JKM (Jurnal Kebidanan Malahayati),Vol 9, No. 1. January 2023,
ISSN (Print) 2476-8944 ISSN (Online) 2579-762X, Hal 53-57

IDENTIFICATION OF ALKALOIDS AND STEROIDS IN MORINGA OLEIFERA LEAVES AS A BREASTFEEDING

Yopi Suryatim Pratiwi[1], Sri Handayani[2], Nurul Fatmawati[3]

[1,2,3]Prodi Kebidanan Program Sarjana STIKES Yarsi Mataram
Korespondensi email: yopisuryatimpratiwi@gmail.com

ABSTRAK : IDENTIFIKASI ALKALOID DAN STEROID DALAM DAUN KELOR SAAT MENYUSUI

Latar belakang: Angka kematian merupakan salah satu indikator kesehatan yang penting dan mencerminkan derajat kesehatan di suatu wilayah. Angka Kematian Bayi (AKB) di Indonesia masih tinggi Angka kematian bayi sebagian besar disebabkan oleh faktor nutrisi. Beberapa penyakit yang timbul akibat malnutrisi antara lain pneumonia, diare, dan perinatal. Pemberian Air Susu Ibu (ASI) eksklusif mampu menurunkan angka kesakitan dan kematian bayi. Alasan yang paling sering ditemukan pada ibu menyusui yang menghentikan pemberian ASI yaitu karena produksi ASI yang kurang. Pemanfaatan tanaman/sayuran yang berfungsi sebagai galaktogogue dapat digunakan sebagai alternatif untuk meningkatkan produksi ASI. Daun kelor merupakan salah satu tanaman yang sering digunakan masyarakat untuk meningkatkan produksi ASI.

Tujuan: Tujuan penelitian ini yaitu mengidentifikasi kandungan alkaloid dan steroid pada daun kelor sebagai upaya untuk melancarkan produksi ASI.

Metode: Metode dalam penelitian ini yaitu melakukan uji laboratorium pada daun kelor segar berwarna hijau muda sampai hijau agak tua sebanyak 100 gram. Skrining alkaloid menggunakan pereaksi Mayer dan Dragendorff, sedangkan steroid dengan pereaksi asam asetat, anhidrat, dan H2SO4 pekat.

Hasil: Hasil penelitian didapatkan daun kelor (*Moringa oleifera*) menunjukkan terdapat kandungan senyawa alkaloid dan steroid.

Simpulan: Pemanfaatan daun kelor merupakan salah satu alternatif yang dapat digunakan untuk mengatasi masalah produksi ASI yang kurang, selain murah dan mudah didapatkan.

Saran: Peneliti selanjutnya disarankan dapat melakukan penelitian terkait inovasi pengembangan pengolahan daun kelor terhadap kelancaran ASI yang langsung diaplikasikan pada ibu-ibu menyusui untuk mencegah kegagalan pemberian ASI eksklusif karena produksi ASI kurang.

Kata Kunci: Daun kelor, Alkaloid dan Steroid

ABSTRACT

Background: The mortality rate is an important health indicator and reflects the degree of health in an area. The Infant Mortality Rate (IMR) in Indonesia is still high. The infant mortality rate is largely due to nutritional factors. A number ofdiseaseSymptoms that arise due to malnutrition include pneumonia, diarrhea, and perinatal. Exclusive breastfeeding can reduce infant morbidity and mortality. The most common reason found in breastfeeding mothers who stop breastfeeding is due to insufficient milk production. Utilization of plants/vegetables that function as galactogogue can be used as an alternative to increase milk production. Moringa leaves are one of the plants that people often use to increase milk production.

Purpose:The purpose of this study was to identify the alkaloid and steroid content in Moringa leaves as an effort to expedite milk production.

Method: The method in this study namelyu did a laboratory test on fresh colored moringa leavesgreenyoung to slightly dark green as much as 100 grams. Alkaloid screening used Mayer's and Dragendorff's reagents, while steroids used acetic acid, anhydrous and concentrated H2SO4 reagents.

Results: The results showed that the leaves of Moringa (Moringa oleifera) showed the presence of alkaloid and steroid compounds.

Conclusion:Utilization of Moringa leaves is an alternative that can be used to overcome the problem of insufficient milk production, besides being cheap and easy to obtain.

Suggestions:Further researchers are advised to conduct research related to the innovation of developing moringa leaf processing for the smoothness of breast milk which is directly applied to breastfeeding mothers to prevent failure of exclusive breastfeeding due to insufficient milk production.

