

University of Mumbai



Academic Planning and
Development Section
No. APD/ICD/2019-20/762
17th March, 2020

Sub : Minor Research Grant Project 2019-20

Sir/Madam,

I am directed to inform you that the said proposal has been considered by the University and the research grant as quoted above is sanctioned to the researcher.

The sanctioned amount will be disbursed in two installments. The first installment of 40% of the sanctioned amount will be disbursed within the month of March. The remaining 60% amount will be disbursed up to 31st December, 2020.

The researcher is expected to spend 60% amount initially from his/her own resources to carry out the work.

Further, I am to inform you that the researcher will have to utilize the 40% sanctioned amount on or before 31st March, 2020 and submit original bills/vouchers of the expenditure along with Utilization Certificate duly certified by the Principal/Director/Head/Institute/University Department/College to the Accounts Section of the University.


Please note that 60% balance amount, out of sanctioned grant will be released after Poster Presentation & final approval of the committee. Therefore you need to submit of utilization certificate after presentation of your research including bills/vouchers/receipts in original through University Account Section.

The report of the research work carried out by the concerned researcher will have to be submitted to the University on or before 31st December, 2020.

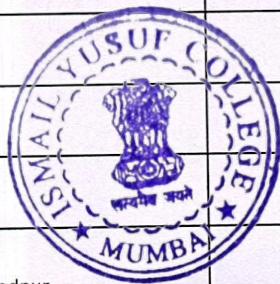
The Principal/Head of the Institute are requested to inform the researcher accordingly and arrange to forward his/her undertaking immediately to enable this office to release first installment of the research grant.



Yours faithfully,


Deepak V. More
Assistant Registrar
(APD Section)

712	DR. PAWAR UMESH RAMCHANDRA	South Ratnagiri District Shikshan Prasarak Mandal's Shri Pancham Khemraj Mahavidyalaya	45000
713	DR AMIT YADAORAO SARAF	Government of Maharashtra Ismail Yusuf College of Arts Science & Commerce	40000
714	Dr. Ajit Abasaheb Kengar	The Kelkar Education Trust's Vinayak Ganesh Vaze College of Arts Science and Commerce	35000
715	DR. DETHE UTTAM LAXMAN	South Ratnagiri District Shikshan Prasarak Mandal's Shri Pancham Khemraj Mahavidyalaya	40000
716	Mr. Nitin Devram Shelake	Government of Maharashtra Ismail Yusuf College of Arts Science & Commerce	35000
717	Dr. Lal Sahab Yadav	Smt. Chandibai Himathmal Mansukhani College	45000
718	Gopal N. Deshpande	Padmashri Annasaheb Jadhav Bharatiya Samaj Unnati Mandal's Bhiwandi Nizampur Nagarpalika Arts Science & Commerce College	40000
719	DR. Asmita. S. Mestry	Bharatiya Vidya Bhavan's M.M. College of Arts N.M. Institute of Science and Haji Rashid Jaffer College of Commerce (Bhavan's College)	35000
720	Dr. Arun Nivrutti Chandore	Rayat Shikshan Sansthas Abasaheb Marathe Arts and New Commerce Science College	30000
721	Dr. Vikram Pralhad Masal	Dapoli Education Society's Dapoli Urban Bank Senior Science College	30000
722	Dr. Raghunath Laxman Ghalme	Dapoli Education Society's Dapoli Urban Bank Senior Science College	35000
723	Dr. Bindu Gopalkrishnan	Shri Vile Parle Kelvani Mandal's Mithibai College of Arts Chauhan Institute of Science and Amrutben Jivanlal College of Commerce and Economics	35000
724	Dr. Jai Knox	Wilson College	35000
725	Dr. Alpa K. Patel,	South Indian Children's Education Society's Arts Science & Commerce College	35000
726	Dr. Vinit Vaidya	Thakur Educational Trust's Thakur College of Science & Commerce	35000
727	Mr. Alok Gude	St. Xavier's College	30000
728	Shri. Suresh. S. Kale	Parle Tilak Vidyalaya Association's Sathaye College	45000
729	Leela Chauhan	Parle Tilak Vidyalaya Association's Sathaye College	35000
730	Dr. Vijaya Lobo	St. Xavier's College	35000
731	Dr. V. G. Chari	Seva Sadan's R.K. Talreja College of Arts Science and Commerce	45000
732	Vijay Kisan Hile	Bharatiya Vidya Bhavan's Hazarimal Somani College of Arts and Science Jayaramdas Patel College of Commerce & Management Studies	40000
733	Dr. Sarita S. Hajirnis	Satish Pradhan Dnyansadhana College Thane (Arts Science and Commerce)	40000
734	Dr. Dhanashree Sagar Patil	Br. Balasaheb Khardekar College	35000
735	Dr. Ritu L. Jain	G. M. Momin College	35000
736	Dr. Deepa Ramabhilash Varma	Visnu Vaman Thakur College, Virar	30000
737	Dr. Rajbhoj Balaji Govindrao	Sundarrao More College of Arts, Comm. & Sci., Poladpur	35000





