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A REVIEW ON TRADITIONAL MEDICINE INSIGHTS, FUNCTIONAL UTILIZATION AND USES OF *DEBREGEASIA LONGIFOLIA*

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Abstract:

This study aims at understanding some important aspects of the antidiabetic properties of *Debregeasia longifolia*, traditionally recognized for its medicinal efficacy, particularly in ethnic communities where various parts of the plant, especially the roots, have been utilized for their therapeutic benefits over time. Extracts from different parts of the plant have been considered for different study, with a dot blot assay performed to assess their activity comprehensively. The evaluation of anti-diabetic properties has been conducted using a colorimeter and light emitting reaction, with the degree of absorbance serving as the primary indicator of significant changes. The results suggest that not only leaf and bark extracts but also the roots of *Debregeasia longifolia* may have promising antidiabetic potential based on ethno-medicinal uses. Furthermore, the study provides insights into the composition and nutritional values of this plant, highlighting its functional utilization in traditional medicine.

Keywords: Antidiabetic properties, extract, light emitting reaction, Degree of absorbance.

Introduction

Most of the developing countries are using wild edible plants for food and adequate amounts of nutrition. This wild plant consists of sufficient amounts of nutrients for supplying adequate amounts of nutrients to the people. *Debregeasia longifolia* plant provides enough protein, energy, vitamins, hormone precursor and minerals. Moreover, this plant is essential to reduce risk factors of different diseases, such as coronary heart disease, diabetes, cancer, neurodegenerative ailments, and many.

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others. Meghalaya is known as a small state in northeastern India. Meghalaya forest provides a large amount of this plant. Several investigations have identified the nutritive value of *Debregeasia longifolia*. The fruits of the traditional plant are used for controlling different diseases, such as diarrhoea and dysentery. This plant produces small and sour fruits for the eradication of gastric problems. For the past decades, this fruit has been used for manufacturing valuable medicines for the eradication of different risk factors. Recognition of plant materials is essential to identify the composition of significant medicines from this plant [1]. The primary aim of this paper is to determine the benefits of this significant plant in the pharmaceutical industry. This project will identify the significant composition and nutritive value of this plant for controlling risk factors of different diseases. Moreover, this paper will shed light on the functions and utilization.

of *Debregeasia longifolia* for the improvement of the pharmaceutical industry. Implementation of a systematic method is essential to reach the research aim. The discussion section will elaborate on the effectiveness of this wild plant. Recommendation and conclusion will be mentioned to enhance knowledge and the impact of this wild plant for reducing different risk factors.

Review of articles

Composition and nutritional values in *Debregeasia longifolia*

Recognition of the components and nutritive value of this wild plant is essential for the improvement of the pharmaceutical industry. *Debregeasia longifolia* belongs to the Uricaceae family and this plant blooms with small flowers. This flower has the capacity to grow acidic water. According to this research paper, this plant contains orange-yellow fruits and has many phenolic compounds. The presence of flavonoids and phenolic compounds are essential for increasing antioxidant activities. The presence of antioxidant activities enables us to produce anticarcinogenic and anti-ageing actors for the improvement of medicinal uses. Moreover, the leaves of this plant are full of antioxidant compounds². This fruit contains 68.15% carbohydrates, 65.56% moisture, 11.9% protein and 1.26% crude fiber. The presence of all these compounds is essential for physical health. Moreover, it is used for getting relief from arthritis. Apart from these, this plant is significant for providing.

therapy for skin illness, indigestion, sunburn, and digestive disorders [2]. On this contradiction, this plant is made up of Manganese (Mn) concentration, the highest value has been detected in this plant. According to periodic research, it has been identified that this plant is significant for the maintenance of hemoglobin formation in the human body. The presence of Mn has been identified as one of the important minerals for the maintenance of health activities. Moreover, the presence of Fe is essential for hemoglobin formation in the human body. This study has identified that the presence of dietary fibers, carbohydrates, proteins, and minerals are important for the maintenance of nutritional qualities. Adequate amounts of nutrients are important for the maintenance of physiological needs. Apart from these, this wild plant fruit is significant for the maintenance of the value of Calcium (Ca). Enough Ca is essential for the proper functioning of blood coagulation and cardiac muscle [2]. The human body requires a large amount of Ca for maintenance of the proportion of extracellular fluid, human blood, and bone. This plant is enriched with the highest among Ca for the maintenance of these activities [3].

