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Research Journal

Half Yearly Journal of Science, Arts, Social Sciences, Commerce, Home Science & Home Science Technology

RESEARCH DEVELOPMENT CELL

WOMEN'S EDUCATION SOCIETY'S
LADY AMRITBAI DAGA COLLEGE FOR WOMEN OF ARTS, COMMERCE & SCIENCE AND SMT. RATNIDEVI PUROHIT COLLEGE OF HOME SCIENCE & HOME SCIENCE TECHNOLOGY
Estd. 1932
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(A Peer-reviewed Journal)

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Editorial

We are pleased that the 'Research Journal' of our college is presenting its Vol. 13 issue. This issue of the Journal contains submission of articles and research papers which shed light on contemporary research questions from the field of Designing, Nutrition, Family Resource Management, Home Science Extension, Cosmetic Technology, Hotel Management and Catering Technology, Pharmacy all forming the branches of Science and Home Science Technology.

The first research paper of the Journal is very useful and technical paper presenting the design and development of Micro-controller based automatic water sprinkler which will enable us to control wastage while watering the public gardens or be it our very own home garden. Similarly another author from the same field of Electronics has shared valuable views on Artificial Intelligence based data dissemination which will improve and enhance the dissemination quality of the network. A well-researched article from the field of Designing deals with human aspects of spaces presenting views of environmental psychology of work spaces that effects the well-being of an employee, considering the long hours that one spends at the work area. Cosmetic related scholarly works forms major part of this issue. One of the research article reviews use of herbs like Sugarcane, Brahmi, Babul Bark and other herbs. The chemical constituents of these random selected herbs are responsible for properties like astringent, antioxidant and antifungal. On the same line of work is the in-depth study on the effectiveness of Symplocos Racemosa, a rich source of alkaloids. It also contain glycosides, tannins, steroids and terpenoids. This review article presents the effectiveness of Symplocos racemose as anti-acne agent. Moving further in the same line of study, another author takes an insight review into various herbs from the family of Fabsceae, which have shown to have different pharmacological actions. A fundamental concern in the management of type 2 diabetes light glycemic control which is known to reduce cardio disease morbidity and mortality. These aspects have been dealt by the Research scholars in the paper from Nutrition. Research Scholars from various fields are working on issues concerning the environment. One such research paper is attempting to check the awareness level of women regarding water conservation as they are an important agents which can contribute to a very great extent in good water practices. Related to the same issues research paper on utilization of solar energy in hotels. Lastly the research journal has a submission on women journalist which looks into the problems faced by women journalist.

We hope that this amalgamation of scholarly work will add up to your knowledge.

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Research Journal

Vol. **13** No. **(2) 2017**

Contents Page No.

- **Applied Electronics**

1. Design and Development of Microcontroller Based Automatic Water Sprinkler....1
   K. Dhawad, A. Khurana, K. Tiwari, D. Jain, N. Saklani
2. Improving Quality of Data Dissemination in Wireless Networks with AI Based Negotiations....4
   S. Kalam, S. Ambatkar

- **Cosmetics Technology**

3. Random Herbs used in Cosmetic Formulation....12
   K. Patel, S. Sakharwade
4. Application of Herbs of Family - *Fabaceae* in Cosmetics....24
   V. Raich, S. Sakharwade
5. Anti-acne Property of Symplocos Racemosa Bark....34
   R. Bobade, S. Sakharwade

- **Home Science**

★ **Food Science and Nutrition**

6. Association of Glycemic Triad with Obesity Indices in Type 2 Diabetics....41
   S. Raghib, S. Vali

★ **Home Science Extension**

7. Working Pattern of Social Workers....48
   T. Choudhary

- **Hotel Management and Catering Technology**

8. Use of Solar Energy in Hotels....52
   S. Rakhi, C. Gajbhiye

- **Interior Design**

9. Environmental Psychology of Workspace 59
P. Pathak, A. Dongre

- **Pharmacy**

10. Formulation and Validation of Topical Herbal Cream for Antimicrobial Activity 65
R. Lonkar, R. Alaspure, M. Umekar, R. Das

- **Interdisciplinary**

11. Issues Faced by Women Journalists in Print Media..... 79
B. Swaminathan

Design and Development of Microcontroller Based Automatic Water Sprinkler

K. Dhawad, A. Khurana, K. Tiwari, D. Jain, N. Saklani

L.A.D. & Smt. R.P. College for Women, Nagpur.

Abstract

It is observed that in gardens of house,schools,colleges,offices or even public gardens, lawns a gardner is appointed for watering the plants and lawns. They do this work using large pipes. At least twice a day watering is carried out. It consumes lot of time. Along with this large quantity of water is also wasted. Saving water is the need of the day. Everyone must save water as much as possible and wherever it is possible. Automatic water sprinkler system is the solution for this issue. Using this system, time and water both could be saved.

Key words : Microcontroller, Sprinkler.

Introduction

Automatic water sprinkler is a embedded system designed to avoid wastage of water and also to ease the job of watering lawns. Almost every house, school, college, office has lawns and gardens. Normally a gardener plants the lawn and garden twice or thrice a day depending on season.

Traditionally, large pipes with lot of water pressure are used for watering gardens or lawns. In this process, huge quantity of water is wasted. Saving water is need of the day. Everyone must try to save water as much as possible and wherever possible. Using sprinklers or drip system saves lot of water. It is useful even in farms. Many farmers are adopting drip system. So we tried to automise sprinkler system and use it for watering college lawn.

