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STUDY OF HERBAL ETNOPHARMACEUTICAL HERBAL PLANTS (*Ipomoea pes-caprae*) IN THE COASTAL AREA OF PEDIWANG VILLAGE, KAO UTARA DISTRICT, UTARA HALMAHERA REGENCY

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ABSTRACT

Background: Ethnopharmacy is an ethnicity in an area using medicinal plants or a perspective in studying traditional medicine. Katang-katang plant (*Ipomoea pes-caprae*) belongs to the family *Convolvulaceae* which grows along the coast. It contains alkaloids, terpenoids, flavonoids, tannins, and saponins as antipyretics, analgesics, anti-inflammatory, and antioxidants. This study aims to find out the local name, the part of the plant used, how to take the material, and how to use it to treat various types of diseases in Pediwang Village. Descriptive research using qualitative methods with sampling techniques, namely *purposive sampling* and *non-random sampling* through semi-structured interviews with data analysis in the form of tables and documentation.

Research Results: Results of interviews with 6 informants, namely the local names Loloro and Batata Pantai, the plant parts used; leaves, stems, and roots taking the material with the condition that 7 young leaves are not yet open

Conclusion: Medicine taken; boiled, brewed, and ground; smeared or affixed, and 9 types of diseases including; 2 infectious diseases; diarrhea and malaria, 5 non-communicable diseases; stomach aches and pains, low back pain, menstrual pain, open wounds, and relieving anxiety in infants/toddlers, 2 uses for body health care; after or before delivery, and miscarriage.

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PRELIMINARY

Indonesia as an archipelagic country has a coastline with a coastline length of 81,000 km. As a result, natural resources in Indonesia are very abundant and can be used as a source of natural ingredients for medicinal raw materials.¹ Indonesia with a wealth of knowledge about traditional medicine. Almost every ethnic group has special knowledge and techniques of traditional medicine before it was written down in ancient manuscripts, knowledge is converted into an oral tradition which states that Indonesian people have existed since time immemorial teaching each other knowledge based on daily experience. With the development of technology and knowledge, it is very possible that the world of medicine is also experiencing various changes and advancements.²

The coastal area of North Halmahera Regency is dominated by sandy beaches that have amazingly beautiful views. There are many types of plants that grow and develop around the beach, located in the coastal area of Pediwang Village which grows wild and develops along the coast which are plants that can be used as medicine, namely the herbal katang-katang plant (*Ipomoea pes-caprae*) which belongs to the family *Convolvulaceae* in Andayani D's research (2018)³, said that *Ipomoea pes-caprae* has the characteristics of straight and long stems, growing spreading and spreading in all directions, red-purple flower crown, oval leaf shape and green color which is useful as an anti-pain. and inflammation.

Traditional medicine is an ingredient or ingredient in the form of plant material, animal material, mineral material, preparation of extract (galenic), or a mixture of these plants which have been used for generations for treatment and can be applied in accordance with the prevailing norms in society.⁴

In the book *Pharmacopoeia Herbal Indonesia Edition II*⁵, herbs are natural ingredients that are processed or unprocessed used for health purposes and can come from plants, animals, and minerals. In Indonesia, the use of traditional medicine is part of the culture that has been used by people for centuries. As a result, herbal medicines are often used to treat diseases and prevent various symptoms, both as complementary medicines and substitute medicines. The combination of disciplines that study the ethnic habits of a community group is called ethnopharmacy.⁶

Ethnopharmaceutical studies are one type of study to describe the knowledge of a particular ethnicity in terms of the use of medicinal plants.⁷ Because there is a strong relationship between public understanding of the importance of natural treatment and its use. Therefore, the purpose of this study was to find out how to use the katang-katang herbal plant (*Ipomoea pes-caprae*) as a treatment for the people of Pediwang Village. The results of this ethnopharmaceutical research are based on traditional medicinal recipes derived from natural ingredients for the development or discovery of new drugs in an ethnicity.

RESEARCH METHODS

Types of research

This type of research is descriptive qualitative research.

Research Location and Time

This research was conducted in a coastal area located in Pediwang Village, North Kao District, North Halmahera Regency. On 18-25 July 2022.

Tool

The research tools used were interview guidelines in the form of questions that had been prepared by the researcher, writing instruments, and documentation in the form of digital cameras/ *mobile phones*.