**Government of Maharashtra
Ismail Yusuf College of Arts, Science and Commerce
Jogeshwari (East), Mumbai 400 060**

NAAC "A" Grade (CGPA 3.14)

Tel.no. (office) 022-28352881

principaliyc@yahoo.co.in

Fax(principal) 022-28202188

Ref. no.: MRP/2022/03

Date: 28th April 2023

UTILIZATION CERTIFICATE

Certified that the sanctioned grant of **Rs. 35,000/-** (Rupees Thirty-five Thousand only) and received amount of first installment of **Rs. 24,500/** (Rupees Twenty-Four Thousand Five Hundred only) from the University of Mumbai under the scheme of support for Minor Research Project entitled "**Development of validated method of HPTLC fingerprinting and profiling of Flavanoids in *Helicteres isora* Linn**" by '**Mr. Nitin Devram Shelke**' has been fully utilized for the purpose for which it has been sanctioned and in accordance with the terms and conditions laid down by the University.

Project No: 716

University Letter. Ref. No.- APD/ICD/2019-20/762

Dated on- 17th March, 2020

Principal Investigator

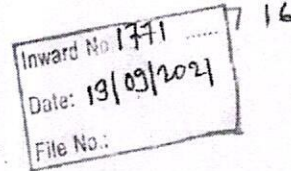


Principal

PRINCIPAL

Government of Maharashtra's
Ismail Yusuf College of
Arts, Science & Commerce,
Jogeshwari (East), Mumbai - 400 060

University of Mumbai



Shri Shelake

13.9.21

Research Project No: 716

NAME OF THE RESEARCHER
LECTURE IN
AMOUNT SANCTIONED
CO-INVESTIGATOR

: Mr. Nitin Devram Shelake
: Botany
: 35,000/-

Ref No. AAMS/ICD/106 of 2021
23rd July, 2021

To,

Government of Maharashtra Ismail Yusuf
College, of Arts, Science & Commerce,
Jogeshwari (East), Mumbai - 400 060.

Sub: - Minor Research Grant Project.

Sir/Madam,

I am directed to inform you that the said proposal has been considered by the University and the research grant as quoted above is sanctioned to the researcher.

The sanctioned amount will be disbursed in two installments. The first installment of 70% of the sanctioned amount will be disbursed within the month of August. The remaining 30% amount will be disbursed up to 31st December, 2021.

The researcher is expected to spend 30% amount initially from his/her own resources to carry out the work.

Further, I am to inform you that the researcher will have to utilize the 100% sanctioned amount on or before 31st December, 2021 and submit original bills/vouchers of the expenditure alongwith Utilization Certificate duly certified by the Principal/ Director/ Head/Institute/University Department of the College to The Deputy Registrar, Accounts Section, Mahatma Phule Bhavan, Vidyanagari, Kalina Campus, University of Mumbai, Mumbai - 400 098.

The report of the research work carried out by the concerned researcher will have to be submitted to the University on or before 31st December, 2021.

The Principal/Head of the Institute are requested to inform the researcher accordingly and arrange to forward his/her undertaking immediately to enable this office to release first installment of the research grant.