This automatic sprinkler system is designed based on microcontroller 8951. Depending on the seasons, amount of water required by plants varies similarly, no of times ,plants should be watered also varies. So the designed system has a facility whereby, according to seasons, time and duration of watering automatically changes. Date and month of the year as well as clock is displayed on the LCD display interfaced to the system, so that if required user can check if system is working as designed or not. A keyboard is provided to set time and date. System can be on thr'out the day.

Working

Instrument works in two modes:

1. Run Mode
2. Set Mode

Run Mode: With Power On, instrument automatically goes to RUN mode.

Current time and calendar is displayed. At the preset time sprinkler will be switched On automatically, for predefined duration.

For time and calendar, I2c based RTC is used

Dc sprinkler working on 12V /1Amp Power supply is used. Two sprinklers can be interfaced to the system at a time.

Sprinkler is driven thr' the driver and controlled by microcontroller Atmel 8951

Set Mode:

In this mode, user can set year, month, date, day of week like Sunday, Monday etc and also clock i.e. hours, minutes and seconds. Clock operates in 24 hour mode.

For Setting, 4 key Key Board is provide.

While instrument is in Run Mode, if Set key is pressed continuously for 5 seconds, system goes to Set Mode and on the LCD display Year XX will be displayed. Using Increment (INC) or Decrement (DEC) key year can be changed to required value. Once required value of year is displayed, pressing set key again will set the year at new value and month will be allowed to set.Similar process can be used to set all the parameters of calendar and clock.

Setting is done in the sequence as Year, Month, Date, Day, Hour, Minutes and seconds.

If user does not want to set any particular parameter, by pressing set key, successive parameter can be displayed and set.

Once all the parameters are set instrument automatically goes to Run Mode. Newly set clock and calendar are displayed.

User can come out of Set mode and enter Run mode any time by simply pressing Esc key.

Operation of the instrument is very user friendly.

Working of the instrument is checked in lawns of LAD College, Nagpur.

It functions exactly as designed.

Testing and Result

Automatic water Sprinkler is installed in College Lawn. It was kept on throughout the day and checked if sprinkler gets on at predecided time for programmed time or not.

By setting RTC at particular month like deliberately selecting season as summer, winter or rainy season, On time duration was checked. It was working as per the progam.

Automatic water sprinkler designed for college lawn works as per the designed criteria.

Future Scope

Presently, system checks the month and time and duration is adjusted as per summer season, winter or rainy season. System is on for longer duration during summer, and very less duration during Rainy Season.

System can be interfaced with soil moisture sensor and on duration can

also be controlled as per soil moisture content.

This sensor could be added without much change in hardware.

Also user could be provided with facility to change duration as per his convenience.

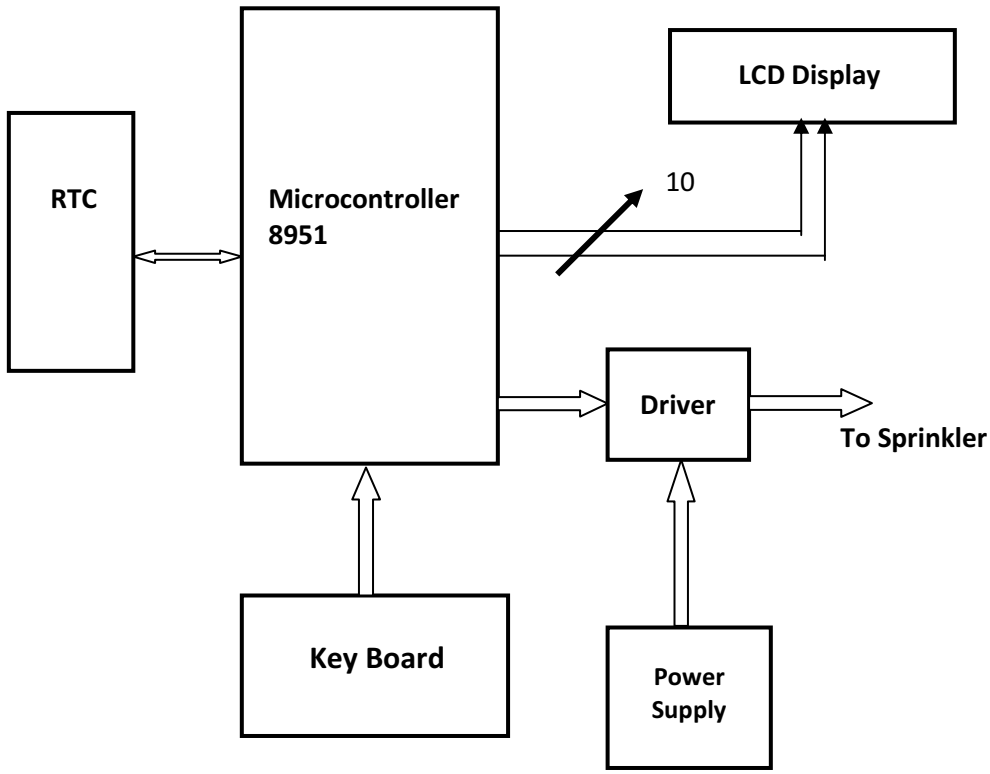

Fig 1. Block Diagram pf Automatic Water Sprinkler

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Improving Quality of Data Dissemination in Wireless Networks with AI Based Negotiations

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Abstract

Data dissemination in wireless networks is a running field of study, and is usually related with sending lossless, low latency, high throughput data from the disseminator to the nodes which need the data. Certain examples of negotiation based data dissemination techniques have suggested that negociation based dissemination is not only faster, but has a higher trust value while sending data between nodes. In this paper, we propose an AI based enhanced data dissemination protocol, which intelligently establishes trust in the network based on previous negotiations in order to improve the dissemination quality of the network. Our results show that, the proposed algorithm gets intelligent as communications increase and shows a 20% improvement in dissemination speed and throughput.

Key words : Artificial Intelligence (AI), Negociation, Dissemination, Trust value.

Introduction

Data dissemination is an ongoing research field, where researchers are finding novel ways to improve the quality of dissemination in wireless networks. Dissemination is mainly concerned with distributing a piece of information to multiple users with low delay, low energy consumption and high throughput. Dissemination is prone to normal network issues like man in the middle attacks, packet dropping, link breakages, node distribution and others.

The most superior performance is obtained using negotiation based dissemination, where the disseminating node first negotiates with the other receiving nodes and disseminates data only when the negotiation conditions are satisfied. For example, if the negotiation has to be done based on the delay of communication, then nodes where the delay of dissemination is less than a given threshold are directly passed for communication, while all other nodes wait for dissemination via some condition for negotiation. Negotiation conditions include, but are not limited to,

- Password based negotiations
- Pre-shared key based negotiations
- Node challenge based negotiations
- Timestamp based negotiations

These techniques are most commonly used by network designers and are the industry de-facto for negotiation based disseminations. Our proposed technique uses a combination of the mentioned negotiation tech-

nique, and applies a AI layer to it in order to improve the overall efficiency of the wireless network. The next section describes some the standard dissemination protocols which were studied before proposing our AI based algorithm. Post that our algorithm is described, and then it's results are compared with standard techniques in terms of primary network parameters. We then conclude the text with our observations about the proposed protocol and how other researchers can improve the protocol further.

Literature review

Data Dissemination is a method which helps in exchanging the data from sender to collector utilizing diverse sorts of data dissemination techniques. Data Dissemination helps in conveying the data at the collector end and encourages at last to end association amongst sender and recipient.

Data Dissemination types

There are distinctive sorts of data dissemination techniques which are grouped below[6].

- The vehiclefor infrastructural Dissemination
- Vehicle to Vehicle Dissemination
- Opportunistic dissemination
- Geographical dissemination
- Peer-to-peer dissemination
- Cluster-based dissemination

Data Dissemination Techniques

Beam effective acknowledgment based absolutely multicasting (beam) framework: point of this protocol is to apply data transfer capacity accurately in the midst of a debacle condition by methods for restricting an aggregate number of in-set up message trades. the beam is made set up of current telecom protocol, for instance, acknowledgment communicates from static to extremely convenient (absm) a versatile communicate protocol. Beam protocol does multicasting instead of broadcasting [10].

More suitable beam efficient cluster primarily based multicasting (ebecm) strategy: aprimary factor of ebecm is to conquer the inconvenience emerges in beam i.e. multicar chain issue. V2v correspondence is given in it and clusters are utilized for normal hubs. ebecm give disaster situation messages to non-multicast gather people which stay far from the issue of multicar chain collision [7].

Urban multihop broadcast protocol: this is a multi-jump broadcasting based protocol that uses RTB/ctb handshake approach for sending groups and tolerating acknowledgments. Message dispersal is troublesome in urban areas. In this way, it at last winds up required to have methodologies or protocols for sending information distributes city zones. Likewise, urban multihop broadcast (umb) protocol is one of them that does directional broadcasting and in addition broadcasting at crossing points in urban regions [6].

Advert-hoc multihop broadcast protocol: in the amb protocol, directional broadcast is indistinguishable as that of umb protocol yet in the event that there need to stand up a perva-

siveness of crossing point broadcast-autos undertaking to choose the closest auto to the convergence making utilization of an absolutely adhoc figuring and the picked auto propels the bundle arrangement to all street areas barring the road section the package is gotten from [6].

Acknowledgment-based broadcast from static to thevery cellular protocol: on this protocol, a car that receives an information parcel may not forward that package deal immediately instead automobile will take a look at if retransmissions from specific friends already cover its entire community retaining in thoughts the quit aim to evade repetition. Additionally, that is done by handling interfacing overwhelming set (cds) of each car. Centers inside the compact discs will choose a shorter persevering time than consistent centers. This empowers them to retransmit first if their neighborhood has now not been secured before [6].In [11] and [12] makers have considered three question dealing with systems.

1. Client-In customer technique customer stores all the vital data for preparing the query and after that procedure the query locally.
2. On-request In on-request strategy server forms the query and broadcasts the outcome to the customer
3. Collaborative-In shared strategy server forms the query and adds an identifier to the tuple which contains the query result and afterward broadcast the data and the standards to the customer. In light of these guidelines, the customer creates the query result.

