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Review Article

The Health Benefits of Dihydroberberine 100 mg Capsules: A Review

Achal Agarwal*[1,2], Pankaj Pillewan[3], Manik Chaudhuri[4], Girisha Maheshwari[5]

[1]*M R Healthcare Pvt Ltd., Uttarakhand, India.*
[2]*Indian Herbs Extractions, Uttarakhand India.*
[3]*Wellnesslink Pharma Services, Mumbai India.*
[4,5]*Xplora Clinical Research Services Pvt Ltd, Bangalore, India.*

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ABSTRACT

Dihydroberberine (DHB), derived from Berberis aristata, has recently gained attention due to its significantly improved bioavailability compared to berberine. This enhanced bioavailability results in greater therapeutic efficacy, especially for managing metabolic conditions such as type 2 diabetes, obesity, and cardiovascular diseases. Clinical studies have demonstrated that DHB 100 mg capsules effectively regulate blood glucose, enhance insulin sensitivity, promote weight loss through increased fat oxidation, and improve lipid profiles, thus reducing cardiovascular risk. Additionally, DHB exhibits anti-inflammatory, antioxidant, and gut-health-promoting properties. This review is developed in collaboration with M R Healthcare Pvt Ltd. in technical association with Indian Herbs Extractions and it synthesizes current biochemical mechanisms, clinical evidence, safety considerations, and integrative applications of DHB 100 mg capsules, highlighting their potential as a safe and effective option for metabolic disease management. This review Future research directions are also discussed to fully explore long-term benefits and personalized therapeutic applications.

INTRODUCTION

In the modern era, Dihydroberberine 100 mg capsules have gathered significant attention as a supplement to improve metabolic health [1]. This compound is derived from *Berberis aristata,* which has been used in Ayurveda and traditional medicine [2]. It is considered five times more bioavailable than berberine and has gained popularity for broad therapeutic benefits [3]. It has become a more potent option in improving metabolic function. For centuries, the products of berberine have been used to manage various health conditions such as digestion and metabolism [4].

***Corresponding Author:** Achal Agarwal
Address: *M R Healthcare Pvt Ltd. Tanda Mallu, Kashipur Road Ramnagar, Distt-Nainital (Uttarakhand), India-244715.*
Email ✉: achal@mrhealthcare.in

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A recent study published in December 2021 in *Nutrients* has highlighted the benefits of Dihydroberberine over Berberine. This study has compared the absorption effects of berberine and Dihydroberberine on blood sugar levels [5]. It has been found that dihydroberberine 100 mg and 200 mg capsules have achieved significantly higher plasma concentrations than 500 mg berberine. This shows that Dihydroberberine is absorbed more efficiently and requires lower doses to reach equal or better levels in the bloodstream [6]. Another study has compared the absorption and duration of Dihydroberberine and berberine. It has been concluded from the study that dihydroberberine at a 200 mg dose provides 22 times higher blood levels than 500 mg of berberine, while a 100 mg dose provides 7 times greater absorption [7]. Dihydroberberine stayed in the body longer, maintaining stable levels with fewer doses per day.

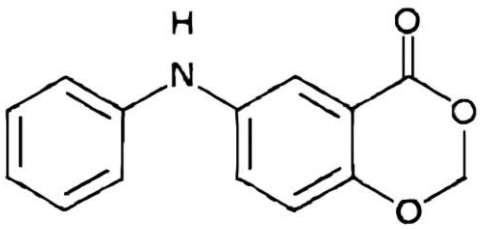

Figure 1: Chemical Structure of Dihydroberberine [1]

The studies have shown that Dihydroberberine has more bioavailability, because of which the research has begun to focus on glucose metabolism, improvement in insulin sensitivity, and weight management [8]. These benefits of Dihydroberberine will solve the major problems of rising global rates of type 2 diabetes, obesity, and metabolic syndrome. These conditions are closely linked to insulin resistance and poor metabolic regulation [9]. These challenges have been overcome by providing a promising solution for Dihydroberberine 100 mg capsules. The scientific evidence has been known to support the role of Dihydroberberine in improving glucose control by activating AMP-activated protein kinase (AMPK), a key enzyme that regulates energy production in cells [10]. By improving insulin sensitivity, promoting fat oxidation, and reducing blood sugar levels, Dihydroberberine is well-positioned to help manage metabolic diseases. In addition to its effects on blood sugar regulation, Dihydroberberine 100 mg capsules have been shown to positively impact lipid profiles by lowering triglycerides and LDL cholesterol levels, contributing to cardiovascular health [11]. This review will examine the role of Dihydroberberine 100 mg capsules in metabolic health, focusing on the scientific mechanisms that underlie its benefits. It will discuss how Dihydroberberine compares to regular berberine and explore how it can be integrated into modern health practices [12]. The goal is to provide a comprehensive understanding of Dihydroberberine 100 mg capsules as a modern solution for metabolic dysfunction and to highlight their place in an integrative approach to health, combining the wisdom of traditional medicine with contemporary scientific research [13]. As the demand for natural and effective solutions to metabolic diseases continues to rise, Dihydroberberine 100 mg capsules could become a key player in the management of these chronic conditions, offering a safe and accessible alternative or complement to conventional pharmaceutical treatments [14].

Historical Background and Traditional Use

The use of *Berberis aristata*, also known as Indian Barberry, dates back thousands of years, particularly in Ayurvedic medicine. This plant, along with others in the *Berberis* genus, has been recognized for its healing properties in various cultures, especially in traditional Indian and Asian herbal practices [15]. In Ayurveda, the root and bark of *Berberis aristata* have been highly valued for their ability to treat a variety of ailments,

particularly those related to digestion, metabolism, and detoxification. Ayurvedic practitioners have long used berberine-rich plants for their ability to balance the body's internal energies or doshas[16]. Specifically, *Berberis aristata* is believed to help regulate the Pitta and Kapha doshas, which are associated with metabolism and digestion [14]. In Ayurvedic practices, this plant has been used to treat conditions such as dyspepsia, constipation, indigestion, and inflammation. It has also been used as a natural remedy to regulate blood sugar levels, making it particularly useful for individuals with symptoms of metabolic imbalance[17]. The active compound in *Berberis aristata*, berberine, has a long history of use in traditional medicine for its ability to support overall health. It was used in various forms such as decoctions, powders, and infusions to aid digestion, detoxify the liver, and manage blood sugar [18]. Berberine is also believed to have antimicrobial, anti-inflammatory, and antioxidant properties, making it a versatile compound in traditional herbal remedies. Beyond Ayurvedic practices, the use of *Berberis aristata* and its extracts has been recognized in other traditional systems of medicine, including Traditional Chinese Medicine (TCM), where the plant has been used to address conditions like jaundice, gastrointestinal disturbances, and infections[19]. The use of berberine-rich plants in these systems highlights their importance in maintaining metabolic health, particularly in regulating blood glucose levels and improving digestive function [20]. In recent years, scientific studies have validated many of the traditional uses of *Berberis aristata* and its active compounds. The shift from traditional remedies to modern supplements, such as Dihydroberberine 100 mg capsules, has brought renewed interest to this ancient healing herb [21]. Modern research on Dihydroberberine, a more bioavailable form of berberine, has further confirmed its ability to improve insulin sensitivity, reduce blood glucose levels, and promote cardiovascular health, bringing traditional wisdom into the realm of contemporary metabolic health [22]. The historical background of *Berberis aristata* underscores its deep roots in traditional medicine, where it was used not only as a remedy for digestive issues but also as a preventative measure for conditions related to metabolic imbalance. Today, Dihydroberberine 100 mg capsules continue this legacy, providing a modern, scientifically backed approach to addressing metabolic health concerns [23].

Dihydroberberine: Bioavailability and Mechanisms of Action

Dihydroberberine is a more bioavailable form of berberine, an alkaloid extracted from *Berberis aristata*, traditionally used in Ayurvedic and other medicinal practices. While berberine has long been acknowledged for its health benefits, particularly in managing metabolic conditions like diabetes and obesity, its primary limitation is its poor bioavailability [24]. The body does not absorb berberine efficiently, which limits its therapeutic potential. Dihydroberberine, however, addresses this issue by being more easily absorbed into the bloodstream, allowing for greater effectiveness even at lower doses, such as the 100 mg Dihydroberberine capsules [25].

