



Utilisation of Moringa (Moringa Oleifera) Leaves for the Prevention of Leucorrhoea

Ratang Hamka¹, Muh.Nasrum Massi², Mardiana Ahmad¹, Hasta Handayani Idrus^{3,4}, Andi Satriana⁵, Setyo Adiningsih³

¹*Midwifery Masters Study Program Postgraduate School, Hasanuddin University, Makassar, Indonesia*

²*Faculty of Medicine, Hasanuddin University, Makassar, Indonesia*

³*Center for Biomedical Research, Research Organization for Health, National Research and Innovation Agency, Jakarta, 10340, Indonesia*

⁴*Department of Biomedical Sciences, Postgraduate School, Hasanuddin University, Makassar, Indonesia*

⁵*Nursing Diploma Study Program, Faculty of Science and Health, Andi Sudirman University, Bone Regency, South Sulawesi Province, Indonesia*
Email: bidanratang@gmail.com

Leucorrhoea is a problem that often occurs in women and one way to prevent it is using complementary therapy using Moringa Oleifera. Moringa oleifera is a herb that has long been used for health with nutrients such as vitamin B6, vitamin C, iron, vitamin B2, vitamin A, magnesium, isothiocyanates. These leaves are rich in antioxidant benefits and plant bio active compounds. This literature review aims to explore the potential utilisation of Moringa Oleifera in the prevention. Methods, literature study through scientific databases and related articles using the keywords 'Moringa Oleifera, and leucorrhoea', the search was conducted through electronic databases, specifically Google Scholar, PubMed, Scholars and Web of Sciences. Furthermore, searching for information, selecting relevant articles according to predetermined criteria to ensure the accuracy of the information, critically evaluating articles to identify important findings and relevant to moringa and leucorrhoea', analysing the data of selected articles to identify patterns, general findings and conclusions, then the results of data analysis are compiled into a literature review. The results of the data analysis were then compiled into a literature review that included an abstract, introduction, methodology, findings, and conclusions. By going

through these steps, this literature review can provide a comprehensive overview of the potential use of *Moringa Oleifera* in preventing leucorrhoea based on information available in the scientific literature. In conclusion, *Moringa Oleifera* have pharmaceutical effects, so it can be a potential option in the prevention of leucorrhoea.

Keywords: *Moringa Oleifera* leaves, vaginal discharge, leukorhea.

1. Introduction

Moringa leaves are a type of plant that has many benefits, as for the benefits of *moringa* leaves have antibacterial and anti-inflammatory properties. Some laboratory research shows that *Moringa* leaf extract appears to prevent and treat uterine infections caused by bacteria, such as *Alternative anti-fungal treatment with natural ingredients is intended to reduce the side effects of chemical use and drug resistance due to the use of high doses in a short time.* Treatment with natural ingredients for anti-fungal is also intended as a supporting treatment and integrated treatment.

Moringa leaves contain secondary metabolites such as tannins, flavonoids, steroids, phlobatanins, glycosides and terpenes. The content of these secondary metabolites can affect anti-fungal activity². In the 'Journal of Natural Sciences Research' states that the presence of tannins can inhibit the formation of fungal cell walls, causing the death of organisms². The results of research on petroleum ether extracts from the leaves and bark of *Moringa oleifera* caused anti-fungal activity against spore germination and mycelial growth of all pathogenic fungi tested². The results of the study mentioned that *Moringa* contains phytochemical constituents such as alkaloids, flavonoids, carbohydrates, glycosides, proteins, saponins, tannins and terpenoids in different solvent extracts namely water and ethanol solvents. Flavonoids enhance the effect of Vitamin C and function as antioxidants, therefore, *Moringa* leaves are known to contain biologically active substances against liver toxins, tumours, viruses and other microbes.

Moringa leaves are a good antifungal against several organisms such as *Saccharomyces cerevisiae* and *Candida tropicalis*. Research states that *Moringa* has flavonoids that are effective as anti-fungal substances. The use of *moringa* leaves as therapy in various cases is generally done by boiling *moringa* leaves, after warming, then drinking. The World Health Organisation (WHO) named the *moringa* tree as a miracle tree, after discovering the important benefits of *moringa* leaves. More than 1,300 studies. Phytochemical tests provide evidence that *Moringa* leaves contain chemical compounds such as alkaloids, flavonoids, phenolics, triterpenoids / steroids, and tannins that function as cancer drugs and antibacterials. This phytochemical compound is bacteriostatic so that it can inhibit the rate of bacterial growth. Based on the background that has been described, this study aims to provide information about the use of *Moringa* leaf boiled water as a complementary therapy in preventing leucorrhoea, using a database in the form of articles from various scientific journals into one literature review.

