Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
NH-4, Wadhe Phata, Satara. Tele Fax- 02162-271238/39/40
Website- www.yes.edu.in, Email-registrar_ytc@yes.edu.in
Approved by AICTE / PCI New Delhi, Govt. of Maharashtra (DTE, Mumbai)
Affiliated to DBATU Lonere & Shivaji University, Kolhapur/ MSBTE, Mumbai.
NAAC B+ **Institute Code – 6757**

Prof. Dasharath Sagare	Prof. Ajinkya Sagare	Dr. Vivekkumar Redasani
Founder, President	Vice-President	Director

NAAC SSR II CYCLE

DVV

Criterion III

3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years.

Sr. No.	Particulars	Page No.
1	Correct Revise Data	3 to 5
2	year wise link for all the research paper and journal	6 to 33
3	screenshots of each research articles clearly showing the title of the article, affiliation, name of the journal, year and author's name. If the links and DOI number are not available	34 to 150

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Criterion III

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Prof. Dasharath Sagare Founder, President | **Prof. Ajinkya Sagare** Vice-President | **Dr. Vivekkumar Redasani** Director

3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years.

Sr. No.	Findings of DVV	Response of HEI
1	HEI is requested to kindly note that as paper published in year 2018 calendar year comes under 2018-19 and so on and paper in 2023 should be consider in year 2023-24 so please relook and provide correct revise data	The data has been reconstituted as per the instructions provided in the comments.
2	Kindly note that multiple counting of same publication with same author or different author in the same calendar year should be counting as one, please relook and provide correct revise data	Same paper has not been considered multiple authors
3	Kindly provide required data in the data templet, as Incomplete Entries should not to be considered	The data has been provided in a template consisting of the detailed description of the papers.
4	Kindly note that Publication in the current UGC CARE with ISSN only will be considered, please relook and provide data accordingly	Only those publications appearing in UGC CARE with ISSN have been considered and listed.
5	Kindly provide year wise link for all the research paper and journaL	Link has been provided for every research paper listed in the template.
6	Kindly provide year wise screenshots of each research articles clearly showing the title of the article, affiliation, name of the journal, year and author's name. If the links and DOI number are not available	The screenshots of each research article have been provided for those papers without DOIs.

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3.3.1.1. Number of research papers in the Journals notified on UGC CARE list year wise during the last five years.

HEI Input :

2022-23	2021-22	2020-21	2019-20	2018-19
68	42	12	15	05

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3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year

Sr.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	Dettol Brand Efforts during Covid-19	Dr.R. R. Chavan	MBA	International Journal of Marketing and Technology	Sep-22	ISSN: 2249-1058 Impact Factor: 6.559	http://www.ijmra.us	https://www.ijmra.us/project%20doc/2022/IJMT_SEPTEMBER2022/IJMT1Sep22.pdf	Yes
2	Study of Factors Affecting the National Anonymously:Dark Web	Prof.Pranjali S.Gade	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/research-paper/factors-affecting-the-national-anonymously-dark-web	Yes
3	Oral cancer Detection Using Image processing and Deep Neural Networks	Asst.Prof.S.V.Thorat	MCA	IRJET	Dec-22	2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V9/i12/IRJET-V9I12130.pdf	Yes
4	Secure Cloud Computing	Dr.Prof.S.P.Jadhav and Prof. S.S, jadhav	MCA	IRJET	Dec-22	2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V10/i1/IRJET-V10I128.pdf	Yes
5	An overview of Bluetooth Technology and it's communication application	Prof.Vanmala V.Kadam	MCA	IJRASET	Sep-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/bluetooth-chat-an-android-chatting-app-based-on-bluetooth	Yes
6	Letest Cyber Security Trends	Prof.Pranjali S.Gade	MCA	IRJET	Dec-22	2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V9/i12/IRJET-V9I12196.pdf	Yes
7	Security Factors Affecting Internet of Things	Prof.Vanmala V.Kadam	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/security-factors-affecting-internet-of-things	Yes
8	Robotics:Social Robot	Prof.Vanmala V.Kadam and Prof.S.S.Jadhav	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/robotics-social-robot	Yes

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9	Virtual Smart Phones	Dr.Prof.S.P.Jadhav	MCA	IRJET	Sep-22	2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V8/i7/IRJET-V8I7384.pdf	Yes
10	Overview of Social Media	Prof.S.S.Jadhav	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/overview-of-social-media	Yes
11	Blue Brain Technology	Prof.Vanmala V.Kadam	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/blue-brain-technology	Yes
12	Embedded System- based Intelligent Wheelchairs for Disabled People	Prof.Vanmala V.Kadam	MCA	IRJET	Dec-22	2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V9/i12/IRJET-V9I12100.pdf	Yes
13	API Testing Using Postman	Prof.S.S.Jadhav	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/api-testing-using-postman-tool#:~:text=Postman%20is%20an%20API%20client,more%20efficient%20and%20less%20tiresome.	Yes
14	IOT:What is IOT and its Adavantages	Prof.Shweta Thorat	MCA	IJRASET	2022	2321-9653	https://www.ijraset.com/	NA	Yes
15	Green Computing for Internet Of Things	Harshal Gajanan Patil, Rasika Vishnu Tapase, Asst.prof.P.S.Gade, Asst.prof.V.V.Kadam	MCA	IRJET	Dec-22	2395-0056	https://www.irjet.net/	https://www.irjet.net/archives/V9/i12/IRJET-V9I12131.pdf	Yes
16	Dairy Farm	Pratiksha Mahadik, Mansi Bhandari, Prof. Snehal Jadhav	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/		Yes

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17	WI-FI Technology	Prof.Shweta Thorat	MCA	IJRASET	Dec-22	2321-9653	https://www.ijraset.com/	https://www.ijraset.com/best-journal/wi-fi-technology	Yes
18	Research on Esterification Reaction Under, Microwave Assisted Synthesis Of Butyl Benzoate For Green Chemistry	A. A. Jadhav, R. P. Devale, K. C. Jagtap,S. D. Patil	Pharmacy	International Journal of Scientific Development and Research	Jun-22	ISSN: 2455-2631	https://ijisrt.com/volume-7-2022_issue-6-june	https://www.ijsdr.org/papers/IJSDR2206017.pdf	Yes
19	Review on General Purpose of Catalysis In Green Chemistry	S.M. Pawar, R. P. Devale	Pharmacy	International J. of Creative Research Thought	Jun-22	2320-2882	www.ijcrt.org	https://ijcrt.org/papers/IJCRT22A6527.pdf	Yes
20	Influence of Newly Synthesized Superdisintegrant on Dissolution Rate Enhancement of Carbamazepine using Liquisolid Compact Technique	V. G. Raut, B. P. Chaudhari, V. K. Redasani	Pharmacy	Asian Journal of Research in Pharmaceutical Sciences	Jun-22	2231–5640 (Print) 2231–5659 (Online)	www.anvpublication.org	https://ajpsonline.com/AbstractView.aspx?PID=2022-12-2-4	Yes
21	Customer recommendation and notification using artificial intelligence and machine learning	Dr. S V Balashetwar, Dr. GG Chiddarwar, Dr. B Vasagi	Engineering	Neuroquantology	Sep-22	1303-5150	https://www.neuroquantology.com/article.php?id=7946	https://www.proquest.com/docview/2901744419?pq-origsite=gscholar&fromopenview=true&sourcetype=Scholarly%20Journals	Yes
22	Degradation Study of Different Brands of Antipyretic Tablets by UV Spectroscopy	U. Rangat, Anjan Ladage, B.P. Chaudhari , V.K. Redasani	Pharmacy	World Journal of Pharmacy and Pharmaceutical Sciences	Jun-22	ISSN 2278 – 435	www.wjpps.com	https://storage.googleapis.com/journal-uploads/wjpps/article_issue/	Yes

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23	Cleaning Validation of Tablet Compression Machine By Swab Sampling	P. D. Khalate, P. S. Londhe, B.P. Chaudhari,V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Jun-22	ISSN 2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/fac8d40b6d6c7e83e044c8f3d189aae4.pdf	Yes
24	Quality by Design (QbD) concept Review in Pharmaceuticals	Kaustubh Jagtap, B.P. Chaudhari , V.K. Redasani	Pharmacy	Asian J. Research Chem.	Jul-22	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2022-15-4-11	Yes
25	Formulation and Evaluation of Ascorbic Acid Effervescent Granules	P. S. Londhe, P. D. Khalate, B.P. Chaudhari , V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Jun-22	ISSN 2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1a14e4be8fa47076cb4df48d06322b13.pdf	Yes
26	Suitability Of Kinetic Energy From Footsteps For Vadjaidevi Temple At Patkhal, Taluka, District Satara	Prof. Shah. Ajinkya S, Mr. Arjun Avinash S, Mr. Khade Sagar S, Mr. Hakim Mohammadsabir N, Ms. Desai Sayali S, Ms. Mane Neha S	Engineering	International Research Journal of Modernization in Engineering Technology and Science	Sep-22	2582-5208	www.irjmets.com	https://www.irjmets.com/uploadedfiles/paper/issue_5_may_2022/25161/final/fin_irjmets1654414779.pdf	Yes
27	Stability Study of Different Marketed Brands of Diclofenac Sodium and Paracetamol Tablets by Using Spectrophotometric Method	A. S. Ladage, Umesh Rangat, B.P. Chaudhari , V.K. Redasani	Pharmacy	European Journal of Pharmaceutical and Medical Research	Jun-22	ISSN 2394-3211	www.ejpmr.com	https://www.ejpmr.com/ho	Yes

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28	Post Market In-Vitro Quality Control Evaluation For Different Brands of Paracetamol Tablets Available in Indian Market	Kaustubh Jagtap, B.P. Chaudhari , A. Jadhav , V.K. Redasani	Pharmacy	World Journal of Pharmacy and Pharmaceutical Sciences	Jul-22	2349-8870	www.ejbps.com	https://www.wjpps.com/Wjpps_controller/abstract_id/17178	Yes
29	Traditional Herbal Syrup: A Review	Snehal Mahamuni, B.P. Chaudhari V.K. Redasani	Pharmacy	European Journal of Biomedical and Pharmaceutical sciences	Aug-22	2349-8870	www.ejbps.com	https://storage.googleapis.com/journal-uploads/ejbps/article_issue/volume_9_september_issue_9/1661837297.pdf	Yes
30	Effect of Verapamil and ferulic acid against chemical induced Convulsions in Albino Mice	P. S. More, V. J. Chaware V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/99c02a5efc7b8421f76ef0089afd74e5.pdf	Yes
31	Potentiation of Effects of Propranolol and Heparin by Antioxidant in Adrenaline Induced Myocardial Infarction in Rats	M. P. Patil, V. J. Chaware, V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/191a794e5e9d8dcdd788b938dfa82ae1.pdf	Yes
32	Evaluation of Nephro-protective Effect of DPP4 Inhibitor and Antioxidant against Gentamycin induced Nephrotoxicity in Albino Rats.	S. J. Kadam, V. J. Chaware, V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/89ee87eef6eaef52da6b771cc562a34a.pdf	Yes
33	Pharmacological evaluation of antidepressant like effect of vitamin E and its combination with amitriptyline: an acute study.	R. R. Jadhav, V. J. Chaware V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/6d77578229baf16d77017bd415e3bf7b.pdf	Yes

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34	Lipid Lowering Effect of Alpha Adreno Receptor Blocker and Antidiabetic Drug in Experimental Animals	S. S. Jagtap, V. J. Chaware V.K. Redasani	Pharmacy	International Journal of Pharm Tech Research	Aug-22	2455-9563	www.sphinxsai.com	https://www.sphinxsai.com/2022/ph_vol15_no2/abstracts/A(66-72)V15N2PT.pdf	Yes
35	Hepatoprotective Effect of Lycopene Against Paracetamol-Induced Hepatic Damage in Albino Rats	S. P. Pawar, V. J. Chaware, V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://scholar.google.co.in/scholar?q=Hepatoprotective+Effect+of+Lycopene+Against+Paracetamol-Induced+Hepatic+Damage+in+Albino+Rats&hl=en&as_sdt=0&as_vis=1&oi=scholart	Yes
36	Curcumin Potentiates Therapeutic Efficacy of Voglibose	D. B. Khandale, V. J. Chaware, V.K. Redasani , A. T. Thorat	Pharmacy	World Journal of Pharmaceutical Research	Aug-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/72f33df90c8ac96be5a03311cbc82e0e.pdf	Yes
37	Design, Development and Evaluation of Traditional Polyherbal Formulation To Cure Dengue and Chikungunya	S. Mahamuni, B. P. Chaudhari, V.K. Redasani	Pharmacy	European Journal of Biomedical and Pharmaceutical sciences	Sep-22	ISSN 2349-8870	www.ejbps.com	https://www.ejbps.com/ejbps/abstract_id/9209	Yes
38	Evaluation of protective role of a Ferulic acid on Letrozole induced polycystic ovarian syndrome in female rats	K. M. Yadav, P. K. Ghadage, R. V. Bhoite, P. B. Phadtare, O. A. Devade	Pharmacy	Journal of Pharmaceutical Advanced Research	Sep-22	ISSN: 2581-6160 (Online)	www.jparonline.com	NA	Yes
39	A Review on in situ Gel of Gastro Retentive Drug Delivery System	B. V. Aiwale, B.P. Chaudhari, A. B. Velhal, V.K. Redasani	Pharmacy	Asian Journal of Research in Pharmaceutical Sciences	Oct-22	2231–5640	www.anvpublication.org	https://ajpsonline.com/AbstractView.aspx?PID=2022-12-4-10	Yes

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40	The Monkeypox Virus, methods to prevent the re-emergence of the Virus	Vinay Gaikwad, R. Kothalikar, Prakash Jadhav, Pankaj Khuspe, Swapnil Phade	Pharmacy	Journal of Advances in Bio-pharmaceutics and Pharmacovigilance	Oct-22	2583-8202	www.matjournals.com	https://matjournals.co.in/index.php/JABP/article/view/1189	Yes
41	Pulsatile Delivery of Drug for a Range of Diseases	Sanket Nikam, Prakash Jadhav, B. P. Chaudhari, Atish Velhal	Pharmacy	Asian Journal of Research in Pharmaceutical Sciences	Oct-22	2231–5640	www.anvpublication.org	https://ajpsonline.com/AbstractView.aspx?PID=2022-12-4-12	Yes
42	A Review on Diverging approaches to Fabricate Polymeric Nanoparticles	S. Deshmukh, B. P.Chaudhari, Atish Velhal, V.K. Redasani	Pharmacy	Asian Journal of Research in Pharmaceutical Sciences	Oct-22	2231–5640	www.anvpublication.org	https://www.indianjournals.com/ijor.aspx?target=ijor:ajrps&volume=12&issue=4&article=014	Yes
43	Pharmacosome as a Vesicular Drug Delivery System	R. R. Shinde, B. P. Chaudhari, A. B. Velhal, V. K. Redasani	Pharmacy	Asian Journal of Research in Pharmaceutical Sciences	Oct-22	2231–5640	www.anvpublication.org	https://ajpsonline.com/AbstractView.aspx?PID=2022-12-4-6	Yes
44	pH Dependent Mucoadhesive In-Situ Gel Formulation Based on Abelmoschus esculentus as Sustained Release Carrier for Gastro-retentivity of Famotidine	B. V. Aiwale, B. P. Chaudhari, S. H. Deshmukh, V.K. Redasani	Pharmacy	International Journal of Pharmaceutical Sciences Review and Research (UGC approved Scopus)	Dec-22	ISSN 0976 – 044X	www.globalresearchonline.net	https://globalresearchonline.net/ijpsrr/v77-2/10.pdf	Yes
45	Regulatory Intelligence	A B. Velhal, Neha Nangare,	Pharmacy	International Journal of Science and Research	Jun-22	ISSN: 2319-7064	www.ijsr.net	https://www.ijsr.net/archive/v11i6/MR22617205617.pdf	Yes

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46	Drug Development process	A B. Velhal, R. Bhosale, V.K.Redasani.	Pharmacy	International Journal of Creative Research Thoughts	Jun-22	ISSN: 2320-2882	www.ijcrt.org	https://ijcrt.org/papers/IJCRT22A6651.pdf	Yes
47	A Review of the Preparation of Regulatory Dossiers in CTD Format and ECTD Submissions	K. A. Virkar, A. B. Velhal, V.K. Redasani	Pharmacy	International Journal of Pharmaceutical Research and Applications	Jul-22	ISSN: 2456-4494	www.ijprajournal.com	https://ijprajournal.com/issue_dcp/A%20Review%20of%20the%20Preparation%20of%20Regulatory%20Dossiers%20in%20CTD%20Format%20and%20ECTD%20Submissions.pdf	Yes
48	Comprehensive Review On Gmp Of Pharmaceutical Products	A. B. Velhal, U. M. Patil, V. K. Redasani	Pharmacy	International Journal of Creative Research Thoughts	Jul-22	ISSN: 2320-2882	www.ijcrt.org	https://ijcrt.org/papers/IJCRT2207051.pdf	Yes
49	Drug Regulatory Affairs - Role of Regulatory Affairs in the Pharmaceutical Industry	Atish Velhal Akash Hitnalli, Ganesh Devane	Pharmacy	Journal of Current Pharma Research	Jun-22	2330-7834(print) 2330-7842(online)	www.jcpr.humanjournals.com	https://www.proquest.com/openview/04f4471ac4d34fb24ddc2fd971388aba/1?pq-origsite=gscholar&cbl=1936342	Yes
50	Regulatory Requirements For Registration Of Biologics In Us	A. J. Patil, A. B. Velhal	Pharmacy	International Journal of Creative Research Thoughts	Jul-22	ISSN: 2320-2882	www.ijcrt.org	https://ijcrt.org/papers/IJCRT2207118.pdf	Yes
51	An Outline On Improving Solubility And Dissolution Rate In Solid Dispersion Technique.	S.P.Nikam, A.B.Velhal, P. D.Jadhav	Pharmacy	International Journal for Research Trends and Innovation	Jul-22	ISSN: 2456-3315	www.ijrti.org	https://www.ijrti.org/papers/IJRTI2209007.pdf	Yes

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52	Evaluation of Anticataleptic Activity of Baclofen On Haloperidol & Pilocarpine Induced Catalepsy	S. D. Virkar, A. B. Velhal, V. J. Chaware, V.K. Redasani	Pharmacy	World Journal of Pharmaceutical Research	Sep-22	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1ce1247291d3f3997d99edf01fd58d24.pdf	Yes
53	Role of Aminated Derivatives of Natural Gum in Release Modulating Matrix System of Losartan Potassium	S. B. Kalbhare, R. K. Pawar, Dr. V.K. Redasani , A. B. Yadav, V.R. Mohite, V. B. Kadam	Pharmacy	International Journal of Pharmaceutical Sciences and Nanotechnology (UGC approved Scopus)	Nov-22	0974-3278	http://www.ijpsnonline.com	https://www.ijpsnonline.com/index.php/ijpsn/article/view/2267	Yes
54	Creation and Development of Promethazine (PT) Fast Dissolving Tablet Using Quality by Design Methodology	I. Kadam Smita Borkar, Vishal Yadav, Prakash Jadhav, Ashish Thorat, Vinay Gaikwad	Pharmacy	Journal of Pharmaceutical Quality Assurance and Quality Control	Dec-22		http://www.matjournals.com/	https://matjournals.co.in/index.php/JQAQC/article/view/1394	Yes
55	A Comparative Study on Antidiabetic Activity of Gymnema Sylvestre, Saxagliptin, Insulin and Alloherbal Combination in Alloxan Induced Diabetic Rats	P.V. Ranaware , V. J. Chaware, A. T. Thorat, V.K. Redasani	Pharmacy	Journal of Emerging Technologies and Innovative Research	Aug-22	ISSN-2349-5162	www.jetir.org	https://www.jetir.org/papers/JETIR2208409.pdf	Yes
56	Life Cycle Management of Analytical RP-HPLC Method Development for Assay of Rizatriptan in Immediate Release Dosage Form	A. M. Bhagwat, R. V. Mayee, A. B. Ekal	Pharmacy	International Journal of Science and Engineering Development Research	Jul-22	ISSN: 2455-2631	www.ijsdr.org	https://www.ijsdr.org/papers/IJSDR2207056.pdf	Yes

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57	Formulation and Evaluation of Aloevera and Vitamin E Peel of Mask	Tayappa BM, Devale RP, Chaware VJ And Redasani VK	Pharmacy	International Journal of Biology, Pharmacy and Allied Sciences	Mar-22	2277–4998	ijbpas.com	https://ijbpas.com/pdf/2022/March/MS_IJBPAS_2022_5957.pdf	Yes
58	Performance evaluation of sludge brick with conventional brick	Mr. Sohel M. Shaikh, Mr. Huzefa F. Tamboli, Mr. Akshay U. Sawant, Mr. Rohit S. Kamble, Mr. Rohit S. More, Mr. Saddam S. Kotwal, Mr. P.G. Borate	Engineering	International Research Journal of Modernization in Engineering Technology and Science	June 22	2582-5208	www.irjmets.com	https://www.irjmets.com/uploadedfiles/paper/issue_6_june_2022/25995/final/fin_irjmets1655213337.pdf	Yes
59	Analysis of G+4 building structure for Seismic Retrofitting using Cross Bracing	Mr. Ajay P. Shinde1 , Mr. Shubham S. Khomane2 , Mr. Shubham M. Khade3 ,Mr. Aniket A. Shelar4 , Mr. Heramb S. Chavan5 , Mr. Shubham H. Pisal6	Engineering	International Journal of Research in Engineering and Science (IJRES	Jul-22	2320-9356	/www.ijres.org	https://www.ijres.org/papers/Volume-10/Issue-7/1007430435.pdf	Yes
60	Comparative Study of Behavior of Framed Structure Under Seismic Zone III & IV Using STAAD Pro	Mr. Girish S. Gaikwad , Mr. Sarang P. Patankar , Mr. Arjun M. Shinde , Mr. Rohan N. Saste , Mr. Siddhant A. Nikam , Mr. A. N. Shaikh	Engineering	International Journal of Research in Engineering and Science (IJRES)	Dec-22	ISSN-(P) 2320-9356	www.ijres.org	https://www.ijres.org/papers/Volume-10/Issue-6/100611951200.pdf	Yes

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61	Effectiveness of supercapacitor during braking operation of electric vehicle	Najmuddin M. Jamadar, H.T. Jadhav	Engineering	Materials Today: Proceedings of Elsevier	Feb-22	2214-7853	Elsevier	https://www.researchgate.net/publication/357986488_Effectiveness_of_supercapacitor_during_braking_operation_of_electric_vehicle	Yes
62	Evaluation and Cost Analysis of Methods of Power Supply for Irrigation Pumps	H. T. Jadhav1 • Tejashri Patil1 • Najmuddin M. Jamadar	Engineering	Elsever Jurnal	Feb-22	2214-7854	Elsevier	https://link.springer.com/article/10.1007/s40031-022-00718-6	Yes
63	Chatbot for Children Assistance	Dr. S V Balshetwar	Engineering	International Journal for Research in Applied Science & Engineering Technology	Mar-22	2321-9653	https://doi.org/10.22214/ijraset.2022.40830	https://www.ijraset.com/research-paper/chatbot-for-children-assistance	Yes
64	Smartphone User Behaviour Predication Using AI	Dr. S V Balshetwar	Engineering	International Journal for Research in Applied Science & Engineering Technology	Mar-22	2321-9653;	https://www.ijraset.com/	https://doi.org/10.22214/ijraset.2022.40906	Yes
65	Blockchain based record date management system using artificial intelligence	Dr. S V Balashetwar	Engineering	Neuroquantology	Sept 22	1303-5150	https://www.neuroquantology.com/article.php?id=7948	https://www.proquest.com/openview/dcb0a038cb73d1db1a4cd5c05d351e13/1?pq-origsite=gscholar&cbl=2035897	Yes

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66	Characterization & removal of Water Hyacinth from Krishna River At Wai Tal-Wai Dist.Satara by effective & economic equipment	Prof.Lembhe Sunil S,Ms.Kenjale Rutuja Vikas,Ms.Nikam Sweta Anil,Ms.Khatmode PallaviPandurang Mr.Pawar Vinayak Anil Mr.Chavan Arun Dashrath Mr. Gole Pranav Ganpat	Engineering	International Research Journal of Modernization in Engineering Technology and Science	May-22	2582-5208	www.irjmets.com	https://www.irjmets.com/uploadedfiles/paper//issue_5_may_2022/24845/final/fin_irjmets1653984914.pdf	Yes
67	Selection of optimum plant layout using AHP- TOPSIS and WASPAS approach coupled with entropy method	Anand S Shivad e & Sagar U Sapkal	Engineering	Decisi on Scienc e Letter	May-22	ISSN 1929-5804(Print)	https://growingscience.com/dsl/online_issu es_dsl.html	https://growingscience.com/beta/dsl/5666-selection-of-optimum-plant-layout-using-ahp-topsis-and-waspas-approaches-coupled-with-entropy-method.html	Yes
68	Review on Microwave, The General purpose in Microwave Assisted Synthesis for Green Chemistry	A. A. Jadhav, R. P. Devale	Pharmacy	Asian J. Research Chem.	Mar-22	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://ajrconline.org/AbstractView.aspx?PID=2022-15-2-15	Yes
69	Acute Toxicity Study and Anti-Nociceptive Activity of Ethanol Extract of Aesculus Indica Seeds on Experimental Animal Models.	Priyanka R. More*, Atish B. Velhal, Vitthal J. Chaware, Vivek Kumar K. Redasani	Pharmacy	Asian Journal of Pharmaceutical Research and Development. 2021; 9(4): 31-38	Jul-21	2320-4850	https://www.ajprd.com/	https://www.ajprd.com/index.php/journal/article/view/986	Yes

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70	Pharmaceutical and biotechnological applications of microsponges as novel nano technological drug delivery system	Shankar B. Kalbhare, Atish B. Velhal, Mandar J. Bhandwalkar, Rupali V. Jadhav, Akash S. Nalawade	Pharmacy	Advance Pharmaceutical Journal 2021;6(4):95-102	Jul-21	2456-1436	https://www.apjonline.in/	https://www.apjonline.in/uploaded/p164.pdf	Yes
71	Role of Autodock vina in PyRx Molecular Docking	RP Pawar, SH Rohane	Pharmacy	Asian Journal of Research in Chemistry	Apr-21	0974-4169	https://www.ajrconline.org	https://ajrconline.org/AbstractView.aspx?PID=2021-14-2-7	Yes
72	A role of herbal drug as an immunity booster during covid-19 pandemic	D Aware, S Rohane	Pharmacy	Asian Journal of Pharmaceutical Chemistry	Sept 21	2231–5683	www.indianjournals.com	https://asianjpr.com/AbstractView.aspx?PID=2021-11-3-11	Yes
73	Formulation and Evaluation of Antifungal Microemulsion Based Gel for Topical Drug Delivery using Milletia Pinnata	B P Gadave, A B Velhal, V K Redasani	Pharmacy	World Journal of Pharmaceutical Research	Sept 21	2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/da45b45b5ec24c853edb51ce8635ba23.pdf	Yes
74	Microneedle: A Revolution in the Transdermal Drug Delivery System	Y R Deshmukh, A P Jagadale, B P Chaudhari, V K Redasani	Pharmacy	International Journal of Pharmacy and Pharmaceutical Research	Sep-21	2349-7203	www.ijppr.humanjournals.com	https://ijppr.humanjournals.com/wp-content/uploads/2021/10/7.Yogeshwari-Rajendra-Deshmukh-Akshay-Popat-Jagadale-Bharatee-Pandurang-Chaudhari-Vivekkumar-K.-Redasani.pdf	Yes

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75	SDC-PC Based Solid SEDDS of BCS Class III Drug	A V Adsul, B P Chaudhari, V K Redasani A V Adsul,	Pharmacy	World Journal of Pharmaceutical Research	Sep-21	2277–7105	www.wjpr.net	https://www.ajprd.com/index.php/journal/article/view/949	Yes
76	Evalauation of Antiepileptic Acitivity of Ficus Racemosa in Chemicals Induced Epilepsy in Mice	P J Chavan, A B. Velhal, V J Chaware, V K Redasani	Pharmacy	Asian Journal of Pharamceutical Research and Development	Oct-21	2320-4851	www.ajprd.com	https://www.ajprd.com/index.php/journal/article/view/997	Yes
77	Role of Functionalized Guar Gum in Solid Dispersion of Non-Steoidal Antiinflammatory Drug	S P Alane , A B Velhal, VK Redasani	Pharmacy	International Journal of Advanced Research	Aug-21	2320-5407	https://www.journalijar.com/	https://www.journalijar.com/article/38311/role-of-functionalized-guar-gum-in-solid-dispersion-of-non-steoidal-anti-inflammatory-drug/	Yes
78	Good Documentation Practices: A Need of Pharmaceutical Industry	P D. Kolekar, A M Bhagwat	Pharmacy	Asian J. Research Chem.	Oct-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2021-14-5-12	Yes
79	CAPA: An Important Concept of Quality Assurance in Pharmaceutical Industry	P A Chavan , A M Bhagwat, A P Chaudhari	Pharmacy	Asian J. Research Chem.	Oct-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.indianjournals.com/ijor.aspx?target=ijor:ajrc&volume=14&issue=5&article=010	Yes

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80	RP-HPLC Method Development and Validation of Tadalafil in Tablet Dosage Form	P A Chavan, R D Shelar, P R Shelake, A M Bhagwat , A B Ekal l	Pharmacy	Asian J. Research Chem.	Oct-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2021-14-5-14	Yes
81	Role of Aminated Derivatives of Natural Gum in Release Modulating Matrix Systems of Losartan Potassium: Optimization of Formulation using Box-Behnken Design	S B Kalbhare, V K Redasani, M J. Bhandwalkar, R K Pawar, A M Bhagwat	Pharmacy	Asian Journal of Pharmaceutical Research.	Jun-21	2231–5683 (Print)	www.ijpsnonline.com	https://asianjpr.com/AbstractView.aspx?PID=2021-11-2-1	Yes
82	Acute Toxicity study of Synthesized drug and Herbal Product	T Yadav, S H Rohane	Pharmacy	Asian Journal of Pharmaceutical Research	Oct-21	2231–5683 (Print) 2231–5691 (Online)	www.indianjournals.com	https://www.indianjournals.com/ijor.aspx?target=ijor:ajpr&volume=11&issue=4&article=006	Yes
83	Skeletal muscle relaxant effect of Bacopa monnieri (L.) natural and micropropagated plant extracts	FA Tamboli, AT Thorat, VD Rangari, HN. More, VH Kutawade	Pharmacy	International Journal of Pharmaceutical Science and Research	June-21	2455-4685	www.pharmacyjournal.net	https://www.researchgate.net/publication/352260783_Skeletal_muscle_relaxant_effect_of_Bacopa_monnieri_L_natural_and_micropropagated_plant_extracts	Yes

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84	SUITABILITY OF RECYCLED PLASTIC WASTE IN PRODUCTION OF PAVER BLOCKS	Prof. Shah. Ajinkya.S, Mr. Anpat Vineet Vijay, Mr. Bhosale Suraj Balu, Mr. Botalji Suhas Suresh, Mr. Surve. Ajinkya. Sanjay, Mr. Bagwan. Saad. Salim, Mr. Bhosale. Pranay Dattatray	Engineering	International Research Journal of Modernization in Engineering Technology and Science	Jul-21	2582-5208	www.irjmets.com	https://www.irjmets.com/uploadedfiles/paper/volume3/issue_7_july_2021/15172/1628083589.pdf	Yes
85	To Study Effect of Gray Water on The Properties of Concrete	AKSHAY SANJAY INGALE, DHULDEV GULAB NARALE, AMOL SOPAN KOLHEKAR, PRANITA CHANDRAKANAT KAMBLE, PROF. SHAH AJINKYA.S	Engineering	INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY	Aug-21	2349-6002	https://ijirt.org	https://ijirt.org/master/publishedpaper/IJIRT152329_PAPER.pdf	Yes
86	Implementation of New Water Distribution Network In Village Saigaon (Rahimatpur)	Kunal Holkar , Dipika Mane , Vivek Yadav , Nivas Madane , Mrudulla Shellar , Shardulla Saudagar , Mr. Alfaj N. Shaikh	Engineering	International Journal of Research in Engineering and Science (IJRES)	Aug-21	ISSN-(P) 2320-9356	www.ijres.org	https://www.ijres.org/papers/Volume-9/Issue-8/Series-1/J09085358.pdf	Yes

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87	Analysis and Design of Sand Filter by using Capped Coconut Shell and Coal	Amey Ramesh Shinde , Deepa Yashwant Gosavi , Shivani Padmakar Jadhav , Sudarshan Sanjay Chougule , Dnyaneshwari Prashant Kamane , Alfaj N. Shaikh	Engineering	International Journal of Research in Engineering, Science and Management	Jul-21	ISSN-online 2581-5792	www.ijresm.com	https://journal.ijresm.com/index.php/ijresm/article/view/1114/1079	Yes
88	Effect of Deep Cryogenic Treatment on Corrosion Behavior of AISI H13 Die Steel	Taran g Shinde	Engineering	Materi als, MDPI	Dec-21	Print: ISSN 0973-4562 Onlin e: ISSN 1996-1944	https://www.mdpi.com/journal/materials	https://www.mdpi.com/1996-1944/14/24/7863	Yes
89	Static Analysis and Weight Optimizatio n of Crankshaft in Single Cylinder Four Stroke Diesel Engine	Dr. Durad undi. Sawan t.Badka r	Engineering	Intern ational Resear ch Journa l of Engin eering and Techn ology (IRJE T	July 21	ISSN 2395-0056 p-ISSN 2395-0072	https://www.irjet.net/	https://www.irjet.net/archives/V8/i7/IRJET-V8I7766.pdf	Yes
90	Design and Implementation of Track Following & Obstacles Avoiding Robotics System Based on Programmable Technique	Asif Mohammad Shikalgar,Suraj Shankar Patil ,Pallavi Machindra Pawar,Pooja Khashaba Mane, Sonali Sunil More, Neha Sunil Kshirsagar	Engineering	International Journal of Research Publication and Reviews	Jul-21	2582-7421	www.ijrpr.com	https://www.ijrpr.com/uploads/V2ISSUE7/IJRPR774.pdf	Yes

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91	Fingerprint and IOT Based Exam Hall Authentication	Omkar Nikam, Indrayani Kashid,Ankita Bhosale, Pooja Phadtare,5Komal Kale	Engineering	International Journal of Research Publication and Reviews	Jul-21	2582-7421	www.ijrpr.com	https://www.ijrpr.com/uploads/V2ISSUE7/IJRPR651.pdf	Yes
92	IOT Based Underground Drainage and Manhole Monitoring System for Cities	Vishakha Bhojane, Anjali Bhosale, Ankita Sankpal, Shubhada Bhosale, Ujjwala Patil	Engineering	International Journal of Research Publication and Reviews	Jul-21	2582-7421	www.ijrpr.com	https://www.ijrpr.com/uploads/V2ISSUE7/IJRPR727.pdf	Yes
93	Automatic Barricade with Traffic Light	Payal Londhe , 2 Prasad Gujar , 3Abhishek Sungar, 4Komal Andhare, 5Akanksha Ramugade	Engineering	International Journal of Research Publication and Reviews	Jul-21	2582-7421	www.ijrpr.com	https://www.ijrpr.com/uploads/V2ISSUE7/IJRPR728.pdf	Yes
94	Role Of Functionalized Guar Gum in Solid Dispersion of Non-Steoidal Anti-Inflammatory Drug	S. P Alane, A.B. Velhal and Dr. V.K Redasani	Pharmacy	International Journal of Advance Research	Aug-21	ISSN: 2320-5407	Peer Reviewed Journals, Open access Journals: International Journal of Advanced Research (IJAR) (journalijar.com)	https://www.journalijar.com/article/38311/role-of-functionalized-guar-gum-in-solid-dispersion-of-non-steoidal-anti-inflammatory-drug/	Yes
95	Evaluation of Antihyperlipidemic Activity of Red Onion in Experimental Animals	Pooja Balasaheb Kadam Vitthal Chaware 2, Vivek Redasani	Pharmacy	Asian journal of pharmaceutical research and development	Aug-21	2320-4850	https://www.ajprd.com/	https://ajprd.com/index.php/journal/article/view/988	Yes

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96	Review on Guassion, the General Purpose in Computational Chemistry for Medicinal Chemistry	S A Nangare, S H Rohane	Pharmacy	Asian J. Research Chem	Jan-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	Na	Yes
97	Review on Discovery Studio: An important Tool for Molecular Docking	S S Pawar, S H Rohane	Pharmacy	Asian J. Research Chem	Jan-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2021-14-1-14	Yes
98	Drug Designing in Discovery Studio	B L Jejurikar, S H Rohane	Pharmacy	Asian J. Research Chem	Apr-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2021-14-2-8	Yes
99	Organization of Swiss Dock: In study of Computational and Molecular Docking Study	N S Patil, S H Rohane	Pharmacy	Asian J. Research Chem	Apr-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.ajrconline.org/AbstractView.aspx?PID=2021-14-2-10	Yes
100	A Review: Mechanism and Role of Superdisintegrants in the Development of Mouth Dissolving Tablets	V G Raut, P S Nikam, B P Chaudhari, V K. Redasani	Pharmacy	International Journal of PharmTech Research	Jan-21	0974-4304, (Online): 2455-9563	https://www.sphinxsai.com/pharmtech.php	https://www.sphinxsai.com/2021/ph_vol14_no1/2/(177-185)V14N1PT.pdf	Yes
101	Evaluation of Protective Role of A Hesperidin on Letrozole Induced Polycystic Ovarian Syndrome (PCOS) in Female Rats	S S Andhalkar, V J Chaware, V K Redasani	Pharmacy	International Journal of PharmTech Research	Jan-21	0974-4304, (Online): 2455-9564	www.sphinxsai.com	https://www.sphinxsai.com/2021/ph_vol14_no1/abstracts/A(186-198)V14N1PT.pdf	Yes

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102	Evaluation of Hepatoprotevtive Activity of Leaves Extract of Pithecellobium Dulce in Experimental Animals	K T Sul, VJ Chaware, VK Redasani V J Chaware,	Pharmacy	Asian Journal of Pharmaceutical Research And Development	Jan-21	2320-4850	https://www.ajprd.com/	https://www.researchgate.net/publication/367751620_Evaluation_of_Hepatoprotective_Activity_of_Leaves_Extract_of_Pithecellobium_Dulce_In_Experimental_Animals	Yes
103	Role of BDNF in Different Neurodegenerative Disease	R J Bhadrike, M M Mali, B P Chaudhari,V K Redasani	Pharmacy	International journal of research in pharmacy and pharmaceutical sciences	Mar-21	2455-698X	https://www.pharmacyjournal.in/	NA	Yes
104	Evaluation of Antidiabetic Potential of Eucalyptus globulus Plant Extract in Dexamethasone-Induced Diabetic Rats	U B Kamble, VJ Chaware, V K Redasani	Pharmacy	Asian Journal of Pharmaceutical Research and Development	Aug-21	2320-4851	https://www.ajprd.com/	https://ajprd.com/index.php/journal/article/view/989	Yes
105	Evaluation of Anticataleptic Activity of Hydroxytyrosol on Haloperidol Induced Catalepsy in Experimental Animals	M Bansode, VJ Chaware, V K Redasani	Pharmacy	Asian Journal of Pharmaceutical Research and Development	Aug-21	2320-4852	https://www.ajprd.com/	https://ajprd.com/index.php/journal/article/view/990	Yes
106	Insilico Molecular Docking Analysis in Maestro Software	A K Galande, S H Rohane	Pharmacy	Asian J. Research Chem	Jan-21	0974-4169(Print) 0974-4150(Online)	www.ajrconline.org	https://www.indianjournals.com/ijor.aspx?target=ijor:ajrc&volume=14&issue=1&article=017	Yes
107	A Review on Medicinal Plants of Natural Origin for Treatment of Polycystic Ovarian Syndrome (PCOS)	S S Andhalkar, VJ Chaware, V K Redasani	Pharmacy	Asian Journal of Pharmaceutical Research and Development	Jun-21	2320-4850	https://www.ajprd.com/	https://www.ajprd.com/index.php/journal/article/view/949	Yes

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108	Efficiency of AUTODOCK: Insilico Study of Pharmaceutical Drug Molecules	U M Satpute, S H Rohane	Pharmacy	Asian J. Research Chem	Jan-21	2231–5691 (Online)	www.ajrconline.org	https://www.indianjournals.com/ijor.aspx?target=ijor:ajrc&volume=14&issue=1&article=016	Yes
109	Study Compaarative Anti-Microbial Activity of Methanolic Extract of Flowers of Calotropis gigantea and Calotropis procera	P B Kadam, D S Kachare, K T Sul	Pharmacy	European Journal of Pharmaceutical and Medical Research	May-21	2394-3211	https://www.ejpmr.com/	https://www.ejpmr.com/home/abstract_id/8367	Yes
110	Evaluation of Antiepileptic Activity of Ficusracemosa in Chemicals Induced Epilepsy in Mice	Prajakta J. Chavan *, Atish B. Velhal.Vithal J Chawre, Vivek K. Redasani	Pharmacy	Asian Journal of Pharmaceutical Research and Development	Oct-21	2320-4850	https://www.ajprd.com/	https://www.ajprd.com/index.php/journal/article/view/997	Yes
111	Liposomes as a carrier for cancer treatment: review	D.S.kachare, R.K.Pawar,P.K.Ghadge,S.S.Mali	Pharmacy	Europian journal of P'ceutical and medical research	Jun-20	2394-3211	www.ejpmr.com	https://www.researchgate.net/profile/Dhanshri-Kachare-2/publication/342276828_LIPOSOME_AS_CARRIER_FOR_CANCER_TREATMENT_A_REVIEW/links/5eeb73c3a6fdcc73be851db3/LIPOSOME-AS-CARRIER-FOR-CANCER-TREATMENT-A-REVIEW.pdf	Yes
112	Role of citrus pectin in biological activity:a review	D.S.kachare, P.K.Ghadge, S.S.Mali	Pharmacy	Journal of pharmacovigilance and quality assurance	jnue 2020	2638-8235	www.ejpmr.com	https://www.researchgate.net/publication/342276944_Role_of_Citrus_Pectin_in_Biological_Activity_A_Review	Yes
113	Formulation and evaluation of herbal scrub using tamarind peel	P.K.Ghadge, Mahamuni S.S., Kachare D.S	Pharmacy	International journal of research	Jul-20	ISSN NO: 2236-6124	www.researchgate.net	https://rjtcsonline.com/AbstractView.aspx?PID=2021-12-1-6	Yes

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114	A Review on Herbal Medicinal Plant for Treatment of Polycystic Ovarian Syndrome	Karishma Yadav*1, Priyanka Ghadge2, Aryan Langeh1, Shankar Kalbhare3, Prajkta Phadtare1, Rupali Bhoite1	Pharmacy	Asian Journal of Pharmaceutical Research and Development	Aug-20	2320-4850	https://www.ajprd.com/	https://www.ajprd.com/index.php/journal/article/view/799	Yes
115	A Review on Antidepressant Activity	Prajkta Phadtare*1, Priyanka Ghadage2, Abhirup Sagare3, Rupali Bhoite4, Karishma Yadav5	Pharmacy	Journal of Pharmacology, Toxicology and Therapeutics	june 2020	issn=1816-496x	https://scialert.net/jhome.php	NA	Yes
116	Analytical Method Development and Validation of Flecainide Acetate by Chromatographic and Spectrophotometric Techniques	Redasani VK, Agrawal YO, Jagtap MS, Mahajan HS and Surana SJ	Pharmacy	Medicinal and Analytical Chemistry International Journal	Dec 2020	2639-2534	https://medwinpublishers.com/MACIJ/	https://medwinpublishers.com/MACIJ/analytical-method-development-and-validation-of-flecainide-acetate-by-chromatographic-and-spectrophotometric-techniques.pdf	Yes
117	Formulation and evaluations of herbal face pack	V. K. Redasani, K. J. Baid and *Drx. Jyoti Yadav	Pharmacy	World Journal of Pharmaceutical Research	2020	ISSN 2277–7105	www.wjpr.net	NA	Yes
118	Sodium Alginate cross-linked Polymeric Microbeads for oral Sustained drug delivery in Hypertension: Formulation and Evaluation	SB Kalbhare, MJ Bhandwalkar, RK Pawar, AR Sagare	Pharmacy	Asian Journal of Research in Pharmaceutical Science	Sep-20	2231–5640	www.anvpublication.org	https://www.indianjournals.com/ijor.aspx?target=ijor:ajrps&volume=10&issue=3&article=006	Yes

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119	Analytical Method Development and Validation of Flecainide Acetate by Chromatographic and Spectrophotometric Techniques	Redasani VK, Agrawal YO, Jagtap MS, Mahajan HS and Surana SJ	Pharmacy	Medicinal and Analytical Chemistry International Journal	Dec 2020	2639-2534	medwinpublishers.com	https://medwinpublishers.com/MACIJ/analytical-method-development-and-validation-of-flecainide-acetate-by-chromatographic-and-spectrophotometric-techniques.pdf	Yes
120	A review on in situ Nasal Gels for Nasal drug delivery system	Mandar J. Bhandwalkar, Imran K Inamdar, Shankar B Kalbhare	Pharmacy	Journal of Pharmaceutical Advanced Research	Nov 2020	ISSN: 2581-6160 (Online)	www.jparonline.com	https://www.researchgate.net/profile/Shankar-Kalbhare-2/publication/348590949_A_review_on_in_situ_Nasal_Gels_for_Nasal_drug_delivery_system/links/600687b1299bf14088a63ceb/A-review-on-in-situ-Nasal-Gels-for-Nasal-drug-delivery-system.pdf	Yes
121	Consumers view on safety of over the the counter drugs preferred at retailers and information sources in (wadhe) satara region	Prathmesh B.Yarsanwar, Karishma J.Baid,Shankar balu Kalbhare,Mandar J.Bhandwalkar	Pharmacy	World journal of pharmacy and pharmaceutical science	Feb 2020	2278 – 4357	www.wjpps.com	https://www.wjpps.com/Wjps_controller/abstract_id/11906	Yes

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122	Role of Citrus Pectin in Biological Activity: A Review	D.S. Kachare*1, P. K. Ghadge2, Sachin S. Mali3	Pharmacy	Journal of Pharmacovigilance and Quality Assurance	Jun-20		https://www.researchgate.net/	https://www.researchgate.net/profile/Dhanshri-Kachare-2/publication/342276944_Role_of_Citrus_Pectin_in_Biological_Activity_A_Review/links/5eeb77e9299bf1faac5edbec/Role-of-Citrus-Pectin-in-Biological-Activity-A-Review.pdf	Yes
123	Sustained Release Matrix Type Drug Delivery System-An Overview	SB Kalbhare, MJ Bhandwalkar, RK Pawar, AR Sagare	Pharmacy	EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH	Dec 2019	2394-3211	www.ejpmr.com	NA	Yes
124	Citric acid cross link carboxymethyl cellulose-polyvinyl alcohol hydrogel films for extended release of water soluble basic drugs	V S Ghorpade A.V.Yadav R.J.Dias K.K.Mali	Pharmacy	Journal of drug delivery science and technology	May 2019	0141-8130	www.sciencedirect.com	https://www.sciencedirect.com/science/article/abs/pii/S1773224718315107	Yes
125	Design, Development and Evaluation of Self Nanoemulsifying Drug Delivery System of Garlic Oil using Capryol PGMC	Priyanka Sangar	Pharmacy	Indian Journal of Pharmaceutical Education and Research	Oct-2019	0019-5464	https://www.ijper.org	https://pdfs.semanticscholar.org/adbc/e93c920f92d8300394a086104dd3ff5ea139.pdf	Yes
126	Formulation and Evaluation of Herbal Scrub Gel	Dhanashri N. Pawar, Arti P. Pawar, Yogita V. Dalvi	Pharmacy	Research J. Topical and Cosmetic Sci.	oct 2019	0976-2981	rjtcsonline.com	https://rjtcsonline.com/HTMLPaper.aspx?Journal=Research%20Journal%20of%20Topical%20and%20Cosmetic%20Sciences;PID=2019-10-1-4	Yes

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127	Synthesis and in vitro antimycobacterial potential of novel hydrazones of eugenol	Sachin H Rohane, Ashlesha J Chauhan, Neeraj Kumar Fuloria, Shivkanya Fuloria	Pharmacy	Arabian Journal of Chemistry	Sep-19	1878-5352	http://www.sciencedirect.com/science/journal/18785352	https://www.sciencedirect.com/science/article/pii/S1878535219301066	Yes
128	Utilization of Press mud for Improvement of Strength of Interlocking Bricks	Mr. Shaikh. A. N. , Miss.Deshmukh P.S. , Mr. Shelar V.E.	Engineering	International Journal of Scientific Research in Engineering and Management	Nov-19	2582-3930	https://ijsrem.com/	https://dnyanshree.edu.in/NAAC/Criterian-III/3.3.1/DIET%20CRIT%203_3.3.1_49_SAN_C.pdf	Yes
129	Estimation of heavy metals from shankhavati tablet	S.S.Dhebe A M Bhagwat SS Deshpande SV Garad	Pharmacy	World Journal of pharmaceutical research	Mar-19	ISSN 2277–7105	www.wjpr.net	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1553130327.pdf	Yes
130	An Empirical study on the employability skill of pharmacy under graduates in satara region	P R bhosale A.M.Bhagwat S.H.Rohane	Pharmacy	European Journal of pharmaceutical and medical research	Mar-19	2394-3211	https://www.ejpmr.com/	file:///C:/Users/Admin/Downloads/Publishedarticle_1554011386ejpmr2019-6-4322-329.pdf	Yes
131	Importance of force decredation study in pharmaceutical industry-A Review	S.R chavan A M Bhagwat Mahesh Rao A.P.Choudhari	Pharmacy	World Journal of pharmaceutical research	Mar-19	2277-7105	www.wjpr.net	https://www.researchgate.net/publication/370471002_IMPORTANCE_OF_FORCED_DEGRADATION_STUDY_IN_PHARMACEUTICAL_INDUSTRY-A_REVIEW_Corresponding_Author	Yes

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132	Study of fructose-glucose ratio in different samples of honey available in satara region	S R Ghadge A M Bhagwat SS deshpande SK budhavale	Pharmacy	World journal of pharmacy and pharmaceutical sceince	Mar-19	ISSN 2278 – 4357	https://www.wjps.com/	https://www.researchgate.net/profile/Avinash-Bhagwat-2/publication/370471000_STUDY_OF_FRUCTOSE-GLUCOSE_RATIO_IN_DIFFERENT_SAMPLES_OF_HONEY_AVAILABLE_IN_SATARA_REGION/links/6451f4e4809a53502145f946/STUDY-OF-FRUCTOSE-GLUCOSE-RATIO-IN-DIFFERENT-SAMPLES-OF-HONEY-AVAILABLE-IN-SATARA-REGION.pdf	Yes
133	Formulation and Evaluation of Polyherbal Soap	Arti P. Pawar, Dhanashri N. Pawar1, Yogita V. Dalvi	Pharmacy	Research Journal of Topical and Cosmetic Sciences;	Mar-19	0976-2981	rjtcsonline.com	https://rjtcsonline.com/AbstractView.aspx?PID=2019-10-1-6	Yes
134	Delaying effect of polyherbal formulation on cataract in stz-in ic induced diabetic wistar rat	K K mali S S ligade R.J.Dias	Pharmacy	Indian journal of pharmaceutical sceiences	Mar-19	0250-474X , 1998-3743.	www.ijpsonline.com	https://www.ijpsonline.com/articles/delaying-effect-of-polyherbal-formulation-on-cataract-in-stznicinduced-diabetic-wistar-rats.pdf	Yes
135	Home Automation Using Arduino And Iot	Pratiksha R. Patil Chaitali Ghadge	Engineering	*International Journal for Science and Advance Research In Technology*	2019	2395-1052	https://ijsart.com/	https://ijsart.com/Home/IssueDetail?id=30030	Yes
136	In Silicostudy for prediction of multiple pharmacological activities of novel hydrazine derivatives	S H Rohane Ashlesha makwana	Pharmacy	Indian Journal of chemistry	Mar-19	0975-0975	nopr.niscpr.res.in	https://nopr.niscpr.res.in/handle/123456789/45930	Yes

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137	Extraction, Characterization and functionalization of tamarind gum	K K mali S S ligade R.J.Dias	Pharmacy	Research journal of pharmacy and technology	Apri 2019	0974-3618	https://www.rjptonline.org/	https://www.researchgate.net/profile/Kailas-Mali/publication/333055878_Extraction_Characterization_and_Functionalization_of_Tamarind_Gum/links/5d08f349458515ea1a6f0fcb/Extraction-Characterization-and-Functionalization-of-Tamarind-Gum.pdf	Yes
138	Pharmacognostic investigation of lanata camera leave	S D patil D M Nirmale	Pharmacy	International Journal of pharmacognocy	2018	0976-500X, and the online ISSN is 0976-5018	https://scialert.net/jhome.php?issn=1816-496x	NA	Yes
139	Health related quality of life questioner of COPD patient	S D patil D M Nirmale	Pharmacy	Journal of Hospital Pharmacy	2018	2348-7704	https://journalofhospitalpharmacy.in/	NA	Yes
140	Traditional aproches for the treatment of diabetes	Aryan Langeh PV bhokare Ashish Thorat	Pharmacy	European Journal of biomedical and pharmaceutical sceince	2018	2349-8870	https://www.ejbps.com/	Na	Yes
141	Formulation, design and characterization of mucoadhesive buccal film of nebivolol using factorial design	Anilkumar J. Shinde , Deepti S. Waghmare, Rahul S. Dalvi and Harinath N. More	Pharmacy	International Journal of Pharmaceutical sciences and Research	2018	2320-5148	www.ijpsr.com	https://ijpsr.com/bft-article/formulation-design-and-characterization-of-mucoadhesive-buccal-film-of-nebivolol-using-factorial-design/	Yes

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142	Freeze dried multicomponent inclusion complexes of quercetin: Physicochemical evaluation and pharmacodynamics study	AS kulkarni R.J.Dias VS Ghorpade	Pharmacy	Journal of research in pharmacy	Nov-2018	ISSN: 2630-6344	www.jrespharm.com	https://jrespharm.com/uploads/pdf/pdf_MPJ_679.pdf	Yes

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Virtual Smart Phones

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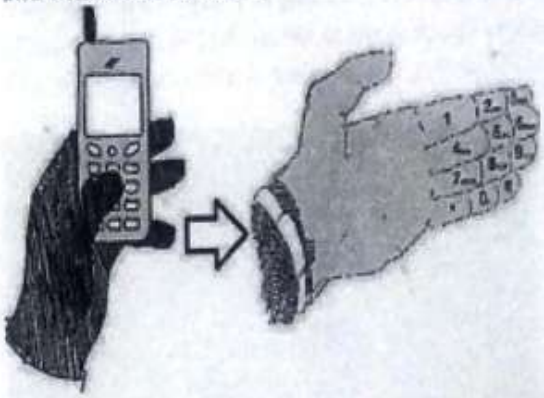
Abstract

For every departure metal money communication may be a manner by that they share/pass their thoughts/fillings to I another, we have a tendency to homosepians chiefly use verbal communication to speak with one another, during this Paper we have a tendency to introduce VSP, a Virtual good Phone that is largely a step to attach each the Physical and virtual world, by employing a little projector, Camera, Speaker, microphone & Cloud Computing Technology over the net within the kind of wearable device. In VSP all the specified element area unit fancied within the wearable device by that use communicate with the assistance of natural hand gesture, Hand movement and net. In VSP user communicate with one another by Virtual mobile with the assistance of bit gesture electromagnetic radiation and cloud computing technology.
VSP can finish the physical dependency of mobile. VSP offer novel interaction methodology to seamlessly communicate with one another in an exceedingly fun and intuitive manner. The user will bit their Palm to form decision and might even be used for looking at movies or pictures on their Palm/wrist. bit gesture is employed for creating and Terminating the decision. VSP uses touch-based interactions as instruction for establishing communication between the various users.

I. INTRODUCTION

The recent advent of novel sensing and show technologies has inspired the event of a spread of multi-touch and gesture primarily based interactive systems. In these systems user could move directly with info victimization bit add natural hand gestures. these days there area unit voluminous approach by that we will hook up with digital world within the controlled surroundings victimization muti-touch and gesture primarily based interaction. sadly, most gestural and multi-touch primarily based interactive systems don't seem to be mobile and little mobile devices fail to supply the intuitive expertise of full-sized gestural systems.
Moreover, info still resides on screens or dedicated projection surfaces. there's no link between our interaction with these digital devices and interaction with the physical world around US. during this paper, we have a tendency to gift VSP-Virtual sensible Phone, a multi-touch and gesture primarily based interaction system that replace the physical transportable device to the virtual multi-touch & natural gesture primarily based interaction on the user palm by that user communicate with alternative digital devices over the network. VSP primarily turns the human hand as a transportable by that is ready to user hook up with the digital world additionally as alternative peoples like their friends and relatives.



VSP is largely a computer-vision primarily based wearable and gestural info interface that augments the physical world around US with digital info and proposes natural hand gestures because the mechanism to move therewith info.

2. RELATED WORK

Recently, there are an excellent form of multi-touch interaction and mobile device merchandise or analysis prototypes that have created it doable to directly manipulate computer programme parts victimisation bit and natural hand gestures. Most of those systems rely upon the physical bit-based interaction between the user's fingers and physical screen and therefore don't acknowledge and incorporate touch freelance freehanded gestures. VSP Virtual sensible Phone Technology takes a unique approach to computing and tries to form the digital facet of our lives a lot of intuitive, interactive and, above all, a lot of natural. It's plenty of advanced technology squeezed

into a straightforward moveable device. once we herald property, we are able to get instant, relevant visual info projected on any object we tend to develop or act with the technology is especially supported hand increased reality, gesture recognition, laptop vision based mostly formula etc.

Augmented Reality

Augmented reality (AR) may be a term for a live direct or indirect read of a physical globe setting whose components square measure increased by virtual computer-generated imagination. it's associated with a a lot of general idea referred to as mediate reality during which a read of reality is changed (possibly even diminished instead of augmented) by a laptop. The augmentation is conventionally in time period and in linguistics context with environmental components.

Virtual good Phone uses increased Reality idea to position digital info on the physical world. With the assistance of advanced AR technology (e.g. adding laptop vision and object recognition) the data concerning the encompassing globe of the user becomes interactive and digitally usable. Artificial info concerning the setting and therefore the objects in it are often keep associate degreed retrieved as an info layer on high of the important view. the most hardware elements for increased reality are: show, tracking, input devices, and laptop. Combination of powerful hardware, camera, accelerometers, GPS and solid state compass square measure typically gift in fashionable Smartphone, that create them prospective platforms

Gesture Recognition

Gesture recognition may be a topic in engineering science and language technology with the goal of decoding human gestures via mathematical algorithms. Gestures will originate from any bodily motion or state however normally originate from the face or hand. Current focuses within the field embrace feeling recognition from the face and hand gesture recognition. several approaches are created mistreatment cameras and pc vision algorithms to interpret signing. Gesture recognition will be seen as how for computers to start to know soma language, so building a richer bridge between machines and humans than primitive text user interfaces or perhaps GUIs (graphical user interfaces), that still limit the bulk of input to keyboard and mouse. Gesture recognition allows humans to interface with the machine (HMI) and act naturally with none mechanical devices. Gestures will be wont to communicate with a pc thus we are going to be largely involved with empty handed semiotical gestures

Computer vision Based Algorithm

Computer vision is that the science and technology of machines that may see. As a study, laptop vision worries with the idea behind artificial systems that extract info from pictures. The image information will take several forms, like video sequences, views from multiple cameras, or multi-dimensional information from a medical scanner. The software system tracks the user's gestures mistreatment computervision primarily based algorithms, the pc vision system for pursuit and recognizing the hand postures that management the menus relies on a mixture of multi-scale color feature detection, read primarily based stratified hand models and particle filtering. The hand postures or states ar depicted in terms of hierarchies of multi-scale color image options at totally different scales, with qualitative interrelations in terms of scale, position and orientation. In every image, detection of time period color options is performed.

The hand postures ar then at the same time detected and half-tracked mistreatment particle filtering, with associate degree extension of superimposed sampling stated as stratified superimposed sampling, to boost the performance of the system, a previous on skin colour is enclosed within the particle filtering. Figure 2: Gesture Recognized Mobile keyboard VSP conjointlyjis additionally} associated with increased reality wherever digital info is superimposed on the user's read of a scene however it also take issue in many vital ways that. Ist VSP permits user to move with the projected info mistreatment hand gestures. Second the

projected onto the Hand/object and surfaces themselves instead of onto glasses, spectacles or watch which ends in a {very} very totally different user expertise.

3. OBJECTIVE

VSP Invention is said to transfer of knowledge & establishing communication from one physical body to different physical body or from one physical body to digital devices or vice-versa with none platform dependency. VSP is essentially AN makes an attempt to create the communication between users and Digital devices additional tangible and interactive. the target of this invention is establishing the connection/communication between humans and conjointly with digital devices by barely gesture on the human Palm/Hand. VSP work on 2 kind of information transfer.

First, It establish auditory communication between the users with the assistance of GSM Technology with none physical cell phone.

Second, For Transfer of knowledge between the humans and conjointly with digital devices. It create use of the net, computer network network or the other kind of information Servers through that device and humans area unit connected to and also the distinguish from one user to a different by the authentication ways like username/password, drawing a pattern on the virtual screen, face recognition, Palm recognition victimization palm lines or fingerprint detection will be used. In VSP auditory communication type one human to a different will be done either by victimization GSM or Internet/Intranet technology.

The Transferring of knowledge from one creature to a different or device victimization VSP, the primary and second digital devices is also gesture recognition VSP system connected to a network as well as a knowledge storage cloud and each uses VSP Technology.

4. WORKING

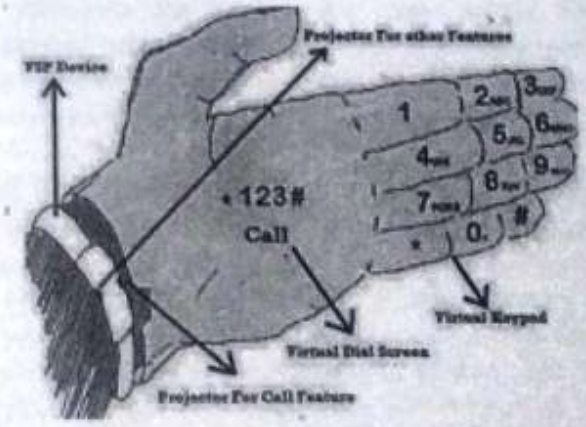
Working of VSP accommodates five Main steps i.e. sanctioning & evidence VSP, Make Call, Receive decision, Capture Image/Video, repetition knowledge & paste/Pass knowledge to different VSP & Digital Devices as follows.

A. sanctioning VSP

The VSP may be a wearable device and user has the key to change (ON)/Disable (OFF) the device through the ability Button, once user change the VSP Device, associate icon seems on the user palm or arm as per user as per designated by the user for showing the standing (if a user has signed in).If not user will hit this icon to login or modification users victimization totally different authentication strategies like: Enter user name and secret, Drawing a secret sign or pattern, Face recognition, image choice and Fingerprint detection and Palm line Detection once a user has signed in with success. VSP is currently prepared for creating and receive calls and different Operations

B. Make Call

After enabling VSP currently user is in a position to create decision and communicate with their relatives and alternative persons. to create decision, Dial mobile range mistreatment virtual key or mistreatment Voice Recognition system. For establishing decision between 2 users, VSP uses 2 technique that ar as follows.



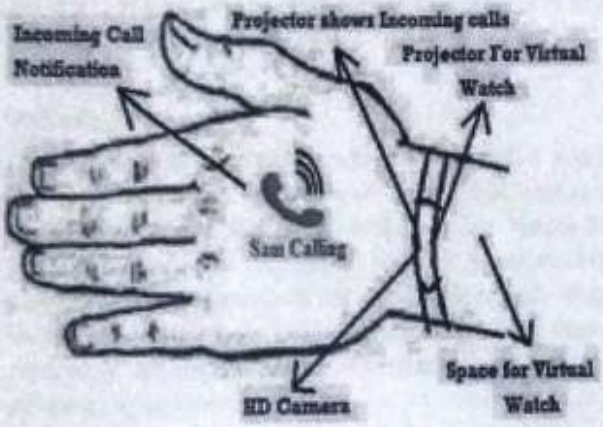
a. build decision mistreatment SIM:

VSP device encompasses a small SIM (Subscriber Identity Module) by that device established the decision mistreatment

GSM/CDMA (Global System for Mobile Communications / Code Division Multiple Access) Technology.

b. build decision mistreatment VOIP:

VSP device encompasses a Wi-Fi (Wireless Fidelity) and Mobile information possibility that connect the device to the Intranet/Internet. by mistreatment this user is in a position to create calls mistreatment VOIP (Voice Over IP) Technology. By mistreatment VOIP user is in a position to create the decision to alternative VSP user additionally as all the others GSM and net VOIP change Digital Devices. once user isn't connected to internet/Intranet. decision is just created mistreatment SIM while not user's permission however once user hook up with net it raise user to pick the choice by that user needed to create decision as per user choice the decision is hook up with alternative person.



C. Receive decision

When a VSP user referred to as by different VSP user or different digital device users by (Physical portable laptop computer, Desktop and personal organiser Personal knowledge assistant) the notification of incoming decision are going to be shown as per user designated Profile if user choose vibrate mode, the tiny vibrator motor indicate incoming decision by vibration & conjointly shows the identity of occupation user on back aspect of palm victimization high Density projector of VSP. If user choose Sound Mode, incoming decision notified by designated ring tone with user Name on the rear aspect of Palm. In Silent mode it solely indicate the name of caller within the back aspect of palm. For attending the incoming decision user simply bit, swipe the incoming decision icon or different bit gesture designated by user. to talk the caller user either use Bluetooth telephone receiver or wired telephone receiver that is connected to VSP device victimization three.0 connective. User is also ready to receive decision directly victimization VSP Device Speaker and Mice. For VOIP calls each user should be connected to the net victimization WI-FI or Mobile knowledge.

D. Capture Image/Video

VSP is additionally ready to capture prime quality Images/Video victimization their prime quality Camera by click capture image button or by victimization gesture (make a fame victimization our index figure and thumbs) for taking photos. once taking the image it shows the image on user hand victimization VSP System. For shoot video with constant gesture user simply needed to alter the camera mode photos to video. User conjointly center or zoom out whereas they capture Image/Video victimization their hand gesture.

E. Copy Data:

In VSP permit users to Transfer (Copy/Paste) knowledge from one shape to a different shape or device by employing a single bit gesture. For copy knowledge user must login initial in VSP device and connected to Internet/Intranet. For distinctive a duplicate event in VSP uses an extended press (Detect by perceiver Program) on copy ready knowledge item (keeping finger on a knowledge item quite one.5 sec. shown on user arm victimization VSP projector) indicates to repeat that knowledge item. Whenever user bit any copy ready knowledge barely perceiver program begin investigating the time and once time exceeds the edge (1.5 sec.) a message seems indicating that {the knowledge|the info|the information} item is being traced and gets traced to the user's distinctive area within the data cloud. The copy knowledge to the information cloud may also be done by other ways (instead of long-press for one.5 seconds). for instance, double faucet on knowledge item or draw a circle the information item to initiate copy victimization this method user copy multiple file for passing/paste to the opposite device all the copy knowledge save within the cloud on temporary bases with distinctive id of every knowledge item.

5. TECHNOLOGIES USED

VSP is largely a wearable device that is combination of hardware still as software system. In hardware VSP incorporates Processor Unit, Ram & storage Memory, Power provide (battery), Sensors (Accelerometer, sixteen Proximity sensing element for distinguishing bit on Arm), light-emitting diode Indicator For Device Mode (ON/OFF), small Vibrator Motor, USB port (For charging or attaching different devices), four small Projectors (like Pico Projectors), one HD Camera for Capturing pictures and videos, Low energy needed WI-FI and Bluetooth devices, GPS system, four bit buttons (ON/OFF

Button, Snap Button, sound Up button, sound down button) and Nano SIM card slot. In software system it use gesture recognition system, bit based mostly interaction system, increased Reality, laptop vision based mostly formula to meet all the objectives.

VSP uses the subsequent Technology for create decision, Receive decision repetition knowledge & paste/Pass knowledge to different VSP & Digital Devices.

a. Voice Call:

In VSP voice decision done by exploitation either by exploitation SIM (GSM/CDMA) or although net exploitation VOIP Technology.

b. knowledge Transfer:

Data transfer from one body to a different body or device in exploitation VSP is completed by exploitation knowledge Cloud. For Accessing knowledge cloud user is also connected to net either by Wi-Fi or Mobile knowledge exploitation SIM.

6.CONCLUSION

VSP is essentially a computer-vision primarily based wearable and gestural interface that augments the physical world around United States with digital info and proposes natural hand gestures because the mechanism to move thereupon info. It connect Physical world to Virtual world. VSP provide intuitive thanks to communicate and knowledge Transfer between completely different(completely different) users similarly as different Digital Devices.

VSP invention fulfil our 2 future necessities. First, it's free morpheme physical dependencies of devices. Second, it connect our physical world to virtual world Some Application of VSP as Follows:

1. employed in Health watching System.
2. accustomed realize info of any Product/Item.
3. accustomed Connect News and Weather Update.
4. accustomed connect completely different Devices just about.
5. employed in Education & coaching system.

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Evaluation of protective role of a Ferulic acid on Letrozole induced polycystic ovarian syndrome in female rats

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ABSTRACT: Background: *Ferulic (*hydroxycinnamic) *acid* is an antioxidant of phenolic phytochemical group used for the skin care product. Polycystic Ovarian Syndrome (PCOS) is a state of hormonal disorder causing an enlarged ovary with small cysts at the outer edges. Aim: The study was designed to investigate the protective effect of ferulic acid (3-methoxy-4-hydroxycinnamic acid) in letrozole induced polycystic ovarian syndrome in rats (PCOS). Methods: All the experimental animals except control group were orally administered with Letrozole (1mg/kg) dissolved in 0.5 % w/v Carboxymethyl cellulose (CMC) solution per oral route for 21 days to induce PCOS. Followed by a dose of ferulic acid (10, 20, and 40 mg/kg p.o.) for 15 days using water as vehicle. Results: The PCOS was confirmed in the letrozole induced rats with increased concentration of androgen, abnormal lipid levels, glucose, glycosylated haemoglobin and also depletion of antioxidants. The administrated of letrozole cause to abnormalities in serum hormone profile, lipid profile, blood glucose levels and increases body weight and ovary weight. Ferulic acid successfully exerted its protective effect by restoring all the parameters to normalize and improving or disappearance of ovarian cysts. Histopathological observations showed a remarkable recovery of the ovarian tissue and the presence of normalized structure of antral follicle. Conclusion: Ferulic acid showed protective effects in letrozole induced PCOS in rats. Biological effects of ferulic acid make it a promising drug for treating clinical and pathological abnormalities against PCOS conditions.

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Keywords: PCOS, Fertility; Ovulation, Letrozole Ferulic acid, Cysts.

INTRODUCTION:

Polycystic ovary syndrome (PCOS) is a common and complex female endocrine disorder in women of reproductive age [1,2] with an estimated prevalence of 6 to 10 % [3]. Clinical manifestation of PCOS amenorrhea, abdominal obesity, hirsutism, and androgen excess (Hyperandrogenism), infertility, and expanded ovaries with multiple cysts. Women with PCOS are at increased risk for diabetes, dyslipidemia, atherosclerosis,

bleeding, hypertension, cardiovascular disease as well as endometrial carcinoma [4]. It is also related with psychological impairments like depression and related mood disorders.

Lipid imbalance, insulin resistance, oxidative stress, and genetics are some of the contributing factors of PCOS [5]. Currently, many therapies are available to induce ovulation and manage PCOS, but it is associated with mild to severe side effects, like; arthritis, hot flushes, muscle or joint pain and psychological side effects like, mood swings, depression, irritability, and bloating. Therefore now-a-days focus is being laid on natural source herbal medicinal plants that have been utilized for the treatment of the various disorders related to the reproductive system due to the lesser or no side effects [3].

Ferulic acid(2*E*)-3-(4-hydroxy-3-methoxyphenyl)prop-2-enoic acid) is water soluble, phenolic compound found in active chemical constituent in Chinese medicine herbs such as female ginseng ,and many staple foods, like; fruits, cereals, vegetables and coffee [6,7]. Ferulic acid has been reported to possess a wide variety of biological effects like Antioxidant, anti-inflammatory, hypoglycaemic, and Hyperlipidemic activities [8]. In this study we evaluated that Ferulic acid (3-methoxy-4-hydroxycinnamic acid) may be beneficial in management of PCOS induced by Letrozole due to the reported activity.

MATERIALS:

Drugs and reagents:

Letrozole and Clomiphene citrate were purchased from retail Shop Satara, India. Ferulic acid was obtained from Dolphin Pharmacy Instruments, Pvt., Ltd. Mumbai.

METHODS:

In this study the experimental models used is Letrozole induced PCOS models. The model was widely used accepted for assessing PCOS activity. All animals were selected and divided into six groups and housed eight female rats per cage. All animals in five groups except control group were orally administered with Letrozole for 21 days.

Two animals from each group were scarified by using CO_2 chamber. Ovaries was removed and observed for presence of cysts. On 22nd day, Test group I, II, and III was administered with Ferulic acid for 15 days, whereas standard group was dosed with Clomiphene citrate for 15 days per oral route [9-11].

Animals:

This prospective comparative study was conducted at Department of Pharmacology, YSPM's Yashoda Technical Campus, Wadhe, Satara, and Maharashtra, India. Healthy, Virgin, cyclic and adult female wistar rats (150 to 200 g) were used in the present study. These animals were procured from registered breeder and acquainted in the quarantine area for one week.

Housing of animals:

The animals were housed in polypropylene cages with paddy husk as bedding. The animals were maintained under standard laboratory conditions of 22 ± 2°C temperatures, 50 ± 15 % of relative humidity, 12 h dark/ 12 h light cycle with free access to pellet diet and water provided *ad libitum*. The study protocol was approved form institutional animal ethic committee. The experiments were performed as per as guidelines of the Committee for the purpose of Control and Supervision of Experiments on Animals (CPCSEA), Governments of India. The Institutional Animal Ethics Committee approved the study protocol YSPM/YTC/PHARMA-IAEC/48/2020.

PCOS induction:

All the experimental animals except control group were orally administered with letrozole (1 mg/kg) dissolved in 0.5 % w/v CMC solution per oral route for 21 days to induce PCOS. Vaginal smear checked or examined daily and the animals in regular estrous phase were selected for study. Vaginal smears were collected and evaluated microscopically using Crystal violet stain to confirm the induction of PCOS. Two animals from each group were scarified by using CO_2 chamber. Ovaries were removed and observed for presence of cysts [11,12].

In female rats, the estrous cycle characterized by proestrus, estrus, metestrus (or diestrus I) and diestrus (or diestrusII) in normal animals. During estrus cyclic differences in vaginal cytology occurs in response to the morphological changes and continuous changes in cell types (leukocytes, nucleated epithelial and cornified epithelial) occurs in PCOS induced animals [8,9].

Treatment groups:

Animals were randomly assigned into six group (Table 1) and adequate supply food and drinking water.

Study design:

The study consisted of 48 female Albino Wistar rats equally divided into 6 groups as group 1 (control

group), group 2 (PCOS induced group), group 3 (Standard group), group 4, 5, and 6 as treatment groups. Following Letrozole administration, standard group was administered with Clomiphene citrate at a dose of 1mg/kg in 0.5 % CMC per oral and treatment group 4, 5, and 6 were administered Ferulic acid with the dose of 10, 20, and 40 mg/kg of body weight respectively in water per oral for 15 days. After 21 days, PCOS control group and after 36 days, animals from other groups were fasted overnight and blood was collected by retro orbital puncture then serum was separated and was used for estimation of hormones, lipid parameters and glucose. Body weight was measured at the end of study (On day 36th) animals were then sacrificed and ovaries were excised, cleaned of fat and weighed [11].

Table 1. Treatment Groups.

Group 1: Control	Healthy rats were administered vehicle (10 ml/kg)
Group 2: Negative control	Animals were administered with Letrozole (1 mg/kg)
Group 3: Positive control	Animals were administered with Letrozole (1 mg/kg) + Clomiphene citrate (1 mg/kg)
Group 4: Test group with low dose	Animals were administered with Letrozole (1 mg/kg) + Ferulic acid (10 mg/kg)
Group 5: Test group with intermediate dose	Animals were administered with Letrozole (1 mg/kg) + Ferulic acid (20 mg/kg)
Group 6: Test group with high dose	Animals were administered with Letrozole (1 mg/kg) + Ferulic acid (40 mg/kg)

Biochemical estimation:

***Measurement of fasting blood glucose*:**

Blood glucose level was measured by using Accu-cheak active glucometer (Roche Diabetes care GmbH Sandhofer Strasse11668305 Mannheim, Germany).

***Hormonal assay*:**

Blood samples were collected by retro-orbital puncture; serum was used for hormonal estimation (FSH, LH and Testosterone). Serum follicle stimulating hormone (FSH), luteinizing hormone (LH), Testosterone was measured via Enzyme Linked Immunosorbent Assay (ELISA) with the help of commercial kits (ELISA kit).

***Lipid profile*:**

The lipid profile (LDL, HDL, Total cholesterol, Triglycerides) was estimated at the end of the study. Lipid profile (LDL, HDL, Total cholesterol, Triglycerides) were quantified by using enzymatic kits procured from Aspen Laboratories pvt, Ltd

***Histopathology*:**

The excised ovaries were fixed in 10 % v/v formalin solution. According to histological procedure, they were subjected to tissue processing by washing with water which was followed by dehydration through ascending grades of alcohol then cleared through xylene. Then paraffin embedding method was used. The blocks were sectioned by using microtome and were placed on slides. These sections were stained with hematoxylene-eosin (HE), dehydrate, cleared and mounted on DPX mount under glass cover slips. The light microscope was used for observation which was connected to a camera to capture image.

Statistical analysis:

The statistical analysis was done by using Graph pad software version 5.0 and results were compared by one-way ANOVA followed by Tukey's Multiple Comparison Test. The results were analysed by Two-way analysis of variance followed by Bonferroni posttests. A p value <0.05 was considered as statistically significant.

RESULTS:

Examination of oestrus cycle:

Fig 1. showed oestrus cycle phase of animals. Displaying oestrous cycle stage only animals with a regular cycle were used for research, Fig 2 demonstrated not observed cornified squamous epithelial cells (Crystal violet staining) in PCOS induced groups.

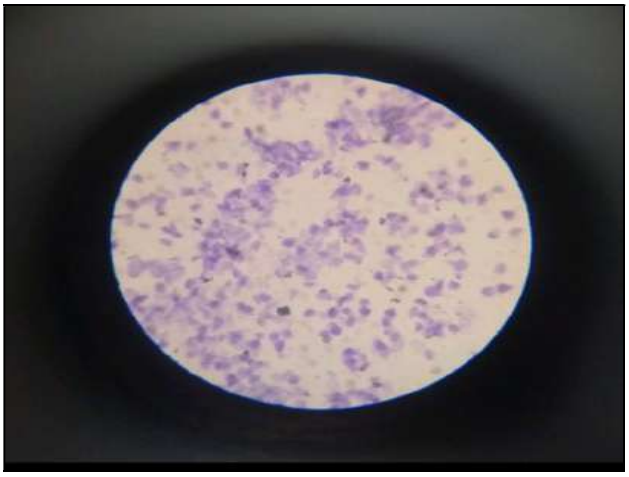

Fig 1. Smear with cornified squamous epithelial cells (Normal animals).

Showed oestrus cycle phase of animals. Displaying oestrous cycle stage only animals with a regular cycle were used for research.

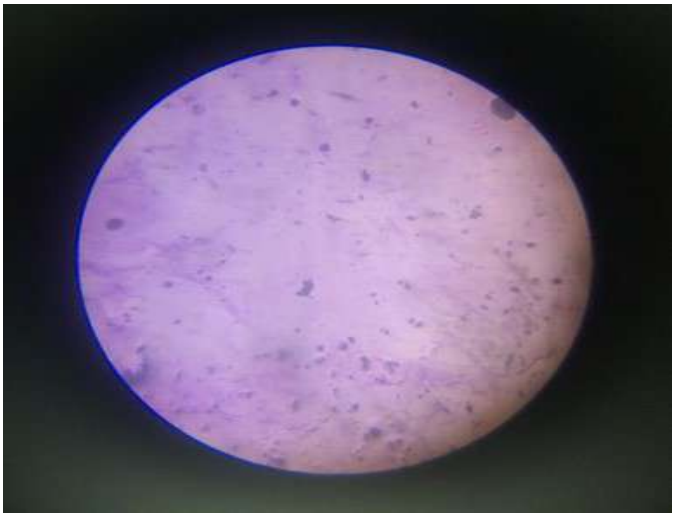

Fig 2. Examination of oestrus cycle (PCOS induced animals).
Not observed cornified squamous epithelial cells (Crystal violet staining) in PCOS induced groups.

Morphology of ovary:

Fig 3 shows Normal ovary structure, where as Fig 4 shows Fluid filled cysts in PCOS induced group.

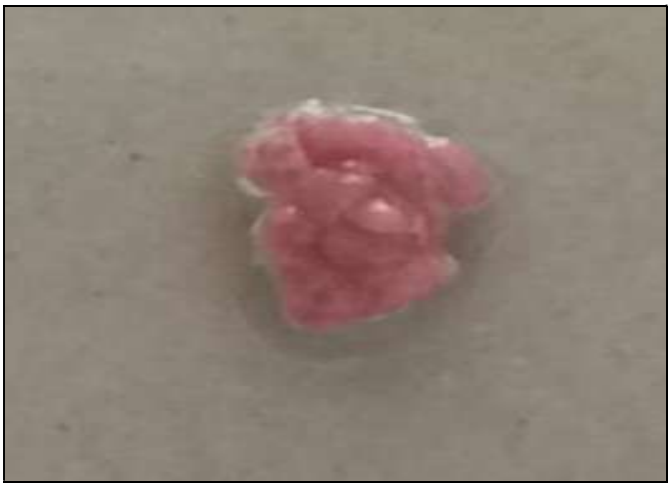

Fig 3. Morphology of ovary (Normal ovary).

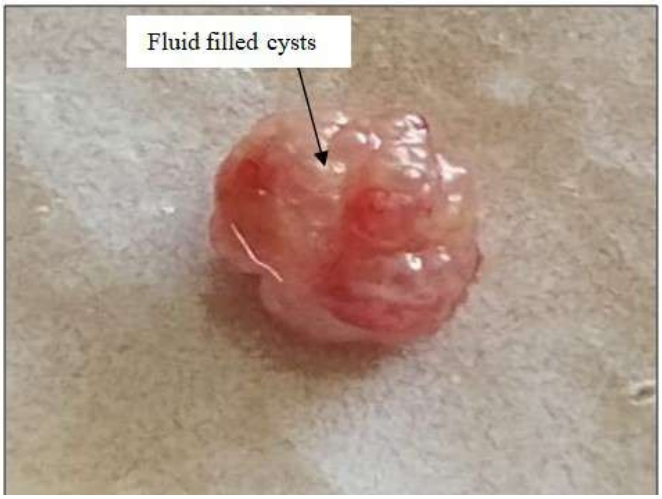

Fig 4. Morphology of ovary (Fluid filled cysts in PCOS induced group).

Body weight:

The effect of Ferulic acid on body weight was represented in Fig 5. Letrozole treatment to a significantly increase in body weight ($p<0.001$) as compared to control group. Oral treatment with Ferulic acid at dose of 10, 20, 40 mg/kg, for 2 weeks ($P<0.001$, $P<0.001$ and $P<0.001$; respectively) significantly reduced the body weight in experimental animals while treatment with Clomiphene citrate (1 mg/kg) significantly decreased ($P<0.001$) body weight when compared to Negative control rats.

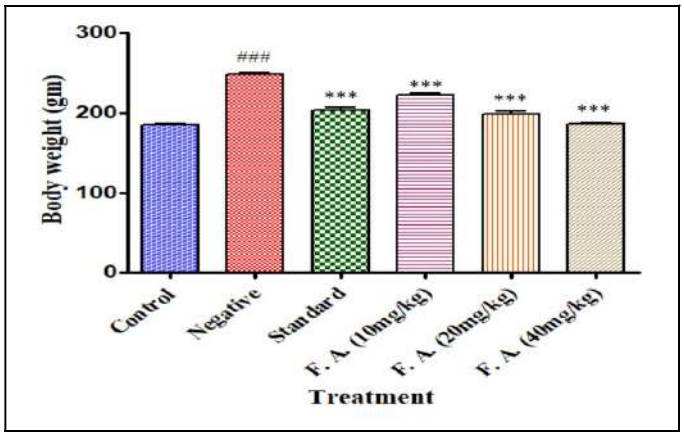

Fig 5. The effect of Ferulic acid on body weight.
All values represent mean ±SEM; n=6; Analysis was performed using one way ANOVA followed by Tukey's multiple comparison test; p value less than 0.05 was considered as statistically significant. ###p<0.001; when compared with normal control. ***p<0.001; when compared with negative control.

Organ weight:

Letrozole treatment to a significantly increase in ovarian weight ($p<0.001$) as compared to control group. Oral treatment with Ferulic acid at dose of 10, 20, 40 mg/kg, for 2 weeks ($P<0.01$, $P<0.001$ and $P<0.001$; respectively) significantly reduced the ovary weight in experimental animals while treatment with Clomiphene citrate (1 mg/kg) significantly decrease ($P<0.001$) ovary weight when compared to Negative control rats as given in Fig 6.

Serum hormonal profile:

The serum levels of Testosterone and luteinizing hormone (LH) were increased in PCOS induced group ($p<0.001$, $p<0.001$; respectively) while follicle stimulating hormone significantly decreased ($p<0.001$) in comparison to the control group. A significant fall ($p<0.001$) in testosterone levels was observed in standard, low dose, intermediate dose and high dose groups. Treatment with at dose of Ferulic acid 10, 20, 40 mg/kg and standard ($P<0.01$, $p<0.01$, $p<0.001$, and

Table 2. The effect of Ferulic acid on serum hormonal level.

Groups	Testosterone (ng/ml)	LH (ng/ml)	FSH (ng/ml)
Control	0.092 ± 0.003	12.17 ± 0.70	25.67 ± 2.72
Negative	0.140 ± 0.003$^{###}$	19.33 ± 1.25$^{###}$	10.50 ± 0.99$^{###}$
Standard	0.112 ± 0.001***	11.17 ± 0.60***	21.67 ± 0.80***
F. A. (10 mg/kg)	0.119 ± 0.002***	15.0 ± 0.68**	15.33 ± 1.11
F. A. (20 mg/kg)	0.092 ± 0.002***	14.50 ± 0.76**	17.50 ± 0.99*
F. A. (40 mg/kg)	0.083 ± 0.002***	11.17± 0.60***	20.17 ± 0.60***

Note: All values represent mean ±SEM; n=6; Analysis was performed using one way ANOVA followed by Tukey's multiple comparison test; p value less than 0.05 was considered as statistically significant. $^{###}$p<0.001; when compared with normal control. *p<0.05, **p<0.01, ***p<0.001; when compared with negative control. LH and FSH are luteinizing and follicular stimulating hormone.

Table 3. The effect of Ferulic acid on lipid profile.

Groups	Cholesterol (mg/dL)	HDL (mg/dL)	LDL (mg/dL)	Triglyceride (mg/dL)
Control	61 ± 1.65	26 ± 1.18	22.17 ± 1.30	82.50 ± 1.97
Negative	102 ± 2.58$^{###}$	14.67 ± 0.66$^{###}$	51.17 ± 2.10$^{###}$	132.80 ± 2.82$^{###}$
Standard	76.67 ± 1.74***	22.67 ± 0.88***	38.67 ± 0.88***	90.83 ± 2.57***
F. A. (10mg/kg)	90.67 ± 1.97**	19.17 ± 1.07*	41.50 ± 0.76**	109.70 ± 2.48***
F. A. (20mg/kg)	71.17 ± 1.35***	21.50 ± 0.76***	37.17 ± 1.32***	90.67 ± 1.97***
F. A. (40mg/kg)	62.50 ± 1.89***	27.67 ± 0.88***	26.67 ± 2.33***	75.67 ± 2.96***

Note: All values represent mean ±SEM; n=6; Analysis was performed using one way ANOVA followed by Tukey's multiple comparison test; p value less than 0.05 was considered as statistically significant. $^{###}$p<0.001; when compared with normal control. *p<0.05, **p<0.01, ***p<0.001; when compared with negative control.

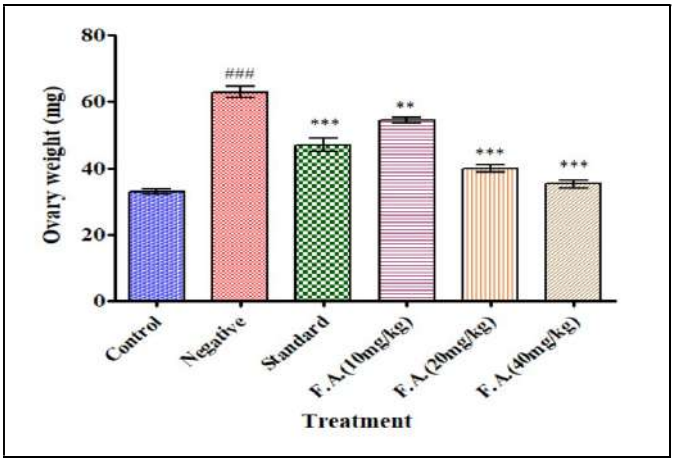

Fig 6. The effect of Ferulic acid on ovarian weight.
All values represent mean ±SEM; n=6; Analysis was performed using one way ANOVA followed by Tukey's multiple comparison test; p value less than 0.05 was considered as statistically significant. $^{###}$p<0.001; when compared with normal control. **p<0.01, ***p<0.001; when compared with negative control.

p<0.001; respectively) produced a significant decreased in Luteinizing hormone levels when compared with Negative group. Animals treated with at dose of Ferulic acid 20, 40 mg/kg and standard produced a significant increase (p<0.05, p<0.05, and P<0.001; respectively) in FSH levels when compared with Negative group (Table 2).

Ferulic acid reduces blood glucose level:

The effect of Ferulic acid on blood glucose levels was represented in Fig 7. Letrozole treatment to a significantly increase in blood glucose levels (p<0.001) as compared to control group. Oral treatment with at dose of Ferulic acid 10, 20, 40 mg/kg, for 2 weeks (P<0.001, P<0.001 and P<0.001; respectively) significantly decreased the blood glucose levels in experimental animals while treatment with Clomiphene citrate (1mg/kg) significantly decrease (P<0.001) blood glucose levels when compared to Negative control rats.

Lipid profile:

The effect of Ferulic acid on serum lipid profile was represented in Table 3. Letrozole treatment showed

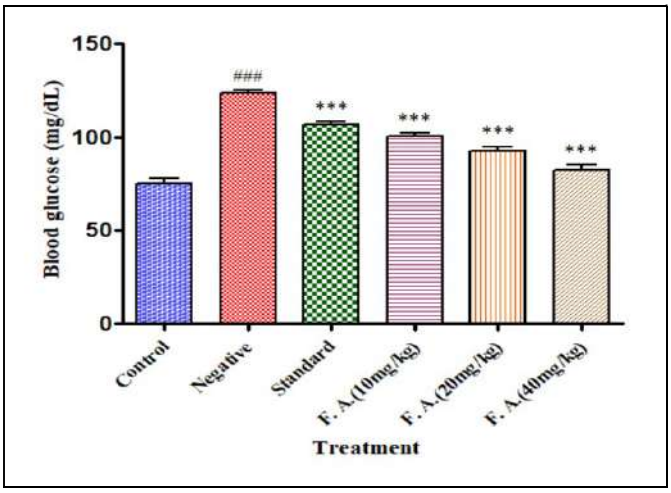

Fig 7. Ferulic acid reduces blood glucose level.
Note: All values represent mean ±SEM; n=6; Analysis was performed using one way ANOVA followed by Tukey's multiple comparison test; p value less than 0.05 was considered as statistically significant. ###p<0.001; when compared with normal control. ***p<0.001; when compared with negative control.

Lipid profile:

The effect of Ferulic acid on serum lipid profile was represented in Table 3. Letrozole treatment showed significant changes in serum lipid as compared to control. Cholesterol, LDL and triglyceride were greatly increased as p<0.001, p<0.001 and p<0.001 respectively while HDL levels were decreased (p<0.001) in PCOS induced group (Negative group). Clomiphene treatment significantly decreased Cholesterol (p<0.001), LDL (p<0.001) and triglyceride (p<0.001) levels when compared to PCOS induced group. While HDL levels significantly increased (p<0.001) when compared to PCOS induced group. Low dose of Ferulic acid (10 mg/kg) decreased the levels of Cholesterol (p<0.01), LDL (p<0.01) and triglyceride (p<0.001). It also increased HDL level significantly (p<0.05) in comparison to negative group. Intermediate dose of Ferulic acid (20 mg/kg) decreased the levels of Cholesterol (p<0.001), LDL (p<0.001) and triglyceride (p<0.001). It also increased HDL level significantly (p<0.001) in comparison to negative group. High dose of Ferulic acid (40 mg/kg) decreased the levels of Cholesterol (p<0.001), LDL (p<0.001) and triglyceride (p<0.001). It also increased HDL level significantly (p<0.001) in comparison to negative group.

Histomorphological changes

Histopathological examination of stained sections of ovary showed ovarian changes and ovarian follicular cysts (Fig 8). Yellow coloured arrow showing numbers of ovarian follicular cysts. Negative group showing multiple numbers of ovarian follicular cysts compared to normal control group. Oral administration of Clomiphene citrate (1 mg/kg), low dose of Ferulic acid (10 mg/kg), Intermediate dose of Ferulic acid (20 mg/kg), and high dose of Ferulic acid (40 mg/kg) significantly improved or disappearance the number of ovarian follicular cysts compared to negative group.

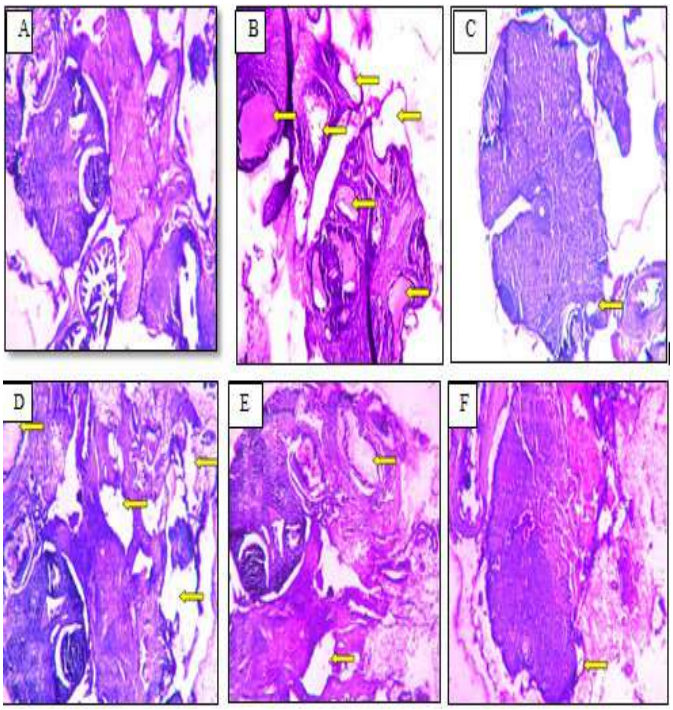

Fig 8. Effect of Ferulic acid in HE-stained ovary tissue (40X).
A. Normal control: showing normal histology of ovary. B. PCOS control: showing large numbers of ovarian follicular cysts. Yellow arrow indicates cysts. C. Letrozole + Clomiphene citrate showing less numbers of cysts. Yellow arrow indicates cysts. D. Letrozole + Ferulic acid (10 mg/kg) showing fewer moderate numbers of cysts. Yellow arrow indicates cysts. E. Letrozole + Ferulic acid (20 mg/kg) showing less numbers of cysts. Yellow arrow indicates cysts. F. Letrozole + Ferulic acid (40 mg/kg) showing less numbers of cysts. Yellow arrow indicates cysts.

