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Ethnobotany of *Rubiaceae* Family Plants Used As Traditional Medicine in Tanjung Gusta Village Sunggal District, Deli Serdang Regency

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Abstract

Medicinal plants are all types of plants that are known to contain compounds that are useful and efficacious to prevent, alleviate or cure a disease. Rubiaceae is one of the flowering plant tribes. This study aims to determine the type of plant, how to use, and the value of ICS (Index Culture Significance) on plants of the Rubiaceae family in Tanjung Gusta Village, Sunggal District, Deli Serdang Regency, which was conducted in May - July 2022. The research method used a descriptive survey conducted by means of field surveys and interviews. The results showed that the types of plants of the Rubiaceae family used as traditional medicine in Tanjung Gusta village are noni (Morinda citrifolia L.), asoka flower (Ixora coccinea), gambier (Uncaria acida), quinine (Cinchona pubeschens), cat's claw (Uncaria tomentosa). How to use noni by squeezing the juice, for asoka flowers by brewing, for gambier by mashing, for quinine which is used is the skin, and for cat's claw by boiling. The highest ICS value is obtained from the noni plant (Morinda citrifolia L) with a value of 24 and the lowest ICS value is obtained from the Asoka plant (Ixora coccinea) and also the quinine plant (Cinchona pubeschens) which both have the lowest ICS value with a value of 12

Keywords: *Ethnobotany, Index Culture Significance (ICS), Rubiaceae, Traditional medicine*

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INTRODUCTION

Indonesia's geographical location is an area that is very rich in plants (flora) and animals (fauna). In fact, Indonesia's natural wealth is one that is spread throughout the world, beating other countries. Especially in using plants and natural ingredients as medicine to reduce pain, cure and prevent certain diseases, apart from that, it is also efficacious for beautifying oneself and maintaining the condition of the body to stay healthy and fit (Helmina, 2021).

Ethnobotany is a branch of science that studies the relationship between humans and the plants around them. This study has double benefits, because apart from being beneficial for humans and the environment, it also protects this knowledge, through protecting the types of plants used (Darma et al, 2019). Medicinal plants have been used by the Indonesian people for centuries in the form of herbal medicine to solve various health problems they face and are a cultural treasure of the Indonesian people that need to be cared for, paid attention to and preserved (Pratidina, 2017). Medicinal plants have thousands of species. Of the total of around 40,000 types of medicinal plants known in the world, 30,000 are thought to be in Indonesia. This number represents 90% of the medicinal plants found in the Asian region. Of this number, 25% or around 7,500 types are known to have herbal or medicinal plant properties. However, only 1,200 types of plants have been used as raw materials for herbal medicines or herbal medicine (Lestari, 2018).

According to Maulidiah (2019), traditional medicines can be mixed from fresh or dried raw materials (simplisia). Traditional medicines that are mixed with fresh raw materials are better known as herbal medicine. Traditional medicine is a concoction made from various types of plant parts which have the property of curing various diseases which have been used for generations since ancient times. Traditional medicine itself still has a variety of compounds, so traditional medicine may occur with interactions between compounds that have a stronger influence (Hannoum, 2022).

One type of plant that is widely used by people, especially people who still adhere to traditional ways of using plants, is the *Rubiaceae* tribe (Haris, 2019). *Rubiaceae* is a family of flowering plants. According to the APG II Classification System, this tribe is included in the Gentianales nation. This tribe consists of trees, shrubs, lianas or herbs that grow on the ground. This tribe is tolerant of various environmental conditions (soil type, altitude, community structure, etc.) and does not specialize in one particular type of habitat (Murdiyanti et al, 2022).

Ethnobotanical research is an observational activity carried out to determine the traditional use of medicinal plants by communities around the Sunggal District area, Deli Serdang Regency based on the knowledge they have. However, people's habits tend to be taken directly from nature for treatment without any interest in cultivating medicinal plants. Apart from that, the lack of public awareness to pass on medical knowledge from the old to the young causes the community to not know the types of plants that function as medicinal plants. So it is necessary to conduct research on ethnobotanical studies of medicinal plants in the communities of Sunggal District, Deli Serdang Regency.