Population and Sample

Population

The population in this study were the people of Pediwang Village, North Kao District, North Halmahera Regency who had knowledge of the use of the katang-katang herbal plant (*Ipomoea pes-caprae*) as medicine.

Sample

The sample in this study was the people of Pediwang Village, North Kao District, North Halmahera Regency with the criteria of local people who have knowledge of the use of the katang-katang herbal plant (*Ipomoea pes-caprae*) as a drug with characteristics such as; Chief of the tribe, village healers or village shamans.

Data analysis

In descriptive qualitative research, the data collection method uses the method; of observation, *purposive sampling*, literature study, and interviews, as well as documentation by selecting and selecting each

incoming data from the results of the research method used to be studied. Then, the presentation of research data in tabular form the results of research data interviews with informants regarding the problems studied and analysis of literature study data for a summary of theories, and sources of a topic of research problems and draw conclusions in the research that has been done.

RESULTS AND DISCUSSION

Halmahera is located in North Kao District, North Halmahera Regency, North Maluku Province, Indonesia, which is included in the Boeing Tribe. The research was carried out from 18-25 July 2022. Interviews were conducted with people who only knew how to treat using herbal ingredients from the katang-katang plant (*Ipomoea pes-caprae*) with the characteristics of the informants obtained from interviews who were reliable informants and could complete the data obtained by the researcher. want like; Tribal chiefs, village healers, or village shamans who only know about the herbal katang-katang plant (*Ipomoea pes-caprae*) which is used as raw material for medicine.

It is known that there is a katang-katang plant species with the species *Ipomoea pes-caprae* with local names in Pediwang Village calling it Loloro and Batata Pantai which can be used as medicine seen in the results

Table 4.2 . The people of Pediwang Village use the katang-katang plant (*Ipomoea pes-caprae*) as traditional medicine since ancient times from generation to generation and learned from their parents based on their knowledge and experience.

From the *survey results* in Pediwang Village in accordance with the recommendations by the community, 6 informants were obtained consisting of; 1 Boeing Tribal Chief in Pediwang Village, 2 Village Shamans, and 3 Village Midwives. From the results of interviews, there are 9 types of diseases that can be treated using herbal ingredients from the katang-katang plant including; 2 infectious diseases, namely diarrhea and malaria, 5 non-communicable diseases, namely low back pain, abdominal pain and pain, menstrual pain, open wounds, and relieving anxiety in infants/toddlers, 2 uses for body health care, namely pregnant women.

The plant parts used are leaves, stems, and roots can be seen in **Figure 4.6**. In taking katang-katang plant material (*Ipomoea pes-caprae*) on the leaves there are certain conditions to take the material. The leaves of the katang-katang plant (*Ipomoea pes-caprae*) selected are the tips of the young leaves that have not yet opened and must consist of 7 young leaves which can be seen in **Figure 4**.

Table 4.3 the results of the study of plant parts used as ingredients for making drugs. For the leaves of the katang-katang plant (*Ipomoea pes-caprae*) in a previous study by researchers Wijaya NR and Dewi TR (2021)¹⁶, "Diversity of medicinal plant species for pre- and post-delivery care in several tribes in North Maluku". That the results of research in several tribes in North Maluku with medicinal plants for treatment before and after childbirth prove the leaves of the katang-katang plant (*Ipomoea pes-caprae*) which have secondary metabolites such as alkaloids, flavonoids, steroids, tannins, which act as anti-inflammatory, antiplosmodic, and antihemolytic which

can be used as herbal medicine for pregnant women in the form of a potion. Anti-inflammatory acts reduce inflammation and pain. Antiplosmodic acts relieve, prevent, and reduce the risk of muscle spasms and relax muscles.²⁹ While antihemolytic plays a role in anemia that occurs or hemolytic anemia. The people of Pediwang Village use this herb for pregnant women after or before giving birth in order to speed up the birth process for pregnant women who are giving birth for the first time or who are having difficult the delivery process.

