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ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TO TREAT DIABETES MELLITUS IN THE BLANAKAN REGION, SUBANG, WEST JAVA, INDONESIA

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ABSTRACT

Diabetes mellitus (DM), characterized by hyperglycemia, is a genetically and clinically heterogeneous group of disorders with the common feature of glucose intolerance. Currently, researchers are starting to look for new antidiabetic compound candidates derived from natural ingredients that have been empirically proven to have antidiabetic effects. This research aims to document and preserve the use of ethnomedicine to treat diabetes mellitus by people in the Blanakan Region, Subang, West Java, Indonesia. Fieldwork was carried out from October to December 2024 using direct interviews, questionnaires, and discussions. Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature. The plant types obtained were grouped into families according to the Cronquist classification system. Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org). This research reports that 30 plant species are commonly used by people in the Blanakan Region to treat DM. Among the various plant parts used, leaves (63.3%) are most often used in making medicine, followed by rhizome (13.3%), fruit (6.7%), flower (6.7%), stem, rind, and seeds (3.3% respectively). Meanwhile, the most frequently used preparation methods were decoction (76.7%) and infusion (23.3%). The results of this research confirm that people in the Blanakan Region still rely heavily on medicinal plants for their health care system, especially for the treatment of DM with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Blanakan Region, Diabetes Mellitus.

INTRODUCTION

Diabetes mellitus (DM) is one of the main public health problems in the world. This disease is a metabolic disorder caused by failure of glucose homeostasis with impaired metabolism of carbohydrates, fats and proteins as a result of defects in insulin secretion and/or insulin action.[1,2] According to the International Diabetes Federation (IDF) report, elevated blood glucose is the third top risk factor for premature death, after high blood pressure and tobacco use globally.[2] In addition, DM has become one of the main causes of morbidity and mortality worldwide. The number of patients is expected to grow to 642 million by 2040, with the greatest increase expected to occur in low- and middle-income countries.[3] Even though several antidiabetic agents have been introduced into the market from natural and synthetic sources, DM and its micro and macro complications continue to be a major medical problem worldwide.[4] The currently available modern drugs used for the treatment of DM are often associated with limitations such as inadequate efficacy, high cost, and various side effects.[5] The use of medicinal plants for the treatment of various diseases has increased throughout the world because they are considered much safer than synthetic drugs.[6,7] Research to obtain new drugs to treat DM originating from natural ingredients continues to be carried out, one of which is through exploring active compounds from natural ingredients, especially medicinal plants which have traditionally been used by people to treat DM in various countries, especially Indonesia.[8,9] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for treating diabetes, is Blanakan Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for diabetes mellitus

in Blanakan Region, Subang, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Blanakan is located in Subang Regency, West Java, Indonesia, with an area of 12.88 km^2. This area has an altitude of 25 meters above sea level with an average maximum air temperature of 33°C and a minimum of 24°C. Moreover, it is located between 06°15′47″ South Latitude and 107°40′23″ East Longitude. This region is a tropical climate area that is mostly inhabited by Sundanese tribes (95%) and other tribes (5%). Vegetation in the study area is in humid conditions with an average rainfall of 2,000 mm/year.

Data Collection

An extensive field survey was carried out to obtain information about medicinal plants from the Sundanese tribe in the study area. To document existing information about medicinal plants from tribal practitioners, several field visits were conducted from October to December 2024 in the Blanakan Region, Subang, West Java, Indonesia. During the research, ethnomedicinal information was collected from middle-aged and older tribal practitioners in their local language (Sundanese), through direct interviews, questionnaires, and discussions. Information on local names of plants, plant parts used, preparation methods and administration routes (e.g., infusion, paste, juice and decoction) of all ethnomedicinal plants collected were recorded during the survey period.

Botanical Identification

Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature.[10] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.[11] Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org).

Ethics Statement

All participants provided verbal consent before the interview and gave consent to publish the information they provided.

RESULTS AND DISCUSSION

This research revealed that there are 30 plant species commonly used by the local Sundanese tribe to treat DM (Table 1). This shows that the study location is affordable in terms of biodiversity. Among the various plant parts used, leaves (63.3%) are most often used in making medicine, followed by rhizome (13.3%), fruit (6.7%), flower (6.7%), stem, rind, and seeds (3.3% respectively). The use of leaves is reported to be easier to prepare and easier to extract active substances from them for treatment. At the same time, leaves have less effect on the mother plant.[12] Meanwhile, the most frequently used preparation method was decoction (76.7%) and infusion (23.3%). These results are in line with previous research which reported that the forms of traditional medicine most widely used by the community were decoctions and infusions.[10]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Blanakan, Subang, West Java, Indonesia.

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	*Alpinia galanga* L.	Zingiberaceae	Lengkuas	Rhizome	Decoction	20 grams once a day
2	*Andrographis paniculata* Nees	Acanthaceae	Sambiloto	Leaf	Decoction	10 grams once a day
3	*Annona muricata* L.	Annonaceae	Sirsak	Leaf	Infusion	250 grams once a day
4	*Annona squamosa* L.	Annonaceae	Srikaya	Leaf	Decoction	100 grams once a day
5	*Artocarpus altilis* (Park.) Forsberg	Moraceae	Sukun	Leaf	Decoction	10 grams once a day
6	*Artocarpus heterophyllus* Lamk.	Moraceae	Nangka	Leaf	Decoction	25 grams once a day
7	*Carica papaya* L.	Caricaceae	Pepaya	Flower	Decoction	25 grams once a day
8	*Cinnamomum verum* J.Presl	Lauraceae	Kayu Manis	Stem	Decoction	50 grams once a day
9	*Cosmos caudatus* Kunth	Asteraceae	Kenikir	Leaf	Decoction	100 grams once a day
10	*Curcuma longa* L.	Zingiberaceae	Kunyit	Rhizome	Infusion	300 grams once a day
11	*Etlingera elatior* (Jack) R.M.Sm.)	Zingiberaceae	Kecombrang	Leaf	Decoction	10 grams once a day
12	*Garcinia mangostana* L.	Clusiaceae	Manggis	Rind	Infusion	300 grams once a day
13	*Gynura procumbens* (Lour.) Merr.	Asteraceae	Sambung Nyawa	Leaf	Infusion	50 grams once a day
14	*Hibiscus sabdariffa* L.	Malvaceae	Rosela	Flower	Decoction	10 grams once a day
15	*Kaempferia galanga* L.	Zingiberaceae	Kencur	Rhizome	Infusion	100 grams once a day

