DOI: 10.55522/jmpas.V14I1.6631 **ISSN NO. 2320 – 7418**

International peer reviewed open access journal

Journal of Medical Pharmaceutical and Allied Sciences

Journal homepage: www.jmpas.com CODEN: JMPACO

Research article

Alpha- amylase inhibition activity of methanolic extract of *Nyctanthes arbor-tristis* flower petals

Vijaya Lakshmi Nandikatti*, Vyshnavi S, Sandhya rani B, Bhavana M

Department of Pharmaceutical-chemistry, Hindu college of pharmacy, Guntur, Andhra Pradesh, India

Corresponding author: Vijaya Lakshmi Nandikatti, ✉ nandikatti2014@gmail.com, **Orcid Id**: https://orcid.org/4444-5555-6666-7777

Department of Pharmaceutical-chemistry, Hindu college of pharmacy, Guntur, Andhra Pradesh, India

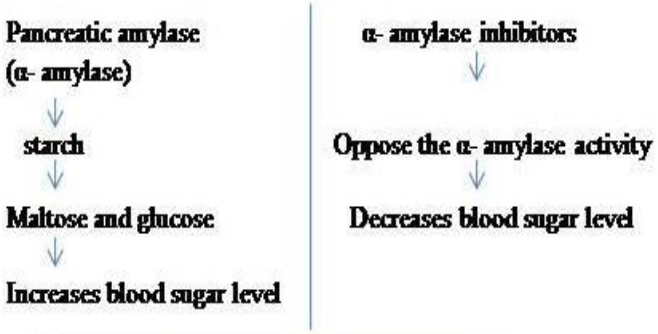
Received - 19-07-2024**, Revised** - 27-01-2024, **Accepted** - 08-02-2025 **(DD-MM-YYYY)**

Refer This Article

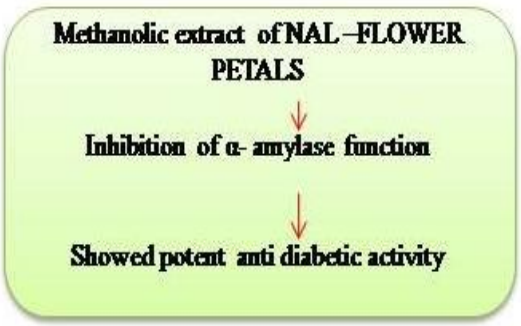
Vijaya Lakshmi Nandikatti, Vyshnavi S, Sandhya rani B, Bhavana M, 2025. Alpha- amylase inhibition activity of methanolic extract of *Nyctanthes arbor-tristis* flower petals. Journal of medical pharmaceutical and allied sciences, V 14 - I 1, Pages - 6971 – 6974. Doi: https://doi.org/10.55522/jmpas.V14I1.6631.

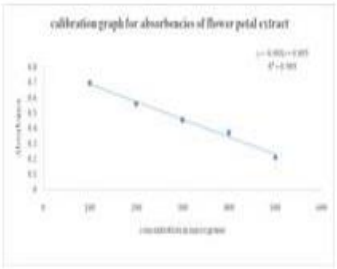
ABSTRACT

Now a day's many people are affected by diabetes- a chronic disorder, treated by using synthetic medicines which needs long-term therapy. To avoid patient inconvenience and side effects, many researchers are getting active ingredients from natural sources. *Nyctanthes arbor- tristis*, A old traditional plant with number of medicinal values. It is having pharmacological activities like antibacterial, anti-allergy, anti-anxiety, anti-inflammatory, anti-malarial, anti-leishmanial, anti-microbial, anti-parasitic, anti-aggressive, CNS depressant, anti-pyretic, hypoglycemic and hypolipidemic. The purpose of this research work is to find out the antidiabetic activity of *Nyctanthes arbor-tristis* flower petals.



Nyctanthesarbor-tristis Linn (NAL), traditional & ayurvedic plant with tremendous therapeutic applications





From literature review we found that there was no report on Alpha- amylase inhibition activity of methanolic extract of *Nyctanthes arbor-tristis* flower petals. The methanolic extraction of *Nyctanthes arbor- tristis* flower petals having phytochemicals like Flavanoids, glycosides, alkaloids, tannins. we are reporting that the methanolic extraction of *Nyctanthes arbor- tristis* flower petals have shown potent anti-diabetic activity by inhibiting the Alpha- amylase activity when comparing with standard Voglibose.

Keywords: Parijata, Methanolic extract, Alpha amylase, Nyctanthes flower petals, Phytochemicals.

INTRODUCTION

Nyctanthes arbor-tristis is also called Parijata (or) night jasmine. It grows natively in tropical & and subtropical regions or around the world it is utilized in Ayurveda, Siddha & Unani systems [1, 2]. Phyto constituents like Terpenoids, flavonoids, alkaloids, glycosides, tannins etc, are present in flower petals [3, 4]. An increase in blood sugar levels in the body it leads to diabetes. Reasons that cause diabetes include sugary drinks, lack of exercise, and intake of more carbohydrates, genetics, and lack of insulin production. Alpha amylase is an enzyme that helps in converting of sugar from starch by intake of food. Diabetes was also controlled by the inhibition of alpha-amylase enzyme activity. There are various methods to evaluate anti-diabetic activity, including alpha-amylase, beta-glucosidase, and hemoglobin glycosylation. The alpha-amylase inhibitors act as carbohydrate blockers, limiting the digestibility and absorption of carbohydrates in the gastrointestinal diet. Anti-diabetic agents function by inhibiting α-amylase [6, 7]. The anti-diabetics agent is to control the blood sugar level in the body without lowering sugar levels. From literature review it was found that there was no report on Alpha- amylase inhibition activity of *Nyctanthes arbor- tristis* flower petals [5]. We aimed to evaluate this activity with methanolic extract [8, 9, and 10].

MATERIAL AND METHODS

Materials

The materials used in this study include fresh *Nyctanthes arbor-tristis* flower petals , 100ml methanolic , 2 gm of extraction was obtained from methanolic extraction, 1gm of Alpha-amylase, starch, buffer, sodium potassium tartarate tetrahydrate and NaOH for the preparation of Dinitro salicyclic acid reagent and voglibose tablets.

Methods

Preparation of methanolic extract of Floower petals of *Nyctanthes arbor-tristis*

The fresh flowers of *Nyctanthes arbor-tristis* was collected and make it free from dirt and digested materials. From the flowers, orange colour stalks were removed and flower petals were separated, weighed accurately 100gms and macerated in 100ml of methanol for 2 days (48hrs). The extract was collected, allowed for the air dry to remove excess solvent. The raw extract was weighed and percentage yield also calculated. It was stored in air tight container and kept in a cool place for further use.

The methanolic extract was subjected to phytochemical screening by following schematic procedure and the results were presented inTable-1.

Anti-Diabetic Activity

Inhibition of α-amylase Enzyme Method

1 ml of α-amylase (0.5 mg/ml) solution was transferred into all 10 ml volumetric flasks (5), and to this methanolic extract of *Nyctanthus arbor-tristis* flower petals was added at various concentrations ranging from 100-500 µg/ml. To this 1% of starch solution and 0.2mm of phosphate buffer (pH-6.9) were added. This mixture was allowed to react at 37ºC for 5 minutes and terminated by the addition of 2 ml of 3, 5-dinitrosalicylic acid reagent. The reaction mixture was heated for 15 min at 100ºC and diluted with 10 millilitres of dis. Tld water in ice bath. The α-amylase inhibition activity was determined by measuring the color intensity of these solutions at 540 nm in a spectrophotometer. The absorbance values were reported in Table -2 and the percentage inhibition was calculated and reported in Table -3, by using the following formulae [11-16].

$$\% \text{ inhibitory activity} = (Ac-As)/Ac \times 100$$

Where Ac is the absorbance of the control and as is the absorbance of the sample.

We also calculated the IC_{50} value and reported in respective tables.

RESULTS

Percentage yield

The concentrated methanolic extract was weighed and calculated the percentage yield and is found to be2%.

Table 1: Results of phytochemical screening of Methanolic extract of flower petals

Phytoconstituents	Plant constituents	Flower -petals constituents
Steroids	+	-
Flavonoids	+	-++
Glycosides	+	+-
Phenols	+	-
Saponins	+	-
Alkaloids	+	++-
Amino acids	+	-
Carbohydrates	+	-
Proteins	+	-
Tannins	+	+

Where **(+)** indicates – presence, (-) indicates – absence of phyto chemicals.

Phyto Chemical

The various phytochemical test were performed among them the methanolic extract was *Nyctanthes arbor-tristis* flower petals having phytochemicals like flavonoids, alkaloids, glycosides, tannins.

