ESTIMATION OF TOTAL MALTOSE CONTENT BY DNS METHOD IN VIDARIKAND (PUERARIA TUBEROSA)

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ABSTRACT
Background: Vidarikand (Pueraria tuberosa DC) is commonly known as Indian kudzu. Bhavaprakash mention the Vidarikand in its Guduchyadi varga they mention the synonyms of Vidarikandas, Swdukanda, Krostri, Sita, Ikshugandha, Kshirvalli, Kshirshukla, Payasvani. Chemical Constituents Tubers contain 85.1% dry matter, 64.6% carbohydrates, 28.4% crude fibres, 10.9% protein, 0.5% ether extract, vidarikand is rich carbohydrates and etc.

Objective: The objective of the present study was to determine the total maltose content in Vidarikand (Pueraria tuberosa).

Materials & Methods: The total maltose content in different concentration was estimated spectrophotometrically by DNS method.

Results: The results showed that root of Vidarikanda (Puerariatuberosa) are rich source of Carbohydrates. The root extract of Vidarikanda in different concentration showed 10.15% of maltose for 2 gm of extract, and 26.45% of maltose in 4gm of extract.

Conclusion: The total maltose content of Vidarikanda was well established by spectrophotometric studies. The estimation of total maltose was done for the first time which can be used for further chemical and biological studies.

Keywords: Vidarikanda [Pueraria tuberosa], Maltose Curve.

Study and Article History: Sample Received at 14/07/2022 study conducted in ACRL, revised on 22/07/2022 & published in Avishkara Vol 1, Issue 3, Aug 2022.

INTRODUCTION:
The perennial herb Pueraria tuberosa, often known as Indian Kudzu (vidarikand), is found in India and other Asian nations. It belongs to the family Fabaceae. In Ayurveda and Chinese traditional practice, the tuber and leaves of this plant have been extensively used for nutritional
and therapeutic benefits. It thrives in humid climates, monsoon forests, and coastal areas. It can be found all over India, from the western Himalayas to Sikkim, at elevations of up to 4000 feet in Kumaon and in tropical and subtropical areas. Nepal and Pakistan are also home to this species. Phytochemical study of the tuber extract revealed the presence of alkaloids, coumarins, carbohydrates, glycosides, steroids, tannins, terpenoids, flavonoids, and anthocyanidins, among other phytoconstituents. Flavonoids such as puerarin (8.31%), daidzein (1.70%), and genistein (1.37%) were discovered in the tuber extract. Puerarin, a bioactive compound found in high concentration in vidarikand, regulates body temperature, lowers blood pressure, relieves spasm, and prevents cardiac arrhythmia. It is also effective in the treatment of diabetic nephropathy. Vidarikand crude extracts have contraceptive properties and may cause changes in the uterine, as observed in a rat model. Plant products have hypcholesterolemic (lowering cholesterol) properties as well. By inhibiting alcohol transport over the gut membrane, it can treat alcohol dependency. This plant contains lupinoside, which helps protect insulin from free fatty acid degradation. It has been reported as an anti-fertility agent. It can also help with child emaciation, debility (physical weakness), and poor digestion. The plant has anti-hypoglycemic properties. It’s used to make a compound decoction nourishing, diuretic, and expectorant and can help with fever and bronchitis. Vidarikand has a lot of heart-protecting qualities. Vidarikand is said to give skin a healthy glow and improve complexion. P. tuberosa has been demonstrated to be an effective fibrinolytic agent. Fibrinogen is a significant risk factor for coronary artery disease and stroke. Chemical Constituents Tubers contain 85.1% dry matter, 64.6% carbohydrates, 28.4% crude fibers, 10.9% protein, 0.5% ether extract. B-sitosterol, sucrose, glucose and fructose have been identified. Pterocarpan- tuberosin, pterocarpanone-hydroxytuberosone, two pterocarpenes-anhydrotuberosin and 3-O- methylanhdydrotuberosin, and a coumestantuberostan, an isoflavone - puerarone and a coumestan - puerarostan are found. Tubers are rich in isoflavonoids such as puerarin, daidzein, genistein and genistin. The present study was carried out to determine total maltose content by using the DNS method. It measures the total Maltose present in the sample.