MATERIAL AND METHOD

Research time

The research was conducted in May - July 2022 in Tanjung Gusta Village, Sunggal District, Deli Serdang Regency.

Method

The research used was a descriptive survey, namely a method carried out by means of field surveys and open interviews in Tanjung Gusta Village, Sunggal District, Deli Serdang Regency. The population in this study were people in Tanjung Gusta Village, Medan Helvetia District, Deli Serdang Regency. Researchers took a sample consisting of 30 respondents with an average age of around 40 years and over.

Data analysis

Index of Cultural Significance (ICS)

` The ICS calculation results show the level of importance of each type of useful plant by society. To calculate the index of cultural significance, use the following Laili et al, (2022) formula:

$$ICS = \Sigma(qx\ 1\ xe)$$

Information:

ICS = index of cultural significance, is the sum of the calculated uses of a plant type from 1 to n, where n indicates the last use of a plant type.
i = intensity value shows values 1 to n.
q = quality value
e = exclusivity value

RESULTAND DISCUSSION

Traditional Medicine-Related Community Beliefs And Knowledge In Tanjung Gusta Village

The following outcomes were found based on community attitudes and knowledge about traditional medicine that were the subject of research, Based on Table 1, it can be seen that the level of public trust in Tanjung Gusta Village towards traditional medicine is highest in age group A (20-35 years) choosing to believe (0.55%), in age group B (36-50 years) choosing to believe (0.4%) and in age group C (>50 years) they chose to believe (0.33%). This is because age group C (> 50 years) has more experience regarding the use of medicinal plants than other age groups, so this age group is more likely to believe in the use of traditional medicine. The belief in the use of traditional medicine is due to the factors of low price, widely available in the neighbourhood, the efficacy obtained and hereditary knowledge about the use of traditional medicine.

Table 1. Level of Community Trust in Tanjung Gusta Village regarding the use of traditional medicine

No	Age group of respondents	Don't believe (%)	Lack of trust (%)	Believe (%)	Strongly believe (%)
1	A (20-35 Years old)	0	0.45	0.55	0
2	B (36-50 Years old)	0	0.13	0.4	0.47
3	C (>50 Years old)	0	0	0.3%	0.7%

According to Leksikowati et al. (2020) stated that local Indonesian people depend on medicinal plants for their survival, so the way they are used and presented is also unique to each tribe and culture. According to Indarwati et al. (2021), for low-income communities, traditional medicine is very beneficial because the community incurs costs that are within the community's capabilities. One of the considerations in choosing a source of treatment is the relatively cheap cost.

Amisim et al. (2020) said that people's trust in traditional medicine can still be maintained if seen from aspects of life that can be seen from a social perspective, it can be seen from social life in Tanjung Gusta Village that they still view traditional treatment using magic and spell methods as still valid and has great influence on human health. If we look at it economically, traditional medicine is very economical, the costs involved in traditional medicine are not too high, in fact many people are helped because sometimes traditional medicine does not cost money, because the healer does not expect compensation for his abilities.

Table 2. Types of Treatment in the Community in Tanjung Gusta Village

No	Age group of respondents	Self-medication (%)	Healer/shaman (%)	Doctor (%)	Health centre/hospital (%)
1	A (20-35 Years old)	0.22	0	0.45	0.33
2	B (36-50 Years old)	0.4	0.33	0.27	0
3	C (>50 Years old)	0.67	0.33	0	0

Based on Table 2, it can be seen that 0.45% of people in Tanjung Gusta Village choose to go to a doctor for treatment, while 0.67% choose to go to a doctor themselves. This is because the village of Tanjung Gusta already has at least 1 person who works as a doctor and the community thinks that modern medicine quickly cures illnesses when compared to traditional medicines which have a long healing period, but most people do not seek treatment directly from a midwife or doctor. doctor, if the disease they are experiencing is not too serious, because people prefer to use traditional medicine by treating it themselves and are influenced by the quite expensive cost of treatment, such as those aged > 50 years they prefer to treat it themselves based on the amount of experience and knowledge about traditional medicine.

