

A SUMMARY OF FINAL REPORT OF MAJOR RESEARCH PROJECT
ON
**ISOLATION OF SECONDARY METABOLITES AND EVALUATION OF
ANTISTEROIDOGENIC ACTIVITIES OF SOME POTENTIAL INDIAN MEDICINAL
PLANTS OBTAINED LOCALLY FROM CHHATTISGARH STATE**

SUBMITTED TO
UNIVERSITY GRANTS COMMISSION, NEW DELHI

BY
**Dr Dilipkumar Pal
Principal Investigator**



**Department of Pharmaceutical Sciences
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)-495 009**

**UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI – 110 002**

Final Report of the Work Done on the Major Research Project

1. Project Report No. : Final Report
2. UGC Reference No.: **F. No 42-694/2013 (SR) dt 25/03/2013 and dt 27/05/2016**
3. Period of report: from 01.04.2013 to 31.03.2017
4. Title of research project: **“Isolation of secondary metabolites and evaluation of antisteroidogenic activities of some potential Indian Medicinal plants obtained locally from Chhattisgarh state.”**
5. a. Name of the Principal Investigator: **Dr Dilipkumar Pal**
 - b. Deptt. and University/College where work has progressed: Institute of Pharmaceutical Sciences, Guru Ghasidas Vishwavidyalya, Bilaspur (C.G.)- 495 009
6. Effective date of starting of the project: 02.04.2013
7. Grant approved and expenditure incurred during the period of the report:
 - a. Total amount approved Rs.= **1192613/-(Rupees Eleven lakhs ninty two thousand six hundred thirteen only**
 - b. Total expenditure:**Rs. 1186684/-(Rs. Eleven lakhs eighty six thousand six hundred and eighty four only)**
 - c. Report of the work done
 - i. **Brief objective of the project:** (A) Isolation of secondary metabolites and evaluation of antisteroidogenic activities of some potential Indian Medicinal plants obtained locally from Chhattisgarh state.
 - ii. **Work done so far and results achieved and publications, if any, resulting from the work (Give details of the papers and names of the journals in which it has been published or accepted for publication:**
 - iii. **Has the progress been according to original plan of work and towards achieving the objective:**
Yes
 - iv. Please indicate the difficulties, if any, experienced in implementing the Project: N.A.
 - v. If project has not been completed, please indicate the approximate time by which it is likely to be completed: N.A.
 - vi. If the project has been completed, please enclose a summary of the findings of the study. Two bound copies of the summary of the findings of the study and work done may also be sent to the Commission
 - vii. Any other information which would help in evaluation of work done on the project: Attached **Enclosure 1**
 1. Research papers presented & lectures delivered at seminars & conferences: Total 08 (Eight).

2. The major equipment (Rotary Evaporator) purchased from this major research project is also being kept in the laboratory accessed for all.

Dr. P. K. S. Patil

SIGNATURE OF THE PRINCIPAL INVESTIGATOR

Principal Investigator
(UGC Project-MRP)
Institute of Pharmaceutical Sciences
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)

Dangra

SIGNATURE OF THE CO-INVESTIGATOR

R. S. S. Patil
REGISTRAR/PRINCIPAL
REGISTRAR (AC/AG)
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Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)

Dangra
08/04/19

HEAD
S.L.T. Institute of Pharm. Sciences
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Bilaspur (C.G.)

SUMMARY OF PROJECT**UGC –Major Research Project****Principal Investigator:**

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UGC approval Letter No and Date: **F. No 42-694/2013(SR) dated 25/03/2013 and dated 27/05/2016**

Since time immemorial men have been using indigenous plants for treatment of diseases. But it is our misfortune that proper evaluation of these plants on scientific basis not yet been done. Keeping this in view the above project was undertaken.

Four plants, i.e. *Celsia coromandeliane* Vahl (aerial parts), *Cyperus rotundus* (rhizome), *Clerodendrum infortunatum* (aerial parts), *Hydrilla verticillata* (whole plant) in sufficient quantities had been collected from different parts of C.G. State. Botanical identification and authentication of these plant parts had been done by Botanical Survey of India, Shibpur, Howrah, W.B. and specific sample has been preserved in our laboratory as Sample No: **UGC-DP1, UGC-DP2, UGC-DP3 and UGC-DP4** respectively for future references.

