

RESEARCH ARTICLE

The Effect in Vivo and in Silico Citronella Grass Extract (*Cymbopogon nardus* L.) on the Plasma ACE Inhibitory activity and Antihypertensive effect

**Rofiatun Solekha^{1,4*}, Ni Nyoman Tri Puspaningsih³, Putri Ayu Ika Setiyowati⁴,
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ABSTRACT:

The mechanism of hypertension is through the formation of angiotensin I into angiotensin II by Angiotensin I Converting Enzyme (ACE) which causes constriction of blood vessels resulting in narrowing of blood vessels. A number of extracts and compounds derived from plants have been proven in vitro as ACE inhibitors including flavonoids. This compound produces the ability to reduce oxidative stress, inhibit angiotensin converting enzyme (ACE) activity, promote vascular endothelial relaxation, and regulate cell signaling and gene expression by lowering Heat Shock Protein 70(HSP 70). The purpose of this study was to determine the effectiveness of the optimal dose of *Cymbopogon nardus* (L.) Citronella grass extract in its activity as a hypertension reducer and the effectiveness of the compound for inhibiting HSP-70 as an antihypertensive. The study employed bioinformatics modeling in its effectiveness in inhibiting HSP-70 in silico and in vitro using *Cymbopogon nardus* (L.) Citronella grass extract with various doses of 25, 50, and 100mg/kg BW in BALB/C mice. Na-CMC was used as a positive control and lead acetate was used as a negative control. Modeling with in silico method was used to observe the inhibition of compounds from Citronella grass stems against heat shock protein 70(HSP-70). The in vitro method with the maceration method was used in its extraction. The HPLC method was used for testing ACE inhibitors. The results of this study were treated with Na-CMC suspension (66.3±1.2%), acetic acid (65.7±0.7%), a dose of 25mg/kg BW (80.9±1.3%), a dose of 50 mg/kg BW was 88.2±1.7 and a dose of 100mg/kg BW (93.9±2.5%). In conclusion, HSP-70 can be used as an indicator of in silico inhibition of hypertension and is effective in reducing hypertension in vitro.

KEYWORDS: Ace inhibitor, Anti-hypertension, Citronella grass, In silico, HSP-70.

INTRODUCTION:

Hypertension is an increase in a person's blood pressure that is higher than normal and can result in morbidity and mortality¹.

Hypertension has been a serious problem until now. WHO (World Health Organization) states that hypertension affects 22% of the world's population, and reaches 36% of the incidence in Southeast Asia. Hypertension is also a cause of death with 23.7% of the total 1.7 million deaths in Indonesia in 2016². The mechanism of hypertension is through the formation of angiotensin I into angiotensin II by Angiotensin I

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Reviewer 2,



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