This research is supported by Tuah et al. (2019) that the benefits felt directly by the community by using medicinal plants are that they are easy to obtain and that the raw materials can be grown in their home gardens, are cheap and can be mixed themselves. According to Kumontoy et al. (2023) stated that the use of plants as medicinal ingredients is often used for minor ailments, the mixture is also quite simple and the plants are easy to obtain and cultivate in the home garden. Serious illnesses are handed over to midwives at village health centers.

Based on Table 3, it is known that most of the people in Tanjung Gusta Village know about traditional medicines. People in Tanjung Gusta Village in age group A (20-35 years) prefer know (0.67%), in age group B (36-50 years) prefer know (0.33%) and in age group C (> 50 years old) chose know (0.5%). This is because the older a

person is, the more they interact with the surrounding community regarding traditional medicines, so the more knowledge they have about medicinal plants.

Table 3. Community Knowledge in Tanjung Gusta Village About Medicinal Plants

No	Age group of respondents	Not aware (%)	Know (%)	Very aware (%)
1	A (20-35 Years old)	0	0.67	0.33
2	B (36-50 Years old)	0	0.33	0.67
3	C (>50 Years old)	0	0.5	0.5

Based on Table 3, it can be seen the knowledge of the people in Tanjung Gusta Village about medicinal plants, in age group C they really know the types of plants used as medicine. In line with Table 1 regarding medicinal plant beliefs, where older people have used traditional medicines from the past until now, so they have more knowledge and experience about medicinal plants. In group B, only a few know about types of medicinal plants, in age group A, very few know about types of medicinal plants. Age groups A and B usually prefer to buy traditional medicine rather than mix it themselves, this is because not all people are interested and only a few people want to learn about traditional herbs, so people at this age have very little knowledge about medicinal plants.

The results of this research are also supported by the opinion of Daud et al. (2021), traditional use of plants by indigenous peoples is a form of knowledge that has developed and been passed down from generation to generation. Medicinal plants are an important component of medicine, in the form of traditional herbal medicines and have been used for hundreds of years. Wahidah et al. (2020) stated that medicinal plants have been used for a long time by the Indonesian people in the form of traditional herbal medicine to help public health and this knowledge has become the cultural wealth of the Indonesian people which needs to be protected and preserved.

Table 4. Frequency of Use of Medicinal Plants in the Community in Tanjung Gusta Village

No	Age group of respondents	Never (%)	Once (%)	Very often (%)
1	A (20-35 Years old)	0.67	0.33	0
2	B (36-50 Years old)	0, 2	0.27	0.53
3	C (>50 Years old)	0	0.5	0.5

Based on Table 4, it is known that on average people in Tanjung Gusta Village often use traditional medicines, but there are differences in frequency between very often and rarely in each age group. In terms of frequency, the highest score obtained very often was in age group B (36-50 years) as much as 0.53%, while the frequency of rarely obtained highest score was in age group A (20-35 years) as much as 0.67%. This is related to Table 1 and Table 3 where the higher the level of trust and level of knowledge towards traditional medicines, the more frequently they are used. From

Table 4, it can be seen that the frequency of use of medicinal plants in the Tigalingga District community is that the higher the age level of the community, the more frequent the use of traditional medicine, and vice versa, the lower the age of the community, the lower the use of medicinal plants.

This is in line with Table 1 and Table 3 where age group C are parents who have knowledge, experience and confidence in traditional medicine, so that age group C very often uses medicinal plants in everyday life. In age group B they often use traditional medicine but not routinely. This is in line with Table 2 where this age group more often seeks treatment from a midwife or nurse. In age group A, few people from Tigalingga District use traditional medicinal plants, but most of them have used traditional medicinal plants. This is because age group A rarely gets sick because they are still considered young, and use traditional medicine only to cure minor illnesses such as colds, warming the body and dysentery.

According to Kumontoy et al. (2023), people use plants in their daily lives because they are easy to obtain and have sufficient availability. In general, local people use their home gardens for medicinal plants because they are easy to obtain and do not require a long time. The plants in the yard are usually self-planted plants and weed plants can also be obtained from local community gardens which have the potential to be used as medicine, food and so on.

