

EKSTRAK DAUN PAKU KAKI KELINCI (*Davallia denticulata* (Burm.f.) Mett.) SEBAGAI INHIBITOR KOROSI RAMAH LINGKUNGAN UNTUK BAJA LUNAK DALAM HCl 1 M

Oleh:

ADINDA PERMATA SARI (NIM: 2210413015)

Prof. Dr. Yeni Stiadi, MS.; Prof. Dr. Emriadi, MS.

Ekstrak daun paku kaki kelinci (*Davallia denticulata* (Burm.f.) Mett.) berpotensi sebagai inhibitor korosi ramah lingkungan pada baja lunak (*mild steel*) dalam medium HCl 1 M karena mengandung metabolit sekunder seperti flavonoid, fenolik, saponin, dan alkaloid yang memiliki gugus heteroatom serta ikatan π sehingga mampu beradsorpsi pada permukaan logam. Efektivitas ekstrak diuji menggunakan metode kehilangan berat (*weight loss*), metode polarisasi potenciodinamik (PDP), spektrofotometri Ultraviolet-Tampak (UV-Vis), spektroskopi Transformasi Fourier Inframerah (FTIR), dan karakterisasi permukaan menggunakan mikroskop optik, serta pengukuran sudut kontak. Hasil penelitian menunjukkan bahwa peningkatan konsentrasi ekstrak dapat menurunkan laju korosi, sedangkan kenaikan suhu meningkatkan laju korosi. Efisiensi inhibisi tertinggi diperoleh sebesar 94,78% dengan metode *weight loss* dan sebesar 97,22% dengan metode PDP pada konsentrasi 4 g/L. Adsorpsi inhibitor mengikuti Isoterm adsorpsi Langmuir dengan pembentukan lapisan monolayer melalui kombinasi fisisorpsi dan kemisorpsi. Analisis FTIR dan UV-Vis menunjukkan adanya interaksi senyawa aktif ekstrak dengan permukaan baja, sedangkan mikroskop optik dan sudut kontak menunjukkan terbentuknya lapisan pelindung yang mengurangi kerusakan permukaan serta meningkatkan sifat hidrofobik baja. Dengan demikian, ekstrak daun paku kaki kelinci efektif digunakan sebagai *green corrosion inhibitor* pada baja lunak dalam medium HCl 1 M.

Kata kunci: *Davallia denticulata* (Burm.f.) Mett., Baja lunak, Korosi, Inhibitor korosi, Adsorpsi Langmuir



ABSTRACT

RABBIT'S FOOT FERN LEAF EXTRACT (*Davallia denticulata* (Burm.f.) Mett.) AS AN ECO-FRIENDLY CORROSION INHIBITOR FOR MILD STEEL IN 1 M HCl

By:

ADINDA PERMATA SARI (NIM: 2210413015)

Prof. Dr. Yeni Stiadi, MS.; Prof. Dr. Emriadi, MS.

The extract of rabbit's foot fern leaves (*Davallia denticulata* (Burm.f.) Mett.) has the potential to be an environmentally friendly corrosion inhibitor for mild steel in 1 M HCl medium due to the presence of secondary metabolites such as flavonoids, phenolics, saponins, and alkaloids containing heteroatoms and π bonds that can adsorb onto the metal surface. The effectiveness of the extract as a corrosion inhibitor was evaluated using several methods, including weight loss, potentiodynamic polarization (PDP), Ultraviolet-Visible (UV-Vis) spectrophotometry, Fourier Transform Infrared (FTIR) spectroscopy, surface characterization using optical microscopy, and contact angle measurements. The results of the weight loss measurements showed that the corrosion rate decreased with increasing concentrations of rabbit's foot fern leaf extract in the HCl medium, while increasing temperature accelerated the corrosion process. The maximum inhibition efficiency reached 94.78% by the weight loss method and 97.216% by the PDP method at an extract concentration of 4 g/L. Adsorption of the extract on the mild steel surface followed the Langmuir adsorption isotherm model through the formation of a monolayer involving both physisorption and chemisorption mechanisms. Potentiodynamic polarization measurements indicated that the extract acted as a mixed-type inhibitor, while FTIR and UV-Vis analyses revealed interactions between the active compounds of the extract and the mild steel surface. Optical microscopy characterization showed that the addition of the inhibitor reduced surface damage to the mild steel, whereas contact angle measurements indicated an increase in the hydrophobicity of the steel surface in the presence of the extract. Therefore, rabbit's foot fern leaf extract can be considered an effective green corrosion inhibitor for mild steel in 1 M HCl medium.

Keywords: *Davallia denticulata* (Burm.f.) Mett., mild steel, corrosion, corrosion inhibitor, Langmuir adsorption

