



***Catharanthus roseus* antioxidant potential: A review article**

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Abstract

Catharanthus roseus has antioxidant effects, one of which plays a role in inhibiting the aging process. The purpose of this study was to determine the antioxidant content of the *Catharanthus roseus*. The literature study used *in vivo*, *in vitro*, *in silico* research articles, and literature review articles from national and international journals accessed from Google Scholar, Elsevier, Science Direct, and PubMed using the keywords *Catharanthus roseus*, antioxidant. We used 13 relevant articles in this literature review. *Catharanthus roseus* is an evergreen suberb or herbaceous plant that grows to a height of 1 m. Antioxidants in a chemical sense are electron donors and biologically antioxidants are compounds that are able to overcome the negative effects of oxidants in the body such as damage to vital elements of body cells. *Catharanthus roseus* has antioxidant effects that are beneficial for the anti-aging process. In addition, *Catharanthus roseus* also has good antioxidant potentials throughout its parts under drought stress.

Keywords: *Catharanthus roseus*, antioxidant, a review

Introduction

Catharanthus roseus also known as *Vinca rosea*, *Vinca multiflora*, *Ammocallis rosea* and *Lechonera rosea*, vinca grows 7-24 inches tall and wide, forming a mound of colorful flowers such as white, pink, or reddish-purple at the tip. branch. *Catharanthus roseus* (L.) is a medicinal plant from the *Apocynaceae* family. There are about two common cultivars of *C. roseus* named after flower colour namely the pink flower "Rosea" and the white flower "Alba".

Antioxidants play an important role in the human body, namely protecting cells from damage caused by free radicals. Antioxidants are compounds that slow or prevent the oxidation process by stopping the chain reaction of free radicals. Free radicals are substances that occur naturally during metabolism in the body and are associated with oxidative stress that occurs and have a role in various degenerative diseases including aging. *Catharanthus roseus* has antioxidant effects, one of which is beneficial for inhibiting the aging process on the skin which is the most visible indicator of the combined effects of biological aging, lifestyle, and the environment. Aging or aging occurs due to damage to cells caused by free radicals. Metabolic processes or negative environmental impacts can continuously form free radicals. Antioxidants are believed to have an important role in this condition.

The antioxidant potential of ethanolic root extracts of two varieties of *C. roseus*, namely rosea (pink flowers) and alba (white flowers) were obtained using different assay systems such as Hydroxyl radical-scavenging activity, superoxide radical-scavenging activity, DPPH radical-scavenging activity, and the nitric oxide radical inhibition method.

Methods

The literature study used *in vivo*, *in vitro*, *in silico* research articles, and literature review articles from national and international journals accessed from Google Scholar, Elsevier, Science Direct, and PubMed using the keywords *Catharanthus roseus*, antioxidant, *in vivo*, *in vitro*, *in silico*. We used 13 relevant articles in this literature review.

Discussion

Indonesia has thousands of plant species scattered in various regions. The existing biodiversity can be used as raw materials for modern and traditional medicines. Plants as traditional medicinal ingredients have been widely

used for health maintenance, treatment, and beauty. Medicinal plants have a long history of use in traditional medicine, one of which is *Catharanthus roseus* which is one of the medicinal plants that has a long history^[5].

Catharanthus roseus also known as *Vinca rosea*, *Vinca multiflora*, *Ammocallis rosea* and *Lochnera rosea*, vinca grows 7-24 inches tall and wide, forming a mound of colorful flowers such as white, pink, or reddish-purple at the tip. branch. *Catharanthus roseus* (L.) is a medicinal plant from the Apocynaceae family. There are about two common cultivars of *C. roseus* named after flower colour namely the pink flower "Rosea" and the white flower "Alba"^[8]. *Catharanthus roseus* known as the Madagascar periwinkle is a native species of *Catharanthus* and is also endemic to Madagascar^[6]. This plant is usually used to treat various diseases^[8]. The content of alkaloids in this plant is useful for the treatment of diabetes, blood pressure, asthma, constipation and cancer and menstrual problems^[8].

Catharanthus roseus is an evergreen subshrub or herbaceous plant that grows to a height of 1 m. The leaves are oval with a length of 2.5 - 9.0 cm and a petal area of 1 - 3.5 cm, shiny green, hairless with a pale midrib, short petioles about 1 - 1.8 cm, and arranged in opposite pairs^[8]. The flowers of this plant are white to dark pink with a dark red centre, and have five lobe-like petals^[6]. This plant has a long history as a traditional medicine in many countries such as South Africa, China, India, Mexico, and Malaysia^[8]. All parts of this plant have been used in regional herbal medicine, including dried roots, leaves, flowers and stems^[7].

Antioxidants in a chemical sense are electron donors and biologically antioxidants are compounds that are able to overcome the negative effects of oxidants in the body such as damage to vital elements of body cells. Antioxidants are compounds that can scavenge free radicals. Free radicals are generated due to several factors, such as smoke, dust, pollution, the habit of consuming fast food that is not balanced between carbohydrates, proteins and fats^[7]. Based on the source, antioxidants consist of natural and synthetic where natural antioxidants are preferred over synthesis because some synthetic antioxidants such as butyl hydroxy anisole (BHA) and butyl hydroxy toluene (BHT) are thought to cause liver damage and are carcinogenic^[3]. This encourages continuous research to identify and isolate natural antioxidant compounds from natural ingredients.

Catharanthus roseus has antioxidant effects that are beneficial for the anti-aging process. Antioxidants are radical scavengers that provide protection to the human body from free radicals by inhibiting the oxidation chain reaction^[19]. The antioxidant potential of ethanolic root extracts of two varieties of *C. roseus*, namely rosea (pink flowers) and alba (white flowers) were obtained using different assay systems such as Hydroxyl radical-scavenging activity, superoxide radical-scavenging activity, DPPH radical-scavenging activity, activity and nitric oxide radical inhibition method. The results showed that the ethanolic extract from the roots of this plant variety showed a satisfactory decreasing effect in the overall test depending on the concentration but *C. roseus* was shown to have higher antioxidant activity than *C. alba*^[4-7]. *Catharanthus roseus* contains a large number of volatile and phenolic compounds including caffeoylquinic acid and flavonol glycosides which are known to have antioxidant activity^[8]. It has an important role in the body's defense system acting as an antioxidant against harmful reactive oxygen species (ROS), by forming such products through normal cellular aerobic respiration^[8]. In addition, previous studies also showed that antioxidant tests of plant extracts and their fractions revealed that *C. roseus* is a good source of natural antioxidants^[9-12]. The previous study showed that *Catharanthus roseus* has good antioxidant potentials throughout its parts under drought stress^[1].

Conclusion

Catharanthus roseus has antioxidant effects that are beneficial for the anti-aging process. In addition, *Catharanthus roseus* also has good antioxidant potentials throughout its parts under drought stress.

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