On research Fransiska et al. (2022), Regarding ethnobotanical studies of medicinal plants in the Toba tribe in Dairi Regency, community knowledge about the use of medicinal plants in everyday life is very high. In age group C (>50 years) they know more about the use of medicinal plants. In age group B (36-50 years), the use of medicinal plants has begun to decrease. In age group A (20-35 years) knowledge of the use of medicinal plants was lower. This is because age group C (>50 years) has more confidence in self-processed medicinal plants that have been taught from generation to generation and their properties are more effective and people believe they are free from side effects.

Table 5. Level of Importance of Medicinal Plants in the Community in Tanjung Gusta Village

No	Age group of respondents	Not important (%)	Important (%)	Very important (%)
1	A (20-35 Years old)	0	0.67	0.33
2	B (36-50 Years old)	0	0, 6	0, 4
3	C (>50 Years old)	0	0.33	0.67

Based on Table 5, it is known that the people in Tanjung Gusta Village consider traditional medicines important. In age group A (20-35 years) they chose important (0.67%), in age group B (36-50 years) they chose important (0.6%) and in age group C (>50 years) they chose important (0.33%). This is because parents instill in their children that traditional medicines are very important in everyday life. Based on Table 5, it is known the level of importance of medicines among the community in Tanjung Gusta Village. Each age group thinks medicinal plants are important, although there are differences that are not very significant, such as age groups A and

B think medicinal plants are important and age C thinks they are very important. People in Tanjung Gusta Village think that medicinal plants are a daily necessity to cure diseases, so they are considered important and safer because of the low side effects of traditional medicine. This is in line with Table 4 of the frequency of plant use where people in Tanjung Gusta Village often use traditional medicine.

According to Utami et al., (2019) to improve people's welfare, medicinal plants can be utilized and increase the country's foreign exchange through the availability of basic medicinal materials, utilization of domestic resources and absorption of productive labor. The government plays a role in conveying policies related to the use of medicinal plants, such as providing information about the benefits of medicinal plants, the benefits obtained from the use of medicinal plants, and the added value obtained from cultivating medicinal plants so that economic conditions in villages can be improved through investment in medicinal plants.

Table 6. Sources of Knowledge about Traditional Medicine in the Community in Tanjung Gusta Village

No	Age group of respondents	Person old (%)	Neighbor (%)	Experience (%)	Mass Media (%)
1	A (20-35 Years old)	0.45	0	0.33	0.22
2	B (36-50 Years old)	0.33	0.13	0.4	0.5
3	C (>50 Years old)	0.5	0	0.5	0

From Table 6 it is known that the information on medicinal plants obtained by the community in Tanjung Gusta Village comes from their parents. In age group A (20-35 years) choose knowledge information from parents (0.45%), in age group B (36-50 years) choose knowledge information from parents (0.33%) and in age group C (>50 years) chose knowledge information from parents (0.15%). This is because the use of medicinal plants has become a culture carried out by parents and followed by their children. This has also been a legacy passed down from generation to generation.

Raodah (2019), states that one of Indonesia's cultural heritage is people's knowledge of traditional medicine which local people believe is based on experience and skills passed down from generation to generation and also because people have used and proven the efficacy of each type of plant in traditional medicine which can be obtained easily. and economical. Information about traditional medicine needs to be explored and developed regarding plants with medicinal potential in order to support local communities to advance the country's economy.

Key Informants

In this research, the healers or key informants who were interviewed were 3 people from Tanjung Gusta Village who were considered by the local community to know a lot about medicinal herbs, namely Mrs. (Old Mother) I. Yoga, 52 years old and works as a healer. He gained knowledge of traditional medicine through the whispers of spirits (ancestors), where he was told the types of plants that have medicinal properties and how to use the medicine. The treatment most commonly used by Mrs. I. Yoga is a steam bath (oukup). The second informant is Mr. (Kila) B. Lia,

50 years old. He obtained knowledge of traditional medicine from the whispers of spirits through dreams regarding information on types of medicinal plants and their uses. The treatment that Mr. B. Tarigan often uses is plain, which is a potion that is drunk and Param, which is a potion that is the result of processed plants mixed with water and then rubbed onto the sick part of the body. The third key informant is Mrs. Maryunani, 64 years old and works as a healer and farmer. He gained knowledge of traditional medicine through dreams, where he was told by someone he did not know who told him about medicinal plants that were useful for curing diseases. The treatment often used by Maryunani is spray, which is a collection of several plants (seeds, leaves, fruit) that are chewed and then sprayed onto the part of the plant that is sick. It can be seen that the key informant in Tanjung Gusta village, subdistrict, is > 45 years old. In general, healers/shamans are people/figures who have more knowledge about medicinal herbs.