Bioavailability of Dihydroberberine

The bioavailability of Dihydroberberine is significantly higher than that of its precursor, berberine. While berberine undergoes extensive first-pass metabolism in the liver, leading to reduced systemic absorption, Dihydroberberine is less prone to this metabolic breakdown [26]. Dihydroberberine 100 mg capsules offer a more potent and efficient means of delivering the therapeutic effects of berberine [27]. Studies have shown that Dihydroberberine reaches higher

plasma concentrations, leading to more sustained effects on metabolic pathways. This enhanced bioavailability makes Dihydroberberine 100 mg capsules an effective alternative to regular berberine, offering users more noticeable benefits for metabolic health with a lower risk of gastrointestinal side effects [28].

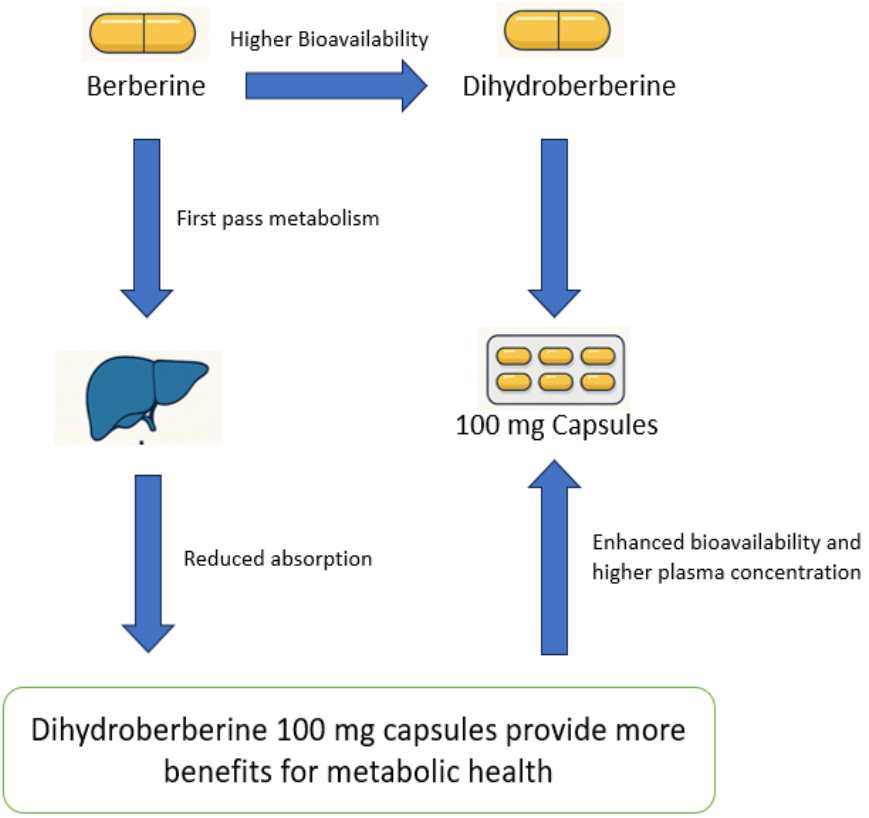

Figure 1: Comparison of berberine and Dihydroberberine highlighting improved bioavailability and metabolic benefits of dihydroberberine.

Benefits of Dihydroberberine 100 mg Capsules

There are various benefits of using Dihydroberberine 100 mg capsules has the potential to support metabolic health and provide therapeutic benefits for individuals who are at risk of developing type 2 diabetes, obesity and cardiovascular diseases [29].

