SKRINING FITOKIMIA DAN HISTOKIMIA METABOLIT SEKUNDER AKAR, BATANG DAN DAUN Cordyline fruticosa (L.)
A. Chev. SEBAGAI AGEN ANTIBAKTERI Ralstonia solanacearum (Smith)
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INTISARI

Cordyline fruticosa merupakan tanaman hias yang sudah diketahui manfaatnya sejak dulu dalam bidang kesehatan salah satunya sebagai antibakteri. Metabolit sekunder seperti alkaloid, fenolik, flavonoid, tanin dan terpenoid bermanfaat sebagai antibakteri. Belum ada pemanfaatan tanaman ini sebagai antibakteri patogen tanaman. Bakteri patogen tanaman yang digunakan yaitu *Ralstonia solanacearum* yang menjadi penyebab tanaman kentang layu, busuk dan bahkan mati sehingga hasil panen menurun. Bakteri ini menjadi objek penelitian karena kentang menjadi salah satu produksi terbesar di Garut dan menjadi bahan makanan pokok yang banyak dikonsumsi. Penelitian ini bertujuan untuk menganalisis potensi perbedaan metabolit sekunder dari akar, batang dan daun *C. fruticosa* sebagai agen antibakteri patogen tanaman yang nantinya dapat dijadikan sebagai bakterisida. Metode uji penelitian ini mencakup uji fitokimia (LC-HRMS), histokimia (uji reagen) dan uji antibakteri (difusi dan MIC). Uji fitokimia menunjukkan adanya perbedaan metabolit sekunder pada ekstrak etanol 70 % akar, batang dan daun dengan jumlah senyawa secara berturut 12, 24 dan 19 yang didominasi alkaloid, fenolik dan terpenoid. Hasil histokimia menunjukkan senyawa alkaloid, fenolik, flavonoid, tanin dan terpenoid disimpan pada jaringan yang berbeda seperti parenkim dan sklerenkim. Uji difusi cakram terhadap *R. solanacearum* menunjukan adanya zona hambat dari ketiga organ tersebut sampai konsentrasi 50 %. Ekstrak batang *C. fruticosa* memberikan hasil terbaik pada konsentrasi 100 % dengan zona hambat sebesar 13,48 mm. Uji MIC juga menunjukkan adanya penurunan persentase bakteri sebesar 98 % pada ekstrak batang *C. fruticosa* dengan konsentrasi 25 %. Kesimpulannya, tanaman andong memiliki perbedaan kandungan dan persebaran metabolit sekunder serta memiliki fungsi sebagai antibakteri *R. solanacearum*.

Kata Kunci: antibakteri; *Cordyline fruticosa*; ekstrak; metabolit sekunder; *Ralstonia solanacearum*

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PHYTOCHEMICAL AND HISTOCHEMICAL SCREENING OF SECONDARY METABOLITE FROM Cordyline fruticosa (L.) A. Chev. ROOT, STEM AND LEAF AS ANTIBACTERIAL AGENT FOR Ralstonia solanacearum (Smith)

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ABSTRACT

Cordyline fruticosa is an ornamental plant that has long been recognized for its medicinal properties, including its antibacterial activity. Secondary metabolites such as alkaloids, phenolics, flavonoids, tannins, and terpenoids have been reported to possess antibacterial properties. However, the potential application of C. fruticosa as an antibacterial agent against phytopathogenic bacteria has not yet been investigated. In this study, Ralstonia solanacearum, the causal agent of bacterial wilt in potato plants, was selected as the target pathogen because it causes wilting, tuber rot, and ultimately plant death, leading to significant reductions in crop yield. This bacterium was chosen due to the economic importance of potato cultivation in Garut, Indonesia, where potatoes represent one of the region's major agricultural commodities and staple food crops. This study aimed to analyze the differences in the secondary metabolite profiles of the roots, stems, and leaves of C. fruticosa and to evaluate their potential as antibacterial agents against phytopathogenic bacteria for future bactericide development. The experimental procedures included phytochemical analysis using liquid chromatography–high-resolution mass spectrometry (LC–HRMS), histochemical analysis using reagent-based staining, and antibacterial assays employing the disk diffusion and minimum inhibitory concentration (MIC) methods. LC–HRMS analysis revealed distinct secondary metabolite profiles among the 70 % ethanol extracts of the roots, stems, and leaves, with 12, 24, and 19 compounds identified, respectively, predominantly belonging to the alkaloid, phenolic, and terpenoid classes. Histochemical analysis demonstrated that alkaloids, phenolics, flavonoids, tannins, and terpenoids were localized in different plant tissues, particularly the parenchyma and sclerenchyma. Disk diffusion assays against R. solanacearum demonstrated inhibitory activity in extracts from all three plant organs at concentrations up to 50 %. Among the tested extracts, the stem extract exhibited the strongest antibacterial activity at 100 % concentration, producing an inhibition zone of 13.48 mm. Furthermore, the MIC assay revealed that the stem extract at a concentration of 25 % reduced bacterial growth by 98 %. In conclusion, C. fruticosa exhibits organ-specific differences in the composition and distribution of secondary metabolites, and its stem extract demonstrates promising antibacterial activity against R. solanacearum, highlighting its potential as a natural bactericidal agent for the management of bacterial wilt disease.

Keywords: *antibacteria; Cordyline fruticosa; extract; secondary metabolites; Ralstonia solanacearu*