Functions and utilization of *Debregeasia longifolia*

Wild fruits are significant for mitigating the requirement of nutritional compounds in developing countries. The utilization of wild fruit is essential for economic development and food security. The plant cultivation and domestication process helped to maintain economical sustainability. Identification of the composition and nutritive value of this fruit is essential for managing the quality of life. This plant is used for medicinal use for the improvement of health status. Apart from the nutritive values, it is beneficial to recognize the chemical compounds of this fruit. There are numerous uses of *Debregeasia longifolia* for prolonged economic growth in India. *Debregeasia longifolia* plant is essential for the improvement of treatment activities. It is essential for treating bone fractures, tumours, diarrhoea, skin disease and urinary complaints. The presence of antimicrobial and anti-inflammatory activities is essential for the eradication of these challenging situations [4]. Morphology-based taxonomy treatment processes have severe controversies. However, the phylogenetic analysis of this plant is quite significant for the pharmaceutical industry. Phylogenetic

Analysis is essential to determine the evolutionary species of this plant. This process is significant to identify the genes, species, and genome of these plants. Proper evaluation of this species is significant for getting numerous facilities of this plant [5].

Apart from these, this plant is economically important as its stem fiber is beneficial for making fishing nets and ropes. Plastome genomic data is required for the identification of the functions of *Debregeasia longifolia*. The ethnomedical properties of this plant are essential for reducing risk factors of different diseases, such as whooping cough and expectorant. The presence of different chemical properties is significant for antimicrobial and anti-inflammatory properties. Apart from these, this plant is used for the maintenance of nutritional demand. Different macro and micronutrients are present for the management of nutritional deficiencies in the human body. Proper use of this plant is beneficial for economic and physiological development. Recognition of nutritive value is essential for managing the risk factors of nutritional deficiencies. Proper utilization of wild plants is essential for eradication of nutritional deficiencies [6].

Antidiabetic activity of *Debregeasia longifolia*

Phytochemical properties of *Debregeasia longifolia* consist of various types of drugs that have a diverse mode of action regarding various diseases such as- bronchial asthma, cancer, and loss of appetite. In present times, antidiabetic activity of this plant has been studied well for gathering additional activity of antioxidants. presence of phenolic components is the main active compound of *Debregeasia longifolia*. On the contrary [4]. Antidiabetic potential of a material consisting of bioactive constituents such as thiazolidinediones, dipeptidyl peptidase iv inhibitor. Biguanides are the main active constituent which diabetic activity can be effectively mitigated. In the case of plants belonging to the family- Urticaceae antidiabetic activity can be reviewed under the methanolic extract and analyzing presence of flavonoid compounds inside them. Plant body extract can be judged by percentage of sulfonylureas. In the juice of leaves sudorific effect can be well studied to an ample extent [7]. There are multiple active elements present inside this plant such as As, Cr and Cu. These three elements are taken into consideration for upcoming searches [8].

To discuss antidiabetic activity of the plant, it can be observed that α -glucosidase is the main constituent which can be further used to inhibit insulin genes. Traditional uses of *Debregeasia longifolia* consist of bark and leaves. Leaves of a medicinal important plant can be used for handling prick seedlings. Softwood cutting can give beneficial results by which phenolic activity of this plant can be observed. Gene regulation is one of the crucial aspects of this plant by which it develops antidiabetic activity [9].