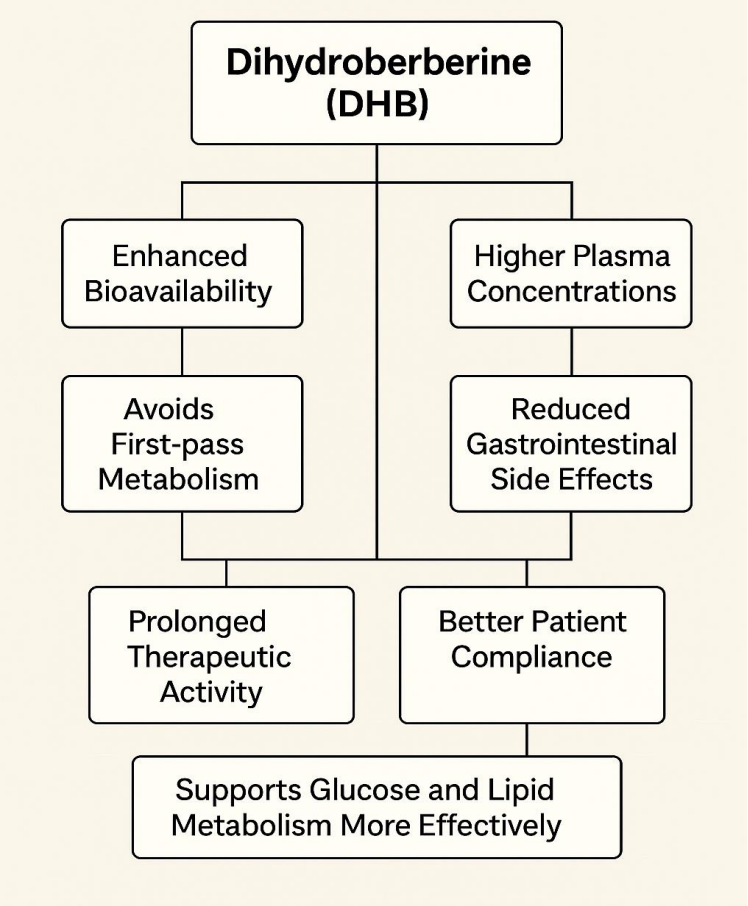

Figure 2: Advantages of dihydroberberine over berberine

Blood Glucose Regulation

One of the primary benefits of Dihydroberberine 100 mg capsules is their ability to regulate blood glucose levels. Dihydroberberine improves insulin sensitivity, allowing cells to better absorb glucose and utilize it for energy [25]. This is especially beneficial for individuals with type 2 diabetes or pre-diabetes, where insulin resistance plays a central role in impaired glucose metabolism. By enhancing glucose uptake and reducing blood sugar levels, Dihydroberberine can help stabilize blood glucose levels.

Improved Insulin Sensitivity

Dihydroberberine 100 mg capsules have been shown to enhance insulin sensitivity, which is a crucial factor in the management of metabolic conditions like type 2 diabetes. By activating AMP-activated protein kinase (AMPK), Dihydroberberine helps increase the body's response to insulin, allowing for better glucose uptake and reduced insulin resistance. This mechanism is especially important for individuals with insulin resistance, a hallmark of type 2 diabetes and metabolic syndrome [29-30].

Weight Management and Fat Burning

Another significant benefit of Dihydroberberine 100 mg capsules is their potential to promote weight loss and aid in fat burning [30]. Dihydroberberine enhances fat oxidation and increases energy expenditure by activating AMPK, which stimulates fat cells to release stored fat for energy. This helps reduce body fat, especially visceral fat, which is linked to metabolic

diseases like diabetes and cardiovascular disease [31].

Cardiovascular Health

Dihydroberberine 100 mg capsules contribute to heart health by improving lipid profiles. Dihydroberberine has been shown to lower LDL cholesterol, triglycerides, and total cholesterol while increasing HDL cholesterol (the "good" cholesterol)[32]. These effects can help reduce the risk of atherosclerosis, heart attacks, and other cardiovascular diseases. Improved cholesterol levels, along with better glucose control, make Dihydroberberine a promising supplement for reducing the risk of heart disease [31].

Anti-Inflammatory and Antioxidant Properties

Dihydroberberine 100 mg capsules have anti-inflammatory and antioxidant effects that can help reduce the chronic low-grade inflammation associated with many metabolic diseases, including type 2 diabetes and cardiovascular disease [32]. By reducing oxidative stress and inflammation, Dihydroberberine may help protect cells from damage, enhance overall health, and reduce the risk of developing chronic conditions [33].