After shade drying and powdering of plant materials, each plant was subjected to soxhalation by petroleum ether, ethyl acetate, ethanol and water successively. The percentage yield of each extract and active constituents present in each extract have been summarized in the following table:

Plant Name	Extract	Yield %	Active constituents
<i>C. coromandeliane</i>	Pet ether extract	1.85	steroid, flavonoids.
	Ethyl acetate	3.25	flavonoids, glycosides, tannins and phenolic compound
	Ethanol	7.65	flavonoids, glycosides, tannins and phenolic compound
	Aqueous	9.65	flavonoids, glycosides, saponins, tannins, phenolic compound
<i>C. rotundus</i>	Pet ether extract	1.98	steroid
	Ethyl acetate	2.25	flavonoids, glycosides, tannins and phenolic compound
	Ethanol	6.06	alkaloid, flavonoids, glycosides, tannins, phenolic compound
	Aqueous	8.98	flavonoids, tannins, phenolic compound
<i>C. infortunatum</i>	Pet ether extract	3.97	steroid, flavonoids.
	Ethyl acetate	6.45	flavonoids, glycosides, tannins, phenolic compound
	Ethanol	6.17	alkaloids, flavonoids, glycosides, tannins, phenolic compound
	Aqueous	6.11	flavonoids, glycosides, tannins, phenolic compound
<i>H. verticillata</i>	Pet ether extract	2.85	Diterpene, phytosterol
	Ethyl acetate	4.67	saponin, flavonoids, annins and phenolic compound
	Ethanol	6.29	alkaloids, flavonoids, glycosides, tannins, phenolic compound
	Aqueous	5.23	flavonoids, glycosides, saponins, tannins, phenolic compound

*Antioxidant activities of different extracts of *C. coromandeliane* Vahl (aerial parts), *H. Verticillata* (aerial parts) and *C. infortunatum* (aerial parts) have been performed by *in vitro* method of nonenzymatic haemoglycosylation method. It was found that ethanol extracts possessed best *in vitro* antioxidant activity.

*A total phenolic content was determined by HPTLC method in *ethanol extract of H. Verticillata*.

*Preliminary pharmacology testing indicated that ethanol extract(s) showed best activities and hence ethanol extracts were taken for phytochemical and pharmacological testing. A preliminary antisteroidogenic activity in female mice was evaluated with ethanol extract(s).

*For isolation of active constituents, solvent system(s) have been determined as follows:

Extract	Solvent system
Ethanol extract of <i>C. coromandeliane</i> (EECC)	Chloroform: ethyl acetate= 91:9
Ethanol extract of <i>C. rotundus</i> (EECR)	Chloroform: ethanol = 90:10
Ethanol extract of <i>C. infortunatum</i> (EECI)	Chloroform: methanol = 95:5
Ethanol extract of <i>H. Verticillata</i> (EEHV)	Chloroform: ethanol: acetic acid=4.8:0.2:0.1

Isolation of compounds through gradient column chromatography for the above extract(s) was done as per the respective solvent systems. Isolated compound(s) from EECC, EECR, EECI and EEHV were characterized and identified by melting point determination and instrumental spectroscopy like UV, IR, and NMR.

Plants were evaluated for preliminary antisteroidogenic activities which indicated positive antifertility action. Further scope of detailed studies in this regard may remain for future

Evaluations of antibacterial and antifungal activities were performed with *Cyperus rotundus* and *Hydrilla verticillata* by Disc Diffusion method and zone of inhibition and minimum inhibitory concentration was determined.

In vitro anti-inflammatory activities were also determined in ethanol extract of *H. Verticillata* (EEHV) and it was found the EEHV at the concentration of 500 mcg/ml showed 76.95% inhibition in heat induced albumin denaturation.

The active constituent(s) responsible for above activities and determination of mechanism of action is future scope of work for this project towards successful implementation for human welfare.

Project fellow was appointed in this project: Mr Arindam Halder.

Some abstracts were presented at different scientific seminars & conferences. Two manuscripts are under preparation and communication in good scientific journals based on the results obtained from this project.

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