Body health care after miscarriage with the leaf of the katang-katang plant (*Ipomoea pes-caprae*). There has been no previous research that states that the leaves of the katang-katang plant (*Ipomoea pes-caprae*) are used as a concoction for pregnant women who experience a miscarriage. Meanwhile, in the Pediwang Village community, shamans or village midwives have done this by using the leaves of the katang-katang plant (*Ipomoea pes-caprae*) which can speed up the process of self-cleaning by women after a miscarriage. But in the results of Andayani D and Nugrahani R (2018) research²¹, screening for phytochemicals and antioxidant activity of ethanol extract of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) from Lombok Island NTB using the DPPH method with vitamin C as a comparison proved that the leaves and flowers of *I. pes-caprae* contain secondary metabolites; tannins, saponins, alkaloids, and flavonoids, and had the highest percentage of inhibition of 91.30%. Katang-katang leaf ethanol extract is able to inhibit free radicals with a value of LC₅₀ around 46,774 which means that the antioxidant activity is strong but

still lower than vitamin C which has an LC of -0.29 so it has the potential to be used as an antioxidant drug.

The benefits of antioxidants for women after a miscarriage can protect the body from cell damage caused by free radicals and can protect against various diseases and fertility. Where antioxidants work by eliminating reactive oxygen produced naturally by the body or what is called stress. So that the function of antioxidants can delay the aging process and improve health, including the health of the reproductive system. The people of Pediwang Village after drinking a decoction of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) can remove the remaining dirty blood from the uterus or in the mother's stomach after a miscarriage. So that the body parts including the uterus become clean and free from disease.

Menstrual pain can also be treated with the leaves of the katang-katang plant (*Ipomoea pes-caprae*). According to the results of Andayani's research (2018) ³, the analgesic activity produced from the 70% ethanol extract of katang-katang (*Ipomoea pes-caprae*) leaves which was tested on male mice with analgesic and anti-inflammatory power of 56.25%, which means the leaves of the katang-katang plant Katang (*Ipomoea pes-caprae*) can relieve pain and inflammation. So that the leaves of the katang-katang plant (*Ipomoea pes-caprae*) can relieve menstrual pain.

The leaves of the katang-katang plant (*Ipomoea pes-caprae*) can also treat diarrhea. According to research by Iriyanto (2021) ³⁰, diarrhea is a condition when the sufferer has watery stools (*faces*) more often and three or more times a day caused by *salmonella bacteria* or contaminated food.

The leaves of the katang-katang plant (*Ipomoea pes-caprae*), it can be used as a medicine to treat diarrheal diseases. Because, the efficacy of the katang-katang plant (*Ipomoea pes-caprae*) has flavonoid compounds that are useful as antioxidants, analgesics, and antibacterials to overcome problems in the digestive tract. So that flavonoids will damage the bacterial membrane to form complex compounds with proteins and can damage the bacterial cell membrane. According to Ermilanda's research (2018) ³¹

Malaria is a disease transmitted through the bite of a female *Anopheles mosquito* infected by the parasite which has symptoms of high fever, headache, weakness, lack of blood, nausea, and vomiting. In previous studies, results have stated rate that the katang-katang plant (*Ipomoea pes-caprae*) is used on the leaves to cure malaria.

I Radisa (2019) ³², showed the results of research for several benefits of medicinal plants as antimalarials, namely plants that contain flavonoids, alkaloids, and tannins.

Meanwhile, according to the results of research conducted by researchers Andayani D and Nurgahani R (2018) screening for phytochemicals and antioxidant activity of ethanol extract of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) from Lombok Island NTB containing secondary metabolites; tannins, alkaloids, and flavonoids with high oxidant activity, with an IC₅₀ of around 46, 774. So that the katang - katang plant (*Ipomoea pes-caprae*) has the potential to be used as an antimalarial drug because of the benefits of the metabolites contained in the plant for antimalarial properties.

Back pain with herbal ingredients from the leaves of the katang-katang plant (*Ipomoea pes-caprae*) contains flavonoid compounds, according to researcher Lindawati (2015)²⁹,

The results of phytochemical tests on the leaf extract of the katang-katang plant (*Ipomoea pes-caprae*) contained flavonoid compounds. Flavonoids are secondary metabolites of polyphenols that are commonly found in plants and have various bioactive functions, including anti-inflammatory and antioxidant. So that the leaves of the katang-katang plant (*Ipomoea pes-caprae*) can be used as medicine to cure low back pain. People in Pediwang Village treat it by means of potions to drink and ingredients that are finely ground and then affixed to the painful area.