2. Methods

This study uses a synthesis method with a scoping review. Scoping review writing refers to the Joanna Briggs Institute (JBI) framework, and checklist items for reporting scoping reviews come from the Preferred Reporting items for Systematic Reviews and Meta-analyses for Scoping Reviews (PRISMA-ScR).

This literature review was compiled through searching scientific articles using 4 databases, namely Google Scholar, PubMed, Cendikiwan and Web of Sciencess. Furthermore, the journals obtained were evaluated based on the inclusion criteria, namely : The keywords used in the literature search for international and national publications using Indonesian and English, namely: ‘Moringa leaves (Moringa Oliefera), “leucorrhoea”. The search results obtained were 1,500 articles. After filtering the year of publication, namely 2016-2023, 520 articles were obtained. Furthermore, selection was carried out related to abstracts, full text, open access type of research, and duplication obtained 50 articles. The final process is done by reading and selecting eligible articles. Based on the criteria, 35 relevant articles were obtained (Table 1). Exclusion criteria are articles other than English and literature review research. The article search strategy can be seen in the figure below Figure 1

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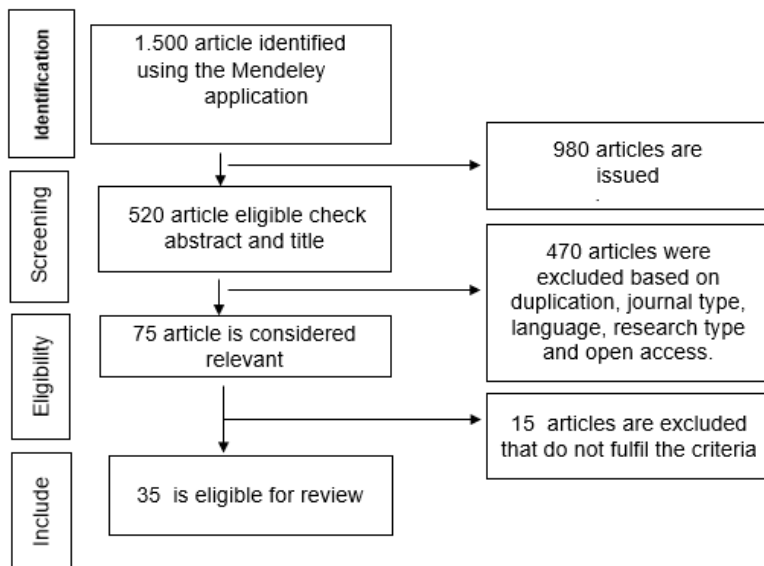


Figure 1. Flow Chart of Article Search

3. Results

This literature review was synthesised using a narrative approach by grouping similar extracted data according to the outcomes measured to achieve the objectives. Review studies that met the inclusion criteria were then collated and a review summary was produced that contained the name of the researcher, year of publication of the review, title of the study,

methods and a summary of the results or conclusions.

The summary of the research journal was entered into the table according to the format mentioned above. To further clarify the analysis, the abstract and full text of the journal were read and examined. The journal summary was then analysed for content contained in the research objectives and results/findings.

Analyse the content of the reviews, then code the content of the evaluated reviews based on the outline or nature of the research conducted by describing it in one sentence, then after collecting, look for similarities and differences in each study. Then discuss to draw conclusions.

During the data extraction process, the researcher was accompanied by two supervisors, who simultaneously reviewed and read all relevant articles and then discussed to reach a consensus on which articles that met the criteria would be ‘included’. Thirty-five articles were selected based on the criteria that discussed the utilisation of Moringa (*Moringa Oleifera*) leaves to prevent leucorrhoea. The search extraction results can be seen in Table 1.

Table 1 Synthesis of research outcomes

No	Authors/Years	Title	Research Type	Sample	Data Analysis	Result
1	Nimmi John, S. Rahima, et al/202	Clinicoetiological study on vaginal discharge among sexually active women attending a tertiary center in North Kerala, India	Cross-sectional study	126 respondents	Chi-square test, and Freeman Halter Fisher test	Vulvovaginal candidiasis is a common cause of vaginal discharge
2	Attilio Anzano., et al/2022	Influence of Extraction Type on Bioactive Compounds and Antioxidant Activity of <i>Moringa oleifera</i> Lam. Leaves	Laboratory experiment	<i>Moringa Oleifera</i> leaves and seeds	Chemical Analysis: Gas Chromatography-Mass Spectrometry (GC-MS) and UV-Vis Spectrophotometry Antimicrobial Activity Test: Agar Diffusion Method and MIC Test	The leaf and seed extracts showed significant antimicrobial activity against several pathogenic microorganisms, including Gram-positive and Gram-negative bacteria
3	Sonia Gómez-Martínez, et al/2021	<i>Moringa oleifera</i> Leaf Supplementation as a Glycemic Control Strategy in Subjects with Prediabetes	Double-blind, randomised, placebo-controlled, parallel study group clinical trials	65 Responden	Chi square test	<i>Moringa oleifera</i> is a nutritional supplement that provides a natural anti-hyperglycaemic effect as a treatment.
4	Gabriel Olvera-Aguirre, et al./2022	The Effect of Extraction Type on Bioactive Compounds and Antioxidant Activity of <i>Moringa oleifera</i> Lam. Leaves	Laboratory experiment	<i>Moringa oleifera</i> leaves	Chromatography Gas-Spektrometri Massa (GC-MS)	Extraction method type has a significant effect on the content of bioactive compounds and antioxidant activity in <i>Moringa oleifera</i> leaves.
5	Hanaa Elgamily, et al./2016	Microbiological Assessment of <i>Moringa Oleifera</i> Extracts and Its Incorporation in Novel Dental Remedies against Some Oral	Eksperimental disc diffusion method	ree solvent extracts (Ethanol, acetone, and ethyl acetate) from the	One-Way ANOVA test	There is an effect of <i>Moringa Oleifera</i> administration on the growth of <i>Staphylococcus aureus</i> and <i>Candida albicans</i> .

	Pathogens		fferent parts of the Moringa tree			
6	Gufran Mahmood Mohammed and Sumaiya Naeema Hawar/2022	Green Biosynthesis of Silver Nanoparticles from Moringa oleifera Leaves and Its Antimicrobial and Cytotoxicity Activities	Eksperiment : green synthesis of silver nanoparticles from Moringa oleifera leaves extract and its antifungal and antitumor activities were investigated.	Moringa oliefera	One-way ANOVA (LSD)	Administration of Moringa Oleifera can reduce the growth of bacteria or fungi (candida albicans and Staphylococcus aureus)
7	Amalia Eka Putri, et al/2022	Antibacterial Activity Test of Moringa and Senggan Leaf Extract Combination Against Escherichia Coli and Staphylococcus Aureus Bacteria In Vitro	Disc diffusion experimental method	simplisia of moringa and senggan leaves	Parametric One Way ANOVA test	The combination of moringa and senggan leaf extracts has antibacterial activity that can inhibit the growth of Escherichia coli and Staphylococcus aureus bacteria.
8	Basri A. Gani1, et al/2023	Fungistatic effect of Moringa oleifera Lam. on the metabolism changes of Candida albicans	Experiment: carried out by means of FTIR, spectrophotometric growth assessment	Moringa oliefera and candida albicans	One Way ANOVA	Mhe Moringa Oliefera can inhibit the growth of candida albicans
9	Ali Yusran, Exsa Sasmita Malan /2020	Moringa seed extract inhibits the growth of Candida albicans	laboratory experiment designed with posttest only control group with agar/Kirby Bauer diffusion method	Ecstact 40%, 60%, 80%, 100%, positif control (ketokonazol), negatif control (aquades).	Kruskal Wallis test	Moringa seed extract inhibits the growth of Candida albicans.
10	Siti Nuryanti, Kasmudin Mustapa dan I Gede Sudarmo /2016	Inhibitory Test of Extract of Moringa Fruit (Moringa oleifera Lamk) on Growth of Fungus Candida albicans	Eksperiment The fungus test uses a pitting method.	Moringa oliefera and candida albicans	Secondary Metabolite Assay of Moringa Fruit Extract	Moringa fruit contains alkaloids, flavonoids and steroids that can inhibit the growth of candida albicans.
11	Herastuti Sulistyani, et al/2023	Can Moringa oleifera Leaf Ethyl Acetate Extract Inhibit Candida albicans Planktonic Cell Growth and Biofilm Formation In Vitro	Eksperimental with microdilusi test	Ektrak Moringa leaves	A one-way analysis of variance and the Post Hoc LSD test	Moringa oleifera leaf an extract inhibits C. Albicans planktonic growth and biofilm formation, as an alternative antifungal ingredient
12	Nuno Coelho, et al/2023	The Green Synthesis and Antibacterial Activity of Silver Nanoparticles Obtained from Moringa Seed Cake	Experimenter	Moringa Seed Cake and Silver Nitrate Solution (AgNO3)	Spectrometer UV-Vis, X-Ray Diffraction (XRD), Transmission Electron Microscopy (TEM)	The antibacterial activity test results showed that silver nanoparticles effectively inhibited the growth of Escherichia coli and Staphylococcus aureus, suggesting potential application in antibacterial treatment.
13	Muobarak J. Tuorkey /2016	Effects of Moringa oleifera aqueous leaf extract in alloxan	Experiment	Dried/powdered moringa and moringa	One-way analysis of variance (ANOVA) Newman-Keuls	Moringa Oleifera it may improve insulin resistance, increase TAC, and enhance

