ABSTRACT

Background: World Health Organization recommends the use of traditional medicine to maintain health. Some breastfeeding mothers use katuk leaves to increase milk production by means of 3 vegetable dish, but the incidence of insufficient breast milk is still high. Improper processing methods can reduce the beneficial effects of katuk leaves.

Purpose To know determine the setting of the gas stove fire in the process of making katuk leaf dish and screening for phytochemical compounds (alkaloids and steroids) of katuk leaf dish.

Method: The manufacture and screening of alkaloids and steroids compounds in katuk leaf dish was carried out twice. The first preparation, the katuk leaves are cooked over high heat and the second is cooked over low heat. Screening for alkaloids using Mayer and Dragendorff reagents, while steroids with acetic acid, anhydrous, and concentrated H2SO4 as reagents.

Results: Based on the research results, vegetable dish cooked on high heat contain steroid compounds, while vegetable dish cooked over low heat contain alkaloids and steroid compounds. The difference in compound content is due to the temperature caused by a large fire which is much higher than that of a small fire. Alkaloids are not heat resistant. Alkaloids and steroid compounds play a role in increasing the milk production.

Conclusion: Vegetable dish made on low heat contain alkaloids and steroid compounds that play a role in increasing breast milk production. Therefore, it is recommended to cook vegetable dish on low heat for increasing breast milk.

Suggestion for the community to make vegetable dish with katuk leaves using low heat so that it does not damage the content of alkaloids and steroid compounds. These compounds play a role in increasing the production of breast milk.
Keywords: Vegetable dish, Gas stove, Katuk leaves.

INTRODUCTION

The World Health Organization (WHO) has 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)

One of the ways to increase breast milk production is by giving a galactogogue (Zuppa et al., 2010). Research in Australia showed 59.9% of postpartum mothers took at least one herb for medicinal purposes during breastfeeding, 24.3% reported using at least one herb to increase breast milk production, 43.4% of breastfeeding women felt herbal medicine to be safer than conventional medicine, and 71.6% previously refused or avoided conventional treatment because of concerns about their baby's health (Sim et al., 2013). In general, Indonesian people, namely 71.8 % use vegetables/plants to increase breast milk production compared to using drugs (Handayani, 2015)

In Indonesia, there are many plants/vegetables that are believed to increase milk production or function as galactogogues, including fennel, moringa leaves, katuk leaves, young papaya fruit, klabet, sweet fennel , torbangun, beluntas, lempuyang, spinach, and cassava leaves. Most of these ingredients have not been scientifically evaluated but are traditionally safe and effective (IDAI, 2010). Most people (50.4 %) use katuk leaves to increase breast milk during breastfeeding by means of vegetable dish. Inappropriate doses and processing methods can reduce the nutritional content and beneficial effects of katuk leaves and can cause side effects (Handayani, Pratiwi and Fatmawati, 2021). Side effects that can be caused include dizziness, nausea, and bronchiolitis obliterans (Padmavathi and Rao, 1990).

Phytochemical screening of katuk leaves contains sterols, alkaloids, flavonoids, tannins, triterpenoids, saponins, polyphenols, and glycosides (Selvi S, 2012). The sterol compounds (phytosterols) and alkaloids (papaverin) of katuk leaves have been shown to increase breast milk production. Alkaloids have heat-resistant properties (Lantah, PL, 2017).

The purpose of this study was to determine the setting of the gas stove fire in the process of making katuk leaf vegetable dish and screening for phytochemical compounds (alkaloids and steroids) in katuk leaf vegetable dish. Efforts to achieve this goal, it is necessary to conduct research on "The Effect of Different Gas Stove Fire Settings on the Content of Alkaloid Compounds and Steroids of Katuk Leaf (Sauropus androgynus (L.) Merr) as an Effort to Increase Breast Milk Production.

RESEARCH METHODOLOGY

Making vegetable dish and checking for alkaloid and steroid compounds from katuk leaves were carried out twice. In the first preparation, the katuk leaves are cooked over high heat and the second is cooked over low heat using a Rinnai brand gas stove type RI 602 AG. The production of vegetable dish was carried out at Muhajirin Asri Housing 3 Block E Number 3, Terong Tawah Village, Labuapi District, West Lombok Regency, West Nusa Tenggara Province, while phytochemical screening was carried out at the Pharmacy Laboratory of the University of Muhammadiyah Mataram (UMMAT).

The ingredients for making clear katuk leaf vegetables are 1500 ml of water, 300 grams of young katuk leaves, and 2 teaspoons of salt. Katuk leaves were obtained from Berukelak Environment, Sasake Village, Central Praya District, Central Lombok Regency. The tools used for making katuk leaf vegetable dish are pots, basins, and vegetable spoons. Vegetable dish is made by: a) Select the young katuk leaves until they are a bit old, then separate the katuk leaves from the stems; b) Bring water to a boil in a saucepan, after the water boils add the katuk leaves; c) Cook for 15 minutes after the water boils over high and low heat, with the pan closed; d) If it is wilted / ripe, add salt.