Keywords: Moringa leaves, Alkaloids and Steroids

INTRODUCTION

The mortality rate is an important health indicator and reflects the degree of health in an area. The Infant Mortality Rate (IMR) in Indonesia in 2017 is still high at 24 per 1,000 live births (Ministry of Health RI, 2017b). Global commitment in the Sustainable Development Goals (SDGs) in the 4th goal sets the target related to IMR deaths to 23 per 1,000 live births (BPPN, 2011). Infant mortality is largely due to nutritional factors, ieas big53%. A number ofdiseasethat arise due to malnutrition include pneumonia (20%), diarrhea (15%), and perinatal (23%) (Ministry of Health RI, 2014).

Exclusive breastfeeding can reduce infant morbidity and mortality (Biks et al., 2015; Lenja et al., 2016). Optimal breastfeeding can prevent 1.4 million deaths worldwide in children under five every year and reduce deaths due to acute respiratory infections and diarrhea 50-95% (Horta BL, 2013). Suboptimal breastfeeding causes 45% of neonatal deaths due to infectious infections, 30% of deaths due to diarrhea, and 18% of deaths due to acute respiratory disorders in children under five years of age in developing countries (Mekuria & Edris, 2015). The percentage of babies who are exclusively breastfed until the age of 6 months is 29.5% and babies who are breastfed aged 0-5 months is 54% (Ministry of Health RI, 2017a). The coverage of exclusive breastfeeding in NTB Province is above the national target, which is 82.68%. The lowest breastfeeding coverage in NTB is the City of Mataram 70.30% (NTB Provincial Health Office, 2018).

Breast milk is the first, main and best food for neonates, which is natural and contains many nutrients needed in the process of growth and development of infants, especially up to 6 months of age. However, insufficient milk production is a common complaint expressed by mothers, especially in the first week of childbirth (Asnidawati & Ramdhan, 2021; Margareth ZH, 2016). Zakaria's research (2016) reported that 38% of breastfeeding mothers stopped breastfeeding on the grounds that milk production was cut off or lack of milk production (Zakaria et al., 2016). A preliminary survey conducted by Indrayani (2015) on 39 respondents from 16 provinces in Indonesia showed that 17.9% of respondents stated that breast milk had not appeared in the first week of breastfeeding, 33.3% stated that the amount of breast milk was small, and 2.6% stated that breast milk did not come out at all during the lactation period. Most (69.23%) of mothers who complained of insufficient milk supply were primiparous women (Indrayani D, Gustirini R, 2015).

In Indonesia there are many plants/vegetables that are believed to increase milk production or function as a galactogogue, including fennel, kelor leaves, katuk leaves, young papaya fruit, klabet, aniseed, torbangun, beluntas, lempuyang, spinach and cassava leaves (Indonesian Pediatrician Association, 2010; Wulandari ET, 2020). Research conducted by Handayani (2021) explains that the plants most widely used as breastfeeding boosters are katuk leaves (50.4%), moringa leaves 38.2%), turi leaves (8.9%), and spinach (2,4%) (Handayani et al., 2021). Most of these ingredients have not been scientifically evaluated but are traditionally safe and effective (Indonesian Pediatrician Association, 2010).

World Health Organization(WHO) has also recommended the use of natural ingredients for traditional medicine as an effort to improve health (promotive), disease prevention (preventive), and treatment (curative). The use of natural ingredients is considered safer than chemical drugs and has relatively fewer side effects if used properly (World Health Organization, 2019). The purpose of this study was to identify the alkaloid and steroid content in Moringa leaves as an effort to expedite milk production.

Based on this background, researchers are interested in conducting research on the identification of alkaloid and steroid content in Moringa leaves (Moringa Oleifera) as a breast milk booster.

RESEARCH METHODOLOGY

This type of research is laboratory observation research to demonstrate the identification of alkaloid and steroid compounds in Moringa leaves (Moringa oleifera L.)

This research was conducted in August 2022 atMuhammadiyah University of Mataram Pharmacy Laboratory.

The materials used in this study were colored Moringa leavesgreenyoung to slightly dark green as much as 100 grams.

The research procedure used to check the steroid content was by the Liebermann-Burchard reaction, in which 2 mL of the test solution was evaporated in a porcelain cup. The residue is dissolved with 0.5 mL of chloroform, then 0.5 mL of anhydrous acetic acid is added. 2 mL of concentrated sulfuric acid was then added through the tube wall. The formation of a brown or violet ring at the boundary of the solution indicates the presence of triterpenoids, whereas a greenish blue ring appears indicating the presence of steroids (Ciulei J, 1984).

Examination of the alkaloid content, namely 2 mL of the test solution was evaporated over a porcelain cup. The resulting residue was then

 DOI 10.33024, http://ejurnalmalahayati.ac.id/index.php/kebidanan

dissolved with 5 mL of 2 N HCL. The solution obtained was divided into 3 test tubes. The first tube was added with 3 drops of 2N HCl which served as a blank. The second tube was added 3 drops of Dragendorff's reagent and the third tube was added 3 drops of Mayer's reagent. An orange precipitate formed in the second tube and a yellow precipitate in the third tube indicated the presence of alkaloids (Farnworth, 1996).