Table 2: Computed values absorbencies of Methanolic extract of flower petals of *Nyctanthes arbor- tristis*

Absorbance	% inhibition	IC_{50} VALUE
0.696	22.32	210
0.56	24.0	
0.456	49.10	
0.374	58.25	
0.214	76.11	

Anti-Diabetic Activity

The anti-diabetic activity of Flower petals of *Nyctanthes arbor- tristis* flower petals evaluated by alpha-amylase inhibition methods.

The alpha amylase inhibition activity was measured by observing the absorbance values of sample solution from the result it was observed that as concentration increases absorbance decreases, which was supported with calculation the percentage inhibition.

Table 3: Computed values % inhibition of α –amylase by the extract of methanol with flower petals of *Nyctanthes arbor- tristis*

Concentration of extract(in µgs)	Absorbance
100	0.696
200	0.56
300	0.456
400	0.374
500	0.214
Standard	0.340

From this we are reporting that, extract of flower petals of NAT having anti-diabetic activity, which is also dose dependent. This was also supported by percentage inhibition values along with IC_{50} value.

Figure 1: Calibration graph for Absorbencies of Methanolic extract of flower petals of *Nyctanthes arbor- tristis*

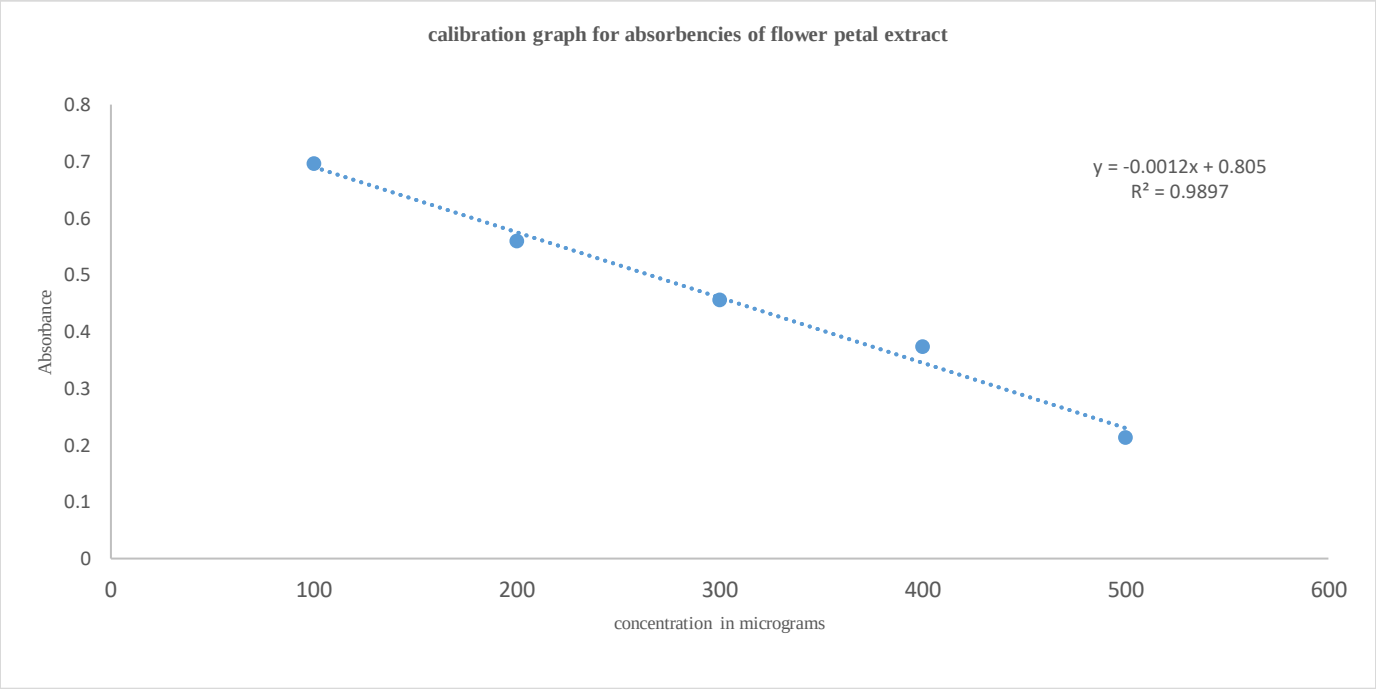
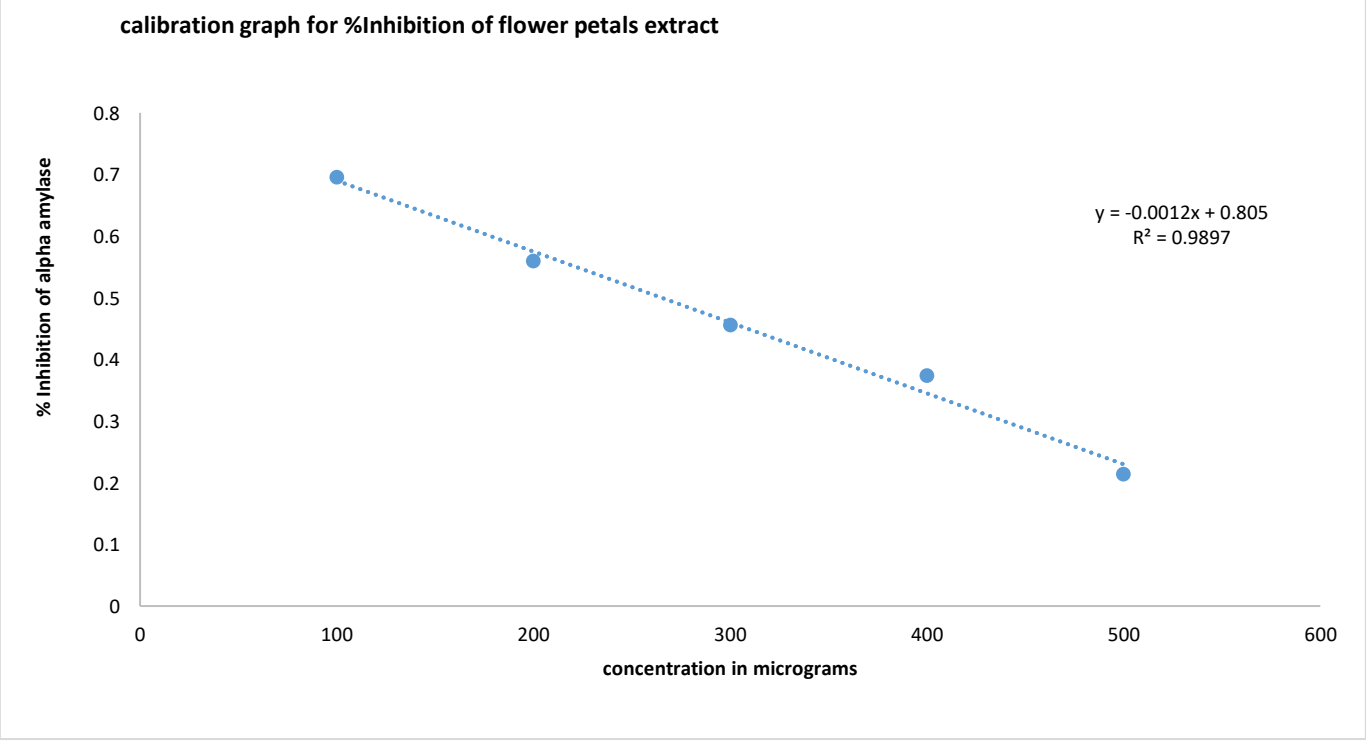


Figure 2: Calibration graph for % inhibition of Methanolic extract of flower petals of *Nyctanthes arbor- tristis*



By considering the results so obtained it was observed that, extract of methanol with flower petals of NAT shown significant effect on α-amylase activity. The calibration graph, showing that as the concentration of extract increases the activity of α-amylase enzyme decreased.

The result showed that the Methanolic extract of flower petals of *Nyctanthes abror -tristis* has excellent Anti-diabetic activity. By decrease in graph value it shows more anti-diabetic activity.

CONCLUSION

From this Work it was concluding that *Nyctanthes arbor-tristis* flower petal having phytochemicals like alkaloids, flavonoids, glycosides, tannins. The extract has shown good anti-diabetic activity by inhibiting the alpha-amylase activity which leads to reduction of blood sugar levels when compared with standard and the graph shown linearity which indicating the activity is dose dependent. As the concentration of extract increases there is increase in the percentage inhibition. In future we want to extend this work by isolated active ingredients of this extract.

Conflicts of interest

In this study we don't conduct conflicts of interest.