		induced diabetic mice		oliefera water extracts and rats	multiple test was used as a post-hoc comparison	immune tolerance.
14	N. Bennour, et al /2019	Effect of solvent evaporation method on phenolic compounds and the antioxidant activity of Moringa oleifera cultivated in Southern Tunisia	Experimental	Moringa Oleifera	One-way analysis of variance (ANOVA), Turkey-test and T-test	The effect of solvent evaporation method on phenolic compounds and antioxidant activity of Moringa oleifera cultivated in Southern Tunisia.
15	Martina Cirlini, et al/2022	Sprouts of Moringa oleifera Lam.: Germination, Polyphenol Content and Antioxidant Activity	Experimenter	Moringa oleifera	Two-way ANOVA test	The Moringa oleifera as a food source of bioactive compounds for acti-oxidants
16	Siraphat Fungtammasan, Vorapong Phupong/ 2021	The effect of Moringa oleifera capsule in increasing breastmilk volume in early postpartum patients: A double-blind, randomized controlled trial	This randomized, double-blinded, placebo-controlled trial	Postpartum mothers	Kolmogorov-Smirnov tests	Giving Moringa Oleifera can increase breast milk production
17	Eulogio J. Llorent-Martínez,et al/2023	Preliminary Phytochemical Screening and Antioxidant Activity of Commercial Moringa oleifera Food Supplements	Experimenter	Six commercial food supplements containing M. oleifera were purchased and analyzed.	A one-way analysis of variance (ANOVA)	Moringa leaf (Moringa Oleifera) is useful as a dietary supplement
18	Mansura Khanam, et al/2022	Effects of <i>Moringa oleifera</i> leaves on hemoglobin and serum retinol levels and underweight status among adolescent girls in rural Bangladesh	Quasi-experimental	226 teenage girl	Analysis in STATA	The consumption of Moringa leaves has the potential to improve Haemoglobin and serum retinol levels.
19	Sandra M. Gomes /2023	Incorporation of Moringa oleifera Leaf Extract in Yoghurts to Mitigate Children's Malnutrition in Developing Countries	Experimenter	Moringa oleifera	One-way analysis of variance (ANOVA)	The Moringa Oleifera is rich in bioactive compounds having numerous biological activities and is a powerful source of antioxidants and nutrients.
20	Anas Ahzaruddin Ahamad Tarmizi, et al/2023	Phytophabrication of Selenium Nanoparticles with Moringa oleifera (MO-SeNPs) and Exploring their Antioxidant and Antidiabetic Potential,	Laboratory experimental	Moringa Oleifera, Selenium	ANOVA (Analysis of Variance)	The MO-SeNPs have potential as effective antioxidant and antidiabetic agents, with Moringa oleifera acting as an efficient phytopharmaceutical agent in the synthesis of nanoparticles. selenium.
21	Jecinta Wanjinu,	Formulation of	Experimenter	Polifenol	Uji MTT	Formulasi Moringa