16	*Mangifera indica* L.	Anacardiaceae	Mangga	Leaf	Decoction	5 grams once a day
17	*Momordica charantia* L.	Cucurbitaceae	Pare	Leaf	Decoction	10 grams once a day
18	*Morinda citrifolia* L.	Rubiaceae	Mengkudu	Fruit	Infusion	250 grams once a day
19	*Moringa oleifera* Lamk.	Moringaceae	Kelor	Leaf	Decoction	250 grams once a day
20	*Nephelium lappaceum* L.	Sapindaceae	Rambutan	Leaf	Decoction	10 grams once a day
21	*Ocimum basilicum* L.	Lamiaceae	Kemangi	Leaf	Decoction	350 grams once a day
22	*Phaleria macrocarpa* (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	400 grams once a day
23	*Phyllanthus niruri* L.	Phyllanthaceae	Meniran	Leaf	Decoction	50 grams once a day
24	*Piper betle* L.	Piperaceae	Sirih	Leaf	Decoction	500 grams once a day
25	*Smallanthus sonchifolius* H.Rob.	Asteraceae	Daun Insulin	Leaf	Decoction	5 grams once a day
26	*Swietenia macrophylla* King.	Meliaceae	Mahoni	Seed	Decoction	8 grams once a day
27	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jamblang	Leaf	Infusion	100 grams once a day
28	*Syzygium polyanthum* (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	50 grams once a day
29	*Vernonia amygdalina* Delile.	Asteraceae	Daun Afrika	Leaf	Decoction	5 grams once a day
30	*Zingiber officinale* Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	100 grams once a day

CONCLUSIONS

The results of this research confirm that people in the Blanakan Region still rely heavily on medicinal plants for their health care system, especially for the treatment of diabetes mellitus with the most frequently used parts of the leaves and their use in decoctions and infusions.

REFERENCES

1. Barcelo A, Rajpathak S. Incidence and prevalence of diabetes mellitus in the Americas. *Pan Am J Public Health*, 2001; 10(5): 300-308.
2. Tafesse TB, Hymete A, Mekonnen Y, Tadesse M. Antidiabetic activity and phytochemical screening of extracts of the leaves of *Ajuga remota* Benth on alloxan-induced diabetic mice. BMC Complement Altern Med, 2017; 17(243): 1-9.
3. Ogurtsova K, da Rocha Fernandes JD, Huang Y, Linnenkamp U, Guariguata L, Cho NH, *et al*. IDF diabetes atlas: global estimates for the prevalence of diabetes for 2015 and 2040. *Diabetes Res Clin Pract*, 2017; 128: 40-50.
4. Piero MN, Nzaro GM, Njagi JM. Diabetes mellitus-a devastating metabolic disorder. *Asian J Biomed Pharm Sci*, 2015; 5(40): 1-7.
5. Bastaki A. Diabetes mellitus and its treatment. *Int J Diabetes Metab*, 2005; 13(3): 111-134.
6. Alkandahri MY, Berbudi A, Subarnas A. Active compounds and antimalaria properties of some medicinal plants in indonesia – A review. *Sys Rev Pharm*, 2018; 9(1): 64-69.
7. Alkandahri MY, Maulana YE, Subarnas A, Kwarteng A, Berbudi A. Antimalarial activity of extract and fractions of *Cayratia trifolia* (L.) Domin. *Int J Pharm Res*, 2020; 12(1): 1435-1441.
8. Alkandahri MY, Kusumiyati K, Renggana H, Arfania M, Frianto D, Wahyuningsih ES, *et al*. Antihyperlipidemic activity of extract and fractions of *Castanopsis costata* leaves on rats fed with high cholesterol diet. *RASĀYAN J Chem*, 2022; 15(4): 2350-2358.
9. Alkandahri MY, Sujana D, Hasyim DM, Shafirany MZ, Sulastri L, Arfania M, *et al*. Antidiabetic activity of extract and fractions of *Castanopsis costata* leaves on alloxan-induced diabetic mice. *Pharmacogn J*. 2021; 13(6)Suppl: 1589-1593.
10. Bieski IGC, Santos FR, de Oliveira RM, Espinosa MM, Macedo M, Albuquerque UP, de Oliveira Martins DT. Ethnopharmacology of medicinal plants of the Pantanal Region (Mato Grosso, Brazil). *Evid Based Complement Alternat Med*. 2012; 2012: 1-36.
11. Cronquist A. The evolution classification of flowering plants. The New York Botanical Garden, New York, NY, USA, 2nd edition, 1988.
12. Ahmed S, Ahmad M, Swami BL, Ikram S. A review on plants extract mediated synthesis of silver nanoparticles for antimicrobial applications: Agreen expertise. *J Adv Res*. 2016; 7(1): 17-28.