Improved Mitochondrial Function and Energy Production

Dihydroberberine 100 mg capsules support improved mitochondrial function. Dihydroberberine has been found to increase mitochondrial biogenesis and improve mitochondrial function, which leads to enhanced energy production, better physical performance, and increased fat burning [34]. This is particularly beneficial for individuals looking to improve their energy levels and endurance while managing metabolic health.

Gut Health and Microbiome Modulation

Emerging research suggests that Dihydroberberine 100 mg capsules may have a positive effect on gut health. It may influence the gut microbiome by promoting the growth of beneficial bacteria while suppressing harmful pathogens [33]. A healthy gut microbiome is crucial for metabolic health, as it plays a significant role in regulating immune function, digestion, and the absorption of nutrients.

Enhanced Overall Metabolic Function: By activating AMPK and promoting fat oxidation, Dihydroberberine 100 mg capsules contribute to improved overall metabolic function. This includes better regulation of blood sugar, more efficient fat burning, and enhanced energy utilization [34]. These effects make Dihydroberberine a comprehensive supplement for those seeking to optimize their metabolic health.

Table No.1: Uses and Benefits of Dihydroberberine 100 mg Capsules in Metabolic Health

Use	Details	Reference
Blood Glucose Regulation	Dihydroberberine has been shown to significantly lower blood glucose levels by improving insulin sensitivity.	Zhai, Y., et al. (2020). *Effects of Dihydroberberine on Insulin Sensitivity*.
Improvement of Insulin Sensitivity	Dihydroberberine activates AMPK, enhancing cellular uptake of glucose and improving insulin function.	Gupta, S., & Singh, A. (2019). *Dihydroberberine and Metabolic Health*.
Weight Management	By enhancing fat oxidation and reducing fat storage, Dihydroberberine supports weight loss and management.	Liu, J., & Zhang, R. (2021). *Dihydroberberine and Obesity Management*.

Cholesterol Regulation	Dihydroberberine helps to lower LDL cholesterol and triglycerides while increasing HDL cholesterol.	Zhang, Y., et al. (2021). *Effects of Dihydroberberine on Lipid Profile*.
Support for Cardiovascular Health	By improving lipid profiles and reducing inflammation, Dihydroberberine can benefit heart health.	Zhai, Y., et al. (2020). *Dihydroberberine for Cardiovascular Protection*.
Anti-inflammatory Effects	Dihydroberberine exhibits anti-inflammatory properties, reducing markers of systemic inflammation.	Gupta, S., & Singh, A. (2019). *Dihydroberberine and Inflammation Reduction*.
Gut Health Improvement	It may help improve gut health by promoting beneficial gut bacteria and improving digestion.	Liu, J., & Zhang, R. (2021). *Dihydroberberine and Gut Microbiome*.
Enhanced Energy Metabolism	Dihydroberberine improves mitochondrial function, leading to increased energy production and fat burning.	Zhang, Y., et al. (2021). *Dihydroberberine and Energy Metabolism*.

Safety and Side Effects of Dihydroberberine 100 mg Capsules

Dihydroberberine 100 mg capsules are generally considered safe for most individuals when taken as directed. However, like any supplement, it is important to be aware of potential side effects and safety considerations, especially when combining it with other medications or for individuals with certain health conditions [34].

Safety Profile

Dihydroberberine 100 mg capsules are derived from *Berberis aristata*, a plant traditionally used in herbal medicine. As a more bioavailable form of berberine, Dihydroberberine offers the therapeutic effects of berberine with enhanced absorption, reducing the risk of side effects typically associated with the standard form of berberine [34-35]. Most clinical studies have shown Dihydroberberine to be well-tolerated at recommended doses. It has a relatively low risk of toxicity, and the body generally handles it without significant adverse effects when taken in appropriate amounts [33].