	et al, 2021	Moringa Oleifera may affect the delivery of polyphenol-loaded phytosomes against breast cancer		Moringa Leaves (MoP)		Oleifera menunjukkan peningkatan bioavailabilitas terutama dalam menghambat pertumbuhan kanker 4T1
22	Caio Henrique da Silva, et al, 2024	The Synthesis of Active Biochar from Moringa Tree Bark (Moringa oleifera) for the Adsorption of Metronidazole Drug Present in Aqueous Media	Experimental	Moringa tree bark	T-t-test / ANOVA	The activated biochar from Moringa oleifera (Moringa oleifera) bark is effective in adsorbing metronidazole drug in aqueous media.
23	Faisal Madhloom, et al/2022	The Antimicrobial Effect of Moringa Oleifera L. and Pomegranate Red against isolated Porphyromonas gingivalis	Experimental	Moringa Oleifera L and Red Pomegranate aqueous extracts	Kruskal-Wallis test at the 5%	Combination of red pomegranate seed albedo and Moringa Oleifera L. showed antibacterial effect.
24	T. Ahmadua, et al/2020	Antifungal efficacy of Moringa oleifera leaf and seed extracts against Botrytis cinerea causing gray mold disease of tomato (Solanum lycopersicum L.)	Laboratory Experimental	The leaves and seeds of Moringa oleifera, and Botrytis cinerea causing grey rot disease in tomato (Solanum lycopersicum L.)	T-test analysis / ANOVA	Extracts of Moringa oleifera leaves and seeds showed antifungal efficacy against Botrytis cinerea, which causes grey rot disease in tomato.
25	Kurnia Wardani, et al/2022	Influencing factors on the incidence of vaginal discharge in women of childbearing age who work as pumice stone workers	Analytic Observational	Women of reproductive age 68 people	Chi-square analytic	Influencing factors on the incidence of vaginal discharge in WUS pumice stone workers are; age, education, menstrual cycle, marital status, knowledge, behaviour, while work fatigue, psychological tension, do not affect the incidence of vaginal discharge.
26	Gunathilake KDPP, et al/2018	In Vitro Anti-Inflammatory Properties of Selected Green Leafy Vegetables	Laboratory Experimental	The samples were fresh green leafy vegetables, Passiflora edulis , Olax zeylanica , Gymnema lactiferum , Sesbania grandiflora , Centella asiatica , and Cassia auriculata L.	Analysis varians one way (ANOVA)	The research suggests that this anti-inflammatory activity may be due to the presence of bioactive compounds, such as polyphenols, flavonoids, and carotenoids in this type of leaf.
27	Lilik Hanifah, et al/2021	Perinatal Care Behaviour and the Incidence of Fluor Albus	Descriptive analytical research design	31 student	Chi-square analytic	There was a significant association between external genitalia care behaviour and the incidence

28	Tawanny KB Aguiar, et al/2023	Providing Help: Synthetic Peptides from Moringa Oleifera to enhance the Antifungal Activity of Itraconazole against <i>Cryptococcus neoformans</i>	Experimenter	Synthetic Peptides from Moringa Oleifera	One Way ANOVA followed by the Tukey test($p < 0,05$).	Synthetic peptides are potential molecules to assist antifungal agents in treating Cryptococcal infections.
29	Jessica Ferreira Rodrigues, et al/2023	Moringa Moringa oleifera Lam. Commercial Beverages: A Multifaceted Investigation of Consumer Perception, Sensory Analysis, and Bioactive Properties	Experimenter	Moringa powder beverage	One Way ANOVA using Tukey's post-test.	The examination of the bioactivity of M. oleifera beverages is essential to prove the health claims associated with such products.
30	Mmabatho Kgongoane Segwatibe, et al/2023	Evaluation of Antioxidant and Antimicrobial Effects of Moringa Leaf Extract and Its Isolated Compoundsa	Experimenter	Extract Moringa Oleifera	DPPH and FRAP test	The extract of M. Oleifera contains antioxidant substances that are efficient to alleviate degenerative conditions such as cancer and cardiovascular diseases but has little activity against infectious diseases..
31	Gabriel Olvera Aguirre, et al/2022	Influence of Extraction Type on Bioactive Compounds and Antioxidant Activity of Moringa oleifera Lam.	Experimenter	Moringa Oleifera	ANOVA PROC for a completely randomised design,	The bioactive compound content and antioxidant activity were higher in MOEEW extract.
32	Hideki Yoshimatsu, et al/2022	Antifungal effect of Moringa oleifera leaf extract on <i>Candida albicans</i>	Experimental	Isolat <i>Candida albicans</i> dari pasien	Analysis with t, test and ANOVA	Evaluated the inhibitory activity and mechanism of action of M. oleifera extract against <i>C. al bicans</i> . It inhibits the growth of <i>C. albicans</i> in a dose and time dependent manner
33	Truong Ngoc Minh, et al, 2022	Potential Use of Moringa oleifera Twigs Extracts as an Anti-Hyperuricemic and Anti-Microbial Source	Experimental	Extract of Moringa Oleifera Twigs.	Analysis with t, test and ANOVA	This research documents the inhibition of antioxidant, antimicrobial, and xanthine oxidase activities, in vitro, of fractions from Moringa oleifera twigs.
34	L. Mereles, et al /2023	Physicochemical and Nutritional Characterization of Paraguayan Organic Moringa oleifera Leaves as a Food Ingredient	Decriptif research	Moringa Oleifera leave	Analysis Proximate	The analysed organically produced dried moringa leaves have high levels of plant protein, micronutrients such as minerals, vitamins, and other compounds of interest such as antioxidants.
35	Hafsa Hapsari, /2022	Phytochemical Analysis and In Vitro Study on Moringa oleifera Leaf Extract as Antioxidant and Growth Inhibitor of HeLa Cervical Cancer Cells.	Experiment	Extract Moringa Oleifera leave	DPPH and MTT Method	The Moringa oleifera leaf extract contains phytochemical compounds, antioxidant activity against DPPH, and cytotoxic activity against HeLa cervical cancer cells.