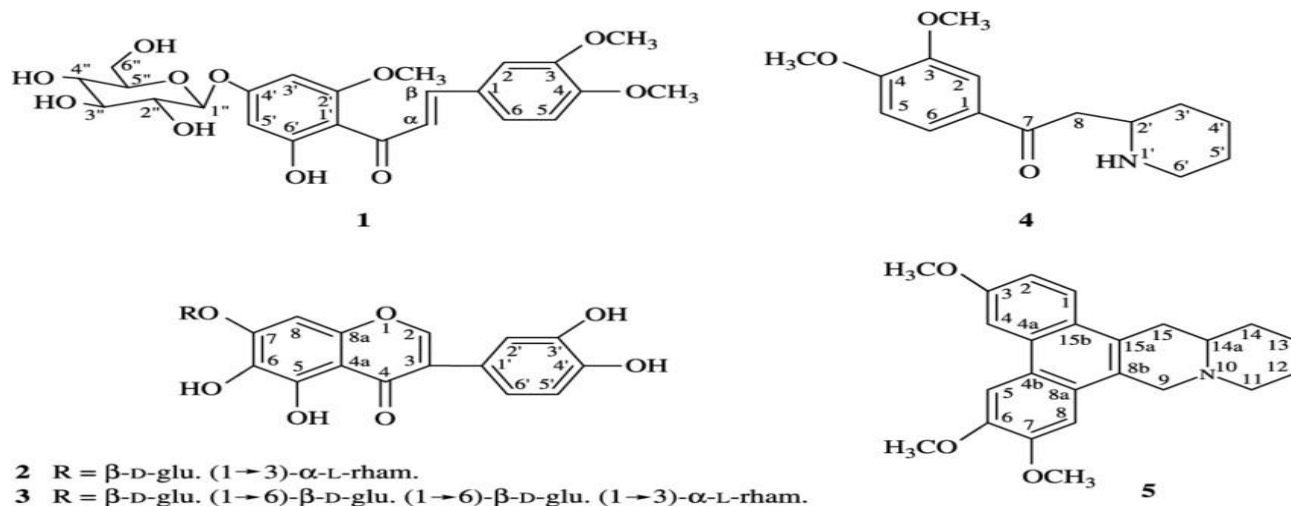


Figure 1: Chemical structure of pharmaceutical active compounds [10]

This image shows that the presence of alpha-L-rhamis the principal compound in which activity of phenolic compounds can be judged. All the active constituents have active benzoid rings that indicate the phenolic activity inside them. Filter of toxin and presence of Na_2CO_3 is the primary active compound present inside *Debregeasia longifolia*. Radical scavenging activity is the first and the foremost crucial aspect in which antidiabetic activity can be calculated. It can be observed that antidiabetic activity of this plant can be developed by the process of radical scavenging activities. Bioactive compounds present inside this plant are effective for in vitro study.

Methodology

To understand traditional uses along with antidiabetic activity of *Debregeasia longifolia*, both qualitative and quantitative analysis can be taken into consideration. Qualitative phytochemicals can be prepared by methanolic extract of leaves of this plant. Quantitative phytochemical estimation of this plant can be understood by total phenolic contents as discussed earlier.

Quantitative analysis

This analysis includes a determination process which is done by the Folin-ciocalteu reagent. Two contents have been analyzed for this study- i) total phenolic content ii) total flavonoid content.

i) Total phenolic content

1 ml of Folin-ciocalteu reagent and aluminum chloride reagent has been taken into consideration for this study. It can be observed that 1 ml of MELD is mixed with 1 ml of Folin-ciocalteu reagent. After that, 7% of Sodium bicarbonate has been added to the solution. The mixture has been warmed for 30 minutes at room temperature. Absorbance was measured in this scenario by 725nm the colorimeter. GAE or Gallic acid equivalent has been measured for this experiment with the aid of a dye extract.

ii) Total flavonoid compound

Aluminium chloride method has been taken for this study for checking the flavonoid compound. 100µl of 5% NaNO₃ has been taken for the proceeding with the examination. 500µl of 10% AlCl₃ has been applied and after 5 minutes 0.5 NaOH applied to the solution. Absorbance was measured at 510nm. In case of these two active constituents, different absorbance is taken because the range of absorbance is different in case of Folin and AlCl₃. The reaction initial value is also different in case of these two active constituents. As mentioned, level of absorbance depends on the light acceptability pattern of to an ample extent. In contrast to the pattern of acceptability, it has been observed that tribal drugs have the best content of phenolic compounds. Phenolic compounds are reported for activating the anti-diabetic gene in DNA.

Discussion

Traditional uses of *Debregeasia longifolia* can be tested by both qualitative and quantitative analysis techniques. In the case of qualitative analysis 7 tests can be performed for addressing the presence of phytochemical constituents. The name of the tests has given positive results in this scenario. Three segments of treatment have been prepared for this study which reflects the presence of antidiabetics.

activity to an ample extent. As per the ideas of dot blot analysis all the confirmation can be effectively judged in this scenario. A dot blot analysis includes-

