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REVIEW: TONIC POTENCY OF ZINGIBERACEAE FAMILY HERBAL PLANTS IN IMPROVING BODY WELLNESS

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ABSTRACT

Body wellness is closely related to health; it is the ability of a person to perform activities without fatigue. Herbal plants can be used to help improve body health and endurance. The Zingiberaceae family is widely found and used by the Indonesian people. This family is widely used as an ingredient in herbal medicines and seasonings. Herbal plants with the potential to improve body wellness can be seen in their tonic effects. Testing the tonic effect can use several methods, namely, the natatory exhaustion test, hanging test, sleep induction test, and rotarod test in mice. Among these, the natatory exhaustion method is the simplest and can be performed quickly. The method used in preparing this article is to collect and understand the primary literature from online databases, such as Google Scholar. This review article aims to provide scientific information to the public regarding herbal plants from the Zingiberaceae family, which have the potential to help maintain a healthy body. Plants that can be used as health enhancers include Red Ginger, Gajah Ginger, Temu Kunci, Temu Giring, Lempuyang Gajah, and Cardamom.
Keywords: Herbal Plant, Zingiberaceae, Tonicum, Health

INTRODUCTION

Body wellness refers to a person's ability to carry out activities without feeling tired (Arifin, 2018). A person's wellness can determine their quality of life because wellness is closely related to health. Body wellness was assessed using predetermined measurements. The components that determine a person's wellness level are the endurance and strength of several organs, including the heart, lungs, and muscles, body growth balance, and flexibility (Sudiana, 2014).

Keeping the body fit can be accomplished with regular exercise, consuming nutritious food, getting enough sleep, and avoiding stress. The importance of maintaining the health and wellness of a body is due to the avoidance of degenerative and other diseases (Prativi *et al*., 2013). Tonicum is a drug that can increase body stamina to delay fatigue and lethargy, as well as nourish the body, restore lost energy, restore physical strength, and increase vitality The consumption of herbal plants can meet the need for supplements or tonics to maintain body fitness (Fithria *et al*., 2017).

An herbal plant that can be used as an alternative treatment to maintain health is the Zingiberaceae family. Zingiberaceae family is a group of plants with a type of temu plant with rhizomes and a distinctive odor. Plants of the Zingiberaceae family are widely distributed in Indonesia, which has a tropical climate (Puspitasari *et al.*, 2019).

Herbal plants are still widely used by the community today because they are easy to find and have many benefits. Traditional medications are applied by processing these herbs into medicinal concoctions used for treatments (Hidayat et al., 2010). Temu-temuan plants are used empirically by boiling, gratings, and slicing. Then, the juice and cooking water of

the temu plant will be taken directly, and because it is without preservatives, it must be consumed immediately (Shanthi et al., 2014). In addition to being consumed directly, herbal plants can be made into a concoction, such as herbalism (Jammu), and produced into Standardized Herbal Medicine (OHT) and phytopharmaceuticals.

This article aims to provide scientific information to the public regarding herbal plants of the Zingiberaceae family that have tonic potential to help improve body wellness and can be applied in everyday life by the community.

RESEARCH METHOD

The method used in the preparation of this review article was to search and discuss primary literature journals through an online database on Google Scholar. The search was conducted by combining the keywords "Herbal Plants", or "Medicinal Plants", and "Body Fitness" or "Tonicum". Primary data sources included research journals published in national and international journals. The screening of journals obtained with inclusion criteria in the form of research articles testing the tonic effect on herbal plants of the Zingiberaceae family using the natatory exhaustion tonic effect testing method published in 2013-2023 and exclusion criteria in the form of herbal plants, not of the Zingiberaceae family, and articles that were not suitable by not including preclinical testing methods and test results. Based on the keywords used in this study, the results of searching journal libraries on Google Scholar obtained 764 journal libraries and 225 articles for each keyword. Moreover, from the literature sources that have been obtained and then screened, obtained 6 data on herbal plants of the Zingiberaceae family, which can be used to improve body wellness and stamina and have a tonic effect, as well as the methods and results of preclinical testing that has been done (Table I).

RESULTS AND DISCUSSION

According to the Ministry of Trade through the Medicinal Plant Commodity Information, the four main rhizomes of medicinal plants with the highest production figures are all from the *Zingiberaceae* family, and two of them are used in wellness and aches concoction, namely *Zingiberaceae officinale* and *Zingiberaceae purpureum* (Kristiana *et al.*, 2022).). Based on the results of the literature search, several plants from the *Zingiberaceae* family were tested and found to have tonic effects (Table I).

Table I. *Zingiberaceae* Family Plant with Tonic Effect

Plants	Method	Test Material	Tests	Results	Reference
Red Ginger	*Natatory exhaustion*	Extract	I. : Aquades 100 mL/kgBB (negative control) II. : 100 mg/kg BB III. : Caffeine 100 mg/kgBB (positive control)	The tonic effect was obtained from the red ginger ethanol extract with an average result of 5.6711 minutes	(Retnani & Parmadi, 2014)
Elephant Ginger	*Natatory exhaustion*	Extract	I. : Na-CMC 1% b/v (negative	The tonic activity was shown by ethanol extract of	(Noer *et al.*, 2023)

			control) II. : 70 mg/kg BB III. : Caffeine 13 mg/kg BB (positive control)	the elephant ginger rhizome for 16.46 seconds.	
Fingerroot	*Natatory exhaustion*	Extract	IV. : Cooking oil 0,5 mL/kgBB (negative control) V. : 100 mg/kg BB VI. : 200 mg/kg BB VII. : 400 mg/kg BB VIII. : Caffeine13 mg/kg BB (kontrol positif)	The most effective tonic effect at a 400 mg/kg dose BB with a swimming endurance of 743.16 ± 22.071 seconds.	(Setyawati & Endrawati, 2019)
Temu Giring	*Natatory exhaustion*	Extract	I. : Cooking oil 0,5 mL/gBB (negative control) II. : 100 mg/kg BB III. : 200 mg/kg BB IV. : 400 mg/kg BB V. : Caffeine 100 mg/kg BB in the cooking oil (positive control)	The highest tonic effect of ethanol extract of Temu Giring rhizome at a dose of 400 mg/kg BB with a swimming endurance of 11 minutes	(Wiyanti & Endrawati, 2017)
Lempuyang Gajah	*Natatory exhaustion*	Extract	I. : Aquades 0,5 mL (negative control) II. : 200 mg/kg BB III. : 400 mg/kg BB IV. : 800 mg/kg BB V. : Caffeine 13 mg/kg	The best tonic effect of ethanol extract of Lempuyang Gajah rhizome has a swimming endurance of 28.8 minutes and the percentage increase in tonic effect (106.71 ± 4.164)%	(Rejeki & Priyandari, 2017)

				BB (positive control)	
Cardamom	*Natatory exhaustion*	Infusion	I. II. III. IV. V.	: Aquades (negative control) : 2,5 g/kgBB : 5 g/kgBB : 10 g/kgBB : Caffeine 0,1 g/kgBB (positive control)	The infusion of cardamom fruit has the best tonic effect at a dose of 10g/kg BB with an average swimming endurance time of 25 minutes 56 seconds.	(Agustien & Susanti, 2020)

The potential of an herbal plant to improve body wellness can be seen from the results of preclinical tests of tonic effects in mice. Tonicum is a drink or medicine that can help improve body wellness and stimulate appetite for food (Wiyanti & Endrawati, 2017). Testing for stimulant or tonic effects can be performed using several testing methods, including:

1. Natatory Exhausted Method

   This method was performed by comparing the exhaustion time of the test animals before and after treatment by recording the duration of the test animals during swimming.
2. Hanging method

   This method was performed by comparing the falling time of the test animals before and after treatment by noting how long the test animals would last as long as they were left hanging on a wire with a height of 30 cm.
3. Sleep induction method

   This method was performed by comparing the time taken to fall asleep from the test animals before being treated and after being treated as long as they were put into the experimental room by recording how long the test animals would last until they fell asleep after being put into the experimental room. The parameters of this test were as follows: when the body position of the mice was reversed, there was no movement of body position.
4. Rotarod method

   This method was performed by comparing the fatigue time of the test animals before and after treatment by recording how long the test animals will last after being placed on a rotarod set at an acceleration of 2 rpm per 15 seconds. Test animals were tested in separate compartments of 11 cm on a rod with a diameter of approximately 3 cm and a rotarod height of 35 cm. Each animal was measured three times at one-hour intervals (Ridayani, 2013; Fitrah *et al*., 2018; Yuliawati *et al*., 2022).