The materials for screening for alkaloids were clear vegetable katuk leaves, chloroform, 25% ammonia, Dragendorff, Mayer, and 2 N HCl. The tools used included filter paper, test tubes, and a Dragendorff atomizer. The procedure for checking is as much as 2 ml of the test solution (katuk leaf clear vegetable) is evaporated on a porcelain cup; The remainder was dissolved with 5 ml of 2 N HCl; The resulting solution is divided into 3 test tubes; The first tube was added with 3 drops of 2 N HCl, which served as a blank; The second tube was added with 3 drops of Dragendorff's reagent and the third tube was added with 3 drops of Mayer's reagent; If an orange precipitate is formed in the second tube and a yellow precipitate is formed in the third tube, it indicates the presence of alkaloids (Farnworth, 1966).
Materials for steroid screening were katuk leaf, glacial acetic acid, ether, and H2SO4. The tools used are filter paper and evaporating dish. Steroid examination was carried out by the Liebermann-Burchard reaction by means of 2 ml of clear vegetable solution from katuk leaves was evaporated in a porcelain cup. The residue was dissolved with 0.5 ml of chloroform, then 0.5 ml of anhydrous acetic acid was added. Then 2 ml of concentrated sulfuric acid was added through the tube wall. If a blue-green ring is formed on the boundary of the solution, it indicates the presence of steroids, whereas if a violet or brownish ring is formed, it indicates the presence of triterpenoids (Ciulei, 1984).

RESEARCH RESULT

Checking the alkaloid compounds and steroids of katuk leaves was carried out twice. The first check was carried out on vegetable dish cooked with katuk leaves (Figure 1) and the second check was for vegetable dish cooked over low heat (Figure 2). Boiling time is 15 minutes. The results of phytochemical screening of alkaloids and steroids in katuk leaf can be seen in Tables 1 and 2.

Table 1 shows vegetable dish cooked over high heat containing steroid compounds and no alkaloid compounds.
Results of Phytochemical Screening of Alkaloid Compounds and Steroids of Katuk Leaf Vegetable Cooked on Low Flame

<table>
<thead>
<tr>
<th>Phytochemical Screening</th>
<th>Reactor</th>
<th>Observation result</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>Mayer</td>
<td>No yellow/white precipitate is formed</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Dragendorff</td>
<td>No orange precipitate is formed</td>
<td>+</td>
</tr>
<tr>
<td>Steroids/Triterpenoids</td>
<td>Acetic Acid, Anhydrous, Concentrated H2SO4</td>
<td>Formation of a brownish-blue-green ring</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 2 shows vegetable dish cooked over low heat containing alkaloids and steroids.

**DISCUSSION**

Boiling on katuk leaves has an impact on the content of phytochemical compounds. Based on the research results, vegetable dish cooked on high heat contain steroid compounds and do not contain alkaloid compounds, while vegetable dish cooked over low heat contain alkaloid and steroid compounds. The difference in compound content is due to the fact that the temperature caused by a large fire is much higher than that of a small fire. A research article mentions that alkaloids have heat-resistant properties (Lantah, PL, 2017). This is likely to cause damage due to the high temperature caused by the large fire during the process of making vegetable dish. Meanwhile, steroids have heat-resistant properties so that they are still detectable both in the manufacture of vegetable dish with high and low heat.

Based on the results of a literature search, consuming boiled water from katuk leaves with a mixture of 300 grams of katuk leaves and 1.5 liters of water boiled for 15 minutes is able to launch breast milk (Situmora, 2019). It is possible that the boiled water of katuk leaves contains alkaloid and steroid compounds.

Alkaloids (papaverin) are able to increase the expression of prolactin and oxytocin genes because they have the ability to relax smooth muscles and dilate blood vessels, causing smooth muscle circulation of the hormones prolactin and oxytocin through the bloodstream. (Neumann, Russell and Landgraf, 1993) Dopamine is able to inhibit the release of prolactin (Siciak et al., 2006) , (Nishi et al., 2008), but papaverine inhibits dopamine receptors so that it can stimulate the release of prolactin (Milenkovic, Parlow and McCann, 1990). Prolactin plays a role in the synthesis of breast milk.

In addition to alkaloids, katuk leaf vegetable dish contain sterols (phytosterols) so that they can increase breast milk production (Subekti S, 2007). Sterols have specific functions in intracellular signal transduction. Like cyclic Adenosine Monophosphate (cAMP), sterols can act as secondary messengers, which can relay signals from receptors on the surface of target cell molecules in cells. Signals are relayed from hormones and growth factors, and cause some changes in cell activity. Therefore, the sterol content in katuk leaves also helps to increase the signal transduction of the hormone oxytocin (Piironen et al., 2000). Phytosterols are able to stimulate Epidermal Growth Factor Receptor (EGF-R) and Prolactin Receptor (PRL-R) so that prolactin and EGF which are needed for cell proliferation and maintenance increase (Zuppa AA et al., 2010)

**CONCLUSION**

Vegetable dish cooked on high heat contain steroid compounds and do not contain alkaloid compounds, while vegetable dish cooked over low heat contain alkaloid and steroid compounds.

**SUGGESTION**

For the community to make vegetable dish with katuk leaves using low heat so as not to damage the content of alkaloid and steroid compounds. These compounds play a role in increasing the production of breast milk.

**REFERENCES**


Milenkovic, L., Parlow, AF and McCann, SM (1990) 'Physiological significance of the negative short-loop feedback of prolactin',
Neuroendocrinology . doi : 10.1159/000125610.