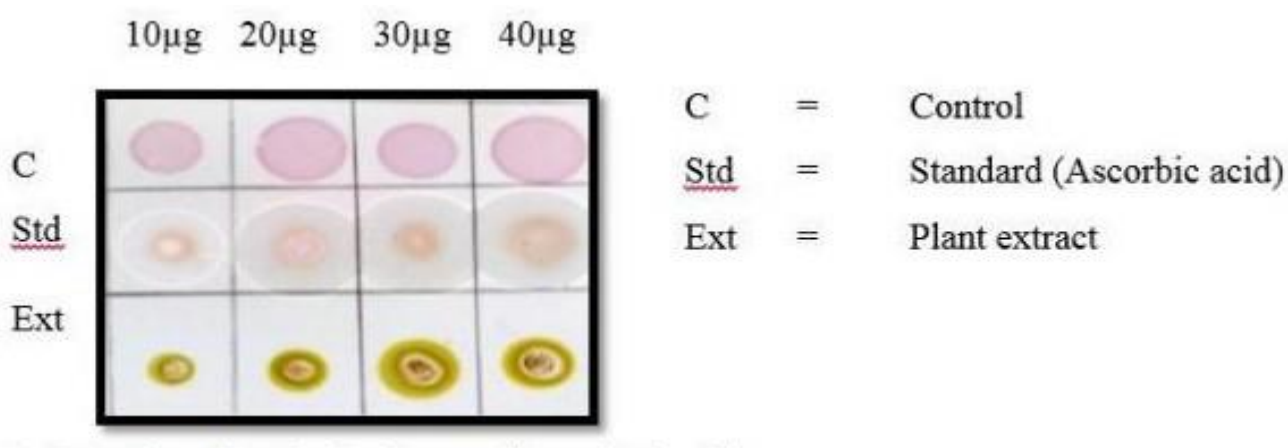


Figure 2: Dot plot analysis of *Debregeasia longifolia* [10]

This analysis shows that all the active constituents have given satisfactory results for the analysis. The total phenolic content is 113.918 mg of GAE equivalents. In the case of total flavonoid components, the equivalent is 52.70 mg. Therefore, it can be said that MELD is the main compound which has given the purple color of this compound¹⁰. Radical scavenging has projected that the mobile phase is the main theme of discussion of absorbance [11]. Absorbent levels can be judged effectively by the phenolic properties present inside the plant.

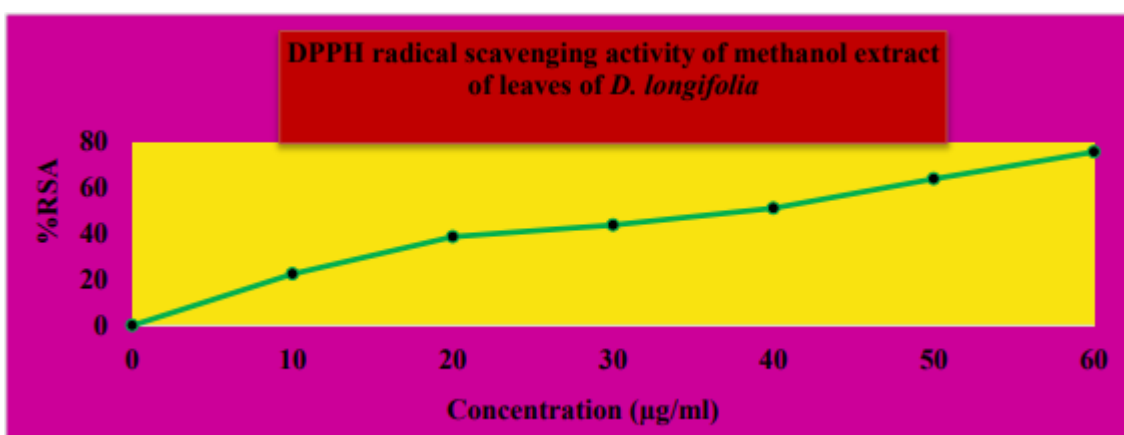


Figure 3: DPPH radical scavenging assay [12]

The above figures show radical scavenging activity of the plant because the solution has been well prepared. In this graph, the concentration has been chosen for 0-60 µg/ml content. Violet color has been reduced to yellowish color which is the main theme of this study. Diphenyl Picryl hydrazine is

the main product of DPPH radical scavenging assay. The scavenging effect of inhibition is $IHN = A_0 - A_1 / A_0 \times 100$ which acts as absorbance control.