Tonic effect testing was performed on mice using *the natatory exhaustion method*. *The natatory exhaustion method* involves pharmacological screening to determine the effect of drugs that coordinate motor effects, primarily on central nervous control. The principle of this method is to test the effect of a tonic on the addition of motor activity produced by looking at the length of swimming time (Mafitri et al., 2018). The tonic effect test method with natatory exhaustion has several advantages over other tonic effect test methods, including that it can already determine the effect of stimulants as an activity enhancer, the stimulant effect can be seen spontaneously from the increase in work capacity, the time used for observation is relatively short, and the set of tools used is quite simple (Fithria et al., 2017). The following herbal plants have a tonic effect that can be used as body wellness enhancers.

Red Ginger and Elephant Ginger - *Zingiber officinale* var. Rubrum and *Zingiber officinale* var. Roscoe

The herbal plants red ginger and elephant ginger are rhizome-type plants of the Zingiberaceae family that have many benefits, and their use has been passed from generation to generation. Red ginger is widely used as a spice and in herbal medicine, pharmaceutical ingredients, and cosmetics (Putri K., 2009). Ginger is traditionally used to treat disease symptoms such as nausea, vomiting, cough, inflammation, constipation, indigestion, and loss of appetite (Stoner, 2013). Red ginger, which has health benefits, can be processed by boiling it and drinking water (Hidayat et al., 2010). The red ginger rhizome contains two main compounds, essential oil, which gives aroma, and gingerol, which gives spicy (Ashraf et al., 2017). Elephant ginger contains metabolite compounds in oleoresin compounds, which are phenol derivatives such as gingerol and shagaol, which can be energy-generating compounds (Noer et al., 2023). The tonic effect of red ginger ethanol extract was tested using male mice (Mus musculus L.) Swiss race, from the results of the data, showed a tonic effect in the sample of the red ginger ethanol extract (Retnani et al., 2014). Testing of the tonic effect of elephant ginger ethanol extract was carried out using white Wistar rats (Rattus norvegicus), and the results showed the tonic effect contained in the sample of elephant ginger ethanol extract (Noer *et al*., 2023).

Fingerroot - *Boesenbergia pandurata*

Fingerroot, scientifically known as *Boesenbergia pandurata*, is a plant of the *Zingiberaceae* family. Fingerroot rhizomes are used in daily life is as cosmetics, spices, and traditional medicine (Priyadi *et al*., 2021). Empirically, fingerroot rhizomes have antimicrobial, antioxidant, anticancer, and anti-inflammatory properties and can be used to treat various infectious diseases (Eng-Chong *et al*., 2012). The use of fingerroot rhizomes by local people is believed to help treat dry cough, intestinal worms, diarrhea, rheumatic diseases, malaria, mouth ulcers, digestive tract disorders, skin diseases, and tonic diseases (Setyawati *et al*., 2019). The metabolite compounds in the fingerroot rhizome are essential oil compounds and flavonoids (Handayani *et al*., 2018). In Widyarman's research, ethanol extracts contain alkaloids, saponins, phenolics, flavonoids, triterpenoids, and glycosides (Widyarman *et al*., 2019). Testing the tonic effect on the ethanolic extract of the fingerroot rhizome has the most effective results in a 400 mg/kg BB test (Setyawati & Endrawati, 2019).

Temu Giring - *Curcuma heyneana*

Temu giring rhizomes are herbal plants widely distributed in Indonesia because of their tropical climate; in humid areas, temu giring is easily cultivated (Widyaningsih, 2011). Temu giring can be used as an anthelmintic for children, smoothing the skin, slimming, stomach medicine, and digestion (Widyawati *et al*., 2015). Temu-giring rhizomes contain metabolites, including saponins, flavonoids, phenols, and essential oils (Jalil, 2019). The essential oil contained in the temu giring rhizome is 0.8-3%, and its components are gamma-terpinene, β-terpinene, terpinolene, δ-element, α-kopaenene, guiazulen, carvone, and 2-undecane (Widyaningsih, 2011). The tonic effect of the ethanol extract of the temu-giring rhizome was tested using the natatory exhaustion method in mice. The results showed that the most effective tonic effect was observed in mice treated with ethanol extract at a test dose of 400 mg/kg BB (Wiyanti *et al*., 2017).