According to Fransiska et al, (2022), stated that it is not uncommon for ordinary people to say that traditional medicine is considered illogical, because of the method of treatment carried out by battra. The preparation of medicinal concoctions, as well as how to use them, is based on knowledge obtained from their ancestors from generation to generation, and treatment techniques are carried out simply accompanied by prayers or jampe.

Types of Medicinal Plants and Their Use as Traditional Medicine in Tanjung Gusta Village

Based on the results of interviews from the people of Tigalingga sub-district and the results of interviews with healers (Key Informants), it is known that for medicinal needs people mostly use plants that come from the bush, herbaceous and liana groups so that people often use plants that are often found around the house, or fields that are generally vegetated. In this study, the parts of the plant used as medicinal ingredients were roots, tubers, stems, leaves, flowers, fruit and sap, but the part most widely used was the leaves. The types of medicinal plants obtained in this research and how to use them can be seen in Table 7.

Based on table 7, the number of medicinal plants used is 5 types from the *Rubiaceae* family, namely: Noni (*Morinda citrifolia* L), Ashoka (*Ixora coccinea*), Gambir (*Uncariaacida*), Quinine (*Cinchona pubeschens*), Cat's Claw (*Uncaria tomentosa*). The parts of plants used as traditional medicine are leaves, flowers, fruit and also bark. In the community in Tanjung Gusta Village, the part of the plant that is widely used as traditional medicine is the leaves. According to Diba et al, (2017) leaves are very easy to get and do not depend on the season like fruit, flowers and seeds, besides that leaves are also easier to mix than roots, stems and skin.

Knowledge of the Use of Medicinal Plants in Tanjung Gusta Village

Based on the results of interviews with key informants in Tanjung Gusta Village, they mostly obtain medicinal plants from gardens, some of which grow wild and are cultivated by the community and cultivated in home gardens. This is also supported by research by Nisyaputri et al., 2018), residents of Monoharjo Village usually practice traditional medicine, including using a variety of medicinal plants planted in their yards. For example, if a family member has a fever, it is usually treated

using medicinal plants, such as cat's whiskers plant (*Orthosiphon aristatus* (Blume) Miq.) which are prepared by crushing the leaves or crushing the leaves and extracting the water and then drinking it.

Table 7. Types of Medicinal Plants and Their Use in Tanjung Gusta Village

No	Latin name	Local name	Benefit	Partused	How to Use
1	*Morinda citrifolia L*	Noni	Treat diabetes	Fruit	1. Wash the noni fruit thoroughly, then grate it. 2. Squeeze the noni fruit, then take the water. 3. Add juicenoni fruit with honey. 4. The potion is ready to drink regularly, 8 tablespoons 2 times a day
2	*Ixora Coccinea*	Ashoka	Treating diarrhea	Flower	Just brew 2 handfuls of finely ground Ashoka flowers with 1/2 glass of water. After filtering, drink the water 2 times a day until healed
3	*Uncaria acida*	Gambier	Heals wounds	Leaf	By crushing the gambier leaves, then apply them to the wound.
4	*Cinchona pubeschens*	Quinine	Overcome malaria	Skin Wood	LabourerQuinine wood contains Quinine which is effective for preventing and controlling the symptoms of malar
5	*Uncaria tomentosa*	Cat's claws	Treating gout	Leaf	Boil 4-5 sheets with a glass of water and cook until boiling. Boiled water from cat's whisker leaves can be drunk 3 times a day.

Index of cultural significance (ICS) of Medicinal Plants in Tanjung Gusta Village

Based on the results of interviews with key informants, the ICS value (index of cultural significance) of plants used as medicine was obtained. The 5 types of plants that have the highest ICS values (see in table 8).