Yours faithfully,



Assistant Registrar
(Academic Planning & Development Section)

Name:	Mr. Nitin Devram Shelake
Title of the project:	Development of validated method of HPTLC fingerprinting and profiling of Flavanoids in <i>Helicteres isora</i> Linn
Subject:	Botany
Project Number:	716
Year:	2019-2020
Amount sanctioned:	35,000/-
Amount released:	28,000/-
Amount utilised:	28,000/-

Project Report:

1. Introduction

1.1 Background

Helicteres isora Linn., a medicinal plant from the Sterculiaceae family, is renowned for its therapeutic properties, particularly in traditional medicine systems. It is known to possess various bioactive compounds, including flavonoids, which contribute to its medicinal efficacy. This study focuses on developing a comparative High-Performance Thin-Layer Chromatography (HPTLC) fingerprinting method for the flowers, fruits, and roots of *Helicteres isora*, aiming to identify, separate, and characterize flavonoids in these different plant parts.

1.2 Objectives

The main objectives of the present study are:

1. To develop comparative HPTLC fingerprints for the flowers, fruits, and roots of *Helicteres isora*.
2. To validate the HPTLC method for the identification, separation, and characterization of flavonoids.
3. To adhere to ICH (International Council for Harmonisation) guidelines during the method development and validation process.

2. Materials and Methods

2.1 Plant Material



Fresh flowers, fruits, and roots of *Helicteres isora* were collected from authenticated sources. The plant materials were cleaned, dried, and powdered separately. Each part was stored under appropriate conditions to prevent degradation.

2.2 Sample Preparation

Ethanollic and Methanolic extracts were prepared by dissolving 100 mg of dried sample in 10 ml of solvents. The extracts were sonicated for 15 min in bath sonicator.

2.3 HPTLC Method Development

2.3.1 Optimization of Chromatographic Conditions

- Stationary Phase: Silica gel plates (HPTLC Silica gel 60 F₂₅₄ plate) were used.
- Mobile Phase: Toluene: Chloroform: Ethanol (4:4:1)-
- Detection: The plates were visualized under UV light (366nm)

2.3.2 Method Development

- Sample Application: Extracts of flowers, fruits, and roots were applied to the HPTLC plates using a spotter or automatic applicator.
- Chromatographic Run: Plates were developed in a saturated chamber until the solvent front reached the desired distance.
- Visualization: Spots were visualized under UV light or after derivatization. Flavonoids were detected based on their characteristic color and R_f values.

2.4 Method Validation

2.4.1 Specificity

- Purpose: To ensure the method accurately identifies flavonoids in different plant parts without interference from other compounds.
- Approach: Analyze extracts of flowers, fruits, and roots to confirm the presence of flavonoid markers.

2.4.2 Linearity and Range

- Purpose: To establish that the method produces consistent results over a range of concentrations.
- Approach: Prepare standard solutions of known flavonoids, and plot calibration curves to assess linearity.

2.4.3 Precision

- Purpose: To determine the reproducibility and reliability of the method.
- Approach: Perform replicate analyses (intra-day and inter-day) and calculate the relative standard deviation (RSD).



2.4.4 Accuracy

- Purpose: To verify that the method accurately measures the concentration of flavonoids.
- Approach: Spike known quantities of flavonoids into the samples and analyze them to check recovery rates.

2.4.5 Robustness

- Purpose: To assess the method's reliability under varying conditions.
- Approach: Alter chromatographic conditions slightly and evaluate the impact on the results.

3. Results

3.1 HPTLC Fingerprints

3.1.1 Flowers

- Description: The HPTLC profile of the flowers exhibited specific spots corresponding to flavonoids with distinct R_f values and colors.

3.1.2 Fruits

- Description: The fruit extracts displayed a different pattern of flavonoid spots compared to flowers, indicating variability in flavonoid content.

3.1.3 Roots

- Description: The root extracts revealed another unique fingerprint, demonstrating the presence of different flavonoids or varying concentrations compared to the flowers and fruits.

3.2 Method Validation

3.2.1 Specificity

- Findings: The method successfully identified flavonoids in all plant parts with minimal interference.

3.2.2 Linearity and Range

- Findings: Calibration curves showed good linearity (R^2 values > 0.99) within the tested concentration range.

