

# Literature Review: The Potencial Effect of Dandang Gendis Leaf (Clinacanthus nutans Lindau)

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**Abstract**—Indonesian are used to use herb to medicate a disease. One of the medicinal plants used is *Clinacanthus nutans* (Burm.f.) Lindau. *Clinacanthus nutans* Lindau is a traditional plant, commonly known as dandang gendhis (Java – Indonesia), ki tajam (Sunda – Indonesia), belalai gajah (Malaysia), Sabah Snake Grass (Singapore), and phaya yo (Thailand). It belonging to the Acanthaceae family. This study aimed to find out the effect of giving the extract of *Clinacanthus nutans* Lindau to subject. This research method was using literature review. The information about *Clinacanthus nutans* Lindau collected from an online database such as Pub Med, Scient direct and Google Scholar. The number of chemical compound were identified from leaves. It contain of alkaloid, flavonoid, polifenol, saponin and tanin Some of the potential effect shown such as antihypoglycemic, antioxidant and anticancer, and analgetic. In this study, we can conclude that in the future *Clinacanthus nutans* Lindau is valuable to use as herbal medicine with more investigation.

**Keywords**—*Clinacanthus nutans* (Burm.f.) Lindau, herbal medicine, chemical compound, potencial effect

## I. INTRODUCTION

Using plant as an herbal plant is a legacy from our ancestors. Apart from advances in medical technology and the discovery of synthetic drugs, medicinal plants are still used in medicine. Several medicinal plants have been shown to have significant medicinal properties. Information about the potential of medicinal plants triggers researchers to conduct further research to determine the content and pharmacological effects of a medicinal plant.

*Clinacanthus nutans* Lindau is a local plant in Southeast Asia. *Clinacanthus nutans* Lindau is known as dandang gendhis (Java - Indonesia), ki sharp (Sundanese - Indonesia), elephant trunk (Malaysia and brunai), Sabah Snake Grass (Singapore), and phaya yo (Thailand) and E zui hua (China) [1]. This plant is commonly used as a herbal plant in Indonesia, Malaysia and Thailand. Initially, this plant was used to treat rattlesnake bites, but then a lot of research was carried out on this plant. From the research that has been done, it is known that dandang gendis has anti-oxidant and anticancer, antihypoglycemic, and analgetic. *Clinacanthus nutans* Lindau contains phytochemicals common to medicinal plants, such as flavonoids<sup>[1]</sup>. In addition, this plant can be used in the field of cosmetics as an anti-aging [2].

*Clinacanthus nutans* Lindau has the characteristics of a tall, upright and usually forms a shrub. This plant is a species that belongs to the Acanthaceae family. The

following is the classification and nomenclature of *Clinacanthus nutans* Lindau:

Kingdom: Plantae Phylum: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Acanthaceae

Genus: *Clinacanthus*

Species: nutans- Lindau Scientific

Name: *Clinacanthus nutans* (Burm. f.) Lindau

The stem is smooth, the leaves are simple, narrow oval or lanceolate with a length of 2.5 - 13 cm and a width of 0.5 - 1.5 cm with a sharp apex, the base of the leaves is round blunt. Petiole 0.3 - 2 cm long, branched in two.



Figure 1. *Clinacanthus nutans* Lindau

## II. METHOD

Information about *Clinacanthus nutans* Lindau as traditional medicine sourced from leading data bases Pubmed, Scient direct and Google Scholar. The search is using *Clinacanthus nutans*, potencial Effect of *Clinacanthus nutans* as key word. This article that used in this review were published at 2016 – 2020.

## III. RESULT

### 1. Antioxidant and antitumor

Research on the benefits of *Clinacanthus nutans* Lindau as an antioxidant was carried out by Yoke Keon Yong (2012) using *Clinacanthus nutans* Lindau leaves taken from Serdang, Selangor, Malaysia. *Clinacanthus nutans* Lindau leaves were roasted at 40–45 C, then powdered. The finished

powder was soaked with chloroform (CNC), methanol (CNM) and aquadest (CNA) at room temperature. The extract was then filtered with Whatman paper No. 1. The chloroform and methanol extract was dried using a rotary evaporator, while the distilled water extract was dried with a freeze drier. All extracts were stored at 20 until use<sup>[1]</sup>. The test was carried out using the DPPH test. DPPH has been widely use to measure the antioxidant property of various sample including fluit, beverages and plant extracts. The result of this study, Trolox was used as standard, and hence the antioxidant capacity of an extract will be expressed in  $\mu\text{g Teq} / \text{g extract}$ . Figure 1 illustrates that the CNC was found to exhibit the highest DPPH scavenging activity compared to CNM and CNA with an antioxidant capacity value,  $7852.63 \pm 449.90 \mu\text{g Teq} / \text{g extract}$ . However, CNA showed the lowest activity with antioxidant capacity value  $864.11 \pm 73.49 \mu\text{g Teq} / \text{g extract}$ . The antioxidant activity of the *Clinacanthus nutans* Lindau extracts decreased in the order of chloroform > methano l > aqueous [3].