Table 8. Index of cultural significance (ICS) of medicinal plants in Tanjung Village Gusta

No	Name Plant	Latin name	Mark				Mark ICS
			q	i	e	qxixe	
1	Noni	*Morindacitrifolia*	3	4	2	3x4x2	24
2	Ashoka	*Ixora coccinea*	3	4	1	3x4x1	12
3	Gambier	*Uncariaacida*	3	3	2	3x3x2	18
4	Quinine	*Cinchona pubbeschens*	3	2	2	3x2x2	12
5	Cat's Claw	*Uncariatementosa*	3	3	2	3x3x2	18

The system for utilizing plant species diversity can be identified by analyzing the level of importance of a type of plant for society, namely by looking for the ICS (Index of cultural significance) value which is the result of quantitative ethnobotanical analysis which shows the importance of each type of useful plant based on the needs of the community, where The ICS number shows the level of importance of each type of useful plant for society.

Based on Table 8, it is known that the plant that has the highest ICS value from the results of research on medicinal plants that has been carried out on the community in Tanjung Gusta Village, Sunggal District, Deli Serdang Regency, obtained the highest Index of Cultural Significance (ICS) for the Mengkudu plant (*Morinda citrifolia* L) with The ICS value is 24, because the majority of people in Tanjung Gusta Village, Sunggal District, Deli Serdang Regency suffer from diabetes. The part used is the fruit. Ashoka (*Ixora coccinea*) with an ICS value of 12, the part used is the flowers. Gambir (*Uncariaacida*) with an ICS value of 18, the part used is the leaves. Quinine (*Cinchona pubeschens*) with an ICS value of 12, the part used is the bark. Cat's Claw (*Uncaria tomentosa*) with an ICS value of 18, the part used is the leaves. According to Has et al. (2020), states that the ICS value shows how important a plant species is in the life of a community group. The higher the ICS value of a plant species, the higher the quality, intensity and exclusivity of that plant species.

According to Maruapey et al. (2022) stated that the higher the utility value of a plant, the greater the plant's importance, but this does not apply to every culture and tribe because each culture has different knowledge. The use value of plant species diversity in the traditional knowledge of local communities is influenced by cultural level, environmental conditions, cultural transformation, technological intervention and interactions between communities. In communities that have a higher cultural level, people are able to manage the diversity of plant resources around them and utilize them optimally and sustainably. On the other hand, for communities that are still left behind, management is based on the interests of fulfilling their daily lives Majore et al., (2018).

CONCLUSION

The conclusions from the results of research that have been carried out regarding the benefits of *Rubiaceae* family plants used as traditional medicine in Tanjung Gusta village are as follows:

1. The types of plants from the *Rubiaceae* family used as traditional medicine in Tanjung Gusta village are Mengkudu (*Morinda citrifolia* L.), Ashoka Flower (*Ixora coccinea*), Gambir (*Uncaria acida*), Quinine (*Cinchona pubeschens*), and Cat's Claw (Uncaria tomentosa).
2. The way to utilize the *Rubiaceae* family plant which is used as traditional medicine in the village of Tanjung Gusta is Mengkudu (*Morinda citrifolia* L). Noni fruit juice with honey, the concoction is ready to drink regularly, 8 tablespoons 2 times a day. Ashoka flowers (*Ixora coccinea*) are used as a traditional medicine to treat diarrhea by: brewing 2 handfuls of finely ground Ashoka flowers with 1/2 glass of water. After filtering, drink the water 2 times a day until healed. Gambir

(*Uncaria acida*) whose leaves are used as a traditional medicine to heal wounds by crushing the gambier leaves, then placing them on the wound. Cinchona (*Cinchona pubeschens*) is used by: Cinchona bark contains Quinine which is effective for preventing and controlling the symptoms of malaria. Cat's Claw (*Uncaria tomentosa*) whose leaves are used as a traditional medicine to treat gout by: boiling 4-5 pieces in a glass of water, drinking 3 times a day.

3. The highest ICS value was obtained from the noni plant (*Morinda citrifolia* L) with a value of 24 and the lowest ICS value was obtained from the Ashoka plant (*Ixora coccinea*) and also the Cinchona plant (*Cinchona pubeschens*) which both had the lowest ICS value, namely 12.

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