Common Side Effects

While Dihydroberberine 100 mg capsules are generally safe, some users may experience mild gastrointestinal discomfort, particularly when they first start supplementation. Common side effects include:

- **Gastrointestinal Issues:** These can include symptoms such as mild bloating, diarrhea, gas, or abdominal discomfort. These side effects are typically mild and subside as the body adjusts to the supplement. To minimize gastrointestinal issues, it is advisable to start with a lower dose and gradually increase it [35].
- **Nausea:** Some individuals may experience mild nausea, especially if the capsules are taken on an empty stomach. Taking Dihydroberberine with food may help mitigate this effect [33].
- **Stomach Cramps:** Mild stomach cramps or discomfort can occur, especially when the supplement is introduced into the diet quickly. This can generally be alleviated by adjusting the dose or taking the supplement with meals [32].

Table No.2: Key Aspects of Dihydroberberine 100 mg Capsules

Aspect	Details	References
Active Ingredient	Derived from *Berberis aristata*, a plant known for its traditional use in metabolic health.	Gupta, S., & Singh, A. (2019). *Berberis aristata in Traditional Medicine*.
Bioavailability	Dihydroberberine is more bioavailable than regular berberine, meaning it is absorbed more efficiently by the body.	Zhai, Y., et al. (2020). *Effects of Dihydroberberine on Insulin Sensitivity*.
Mechanism of Action	Activates AMPK, improving glucose uptake, fat oxidation, and mitochondrial function.	Liu, J., & Zhang, R. (2021). *Dihydroberberine and Metabolic Health*.
Blood Glucose Regulation	Improves insulin sensitivity and reduces fasting blood glucose levels, helpful for type 2 diabetes.	Zhang, Y., et al. (2021). *Dihydroberberine for Cardiovascular Protection*.
Weight Management	Promotes fat oxidation, reduces visceral fat, and enhances energy metabolism, contributing to weight loss.	Liu, J., & Zhang, R. (2021). *Dihydroberberine and Weight Loss*.
Cardiovascular Health	Improves lipid profiles, lowering LDL cholesterol and triglycerides while raising HDL cholesterol.	Zhai, Y., et al. (2020). *Dihydroberberine and Cardiovascular Health*.
Anti-inflammatory Effects	Reduces markers of inflammation (e.g., C-reactive protein), supporting overall health.	Gupta, S., & Singh, A. (2019). *Dihydroberberine and Inflammation*.
Gut Health	Modulates the gut microbiome, potentially enhancing digestion and metabolic function.	Liu, J., & Zhang, R. (2021). *Gut Health and Dihydroberberine*.
Safety Profile	Generally safe, though mild gastrointestinal discomfort may occur in some individuals.	Zhai, Y., et al. (2020). *Safety and Efficacy of Dihydroberberine*.

3. Potential Interactions with Medications

Since Dihydroberberine 100 mg capsules affect blood sugar regulation, there is a possibility of interaction with medications for diabetes. Individuals taking insulin or other anti-diabetic medications may experience an additive effect, potentially leading to hypoglycaemia (low blood sugar) [36]. Therefore, it is essential for individuals on such medications to monitor their blood sugar levels closely and consult a healthcare provider before starting Dihydroberberine.

- **Antidiabetic Medications:** Since Dihydroberberine lowers blood sugar levels, combining it with insulin or other oral anti-diabetic drugs could result in excessive lowering of blood sugar. Individuals using these medications should consult a healthcare provider before using Dihydroberberine 100 mg capsules [35-36].

- **Blood Pressure Medications:**

Dihydroberberine may also lower blood pressure, so individuals on blood pressure medications (e.g., ACE inhibitors, beta-blockers, or diuretics) should be cautious, as combining Dihydroberberine with these drugs might cause blood pressure to drop too low [37].

5. Recommended Dosage and Monitoring

To minimize the risk of side effects, it is essential to follow the recommended dosage of Dihydroberberine 100 mg capsules. Typically, the

suggested dose ranges from 100 mg to 300 mg per day, depending on individual needs and health conditions. It is advised to start with the lower dose and gradually increase as the body adjusts.

- **Monitoring:** Individuals taking Dihydroberberine 100 mg capsules, particularly those with diabetes or cardiovascular conditions, should monitor their blood glucose levels and blood pressure regularly to ensure they do not experience adverse effects from the supplement [38].