DISCUSSION:

Polycystic ovarian syndrome (PCOS) is major female health problem. It is a chronic metabolic disorder characterized by hyperglycaemia, obesity, excess androgen level, hyperlipidaemia, and decrease FSH level. The World Health Organization estimates that it affects 116 million women worldwide as of 2012 [13]. Various experimental models for PCOS have been developed in rats like administration of testosterone propionate (TP), dehydroepiandrosterone (DHEA), and 5a-dihydrotestoterone (DHT) and Estradiol valerate (EV). It is models fully convincing and identify with the

condition of human PCOS completely [14]. Letrozole is a non-steroidal aromatase inhibitor that reduces conversion of androgens to estrogens in the ovary, resulting increased testosterone and decreased E2 production and stimulate PCOS like condition by causing circulating hyperandrogenism, hormonal imbalance, and intra ovarian androgen excess leading to appearance of polycystic ovary. Letrozole induced PCOS was causehyperglycaemic condition which may contribute to insulin resistance, hyperlipidaemia leading to metabolic syndrome [10-15]. Letrozole induce animal model causes polycystic ovarian syndrome in our research study. It is PCOS rat model characterized by an increase in androgen biosynthesis. P450 aromatase enzyme is responsible converting testosterone and androstenedione to estradiol and estrone. This enzyme inhibits activity led to enhance ovarian androgen production or concentration and resulted in PCOS disorder. Due to inhibit of aromatase enzyme activity increases ovarian androgen secretion and resulted into increase level or concentration of testosterone, LH, and FSH, Letrozole treatment showed some metabolic feature, like increased body fat, triglycerides, cholesterol and body weight [10,14]. Ferulic acid showed marked significantly decreased body weight and ovary weight in PCOS rats that may be responsible for reduced the fatty formation, decreasing follicular cysts (follicular fluid). The body weight was considerably reduced by treatment with Ferulic acid (20 and 40 mg/kg). The weight of ovaries in the negative control group was greater than that of normal control group rats. Ferulic acid (20 and 40 mg/kg) treatment significantly decreased ovaries weights which matched to those in control group animals. Type-2 diabetic mellitus and insulin resistant hyperglycaemia are inter-linked with PCOS. Altered insulin levels which can directly stimulate ovarian androgen production in PCOS Insulin stimulate adrenal steroidogenesis by enhancing sensitivity to adrenocorticotrophic hormone (ACTH) and increase pituitary LH release. Increase androgen level cause ovarian cyst. FA improves altered insulin levels, impaired glucose homeostasis and insulin sensitivity [15]. PCOS induced rats showed marked rise in blood glucose level relative to control group. Oral administration of Ferulic acid significantly reduced the increased blood sugar levels, and indicating the beneficial impact of Ferulic acid on insulin resistance and diabetic condition. Women with PCOS are hyperandrogenemic which is associated with alteration in circulating lipoprotein and lipid level resulting in dyslipidemia. Regulation of carbohydrate metabolism, insulin plays important role in the metabolism of lipids. Insulin is inhibitor of lipolysis, since it inhibits the activity of the hormone-sensitive lipases in adipose tissue and increased FFA concentration into the circulation. Increased FFA concentration also raises β-oxidation of fatty acids, producing more acetyl-CoA and cholesterol. FA decreased the levels of FFA, TG, Cholesterol and phospholipids in plasma [16-19]. Characteristically PCOS patient have increased cholesterol level. The women with PCOS tend to be obese probably due to high cholesterol and lipid content. The same effect was seen in current research work after PCOS induction. In comparison with the normal control group, the negative control group reported significantly enhanced LDL, Cholesterol, triglycerides concentration and lowered HDL concentration. Ferulic acid (10, 20, and 40 mg/kg) decreased significantly LDL, cholesterol, triglycerides levels and enhanced HDL level. Ferulic acid displayed beneficial outcome against hyperlipidaemia. In this research, non-steroidal aromatase inhibitor Letrozole blocks the conversion of testosterone to estradiol. This lead in testosterone and LH level increased while FSH level decreased. This imbalanced hormonal level leads to inconsistent oestrus cycle [20,21]. The similar condition has been noted in our research. Letrozole induced rats showed considerably increased levels of testosterone, LH and decreased FSH levels compared to control. Standard drug Clomiphene citrate (1 mg/kg), and Ferulic acid (20 and 40 mg/kg) treated rats showed significantly decreased testosterone, LH level and FSH level increased. The Histopathological report of Letrozole induced rats indicated the existence of polycysts in the ovary. Negative group showed large numbers of ovarian follicular cysts. After treatment with Ferulic acid (20 and 40 mg/kg), decreased or improved numbers of ovarian follicular cysts. All the biochemical and Histopathological parameters in our results advocate the Ferulic acid is most constructive treatment against PCOS.

CONCLUSION:

Treating the various parameters in PCOS induced rats, the impact of Ferulic acid treatment with intermediate (20 mg/kg) and high (40 mg/kg) dose was observed to be similar with standard treatment (Clomiphene citrate). In Letrozole induced PCOS animals, Ferulic acid restored the lipid profile, hormone and glycemic status

as well as ovarian morphology. Ferulic acid might be beneficial in managing PCOS condition due to multiple pharmacological actions like hypoglycemic effects, antihyperlipidemic, anti-inflammatory, protective action against obesity, phytoestrogenic and antioxidant activity. Biological effects of Ferulic acid make it a promising drug for treating clinical and pathological abnormalities against PCOS condition.

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REVIEW ARTICLE

Review on Guassion, the General Purpose in Computational Chemistry for Medicinal Chemistry

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ABSTRACT:
In these review we explain all the detailed information about guassian software. Now a days the guassian very much beneficial in to computational chemistry for medicinal chemistry work by the various calculations. This is initially used bye the john poples. Guassiansoftware capable of predicting many properties and calculations of molecules and reaction. Molecular docking also done bye this software. Varios authors wordks on their subject by using this software. I shows interest into guassian because of this is very beneficial for calculations. In guassian varios mathematical equations are added and this will be feneficial or helpful to guide scientist.

KEYWORDS: Molecular docking, Drug Discovery, Guassion Software.

1. INTRODUCTION:

Guassian software is a general purpose computational chemistry software package. Guassian software initially started used in or relesed in 1970 by the scientist john pople. And the scientist john pople started his research group at the Carnegie Mellon University as guassian 70 then this continusly udtaed by them. the name of software originates from scientist pople's use of guassian orbitals to speed up the molecular electronics structure calculation opposed to using slater type of orbital then choice to 9 improve the the performace of the software on computating capacities of current computer hardware for hartee fock calculations. The current updated version of this is guassian 16. This is originally availble through quantum chemistry programme exchnage. it was later licensed out by the university carnegie mellon university ans since 1987 has been developed and licensed by the guassian.

Guassian:

Original author	**John poples**
Developers	Carnegie mellon university
Initial release	1970, 50 years
Stable release	Guassian 16/2017
Website	Www.guassian.com

We will use the guassian programme in windows environment. Guassian is capable of predicting many properties of molecules and reaction, including the following

- Molecular energies and structures
- Reaction pathway
- NMR properties
- Energies and structures of transition states
- Bond and reaction energies
- Vibrational frequecies
- Molecular orbital
- Atomic charges and electrostatic potential
- Multiple moments

Computation can be carried out on system in gas phase and in their ground state or in an excited state

Guassuian input files:

In this Guassian input files inclufdes several different sections.

- Link 0 commands- locate and name scratch files we will not use this opti
- Route section- spec

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method basic sets and other options
- optional addition sections- additional input needed fo9r specific job type
- Title section- brief description of calculation.

JOB TYPES FOR GUASSIAN INPUT:

There are 3 key components to this specification
1. Job type
2. The method
3. Basic set.

Computer aided drug design:

Simply rational design is the inventive process of finding new medication based on biological target. The drugs are commonly organic small moleculesthats activates or inhibits function of biomolecules such like a protein. That is further give the therapeutic action to the patient. Basic in that isdrug design means the invole in molecules that complementry in shape and size of biomolecules. They bind with each other and form the bond. Drug design not relies on computer modelling. This type of modelling callled as computet aided drug design. Drug design depends on knowledge of 3D structures of biomolecules that is known as structural aided drug design. In addition to small molecules biopharmaceutical includes peptides ans especially therapeutic antibodies are incresingly important class of drug and computational method for improving affinity, selectivity and stability been developed.

Drug design also known as efforts to develop a new drug by molecular modification of lead compound for optimization of desired efferts and minimization of side effects.

Now a days structural based drug design is the growing, interative and powerful approaches includes the structural evaluation of target and drug discovery process it is time consuming and as well as cost cunsuming too developing ideas of new effects and potential drug lead molecule

MOLECULAR DOCKING:

Molecular docking is very useful and intresting beneficial to us docking means the attempt to find best matching between two molecules. Docking is the process in which prdedict the preffere orientation of one ligand when bound in an active site to form stable complex. Aim for the molecular docking is to achive an optimization conformation for both receptor and ligand and the relative orientation between protein and ligand such that free energy of overall system is minimized. successful dockingvmethod search high dimensional spaces effectively and use a scoring function that correctly ranks candidate docking. Importance of the molecular docking is that identification of the ligands, correct binding geometry, prediction of binding affinity. etc. therae are rigid docking is the part of molecular docking in that we studied about internal geometry of receptor and ligand. Another type of docking is flexible docking in that we studied about the enumaration on rotation of the one of the molecules is performed. There are various application of molecular docking like lower free energy structures, calculate differntial binding of ligands, library design, novo design, screening of side effects, specificity of potential drug etc [1-3].

REVIEW OF LITRETURE:

Molecular studies docking charge transfer excitation and wave function analyses valacuclovir a potential antiviral drug this study carried by author Fathima Rizwana and Christina susan abraham and software used is guassian 0.9 [4].

Quantum chemical insight into molecular structure NBO anlysis of hydrogen bonded interaction spectroscopic drg likeness and molecular docking of novel anti covid 19 author for this is SJ. Jenepha Mary and C james study carried by the software guassian 0.9 [5].

Conformational anlysis and quantum descriotors of 2 new imidazole derivative by experimental DFT, AIM molecular docking studies adsorption activity on ghraphene study by author Veena S kumar and MS roxy software used by them is guassian 0.9 [6].

Computational assesment on wave function anlysis molecular conformation and molecular docking explores on 2-5 amino-2methylanilino-4-3 pyridile pyrimidine study by author K arulabraham and S mutha and software is guassian 0.9 [7].

Quantum computational spectroscopic and molecular dockinnn studies on 2acetylthoprene and its bromination deerivatives author is M habib rahman and M raja software is guassian [8].

Synthesis of 1-2-3 bistriazole derivative of embaline and evaluation of its effect on high fat diet streptozotacin induced type 2 diabetes in rats and molecular docking author for this antony stalin and perumol palani guassian 0.9 software used by them [9].

Studies of charged transfer complex og qunodic acid with carboxyllic acid, R kavitha and Biological evaluation mol docking and DFT rajendran are the authors and guassian is software used by them. [10].

Conformational profile vibrational abign NLO properties and molecular docking of biological active herbicide 1,1 dimethyl phenyleurea I
guassian is used 0.9 [11

Detailed quantum mechanical, mol docking QSAR prediction, photovoltaic light homesting efficasy analysis of benzil and its halogenated analogus author Yshyama mary B suresh kumar guassian software used for this. [12].

M abhinaya and etal are the authors for the inhibition of biofilm formation quarnum sensing activity wae done on isolated 3-5-7 tri hydroxy and lave from alstonia scholoris lead by using chemistru guassian 0.9 [13].

New thiazide pyridine and pyrazole derivatives as antioxidant bcandidates synthesis DFT calculations and molecular docking by using guassian softwaew by eatal and yassine kaddouri [14].

2D QSAR and docking study of series gaumerin derivatives as inhibitions of CDR with an applicatiomof molecular docking bu guassian software author is Ranina kasmi and etal [15].

Y shyama and etal do study on the DFT and molecular docking investigation of oxicum derivatives was studied by using guassian [16].

Nasima arshad and etal studied on the structural elucidation DNA binding DFT molecular docking and cytotoxic activity studieson novel design crystal thiosemicarbazides was studied by using guassian software [17].

K haruna and etal bdo study on the confirmational profile and the vibrational assignments NLO properties and molecular docking of biological active herticides 1-1 dimethyl 3- phenykurea studies by guassian software [18].

Y shyamo mary and etal do study on the detailes quantum mechanical molecular docking QSAR prediction photovoltic light havsting efficasy analysis of benzil and its halogenated analogus studies by using guassian 0.9. [19].

Mohammad abdul mumit and tarum kumar studied on DFT studies on vibrational and electron spectro homo lumo, MEP HOMA, NBO and molecular docking analysis of benzyl, hydrazine carbodition by using guassian [20].

Towaeds better modelling drug loading in solid lipid nanoparticles molecular docking experiments done by author Rania hathout, abdelkader a metwally by using guassain software [21].

Spectral investigation, DFT computation and molecular docking studies of the Antimicrobial 5 nitroisatin dimer VK rastogi and VB joyhy are the authors, guassain software used by them. [22].

Investigation of DNA RNA molecules for efficasy and activity of corrosion inhibition by DFT and molecular docking tuzun and C kaya are authors. [23].

CONCLUSION:

The review totally focused on prediction of many properties of molecules and reactions using this software. Guassian software is an computer program helped to chemists, chemical engineers, physicist, biochemist and other scientist to predicting many properties of molecules and reactions. such as energies molecular structures, spectroscopic data ie NMR IR UV etc. These prediction based on present review have been becoming a helpful tool to guide scientist for the prediction of various properties.

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Role of BDNF in different neurodegenerative diseases

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Abstract
Neurodegeneration is the progressive loss of shape or characteristic of neurons, such as death of neurons. Many neurodegenerative diseases consisting of amyotrophic lateral sclerosis, Parkinson's, Alzheimer's, and Huntington's occur due to neurodegenerative processes. Such sicknesses are incurable, resulting in progressive degeneration and loss of life of neuron cells. Neurodegeneration can be discovered in lots of different ranges of neuronal circuitry starting from molecular to systemic Neurodegenerative ailment is an umbrella time period for a range of conditions which on the whole have an effect on the neurons in the human brain. Mind-derived neurotrophic element, additionally called BDNF, is a protein that, in people, is encoded by using the BDNF gene. BDNF is a member of the neurotrophin circle of relatives of increase elements that are associated with the canonical Nerve increase thing. Neurotrophic factors are determined inside the mind and the outer edge. BDNF acts on sure neurons of the valuable apprehensive system and the peripheral nervous machine, helping to support the survival of current neurons, and inspire the increase and differentiation of recent neurons and synapses. Inside the mind, it is energetic inside the hippocampus, cortex, and basal forebrain areas critical to learning, memory, and better wondering. It's also expressed within the retina, motor neurons, the kidneys, saliva, and the prostate. BDNF itself is critical for long-term memory. Even though the massive majority of neurons inside the mammalian mind are shaped prenatally, elements of the grownup mind maintain the potential to grow new neurons from neural stem cells in a procedure known as neurogenesis.

Keywords: neurodegeneration, brain-derived neurotrophic factor, nerve growth factor

Introduction
Brain derived neurotrophic factor (BDNF) is a neuro-defensive protein that regulates neuronal survival, growth and differentiation. The BDNF hypothesis of depression postulates that stress reduces BDNF concentrations in limbic device structures and this underpins the imperative pathogenic process in melancholy, even as antidepressants restore BDNF concentrations and through this alleviate depressive signs and symptoms. This idea has been derived from a wealthy literature and has drawn sizeable assist, so that it will be reviewed on this paper. Further this paper investigates the have an impact on of a not unusual unmarried nucleotide polymorphism (Val66Met) inside the gene encoding BDNF, which has a purposeful position in BDNF expression and can confer susceptibility to melancholy [1].

Brain-derived neurotrophic issue, also known as BDNF, is a secreted protein secreted in humans, is encoded by using the BDNF. Its miles a member of the neutrophin own family of increase factors, NGF. BDNF acts on sure neurons of the vital fearful system and the peripheral fearful gadget, supporting to support the survival of current neurons, and encourage the increase and differentiation of new neurons and synapse. Neurodegeneration is the innovative lack of shape or feature of neurons, including demise of neurons. Many neurodegenerative sicknesses which includes amyotrophic lateral sclerosis, Parkinson's, Alzheimer's, and Huntington's occur because of neurodegenerative methods. Such illnesses are incurable, ensuing in modern degeneration and demise of neuron cells. Neurodegeneration may be located in many distinctive tiers of neuronal circuitry ranging from molecular to systemic Neurodegenerative disease is an umbrella term for a number conditions which by and large affect the neurons inside the human mind. Neurodegenerative disease is an umbrella time period for various conditions which frequently have an effect on the neurons in the human mind. Mind-derived neurotrophic thing, additionally known as BDNF, is a protein that, in human beings, is encoded with the aid of the BDNF gene. BDNF is a member of the neurotrophin circle of relatives of increase factors, which can be related to the canonical Nerve boom factor. Neurotrophic factors are proteins, which play a crucial function in proliferation, differentiation, protection, plasticity, survival and function of neurons within the valuable and peripheral worried systems. These neuroprotective molecules exert sizable manage over the existence and demise pathways in cells. They participate in local responses to diverse types of neuronal stressors. In mammals, the neurotrophin brain-derived neurotrophic issue (BDNF) is a primary regulator of axonal growth and connectivity, neuronal differentiation, survival and synaptic plasticity. It is a key molecular goal in the development of medication in opposition to neurological problems. Several studies have proven the involvement of BDNF within the pathogenesis of neurodegenerative illnesses and psychiatric disorders, like depression and schizophrenia. The neurotrophic movements of BDNF had been installed with various neuronal populations. In the periphery system, BDNF has proven neurotrophic movements on small fiber sensory neurons concerned in sensory neuropathies

Brain Derived Neurotropic Factor (BDNF)
Brain-derived neurotrophic factor, additionally known as BDNF, is a secreted protein secreted in humans, is encoded by using the BDNF.

family of growth factors, NGF. BDNF acts on positive neurons of the relevant worried system and the peripheral worried device, helping to assist the survival of existing neurons, and inspire the boom and differentiation of new neurons and synapse [4].

Feature of BDNF

BDNF acts on positive neurons of the significant nervous system and the peripheral anxious gadget, supporting to aid the survival of present neurons, and encourage the growth and differentiation of latest neurons and synapses. Inside the mind, it's far active within the hippocampus, cortex, and basal forebrain—regions important to learning, memory, and higher questioning. It's also expressed inside the retina, motor neurons, the kidneys, saliva, and the prostate. BDNF itself is important for long-term reminiscence. Despite the fact that the significant majority of neurons within the mammalian mind are formed prenatally, components of the person mind keep the potential to develop new neurons from neural stem cells in a procedure called neurogenesis. Neurotrophins are proteins that assist to stimulate and control neurogenesis, the ability to make BDNF go through developmental defects inside the brain and sensory anxious system, and normally die quickly after delivery, suggesting that BDNF plays an essential position in regular neural development.

Different vital neurotrophins structurally associated with BDNF include NT-3, NT-four, and NGF [5, 6].

Synthesis and Release

BDNF is made within the endoplasmic reticulum and secreted from dense-core vesicles. It binds carboxypeptidase E (CPE), and the disruption of this binding has been proposed to reason the lack of sorting of BDNF into dense-core vesicles. Different trends consist of sensory neuron losses that affect coordination, balance, hearing, flavor, and respiration. Knockout mice additionally showcase cerebella abnormalities and a boom in the range of sympathetic neurons. sure varieties of physical exercising have been proven too markedly (threefold) boom BDNF synthesis inside the human brain, a phenomenon that's in part accountable for exercise-triggered neurogenesis and upgrades in cognitive function. Niacin seems to up modify BDNF and tropomyosin receptor kinase B (TrkB) expression as properly.

Parkinson's disease (PD)

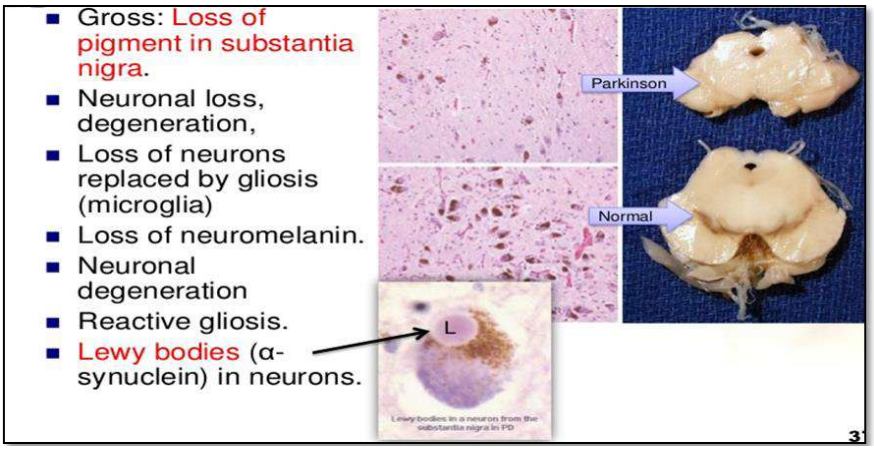

Fig 1: Pathology of Parkinson's diseas

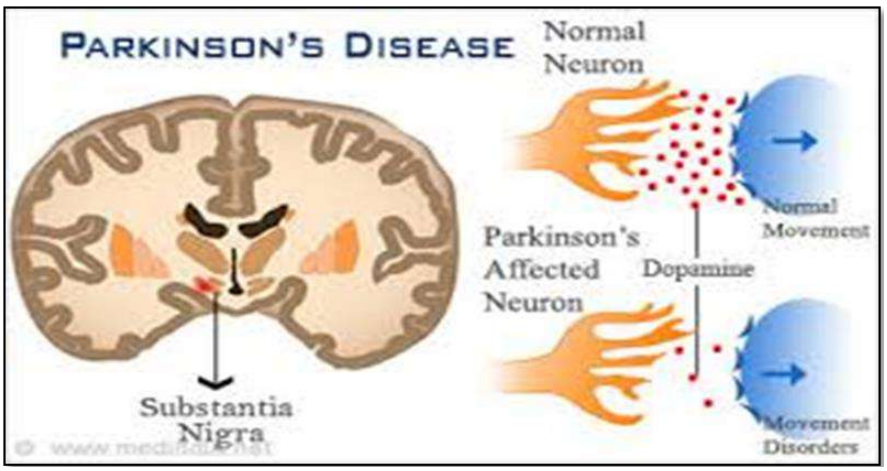

Fig 2: Pathology of Parkinson's disease

Parkinson's disease is basically related to the slow lack of cells inside the substantia nigra of the brain. This region is accountable for the producing of dopamine. Dopamine is a chemical messenger that transmits signals between areas of the mind to coordinate hobby. As an instance, it connects the substantia nigra and the corpus striatum to modify muscle pastime.If there is deficiency of dopamine inside the striatum the nerve cells on this place fire out of manipulate. This leaves the character not able to direct or control moves. This results in the pre

Because the disease progresses, other regions of the mind and fearful device degenerate as properly causing a more profound motion disease.

A protein known as alpha synuclein seems to be worried in neuronal degeneration. Alpha synuclein is produced thru dopaminergic neurons and is damaged down by using manner of other proteins, which includes parkin and neurosin.

Defects in any of the proteins that smash down alpha synuclein can also result in its accumulation, ensuing in the formation of deposits known as Lewy bodies in the substantia nigra.

However, other mechanisms affecting the accumulation of alpha synuclein had been recognized, and it isn't clear whether or not Lewy bodies are a purpose of or arise as a result of the disorder. Other findings in humans stricken by Parkinson ailment consist of mitochondrial dysfunction, main to accelerated production of free radicals that motive considerable harm to mind cells, and heightened sensitivity of the immune device and neurons to molecules known as cytokines, which stimulate inflammation.

Symptoms

Tremor at relaxation is the characteristic function of PD that earned it the sooner call of the shaking palsy. Rest tremor occurs rarely in every other situation. The tremor is gradual and rhythmic. It normally starts in one hand and handiest later spreads to contain the opposite aspect of initial involvement. Pressure is a term meaning a tightness or boom in muscle tone at relaxation or during the complete variety of movement of a limb. It can be felt as stiffness within the limbs, the neck, or even the trunk. Bradykinsia is slowness in bobbing up or initiating motion, and reduce in high-quality motor coordination (manifested via the inability to button a blouse, cut meat, and so forth.). Gait (walking) lower inside the natural arm swing is visible first, and most effective later do issues with slow, small steps and shuffling (festinating) arise stability issues and impairment of posture usually occur late within the course of normal pd, and are actually the maximum disabling of all the signs.

Treatment

Following drugs used in treatment of Parkinson's disease [10, 11]

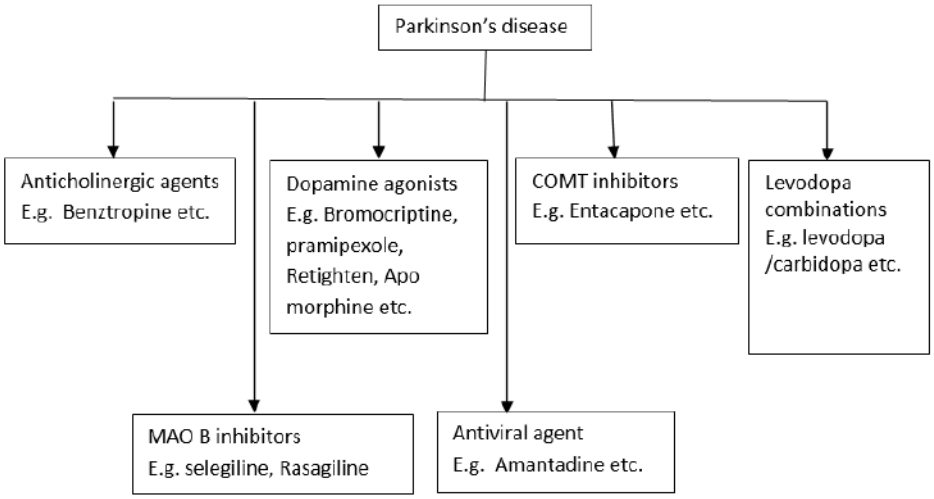

Fig 3: Parkinson's disease

Mechanism of action

Levodopa: Dopamine itself does not go the blood-brain barrier, but it's immediately precursor, levodopa, is with no trouble transported into the CNS and is transformed to dopamine within the brain. Big doses of levodopa are required, because a lot of the drug is decarboxylated to dopamine within the periphery, resulting in aspect outcomes that consist of nausea, vomiting, cardiac arrhyth mias, and hypotension. Carbidopa: The outcomes of levodopa at the CNS can be substantially better through coadministering carbidopa, a dopa decarboxylase inhibitor that doesn't move the blood-brain barrier. Carbidopa diminishes the metabolism of levodopa inside the gastrointestinal (GI) tract and peripheral tissues; for that reason, it increases the provision of levodopa to the CNS. [10].

Function of BDNF in Parkinson's sickness

BDNF performs a position in the advertising of the survival and function of striatal dopaminergic neurons and in regulating synaptic connectivity. other research have shown that BDNF mind and peripheral tiers are decreased in PD patients in comparison to HC verified that remedy with anti parkinsonian pills mayrise BDNF ranges. The position of physical interest in preventing PD onset or development has additionally been verified. BDNF maximum widely expressed and properly characterized member of the neurotropic family within the mammalian mind. It generated following cleavage of the precursor protein proBDNF and BDNF BDNFpro and the prodomuin are all biologically energetic functionally, BDNF has roles in various degree of neuronal in numerous of neuronal circuit development and additionally alter neural citrate shape and synaptic plasticity in person mind in molecular function BDNF in CNS and exceptionally lighting its therapeutic potential for situation which includes Parkinson's ailment stroke and spinal twine injury [12].

Alzheimer's disease (ad)

Alzheimer's disorder is a neurological ailment wherein the loss of life of brain cells reasons reminiscence loss and cognitive decline. A neurodegenerative kind of dementia, the disease starts offevolved moderate and receives gradually worse. [13, 14]

Pathology

The traditional neuropathological signs and symptoms of Alzheimer's disease are amyloid plaques and neurofibrillary tangles. Plaques consist largely of the protein fragment beta-amyloid. This fragment is made from obvious molecule called amyloid precursor protein. Tangles consist of tau, a protein typically concerned in keeping the inner structure of the nerve cell. at the same time as tau is commonly changed by means of phosphorylation, or the attachment of phosphate molecules, excessive phosphorylation appears to make contributions to tangle formation and stops the protein from sporting out its regular functions. Oxidative stress, or harm to mobile systems by using poisonous oxygen molecules known as free radicals, is also appeared as a pathology characteristic of Alzheimer's. People with Alzheimer's normally revel in brain inflammation. Many of the oldest sufferers with Alzheimer's show symptoms of cerebrovascular disease further to traditional Alzheimer's neuropathology

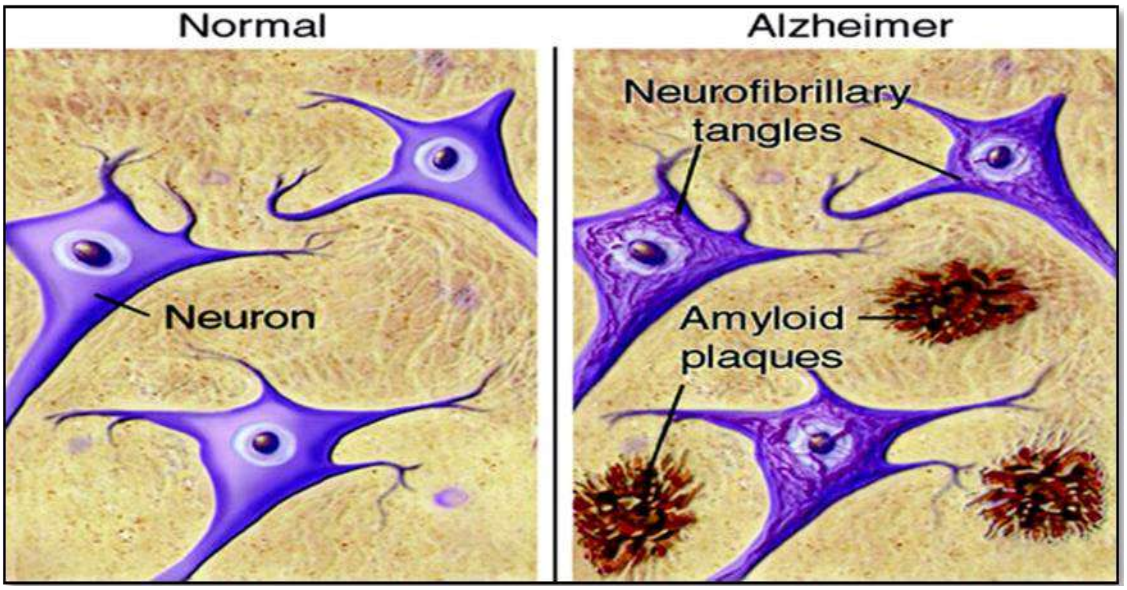

Fig 4: Pathogenesis of Alzheimer's disease

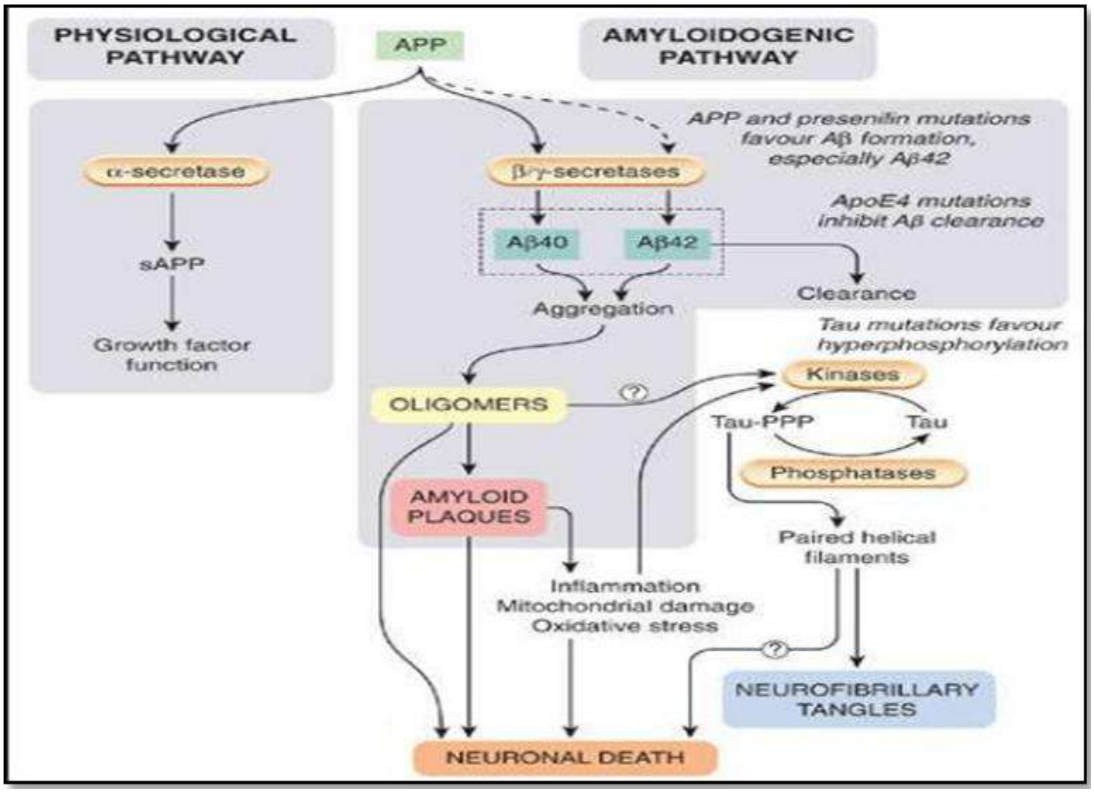

Fig 5: Pathogenesis of Alzheimer's disease

Symptoms

Normal early signs and symptoms of Alzheimer's may also include: reminiscence: often forgetting recent activities, names and faces. Repetition: becoming increasingly more repetitive, e.g. repeating questions after a totally quick interval. Misplacing matters: frequently misplacing objects or setting them in peculiar places. Confusion: Uncertainty approximately the time of day. Disorientation: mainly faraway from everyday surroundings. Language problems: locating the right phrases. Temper and conduct: some human beings turn out to be disinterested in what's going on around them, turn out to be irritable, or lose confidence memory and wondering abilties: humans will discover that their capability to consider, suppose and make selections worsens. Conversation: communique and language come to be tougher. Behavior: a person's conduct might also trade and some people can grow to be unhappy or depressed. Anger and agitation become more not unusual and people may additionally develop anxieties or phobias. Hallucinations: humans can also revel in hallucinations, where they may see matters or human beings that aren't there. Restlessness: problems with dozing and restlessness at night often arise. Unsteadiness: humans may additionally turn out to be increasingly unsteady on their feet and fall more frequently. Each day activities: human beings steadily require extra help with daily sports like: dressing, toileting and consuming.

Treatment

Following drugs used in treatment of Alzheimer's disease [13, 15].

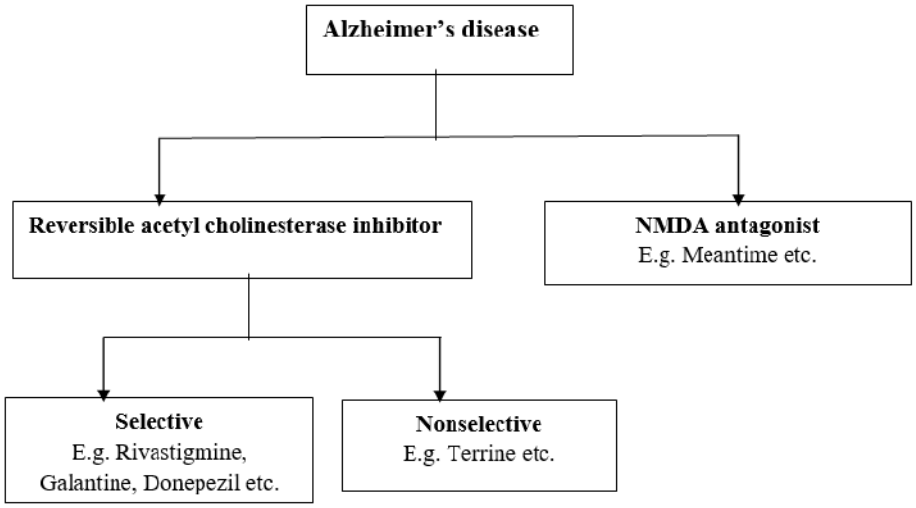

Fig 6: Alzheimer's disease

Mechanism of Action of Memantine

Memantine is the primary in a singular class of Alzheimer's disease medicinal drugs acting at the glutamatergic machine by way of blockading NMDA receptors. It turned into first synthesized by using Eli Lilly and agency in 1968 as a capability agent to treat diabetes; the NMDA interest become found inside the Nineteen Eighties. Memantine is marketed beneath the manufacturers Namenda / Auxura / Ebixa and memory amongst others. Memantine has been proven to have a modest effect in slight-to-extreme Alzheimer's ailment and in dementia with Lewy our bodies. Notwithstanding years of studies, there is little evidence of impact on mild Alzheimer's disease [17].

Role of BDNF in Alzheimer's disease:

It has been suggested that the early reminiscence dysfunction visible in Alzheimer's ailment may be related to the levels of BDNF in the hippocampus. Proof to guide this consists of appreciably decreased BDNF mRNA levels in Alzheimer's sickness hippocampus and parietal cortex and decreased protein levels of BDNF in entorhinal cortex, hippocampus, and temporal, frontal and parietal cortex. In contrast to mature NGF, mature BDNF protein can be visualized by way of western blotting, collectively with its seasoned-form. Both paperwork have now been proven to be decreased in Alzheimer's ailment, with a discount in mature BDNF of 23% reported in frontal cortex moreover a modern lower from everyday turned into visible in proBDNF in MCI (21%), and compared with Alzheimer (30%) parietal cortex [18].

Huntington's ailment

About Huntington sickness is a monogenetic hereditary neurodegenerative sickness caused by a defective gene on chromosome four. the HD gene is liable for generating a protein referred to as Huntington, a protein this is observed during the frame`s tissue however this is most concentrated in the brain. [19].

Pathology

Huntington sickness additionally known as Huntington chorea, an exceedingly rare, and forever deadly, hereditary neurological ailment this is characterised through abnormal and involuntary movements of the muscular tissues and innovative loss of cognitive capability. The disorder became first described by the american medical doctor George Huntington in 1872. Signs and symptoms of Huntington ailment typically seem between the whole of 35 and 50 and get worse over time. They start with occasional jerking or writhing actions, called choreiform movements, or what seem like minor troubles with coordination; these actions, which might be absent all through sleep, get worse over the following couple of years and development to random, uncontrollable, and frequently violent twitchings and jerks. Symptoms of intellectual deterioration may also seem which includes apathy, f

moodiness; these symptoms may progress to memory loss, dementia, bipolar disease, or a toddler of a person with Huntington ailment has a 50 percentage chance of inheriting the genetic mutation related to the sickness, and all folks that inherit the mutation will eventually increase the ailment. The genetic mutation that reasons Huntington disorder happens in a gene known as HD (formally named Huntington [Huntington disease]). This gene, that's located on human chromosome 4, encodes a protein known as Huntington, which is shipped in certain areas of the mind, in addition to different tissues of the body. Mutated kinds of the HD gene include abnormally repeated segments of deoxyribonucleic acid (DNA) referred to as CAG trinucleotide repeats. Those repeated segments bring about the synthesis of huntington proteins that incorporate lengthy stretches of molecules of the acid glutamine. While those odd huntington proteins are reduce into fragments for the duration of processing through cell enzymes, molecules of glutamine challenge out from the ends of the protein fragments, causing the fragments to stick to different proteins. The ensuing clumps of proteins have the ability to purpose neuron (nerve mobile) dysfunction. The formation of strange huntington proteins leads to the degeneration and eventual loss of life of neurons inside the basal ganglia, a couple of nerve clusters deep inside the brain that control motion.

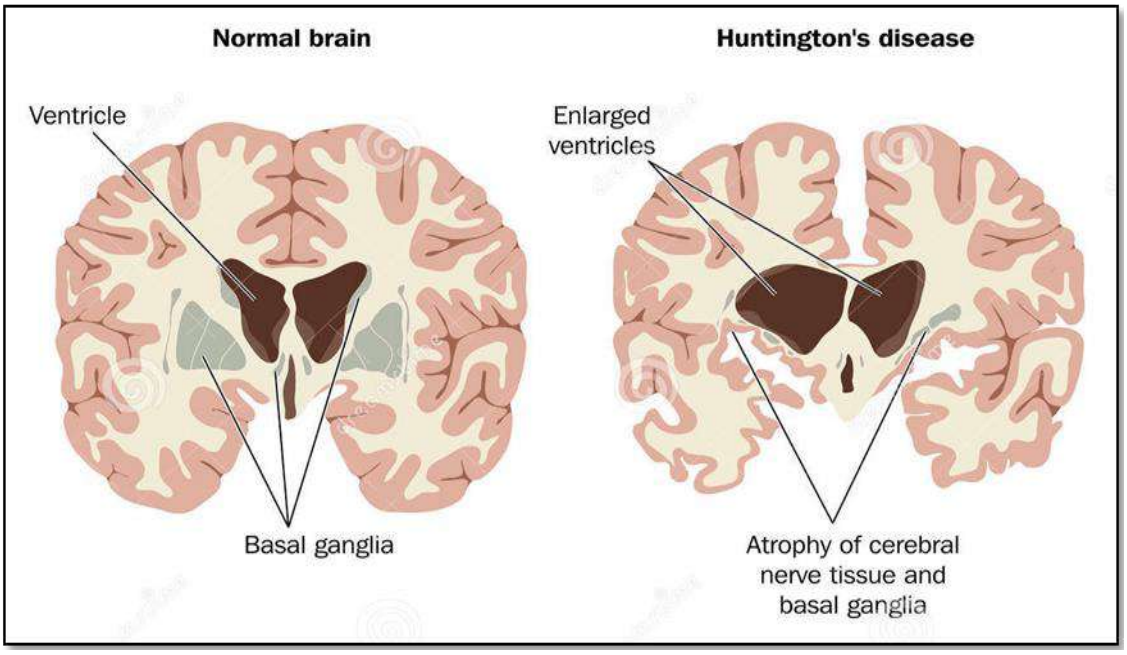

Fig 7: Pathogenesis of Huntington`s Disease

Symptoms

Signs and symptoms can appear at any age, but maximum commonly do so between the 35 and fifty five years. Below is a list of signs which can be relevant in a few instances. it is crucial to do not forget these may also vary depending at the character: moderate uncontrollable actions, Clumsiness, Stumbling, some moderate symptoms of lack of emotion, lack of recognition, moderate attention troubles, Lapses in brief-term memory, melancholy, mood modifications - this can encompass antisocial conduct and aggression [19].

Treatment

Following drugs used in treatment of Huntington Disease

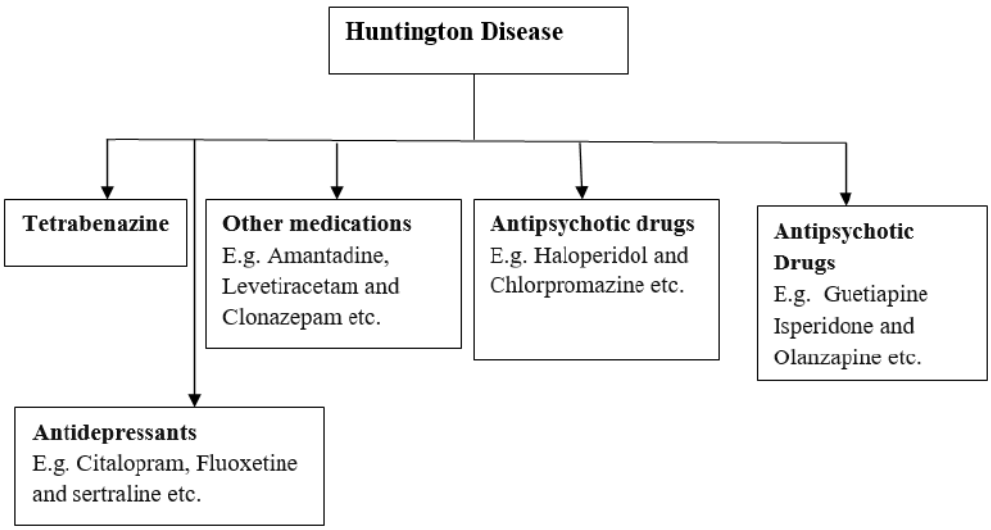

Fig 8: Huntington's disease

The Mechanism of Action

Citalopram

The antidepressant, antiobsessive-compulsive, and antibulimic movements of citalopram are presumed to be linked to its inhibition of CNS neuronal uptake of serotonin. Citalopram blocks the reuptake of serotonin on the serotonin reuptake pump of the neuronal membrane, improving the moves of serotonin on 5HT1A autoreceptors. SSRIs bind with considerably less affinity to histamine, acetylcholine, and norepinephrine receptors than tricyclic antidepressant pills [20].

Role of BDNF in Huntington's disease

BDNF performs a function in the mechanism of antidepressant drug motion. The antidepressants known to affect BDNF ranges are selective serotonin reuptake inhibitors (SSRIs) and lithium moreover, memantine, riluzole, (a non-competitive inhibitor of ionotropic glutamate NMDA receptor) cystamine and cysteamine, have lately been proven to growth BDNF levels and their results on HD had been Serotonin might also have defensive consequences on striatal and cortical neurons by using activating cyclic AMP and CREB signals, which additionally cause BDNF expression; different target genes of cyclic AMP-CREB signalling that may play a role within the neuroprotective effect of SSRIs include Bcl-2 and NFKB.

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A Review on Antidepressant Activity

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Abstract

Depression is a widespread psychiatric disorder affecting around 21% population of the world. It is fourth leading cause of disease trouble universal by ranked and it is expected to turn into the second most immobilizing disorder. Moreover, it is not easy to expect which patient will retort to whichever given treatment. At present obtainable antidepressant drugs are effective and harmless, but limitations range from a delayed start of action to a considerable rate of non-responders. In the systems of traditional medicine, numerous plants and formulations have been used to take care of depression for thousands of years. The presently using drugs can impose a variety of side effects including cardiac toxicity, hypopiesia, sexual dysfunction, body weight gain and sleep disorder. During the last decade, there is a growing interest in the therapeutic effects of natural products on mental disorders.

Keywords*: - Depression, Neurotransmitters, Antidepressant drugs, Mechanism, Pathophysiology, Medicinal plants*

INTRODUCTION

Depression is a chronic mental disorder that causes changes in mood, thoughts, behavior and physical health. It's a common but serious disease that can take away a person's ability to enjoy life and cause decline in capacity to undertake even the simplest daily tasks (1). Other than its chronic nature, symptoms associated with this mental disorder are often recurring and life threatening. According to the World Health Organization (WHO) unipolar depression is one of the leading causes of disability-adjusted life year (DALY) and approximately 350 people worldwide are

said to suffer from this mental disorder (2). As described in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM- V) , the hallmark of major depressive disorder (MDD) is the occurrence of depressed mood (dysphoria) and loss of interest in activities that were rather pleasurable in the past (anhedonia) for a duration of at least two weeks (3). These symptoms must also be accompanied by at least four of the following manifestations such as changes in appetite or weight, sleep patterns, altered psychomotor activity, feelings of worthlessness or guilt, difficulty concentrating or making decisions and recurrent thoughts of death or suicidal ideation (4). Even though there are plenty of drugs developed for the management of depression, one of the challenges in dealing with this disease is that a significant portion of the patients taking antidepressants fail to attain full remission (5). Some patients also develop treatment resistant depression in which the patients fail to respond to the available drugs or other therapeutic approaches.

DEPRESSION

Definition

Depression is a chronic mental disorder that causes changes in mood, thoughts, behavior, and physical health (6). It's a serious but common disease that cans away a person's ability to enjoy life and cause decline in capacity to undertake even the simplest daily tasks (7).

Symptoms

1. Feelings of unhappiness or sadness
2. Loss of pleasure in normal activities or interest
3. Frustration or irritability
4. Excessive sleeping or insomnia
5. Changes in appetite
6. Reduced sex drive
7. Restlessness or agitation
8. Slowed speaking, thinking or body movements
9. Tiredness, loss of energy, fatigue
10. Frequent thoughts of death, suicide or dying

Types of depression

1. Major depressive disorder

Major depressive disorder is also known as unipolar depression. In this type of disorder of depression typically show anhedonia and dysphoric mood followed by physical changes in such as enhanced or reduced appetite, weight gain or loss, sleep alteration in pattern and sustained fatigue (8). Disturb in executive and cognitive functions are also demonstration by coherent thinking and lack of

concentrations as well as morbid brooding by thoughts of suicide and death (9).

2. Dysthymic Disorder

Dysthymic disorder is known as persistent depressive disorder (10). Patients display sadness or depressed mood that persists for the majority of the duration of the day for a minimum of two years in one year in adolescents and adolescents and adult. Majority of the major depressive disorder patients do not meet the full criteria of as there is interruption by remission of shorts periods (11).

3. Melancholic Depression

There is an almost absolute lack of ability to experience pleasure in all or almost everything. Morning mood is a worst and apparent in the psychomotor retardation is in this patients of subset (12). This type of depression is seen major frequently in the aged, in patient with psychotic depression and more severe form of depression (13).

4. Seasonal Affective Disorder

Seasonal affective disorder is depression type that's related to changes in seasons. This type of depression described as recrudesces by the year early winter or during fall (14). This seasonal affective disorder is characterized by feelings of guilt, low mood, increased irritability and worthlessness, shared symptom with other depressive disorder (15). Patients show a significant carving for foods high in carbohydrates and increased in appetite which results in obesity (weight gain).

5. Post-Partum Depression

Post partum depression is described group of heterogeneous depressive symptoms that have an effect on mothers (16). These symptoms may outward after or before giving birth. Half of the "postpartum" episode starts before the delivery time. Thus, are assigned to inclusively as "peri-partum" episodes (17). According to DSM-V anxiety and mood swings symptoms during pregnancy.

6. Psychotic Depression

Psychotic depression is depressive disorder is describe which is accompanied and very severe and psychotic symptoms. It is seen commonly as a combination of depression and psychosis that is not distinct into more of the two (18). It includes the symptoms of psychotic features such as delusions or hallucinations. Other than that its severe psychotic depression is related with poor response, prolonged course to higher relapse rate and available drugs (19).

EPIDEMIOLOGY OF DEPRESSION

Depression is a large universal burden of disease and affects people in all communities across the world and 450 million people experience from several type of behavioral and mental disorder (20). The one year currency of depression is 4-8% and the lifetime currency for major depression as 14-17%. The lifetime currency rates of depression among men are 5-12% and women are 10-25%.

Moreover, bipolar disorder and major depression were associated with three fold increased risk of premature mortality as compared to general population.

The prevalence of depression in children is low and then increases in all the way through adolescence with a one-year prevalence of 4-5% in intermediate to late juvenescence (21). Depression is large risk aspect for suicide observed in adolescents; it's one of the main causes of death in this age group (22). Depression also leads to educational impairments and serious social and associated with substance abuse, increased rate of smoking, obesity.

ANTIDEPRESSANT DRUG

1) ***Selective serotonin re-uptake inhibitors (SSRIs)***
   e.g - Fluoxetine
   Citalopram

2) ***Serotonin and norepinephrine re-uptake inhibitors (SNRIs)***
   e.g - Amoxapine
   Desipramine

3) ***Monoamine oxidase inhibitors (MAOIs)***
   e.g - Clorglyline

4) ***Tricyclic antidepressants (TCAs)***
   e.g - Imipramine

5) ***Tetracyclic antidepressants***
   e.g - Amoxapine
   Desipramine

6) ***Serotonin receptor modulators (SRMs)***
   e.g - Trazodone

ANTIDEPRESSANT MECHANISMS

Neurotransmitters are endogenic chemicals that communicate signals covering a synapse from one neuron to another 'target' neuron. Brain neurotransmitters competency not be secreted in sufficient amounts to relieve disorders of mood (23). The chemicals like melatonin, dopamine and serotonin are the most essential in brain for sense. Onetime the nerves are robbed of those neurotransmitters, they

can't send messages to different nerves which leads to depression (24). The messages that are passed direct the neurons are exhibited as behavior, emotions, appetite, temperature, or several alternative functions. Low levels of norepinephrine and serotonin within the conjugation area leads to depression (25). Hence, antidepressant like medicine used to treat this works by enhancing the number of restricted neurotransmitter in that specific part of the brain which authorizes to transfer the message (26).

All type of antidepressant works at brain among small differences, all antidepressant medicine affect the neurotransmitters how to work within the brain, mainly norepinephrine and serotonin, thus manage the balance of the neurotransmitters.

Selective serotonin reuptake inhibitors have different mechanism of action. SSRI has three different serotonin reuptake inhibitors those are paroxetine, sertraline and fluoxetine (27). These have selective effect for both fluvoxamine and citalopram on the serotonin reuptake pump. It leads to primary enhance in serotonin at the cell body and dendrites (28). So, SSRLs act by blocking the serotonin reuptake pump (5-HTT).

Serotonin norepinephrine reuptake inhibitors SNRIs block both norepinephrine transporter (NET) and 5-HTT. Blocking those transporters prohibit the neuron from vaccuming up extreme neurotransmitters, granting a lot of to stick in the synapse and excite postsynaptic receptors (29).

Monoamine oxidase inhibitors (MAOIs) MAOIs aren't retake blockers as all they enhance neurotransmitter amount by inhibiting monoamine oxidase (MAO), relate enzyme that breaks down all 3 monoamine like dopamine, serotonin, and monoamine neurotransmitter (30). Thus, MAOIs enhance the level of all 3 neurotransmitters thought critical in depression; these are adequacy advantage by others (31).

Tetracyclic and Tricyclic antidepressant alleviate depression by affecting naturally happen chemical messengers (32). Cyclic antidepressants generally block the results of 2 neurotransmitters known as norepinephrine and serotonin these are accessible in the brain. This looks to assist brain cells receive and send messages (33). The roles of these chemicals have treat the depression.

Serotonin receptor modulators are used in the treatment of irritable intestine syndrome. Serotonin plays a important role in the humour reflexes and initiation of peristaltic, and in alteration of visceral sensations.

Lithium utilized for manic depression. Manic depressive patient's ability serious mood changes, starting from frenzied state to sadness or depression relate degree excited.

NEUROTRANSMITTER SYSTEM

The adrenaline, noradrenaline, dopamine, catecholamine from the adrenergic system in the Central Nervous System. Some of these adrenergic neurons discharge catecholamines in to the frontal cortex and radiate from the ancient limbic system (emotional centres) (2). The catecholaminergic pathways are responsible for mood stress (flight or fight), alertness responses. Serotonin is the main neurotransmitter regulates the excitatory catecholamine system of the Central Nervous System. Serotonin neurons are important as the control of mood, appetite, sex drive, memory (34).

The noradrenaline and serotonin system have their most important cell bodies in small region of the brain stem that serve as headquarters for sending axonal projections throughout the brain in specific pathways that mediate specific functions (35). Multiple noradrenergic and serotonergic pathways may be dysfunctional in depression generating many different symptoms.

The projection of the serotonin system arises from the nuclei of the raphe magnus and dorsal raphe. The serotonin receptors (5-HT) have been identified into various sub-types with 5-HT1 and 5-HT2 sub types being of greater interest in psychiatry. Subclass is 5-HT1A which is concentrated in hippocampus and raphe. These receptors are implicated as autoreceptor that modulate 5-HT release from presynaptic neurons. The 5-HT2 receptor occurs in high concentration in the nucleus accumbens and frontal cortex.

HYPOTHESIS OF DEPRESSION

Several hypotheses of the biological determinants of depression have emerged over the most important of these and the implications therefore are reviewed below. Today it is generally accepted that depression is not necessarily due to a shortage of one vital brain neurotransmitter, but rather to a disruption in the equilibrium between different regulatory systems

1. The monoaminergic hypothesis of depression

This hypothesis has develop to contemplate the prospect that depression can be the result of a inadequacy in signal transduction against the monoamine neurotransmitter to its postsynaptic neuron, even with normal levels of receptor and neurotransmitter being present (3). The monoaminergic hypothesis of depression accept that the major symptoms of depression are the result of inadequate concentration of serotonin (5-HT) and noradrenaline (NA) in the synaptic clefts related to neurons in the brain (36). Emerging theories that link environmental and genetic and risk factors for depression by resulting in less key gene products, down regulating certain genes, such as brain derived neurotrophic factor (BNDF), being produced. So if the encoding gene is repressed the result may be atrophy or even apoptosis of neurons (37).

2. The dopamine hypothesis of depression

The original hypothesis was formulated in the late nineteen seventies by Solomon snyder and linked schizophrenia with dopamine (DA) activity (38). Later this hypothesis was extended to include depression following the observation that many antidepressants influence the metabolism of dopamine following chronic antidepressant treatment, the presynaptic DA receptors become subsensitised and this result in an increase in DA release (39). A decrease in homovanllinic acid (HVA), the main metabolite of dopamine, in the cerebral spinal fluid (CSF) of decreased patients who demonstrate marked motor retardation has also been reported (40). Therefore, a reduced in the ratio of HVA to DA is indicative of decreased turnover of DA (41). This hypothesis is also supported by reports of significantly reduced dopamine turnover in depressed suicide victims (42).

3. The permissive hypothesis of depression

This hypothesis emphasizes 5HT as a neuromodulator and its importance as a target for antidepressant action. According to this theory, a lowered concentration within the Central Nervous System (CNS) of 5-HT results in an affective state regulated by NA (43). Decreased NA and 5-HT levels will give rise to depression. This means that 5-HT can act as a permissive modulator of neurotransmitter functions through connections between serotonergic pathways and make connections with dopaminergic and

noradrenergic pathways via the associated receptors (44).

4. The glutamatergic N-methyl –D-aspartate hypothesis

Current discovery specify that the affliction of CNS glutamatergic pathways can play a role as in mechanism involved in depression (45). Several studies have independently confirmed that compounds which reduce activity at the NMDA receptors produce similar effects to clinically active antidepressants. It is therefore hypothesized that adaptive changes in the NMDA receptor complex could be a common pathway affected by all antidepressants (46).

MEDICINAL PLANTS USED IN DEPRESSION

Medicinal plants throughout the world have been utilized to treat disorders of the body and the brain since antiquity. Herbal medicine has been a proper alternative for the management of mental disorder such as depression, anxiety, and dementia between plenty others. Discovering antidepressants from herbal sources appear to be proper approach due to their lower prevalence of side effects and therapeutic efficacy (47). Hyperforin and hypericin are flavonoids present in hypericum that are claimed to be important for the antidepressant activity of the plant.

Medicinal plants largest universally used to treatment of depression throught the world are *Centella asiatica, Hypericum perforatum, Rauwolfia serpentina, Pfaffia paniculata, Schizandra chin, Rhododendron molle, Thea sinensis, Valeriana officinalis, Uncaria tome, Withania somnifera.*

There is a long history of using plants for treating different diseases in Ethiopia. This herbal based therapy is high valued and has passed from one generation to another generation by word of mouth. Herbal therapy closed continues to be the first preference treatment option for nearly 80% of the population. Plants such as *Whitiana somnifera, Justica odora, Calpurnia aurea and Aspargus leptocladodius* have traditionally been used for depression treatment (48).

1. Clitoria ternatea

Mood disorders are one of the major common mental sicknesses with a lifetime risk of 10% in the widespread population. Most of the drugs that are currently being used within the treatment of depression adversely influence the quality of life of the patients. This leads to patient's non-

compliance with medication, which further complicates the problem.

In the present study, clitoria ternatea (150 and 300 mg/kg) produced significant dose dependent antidepressant effect in behavioral despair tests. The plant clitoria ternatea contains tannin; the antidepressant activity may be due to MAO inhibition, thereby enhancing norepinephrine and dopamine levels in the brain (11).

2. Zingiber officinale

Ayurveda mentions a number of single and compound drug formulations of plant origin that are used within the treatment of psychiatric disorders and are claimed to have a better side-effect profile than conventional drugs.

Zingiber officinale (150 and 300 mg/kg) significantly ($p<0.001$) and dose dependently decreased the immobility time as compared to group of control mice. Thus, the activity of zingiber officinale could involve particular mechanisms of the established agents as described above.

As medicinal plants possess their importance considering ancient time, people are using it from different ways by medicine source. From the highly beneficial animal study, we achieve that the plant extract zingiber officinale show a significant antidepressant activity in TST and FST models of depression (20).

3. Magnolia officinalis

Magnolia officinalis, M. dealbata, M. grandiflora, M. obovata and are the plants from family Magnoliacea which are used to treatment of neurological diseases such as depression, convulsion, seizure, and anxiety and as sedative and painkiller.

Magnolol and honokiol are two main compounds identified in these plants. These compounds came to be reported to cause antidepressant effects through affecting serotonergic system investigated the effect of the oral use of such two compounds at mild chronic stress induced depression. Mild chronic stress caused reduced in 5-HT and its metabolite, 5-HIAA, in different parts of the brain and abolish the activity of platelets adenylyl cyclase.

These two compounds caused the changed value of adenylyl cyclase, 5-HIAA, 5-HT, and corticosterone to return to baseline levels. The antidepressant effects of honokiol and magnolol in this study were assign to the improvement of the induced disturbance in HPA axis, AC-cAMP pathway, serotonergic system (49).

4. Hypericum perforatum

In the current years, H. perforatum has exist competing for being commercially accessible as an antidepressant and for this reason some studies have been manage to discover the chemical compounds responsible for this effect and their action mechanisms. Biochemicals investigations possess determine that H. perforatum is a weak inhibitor of monoamine oxidase but inhibits synaptosomal restoration of dopamine, serotonin, and norepinephrine. H. perforatum extract exerts down-regulatory effect on beta-adrenergic receptors and up-regulatory result on serotonin receptors, and changes the neurotransmitters concentrations in definite regions of the brain.

The antidepressant effects of H. perforatum certain compounds like as Hyperforin, hypericin, and isoquercetin have been demonstrated (50).

5. Rosmarinus officinalis L.

R. officinalis is from family Labiatae and has numerous pharmacological effects including ant diabetic, antibacterial, and anti-oxidant, hepatoprotective, anticoagulant, antiulcer, diuretic and anti-inflammatory. An experimental study showed that hydroalcoholic R. officinalis extract (100 mg/kg) with treatment significantly reduced immobility duration in suspension in mice and forced swim test. Pretreatment with pchlorophenylalanine (serotonin synthesis inhibitor), NAN-190 (receptor antagonist 5-HT1A), ketanserin (receptor antagonist 5-HT2A), mCPBG (antagonist receptor 5-HT3), prazosin (1 adrenoreceptor antagonist), SCH23390 (D1 dopamine receptor antagonist), and sulpiride (D2 dopamine receptor antagonist) inhibited the antidepressant effects of R. officinalis extract (49).

6. Passiflora foetida

At the basis of the clinical association of stressful life events and depressive episodes, many of the animal models for the antidepressant evaluation of drug activity evaluate stress –precipitated behaviors. Harmaline alkaloids present in p.foetida doing by reversible monoamine oxidase inhibitors and in common with other beta caroline binds to HT (5-hydroxy tryptamine) receptors. MAO regulates the metabolic degradation of catecholamines, serotonin and other endogenous amine in central nervous system. Inhibition of this enzyme causes a reduction in metabolism and subsequent increase in the concentration of biogenic amines. Also the flavonoid components of MERF might be interacting with adrenergic and

serotonergic systems in mediating the antidepressant effects of MERF (51).

CONCLUSION

Depression is an incapacitating disease which needs appropriate treatment. This presentation reviews the pharmacology of antidepressant drugs and the future perspectives of treating mood disorders such as depression. The foremost theory for explaining the biological basis of depression has been the monoamine hypothesis. Depression is due to a deficiency in one or other biogenic monoamines (serotonin, 5-HT; noradrenaline, NA; dopamine, DA). Antidepressant drugs are therefore classified according to their ability to improve monoaminergic transmission. Since this first theory, other explanations based on abnormal function of monoamine receptors or associated with impaired signaling pathways have been suggested. Notable progress has been accomplished in the treatment of major depressive disorders with new compounds recently discovered (selective serotonin reuptake inhibitors: SSRI; serotonin noradrenaline reuptake inhibitors: SNRI). Behavioral, electrophysiological and micro dialysis studies have shown that serotonin (5-HT) receptors exert a key role in modulating antidepressant activity.

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FORMULATION AND EVALUATIONS OF HERBAL FACE PACK

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ABSTRACT

Ayurvedic face packs help store the wrinkles, pimples, acne and dark circles. They even make the skin more fair and smooth. The Natural Face Packs do contain some essential vitamins required for our skin's health and glow. Such compounds are also proving beneficial in many ways for our bodies. Natural facial packs a less complex.They help us look after the skin and also prove its worthiness by through blood circulation within the facial veins.

KEYWORDS: Hibiscus, Sandle wood, Multani mitti, Orange peel, Termeric, Neem.

1. INTRODUCTION

Cosmetics are described as the products used to purify, embellish, encourage or alternate the appearance. Various herbs have been used since ancient times to clean, beautify and treat them. The herbal pasties, called "Mukhalepa" in ayurveda, were used as facial therapy.[1] For the treatment of acne, pimple, rash, stains and pigments, this herbal paste smeared on the face Face pack is the smooth powder used for facial application. Herbal face packs are cheaper and have no side effects to get fair skin naturally Current research article deals with the formulation and evaluation of herbal face pack for radiant skin at home using natural materials such as multani mitti, turmeric, aloe vera, sandalwood, lemon peel, rose petal powder, manjistha, lodhra and gramme flour.[2] Various skin types require various kinds of herbal face packs. Home made natural face packs and masks make way for smooth, healthy and silky skin. In ayurveda, the herbal paste applied to the face is known as "mukhalepa" for treating acne, pimples, wounds, stains and pigments "Mukhalepana" is the process of smearing a herbal mix on face. This therapy is now popularly termed as facial. Face pack is the smooth powder that is used for facial application

and a good herbal face pack will supply the skin with the necessary nutrients and should penetrate the subcutaneous tissues to supply the nutrients needed.[3]

These packs are available in various styles and forms and are generally categorized as:[4]
Plastic masks: wax-based, latex-based, or vinyl-based[4]
Hydrocolloid masks: Gel masks (ready to use)[4]
Argillaceous masks: clay-based or earth-based (ready to use or dry powder)[4]

Chemically prepared facepack

Chemically formulated face packs provide vital nutrients to the skin.
Helps to popular, depending on the ingredients,
acne, pimple, scar, black head and markings.

Advantages[5]

1. They help recover the skin's missing shine and glow in a short period of time.
2. Daily use of the natural face masks gives skin shine, enhances skin texture and teint.

Disadvantages[5]

1. The One Face pack should not be Apply All Over The Face:
2. -As every part of our face doesn’t have the same type of skin.
3. Sometimes it takes longer duration of time for drying of face pack.
4. It may cause the irritation. Sometimes face pack cause redness to skin.
5. There is difficulty of application of face pack for dry skin person.

Benefits of applying face pack[6]

Nourishes the skin. Fruit facepacks supply essential nutrients to skin.
Helps to reduce, acne, pimple, scars and marks depending on its herbal ingredients. Usually face packs made of neem and tulsi help to reduce acne and pimple. Facepacks which are recommended for acne, pimple, black heads usually control the over discharge of sebum from sebaceous glands and remove the harmful bacteria inside acne lesion. The scars and marks of skin can be reduced by adding fine powder of sandal, rose petals and orange lentils with acne face pack.Face packs usually remove dead cells of skin.These face masks provide a soothing and relaxing effect on skin.They help to restore the lost shine and glow of skin in short span of time.Regular use of natural face masks bring glow to skin, improves kin texture and complexion.The harmful effects of pollution and harsh climates can be effectively combated

with judicial use of face packs.They help to prevent premature aging of skin. Formation of wrinkles, fine lines and sagging of skin can be effectively controlled by using natural face packs. Natural face packs make the skin look young and healthy.

Precautions to be taken while applying face pack[7]

Select the face pack according to your skin type. Take opinion of natural therapist or concerned skin expert before applying face pack.

The face pack should not be left on face more than 15 to 20 minutes. Keeping for very long time may result in formation of wrinkles, sagging of skin and enlargement of open pores.

Apply face pack once in a week.

Don't try to peel or scratch the dried face pack. This may harm under lying skin. Spray water (which is at room temperature) on face before removing dried face pack. After removing the mask, roll an ice cube on facial skin. This helps to close open pores and tightens skin. It also tones and sooths the skin.

Do not scrub face vigorously. This may result in eruption of pimples and dark spots.
Stay away from heat when you have applied face pack.

Avoid applying face pack near "eye zone". The skin around eye is very delicate. The process of removing face pack may damage skin around eyes.

2. MATERIAL AND METHOD

Material

Sr. no.	Material	Manufactured by
1	Hibiscus Sabdariffa powder (Jasmine)	Waghdole Aayurvedic's
2	Azadirachta Indica powder (Neem)	Waghdole Aayurvedic's
3	Curcumina longa powder (Termeric)	Waghdole Aayurvedic's
4	Citrus Aurantium powder (Orange peel)	Waghdole Aayurvedic's
5	Sandle wood powder (Chandan)	Waghdole Aayurvedic's
6	Embilica Officinalis powder (Amla)	Waghdole Aayurvedic's
7	Fuller's Earth Clay powder (Multanimitthi)	Sharangdhar

Method

1. **Collection:** Marketed powders were collected.
2. **Formulation table no. 1.**

Table no. 1.

Sr. no	Material	Formula 1	Formula 2
1	Orange peel powder	10%	8%
2	Multani mitti	25%	23%
3	Turmeric powder	10%	8%
4	Neem powder	5%	6%
5	Amla powder	4%	5%
6	Hibiscus powder	26%	35%
7	Sandlewood powder	20%	20%

3. How to use

- Collect powder of all of herbs – Orange peel, Neem powder, Multani mitti, Hibiscus powder, Termeric powder, Amla powder, Sandle wood powder.
- Mix all powder as per formula in dry form.
- Make paste at the time of application by using rose water or aloevera gel.
- Wash the face with fresh water before it dries up.

V (Formulation no.1)

(Rose water)

Formulation

(Before application of face pack) (Application of face pack) (Result after washing)

4. Evaluation Table

4.1) Organoleptic properties

Table no. 2.

Properties	Observations
Nature (Apperance)	Powder
Colour	Creamish Yellow
Odour	Slight
Taste	Characteristic
Texture	Fine

4.2) Genaral powder characteristics

Table no. 3.

PROPERTIES	OBSERVATIONS
Particle size	20-25µm
Angle of repose	32.09º±1º
Grittiness	No gritty particles were found
Nature of face after wash	Soft and fresh, free from dirt

5. Methods of evaluation

Following evaluation parameters were performed to ensure superiority of prepared face pack;

5.1) Organoleptic evaluation

The organoleptic parameters includes its nature, colour, odour, and consistency which were evaluated manually for its physical properties.

5.2) Physical evaluation

The particle size were tested by microscopy method.

5.3) Irritancy test

Mark an area of (1sq.cm) on on the left hand dorsal surface. Difinite quantities of prepared face pack were applied to specific area and time was noted. Irritacy, erythematic, edema, was cheaked if any for regular intervals up to 24 hrs and reported.

5.4) Stability studies

Stability testing of prepared formulation was conducted by storing at different temperature .

6. RESULT AND OBSERVATIONS

(Day 1)

(After 10 days)

Organoleptic evaluation

Face pack was preapared and evaluated for organoleptic parameters showed in table. The colour of formlation was slight yellow. The odour of prepared formulation was good and acceptable which is desirable as cosmetic formulations. The texture and smoothness was good acceptable which is desirable as cosmetic formulation.

Table 4: Organoleptic properties

Table no. 4.

Sr. no.	Parameters	Observations
1	Apperance	Powder
2	Colour	Slight yellow
3	Odour	Slight
4	Texture	Fine
5	Smoothness	Smooth

Irritancy test

The formulation show no irritation, redness, edema and inflammation during irritancy studies. The formulation is safe to use for skin.

Table 5: Irritancy test.

Table no. 5.

Sr. no.	Parameters	Observations
1	Irritant	No irritation
2	Erythema	No irritation
3	Edema	No irritation

Stability study: The stability study shows slight change in pH of formulation which was stored at 40°C and no changes were observed at room temperature and at 35°C. There was no change in colour and odour at other mensioned conditions of stability which were showed in following table.

Table 6: Parameters of stability studies of formulation.

Table no. 6.

Sr. no.	Parameters	Observations		
		Room temp.	35°C	40°C
1	Colour	No change	No change	No change
2	Odour	No change	No change	No change
3	pH	6.8	6	6
4	Texture	Fine	Fine	Fine
5	Smoothness	Smooth	Smooth	Smooth

7. CONCLUSION

In the present scenario, people need cure for various skin problems without side effects. Herbal ingredients opened the way to formulate cosmetics without any side effects. Herbal face packs are considered as sustaining and productive way to advance the appearance of skin. Thus in the present work, it is very good attempt to formulate the herbal face pack containing naturally available ingredients like Hibiscus, orange peel, Neem, Multani mitti, Sandle wood and Amla. It is suggested that the prepared formulation was physically and microbiologically stable and possesses characteristics of standerd cosmecutical formulation for skin care.

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SUSTAINED RELEASE MATRIX TYPE DRUG DELIVERY SYSTEM: AN OVERVIEW

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SUSTAINED RELEASE MATRIX TYPE DRUG DELIVERY SYSTEM: AN OVERVIEW

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ABSTRACT

Sustained drug release formulations are quite helpful in treating chronic diseases. Matrix tablets have been the most likely forms of sustained drug release forms given by oral route. Matrix tablets work by maintaining a constant plasma drug concentration and sustains the rate of release of drug over time and produces therapeutic action for prolonged time period. Extended release plays an important role in formulations having the shorter half-life and high dosing frequency. The matrix controls the rate of release of the drug. Retardants like hydroxy propyl methyl cellulose (HPMC), polyglycolic acid, poly methyl methacrylate are used. The drug is embedded into a matrix core of the retardant. The matrices used may be hydrophobic, bio degradable or mineral types. Different classes of polymers are used in controlling the release of drugs in matrix tablets which may be formulated by wet granulation or direct compression methods. The mechanisms involved in drug release in matrix tablets include both dissolution-controlled and diffusion-controlled. Thus, matrix tablets improve patient compliance by reducing the frequent administration of drug and produce better therapeutic efficacy.

KEYWORDS: Sustained release, Matrix, Polymers.

INTRODUCTION[1,2]

The best route of administration of drugs among all other routes is oral route of Administration. This is because of advantages like low manufacturing cost, ease of administration etc. Many researchers on Rapid and novel delivery had taken place over the past many years. The objective of any drug delivery system is to produce a therapeutic effect

in the specific site to maintain the aspired drug concentration. For the release of medication for a long period of time After administration of a single dose. Sustained release Matrix tablets are used. Matrix tablets are the best commercial affordable sustained action drugs as they can accommodate large doses of drugs, no special requirements while manufacturing. Sustained release matrix type drug delivery system is the novel drug delivery system (NDDS) which plays an important role in improving the therapeutic effectiveness of the drugs by providing controlled, sustained release and by targeting to the desired site. A constant drug level is maintained for a specific period of time so that the adverse effects are cut down. The basic principle of sustained release drug delivery system is to enhance the pharmacokinetic and pharmacodynamic as well as biopharmaceutical properties in a way where its use is maximized, the side effects are cut down and the disease is cured efficiently when compared to conventional dosage forms.

The dosing frequency is reduced with SRDDS As these optimise pharmacokinetic, biopharmaceutics and pharmacodynamic properties of the drug compared to conventional doses forms. Conventional methods and complex procedures like coating and pelletization is not used in the manufacture.

Advantages[1,2,6]

- Therapeutic concentrations Maintain rate constant levels.
- Drug concentration in blood is uniform.
- Reduction in frequency of administration of dose.
- Ease of manufacturing and cost efficient.
- Accumulation of drug is reduced as the frequency of Administration is less.
- The deficiency in treatment can be improved.
- Compliance problems of the patients are reduced.
- Maximizing bioavailability and minimising local side effects.

Disadvantages[3,4]

- Cost of production is high compared to conventional doses form.
- In vivo and vitro correlation is poor.
- First pass metabolism has increased potential.

Rationale of Developing Sr Material Dds[15,19]

- Reduction in truck frequency.

- Reduction of toxicity.
- The activity of a drug having less half life is increased.
- Stabilise plasma level drug concentration.

Principle of Sustained Release Drug Delivery Systems[5,8,9]

The active ingredients are released into and absorption pool by the conventional dosage forms. The solution of drug at absorption site is known as absorption pool. Ke,Kr&Ka are first order rate constant of drug elimination, drug release and drug absorption . In conventional doses form drug release immediate showing that Kr>>>>Ka. But Kr <<<< Ka for non immediate release dosage forms, i.e., The rate limiting step is Release of drug doses form. Zero order kinetics is seen and that is shown by the equation.

Kr°= Rate In = Rate Out = KeCd Vd

Where, K: Zero-order rate constant for drug release- r°Amount/time, K : First-order rate constant for overall e drug elimination-time, C: Desired drug level in the d body – Amount/volume, and V: Volume space in d 4 which the drug is distributed in litre.

Factors Considered In Dosage Form Design[7,11,12]

There are mainly 2 kinds of factors that effect the dosage form design. They are divided into:

1. **Biological factors**

a. First pass effect: Drugs which suffer an extensive first pass effect shows retarded release rate. This retarded release rate affects the bioavailability.

b. Half life: The half-life of a drug is the measure of its time of residence in the body. If the medication has a short half-life (less than 2 hours), a prohibitively large amount of the drug may be found in the dosage form. On the other hand, a drug with a half-life of removal of eight hours or more is adequately maintained in the body when administered in traditional doses and continuous delivery of drugs systems

c. Adverse effects: Prolonging the drug release may develop undesirable adverse reactions.

d. Absorption and solubility: absorption and solubility both are interlinked. incorporation of drugs which are poorly water soluble can cause the reduction in overall absorption efficiency.

2. Physiochemical Factors

a. Drug stability: The important factor in oral dosage forms is the loss of medication in the GI tract by means of acid hydrolysis and/or metabolism. While a drug undergoes degradation in solid states at a much slower rate than a suspended or solution substance. It

is possible to significantly improve the relative bioavailability of a medication that is toxic in the stomach; the most effective control unit would be one that activates its substance only in the intestine.

b. **Aqueous solubility & Pka:** A medication to be absorbed and dissolved in the aqueous phase adjacent to the route of administration site and then partitioned into the absorbing membrane. Two of the most important physicochemical properties of a drug that affect its absorption activities are its aqueous solubility and, if it is soft acid, its pKa. Such properties reward a dominant role in the success of controlled release schemes. Drugs with high aqueous solubility have poor degradation levels and are typically susceptible to oral bioavailability tribulations.

c. **Partition Coefficient:** It is the ratio of the drug in the oil phase to that of the aqueous phase. Drugs having higher partition co efficient are not suitable for oral SRDDS as they won't partition out of the lipid membrane once it gets in the membrane . It can be calculated by the formula

$$K = Co / Cw$$

Co = Equilibrium concentration in organic phase

Cw= Equilibrium concentration in aqueous phase

d. **Diffusivity and molecular size:** The membrane cavitie's size and shape influences the diffusivity. Ntermediate molecular weight drug diffusion coefficient is 100-400 Daltons; 10-6-10-9 cm2/sec is due to flexible polymer array. For drugs having molecular weight > 500 Daltons, the diffusion coefficient in many polymers are very less i.e. less than 10-12 cm2/sec. Proteins and peptides are examples of drugs that are difficult to control drug release level from dosage form.

Requirements To Be Met To Incorporate Drug Into Sustain Release Dosage Form[17,18]

Both the physiochemical and pharmacokinetic properties had to be considered while incorprating the drug into SRDDS:

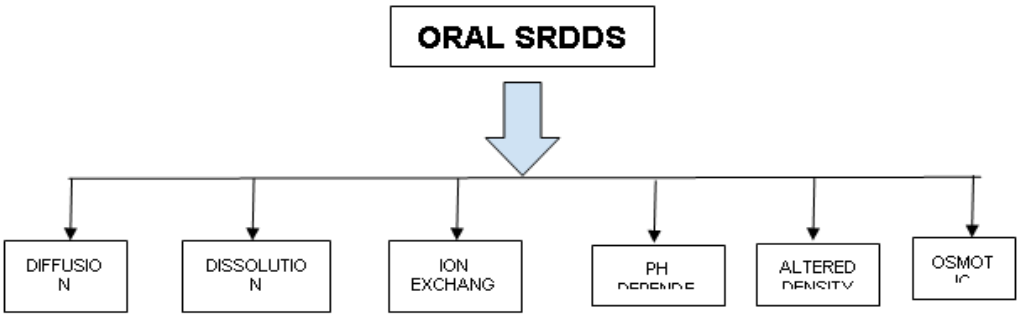
Table No 1: Physicochemical Parameters for Drug Selection.

Parameters	Criteria
Molecular size	< 1000 Daltons
Aqueous Solubility Apparent partition coefficient	More than 0.1 mg/ml for pH 1 to pH 7.8 High
Absorption mechanism	Diffusion
General absorbability From all GI segments	Release Should not be influenced by pH and enzymes

Table No.2: Pharmacokinetic Parameters for Drug Selection.

Parameters	Comment
Elimination half-life	Between 2 to 8 hrs
Absolute bioavaliability	Should be 75% or more
Absorption rate constant (Ka)	Must be higher than release rate
Apparent volume of distribution(Vd) Required for design	Larger Vd and MEC, Larger will be the required dose
Total clearance	Not depend on dose
Elimination rate constant	Required for design
Therapeutic concentration (Css)	The lower Css and smaller Vd, the loss among of drug required.
Toxic concentration	Apart the value of MTC And MEC safer the dosage form

Formulation Strategies[13,14,16]



1. **Dissolution sustained systems:** A product that naturally retains this drug at a slow dissolution rate and reduces its dissolution rate by sufficient salt or derivative formation for those drugs with high water solubility. Generally speaking, these devices are used in the processing of enteric coated dosage forms.Stomach safety from the effects of drugs like Aspirin is used, a coating that dissolves in natural or alkaline water. It delays drug release from the dosage process until the lower pH of the intestine is achieved.
2. **Diffusion sustained system:** It involves the passage of drug molecules from higher concentration to the lower concentration. The flux of drug is given by

   J= - D dc/dx

   D = diffusion coefficient in area/ time dc/dx = change of concentration 'c' with distance 'x'
3. **pH– Independent formulations:** Maintain the constant pH , help to make pH-independent drug release substitutes such as amino acid salts, citric acid, phthalic acid, phosphoric acid and tartaric acid applied to the formulation. Preparation of buffered sustained release formulation is generally done by combining a simple or acidic product with one or more buffering agents, granulating with suitable pharmaceutical excipients, and covering with permeable film forming polymer with gastrointestinal fluid. As

gastrointestinal fluid permeates through the membrane, the buffering agents change the fluid inside by making a constant drug release rate to the correct constant pH.

4. **Ion exchange:** Using ion exchange resin is an appealing strategy for continuous drug delivery as the characteristic of drug release depends largely only on the ionic environment of drug-containing resins and is less sensitive to environmental conditions such as enzyme content and pH at the absorption site zero order release kinetic can be accomplished satisfactorily using this approach.
5. **Altered density:** Not releasing of all the drug contents in GIT causes a limited use, to over come this various methods are developed to increase the resident time in GIT.

a. **High density Approach:** The density of the pellets should be 1-4 gm/cm3 which is more than that of the stomach contents. The drug is coated with heavy inert materials like Zinc Oxide.

b. **Low density approach:** lobular shells with a thickness smaller than that of gastric fluid used as a product carrier for sustained release purposes such as polystyrene, pop rice and popcorn are all used as carriers to undercoat the surface of these empty shells with sugar or polymeric materials such as methacrylic polymer and cellulose acetate phthalate. A mixture of product with polymer such as ethyl cellulose and hydroxy propyl cellulose then coats the undercoated shell. The final product thus remains on the gastric fluid for a long time, while the substance is gradually released.

Table No.3: Examples of Polymers.

TYPE	EXAMPLE
Soluble polymers	Polyethylene glycol (PEG) Polyvinyl alcohol (PVA)
Biodegradable polymers	Polyacetic acid (PLA) Polyglycolic acid (PGA) Polyanhydrates
Hydrogels	Poly-hydroxyethyl methacrylate (PHEMA) Cross-linked polyvinyl alcohol (PVA) Polyacrylamide(PA)
Mucoadhesive polymers	Polycarbophil Sodium carboxymethylcellulose Tragacanth Methylcellulose
Non-biodegradable polymers	Cellulose acetate (CA) Polyethylene vinyl acetate (PVA) Polyether urethane (PEU)
Natural gums	Xanthan gum Guar gum Karaya gum Gum arabic

Classification of Matrix Tablets[10,17]

Matrix tablets can be classified as;

A) On the basis of retardant materials used :

Under this category the matrix tablets are further divided into 5 types:

a) Hydrophobic matrices (plastic matrices)

b) Lipid matrices

c) Hydrophilic matrices

d) Bio-degradable matrices

e) Mineral matrices.

B) On the basis of porosity of matrix:

a) Macroporous systems

b) Microporous systems

c) Non-porous systems.

A) ON THE BASIS OF RETARDANT MATERIAL USED

a) Plastic matrices or hydrophobic matrices

Plastic matrices were first introduced in 1959 by using hydrophobic/ inert materials. In this method; firstly, the drug was mixed with a hydrophobic polymer and then compressed into a tablet. The dispersion of the drug is achieved by the diffusion across a network of channels which exists between compact powder particles. Thus, sustained release is produced. The hydrophobic matrices are made by using polyethene, poly-vinyl chloride and acrylate polymers and their co-polymers. These matrix tablets are inert in nature due to the presence of water and gastro- intestinal fluids. The mechanism of these matrix tablets is diffusion and the liquid penetration is the rate limiting step.

b) Lipid matrices

Lipid waxes are used in the preparation of these matrices. The drug is released from these matrices through pore diffusion and erosion. The sustained release through these matrices is more sensitive to digestive fluid composition when compared to totally insoluble polymer matrix. Carnauba wax is combined with stearyl alcohol/ stearic acid to form the retardant base for most of the sustained release formulation.

c) Hydrophillic matrices

A matrix is defined as a properly mixed composite of one or more drugs using a hydrophilic polymer (gelling agent). The hydrophillc polymer matrix is often used in oral controlled drug

delivery because of the efficiency in obtaining a desirable drug release profile, cost effectiveness and broad regulatory acceptance. These matrices are further divided into three groups based on the polymers used;

- **Cellulose derivatives**

The polymers used in the formulation are methylcellulose 400 and 4000cps, hydroxypropylmethyl cellulose (HPMC) 25, 100, 4000 and 15000cps, hydroxyl ethyl cellulose and sodium carboxymethyl cellulose.

- ***Non-cellulose natural/semi—synthetic polymers***

Polymers of acrylic acid: The most widely used polymer under this category is carbopol-934. Other polymers include agar-agar, alginates, carob gum, molasses, polysacharrides of galactose and mannose, chitosan and modified starches.

d) Biodegradable Matrices

Polymers linked to one another via functional groups having unstable linkage in the backbone, are present in biodegradable matrices. These matrices are degraded biologically and the enzymes which are generated by the surrounding living cell erode the matrix. The degradation can occur by non enzymatic process by metabolising the oligomers and monomers. Natural polymers include proteins and polysaccharides. It also contains certain modified natural polymers. The synthetic polymers include aliphatic polyesters and poly anhydrides.

e) Mineral matrices

Mineral matrices contain polymers obtained from different species of seaweeds. Alginic acid, a hydrophilic carbohydrate obtained from species of brown seaweeds by using dilute alkali, is an example of mineral matrices.

B) ON THE BASIS OF POROSITY OF MATRIX

In this the drug molecules diffuse across the matrix and produce sustained release.

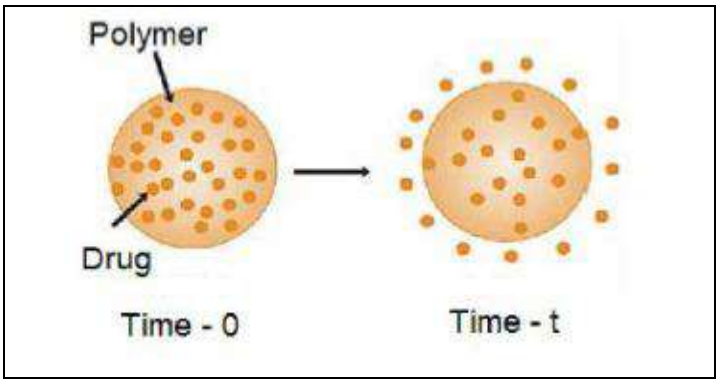


Figure: Diffusion of Drug Across The Matrx.

The matrix is further divided into 3 types.

a) Macro porous systems

The pores of this kind of matrix range from 0.1µm to 1µm which is larger than the diffusant molecule size. In this type of system permeation of drug occurs through these pores.

b) Micro porous systems

Permeation of drug molecules occurs through pores of sizes ranging from 50-200Å.

c) Non-porous systems

These systems have no pores. The diffusion of molecules occurs through network meshes. There is no pore phase where as the polymeric phase is present.

CONCLUSION

The review of the above article is mainly focused on the formulation and uses of the SRDDS. It concludes that the use of matrix tablets was really helpfull to over come the patient complience problems which are associated with the conventional dosage forms . The cost of production of the matrix tablets is also under control. Due the use of these tablets the daily required frequence of the doses was also reduced.

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PHARMACOGNOSTIC INVESTIGATION OF *LANATA CAMARA* LINN.

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Keywords:

Lanata camara L. (Verbenaceae), Macroscopy, Microscopy, Phytochemical screening *etc*

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ABSTRACT: *Lantana camara* is reported to be used in traditional medicine system for the treatment of itches, cuts, ulcers, swellings, bilious fever, cataract and rheumatism. Different part of plants are used in the treatment of cold, headache, chicken pox, eye injuries, whooping cough, asthma, bronchitis, arterial hypertension. *Lantana camara* has scientifically study for various thearapeutical activity like antioxidant, antipyritic, larvicidal, insecticidal, antimicrobial and wound healing. The present study is an effort to give detail information regarding macroscopy, microscopy, physical constant, phytochemical screening, traditional uses of leaves of *Lanata camara*. This study helps in identification of this particular plant species. It provides guidelines for identification of plant species to the budding researchers. Further study on plant is needed to be carried out.

INTRODUCTION: Aims and Objectives:

- To study the morphological and microscopical characteristics of plant *Lanata camara* linn.
- Determine the physical constants of the *Lanata camara* L.

Synonyms: *Lanata camara* linn. Ghaneri (in Marathi), *Lanata aculeata* L., *Camara vulgaris*.

Biolological Source: It consists of dried whole plant of *Lanata camara* L. belonging to family Verbenaceae.

Scientific Classification of *Lanata camara* Linn: [3, 4]

Kingdom : Plantae
Order : Lami
Family : Verbenaceae
Genus : Lantan
Species : Camara
Clade : Angiosperms
Clade : Eudicots
Binomial name : *Lantana camara*
Synonyms : *Camara vulgaris*, *Camara aculeata*

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Description: *Lanata camara*, also known as big sage (Malayshiya), wild-sage, red-sage, white-sage (Caribbean) and tickberry (South Africa) is a species of flowering plant with in the verbena family, Verbenaceae that is native to the American tropics.

Distribution: *Lanata camara*, often planted to embellish gardens, has spread from its native Central and South America to around 50 different countries, where it has become an invasive species.

It spread from the Americas into the rest of the World when it was brought back to Europe by Dutch explorers and cultivated widely, soon spreading into Asia and Oceania, where it established itself as

FIG. 1: FLOWERS AND LEAVES OF *L. CAMARA* LINN.

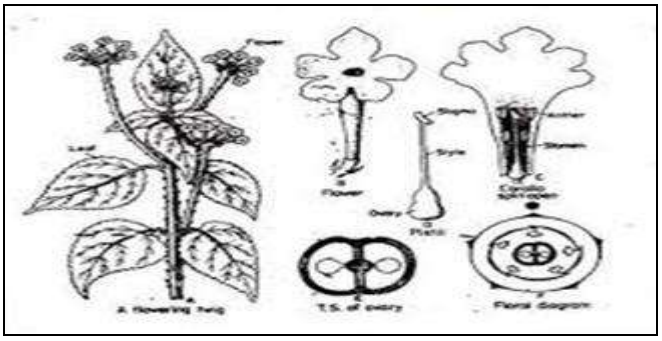

FIG. 2: SCIENTIFIC CLASSIFICATION OF *L. CAMARA*

Morphological Characters:

Colour : Green
Odour : Characteristics
Taste : Bitter
Shape : Ovate
Size : length 5 - 8 cm, wide 3 - 4 cm

Microscopic Characters: [5]

Upper Epidermis: Single layered - Oval shaped parenchyma. Cells covered with cuticle having multicellular covering trichomes, stomata is present.

Lamina: Being dorsiventral leaf, it is differentiated into upper palisade cells and lower spongy parenchyma.

Vascular Bundles (Mid rib): Possess vascular bundles xylem and phloem in collateral open arrangement.

Lower Epidermis: Possess multicellular grandular trichomes with paracytic stomata.

Chemical Constituents: [6]

Mono and Sesquiterpenes: They contain bisabolene derivatives with traces of monoterpenes and beta-curcumene (1.5%), E-nuciferal, nuciferol (3.9%), (-) ar-curcumene-15-al (5.6%) Y-curcumene (8%), ar-curcumene (9.7%) (-) epi-beta bisabolol (10%), (-) y-curcumene-15-al (14.9%).

Triterpens: Lantadene-A, B, C, D, Pentacyclic triterpenes like oleanolic acid, ursolate acetate, ursolic acid, reduced lantadene, lantalonic acid, lantic acid.

Iridoidglycoside: Theveside, theviridoside, gepri-poside, 8-epiloganin, shanzhside methyl ester, lamiridoside

Furanonaphthaloquinones: diodantunezone

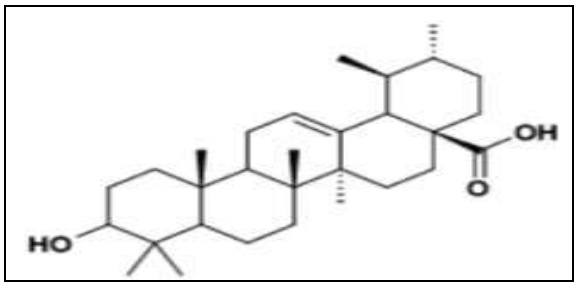

FIG. 3: URSOLIC ACID

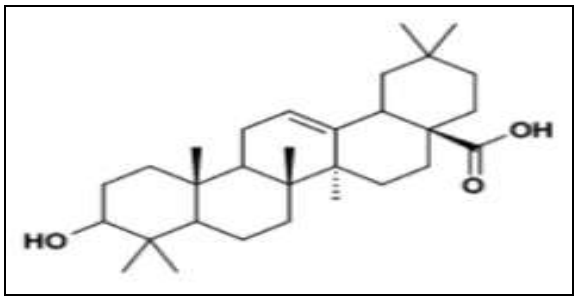

FIG. 4: OLEANOLIC ACID

Determination of Physical Constant:
Ash Value:

a. Total ash
b. Water soluble ash
c. Acid insoluble ash

Loss on Drying:

Determination of Ash Value: [20] Ash values are helpful in determining the quality and purity of a crude drug, especially in the powdered form. The objective of ashing vegetable drugs is to remove all traces of organic matter, which may otherwise interfere in an analytical determination. On incineration, crude drug normally roots an ash usually consisting of carbonates, phosphates and silicates of sodium, potassium, calcium and magnesium. The total ash of a crude drug reflects the care taken in its preparation. A higher limit of acid-insoluble ash is imposed, especially in cases where silica may l
oxalate content of t

Total Ash Value: Weighed accurately about 2 to 3 g of the powdered drug in a tarred silica crucible. Incinerated at a temperature not exceeding 450 ºC for 4 h, until free from carbon, cooled and weighed. Calculated the percentage of ash with reference to air-dried drug using following formula,

$$\% \text{ Total ash value} = \frac{\text{Wt. of total ash}}{\text{Wt. of crude drug taken}} \times 100$$

The results were given in **Table 6**.

Water Soluble Ash Value: The ash was boiled with 25 ml of water. Filtered and collected the insoluble matter on an ashless filter paper, washed with hot water and ignited in a tarred crucible at a temperature not exceeding 450 ºC for 4 h. Cooled in desiccators, weighed and subtracted the weight of insoluble matter from the total weight of ash. The difference in weight represented weight of water soluble ash. Calculated the percentage of water soluble ash with reference to the air-dried drug using the following formula

$$\%\text{Water soluble ash value} = \frac{\text{Wt. of total ash - Wt. of water insoluble ash}}{\text{Wt. of crude drug taken}} \times 100$$

The results were given in **Table 4**.

Acid Insoluble Ash Value: Boiled the ash for 5 min with 25 ml of 2 M HCl. Filtered and collected the insoluble matter on an ashless filter paper, washed with hot water and ignited in a tarred crucible at a temperature not exceeding 450 ºC for 4 h. Cooled in desiccators and weighed. Calculated the percentage of acid insoluble ash with reference to the air-dried drug using following formula,

$$\% \text{ Acid insoluble ash value} = \frac{\text{Wt. of acid insoluble ash}}{\text{Wt. of crude drug taken}} \times 100$$

The results were given in **Table 4**.

Loss on Drying: [21] Loss on drying is the loss of mass expressed as per cent w/w. The test for loss on drying determines both water and volatile matter in the crude drug. Moisture is an inevitable component of crude drug, which must be eliminated as far as possible. An accurately weighed quantity of about 5 g of powdered drug was taken in a tarred porcelain dish. The powder was distributed evenly. The porcelain dish kept open in vacuum oven and the sample was dried at a temperature 110 ºC for 2 h until a constant weight was recorded. Then it was cooled in a desiccators to room temperature, weighed and recorded. % Loss on drying was calculated using the following formula.

$$\% \text{ Loss on drying} = \frac{\text{Loss in weight of the sample}}{\text{Weight of the sample}} \times 100$$

Extraction: In the present study, the dried leaves of *Lanata camara* belonging to family Verbenaceae were reduced to coarse powder and around extracts was subjected to hot continuous extraction (Soxhlet) with methanol and then evaporated after the effective extraction, solvent were evaporated to dryness and the extract obtained with each solvent was weighed.

Uses:

Anthelmentic Activity: Helminthes infections are among the most common infection in man. Leaves extract is most effective to anthelmentic activity [7]. *Lantana camara* root is sweet and cool. The root benefits for antipyretic, antitoxic, pain relievers or analgesics, stop bleeding or hemostatics. *Lantana camara* medicinal uses for treating influenza, tuberculosis, epidemic parotitis, rheumatism, sprains, haematoma. Also used to treat skin diseases related to emotional disorders or neurodermatitis, to treat leucorrhea (fluoralbus), gonorrhea, and frequent urination [8]. The leaves are bitter, cool, smelly, and somewhat toxic. *Lantana Camara* leaf benefits for antipruritus, antitoxic, antiswelling, vomiting stimulant (emetikum). Tuberculosis accompanied by coughing up blood, treating children's cough and curing asthma.

The flower tasted sweet and cool. *Lantana Camara* flowers benefits to stop hemorrhoid, cures skin, furunculus, skin inflammation (dermatitis), pruritus, bruising (haematoma), wounds and sprains, to cure rheumatism. Also used to stimulate vomiting for food poisoning, treat tussis, and frequent urination.

RESULT AND DISSCUSION:

Preliminary Pharmacognostic Characteristics: In present study, the leaves of *Lanata camara* plants were investigated for its macroscopic characteristics.

TABLE 1: ???

S. no.	Parameter	Observation of *L. camara* (Verbenaceae)
1	Colour	Green
2	Odour	Characterstic
3	Taste	Bitter
4	Shape	Ovate
5	Size	Length 5 - 8 cm, wide 3 - 4 cm

Microscopically Characteristics: In present study, the leaves were investigated for its microscopically characteristic.

TABLE 2: ???

S. no.	Observations	Inference
1	Upper Epidermis Parenchyma Trichomes Stomata	Single layered, lignified. Multicellular covering trichomes Stomata Present
2	Lower Epidermis Trichomes Stomata	Multicellular, glandular trichomes Paracytic stomata present
3	Vasculer Bundles	Xylem and phloem present
4	Lamina	Upper palisade cells and lower spongy parenchyma present

TABLE 3: OBSERVATION TABLE OF NATURE, COLOUR OF *L. CAMARA* LINN. LEAVES EXTRACTS

S. no.	Extracts	Plant part	Nature of extract	Colour	Weight (gm)
1	Methanol	Leave	Semisolid	Green	1.3gm
2	Aqueous	Leave	Semisolid	Brown	2.0gm

Determination of Ash Values:

TABLE 4: PHYSICAL CONSTANT OF LEAVES *L. CAMARA* L.

S. no.	Physical constants	*Lanata camara* L.
1	Ash value (% w/w)	
	Total ash	
	Leaves	18.82%
	Acid insoluble ash	
	Leaves	1.3%
	Water soluble ash	
	Leaves	11.85%
2	Loss on drying (% w/w)	
	Leaves	96.60%

CONCLUSION: Our research concluded that our finding helpful for future research.

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Reviewer's recommendations:

1. Specify designation and current full address of corresponding author.
2. Check for spelling, grammar and punctuation error(s).
3. Mention plants authentication voucher specimen number into the manuscript.
4. Mention the caption of table 1 and 2.
5. Mention acknowledgement into the text.
6. Mention conflict of interest into the text.
7. References are out of format, see Instructions to Authors.

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HEB

Health related Quality of life questionnaire for COPD patients

JOHP

Mrs. Patil Swapnali Dhananjay, Mr. Nirmale Dnyaneshwar Mahadev***

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ABSTRACT:

Understanding a chronic obstructive pulmonary disease (COPD) patient's health status is an integral part of overall patient's management. International guidelines on the management of COPD recommend that both lung function and health status are monitored regularly to guide any change in treatment and both the European respiratory system and American thoracic society recommend that health status should be assessed as an outcome in clinical trials of new and existing pharmacological therapies for treatment of COPD. In present work we use disease specific questionnaire to assess health status in COPD patients and are Clinical COPD Questionnaire (CCQ).St.Geroge Respiratory Questionnaire (SGRQ), COPD Assessment Test (CAT) to evaluate health status impairment and improvement in COPD patients.

Keywords:- SGRQ, CAT,COPD.CCQ.

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INTRODUCTION:

Chronic obstructive pulmonary diseases (COPD) are a potentially fatal, slowly progressive respiratory disease in contrast to asthma. COPD is characterized by air flow obstruction that is not fully reversible. The sign and symptoms are chronic cough, excessive mucus production, wheezing and shortness of breath after mild exertion. In COPD conditions the chronic inflammation leads to structural changes referred to as airway remodeling. Bronchodilators play a central role in symptomatic relief of acute broncho constriction in both conditions and are the primary maintenance therapy for COPD patients. There is some epidemiologic evidence that mucus hypersecretion is accompanied by airflow obstruction of particularly peripheral airway, perhaps as a result of obstruction of particularly peripheral airway. The primary physiological abnormality in COPD is an accelerated decline in the forced expiratory volume in one second (FEV1) from the normal rate in patients over 40 years of age. The world health organization predicts that by 2020 COPD will rise from its current ranking as 12th most prevalent disease worldwide to the 5th and from the 6th most common cause of death to the 3rd. The assessment of health related quality of life is an important tool for the determining the impact of disease (COPD) and monitoring there response to treatments.

The CCQ is divided into 3 domains (Symptoms, Functional and mental status). The CCQ is correlates clinical status of airway, (e.g. airway obstruction and airway inflammation) it helps to identify not only the clinical status of airway but also activity limitation and emotional dysfunction in the patients.

St.Geroge Respiratory Questionnaire (SGRQ) is designed to measure the impact of chest disease on health related quality of life and well being. It can be used in COPD as well as in asthma. It has been shown to correlate well with established measures of symptoms level, disease activity and disability. The first part (symptoms) evaluates symptomatology, including frequency of cough, sputum production, wheeze, breathlessness and the duration of frequency of attacks of breathlessness or wheeze. The second part has two components activity and impact. The activity section addresses activities that cause breathlessness or are limited because of breathlessness. The impact sections covers a range of factors including influence on employment, being in control of health, panic, stigmatization, the need for medication, side effects of prescribed therapies, expectations for health and disturbance of daily life. The SGRQ consists of three sections and a total score: symptoms measuring the frequency and severity of respiratory symptoms; Activity measuring limitations of activities by breathlessness and activities that cause breathlessness; Impacts, measuring disturbance in social and psychological functioning due to airway disease; Total score summarizes the impact of the disease on overall health status.

CAT scores had already been categorized in to severity scores. Low impact (CAT score 1 to 10) Medium impact (11 to 20), High impact (31 to 40).In case of CAT is a short, simple questionnaire which is quick and easy for patients to complete. It provides a framework for discussions with COPD patients and should

enable and them to gain a common understanding and grading of the impact of the disease on their life. It should help us to identify where COPD has the greatest effects on the patients health and daily life. The CAT provides a reliable measure of the impact of COPD on a patient's health status. The CAT dose not replaces COPD treatment but help us monitor their effects. e.g. Recovery from exacerbations. CAT scores severity and to better understand the minimal clinically relevant change from one visit to the next. The CAT provides a reliable measure of the impact of COPD on patient's health status.

QUALITY OF LIFE QUESTIONAIRE

A) Clinical COPD questionnaire (CCQ)

B) St. Geroge Respiratory Questionnaire (SGRQ)

C) COPD assessment test (CAT)

Clinical COPD Questionnaire (CCQ):

The CCQ is valid, reliable and responsive to change in patients with COPD (including patients at risk for COPD). A Primary aim during development of the CCQ was to create a scale capable of measuring change in health status. For example post intervention change. Individual items within the CCQ are equally weighted that number by ten.

- Calculation of scores: CCQ Symptoms scores = (item 1+2+5+6) /4
- Functional state = (item 7+8+9+10) /4
- Mental state = (item 3+ 4) /2
- Total scores= (item 1 + 2+3+ 4+5+6+7+8+9+10) / 10.

Saint George's respiratory questionnaire:

St. George's respiratory questionnaire (SGRQ) is an index designed to measure and quantify health related health status in patients with chronic airflow limitation. It has been shown to correlate well with established measures of symptoms level, disease activity and disability.

The first part (symptoms) evaluates symptomatology, including frequency of cough sputum production, wheeze breathlessness and the duration and frequency of attacks of breathlessness or wheeze. The second part has two component activity and impacts. The activity section addresses activities that cause breathlessness or are limited because of breathless. The impacts section covers range of factors including influence on employment being in control of health, panic, stigmatization, the need for medication, side effects of prescribed therapies, expectations for health and disturbance of daily life

Structure of SGRQ:

Part 1 (Questions 1-8) addresses the frequency of respiratory symptoms. It is not designed to be a precise epidemiological tool, but to assess the patient Perception of their recent respiratory problems.

Part 2 (Sections 9-16) addresses the patient's current state (i.e. how they are these days).The activity Score measures of psycho-social function. Validation studies for the original SGRQ showed that this component relates in part to respiratory symptoms.

Three component scores are calculated for the SGRQ:

- Symptoms-This component is concerned with the effect of respiratory symptoms their frequency and severity.
- Activity-concerned with activities that cause or are limited by breathlessness
- Impacts-covers a range of aspects concerned with social functioning and psychological disturbances resulting from airways disease
- A total score is also calculated which summarizes the impact of the disease on overall health status. Scores are expressed as a percentage of overall impairment where 100 represents worst possible health status and 0 indicates best possible health status.

Three component scores are calculated: Symptoms; Activity; Impacts, Total score is also calculated.

Principle of calculation:

Each questionnaire response has a unique empirically derived 'weight'. The lowest possible

Weight is zero and the highest is 100. Each component of the questionnaire is scored separately in three steps:

1. The weights for all items with positive responses are summed.
2. The weights for missed items are deducted from the maximum possible weight for each component. The weights for all missed items are deducted from the maximum possible weight for the total score.
3. The score is calculated by dividing the summed weights by the adjusted maximum possible weight for that component and expressing the result as a percentage.

   Score = 100 x Summed weights from positive items in that component /Sum of weights for all items in that component
4. The Total score is calculated in similar way:

   Score = 100 x Summed weights from positive items in the questionnaire/Sum of weights for all items in the questionnaire Sum of maximum possible weights for each component and Total:

   A) Symptoms 662.5
   B) Activity 1209.1
   C) Impacts 2117.8
   D) Total 3989.4

(Note: these are the maximum possible weights that could be obtained for the worst possible state of the patient).

It will be noted that the questionnaire requests a single response to questions 1-7, 9-10 and 17. If multiple responses are given to one of these questions then averaging the weights for the positive responses for that question are acceptable. That this is a better approach than losing an entire data set and have used this technique in calculating the results used in our validation studies. (Clearly a better approach is to prevent such multiple responses occurring but it is difficult to prevent (occasional accidents). This method is used in the Excel calculator.

SYMPTOMS COMPONENT:

This is calculated from the summed weights for the positive responses to questions 1-8

A) **ACTIVITY COMPONENT:** This is calculated from the summed weights for the positive responses to questions 11 and 15.

B) **IMPACTS COMPONENT:** This is calculated from the summed weights for the positive responses to questions 9-10, 12-14 and 16-17.

C) **TOTAL SCORE:** Total score is calculated by summing all positive responses in the questionnaire and expressing the result as a percentage of the total weight for the questionnaire.

HANDILING MISSED ITEMS:

It is better not to miss items and any missing items are the fault of the experimenter, not the patient. We have examined the effect of missing items and recommend the following methods

A) **Symptoms:** The Symptoms component will tolerate a maximum of 2 missed items. The weight for the missed item is subtracted from the total possible weight for the Symptoms component (662.5) and from the Total weight (3989.4).

B) **Activity:** The Activity component will tolerate a maximum of 4 missed items. The weight for the missed item is subtracted from the total possible weight for the Activity component (1209.1) and from the Total weight (3989.4).

C) **Impacts:** The Impacts component will tolerate a maximum of 6 missed items. The weight for the missed item is subtracted from the total possible weight for the Impacts component (2117.8) and from the Total weight (3989.4)

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COPD assessment questionnaire (CAT): CAT scores had already been categorized in to severity scores. Low impact (CAT score 1 to 10) Medium impact (11 to 20), High impact (31 to 40).In case of CAT is a short, simple questionnaire which is quick and easy for patients to complete. It provides a framework for discussions with COPD patients and should enable and them to gain a common understanding and grading of the impact of the disease on their life. It should help us to identify where COPD has the greatest effects on the patients health and daily life. The CAT provides a reliable measure of the impact of

COPD on a patient's health status. The CAT dose not replace COPD treatment but help us monitor there effects.e.g. Recovery from exacerbations.CAT scores severity and to better understand the minimal clinically relevant change from one visit to the next. The CAT provides a reliable measure of the impact of COPD on patients health status. The COPD Assessment Test (CAT) is a patient-completed instrument that complements existing approaches to assessing COPD such as FEV1 measurement. It has been designed to provide a simple and reliable measure of health status in COPD and assist patients and their physicians in quantifying the impact of COPD on the patient's health. The CAT does not replace other COPD disease management tools such as smoking cessation or rehabilitation programs.

The CAT has undergone a rigorous, scientific development process and the first validation studies show that it has properties very similar to much more complex health status questionnaires such as the St. George's Respiratory Questionnaire (SGRQ)' that are used in research studies. It takes only a fraction of the time to complete, however making it suitable for routine of the time complete, however making it suitable for routine use, it is being used in COPD studies in Europe.USA and Asia. Follow up of subject enrolled COPD subjects were advised to visit the study site depending on their treatment regimen. Complete details were noted on 4th, 8th, 12th week's visit of the subject and a proper data towards quality of life was recorded. Telephonic contact was made to certain subjects who did not turn up for subsequent visit, leading to loss follow up.

DISCUSSION:

The assessment of health related quality of life is an important tool for the determining the impact of disease (COPD) and monitoring there response to treatment. Understanding a chronic obstructive pulmonary disease (COPD) patient's health status is an integral part of overall patient's management. International guidelines on the management of COPD recommend that both lung function and health status are monitored regularly to guide any change in treatment and both the European respiratory system and American thoracic society recommend that health status should be assessed as an outcome in clinical trials of new and existing pharmacological therapies for treatment of COPD.

In present work we used disease specific questionnaire to assess health status in COPD patients are Clinical COPD Questionnaire (CCQ), St.Geroge Respiratory

Questionnaire (SGRQ) and COPD Assessment Test (CAT) used to evaluate health status impairment and improvement in COPD patients. Details are given below.

Questionnaire	**Number of items**	**Number of domain**	**Domain score**	**Total score**
CCQ	10	3	1.Symptoms	Total score

			2.Functional 3. Mental	
SGRQ	50	3	1.Symptoms 2. Activity 3. Impact	Total score
CAT	08	--	1. Cough 2. phlegm 3.Chest tightness 4.Breathlessness going uphill. 5.Activity limitation at home 6. Confidence while leaving home. 7.Sleep 8. Energy	Total score

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TRADITIONAL APPROACHES FOR THE TREATMENT OF DIABETES

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ABSTRACT

Diabetes is a metabolic disorder caused due to increased glucose level in blood due to various problems regarding secretion of hormone ie. Insulin which is secreted from the beta cells of islets of langerhance or glucose resistance takes place in the cells. According to WHO there are total 125 million diabetic patients throughout the word and 33 million in India which is expected to incr. by 80 million in 2030. This review will briefly summarie anti diabetic drugs will be discussed. The aim of this article is to present an overview of all anti diabetic drugs on the basis of they were used by the various tribal groups in different part of India. More than 100 traditional plants which were been used by tribal groups for the treatment of diabetes. Traditional treatments have mostly disappeared in occational socities, but some are prescribed by practitioners of alternative medicine or taken by patients as supplements to conventional therapy. However, plant remedies are the menstay of treatment in underdeveloped regions. In this article I have included 124 plant along with their family, local name, tribal group, area, pharmacological action, type of diabetes, part of plant, to be taken, along with the reference in the tabular form.

INTRODUCTION

1.1 Herbal Medicine

Plant kingdom had played vital role in man's existence on this earth. Nature has always stood as a golden mark to amplify the outstanding phenomenon of symbiosis. Medicinal plants existing even before human being made their appearance on the earth.[1] Natural products have been derived from higher plants, microbes or animals and those can be of either terrestrial or marine or aquatic origin.

Practically every country develops its own medical system, which includes the ancient civilization of China, Egypt and India. Thus, the Indian Medical system Ayurveda came into existence. The raw materials for Ayurvedic medicines were mostly obtained from plant sources in the form of crude drugs such as dried herbal powders or their extracts or mixture of products. In addition, Siddha and Unani are traditional health care systems have been flourishing for many centuries in the country. Apart from these systems there has been a rich heritage of ethanobotanical tradition of herbs by diversity of tribal communities in the country.

The medicinal preparations based on these raw materials were in the form of crude drug. Many of these reputed medicinal plants came under chemical investigation leading to the isolations of active principles with the advent of scientific methods.

There was continuous activity in this area since 1800 AD and many of the well known medicinal plants were chemically analyzed and their active principles were characterized. Soon after their isolation and characterization of these compounds, either in pure state or in the form of extracts, became part of pharmacopoeias of several countries. This is where herbal medicine and modern medicine have a common link.[2] Care system, because of popular concern over toxicity and resistance of modern drugs. India is one of 12 leading bio-diversity centers with presence of over 45,000 different plant species, 15000-18000 flowering plants, 23,000 fungi, 16,000 lichens, 18,000 bryophytes and 13 million marine organisms. From this flora 15,000 to 20,000 have good medicinal value. Among those only about 7,000 plants are used in Ayurveda, 600 in Siddha, 700 in Unani and 30 in modern medicines.

The WHO estimated that 80% of the population of developing countries relies on traditional medicines, mostly plant drugs, for their primary health care needs. Also, modern Pharmacopoeias still contain at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants. Demand for medicinal plant is increasing in both developing and developed countries due to increasing recognition of natural products, being non-narcotic, having less side-effect, easily available at affordable prices and sometime the only source of health

care available to the poor. Medicinal plant sector has traditionally occupied an important position in the socio-cultural, spiritual and medicinal arena of rural and tribal lives of India.[3]

Demand for medicinal plant is increasing in both developing and developed countries, and the bulk of the material trade is still from wild harvested sources on forest land and only a very small number of species are cultivated. The expanding trade in medicinal plants has serious implications on the survival of several plant species, with many under serious threats to become extinct. A holistic management action plan is necessary to formulate for assessment and management of resource base; best harvesting and processing practices; trade issues and aspects dealing with the intellectual property rights on the traditional medicines by the tribal people.[4]

1.1.2 Steps necessary for promoting herbal drugs

Phytochemistry or natural product chemistry research is the backbone of herbal industry. For promoting use of herbals in modern medicine, phytochemistry should be envisaged for; isolation, purification and characterization of new phytoconstituents, use of newly isolated phytoconstituents as "lead" compound for the synthetic design of analogues with either improved therapeutic activity or reduced toxicity and conservation of lead phytoconstituents into medicinally important drugs.

1.1.3 Ethno-pharmacological approach to herbal drugs

The term ethno-pharmacology refers the interdisciplinary scientific observation, description, and experimental investigation of indigenous drugs and biological activities. Recent interest in the use of ethno-pharmacological information of plant drugs has greatly increased for several reasons. Scientists showed that 119 important plant derived drugs used in one or more countries, 88 were regarded as having been discovered as a result of being derived from a plant used in traditional medicine.[5]

1.1.4 Current status of herbal drugs

Recent years newer and newer diseases are posing threat to humanity. In fact diseases are not new but are detected newly. Despite this, WHO had taken the vouch of providing "Health for all" by 2000 AD. In spite of stupendous advances made by modern medicine, the present century has many more health problems than earlier centuries. Drugs for viral diseases like AIDS, certain type of cancers, arthritis, parkinsonism are yet to come. The newer concepts about herbal drugs have immunomodulators and are recognized for prophylactic and preventive therapy.

Surprisingly, a recent survey revealed that more than 50% of all prescription drugs issued by rational physicians are either directly derived from the natural sources or synthesized from the natural models as the sole ingredient or as one of the several ingredients. It seems certain that the continued scientific study of medicinal plants afford a plethora of novel, structurally diverse and bioactive compounds. Multidisciplinary research on plants has lead to many new drugs, as well as prototype active molecules and biological tools.[6]

1.1.5 Future prospects in herbal medicines

At the moment, scientific research on medicinal plants is continuing most intensely in research institutes, universities and pharmaceutical laboratories as well as in the clinics of many developed countries. This research is oriented mainly in two directions. Firstly the active ingredients of plants that have long been known for their healing properties are been investigated. The second sphere of basic research has led to the discovery of new kinds of medicinal plants and new drugs from the more remote regions of the world where new species with unknown substances still remain to be looked into.

Each and every traditional medicine are tested and validated scientifically. CSIR, New Delhi, already involved in this filed, validated about 350 formulations for different activities. The WHO has emphasized the need to ensure the quality control of herbs and herbal formulations by using modern techniques. Several countries have herbal pharmacopoeias and lay down monographs to maintain their quality. The Ayurvedic pharmacopoeia of India which was recommends basic quality parameters for eighty common Ayurvedic herbal drugs.[7]

1.2 Diabetes

There are many diseases that are caused due to genetically disorders, and one of this is Diabetes Mellitus. Diabetes is a disorder of metabolism (the way our bodies use digested food for growth and energy). Most of the food we eat is broken-down by the digestive juices into a simple sugar called glucose. Glucose is the main source of fuel for the body. After digestion, the glucose passes into bloodstream where it is available for body cells to use for growth and energy. Glucose gets into the cells in presence of insulin, a hormone produced by the pancreas. Normally, pancreas is automatically producing the right amount of insulin to move the glucose from our blood into our cells. If body doesn't make enough insulin or the insulin doesn't work right, the sugar cannot get into the cells. It stays in the blood. This makes high levels of glucose (or sugar) in the blood producing hyperglycemia. As a result, glucose builds up in the blood, overflows into the urine, and passes out of the body in urine (glucosuria). Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose. Thus, Diabetes is a chronic condition that occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin.[8]

There are more than 125 million people with diabetes in the world today and this number is expected to approach 220 million. It is also estimated that there are 30 to 33

million diabetics in India now, and every fourth diabetics in the world today is an Indian. Indians are genetically more susceptible to diabetes and the WHO predicts the number of diabetes in India would group to 80 million by 2030.There are two types of Diabetes; Diabetes insipidus and Diabetes mellitus.

1.2.1 Diabetes Insipidus: Despite the similar names diabetes insipidus is not related to diabetes mellitus. Some people with diabetes insipidus have kidneys that don't concentrate urine very well (meaning their urine is more diluted). They might wake up 2 or 3 times in the night to urinate. People with diabetes insipidus are thirsty all the time They often. want to drink liquids every hour.

Etiology of Diabetes insipidus suggests that in some people, a part of the brain doesn't make enough anti diuretic hormone (ADH).In other people, the kidneys do not work with this hormone the way they should. Most people with diabetes insipidus get it after an injury to the head or after brain surgery or in case of a brain tumor.[9]

1.2.2 Diabetes mellitus: It is a clinical syndrome characterized by hyperglycemia due to the pancreas may produce little insulin, if any. In other cases, the pancreas may produce some insulin, but the cells do not respond to it. Diabetes mellitus is characterized by hyperglycemia, glucosuria, negative nitrogen balance and sometimes ketonemia. It is classified as follows.

Type I: Immune mediated - Juvenile onset /Insulin dependent (could be in children with a more rapid onset or adults with a slower onset "late autoimmune diabetes of adults").
Type II: Insulin resistant -Adult onset diabetes/non-insulin dependent diabetes.

A. Gestational diabetes mellitus
B. Other specific types (e.g. certain genetic defects; drug induced; etc).[10]

Type I: It is characterized by severe lack of insulin due to the destruction of most or all of the beta cells in the islets of Langerhans by an autoimmune process, usually leading to absolute insulin deficiency. The onset is usually acute, developing over a period of a few days to weeks. Over 95% of persons with type 1 diabetes mellitus develop the disease before the age of 25 and most often between the ages of 10 and 16, with an equal incidence in both sexes and an increased prevalence in the white population. Type I diabetes is invariably treated with insulin.

Type II: Insulin resistance in peripheral tissue and insulin secretary defect of the beta cell of pancreas, so that less glucose is produced, and impairment of insulin's ability to stimulate the uptake of glucose in muscles and other tissues. The cause of this insulin resistance has not yet been fully established, but may involve defects in the action of insulin after it has bound to the insulin receptor on the surface of cells. This is the most common form of diabetes mellitus and is highly associated with a family history of diabetes, older age, obesity and lack of exercise.[10]

A. Gestational diabetes: Occur during pregnancy, sensitivity to insulin decreases (placental hormones affect glucose tolerance). Beta cells may not be able to meet this increased need for insulin gestational diabetes. They are occurs in up to 14% of pregnancy. This increases subsequent risk of developing type II diabetes. Increased risk for perinatal mortality and neonatal morbidity.

B. Other types of diabetes mellitus: Specific genetic/molecular defects have been identified in a minority of what were considered type II diabetes:
Genetic defects of function of beta cell. e.g. Hepatic nuclear factor 4 alpha - autosomal dominant condition of impaired insulin secretion; early onset and slowly progressive; type I(mature onset diabetes of the young).e.g. Mutation of mitochondrial DNA.

2) Genetic defects in the action of insulin: e.g. insulin receptor - (severeinsulin resistance) Lipoatrophic diabetes.
3) Endocrine disorders
- Diseases of the pancreas, e.g. pancreatitis, neoplasia, cystic fibrosis, haemochromatosis
- Endocrinopathies, e.g. acromegaly, Cushing's syndrome, hyperthyroidism, pheochromocytoma

4) Drug/chemical induced, e.g. vacor, pentamidine, glucocorticoids, thiazides, dilantin
5) Infection, e.g. congenital rubella, cytomegalo virus
6) Immune mediated (uncommon), e.g. Stiff man syndrome, anti-insulin receptor antibodies.

7) 1.2.3 Causes of Diabetes
a. Heredity i.e. family history of late onset diabetes
b. Obesity i.e. over weight
c. Lack of physical activity i.e. sedentary life style
d. Women with prior gestational diabetes
e. Stress and Strain

1.4.4 Diabetes Symptom
A. Symptoms of type I diabetes may include
- Increased thirst and urination
- Blurred vision
- Feeling very hungry
- Weight loss in spite of increased eating

B. Symptoms of type II diabetes may include
- Feeling tired or ill
- Frequent urination (especially at night)
- Unusual thirst
- Weight loss
- Blurred vision
- Frequent infections
- Slow healing of sores.
- Having dry, itchy skin
- Having tingling in the feet.

1.2.5 Complications occur in diabetes

Acute Complications

Type – I Diabetes (IDDM)

- Due to illness or fever, insulin requirement increases and if additional requirement of insulin is not met with, a diabetic coma can develop.
- Diabetic Ketoacidosis – Appearance of large amount of glucose along with „Ketone" bodies in urine.

Type – II Diabetes (NIDDM)

- Dehydration coma – Loss of excessive amounts of water and salt.
- Skin problems.

Long term complications

- **Eyes:** Progressive loss of vision, leading to blindness, diabetes is among the three common causes of blindness today.
- **Heart:** Diabetics are very prone to developing high blood pressure.
- **Blood vessels and circulation:** The arteries may develop fat deposits hindering flow of blood, affecting the blood supply to extreme parts of limbs.

An injury of such limbs may develop gangrene, which may lead to an amputation.

- **Kidneys:** More susceptible to infections of the urinary bladder and Kidneys. It may also lead to failure of kidney functions.
- **Nervous System:** Diabetes affects the nerves leading to loss of sensation. In contrast certain diabetics may suffer from tingling or burning sensation in extreme parts of limbs ([10.1])

1.2.6 Prevention of diabetes mellitus

It may not be possible to prevent diabetes in all cases but even delay in its onset is an achievement. First step is the identification of high-risk groups. These high-risk individuals follow.

- Regular exercise to maintain normal body weight
- Obese persons should undergo diet control and exercise to reduce weight.
- Avoid fast food and take original Indian lacto vegetarian food
- Avoid stressful life.
- Meditation and yoga can also help.
- Two diabetics should not marry.

If above non-pharmacological methods fail drugs may be used for prevention of diabetes. Marker compound, chemical constituents within a medicinal plant that can be used to verify its potency, isolated for direct use as drugs and lead compounds or pharmacological agents. Here given some active agents isolation from medicinal plants used as an antidiabetic agent are given in table 1.1 ([11]).

Table 1.1: Active antidiabetic principles isolated from the medicinal plants.

Sr. No	Botanical name	Part used	Active Principles (Marker)
1	*Acontiumcarmichaeii*	Root	Aconitan A,B,C &D
2	*Anemarans*	Rhizomes	Anemarans A, B, C&D
3	*Atractylodes japonica*	Rhizome	Glycons A,B,C,D Atractants
4	*Bauhinia pururea*	Aerial part	Quercetin
5	*Capsicum annum*	Fruit	Capsaicin
6	*Clytiarichardiana*	Leaves	SaudinRhamnoside
7	*Cyperusrotundus*	Rhizome	Cyperene
8	*Dioscorea japonica*	Rhizome	Glycans A,B,C,D,E,F
9	*Galegaofficinalis*	Seed	Galegin
10	*Holarrhenaantidysenterica*	Seed	Conessine
11	*Holarrhenaantidysenterica*	Stem Bark	Conessine
12	*Lathyrus japonica*	Seed	Lathyrines
13	*Lepidiumruderale*	Aerial part	Lepidine
14	*Picrorhizakurroa*	Rhizome	Picroside I, II
15	*Piper nigrum*	Fruit	Piperin
16	*Piper longum*	Fruit	Piperin
17	*Potatorumancisteroides*	Aerial part	Tormetic acid
18	*Plumbagozeylanica*	Root	Plumbagin
19	*Swertiachirata*	Whole plant	Sawertiamarine, Mangeferin
20	*Zingiberofficinale*	Rhizome	6,8,10-gingerol

2. MATERIAL AND METHODS

The present study is an attempt to compile the medicinal plants growing and utilizing among the different tribal culture in India with their mode of use. We reviewed scientific studies published in journals, books, theses and reports. Relevant literature was searched in various electronic databases[12] using keywords such as "medicinal plants", "tribal", "ethnobotany OR ethnopharmacology OR Indigenous OR Indian", and "survey".

Figure 1: Distribution of % population of tribes in Indian states.

We do not claim to have included all the tribal communities existing information about traditional uses of medicinal plants, but we rather chose to focus on information easily accessible to researchers. In last few decades, it is possible to record the traditional and tribal knowledge related to medicinal plants of different tribal communities. However, in most cases, this information has yet to be made available to modern world.

We reviewed 15 publications that provided information about the use of medicinal plant species to treat diabetes's diseases. We only used publications presenting first-hand ethnobotanical information. A list was produced, showing name(s), part(s) used, use(s), mode of use(s), type of diabetes, pharmacological action(s) and reference(s).

In present study, we focused our review on traditional medicinal practices of tribal communities living in the different Indian forests. The precision of botanical identification in this review depended on that from original sources. Latin names and native status (native vs. introduced) were verified.

Table 2.1

Name of Plant with Family	Local Name	Area	Type of Diabetes	Phrmacological Action	To Be Taken	Part of Plant	Reference
Catharanthus roseus Apocynaceae	Nithyakalyani	Kancheepuram District of Tamil Nadu, India	Type II Diabetes	Glucose metabolism , Lipid peroxidation	cow's milk and taken Orally	Whole plant	Elavarasi, S., & Saravanan, K. (2012).
Gymnema sylvestre Asclepiadace	Sirukurinchan	Kancheepuram District of Tamil Nadu, India	Type II Diabetes	Insulinotropic , glucose utilization , glucose hemeostatic	cow's milk and taken orally	Leaf	Elavarasi, S., & Saravanan, K. (2012)
Momordica charantia Cucurbitaceae	Karella	Plants Diversity of Bhadrawati Tahsil of Chandrapur District, Maharashtra,	Type I & Type II Diabetes	HIT-T15 hamster pancreatic β cells , cells reparative effect		Fruits and Seeds	Harney, N. V. (2013)
Enicostema axillare (Lam) Gentianaceae	Raynal	Studies on herbal medicinal plants in Marathwada region (MS) India	Type I Diabetes	Insulin theapy in relation to nephrapathy , amelioration of STz Induced.	Leaf juice	Leaves	Ladda, R. G., Aradwad, (2013)
Aeglemarmelos Corr.ex Roxb (Rutaceae)	Vilvam	Plants of kalavai, vellore district, tamil	Type II Diabetes	Repair pancrea's beta calls	Leaf juice	Leaves	Natarajan(2013)
Name of Plant with Family	**Local Name**	**Area**	**Type Of Diabetes**	**Pharamacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Brassica juncea (Linn.)Czern. Brassicaceae	Sarson	The baiga tribe living in rewa district m.p.	Type I Diabetes	Anti diabetic , Antihyperlipidemics , immunomodulators	round powdered seeds mixed with lime juice	Seed	Yadav, M., Khan, K. K.,(2012)
Cajanus cajan (Linn.)Millsp. Fabaceae	Arhar	The baiga tribe living in rewa district m.p.	Type II Diabetes	Prevent Insulin Resistance	One teaspoon seeds with water	Seed	Yadav, M., Khan, K. K.,(2012)

Cassia fistula L. Caesalpiniaceae	Amaltas	The baiga tribe living in rewa district m.p.	Type II Diabetes	Insulin treatment Reverses the insulin Resistance , Haematemesis , Diabetes , Leucoderma	One tea spoon powder of seeds is given once In the morning for about 15 days or more.	Seed	Yadav, M., Khan, K. K.,(2012)
Cassia occidentalis Linn. Caesalpiniaceae	Chakwad	The baiga tribe living in rewa district m.p.	Type II Diabetes	Hematic glucorticoid activiting enzyme , Diabetes , Hepatic B Constipation , fever , malaria	One teaspoon seeds with water is taken orally for about 15 days	Seed	Yadav, M., Khan, K. K.,(2012)
Cassia sophera L. Caesalpiniaceae	Kasundi	The baiga tribe living in rewa district m.p.	Type II Diabetes	Blood sugar under control during diabetes , Pain killer , snakebites		Bark	Yadav, M., Khan, K. K.,(2012)

Name of Plant with Family	Local Name	Area	Type Of Diabetes	Pharamacological Action	To Be Taken	Part of Plant	Reference
Hedyotis scandens Roxb. Rubiaceae	*Yakauka*	Khamptis of arunachal pradesh	Type II Diabetes	Antidiabetic action , antioxidant , antibacterial	Leaf juice	Leaf extract	Sen, P., Dollo, M., Choudhury, M. D. (2008)
Lobelia sinensis Lobelliaceae	*Yahang-en*	Khamptis of arunachal pradesh	Type I , II Diabetes	Hypoglycemic , Antidiabetic agent	Leaf juice	Leaf extract	Sen, P., Dollo, M., Choudhury, M. D. (2008)
Vincarosea Linn. Apocynaceae	*Nayantara*	Khamptis of arunachal pradesh	Type II Diabetes	Anti hyperglycermic Activity , Hepotoprotective effect	Leaf juice	Leaf extract is used	Sen, P., Dollo,
Pterocarpus marsupium Roxb. Fabaceae	*Venga*	Achenkovil forest of kollam district, kerala	Type II Diabetes	Pancreatic beta cell regulation , hypoglycemic activity	is taken internally thrice a day for two weeks against diabetes.	Dried heart wood	M., Choudhury, M. D. (2008)
Hedyotis scandens Roxb Rubiaceae	Yakauka	Ethnomedicinalsurveyuri,kash mirhimalaya	Type II Diabetes	Antidiabetic action , antioxidant , antibacterial	Leaf juice	Leaf extract is used	Khan, Z. S., Khuroo, A. A. (2004)
Name of the plant and family	**Local name**	**Area**	**Type of diabetes**	**Pharamcolgical action**	**To be taken**	**Part of plant**	**Reference**
Aristolochia bracteolate Aristolochiaceae	Kiramar	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district (maharastra)	Type II Diabetes	Decreases lipid peroxidation , enhance level of glutathione	juice is taken orally	Leaves,	Ghoshal, K. P., & Gadekar, G. P. (2014)
Aloe vera Liliaceae	Korphad	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district (Maharastra)	Type II Diabetes	Aute hypoglycaemic , antihyperglycemic Antihyper-cholesterolemic agent	Leaf juice is taken orally	Leaves	Gadekar, G. P Ghoshal, K. P.

Allium Sativum Lilliaceae	Lahsun	The baigatribe living in rewa district m.p.	Type II Diabetes	Diabetic nephropathy,improved glucose tolerance	Leaf and bulb taken orally to treat diabetes.	Leaves	Yadav, M., Khan,K. K.(2012)
Centella Asiatica Linn. Apiaceae	Bormanimuni	Ethno antidiabetic plants of assam	Type II Diabetes	Immunocompromised condition , ischemia	juice is taken orally	Whole plant	Sarmah, P. C. (2011)
Lobelia sinensis Lobelliaceae	Yahang-en	Ethnomedicinalsurveyuri,kash mirhimalaya	Type II Diabetes	Angiotension Receptor Blocker in Treatment of	Leaf juice	Leaf extract is used	Khan, Z. S Khuroo, A. A., . (2004)
Name of the plant and family	**Local name**	**Area**	**Type of diabetes**	**Pharamcolgical action**	**To be taken**	**Part of plant**	**Reference**
Colocasia esculenta(L) Araceae	Kolakachu	Ethno antidiabetic plants of Assam	Type II Diabetes	Hypoglycemic activity , antibacterial activity		Roots	Sarmah, P. C. (2011)
Adhatoda vasica Acanthacrae.	Vasaka	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antitubercular action , cold , fever , antitissue		Plant	Thirumalai, T., DSathiyara.(2012)
Brassica juncea Brassicaceae	Kadugu	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypertension , hyperglycaemia	Seed decoction is taken daily	Seed	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Cassia Caesalpinacea	Auriculata	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antiociceptive activity , antioxidant	Two flower take	FLOWER	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Cajanus cajan Fabaceae	Thovaray	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antidiabetics hypoglycemic	Seed	SEED	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Costus igneus Costaceae	Kostum	Local people in javadhu hills tamilnadu, india	Type I , II Diabetes	Hypoglycemic	Leaves juice	Leaves	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Colocasia esculenta Araceae	Shaeppamkiz Hangu	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypoglycemic	POWDERED Leaves are USE	Leaves	Thirumalai, T., Beverly, C.

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Curcuma longa Zingiberaceae	Kasturimanja L	Local people in javadhu hills tamilnadu, india	Type I, II Diabetes	Disfunction &insulin rsistance are basis of hypertension		Rhizome	Thirumalai, T., Beverly, C. DSathiyara (2012)
Cuminum cyminum Apiaceae	Cheerakam	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypoglycemic activity , pancreatic beta cells regenation	One teaspoon seeds with water	Seed	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Ficus benghalensis Moraceae	Aalamaram	Local people in javadhu hills tamilnadu, india	Type I ,II Diabetes	Hypoglycemic activity , antibacterial activity	One teaspoon seeds with water	Seed	Thirumalai, T., Beverly, C. DSathiyara
Euphorbia hirta Euphorbiaceae	Amman Pacharisi	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypoglycemic activity , antibacterial activity, Antihyperlipidemic	Leaf juice	Leaves	Thirumalai, T., Beverly, C. DSathiyara.(2012)
Eclipta alba	Karsalamkanni	Local people in javadhu hills	Type II Diabetes	Antihyperglycermic hypercholesterolemic , diuretic			Thirumalai, T., Beverly, C.

Asteraceae		tamilnadu, india			Leaf is used	Leaves	DSathiyara.(2012)
Enicostemma littorale Gentianaceae	Vellaruku	Local people in javadhu hills tamilnadu, india	Type I , II Diabetes	Diabetic retinopathy , cancer	powder leaves	Leaves	Thirumalai, T., Beverly, C. DSathiyara.(2012)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Gymnema sylvestre Apocyanaceae	Sakkaraikolli	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Control of blood glucose level , acte hypoglycaemic effect	Leaves Leaf juice is taken daily	Leaves Leaf	Thirumalai, T., Beverly, C. DSathiyara. (2012)
Hibiscus rosa sinensis Malvaceae	Chemparathy	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antihyperglycemic activity , pancreatic beta cells release	Leaves Fresh leaf is taken regularly	Leaves leaf	Thirumalai, T., Beverly, C. DSathiyara. (2012)
		Local people in	Type II	Blood pressue , anti diabetic	Seed powder is		

Momordica charantia Cucurbitaceae.	Pavakai	javadhu hills tamilnadu, india	Diabetes	agent , antihyperglycemic	mixed with water and taken Orally	Seed	Beverly, C. DSathiyara .(2012)
Mangiferaindica Anacardiaceae	Mamaran	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antioxidant	Leaves The powered leaves are mixed with cow milk and taken Orally	Leaves	Thirumalai, T., Beverly, CD Sathiyara .(2012)

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Melia azedarach Meliaceae	Malaivembu	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Cancer , osteogenic sarcoma	Seed powder	Seeds	Thirumalai, T., Beverly, C. DSathiyara. (2012)
Ocimum sanctum Lamiaceae	Tulsi	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypoglycemic , antihyperglycaemia		Leaves	Thirumalai, T., Beverly, C. DSathiyara .(2012)
Punica granatum Lythraceae	Madulai	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Improved glucose tolerance digestive problem		Flower	Thirumalai, T., Beverly, C. DSathiyara. (2012)
Phyllanthus amarus Euphorbiaceae	Kilanelli	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Antioxidant , antinociceptive	Leaves Leaf juice is taken orally to treat	Leaves Leaf	Thirumalai, T., Beverly, C. DSathiyara. (2012)
			Type II Diabetes	Insulin mimetic activity ,			

Psidium guajava Myrtaceae	Koiyaa	Local people in javadhu hills tamilnadu, india		antihyperlipidemic	Fruit Daily one fruits is taken	Fruits	Beverly, C. D Sathiyara . (2012)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Sperma cocehispida Rubiaceae	Nathachuri	tamilnadu, india	Type II Diabetes	Antioxidative activity	leaves are taken twice Daily	Leaves	DSathiyara 2012
Solanum nigrum Solanaceae	Manattakkali	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Hypoglycemic activity , antihypertension	Leaves Leaf juice is taken orally	Leaves Leaf	Thirumalai, T., Beverly, C. DSathiyara. (2012)
Trigonella foenum Fabaceae	Vendhyem	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Insulin mimetic propertic , reduce lipid peroxidase	Seed powder	Seed	Thirumalai, T., Beverly, C.

							DSathiyara .(2012)
Eugenia jambolana Myrtaceae	Naval	Local people in javadhu hills tamilnadu, india	Type I ,II Diabetes	Hypoglycemic activity , antidiabetic activity	Seed powder	Seed	Thirumalai, T., Beverly, C. DSathiyara. (2012)
Ficus racemosa Moraceae	Atthi	Local people in javadhu hills	Type II Diabetes	Hypoglycemic activity , antihyperglycemic activity	Root decoction is	Root	Thirumalai, T.,

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Vincarosea Apocynaceae	Nittiyakalyani	Local people in javadhu hills tamilnadu, india	Type II Diabetes	Amtihyperglycemic effect , hupoglycemic effect , antioxidant increases pancreatic , secreation	Leaves Leaf juice is taken orally	Leaves Leaf	Thirumalai, T., Beverly, C. DSathiyara .
Cassia tora Fabaceae	Tarota	Bhadrawatitahsil of chadrapur,districtmaharashtra, india	Type II Diabetes	Reduce insulin resistance , diabetic nephropathy , Anti inflammation ,	Leaf juice	Leaves	Harney, N. V. (2013)
Butea monosperma Fabaceae	Palas	Bhadrawatitahsil of chadrapur,districtmaharashtra, india	Type II Diabetes	Antidiabetic , hyperlipidemic		Barks, leaves, fruits, seeds	Harney, N. V. (2013)
Ficus bengalensis Moraceae	Wad	Bhadrawatitahsil of chadrapur,districtmaharashtra, india	Type II Diabetes	Antidiabetic , diabetes mellitus , reduces oxidative stress , Pancreatic beta cells regenerated		Bark, leaves, fruits, seeds	Harney, N. V. (2013)
Syzigium cumini Myrataceae	Jambul	Bhadrawatitahsil of chadrapur,districtmaharashtra, india	Type I , II Diabetes	Hypoglycemic activity, antidiabetic , preventing and treatment of diabetes		Bark, leaves and fruits	Harney, N. V. (2013)

Momordica charantia Cucurbitaceae	Karella	Bhadrawatitahsil of chadrapur, district maharashtra, india	TypeI , II Diabetes	Hypoglycemic activity, antidiabetic activity ,	Seed powder	Fruits and Seeds	Harney, N. V. (2013)
Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Diospyrous melanoxylon Ebenaceae	Tembhurni	Bhadrawatitahsil of chadrapur,districtmaharashtra,India	Type II Diabetes	Anti hypertension , diabetes mellitus , gall bladder disease , stoke		Fruits and Seeds	Harney, N. V. (2013)
Ficus recemosa Moraceae	Medi	Raditional Healers of thadvai, warangal district, andhra pradesh, india.	Type II Diabetes	Antidiabetic activity , antihyperglycemic activity , hypoglycemic activity.		Bark	Naini, V., & Mamidala, E (2013)
Marsilea minuta L . (Marsileaceae)	Aarakkerai	Plants of kalavai, vellore district, tamil Nadu, india	Type I , II Diabetes	Antidiabetic activity , drug resistance epilepsy	Leaf juice	Leaves	Natarajan(2013)
Cynodon dactylon (L.)Pers Poaceae	Arugampul	Plants of kalavai, vellore district, tamil Nadu, india	Type I Diabetes	Antidiabetic activity ,		Whole plant	Natarajan(2013)
Abrusprecatorius L .Fabaceae	Ghumchi	Plants of tribal areas of	Type I ,II Diabetes	Antidiabetic activity , heart disease , tumors ,.	Leaf juice (two	Leaf	Yadav, M., Khan, (2012).

		district rewa used to treat		Colic	teaspoon) given orally		

Name of Plant with Family	Local Name	Area	Type Of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Wrightia tinctoria, (Roxb.) Apocynaceae	Safed Korea	Surguja district	Type I, II Diabetes	Antioxidant , diabetic neuropathy , antihypertension	Seed powder	Seed	Shrivastava, S., & Kanungo, V. K (2013) .
Gymnema sylvestre, R.Br .Asclepiadaceae	Gudmar	Surguja district	Type I Diabetes	Antidiabetic activity , repair pancreatic damage	Leaf juice	Leaves	Shrivastava, S., & Kanungo, V. K .(2013)
Tinospora cordifolia, Miers. Menispermaceae	Guluchi	Surguja district	Type II Diabetes	Antidiabetic activity , hypoglycemic activity		Stem	Shrivastava, S., &Kanungo, V. K. (2013)
Pterocarpus marsupium, Roxb .Fabaceae	Beeja	Surguja district		Antidiabetic activity , hypoglycemic activity		Bark	Shrivastava, S., &Kanungo(2013)
Anogeissus latifolia, Roxb Combretaceae	Dhawa	Surguja district	Type II Diabetes	Antidiabetic activity , hypoglycemic activity , endocrine disease		Bark	Shrivastava, S., & Kanungo, V. K. (2013)
Asparagus racemosus, Liliaceae	Willd.	Surguja district	Type II Diabetes	Antioxidant , neuropathy , antidiabetic , Nephropathy		Root	Shrivastava, S., & Kanungo, V. K (2013)

Cassia fistula, L Fabaceae	Amaltas	Surguja district	Type I Diabetes	Antidiabetic , improve serum lipid		Fruit	Shrivastava, S., & Kanungo, V. K. (2013)
Madhucalongifolia, var LatifoliaRoxb. Sapotaceae	Mahua	Surguja district	Type II Diabetes	Anti-inflammatory , snake bite poisoning		Flower/Bark	Shrivastava, S., & Kanungo, V. K. (2013)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Phramacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Catharanthus roseus, *G.Don* Apocynaceae	Sadabahar	Surguja district	Type II Diabetes	Antidiabetic activity , Antioxidant .	Leaf juice	Leaves	Shrivastava, S., & Kanungo, V. K. (2013)
Momordicacharantia, L .Cucurbitaceae	Karela	Surguja district	Type I , II Diabetes	Antidiabetic activity , Hypoglycemic activity		Fruit	Shrivastava, S., & Kanungo, V. K. (2013)
Syzygium cumini, *(L.)Skeels*	Jamun	Surguja district	Type I , II Diabetes	Antidiabetic activity , Antiinflmmatory ,	Leaf juice	Leaves	Shrivastava, S., & Kanungo, V. K.

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Myrtaceae				antioxidant .			(2013)
Ptarocarpus marsupium Fabaceae	Egisa	District, andhra pradesh, india.	Type II Diabetes	Antidiabetic activity , Hypoglycemic activity	stem juice	stem	Sarmah, P. C. (2011)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Ocimum sanctum L. Lamiaceae	Kalitulsi	The baiga tribe living in rewa district m.p.	Type II Diabetes	Antidiabetic activity , Hypoglycemic , reduction of blood sugar	Leaf powder is taken orally with honey	Leaf	Yadav, M., Khan, K. K(2012)
Hibiscus rosa-sinensis L .Malvaceae	Gurhal	The baiga tribe living in rewa district m.p.	Type II Diabetes	Antidiabetic activity , Stimulate insulin secreation	Leaf juice	Leaf	Yadav, M., Khan, K. K(2012)
Punica granatum L. Punicaceae	Anar	The baiga tribe living in rewa district m.p.	Type II Diabetes	Antidiabetic activity , Antioxidant , antihypertension		Fruit	Yadav, M., Khan, K. K(2012)
Nelumbo Nucifera Gaertn .Nelumbonaceae	Kamal	The baiga tribe living in rewa district m.p.	Type II Diabetes	Antidiabetic activity , improve glucose tolerance	Flowers made to juice and taken orally	Flower	Yadav, M., Khan, K. K(2012)
Ficus retusa Linn. Moraceae	Athimaram	Plants of kalavai, vellore district, tamil	Type II Diabetes	Diabetes mellitus Antidiabetic activity ,	Leaf juice	Leaves and	Natarajan (2013)

		Nadu, india					
Gymnema sylvesire Asclepiadaceae		Studies on herbal medicinal plants in Marathwada region (MS) India	Type I ,II Diabetes	Diabetes mellitus Antidiabetic activity ,	Leaf juice	Leaves	Ladda, R. G., Aradwad, (2013)
Syzygium cumini Linn. (Myrtaceae)	Naval palam	Plants of kalavai, vellore district, tamil Nadu, india	Type I ,II Diabetes	Antidiabetic activity , anti-inflammatory , antinociceptive	Seed powder	Seed	Natarajan (2013)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Alliumcepa Linn .Liliaceae	Piyaz	Plants of tribal areas of district rewa used to treat diabetes	Type I , II Diabetes	Antidiabetic activity, antihyperglycemic, antioxidant.	Leaf juice is taken orally with honey or milk till .	Leaf	Yadav, M., Khan, K(2012).
Cassia fistula L .Caesalpiniaceae	Amaltas	Plants of tribal areas of district rewa used to treat diabetes	Type I Diabetes	Antidiabetic activity , improve serum level	One tea spoon powder of seeds is given once In the morning for about	Seed	Yadav, M., Khan, K(2012).

					15 days or more.		
Ficus benghalensis Linn Moraceae	Bargad	Plants of tribal areas of district rewa used to treat diabetes	Type I ,II Diabetes	Antidiabetic activity , antistress , antiallergic , improve insulin stimulation	Ground powder mixed along with honey is	Bark	Yadav, M., Khan, K. K.(2012)

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Ficus racemosa L . Moraceae	Gular	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , antibacterial	ried frits taken with warm water	Fruit	Yadav, M., Khan, K. K.(2012)
Lantana camara Linn .Verbenaceae	Raimunia	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , asthma , emphysema .	Leaf and fruits consumed raw	Leaf and fruit	Yadav, M., Khan, K. K.(2012)
Mangifera indicaL .Ana Cardiaceae	Aam	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , reduce blood pressure , antimicrobial	Dry kernel powder with cow's milk is taken till care .	Seed	Yadav, M., Khan, K. K
Musa paradisiacal Musaceae	Kela	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , antioxidant activity	Stem extract	Stem	Yadav, M., Khan, K. K.(2012)
Nelumbonucifera		Plants of tribal areas of district	Type I , II Diabetes		Flowers made to juice		Yadav, M., Khan,

gaerth .Nelumbonaceae	Kamal	rewa used to treat diabetes		Antidiabetic activity , diabetes mellitus .	and taken orally for about 15 days.	Flower	K. K.(2012)
Ocimum sanctum L .Lamiaceae	Kalitulsi	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , hypolipidemic , reduce of blood sugar .	Leaf powder is taken orally with honey.	Leaf	Yadav, M., Khan, K. K.(2012)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Punica granatum L . Punicaceae	Anar	Plants of tribal areas of district rewa used to treat diabetes	Type II Diabetes	Antidiabetic activity , antioxidant , Antihypertension, hypolipidemic .		Fruit	Yadav, M., Khan, K. K(2012)
Zygium cumini Myrtaceae	Jamern	Plants of tribal areas of district rewa used to treat diabetes	Type I ,II Diabetes	Antidiabetic activity , repair immunoreactive beta cells	Seed powder	Seed	Yadav, M., Khan, K. K(2012)
Bombox malabaricum D C Bombacaceae	Simolu	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity ,		Root	Sarmah, P. C. (2011)
Bougainvillea spectabili swilld	Bougainvelli	Ethno antidiabetic plants of	Type II Diabetes	Antidiabetic activity , antihyperglycemic activity	Leaf juice	Leaf	Sarmah, P. C.

Nyctaginiacea	a	Assam					(2011)
Caesalpinia crista *Linn* .Caesalpiniaceae	Lataguti	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , obesity , cancer , stoke , antioxidant	Seed powder	Seed	Sarmah, P. C. (2011)
Cajanus cajan Mill Papilionaceae	Rahar	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity ,acute hypoglycemic	Leaf juice	Leaf	Sarmah, P. C. (2011)
Canna indica Linn Cannaceae	Parijat	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , hypoglycemic activity , antihypertension	Leaf juice	Leaf,Stem	Sarmah, P. C. (2011)
Cannabis sativa Linn Cannabaceae	Bhang	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , neuroprotective effect , Psycho tonic effect ,	Leaf juice	Leaf,stem, flower	Sarmah, P. C. (2011)
Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of**	**Reference**
Carrica papaya Linn Carricaceae	Amita	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , heart attack , stoke , anemia , jaundice	Seed powder	Seed	Sarmah, P. C. (2011)
Casia alata Linn. Caesalpiniaceae	Khorpat	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity ,antinociceptive , antioxidant		Tender,leaf	Sarmah, P. C. (2011)
Cassia angastifolia Linn Caesalpiniaceae	Channa	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , Antioxidant , hypoglycemic	Leaf juice	Leaf	Sarmah, P. C.

MarsileaminutaL. (Marsileaceae)	Aarakkerai	Plants of kalavai, vellore district, tamil Nadu, india	Type I , II Diabetes	Antidiabetic activity , drug resistance epilepsy	Leaf juice	Leaves	Natarajan(2013)
Cynodon dactylon(L)*pers* Poaceae	Arugampul	Plants of kalavai, vellore district, tamil Nadu, india	Type I Diabetes	Antidiabetic activity ,		Whole plant	Natarajan(2013)
Abrus precatorius L Fabaceae	Ghumchi	Plants of tribal areas of district rewa used to treat	Type I ,II Diabetes	Antidiabetic activity , heart disease , tumors ,. colic	Leaf juice (2 teaspoon) given orally	Leaf	Yadav, M., Khan, K(2012).

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Cassia sophera Linn Caesalpinacea	Bonmadelu	Ethno antidiabetic plants of assam	Type II Diabetes	Antidiabetic activity , antihyperlipidemic antioxidant	Seed powder	Seed,stem,b Ark	Sarmah, P. C. (2011)
Tinospora Cordifalia (Menispermaceae).	ThippaTeega	Raditional Healers of thadvai, warangal district, andhra pradesh, india.	Type II Diabetes	Antidiabetic activity , Oxidation stress	Creepers and Leafs Dry powder or One teaspoon Juice	Leaf	Naini, V., &Mamidala, E. (2013)
Litsea sebifera Lauraceae	Narre Mamedi	Raditional Healers of thadvai, warangal district, andhra pradesh, india.	Type I Diabetes	Antidiabetic activity , Anti-inflammatory , antipyretic	Bark, Juice of bark is mixed with water	Bark	Naini, V., &Mamidala, E. (2013)
Sphaeranthus indicus Linn Asteraceae	Sphaeranthus indicus Linn (Asteraceae)	Raditional Healers of thadvai, warangal district, andhra pradesh, india.	Type II Diabetes	Antidiabetic activity , Antiobesity , antioxidant	The leaves are grinded with pepper and a dose of spoon extract is taken	Leaf.leaves	Naini, V., & Mamidala, E.(2012)

					Orally		
Acacia Arabica Mimosaceae	Indian babool	Kolli hills, Namakkaldistrict,tamiln adu, southern india	Type II Diabetes	Antidiabetic activity , Hypoglycemic activity		Bark, gum, pods, leaves and Seeds	Elavarasi, S., & Saravanan, K. (2012)
Name Of The Plant With Family	**Local Name**	**Area**	**Type Of Diabetes**	**Pharamacological Action**	**To Be Taken**	**Part Of Plant**	**Reference**
Syzygium cumini Myrtaceae	Java plum	Kolli hills, Namakkaldistrict,tamiln adu, southern india	TypeI , II Diabetes	Antidiabetic activity , antidyslipidemic		Fruit, leaves, dried seed and bark	Elavarasi, S., & Saravanan, K.(2012)
Ficusra cemosa Urticaceae	Cluster fig	Kolli hills, Namakkaldistrict,tamiln adu, southern india	Type II Diabetes	Antidiabetic activity ,diarrhea , dysentery , heomoptysis		Bark, leaves and unripe fruit	Elavarasi, S., & Saravanan, K. (2012)
Cedrus deodara Loud Pinaceae	Deodar	Medicinal plants Of tehsil billawar, district kathua, j&k,	Type II Diabetes	Antidiabetic activity, antitumor , anti-inflammatory , analgesic		Leaves	Bhushan, B., &

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.		India			Leaf juice		(2013)
Mimosa pudicaLinn. Fabaceae	Chui-mui	Medicinal plants Of tehsil billawar, district kathua, j&k, India	Type I ,II Diabetes	Antidiabetic activity , urinary problem	Leaf juice	Leaves	Bhushan, B., & Kumar, M. (2013)

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Xanthium strumarium Asteraceae	Maruloo Mathangi	Traditional healers of thadvai, warangal district, andhra pradesh, india.	Type II Diabetes	Antidiabetic activity , antioxidant activity		Roots & Seeds	Naini, V., &Mamidala, E. (2013)
Sesbania sesban *Merill* Papilionaceae	Jayanti	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity ,hypoglycemic , antioxidant , diabetic nephropathy	Leaf juice	Leaf, tender stem	Sarmah, P. C. (2011)
Sterculia villosa Roxb. Starculiaceae	Udal	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , dysentery , skin disorder		Root	Sarmah, P. C. (2011)
Swetia chirayta Roxb. Gentianaceae	Cherota	Ethno antidiabetic plants of	Type II Diabetes	Antidiabetic activity , hypoglycemic activity , analgesic, hepatic , antiinflammation		Aerial plant	Sarmah, P. C. (2011)

Name of Plant with Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Tabernaemontana diveri Cota (L) R Br Apocyanaceae	Kothalphool	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , hypoglycemic activity	Leaf juice	Leaf	Sarmah, P. C. (2011)
Terminalia catapa Linn Combretaceae	Badam(desi)	Ethno antidiabetic plants of Assam	Type I, II Diabetes	Antidiabetic activity , hypoglycemic activity		Fruit,seed	Sarmah, P. C. (2011)
Terminalia chebuta Roxb .Combretaceae	Selekha	Ethno antidiabetic plants of Assam	Type I , II Diabetes	Antidiabetic, tumor ,colic , swelling		Fruit	Sarmah, P. C. (2011)
Thevetia peruviana (pers) MerillApocyanaceae	Halodhiakoro Bi	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , antiapoptatic , Antilipidemic		Bark	Sarmah, P. C. (2011)
Tinospora cordifolia Miers Menispermaceae	Sidhilota	Ethno antidiabetic plants of Assam	Type I Diabetes	Antioxidant, antidiabetic	Leaf juice	Leaf, bark	Sarmah, P. C. (2011)
Tinospora crista Miers Menispermaceae	Sagunilata	Ethno antidiabetic plants of Assam	Type II Diabetes	Anti-inflammatory , asthma , fever , jaundice		Leaf, root	Sarmah, P. C. (2011)
Vinca rosea Linn (cartharanthu sreseus) Apocyanaceae	Nayantora	Ethno antidiabetic plants of Assam	Type II Diabetes	Antidiabetic activity , hypoglycemic activity, Antioxidant	Leaf juice	Leaf	Sarmah, P. C. (2011)

Conscinium fenestratum Menispermaceae	Maramaneal	Raditional Healers of thadvai, warangal district, andhra pradesh, india.	Type II Diabetes	, Diabetic retinopathy decrease lipid peroxidation, antioxidant		Stem	Naini, V., & Mamidala (2011)

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharmacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Momordica charantia L .Cucurbitaceae	Pavakai	Kalavai, vellore district, tamil Nadu, india	Type I,II Diabetes	Blood pressure control Antidiabetic activity ,		Bark	Natarajan (2013)
Ficusretusa Linn Moraceae	Athimaram	Kalavai, vellore district, tamil Nadu, india	Type II Diabetes	Antidiabetic activity , Anti-inflammatory , hypocholesteroaemic	Leaf juice	Leaves and Fruit	Natarajan (2013)
Cassia auriculata L. Caesalpiniaceae	Aavaram poo	Kalavai, vellore district, tamil Nadu, india	Type I Diabetes	Antioxidant , antidiabetic activity		Whole plant	Natarajan (2013)
Aegle marmelos Corr.ex Roxb Rutaceae	Vilvam	Kalavai, vellore district, tamil Nadu, india	Type II Diabetes	Opthalmia , deafness, diarrhea , dysentery antidiabetic	Leaf juice	Leaves	Natarajan (2013).
Syzygium cumini Linn. Myrtaceae	Naval palam	Kalavai, vellore district, tamil Nadu, india	Type II Diabetes	Antidiabetic activity , hypoglycemic activity , Antiinflammtory	Seed powder	Seed	Natarajan (2013).

Cynodon dactylon (*L.*)*Pers*. Poaceae	Arugampul	Kalavai, vellore district, tamil Nadu, india	Type I,II Diabetes	Antioxidant , antihyperglycemic , Antihyperlipidemic		Whole plant	Natarajan (2013).

Name of Plant with Family	**Local Name**	**Area**	**Type of Diabetes**	**Pharamacological Action**	**To Be Taken**	**Part of Plant**	**Reference**
Lobelia sinensis Lobelliaceae	*Yahang-en*	Khamptis of Arunachal Pradesh	Type II Diabetes	Angiotension Receptor Blocker in treatment of diabetic nephropathy		Leaf extract is used for The Treatment	Sen, P., Dollo, M., Choudhury , M. D. (2008)
Vincarosea Linn. Apocynaceae	*Nayantara*	Khamptis of arunachal pradesh	Type II Diabetes	Hypolipidaemic Effect , Hypoglycemic Properties , Neuropsycho-pharmacological effects		leaf extract is used for the treatment	Sen, P., Dollo ,M., Choudhury M. D. (2008),
Pterocarpus marsupium Roxb Leguminosae		Kollam district, kerala	Type II Diabetes	Pancreatic beta cell regulation , Hypoglycemic activity	decoction is taken internally thrice a day	Dried heart Wood	Udayan, P. S., George, S.
Coccinia grandis Cucurbitaceae	Koovai	Local people in javadhu hills tamilnadu, india	Type I , II Diabetes	Antiulcerogenic , antioxidant	Fruit		Thirumalai, T. Beverly, C.

Name of Plant With Family	Local Name	Area	Type of Diabetes	Pharmacological Action	To Be Taken	Part of Plant	Reference
Agel marmelos Rutaceae	Bel	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district (maharastra)	Type II Diabetes	Repair tissue , Diabetic foot ulcer , hyperlipidemia		The dried And Powdered Leaves	Ghoshal, K. P., & Gadekar, G. P. (2014)
Asparagus racemosus Asparagaceae	Shatavari	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district maharastra	Type II Diabetes	Diabetic retinopathy , decrease lipid peroxidation , enhance level of glutathione		Tuberous root,	Ghoshal, K. P., & Gadekar, G. P. (2014)
Andrographis paniculata Acanthaceae	PaniculataBhui, Neem	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district(maharastra)	Type II Diabetes	Increase glucose utilization & lower Hyperglycemic , cold, fever, malaria.	juice is taken orally	Leaves, The juice of the leaves	Ghoshal, K. P., & Gadekar, G. P (2014).
Azadirachtaindica Meliaceae	Neem	Survey on ethnomedicinal anti-diabetic plants from deori taluka of gondia district (maharastra)	Type II Diabetes	Reduce peripheral utilization of glucose	juice is taken orally	Leaves, Dried and Powdered leaves	Ghoshal, K. P., & Gadekar, G. P. (2014)

3. DISCUSSION

The present review is an attempt to compile the traditional ethnobotanical medicinal plants utilized in various parts of India. This study will be help to future researcher to understand the correlation between different tribes and their approach to treat Diabetes s. In this study, medicinal plants which are being utilized to treat0 the Diabetes disease among the tribes were focused. Data obtained from present investigation is compiled in Table 2.1 and the medicinal plants species are arranged in alphabetical order. A total of 124 plant species belonging to 63 families have been reported for the treatment of Diabetes diseases. The most of the medicinal plants are belongs to malvaceae, leguminosae, poaceae, liliaceae, cucurbitaceae, gentianaceae, asteraceae, zingiberaceae, verbenaceae and Apocynaceae. The botanical name, local name, native tribe utilized, part of plant, mode of use, pharmacological activity and references are provided. The compilation revels that the different plant parts were used in treatment of diabetes. Among these leaves were highly utilized leaves (27%) followed by whole plant (4%), roots (8%), seed (22%) fruit (17%) , stem (6%), shoot and bark (12%), Table 1 show that there are some medicinal plants which were accepted in different tribes as medications for diabetes. They are either used single or in combination or the same part or other parts.These plants are also recommended in Indian system of medicines such as Ayurveda and siddha systems of medicines, these findings indicate these tribes are some or other way relates to these systems. The preparation method of medication sometimes varies from *vaidus* (Medicine man) to *vaidus*. The popular forms are decoction, juice, extract, powder, fresh part, and paste. The duration of treatment varies from weeks to months.

4. CONCLUSION

A significant contribution to human health are provided by medicinal plants of the locality and one of the most significant ways in which humans directly reap the benefits are provided by biodiversity. India has long history of medicinal plant utilization in traditional and tribal culture. Here we reported on 124 medicinal plant species. Used in the traditional health care systems of tribal people from the India. This is the most comprehensive review to date and it shows striking similarities between medicinal plants being used in nations. Thus, by triangulation, it is probably still possible to document most of the knowledge, but research should continue, especially in areas or within nations that have received less attention.

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