3.2.3 Precision

- Findings: The method demonstrated acceptable precision, with RSD values within the ICH guidelines (< 2%).

3.2.4 Accuracy



- Findings: The recovery rates for spiked samples were within the acceptable range (95-105%).

3.2.5 Robustness

- Findings: Minor variations in chromatographic conditions did not significantly affect the results, indicating method robustness.

4. Discussion

4.1 Comparative Fingerprints

The comparative HPTLC fingerprints of flowers, fruits, and roots of *Helicteres isora* revealed distinct profiles for each plant part. This indicates the presence of specific flavonoids that vary among different plant parts, which may be related to their medicinal properties.

4.2 Validation and Methodology

The HPTLC method developed and validated according to ICH guidelines proved to be specific, linear, precise, accurate, and robust. The method is suitable for the identification, separation, and characterization of flavonoids in *Helicteres isora* and can be used for quality control and standardization of this medicinal plant.

5. Conclusion

The study successfully developed a validated HPTLC method for comparative fingerprinting of flowers, fruits, and roots of *Helicteres isora*. The method provided distinct profiles for each plant part, facilitating the identification and characterization of flavonoids. This approach offers a reliable tool for quality control and further research on the medicinal properties of *Helicteres isora*.



NO. 02

DATE: _____

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Shop No.7, Kalpaka CHS., Bldg. No. 1,

Siddharth Nagar, Road No. 16,

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Mobile : 99200 18225

RECEIVED With thanks from The Principal, Ismail Yusuf
College.

The sum of Rupees Thirty four thousand two hundred &
fifty one only. In full/part payment of

Our Bill No. 167/21-22 Dated 31/3/22 By Cash / Cheque No. _____

Dated _____ drawn on _____

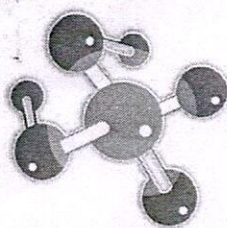
For NEEV RESEARCH PRODUCTS

₹. 34251/-

This receipt is valid subject to Realization of cheque

Proprietor





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Mob. 99200 18225 • Email. neevresproducts07@gmail.com | GSTIN : 27BGSPS0165D1Z6

Tax Invoice

To,
The Principal,
Ismail Yusuf College
Jogeshwari East
Mumbai - 400 060

Tax Invoice No: 167 / 21-22

Date: 31/03/2022

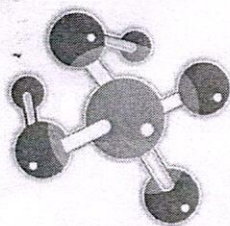
PO No:-

Dtd.

Sr No.	Particulars	HSN Code	Qty	Rate (Per)	Total
1.	Acetone, Molychem make, Cat no. 21040 - 2.5 ltr	29141100	02	1,066.00	2,132.00
2.	Toluene, Molychem make, Cat no.26680 - 2.5 ltr	29023000	02	839.00	1,678.00
3.	n-Pentane, Molychem make, Cat no.24633 - 500ml	29012990	01	429.00	429.00
4.	n-Hexane, Molychem make, Cat no.23490 - 2.5 ltr	29012990	02	2015.00	4030.00
5.	Dichloromethane, Molychem make, Cat no.22950-2.5 ltr	29031200	02	1268.00	2536.00
6.	Diethylamine, Molychem make, Cat no.14150-500ml	29211990	01	319.00	319.00
7.	Ethyl Formate, Molychem make, Cat no.60160-500ml	29151290	01	520.00	520.00
8.	Formic Acid 98%, Molychem make, Cat no. 23325-500ml	29151100	01	507.00	507.00
9.	n-butyl Acetate, Molychem make, Cat no. 22392-500ml	29153300	01	520.00	520.00
10.	1,4-Dioxan, Molychem make, Cat no. 23070-500ml	29329900	01	488.00	488.00
11.	Glacial Acetic Acid, Molychem make, Cat no.21020-500ml	29152100	01	322.00	322.00
12.	Triethylamine, Molychem make, Cat no. 26765-500ml	29215990	01	553.00	553.00
13.	N- Propanol, Molychem make, Cat no.25175-500ml	29051210	01	328.00	328.00
14.	Cyclohexane, Molychem make, Cat no. 22830 -500ml	29021100	01	338.00	338.00
15.	2-Propanol , Molychem make, Cat no.25180-500ml	29051220	01	319.00	319.00
16.	Acetonitrile, Molychem make, Cat no.21060-500ml	29269000	01	504.00	504.00
17.	2-Butanol, Molychem make, Cat no.22399-500ml	29051490	01	358.00	358.00
				C/F	15,881.00