The reaction time of all these que-

Algorithm	Decision Mode	Priority Function	Starvation
RXW	Nonpreemptive	Waiting for time and no of requests for the data item	Minimum
EDF	Preemptive	Deadline of requested data	Possible
SIN	Nonpreemptive	SIN value.	Minimum
On-demand data broadcast	Nonpreemptive	Length of the requested data items	Possible
BPTC	Nonpreemptive	Access probability and time constraint	Minimum
Preemptive Scheduling	Preemptive	Deadline of requested data	Possible
HPF-EDF	Non- preemptive	Deadline for thequery and the popularity of the data	Possible
The Real Time Scheduling Strategy	Nonpreemptive	Deadline for query and number of requests for data	Possible
PAW	Nonpreemptive	Total number of outstanding request for data and timestamps of requests	Minimum

ry handling techniques is considered and keeping in mind that preparing the query the server picks the best strategy to process the query. In light of the deadline of query one of this query, preparing techniques are taken and the broadcast data is planned for the channel with the goal that query brings about the channel to meet the deadline of the query. Here the single channel situation is considered. At the point when the quantity of questions increments figuring the reaction time for every one of the inquiries is tedious, this is on account of disjoined needs to consider the channel portion bandwidth, size of the query result, thedeadline of the query and so on.

The following table shows comparison of various data dissemination protocols, compared over the starvation parameter. From our review it is eminent that non-preemptive solutions to data dissemination are better and more efficient, and must be used for dissemination of data in the networks.

Artificial intelligence based data dissemination protocol

Artificial intelligence is a field of evolutionary algorithms, where the system under optimization continuously learns from the environment, and takes the most optimum decision based on the analysis of outputs obtained in each of the iterations. Our AI based data dissemination protocol can be described as follows,

1. Setup N number of nodes randomly in the network
2. Set some nodes as dissemination nodes, and other nodes as the receiving nodes. Let D nodes are disseminating and R nodes are receiving
3. If node Ri is receiving from node Di for the first time, then there will be a negotiation between Ri and Di. If the negotiation succeeds, then Di broadcasts the ID of node Ri to all the other disseminating nodes, and marks it as valid for all disseminations
4. Otherwise, Di doesn't pass the Ri to the other nodes, and if Ri wants to get data from any other disseminating node, then it needs to perform a successful negotiation with that node, if the negotiation succeeds, then step 3 is repeated, else step 4 is repeated
5. Thus, each disseminating node, maintains a list of valid negotiated nodes in the following format,
6.

Disseminating node ID	Receiver ID	Negotiated by Node

7. So, whenever a dissemination request comes to a node, then first this table is referred. If the receiver ID is present in the table, then the node is auto-negotiated, and data is sent to it. Otherwise, there is manual negotiation of the node based on delay, throughput and energy, and if the negotiation passes, then again step 3 is repeated, and the table is updated locally as well as on all the disseminating nodes in the network.

We tested our AI based algorithm on various simulation conditions and found it to give optimum results in most of the cases. The results and comparative analysis is described in the next section.

Results and Analysis

We tested our AI based protocol for various combinations of network states. These combinations include changing the number of nodes and varying the negotiation conditions. The network parameters used are defined as follows,

Parameter	Value
Number of receiving nodes	10 to 100
Number of dissemination nodes	1 to 10
Data size	10 bytes to 1000 bytes
No. of communications	1 to 100

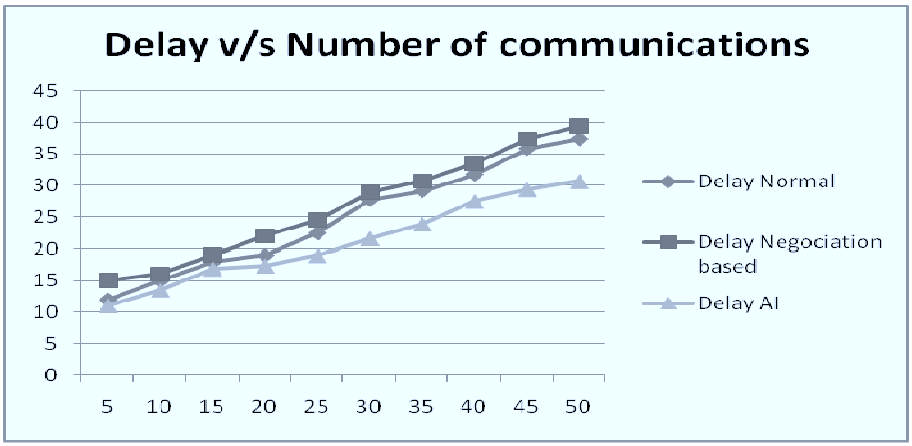
A sample AI table obtained from our simulations with 20 communications and 10 receiving nodes and 5 disseminating is shown as follows,

Disseminating node ID	Receiver ID	Negotiated by Node
1	6	1
1	8	4
2	9	3
2	15	3
2	16	4
3	7	5
3	8	5
3	9	4
4	10	2
4	12	2

Thus, node numbers 6, 8, 9, 15, 16, 7, 10 and 12 are already negotiated by other dissemination nodes, and thereby do not need further negotiations, so these nodes can directly receive the data via flooding from any of the disseminator nodes. Thus, there is a reduction in number of negotiations, which improves the overall throughput, and reduces the delay of dissemination in the network.

In our analysis, we compared the end to end delay for communication and the communication throughput of the proposed protocol with normal dissemination and trust based dissemination technique, and obtained the following results,

Number of communication	Delay Normal	Delay Negotiation based	Delay AI
5	12	15	11
10	15	16	13.5
15	18	19	16.8
20	19	22	17.3
25	22.5	24.5	18.9
30	27.8	28.9	21.6
35	29.2	30.7	23.9
40	31.8	33.5	27.5
45	35.9	37.4	29.4
50	37.4	39.5	30.7



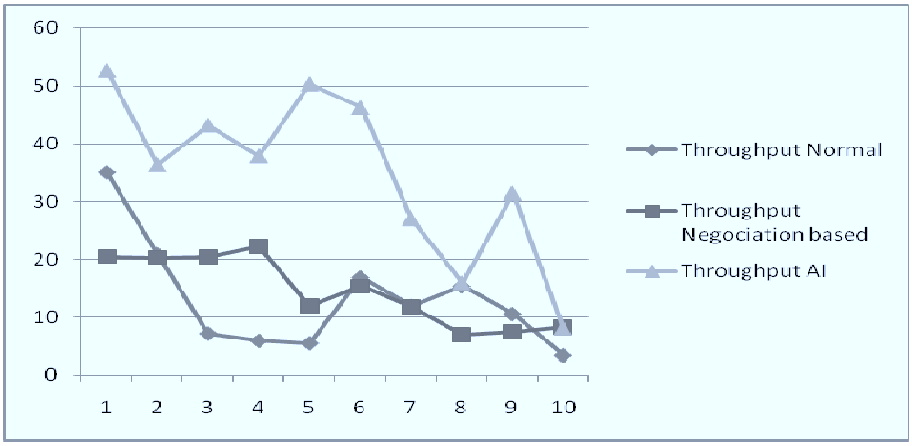
Similar observations were made for network throughput, and the following results were obtained,

Number of comms.	Thr. Normal	Thr. Negotiation based	Thr. AI
5	34.91667	20.46667	52.72727
10	20.8	20.3125	36.2963
15	7.055556	20.42105	43.21429
20	5.789474	22.27273	37.86127
25	5.377778	11.95918	50.37037
30	16.79856	15.36332	46.2963
35	11.84932	11.72638	27.02929
40	15.28302	6.895522	15.89091
45	10.44568	7.406417	31.42857
50	3.315508	8.227848	7.947883

Throughput is always higher due to lesser delay and higher number of received packets. Thus, our algorithm performs better when compared with other standard techniques.

Conclusion

The observed results demonstrate that the delay efficiency of theAI based dissemination system is superior than the existing standard protocols like normal dissemination and negotiation based dissemination. The AI layer also improves the throughput of communication for the network. The system also performs well with varying number of nodes and thus is suitable for any network size.



Future work

Our work shows good performance in simulation scenarios, we plan to implement this protocol in real time and check it's performance under real life network scenarios. Researchers can test the protocol for other wireless network types like WSNs, MANETs and VANETs in order to check the suitability of the system for their particular application.

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Random Herbs used in Cosmetic Formulation

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Abstract

For this review article, eight random herbs were selected. Extraction techniques such as Decoction for Babul bark and Sugarcane, Maceration for Marigold and Brahmi, Soxhlation for Banyan roots, Guava leaves and Lotus, Expression for Kiwi can be performed. Chemical test (identification) of these extracts results the presence of various secondary metabolites such as flavonoids, polyphenols, terpenoids, glycosides, carbohydrates, saponins, polysaccharides, steroids, tannins and so on. These chemical constituents are responsible for various properties such as astringent, antioxidant, antimicrobial, antifungal and so on.

Key words :

Introduction

Secondary metabolites like alkaloids, flavonoids, glycosides, terpenes and few other pigments present in plants provide them protection from disease, stressful environment and help in maintaining their health status. Active constitutes present in the plant are also known to be important for human as well.

Since long time, plants have been used for antibacterial, antiviral, antifungal, antioxidant, soothing, wound healing, anti-inflammatory and various other uses. The plants have the potential to enhance both humoral and cell medicated immunity because of metabolites like alkaloids, flavonoids, glycosides, polyphenols, terpenes, tannins etc. Use of plant extract in cosmetic formulation has increased worldwide for their desire effect.

For this review article, eight random herbs having different secondary metabolites were selected. Various extraction techniques can be use such as:

1. Decoction for Babul bark and Sugarcane.
2. Maceration for Marigold and Brahmi.
3. Soxhlation for banyan roots, Guava leaves and Lotus.
4. Expression for Kiwi

The chemical moieties present in these extract were identified through various chemical test.

ACACIA ARABIA (BABUL) :

Mimosaceae

The plant : A moderate sized tree upto 30 m in height with spreading branches, crooked and gnarled stems, white spines and pale yellowish grey

to nearly white bark with pale red inside: leaves bipinnate, 2.5-5 cm long, main rachis pubescent with a cup shaped gland between each pair of pinnae, 5-15 pairs of pinnae of 12-30 pairs linear oblong, obtuse; flowers in large terminal tomentose panicles, heads numerous, globose, fruits sessile, thin, flat, slightly curved pods, covered with pale brown tomentum; seeds 10-20 per pod.[1][2]

Geographical source: Babul is characteristic of dry region, but does not thrive without irrigation, if the climate is too arid. Babul is indigenous to the plains of Andhra Pradesh and Maharashtra, and is cultivated or found self-sown throughout the drier parts of India.[2][3]

Part use: Bark of stem.[4]

Chemical constituents: Tannin, sucrose, polyphenolic compounds (catechin, epicatechin, dicatechin, quercetin, gallic acid, leucocyanidin gallate).[6]

Properties: Astringent, antioxidant, demulcent, Antimicrobial, thermogenic, styptic, expectorant.[1][3][5]

Uses :

1. Tannin present in babul bark gives astringent property and hence decoction of bark is largely used as a gargle and mouthwash, can also be used in toothpaste. As gargle, it is useful in spongy gums, relaxed sore throat and as wash in hemorrhagic ulcers and wounds. [7]
2. Phenolic compound such as catechin, epicatechin contributes antioxidant property by increasing cell metabolism which promotes even skin tone and helps keep acne and wrinkles at bay. Babul extract can be incorporated in face mask and packs.

SACCHARUM OFFICINARUM (SUGARCANE)

Poaceae

The plant: A tall perennial grass, upto 6 m high with stems of varying thickness and color, leaves 1.5 m long, 60 cm broad, erect or drooping, varying in color from light to dark green, inflorescence large, pyramidal, spikelet usually surrounded by long silky hair from their base, glumes two, glabrous on the back, lemmas not cuspidate; grains oblong to sub globose.[8]

Geographical source: They were formerly cultivated extensively in all the tropical countries for the production of sugar. Found in India, China, Brazil, Thailand, Pakistan and Mexico.[9]

Part use : cane (stem)[10]

Chemical constituents: Sucrose, Protein, Polyphenols, Flavonoids (caffeic acid, quercetin, apigenin, albanin A, cis- p- hydroxycinnamic), Carbohydrate, Amino acids.[9][10][11]

Properties : Demulcent, sweet, antiseptic, antioxidant, cooling, laxative, diuretic and stimulant.[8][10]

Uses:

1. In sugarcane extract, presence of amino acid is claimed. Amino acids are used in cosmetics as they provide moisturizing properties to the skin.
2. Glycolic acid naturally present in

Cane Sugar removes dead skin cells, dirt, and oil that can clog and stretch pores. This makes sugarcane an excellent ingredient in exfoliate and masks.[12]

CALENDULA OFFICINALS (MARIGOLD)

Asterceae

The plant: Marigold is a genus of annual or perennial, mostly herbaceous plants in the sunflower family Asteraceae. [13]

Geographical source: Marigold was first discovered by the Portuguese in Central America in the 16th century. They introduce this flower to Europe and India. A major centre of marigold production in India is the Calcutta region.[14]

Part use : petals[15]

Chemical constituents: Flavonoids, Tannins, Carotenoids, Alcohols, Polysaccharides, Linoleic acid, Triterpenes, Saponins, Tocopherols.[15][16]

Uses:[15][17][18]

1. The bright yellow or orange color of the petals of marigold is due to the presence of antioxidant carotenoids - lutein, zeaxanthin and lycopene that can prevent damage from free radicals. The antiseptic, anti-inflammatory and anti-bacterial properties of marigold helps in healing skin ailments such as acne, athlete's foot, Candida, burns, rashes, calluses, corns, eczema and many more. The skin healing property of marigold has seen its extensive use in cosmetic products.[17]
5. The antibacterial activities of free oleanolic acid and its glucosides inhibits bacterial growth of Gram positive bacteria and hence marigold extract can be incorporated in mouthwash.
6. Carotenoid a fat soluble pigment can be used in lip cosmetics.[15]
7. Carotenoid can also be used in highlighting the hair by incorporating it in a hair dye.[15]

FICUS BENGHALENSIS (BANYAN)

Moraceae

The plant : A large tree upto 30 m in height with widely spreading branches bearing many aerial roots functioning as prop roots, bark greenish white, leaves simple, alternate, often in clusters at ends of branches, stipulate, 10-20 cm long and 5-12.5 cm broad, broadly elliptic to ovate, entire, coriaceous, strongly 3-7 ribbed from the base; the fruit receptacles are axillary, sessile, in pair, globose, brick- red when ripe, enclosing male, female and gall flowers; fruit small, crustaceous acheness, enclosed in the common fleshy receptacles.[20]

Geographical source: Found in almost all the parts of India. Banyan tree is the National tree of India. It is wild in the lower Himalayas and grown in gardens and road sides for shade.[21]

Part used : Rootbark[22]

Chemical constituents: Tannins, wax, caoutchouc, Flavonoids, carbohydrate, saponins and steroid.[21][22][23]

Properties: Astringent, cooling, anti-inflammatory.[20][22]

Uses: [23]

1. Tannins give astringent and cooling effect, cleansing the teeth with the aerial roots of the banyan is beneficial in preventing teeth and gum disorder.
2. Terpenes or Terpenoids exhibits analgesic, antioxidant, anti-inflammatory, antibacterial properties. Thus extract of aerial root exercises a soothing effect on the skin and mucous membrane.

BACOPA MONNIERI (BRAHMI)

Scrophulariacea

The plant : A prostrate or creeping, juicy, succulent, glabrous annual herb rooting at the nodes with numerous ascending branches; leaves simple, opposite, decussate, sensible, obovate-oblong or spatulate, entire, fleshy, obscurely veined, punctate; flowers pale blue or whitish, axillary, solitary, on long slender pedicles; fruits ovoid, acute, 2-celled, 2-valved capsules, tipped with style base; seeds minute, numerous.[24]

Geographical source: A small, creeping herb, commonly growing in marshy places throughout India, ascending to an attitude of 1,320 m. It can be easily grown in damp areas, and can be propagated by seed and also vegetatively.[24]

Part used : Whole plant root, stalks and leaves.[25]

Chemical constituents :[26][27]

1. Brahmi contains the alkaloids brahmine, herpestine and mixture of 3 other alkaloids.
2. The herb also contains the saponins, monnierin, hersaponin, bacoside A and B.
3. Other constituents present in plant are D-mannitol, betulic acid, sitosterol, stigmasterol and its esters, heptacosane, octacosane, nonacosane, nicotine, triacontane, hentriacontane, luteolin and 7-glucoside.