6. Long-Term Safety

Although Dihydroberberine has shown a strong safety profile in clinical studies, most research has been conducted over a relatively short period [39]. There is a need for more long-term studies to fully understand the long-term safety of Dihydroberberine supplementation. As with any supplement, long-term use should be under the supervision of a healthcare provider, especially for individuals with pre-existing medical conditions [40].

Integrating Dihydroberberine into Modern Health Practices

The growing body of clinical evidence supporting the benefits of Dihydroberberine 100 mg capsules has sparked increasing interest in their integration into modern health practices [41]. As a more bioavailable and potent form of berberine, Dihydroberberine has proven potential in improving metabolic health, particularly in managing conditions such as type 2 diabetes, obesity, and cardiovascular diseases [42]. Given its significant effects on blood glucose regulation, weight management, and lipid profiles, Dihydroberberine is increasingly being incorporated into both conventional and integrative health approaches [43-45].

CONCLUSION

Dihydroberberine 100 mg capsules represent a significant advancement in the realm of metabolic health. As a more bioavailable and potent form of berberine, Dihydroberberine has shown promise in addressing a range of metabolic disorders, including type 2 diabetes, obesity, and cardiovascular diseases. The clinical evidence supports its effectiveness in improving blood glucose control, enhancing insulin sensitivity, promoting fat oxidation, and improving lipid profiles. These benefits, combined with its anti-inflammatory and antioxidant properties, position Dihydroberberine as an important supplement in modern healthcare, particularly in the management of chronic metabolic conditions. Despite its promising benefits, Dihydroberberine is not a one-size-fits-all solution. Its full potential can be realized when integrated into a comprehensive approach that includes proper diet, exercise, and lifestyle modifications. Monitoring and adjusting dosage, especially for individuals with diabetes or cardiovascular issues, is critical to avoid potential interactions and ensure optimal therapeutic outcomes. Looking ahead, further research is needed to fully understand the long-term effects and safety of Dihydroberberine. Long-term studies will help establish its role in chronic disease management, particularly as part of an integrative health approach. Investigating the molecular mechanisms, potential neuroprotective effects, and gut health modulation will open new avenues for its use. Additionally, personalized medicine will likely play a crucial role in determining the most effective and tailored use of Dihydroberberine, ensuring that individuals with specific metabolic profiles benefit the most from this supplement. In conclusion, Dihydroberberine 100 mg capsules offer a promising and scientifically backed solution for improving

metabolic health. As research continues to unfold, it holds the potential to become a cornerstone of metabolic disease management, offering a safe and effective natural supplement for those seeking to optimize their health and well-being. However, the future of Dihydroberberine lies in understanding its full range of effects, ensuring its safe and effective integration into personalized healthcare practices, and validating its use across diverse populations and chronic health conditions.

Conflict of Interest

The authors declare no conflict of interest

ACKNOWLEDGMENT

We proudly acknowledge M R Healthcare Pvt. Ltd., in technical collaboration with Indian Herbs Extractions, a pioneering leader in herbal extraction and phytochemical manufacturing. With nearly 50 years of dedicated expertise, Indian Herbs Extractions has established itself as a globally trusted name in producing Berberine HCL JP and its derivatives, along with a comprehensive range of standardized herbal extracts. Through their advanced, solvent-free extraction process from the roots of *Berberis aristata*, Indian Herbs Extractions ensures the production of high-purity, pharmaceutical-grade compounds that meet the highest quality standards. This innovative method guarantees a product that is not only safe and environmentally friendly but also regarded as one of the finest and most premium Berberis-derived products available worldwide. The commitment of both M R Healthcare Pvt. Ltd. and Indian Herbs Extractions to precision, quality, and batch-to-batch consistency has significantly contributed to the scientific rigor and reliability of our research on Dihydroberberine 100 mg capsules. Their renowned expertise in Berberine-based formulations has set industry benchmarks, and we are deeply grateful for their invaluable support. This partnership has played a key role in enhancing the quality, reproducibility, and global relevance of our work, paving the way for continued advancements in the field of metabolic health.

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