Lempuyang Gajah - *Zingiber zerumbet*

The herbal plant Lempuyang Gajah is one type of plant that grows widely in Southeast Asia. Lempuyang Gajah rhizome is empirically used to treat asthma, dysentery, deworming, gastrointestinal disorder, treating swelling, lumbago, diabetes, inflammation, chest pain, rheumatic pain, bronchitis, dyspepsia, and sore throat. The metabolite compounds found in the ethanolic extract of emptying Gajah are terpenoids, flavonoids, and alkaloids. Elephant lempuyang plant extract contains terpenoids, flavonoids, alkaloids, and zerumbone content

of 2.53 ± 0.24% w/b (Hanwar *et al*., 2019).). Elephant lempuyang plants also contain alkaloids, saponins, flavonoids, polyphenols, and essential oils, particularly in the rhizome. This plant is effective as a stomachic, carminative, stimulant, tonic, external medicine, anti-spasm, and appetite enhancer. The tonic effect of the ethanol extract on emptying the Gajah rhizome was performed using the natatory exhaustion method in mice. The results showed that ethanol extract from lempuyang gajah rhizome has a tonic effect (Rejeki *et al*., 2017).

Kapulaga - *Amomum cardamomum*

Amomum cardamomum is the scientific name of the cardamom plant. Cardamom is a native Indonesian plant widely found on the islands of Java and Sumatra. The compounds found in cardamom fruit and rhizomes are saponins, flavonoids, polyphenols, and essential oils. This cardamom fruit contains essential oils consisting of sineolterpene and terpineol compounds, which have many health benefits (Syafitri et al., 2020). Cardamom plants contain flavonoid and terpenoid metabolites, including borneol, cineole, pinene, camphene, and comfort (Agustien et al., 2020). Empirically, cardamom is widely used to treat sore throat, cough, flatulence, and nausea (Fernandarisky et al., 2020). The tonic effect test on cardamom fruit infusion was performed using the natatory exhaustion method. The results showed that The best or most effective tonic effect was observed in mice with cardamom infusion at a test dose of 10 g/kg BB (Agustien et al., 2020).

From the several studies above, plants of the Zingiberaceae family that provide tonic effects are Red Ginger, Fingerroot, Temu Giring, Lempuyang Gajah, and Cardamom. Metabolite compounds in the ethanol extract of the plants included alkaloids, Phenolics, Flavonoids, Gingerol, Glycosides, Essential oils, Saponins, Terpenoids, and Triterpenoids. Compounds that are thought to have a tonic effect with the exact mechanism of action of caffeine are flavonoid compounds, which act as adenosine A1 receptor antagonists. Flavonoids indirectly create excitement so that the body and eyes become refreshed refreshed (Sani K et al., 2020). According to Herdayanti et al., (2021), it is known that flavonoid and alkaloid secondary metabolite compounds show efficacy as a tonic (Herdayanti et al., 2021). The tonic effect produced will be directly proportional to the concentration of the ethanol extract of the plant, where if the concentration of the extract used in the test is great, the higher the tonic effect produced.

In addition to the plants above that have been tested for tonic effect, there are also the plants of *Zingiberaceae* family that have properties to improve wellness based on regional traditions, namely galangal (*Alpinia galanga* (L.) Willd.), turmeric (*Curcuma domestica* Val.), temulawak (*Hedychium coronarium* J.Koenig), aromatic ginger (*Kaempferia galanga* L.), dan bonglai (*Zingiber purpureum Roscoe*).

CONCLUSION

Based on the result of the review, herbal plants of the *Zingiberaceae* family that can be used to help improve wellness and health include red ginger, fingerroot, temu giring, lempuyang gajah, and cardamom, which have been scientifically proven because these plants have a tonic effect that can improve body wellness and stimulate appetite.

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