REFERENCES

1. Pushpendra Kumar Jain, Arti Pandey, 2016. The wonder of Ayurvedic medicine - Nyctanthes arbortristis. International Journal of Herbal Medicine. 4(4), Pages 3-9. Doi: https://dx.doi.org/10.22271/flora.

2. Himanshi Rawat, Yashika Verma, Neha Saini, et.al, 2021. Nyctanthes arbor-tristis: A traditional herbal plant with miraculous potential in medicine. International Journal of Botany Studies. 6(3), Pages 12-22.

3. Sweta Pundir, 2022. A Review on Pharmacological Activity of Nyctanthes arbor-trist. Research Journal of Pharmacognosy and Phytochemistry. 14 (2), Pages 108-112. Doi: 10.52711/0975-4385.2022.00014.

4. Ria Chakraborty, Santa Datta, 2022. A Brief Overview on the Health Benefits of Nyctanthes arbor-tristis Linn.- A Wonder of Mother Nature. Indo Global Journal of Pharmaceutical Sciences. 12, Pages 8-12. Doi: http://doi.org/10.35652/IGJPS.2022.12024.

5. Jaspal Singh, Amar Singh, Ajeet Singh, et.al, 2021. Nyctanthes arbor-tristis: a comprehensive review. World J Curr Med Pharm Res. 3(4), Pages 55-58. Doi: https://doi.org/10.37022 /wjcmpr.v3i4.181.

6. Smita Parekh, Anjali Soni, 2020. Nyctanthes arbor-tristis: Comprehensive review on its pharmacological, antioxidant, and anticancer activities. Journal of Applied Biology & Biotechnology. 8(01), Pages 69-72. Doi: https://dx.doi.org/10.7324/JABB.2020.80116.

7. Reema Srivastava, Deepali Trivedi, Gauri Shukla, et.al, 2018. Nyctanthes arbor-tristis: A Wonder Indian Herbal Drug Needs Healthcare Attention. Biomed J Sci & Tech Res. 5(3), Doi: http://dx.doi.org/10.26717/BJSTR.2018.05.001199.

8. Kulkarni DM, Dhakne RB, Patil RR, 2022. Review of Nyctanthes arbor-tristis as a medicinal plant. Indian Journal Res Methods Pharm Sci. 1(1), Pages 21-26.

9. Nisha Verma, Rajeev Kumar Yadav, 2020. Nyctanthes arbor-tristis – A Review. Journal of Emerging Technologies and Innovative Research. 7(5), Pages 32-38.

10. M Nirmali Wickramaratne, J C Punchihewa, D Wickramaratne et al, 2016. In-vitro alpha amylase inhibitory activity of the leaf extracts of Adenanthera pavonina. BMC Complement Altern Med. 16(466), Pages 9-18. Doi: 10.1186/s12906-016-1452-y.

11. Karan Khadayat, 2020. Evaluation of the alpha-amylase inhibitory activity of Nepalese medicinal plants used in the treatment of diabetes mellitus. Clinical Phytoscience. 6, Pages 34-37. Doi: https://doi.org/10.1186/s40816-020-00179-8.

12. Sudha P Shobha Y Bhargava, Ameeta R Kumar, et.al, 2011. Potent a-amylase inhibitory activity of Indian Ayurvedic medicinal plants. BMC Complement Altern Med. 11(5), Doi: 10.1186/1472-6882-11-5.

13. Bhosale Hemlata, Gawali Pornima, Kadam Tukaram, et.al, 2019. In vitro anti-amylase activity of some Indian dietary spices. Journal of Applied Biology & Biotechnology. 7(04), Doi: 10.7324/JABB.2019.704011.

14. Wason Parklak, 2023. In Vitro α-Amylase and α-Glycosidase Inhibitory Effects, Antioxidant Activities, and Lutein Content of Nine Different Cultivars of Marigold Flowers (Tagetes spp.). Molecules. 28(8), Pages 28-32. Doi: https://doi.org/10.3390/molecules28083314.

15. Menakshi Bhat, 2011. Antidiabetic Indian Plants: A Good Source of Potent Amylase Inhibitors. Evidence-Based Complementary and Alternative Medicine. Pages 18-22. Doi: https://doi.org/10.1093/ecam/nen040.

16. Bansal Gulshan Suri Ka, G Parul, et.al, 2015. A Comprehensive review on Nyctanthes arbortristis. Int J Drug Dev Res. 7(1).