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# Contribution Of Kurkuminoid Proteins From White Kunyit Root Extract (*Curcuma Zedoaria Rosc.*) As Anti-Inflammatory Medicine

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**ABSTRACT**

This research aims to identify curcuminoid compounds from white turmeric *(Curcuma zedoaria Rosc.)* rhizome extract as anti-inflammatory drugs. White turmeric rhizomes contain curcuminoids which can be used as anti-inflammatory. Curcuminoids are yellow polyphenols, insoluble in water and acidic solvents but soluble in dimethyl sulfoxide, acetone and ethanol. It has various benefits such as lowering blood sugar levels, acting as an antioxidant, and having anti-carcinogenic properties. The identification of curcuminoid compounds in white turmeric as potential anti-inflammatory drugs provides a significant contribution to the development of natural drugs for inflammation-related disorders. The research method used is descriptive through literature research, with a focus on exploring the contents and benefits of white turmeric in traditional medicine. This research provides evidence that supports the efficacy of curcuminoids from white turmeric rhizome extract as an anti-inflammatory agent. However, to validate the effectiveness and safety of using white turmeric as an anti-inflammatory drug in humans, further research is needed including pharmacodynamic studies, pharmacokinetics and clinical trials. Apart from that, purification of curcuminoid compounds and research on interactions with other drugs also need to be carried out to strengthen the scientific basis and develop more effective drug formulations

Keywords: white turmeric, curcumin, anti-inflammatory

## I. INTRODUCTION

Indonesia, as a country with a tropical climate, is rich in biodiversity. One of them is medicinal plants, 80% of which are used by the world population can be found in Indonesia. There are 28,000 species and 1,000 of them have been used as medicinal plants.

The use of medicinal plants and traditional medicine has been known since ancient times to treat diseases and protect the body from disease attacks. A bad lifestyle will affect health and cause disease, so health will be an expensive thing. The lack of affordability of synthetic drugs or modern drugs causes a decrease in the quality of health. From these problems, it is necessary to have alternative drugs that are not inferior in efficacy to synthetic drugs, namely returning to nature by utilizing plants as medicines.

WHO (*World Health Organization*) has suggested the use of plants as herbal medicines to maintain health, prevent, and treat disease. This shows support for alternative medicine known as back to nature. The use of herbal medicine continues to increase in both developed and developing countries. In Indonesia itself as a developing country in 2001, it increased from 1.3 trillion to 1.5 trillion in 2002 and will continue to increase over time.

Medicinal plants are plants that contain ingredients that can be used as a treatment and their active ingredients can be used as synthetic medicinal ingredients (Nobiola et al., 2020). The type of medicinal plant that is widely used is the Zingiberaceae family, which is a type of herb, has rhizomes and has a distinctive odor (Nobiola et al., 2020).

Plant species that include temu-temuan include temulawak, turmeric, ginger, kencur, galangal, and others. One of the temu-discovery plants, which is widely used by the community, is turmeric, which is currently starting to be used as a medicinal plant. In the white turmeric rhizome there are several efficacious ingredients, namely curcumin, flavonoids, polyphenols, and essential oils. With the content in white turmeric is believed to be used as an antibacterial. White turmeric has the ability to inhibit high bacterial growth compared to other species. To increase the usability of one of the biodiversity, namely medicinal plants in Indonesia, as well as an effort to add to the alternative medicine library, the researchers will test the extract of white turmeric rhizome (*Curcuma zedoaria Rosc*.) as an anti-inflammatory drug.

Turmeric is a native Southeast Asian plant whose distribution center is in the Malay Peninsula, Sumatra Island, and Java Island. One type of turmeric that is widely used as an ingredient in traditional medicine is white turmeric (*Curcuma zedoaria Rosc.).* White turmeric (*Curcuma zedoaria Rosc.)* is proven to have pharmacological effects, where the compounds contained in white turmeric have the benefit of healing wounds caused by cancer and tumors. The rhizomes of white turmeric contain curcuminoid compounds that can be used as anti-inflammatory (anti-inflammatory). White turmeric contains saponins which have anticancer benefits and polyphenols as antioxidants (Linda et al., 2014). The main compound of white turmeric rhizome that has medicinal benefits is curcuminoids (Listyana, 2018).

## II.METHODS

This research is a literature review. The research method used in this research is descriptive research. This research was conducted by reviewing one of the traditional medicinal plants white turmeric (*Curcuma zedoaria Rosc.,)* as an anti-inflammatory drug.

## III. RESULT AND DISCUSSION

Based on previous studies, the results of the identification of curcuminoid compounds in white turmeric rhizome extract contained curcumin type curcuminoid compounds with a level of 0.60%, Curcuminoids have many benefits, including lowering blood sugar levels, as antioxidants and anticarcinogenic (Pricilia & Saptarini, 2016). There is also research that Curcuminoids are polyphenols that are yellow in color, have insoluble properties in water and acid solvents, but are soluble in dimethyl sulfoxide, acetone and ethanol solvents. Yustinianus et al., (2019), added that curcuminoids can be used as antispasmodics, hepatoprotective, antiaging, neuroprotective, anticoagulants and lower blood lipids. According to Linda et al., (2014) The white turmeric part in the form of rhizomes contains curcumin as an antitumor and anti-inflammatory (anti-inflammatory). Seeing the high benefits of curcuminoids as an ingredient for making natural medicines and also widely used in the food coloring process, it is necessary to identify white turmeric as an anti-inflammatory drug in accordance with the objectives of this study, namely to identify curcuminoid compounds from white turmeric rhizome extract (*Curcuma zedoaria Rosc.)* as an anti-inflammatory drug.

## A. White Turmeric (*Curcuma zedoaria Rosc.)*

White turmeric has a Latin name, Curcuma zedoaria Rosc,. White turmeric is currently about 50% to 60% used as a traditional medicinal plant in Indonesia, because of its many properties. The rhizome part of white turmeric has benefits, including increasing appetite, counteracting toxins, reducing body heat, reducing itching, accelerating healing of inflammatory wounds. White turmeric also contains phenol components in the form of curcuminoids that function as antioxidants and contain active compounds of essential oils that have a carmivatum effect so that they can increase appetite (Mu'addimah et al., 2015). White turmeric contains active compounds, namely curcumin, which acts as an antitumor, antibacterial and antioxidant (Mozartha et al., 2019). White turmeric is proven to have pharmacological effects, which have properties that can accelerate wound healing caused by cancer and tumors. The white turmeric part in the form of rhizomes contains curcumin as an antitumor and anti-inflammatory (anti-inflammatory). Turmeric has main contents including arylheptanoid compounds (curcuminoids), essential oils with various monoterpenes and sesquiterpenes, and polysaccharides.

## B. Classification and Morphology of White Turmeric

Turmeric is a plant that has medicinal properties, such as shrubs, and is found throughout regions that have a tropical climate. Turmeric plants can usually thrive and grow wild in open land such as forests / garden waste. In addition to growing in the forest, in some areas in South Asia, such as India, South China, Taiwan, Indonesia, and the Philippines, this plant is grown and also cultivated and traded. This plant is also an annual, which is generally more than one year old (Fathonah, 2019).

White turmeric is one type of annual plant. White turmeric has a round leaf shape that is light green in color. This plant has flowers that grow on a pseudo-stem that has a height of about 30-70 cm. White turmeric has fleshy roots like tubers the size of quail eggs but slightly longer. This turmeric rhizome grows very short, yellowish white and slightly pale, has fiber-like roots, and a distinctive smell like boiled beans (Fathonah, 2019). White turmeric *(Curcuma zedoaria Rosc.,)* belongs to the temu-temuan tribe *(Zingiberaceae*). White turmeric has a height of 1 meter to 2 meters with a pseudo-stem that is slightly brownish green. The part of white turmeric that is used for traditional medicine, one of which is as a cancer drug, is the rhizome (Lobo et al., 2009). The classification of the white turmeric plant is as follows: Kingdom: *Protista* Division: *Magnoliophyta* Class: *Liliopsida* Order: *Zingiberales* Family: *Zingiberaceae* Genus*: Curcuma* Species: *Curcuma zedoaria (Berg*.)

***Image. 1**. White Turmeric Rhizome*
*(Source:https://repository.arraniry.ac.id/id/eprint/18227/ )*

## C. Benefits of White Turmeric

White turmeric (*Curcuma zedoaria Rosc.*) consists of several specific parts. The parts of white turmeric have different benefits in their use, both scientifically and traditionally. The rhizome of white turmeric can produce oil. This oil has benefits including reducing nausea, feeling like vomiting and can facilitate menstruation, while white turmeric roots are useful for overcoming vaginal discharge. White turmeric rhizome powder has benefits as an antiallergic, while the leaves can be made into juice which is useful for the treatment of leprosy and the treatment of furunculosis (Fathonah, 2019).

White turmeric has been shown to have pharmacological activities including hemostatic properties (stopping bleeding), potential as an antibacterial, besides that the curcumin compound found in white turmeric rhizomes has benefits as an anti-tumor, and antioxidant. Based on scientific research, there have been many reported benefits of white turmeric, including as an antioxidant, anti-inflammatory (anti-inflammatory), anticancer, and antibacterial. Active compounds contained in turmeric are tannins, flavonoids, terpenoid compounds, saponins, alkaloids, glycosides, phenols and steroids (Hasanah, 2018). The results of research by Yustinianus et al., (2019), some rhizomes of the zingiberaceae tribe from South Sulawesi, extracted by sokletasi using acetone solvent produced the highest curcuminoid content found in turmeric rhizomes, namely 11.33%. Curcuminoids are one of the compounds in white turmeric rhizomes that can be utilized as medicine.

## D. Content of White Turmeric Compounds

White turmeric (*Curcuma zedoaria Rosc*.), contains chemical compounds including curcuminoids, essential oils, astringence, flavonoids, sulfur, gum, resin, flour, a little fat. In addition, Curcuma zedoaria also contains alkaloids, phenols, saponins, glycosides, steroids, terpenoids, and other ingredients that are thought to be used as antimicrobial, antifungal, anticancer, antiallergic, antioxidant, and analgesic (Lobo et al., 2009). One of the active compounds contained in white turmeric is curcuminoids. Curcuminoids are one class of phenolic compounds that have properties that are difficult to dissolve in water at acidic pH and are quickly hydrolyzed in alkaline solutions. The rhizome of the curcuma tribe contains curcuminoi with levels of about 3-5%.

One of the curcuminoid compounds that acts as the main pigment of the three groups of curcuminoid compounds is curcumin (Adnina, 2018).Kesuma (2009) states that ethanol extract of turmeric rhizomes and ethyl acetate extract of turmeric rhizomes have anti-inflammatory effects (anti-inflammatory). Essential oil from the steam distillation of turmeric rhizomes is reported to have active compounds with molecular groups similar to curcumin which have anti-inflammatory properties (Solfaine et al., 2007). This study concluded that curcumin in white turmeric (*Curcuma zedoaria Rosc.)* has significant potential as an anti-inflammatory drug. A comprehensive analysis of the white turmeric rhizome extract showed a rich content of

curcuminoids, especially curcumin, which has strong anti-inflammatory activity. These findings provide a strong basis for the development of white turmeric as a potential source for effective anti-inflammatory therapies in the medical field. By decimian, the identification of curcuminoid compounds in white turmeric rhizome extract contained curcumin-type curcuminoid compounds with a level of 0.60% which can treat anti-inflammatory diseases.

## IV. CONCLUSION

Curcumin found in white turmeric has been consistently shown to have strong anti-inflammatory activity. Numerous scientific studies have shown that this compound is able to reduce inflammation with significant effectiveness. In this context, white turmeric is not only a potential traditional medicinal plant, but also a potential source for effective anti-inflammatory therapies in the medical field.

In the literature review conducted, the authors found that curcumin in white turmeric has various anti-inflammatory mechanisms of action. Moreover, its ability to reduce inflammation has been supported by strong experimental and clinical evidence. In practice, the use of white turmeric as an anti-inflammatory drug has been widely recognized by the public, especially in traditional medicine in many cultures.

However, the authors also recognize that although there have been many studies supporting the effectiveness of curcumin as an anti-inflammatory drug, further research is still needed to thoroughly validate its effectiveness, especially in the context of human use. Further studies on pharmacodynamics, pharmacokinetics, and clinical trials need to be conducted to confirm the clinical benefits of using white turmeric as an anti-inflammatory drug. In addition, it is also important to consider possible side effects and interactions with other drugs in the use of white turmeric as anti-inflammatory therapy.

Therefore, further in-depth research is needed to strengthen the scientific basis and develop more effective and safe drug formulations. Thus, the authors are of the view that curcumin in white turmeric has great potential as an effective and valuable anti-inflammatory drug. However, its use in clinical practice should be supported by strong scientific evidence and an in-depth understanding of its mechanism of action and side effects.

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