**MATERIALS & METHODS:**

**Collection and Identification of plant material:** The roots of plant material were collected from Shree Jagadguru Gavisiddheshwara Ayurveda Medical College Pharmacy, Koppal, Karnataka and authenticated by taxonomist. The plant material was washed using distilled water and dried under the shadow. It was grated to form a fine powder. The powder was stored in a airtight container until further use.

**Preparation of solution:**

DNS reagent: prepare by dissolving 1gm of DNS into 50ml of distilled water and add slowly 30gm of sodium potassium tartarate and 20ml of 2N NaOH dilute the final volume to 100ml with distilled water preserve the reagent at 4°C or in brown bottle. 

Maltose working standard solution: 1mg/ml Dissolve 100mg of maltose in 100ml of water.

**Extract preparation:** 2 to 4 gm of the powdered sample was macerated with 100ml of water and kept for 24 hrs then filtered, the solvent was evaporated on water bath and later used for analysis.

**Estimation of Total Maltose:**

1. Pipette out 0.2 to 1ml of maltose standard solution into a series if test tubes, make the volume to 1ml with distilled water.
2. Add 1ml of DNS reagent to all the test tubes, then heat the test tube for 5min in boiling water bath and cool. then add 8ml of distilled water to each test tube.

3. Read the absorbance at 540 nm. plot the graph against absorbance vs. concentration of maltose.

<table>
<thead>
<tr>
<th>Maltose solution in ml</th>
<th>Distilled water in ml</th>
<th>DNS in ml</th>
<th>Heating boiling water bath for 5 min</th>
<th>Distilled water in ml</th>
<th>Concentration mg/ml</th>
<th>Absorbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>0</td>
<td>0.0711</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>0.8</td>
<td>1</td>
<td>8</td>
<td>0.020</td>
<td>0.2794</td>
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</tr>
<tr>
<td>0.4</td>
<td>0.6</td>
<td>1</td>
<td>8</td>
<td>0.040</td>
<td>0.3908</td>
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<tr>
<td>0.6</td>
<td>0.4</td>
<td>1</td>
<td>8</td>
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<td>0.5029</td>
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<tr>
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<td>1</td>
<td>8</td>
<td>0.080</td>
<td>0.5721</td>
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<td>1</td>
<td>8</td>
<td>0.10</td>
<td>0.6961</td>
<td></td>
</tr>
<tr>
<td>(2g extract) 0.2</td>
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<td>1</td>
<td>8</td>
<td></td>
<td>0.2869</td>
<td></td>
</tr>
<tr>
<td>(4g extract) 0.2</td>
<td>0.8</td>
<td>1</td>
<td>8</td>
<td></td>
<td>0.4523</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Standard maltose curve.

**CALCULATION:**

The percentage of total maltose content present in two different concentration of extracts of Pueraria tuberosa determined as follows:

Absorbance corresponds to 0.2 ml of test sample = x mg of maltose.

100 ml of sample solution contain = x/0.2*100 mg glucose = % of total maltose present.

Absorbance of sample was found to be 0.2869(2g extract) Therefore, = (0.02030/0.2) *100 = 10.15% of total carbohydrate content present.

Absorbance of sample was found to be 0.4523(4g extract) Therefore, = (0.0529/0.2) *100 = 26.45% of total carbohydrate content present.

**RESULTS AND DISCUSSION:**

The results for total maltose content in the Vidarikanda species are presented in the table1. And it is expressed in terms of percentage.

The Vidarikanda root showed 10.15% of maltose for 2g of extract and 26.45% of maltose for 4g of extract. The maltose content was revealed in the roots of Vidarikanda.
CONCLUSION:

The present study revealed the Maltose content in the root of Vidarikand (Pueraria tuberosa) which is medicinally important plants.

REFERENCES:
