

Thesis Title	Biological Activities of <i>Cordyline fruticosa</i> Leaves and Synthesis of Xanthene Derivatives using Hexabromoacetone
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Abstract

This research work contains biological activities of *Cordyline fruticosa* Back leaves and synthesis of xanthenes derivatives using hexabromoacetone. Methanol (MeOH), ethyl acetate (EtOAc) and hexane extracts from *C. fruticosa* Back leaves were measured for antioxidant and antibacterial activities. All extracts showed potent antioxidant activity on DPPH radical scavenging (IC_{50} 0.94-8.19 mg/mL) and FRAP assay (9.58-31.36 mmol Fe^{2+} eq/g) with the strongest activities of EtOAc extract. All extracts also presented the potent Fe^{2+} chelating activity (IC_{50} 0.91-3.89 mg/mL) with the highest activity of hexane extract. In the Folin-Ciocalteau assay, MeOH extract showed the highest total phenolic content (41.91 ± 1.32 mg GAE/g) but performed low antibacterial activity against *Bacillus cereus*, *Salmonella thypii* and *Streptococcus sobrinus* with a diameter of inhibition zone of 9.1, 8.1 and 8.1 mm, respectively at a concentration of 500 ppm. Furthermore, a novel and efficient method for the synthesis of xanthene derivatives using hexabromoacetone (Br_3CCOBr_3) has been established under solvent-free conditions. The reaction of various aromatic aldehydes with β -naphthol, 5,5-dimethyl-1,3-cyclohexanedione or 5-methyl-1,3-cyclohexanedione in the presence of 5% mol Br_3CCOBr_3 was successfully applied, providing the desired products in excellent yields at short reaction times.

Keywords: Antibacterial Activity/ Antioxidant Activity/ *Cordyline fruticosa* Back/ Hexabromoacetone/ Solvent-Free Conditions/ Xanthene Derivatives

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LIST OF TECHNICAL VOCABULARY AND ABBREVIATIONS

a.t.	=	ambient temperature
cm	=	centimeter
DCE	=	1,2-dichloroethane
DMAC	=	dimethyl acetamide
DPPH	=	1,1-diphenyl-2-picrylhydrazyl
g	=	gram
GAE	=	gallic acid equivalent
h	=	hour
IC ₅₀	=	half maximal inhibitory concentration
L	=	liter
m	=	meter
mg	=	milligram
min	=	minute
mL	=	milliliter
mM	=	millimolar
mm	=	millimeter
mmol	=	millimol
MW	=	microwave
nm	=	nanometer
ppm	=	part per million
TPTZ	=	2,4,6-tris(2-pyridyl)-s-triazine
µg	=	microgram
µL	=	microliter
µM	=	micromolar
°C	=	degree in celsius