Aches and pains in the stomach are treated with the leaves of the katang-katang plant (*Ipomoea pes-caprae*) in Pediwang Village. They are treated by making potions to drink or ingredients that are finely ground and then affixed to the sore or painful area. According to Andayani's research (2018)³, the effectiveness of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) proves that it has analgesic activity produced by the 70% ethanol extract of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) in mice. So the leaves of the katang-katang plant can relieve aches and pains in the stomach.

The treatment method of the leaves of the katang-katang plant (*Ipomoea pes-caprae*) is finely ground and then applied to an open wound. According to the results of research Kiriwanno (2021)³³, showed that katang-katang leaves (*Ipomoea pes-caprae*) contain several active compounds that function as

antibacterial agents, namely steroids, saponins, tannins, and flavonoids that can stimulate the growth of new cells in the body. wounds and as an antimicrobial. From the role of the content in the leaves of the katang-katang plant (*Ipomoea pes-caprae*) it can heal wounds on the skin or open wounds.

The stems and roots of the katang-katang plant (*Ipomoea pes-caprae*) it can relieve anxiety in infants and toddlers. Previously, there was no research that stated that the parts of the katang-katang plant (*Ipomoea pes-caprae*), namely stems and roots, can relieve anxiety in infants/toddlers by tying them to body parts. However, the Pediwang people believe and believe that the benefits of the stems and roots of the katang-katang plant (*Ipomoea pes-caprae*) can make babies/toddlers feel safe when they want to travel across the ocean.

In Pediwang Village, they call it "Sawang Laut" or what is interpreted as a repellent for danger from spiritual disturbances when traveling across the open sea. Means of stems or roots of the katang-katang plant (*Ipomoea pes-caprae*) tied to the feet or hands of the baby/toddler until it passes through the ocean and then is released. As seen in **Figure 4.8**.

From the discussion above, it can be concluded that the katang-katang plant (*Ipomoea pes-caprae*) has various kinds of secondary metabolites that can cure several types of diseases, and treatments for body health that have been applied to the people of Pediwang Village for long time by the shamans or village midwives. It is evident from the disease cured by the katang-katang plant (*Ipomoea pes-caprae*) the compounds contained in the

plant parts have been studied and tested by previous researchers. The difference between previous with this study is that there is 1 type of infectious disease; Malaria, and 2 body health treatments; after miscarriage and alleviating anxiety

in infants and toddlers only as a belief of the people of Pediwang Village from utilizing the said katang-katang (*Ipomoea pes-caprae*) plant parts, such as; stems and root

Table 4.2. Research Results Local Names, Plant Species Katang-katang (*Ipomoea pes-caprae*)

No.	Local Name	Species
1.	Loloro	<i>Ipomoea pes-caprae</i>
2.	Beach Batata	<i>Ipomoea pes-caprae</i>

Table 4.3. The results of the research on the method of taking the material, the part used, the method of treatment, and the type of disease.

No.	How to take ingredients	Parts used	How treatment	Types of diseases
1.	Conditions for the leaves; the tips of young leaves that are still closed, and must be 7 leaves.	Leaves (young leaf tips).	Leaves (young leaf tips) 7 are taken, then washed, and boiled for 10 minutes until the cooking water changes color, then drunk. It can also be done in other ways, namely Leaves (tips of young leaves) 7 are taken, then washed clean, grown finely, then affixed to the sore/painful part.	Diarrhea, Malaria, after and before childbirth, miscarriage. pain , abdominal aches and pains, menstrual pain, open sores.
2.	Long stems (middle stems of plants).	stem	The stems or roots are taken, then washed, then tied to the hands or feet.	“Sawang Pantai” or eliminate anxiety and fear in Babies/Toddlers when crossing the ocean.
3.	The roots are long and large.	Root		