RESEARCH RESULT

Checking the alkaloid and steroid compounds of Moringa leaves was carried out at the Mataram Muhammadiyah University Laboratory. The results of checking alkaloids and steroids in Moringa leaves can be seen in Table 1.

Table 1
Results of Phytochemical Screening of Alkaloids and Steroids of Moringa Leaves

Class	Prereaction	Observation	Results
Alkaloids	Mayer	No formation of yellow/white precipitate	+
	Dragendorff	No formation of orange precipitate	+
Steroids/triterpenoids	Acetic anhydrous acid, concentrated H2SO4	Formation of a brownish blue-green ring	+

The results of phytochemical screening on Moringa leaves (Moringa oleifera) showed the presence of alkaloid and steroid compounds.

DISCUSSION

Moringa is a type of medicinal plant from the Moringaceae family which is rich in nutrients. Nutrient content such as minerals, vitamins and amino acids are spread in all parts of the Moringa plant. All parts of the moringa plant can be consumed, from the leaves, bark, flowers, fruit, to the roots (Septadina et al., 2018; Toripah, 2014). All parts of the moringa plant are traditionally used for different purposes, but it is generally the leaves that are used most often (Leone et al., 2015).

Moringa leaves are similar to katuk leaves, round in shape and green in color. Moringa leaves are delicious to eat in a variety of dishes. The superiority of Moringa leaves lies in its nutritional content, especially the mineral and vitamin groups. Every 100 g of Moringa leaves contain 3390 SI of vitamin A, two times higher than spinach and thirty times higher than green beans. Moringa leaves are also high in calcium, around 440 mg/100 g, and phosphorus 70 mg/100 g (Zakaria et al., 2016).

Results of phytochemical tests conducted in this studyshowed that Moringa leaves contain alkaloids and steroids.This is in line with research conducted by Tekle (2015) which showed the presence of alkaloids, tannins, flavonoids, polyphenols, saponins, and essential oils in Moringa leaf extract (Tekle et al., 2015). Similar research tooshows that there is alkaloids, flavonoids, saponins, phenols, steroids/triterpenoids, and tannins in Moringa leaf extract (Dwika et al., 2016; Yulianto, 2020; Zulfiah et al, 2020).

Theoretically, alkaloids and steroids are compounds that have a lactagogue effect, where these compounds have the potential to stimulate the hormones oxytocin and prolactin (Princess, 2021; Sukmawati, 2019). Compounds that have a lactagogum effectmost effective in increasing and increase milk productionby directly stimulating the protoplasmic activity of the secretory cells of the mammary glands, stimulating the secretory nerves in the mammary glands so that milk production increases, or stimulating the hormone prolactin acting on alveoli epithelial cells (Alindawati et al., 2021; Raguindin et al., 2014).

Moringa leaves (Moringa oleifera) is a galactogogue food that has a high micronutrient content compared to other galactogogue foods, the nutritional content such as phytosterol compounds, polyphenols, and steroids (lactogogum effect) plays a role in the prolactin reflex and increases prolactin hormone levels, thereby stimulating the alveoli to produce ASI (Damayanti A, 2022; Rochmayanti NS, 2022). The alkaloid content contained in Moringa leaves works synergistically with the hormone oxytocin. Alkaloids have a function that directly acts on all smooth muscles. When smooth muscle contracts, there will be milk ejection and an increase in the number and diameter of the alveoli on average is proportional to the increase in milk produced (Rosalinda Sinaga, 2020).

Moringa leaves are one of the answers to overcome the problem of nutritional imbalances faced by most of the world's people (Rani et al, 2019). Utilization of Moringa leaves to increase exclusive breastfeeding can be an alternative that is cheap, easy and down-to-earth (local wisdom) because Moringa leaves grow naturally in almost

every area. In traditional markets, Moringa leaves are sold at very cheap prices and can be reached by all levels of society (Sormin, 2018).

The use of Moringa leaves in increasing milk production can be processed into vegetables, or you can also use Moringa leaf powder. The aroma of Moringa leaves is rather unpleasant, but the aroma is reduced when the Moringa leaves are processed into clear vegetables or bobor vegetables(Zakaria et al., 2016). Consumption of Moringa leaves can also be started from the third trimester of pregnancy as a preparation for breastfeeding.

CONCLUSION

Utilization of Moringa leaves is an alternative that can be used to overcome the problem of insufficient milk production, besides being cheap and easy to obtain. Based on the research results menshowMoringa leaves contain alkaloid and steroid compounds that play a role inincrease and increase milk production.

SUGGESTION

Further researchers are advised to conduct research related to the innovation of developing moringa leaf processing for the smoothness of breast milk which is directly applied to breastfeeding mothers to prevent failure of exclusive breastfeeding due to insufficient milk production.

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