

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

Final Report of the work done on the Minor Research Project.

1	Project report	Final
2	UGC Reference No.F.	1499-MRP/14-15/KAMY013/UGC-SWRO
3	Period of report:	From 2015 to 17
4	Title of research project	Elucidation of phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle.L</i>)
5	(a) Name of the Principal Investigator	Dr.M.Seema
	(b)Deptt.	Microbiology
	(a) College where work has progressed	JSS College of Arts, Commerce And Science, Ooty road, Mysuru-570 025
6	Effective date of starting of the project	4 th Feb 2015
7	Grant approved and expenditure incurred during the period of the report:	
	a.Total amount approved Rs.	Rs. 405000/-
	b.Total expenditure Rs.	Rs.404497/-
	c.Report of the work done:	
	i. Brief objective of the project	Project report enclosed.
	ii. Work done so far and results achieved and publications, if any, resulting from the work	1. .Poster presentation at state level conference on Frontiers in Life Sciences-2017(FILS-17) held on 28-3.2017at Government Science College ,Hassan.Title: Antifungal activity of two endemic varieties of <i>Piper betle L</i> . 2. Poster presentation at National level Conference on Food Based approaches for translational Nutrition held on April 12 th &13 th 2017 at Yuvaraja's College,Mysuru.Title: phytochemical analysis of two endemic varieties of <i>Piper betle L</i> 3.Paper has been Communicated: Title: Phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle.L</i>)
	iii. Has the progress been according to original plan of work and towards achieving the objective. if not, state reasons	YES
	iv. please enclose a summary of the findings of the study. One bound copy of the final report of work done may also be sent to the concerned Regional Office of the UGC.	Enclosed
	v. Any other information	NIL

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SIGNATURE OF THE
PRINCIPAL INVESTIGATOR

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PRINCIPAL

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Final Report of the work done on the Minor Research Project

1	Title of the Project	Elucidation of phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle</i> .L)
2	NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR	Dr.M.Seema Department of microbiology JSS College of Arts, Commerce And Science, Ooty Road, Mysore-570 025
3	NAME AND ADDRESS OF THE INSTITUTION	JSS College of Arts, Commerce And Science, Ooty Road, Mysore-570 025
4	UGC APPROVAL LETTER NO. AND DATE	1499-MRP/14-15/KAMY013/UGC-SWRO dated 4 th Feb 2017
5	DATE OF IMPLEMENTATION	4 th Feb 2017
6	TENURE OF THE PROJECT	2015-17
7	TOTAL GRANT ALLOCATED	Rs. 405000/-
8	TOTAL GRANT RECEIVED	Rs.374432/-
9	FINAL EXPENDITURE	Rs.404497/-
10	TITLE OF THE PROJECT	Elucidation of phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle</i> .L)
11	OBJECTIVES OF THE PROJECT	1.Phytochemical analysis of aqueous and solvent extracts leaves of betelvine 2.Antimicrobial activity of betelvine leaf extract
12	WHETHER OBJECTIVES WERE ACHIEVED	Enclosed
13	ACHIEVEMENTS FROM THE PROJECT	1.Poster presentation at state level conference on Frontiers in Life Sciences-2017(FILS-17) held on 28-3.2017at Government Science College ,Hassan.Title: Antifungal activity of two endemic varieties of <i>Piper betle</i> L. 2. Poster presentation at National level Conference on Food Based approaches for translational Nutrition held on April 12 th &13 th 2017 at Yuvaraja's College,Mysuru.Title: phytochemical analysis of two endemic varieties of <i>Piper betle</i> L. 3.Paper has been Communicated: Title: Phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle</i> .L)
14	SUMMARY OF THE FINDINGS	Piper betle L. (Piperaceae) is a tropical shade-loving perennial evergreen climber. It is an important medicinal plant and its use is mentioned in our vedic literature such as, Charaka Samhita, Sushruta Samhita and Astanga Hridayam. It is known to have medicinal properties such as