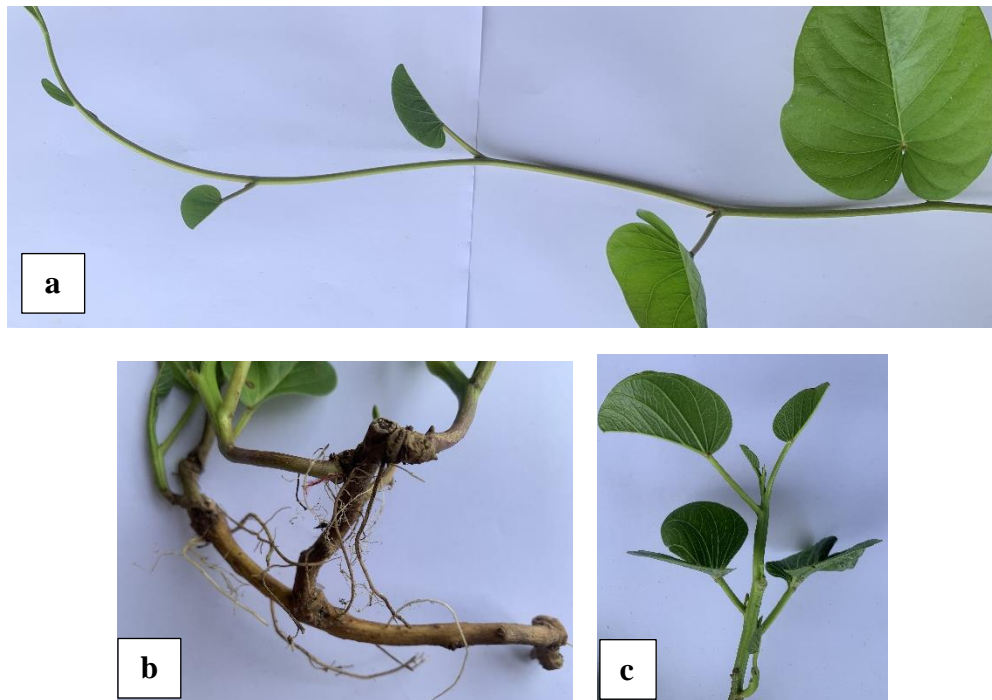


Figure 4.6. a) Katang-katang plant stem (*Ipomoea pes-caprae*); b) Roots of Katang-katang Plant (*Ipomoea pes-caprae*); c) Leaves of Katang-katang Plant (*Ipomoea pes-caprae*). (Documentation: Private)



Figure 4.7. Katang-katang Plant Leaves (*Ipomoea pes-caprae*) A total of 7 leaves as a condition. (Documentation: Private).



Figure 4.8. The stem or roots of the Katang-katang plant (*Ipomoea pes-caprae*) are tied to the feet and hands of babies/toddlers. (Documentation: Private).

CONCLUSION

Based on the research on herbal ethnopharmaceuticals of the katang-katang plant (*Ipomoea pes-caprae*) conducted in Pediwang Village, North Kao District, North Halmahera Regency, they are as follows:

1. Local names of katang-katang (*Ipomoea pes-caprae*) plants in Pediwang Village: Loloro and Batata Pantai.
2. How to take herbal ingredients from the katang-katang plant (*Ipomoea pes-caprae*) for treatment: For how to take ingredients in the form of leaves, there are certain conditions to take these ingredients. The selected leaves

What is done is drunk, rubbed, pasted, and smeared. How to present the medicinal plants in the form of potions.

3. Diseases that can be cured or treated from the herbal ingredients of the katang-katang plant (*Ipomoea pes-caprae*): 9 types of diseases that can be treated using herbal ingredients of the katang-katang plant (*Ipomoea*

are the tips of young leaves that have not been opened and must consist of 7 young leaves.

3. The herbal parts of the katang-katang plant (*Ipomoea pes-caprae*) used by the people of Pediwang Village as treatment: The parts of the loloro plant used are leaves, roots, and stems.
4. The way the people of Pediwang Village make traditional medicines from the herbal ingredients of the katang-katang plant (*Ipomoea pes-caprae*): the ways of processing medicinal plants include boiling, pounding, soaking, brewing, and how to use

pes-caprae), including; 2 infectious diseases, 5 non-communicable diseases, 2 uses for body health care as follows:

- After and before giving birth
- After miscarriage
- Low back pain
- Stomach aches and pains
- Diarrhea
- Malaria

BIBLIOGRAPHY

1. Mapanawang, LA, Masipagunung A, Budiadji AF, Sultoni S., et al. Identification of the compounds that are contained in extracting methanol laor (*Polychaeta*). IJHMCR. 2018 ;3 (01): 835-840.DOI: 10.22301/IJHMCR.2528-3189,835.
2. Dutu LD, Mapanawang AL, Wungow S. et al. Identification of Nitric Oxide Compounds in Laor (*Polychaeta*) Methanol Extract in Tagalaya Village Tobelo Halmahera Utara Village. IJHMCR.2020 ;5 (03):1776-1780.DOI: 10.22301/IJHMCR.2528-3189.1776.
3. Andayani D, H. Effectiveness of Katang-katang (*Ipomoea pes-caprae* L.Sweet) Leaves in Inhibiting Pain in Phase 2 with Licking Time Method in Male Mice. J Research and Health Studies. 2018 ;4 (2):83-89.ISSN: 2407-8603.
4. Republic of Indonesia. Regulation of the Drug and Food Control Agency Number 26 of 2018 concerning Electronically Integrated Business Licensing Services for the Drug and Food Sector. 2018.
5. Indonesian Herbal Pharmacopoeia II Edition. Jakarta: Ministry of Health RI.2017
6. Mufidah F, Z. Efficacious Plants for Malaria Treatment in Indonesia Based on Ethnopharmacy. J Scientific Pharmacy. 2020 ;10 (2);160-121.DOI:10.33751/jf.v10i2.2134.
7. October. Ethnopharmaceutical Study of Medicinal Plants for Hair Treatment and Growth in Several Regions in Indonesia. J Jamu Indonesia. 2018 ;81 -88.
8. Budiadji AF, Mapanawang AL, Ngetje FN, Wattimury M., et al. Identification of Oleic Acid Contained in Gedi Extract. IJHMCR. 2016;1 (02):165-169.DOI: 10.22301/IJHMCR.2528-3189.165.
9. Definition and Scope of Ethnopharmaceutical. [Internet]. 2022. Available from:. Retrieved March 13, 2022.
10. Moelyono Moektiwardoyo. Ethnopharmacy. Ed 1.Yogyakarta: Deepublish. 2017
11. Tongo-Tongo M, Missy SM, Ismail, Averous. et al. Identification of Compounds Contained in Metallifer Extracts of Golobe Trunks Marbles (*Eflingera Alba* (blume) AD Poulsen).IJHMCR. 2018 ;3 (04):1120-1123.DOI:10.2230/IJHMCR.2528-3189.1120.
12. Wardhani FK, Poedjirahajoe. Potential Utilization of *Ipomoea pes-caprae* (L.) R. Br in Kebumen Petanahan Coastal Forest. J Forestry Science. 2020 ;14 (2):145-153.
13. Backer AC & Van Ben Brick Jr RCB. Flora of Java. Netherlands : Groningen nordhoff. [Internet]. 1996. Available from: <http://kin.perpusnas.go.id/DisplayData.aspx?pId=164467&pRegionCode=UN11MAR&pClientId=112> . Retrieved April 23, 2022.
14. Plant Research Center Agency. Indonesian Medicinal Plants. Treads of the Horse (*Ipomoea pescaprae*) (LJSweet). Available from:. Retrieved March 16, 2022.