In the other search shows that study demonstrated the antioxidant capacities of *Clinacanthus nutans* Lindau extracts and their efficacies against hypercholesterolemia-induced oxidative stress in rats. The results indicated that *Clinacanthus nutans* Lindau is rich in multiple natural antioxidants, and hence its effects may be contributed by multiple bioactive compounds. Thus, *Clinacanthus nutans* Lindau may be a good source of functional ingredients that can be used for managing oxidative stress-related diseases [4].

The other study show the methanol extract of *Clinacanthus nutans* Lindau leaves even in low-dose (200 mg/kg) contains antitumor and antioxidant constituents that are capable of scavenging free radicals and inhibiting the growth of tumor progression. These findings also indicate that the phytochemical constituents present in methanol extract could be used as an alternative and complimentary for cancer prevention and treatment [5].

Reseach by Fahmi yakob (2018), *Clinacanthus nutans* Lindau was used as the biological agents. Appearances of reddish brown colour in silver nitrate solution indicated the formation of silver nanoparticles. This method has been widely used to determine the formation of silver nanoparticles [6].

## 2. Antihypoglikemic

Research conducted by Nena Ristra Dewinta et al (2019), dandang gendis leaves were extracted by maceration process using 70% polar ethanol solvent. Dandang gendis leaves are dried for 72 hours at room temperature and should not be exposed to direct sunlight and then powdered. The sample powder was wrapped in filter keatas then soaked with 70% ethanol solvent in a closed vessel gradually. The bath is often stirred and left for 24 hours then filtered over a Buecher funnel. The ethanol content obtained is obtained by using a rotary evaporator to form a paste. The paste form filtrate is an ethanol extract of dandan gending leaves. The test animals used in this study were male mice (*Rattus norvegicus*) Wistar strain aged 2 - 3 months with an average weight of 200 grams. Rats were made hyperglycemic which were then grouped into 5 groups where each group received different treatments, namely K (0) DM rat group was given Aquadest and CMC Na 1%, K (1) DM rat group was given ethanol extract at a dose of

75mg.kgBW, ( K2) DM group of mice were given ethanol extract of 150 mg / KgBB of dandang gendis leaves, K (3) the DM group of mice were given ethanol extract of dandang gendis leaves at a dose of 300 mg / kg and K (4) the DM group of mice were given metformin 500 mg. Dandang gendis extract and metformin are given once a day with sonde for 14 days. Based on research that has been done, it is known that the largest decrease in blood glucose levels was shown by group 1 as much as 130 mg / dL, where group 1 received a dose of 75mg / kgBB of dandang gendis extract [5].

Abdullah N et al (2017) conducted research by making extracts from leaves, stems and a combination of leaves and stems. The prepared sample was dried in an oven at 50 ° C for 24 hours, then powdered with a grinder machine (RT-34). Then extracted with 2 different types of solvents, namely ethanol and water, with a maceration process. The powder is soaked in solvent for 24 hours then filtered. The ethanolic extracts were evaporated at 60 ° C using rotatory evaporator (Buchi B-491 R-210, USA) while the aqueous extract were freeze dried using VirTir Bench Top Freeze Dryer. Dried extract were weighed and dissolved in 10% dimethylsulphoxide (DMSO) to yield a stock solution from which higher concentration were prepared [7].

The result from the reseach shows that all the aqueous extract of *Clinacanthus nutans* Lindau exhibited a significant inhibition effect compared to the control. In contrast, the ethanolic leaves and stem extracts did not show any entrapment ability in decreasing glucose movement into the external solution. However, the inhibition effect exhibited by the ethanolic mixture extract was significantly different compared to control[7].

Another study states that giving the water fraction of dandang gendis leaves (*Clinacanthus nutans*) can reduce blood glucose levels in male wistar rats induced by fructose and high-fat feed. The dose of 15.89 mg / kg BW is the most effective dose in reducing blood glucose levels and has an effect comparable to metformin [8].

## 3. Analgetic

Reseach by Em-on Chairateep (2018) analyzed the *Clinacanthus nutans* Lindau -based biodegradable patch for analgesic a design of experiment (DoE) by minitab version 18 program. They are made up some vorious concentration of 2%, 4%, dan 6% of sodium alginate (ALG-Na) and Aloe vera juice. The results show that the combination of 6% of sodium alginate (ALG-Na) and anethole produced the total quality (max stress, % elongation, mucoadhesive time, cost of production) (R2 adj > 87.95%<sup>[9]</sup>). From the Accelerated stability test performed, it was observed that the weight and thickness of the patch were not statistically significantly different[9].

## IV. CONCLUSION

*Clinacanthus nutans* Lindau is an herbal plant that is widely used by people in Southeast Asia such as Indonesia, Malaysia, Thailand and Singapore, as well as by the Chinese community. Research on *Clinacanthus nutans* Lindau has been widely carried out. From existing research, we can find out the chemical content of *Clinacanthus nutans* Lindau and its pharmacological effects, including as an antioxidant and anti-tumor, antihypoglycemic and anti-pain. The

pharmacological properties come from either the stems or leaves of *Clinacanthus nutans* Lindau. For further research, it is hoped that there will be research on the benefits of *Clinacanthus nutans* Lindau for cosmetics

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