4. Discussion

This literature review was conducted by analyzing 35 journals published in the last 10 years. The review presented discusses the use of *Moringa Oleifera* with the prevention of leucorrhoea. For women, taking care of their reproductive organs is also a very important thing to do (Abd El-Hack et al., 2022). because if it is not handled properly, it can cause various potentially adverse effects or consequences, such as diseases that can be transmitted sexually called Sexual Transmitted Diseases (STD), which cause infections and other diseases. Therefore, it is very important to carry out maintenance, treatment and prevention, this can be done by: not inserting foreign objects into the vagina, using underwear that absorbs sweat, using loose pants, washing the vagina, changing underwear when necessary, and maintaining the cleanliness of the female or pubic area starting from the front area to the back area, shaving the female area (Leone et al., 2016). If a woman's private area is not cleaned regularly and properly, it will cause an uncomfortable condition and can cause vaginal discharge. Vaginal discharge can also occur due to the use of drugs, hormones, sweat pants, and sexually transmitted diseases (Saa et al., 2019).

Research conducted by Su-Kyung Jwa, 2019 showed that most respondents experienced vaginal discharge in 30 people (68.2%). Vaginal discharge, also known as *fluor albus*, is characterised by a white discharge in the female genital area and causes wet underwear. The most common causes of vaginal discharge are infections, vaginal area (vaginitis) or in the cervix (cervicitis) in women over 45 years old usually caused by a decrease in the levels of estrogen hormones produced during the menstrual cycle. Vaginal discharge is common in women during childbearing years (20-45 years of age) and rare during puberty (Tuorkey, 2016). Vaginal discharge causes itching in a woman's private area and can be distracting, reduce pleasure and cause discomfort during sex (Jaja-Chimedza et al., 2017).

In physiological conditions, the reproductive organs of the vagina can secrete a small amount of mucus-like fluid. The mucus in question is secreted by the body glands located in the cervix and has the function of moisturising the vaginal walls. Mucus secreted physiologically serves as a protective / lubrication (lubrication). Vaginal discharge is called abnormal or pathological if the acidity is greater than five (Elgamily et al., 2016). The condition in question is not called vaginal discharge but a physiological problem, because there is no burning, itching, irritation or unusual damage to the skin of the vaginal area. And during the examination no germs, parasites, fungi or malignant cells causing disease were found. Mucus is used to control unwanted foreign bodies by the female body. Mucus acts as a lubricant during sex and keeps the vaginal walls clean before menstruation (Akter et al., 2021; Kou et al., 2018).

5. Conclusion

The literature review highlights *Moringa Oleifera*'s potential in managing leucorrhoea and stresses the importance of women's reproductive health. It identifies common causes of vaginal discharge, including infections and hormonal changes, and distinguishes between normal and pathological discharge based on acidity levels. Practical recommendations include maintaining hygiene practices and integrating traditional remedies like *Moringa*

Oleifera with modern preventive measures for optimal health outcomes.

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