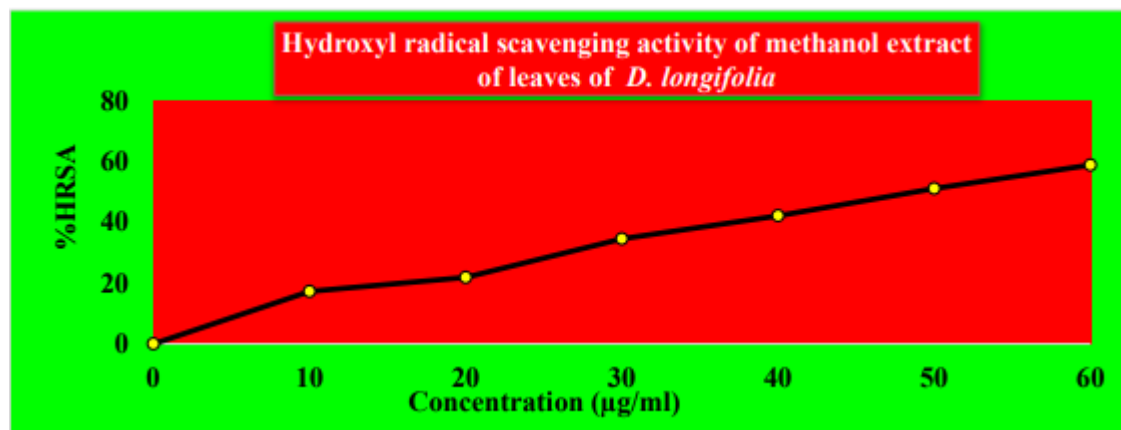


Figure 4: Hydroxyl scavenging assay of *Debregeasia longifolia* [12]

Scavenging analysis of the experiment shows that the scavenging potential of this plant is high in this scenario. Not only that, but maximum activity of MELD is also 75% which discusses the activity of phenolic compounds. Like the DPPH radical scavenging assay of this compound, the hydrogen donating ability is the main theme which discusses the effect of concentration [13]. Antiproliferative property of this study is the main theme which discusses the activity of the color changing mechanism [12]. Reagents and chemicals used: MTT “(3-[4, 5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide”). In contrast to the cytotoxic activity of MTT, it has been observed that all the chemicals are well studied and have a validation to 595 nm wavelength. Reduction assay has been performed for understanding the level of culture supernatant. In contrast to the culture supernatant, the first and the foremost crucial aspect depends on the cell variability. In contrast to cell viability, it has been confirmed that thin layer chromatography and use of TLC plate is the principal and pivotal process [14]. The process of cell culture and MELD process of chromatography has been intermingled with the DMSO for checking the color changing activity. The interpretation of the result further shows that all the constituents present in this scenario have an activity of kinase in which toxicity level has been decreased [12]. The result further shows that it can be used as a potential drug. Activity of drugs is further extended by the activity of in vivo analysis. Higher toxicity at a lower concentration is one of the crucial aspects for this study. The result further shows that IC_{50} of

MELD have been recorded as 437.92 $\mu\text{g/ml}$ against *HepG2*. The presence of glycoside has anti diabetic activity which has been projected by solvent ratio of leaf extract of *Debregeasia longifolia* [15].

Conclusion and recommendation

The antioxidant activity of *Debregeasia longifolia* leaves and bark indicates that it has a great role in antidiabetic activity. Due to the presence of potent bioactive activities inside it, it stimulates the formation of antioxidants to an ample extent. It can be further said that all the materials are beneficial for taking into consideration. Phenolic and flavonoid activities present inside the plant are beneficial for enhancing the antidiabetic property to an ample extent. Introduction of radiolabeled probes is the main theme of this study which can be further evaluated under injection of potential drugs. Hydrogen donating ability is also an important aspect of this study which is dependent on the parts used of this plant. In contrast to the used part of *Debregeasia longifolia* leaves bark and stems and roots are main aspects which can be used to an ample extent. Antidiabetic activity inside a plant can be considered as one of the most traditional uses to an ample extent. This study further shows that presence of flavonoid, phenolic and free hydroxyl compounds are the main materials of this study. Two assays have been taken into consideration for this study which shows that radical scavenging and hydroxyl scavenging are one of the crucial aspects. The presence of diphenyl has been proved in the plant extract which is beneficial for checking the activity at room temperature. The presence of calcium, selenium and others are one of the most crucial chemicals of this study which can be further proved by the boiled extract of this plant. To understand, advanced activity of these plants, the vasodilator process is beneficial to get the best result. Hepatoprotective activity of these plants can be chosen for proceeding with the best result.

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