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Tax Invoice

To,
The Principal,
Ismail Yusuf College
Jogeshwari East
Mumbai - 400 060

Tax Invoice No: 167 / 21-22
Date: 31/03/2022
PO No:-
Dtd.

Sr No.	Particulars	HSN Code	Qty	Rate (Per)	Total
				B/F	15,881.00
18	Isoamyl alcohol, Molychem make, Cat no. 21830-500ml	29051990	01	351.00	351.00
19	Distilled Water, Molychem make, Cat no.32229-5ltr	22011010	01	270.00	270.00
20	Cyclohexane, Molychem make, Cat no.22830-500ml	29021100	01	338.00	338.00
21	Dichloromethane, Molychem make, Cat no.22950-500ml	29031200	01	332.00	332.00
22	1,2 Dichloroethane, Molychem make, Cat no. 22945-500ml	29031500	01	299.00	299.00
23	TLC Plate	38220090	01	6795.00	6795.00
24	100ml Beaker, Supertek make, Cat no.15.101.0100	70179090	10	55.00	546.00
25	50ml Measuring Cylinder, Supertek make, Cat no.70.504.0050	70171000	02	247.00	494.00
26	2ml Glass Pipette, Supertek make, Cat no.70.301.0002	70179010	10	110.00	1099.00
27	5ml Glass Pipette, Supertek make, Cat no.70.301.0005	70179010	10	113.00	1134.00
28	10ml Glass Pipette, Supertek make, Cat no.70.301.0010	70179010	10	130.00	1295.00
29	NAPHTHOL GREEN B for Microscopy Molychem make, Cat no. 32005 -25gm	3822090	01	192.00	192.00
GSTIN/UIN : 27BGSPS0165D1Z6			Total		29,026.00
Our Bank A/c No: 002220110000268			CGST @ 9%		2612.34
Bank Name: Bank Of India Goregaon (W) Branch			SGST @ 9%		2612.34
			Less Round Off		0.32
			Final Total		34,251.00

Rupees Thirty Four Thousand Two Hundred and Fifty One Only.

- Terms: 1) Chemical sold as per bill are for laboratory use only and not for medical.
2) Interest @ 18% will be charged if payment in not received within 30 days.
3) Goods once sold will not be taken back.



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09158854815

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Shop No. 01/ 03, Om Sai Ram CHS Ltd.,
Shree Swami Samarth Nagar, Wavte Wadi, Virar East.

Customer's Name : Principal I.Y. No. :

620

College.

Date : 21-3-2021

Sr. No.	Description	Qty.	Rate	Amount
	cutting Blade	1		213
	Airtight Container.	1		236



RUPEES Four Hundred &
fourty nine only.

TOTAL 449

E. & O. E.

Note : Goods Sold or Repairation
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[Signature]

Authorised Signatory



ॐ गणेशाय नमो:

Mob.: 09270462949
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Deepak Hardware

Plumbing, Painting, Water Proofing and Building Construction Material.

Shop No. 01/ 03, Om Sai Ram CHS Ltd.,
Shree Swami Samarth Nagar, Wavte Wadi, Virar East.

Customer's Name : Principal I.Y. No. : 618

College Date : 21-3-2021

Sr. No.	Description	Qty.	Rate	Amount
1	Gloves Box	1		300
RUPEES <u>Three Hundred,</u> <u>only,</u>			TOTAL	300

E. & O. E.

Note : Goods Sold or Repairation
are Valid For Three Months Only.



PRINCIPAL
Government of Maharashtra's
Ismail Yusuf College of
Arts, Science & Commerce.
Jogeshwari (East), Mumbai - 400 060

For Deepak Hardware

14um
Authorised Signatory