antiseptic, analgesic, antibacterial, carminative and stimulant etc. This plant is having geographical indication tag. There are many varieties and difference among these is not well documented. Hence, two varieties of betel vine commonly cultivated in Mysuru viz., 'Mysuru veelyadele' and 'Ambadi veelyadele' were considered for the present study for comparing the chemical components. Preliminary quantitative phytochemical analysis for Carbohydrates, Phenolics, Flavonoids, Ascorbic acid and α -tocopherol were made by following standard procedures using aqueous and solvent leaf extracts. Variation in the quantity of phytochemicals was observed in both the varieties. Significant biological activity was showed by ethyl acetate extract and hence this was partially purified using TLC, HPLC and LCMS. The separated molecules from TLC were subjected to HPLC for the confirmation of purity. Studies revealed the presence of Gallic acid, Transcinnamic acid, Caffeic acid, Chlorogenic acid, Synergic acid and Coumaric acid. In LCMS a molecule having molecular mass of 290.035 and retention time of 0.68 was found in both the varieties. The four compounds identified in Mysuru veelyadele were absent in Ambadi veelyadele. Further work on characterization of active principles is in progress.

The *in vitro* antimicrobial activity of aqueous and solvent leaf extracts of two different varieties of *Piper betle* L. namely *Mysuru veelyadele* and *Ambadi veelyadele* leaf extracts were studied against phytopathogenic fungi such as, *Fusarium oxysporum*, *Rhizopus artocarp*, *Phomopsis azadirachtae*, *Pyricularia oryzae*, *Rhizoctonia solani*, *Sclerotium rolfsii* and post harvest pathogens *Fusarium moniliforme*, *Penicillium digitatum*, *Aspergillus niger* and *Aspergillus flavus* by poisoned food technique. Aqueous extract of both the varieties showed significant inhibition of *Rhizoctonia solani*, *Phomopsis azadirachtae* and *Sclerotium rolfsii* when compared to other pathogens. Among the solvent extracts tested, hexane and ethyl acetate extract of *Mysuru veelyadele* has shown significant activity against *Phomopsis azadirachtae*, *Pyricularia oryzae*, *Rhizoctonia solani*, *Sclerotium rolfsii* at 100 ppm and *Ambadi veelyadele* was effective on only two phytopathogens viz., *Rhizoctonia solani* and *Sclerotium rolfsii* at 100ppm. The remaining pathogens listed above were inhibited at 500ppm except *Rhizopus artocarp*. Other solvent extracts of these two plant varieties have shown a range of activity against most of the phytopathogens tested.

15	CONTRIBUTION TO THE SOCIETY	This study has revealed the presence of many bioactive molecules in both the varieties of Piper betle L. It has further confirmed that the plant extracts could be used for control of phytopathogenic fungi and shows that Piper betle L. could be exploited for new potent antimicrobial agent against plant pathogen. This study forms a basis for the characterization of the phytochemicals of the two varieties. The presence of various bioactive compounds justifies the usage of betel leaf as an herbal choice for treating various plant diseases. Aqueous and solvent extracts are found effective, it will help in the formulation of ecofriendly control measure, which is cheap and can be recommended to the farmers.
16	WHETHER ANY PH.D. ENROLLED/PRODUCED OUT OF THE PROJECT	NO
17	NO. OF PUBLICATIONS OUT OF THE PROJECT	<p>1. Poster presentation at state level conference on Frontiers in Life Sciences-2017(FILS-17) held on March 28th 2017 at Government Science College, Hassan. Title: Antifungal activity of two endemic varieties of <i>Piper betle</i> L.</p> <p>2. Poster presentation at National level Conference on Food Based approaches for translational Nutrition held on April 12th & 13th 2017 at Yuvaraja's College, Mysuru. Title: phytochemical analysis of two endemic varieties of <i>Piper betle</i> L.</p> <p>3. Paper has been Communicated : Title: Phytochemical and antimicrobial characteristics of Betel vine(<i>Piper betle</i>.L)</p>

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(PRINCIPAL INVESTIGATOR)

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