15. Nomleni FT, Daud Y, Tae F. Ethnobotany of Traditional Medicinal Plants in Huilelot Village and Uiasa Village, All District, Kupang Regency. *JBE*. 2021;6(1):60-73.DOI: <https://doi.org/10.32938/jbe.v6i1.993>
16. Wijaya NR, Dewi TR. Species Diversity of Medicinal Plants for Pre- and Post-Labor Care in several Tribes in North Maluku. *BB Biogen*. 2020 ;26 (02):145-156.
17. Ndruru EN, Delita F. Analysis of Mangrove Forest Utilization by the people of Nipah Village, Seo Nagalawan Village, Perbaungan District, Serdang Bedagai Regency. *El Jugharfiyah*. 2021 ;1 (1):1-13.
18. Cristiane DSB, Hugo GTDS, Lilian WR, Gislaine FS, Mariana FA, Veronica DAP, Tania MB, Angelica GC, Jose RS, Nara LQ. et al. *Ipomoea pes-caprae* (L.) R. Br (Convolvulaceae) Relived Nociception and Information in mice-A Topical Herbal Medicine Against Effects due to Cnidarian Venom-skin Contact. *JE*. 2017 ;200 (22):156-164.
19. Orange F, Budiadji AF, Mapanawang F, Wungow S. et al. Identification and Benefits of Halmahera Orange Fruit Extract Compounds and Benefit (*Momordica cochinchinensis* (Lour.) Spreng) Using Chromatography-mass spectroscopy (GC-MS) Gas Methanol. *IJHMCR*. 2021 ;6 (01):1968-1975.DOI: 10.22301/IJHMCR.2528-3189.1968.
20. Safutra E, Zurait. Study of the Bioactive Potential of Sea Kangkung (*Ipomoea pes-caprae*) from the Coast of West Aceh as a Tyrosinase Inhibitor and Antioxidant. *J Aquaculture*. 2018 ;2 (1):78-89.E-ISSN: 2620-7397, P-ISSN: 2579-4752.
21. Andayani D, Nugrahani R. Phytochemical Screening and Antioxidant Activity of Ethanol Extract of Katang-katang Leaves (*Ipomoea pes-caprae*. L) from Lombok Island, West Nusa Tenggara. *JPSCR*. 2018 ;02:76 - 83.DOI:10.20961/jpscr.v3i2.21924.
22. Salenda CM, Yamlean PV.Y, Lolo WA. Effect of Gel Base Concentration of Ethanol Extract of Tapak Kuda Leaf (*Ipomoea pescaprae* (L.) R. Br) on Antibacterial Activity on *Staphylococcus aureus*. *J. Scientific Pharmacy-UNSRAT*. 2018 ;7 (3):2302-2493.
23. Sasmi J, Nursalmi M, Samsul K. Types of Plants used for Medicine in South Kluet District. *J Biotik*. 2017 ;5 (11):36-59.
24. Muthallib EK, Fatimawali, Edy HJ. Formulation of Ethanol Extract of Tapak Kuda (*Ipomoea pes-caprae*) Ointment and Testing its Effectiveness Against Open Sores on Rabbits Back. *Pharmacon J Scientific Pharmacy*. 2013 ;2 (3):72-82.

25. Lingger EZS, Astuty E, Taihuttu Y MJ Inhibitory Test of Ethanol Extract of *Ipomoea pes-caprae* leaves on the growth of *propionibacterium acne* bacteria . *J Natural and Environmental Sciences*. 2021 ;12 (1):34-38.P ISSN: 2086-4604, E ISSN: 2549-8819.
26. <https://www.google.co.id/maps/@1.3968947,128.0014236,1106m/data=!3m1!1e3?hl=en> . Retrieved June 22, 2022.
27. Sugiyono. *Understanding Qualitative Research*. Bandung: PT. ALFABETA. 2012
28. Sugiyono. *Quantitative, Qualitative and R&D Research Methods*. Bandung: PT. ALFABETA. 2016.
29. Lindawati E, Determination of Eperison HCL Levels in Antispasmodic Drug Tablets Using a UV- *Vis Spectrophotometer* . [Internet]. 2015. Available from: <https://d1wqtxts1xzle7.cloudfront.net/53164> . Retrieved 27 July 2022.
30. Iryanto AA, Joko T, Raharjo M. Literature Review: Risk Factors For The Incidence of Diarrhea in Children Under Five in Indonesia. *J Environmental Health*. 2021;11(1):1-7, DOI: 10.47718/jkl.v10i2.1166.
31. Ermilanda P, Arief B. Knowledge Level of Patients About Malaria in Aimere Village, Aimere District, Ngada Regency, NTT Province. *Indonesian Men's Pharmacy Academy Malang*. 2017. [Internet]. Available from : epository.poltekkespim.ac.id/id/eprint/29/1/ARTIKEL%20KTI.pdf. Retrieved August 8, 2022.
32. Radisa K, Ramadhania Z M. Some Medicinal Plants As Antimalarials. *J Farmaka*. 2019;17(3):99-107. DOI: 10.24198/jf.v17i3.22062 . [Internet]. Available from : DOI (PDF) : <https://doi.org/10.24198/jf.v17i3.22062.g12486> . Retrieved August 8, 2022.
33. Kiriwenno JV, Yunita M, Latuconsina V Z. Comparison of Antibacterial Activity Between Katang-katang Leaf Extract (*Ipomoea pes-caprae*. L) and Seith Oil Against *Staphylococcus aureus* Growth . *Pharmaceutical Magazine*. 2021;17(1):122-131. ISSN-p: 1410-590x, ISSN-e: 2614-006