Properties : The plant is astringent, bitter, pungent, heating, laxative, tonic and antioxidant.[24][25]

Uses :[24][28][29]

1. Foot cream can be formulated by incorporating Brahmi extract as it contains Bacoside-A, saponins which gives wound healing property.
2. Applying brahmi oil on the scalp is good to strengthening the hair follicles. Its massaging is beneficial in checking dandruff, itchiness, formation of split ends and flakes as it contains alkaloids.
3. It coats the hair follicles reducing the damage to hair. This also allows the hair to develop volume and length.
4. It is useful for all sorts of skin problems such as eczema, psoriasis, abscess, ulceration boils etc.

PSIDIUM GUAJAVA LINN (GUAVA)

Myrtacea

The plant: A small tree upto 8 m in height with smooth, pinkish brown bark, having grey patches exfoliating

in very thin Woody flakes; leaves simple, opposite, light green oblong or elliptic- oblong, glabrous above, pubescent beneath, pellucid- punctate, lateral nerves 10-20 pairs joined by intramarginal veins; flowers white, fragrant in axillary 1-3 flowered cymes; fruits globose or pyriform berries often varying in size and shape, pulp yellowish white or red.[31]

Geographical source: Guava is often referred to as the apple of the tropics; it is a native of tropical America, probably from Mexico to Peru and has long been naturalized in India. The important Guava growing states are Uttar Pradesh, Bihar, Maharashtra, Assam, West Bengal, Andhra Pradesh and Madras; about half of the total area is reported in Uttar.[32]

Part used : Leaves[33]

Chemical constituents : [32][34]

1. The leave of Guajava contains catechol and pyrogallol types of tannins (8-15%).
2. It also contains Phenolic compounds (gallic acid, caffeic acid, rutin, quercetin and luteolin), was, essentially oil (caryophyllene, d- and l- limonenes, a bicyclic sesquiterpene alcohol and a tertiary sesquiterpene alcohol).
3. It also contains carotene, vitamins B1, B2, B6, niacin and vitamin C.

Properties : Astringent[33]

Uses : [35][36]

1. The guava leaves are used for wounds, ulcers and as an astringent for bowels. It is an efficacious gargle for swollen gums and ulceration of the mouth.
2. Leaves when ground make excellent poultice.
3. Oil of guava leaves, becomes logical ingredients of choice for skin care preparation.
4. Guaijaverin from leaves of guava has potential as an antiplaque agent due to its bacteriostatic property by inhibiting the growth of *S.mutans*and *Staphylococcus aureus*
5. Flavonoids and polyphenolic could be responsible for antioxidant and anti-inflammatory activities, therefore extract of guava leaves, becomes logical ingredients of choice for skin care preparation.

NELUMBO NUCIFERA (LOTUS)

Nymphaeaceae

The plant: A large handsome aquatic herb with slender, elongate, branched, creeping, rhizomes, sending out roots at the nodes; leaves 60-90 cm or more in diameter, petioles very long, smooth or with small prickles, much raised out of water; flowers solitary, large, fragrant, white or rosy with a centrally located yellow obvonical spongy torus in which carpels are sunken; fruits ovoids, nut-like achenes.[37]

Geographical source: N. Nucifera is a native of China, Japan and possibly India. This large aquatic herb with its elegant sweet scented flowers is generally met with in tanks and ponds throughout India.[38]

Part used : Flower(petal)[39]

Chemical constituents : [38][39][41]

1. The lotus is full of compounds that benefit the skin, including antioxidants, flavonoids, fatty acids, proteins, vitamins, and minerals.
2. Alkaloids (nelumbine), Flavonoids (myricetin, quercetin, kaempferol, diosmetin, isonamnetin derivative.)
3. Petals also contains aliphatic hydrocarbon anthocynin, carotenoid pigment, n- triacntanol- amyrin, luteolin, phenylalanine, arginine, fatty acid(2-4%) such as palmitic acid, benzyl salicylate, linalool and benzyl acetate, quercetin.

Properties: Cooling, sedative, astringent, cholagogue, diuretic, bitter, refrigerant and expectorant.[37][39]

Uses : [37][40][41][42]

1. Flower yielded quercetin, luteolin and thus their glycoside and kaempferol glycosides, extract of flower can be used in lip balm.
2. Nelumbo nucifera helps to increase the volume, strength, and elasticity of the brittle hair due to nelumbine present in it.
3. Lotus oil is excellent for skin care, cooling for eyes and hair, wound healing, skin ailments.
4. Skin white listing property is due to the inhibition of tyrosine present in petals.
5. It also act as anti-acne due to its antibacterial property, it reduces the heat generated on skin in acne due to its cooling effect.
6. It reduces the pigmentation of skin and improves complexion.

ACTINIDIA DELICIOSA (KIWI)

Actinidiaceae

Geographical Source: Kiwi fruit is also known as Chinese gooseberry, it is native to China with its cultivation dating back to the 19th Century. It is national fruit if China. In India it is cultivated in Shimla District.[45]

Chemical Constituents: Vitamins (A,C,E,K), Carotenoids, Phenolic Compounds, Proteins, Carbohydrates, Starch, Sugar.[45]

Part use: fruit.

Uses:[46][47]

1. Kiwi fruit has Vitamin C which helps fight dark spot that are associated with Sun damage and ageing.
2. Kiwi fruit extract, a fruit acid, also works to help balance healthy pH level in the skin. It is also rich in Vitamin E,another powerhouse anti-oxidant that fights ageing by supporting collagen and elastic proteins from free radical damage. It helps fight hair loss and maintain hair health.
3. It also contains actinidin, a protein found in Kiwi, which helps manage both dead skin cells and the dirt that accumulate on the skin over the course of the day; it also nourishes hair and promotes hair growth. The high amount of copper in Kiwi maintains the natural color in hair preventing premature greying of hair.

Table 1. Compounds can be identified for their presence by following tests listed in table.[48][49]

Compound	Test Method	Results	Properties
Phenol	Ferric chloride test	Turns yellow and slighty red	Antioxidant
Flavonoid	Hydrochloride-magnesium power reaction	Turns dark red	Antioxidant, Anti-aging
Alkaloid	Bismuth potassium iodide test Mercuric potassium iodide test Iodized potassium iodine test	Precipitations generation	Antibacterial
Carbohydrates, polysaccharide, glycosides	Alkaline tartaric acidic test Naphthol test	Brick red precipitations generated Purple rings generated	Soothing, moisturizing.
Saponin	Foam test	Foam generated and last for long	Cleansing, Antioxidant
Steroids, terpenes	Glacial acetic acid-conc. Sulfuric acid test Chloroform-conc. Sulfuric acid test	A series of changes in colour Chloroform layer turns dark red	Anti-inflammation, antifungal, Anti irritant
Amino acids, polypeptides, proteins	Precipitation test Biuret test Ninhydrin test	Turns turbid Turns violet Turns blue or purple	Growth promoter
Tannin	Ferric chloride test Sodium chloride gelatin test Alkaloids reaction	Turns purplish red Turns turbid Turns turbid when dropping	Astringent

Table 2. Summary of the chemical constituent's presents in eight herbs, their Pharmacological actions / properties

Sr. No.	Herbs	Botanical Name	Family	Extraction Method	Chemical Constituents	Properties
1	Babul Bark	*Acacia Arabia*	*Mimo-saceae*	Decoction	Tannin, Polyphe-nol, Sucrose.	Astringent, Anti-Microbial, Anti-Fungal, An-ti-Bacterial, Anti-Oxidant
2	Sugar Cane	*Saccharum officinarum*	*Poaceae*	Decoction	Polyphenol, Flavonoids, Carbo-hydrates, Proteins, Amino acid.	Soothing property, Anti-Oxidant
3	Mari-gold	*Calendula officinal*	*Asterceae*	Maceration	Flavonoids, Terpe-noids, Saponins, Tocopherols, Tannin, Polysaccharide, Triterpenes	Moisturizing, An-ti Inflammatory, Anti-Ageing, Anti Irritant, Anti-Oxidant
4	Brahmi	*Bacopa Monnieri*	*Scrophul-ariaceae*	Maceration	Saponins, Alkaloids, Triterpenoids, Antraquinone	Anti-Oxidant, Healing, Anti-fungal.
5	Banyan roots	*Ficus benghalensis*	*Moraceae*	Soxhlation	Tannins, wax caoutchouc, flavonoids, carbohydrate, steroid, saponins.	Healing, Anti Inflammato-ry, Anti-Microbial, Anti-Oxidant
6	Guava Leaves	*Psidium Guajava*	*Myrtacea*	Soxhlation	Tannin, Polyphe-nol, Flavonoids,Vitamin B and Vitamin C.	Good Antioxidants, As-tringent, Anti-Wrinkle
7	Lotus petals	*Nelumbo Nucifera*	*Nympha-eaceae*	Soxhlation	Anthocyanin, Pal-mitic acid, Alkaloids, Carotenoid pig-ment, Flavonoids.	Astringent, Emol-lients, Anti-oxidants, Anti Inflammato-ry
8	Kiwi	*Actinidia Deliciosa*	*Actini-diaceae*	Expression	Vitamins (A,C,E,K), Carote-noids, Phenolic Compounds, Pro-teins, Carbohydrates, Starch, Sugar.	Anti-Oxidant, Moisturing, Soothing, Promote hair growth.

Table 3. The extract of above herbs can be used in many cosmetic formulations, depending on the chemical constituents present in these herbs.

Extract	Properties	Formulation
Babul bark	Astringent Antifungal	Mouthwash Antidandruff shampoo
Sugarcane	Soothing Antioxidant	Body wash Sunscreen
Marigold	Moisturizing Anti-inflammatory	Moisturizing cream Foot cream
Brahmi	Cleansing Healing	Shampoo Foot spray
Banyan root	Anti-inflammatory Antioxidant	Under eye serum Ant wrinkle cream
Guava leaves	Astringent Antibacterial	Shaving lotion Anti-acne
Lotus petals	Emollient	Lip balm
Kiwi	Hair growth promotor	Hair tonic

Conclusion

Chemical test of these herbal extracts shows that all the herbs share a common property that is antioxidant which is mainly due to flavonoids, polyphenols, terpenoids, terpenes present in them. Other secondary moieties present are alkaloids, terpenes, glycosides, carbohydrate, saponins etc. These moieties are responsible for various properties such as astringent, antioxidant, healing, soothing and so on, which can be successfully incorporated in numerous category of personal care products.

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Application of Herbs of Family - *Fabaceae* in Cosmetics

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Abstract

Herbs play important role in cosmetics. Herbs belonging to different families have different properties. 'Family' is important major taxonomic rank, they may be divided into sub-families. Herbs from a family have shown to have different pharmacological action, for which they are used in different formulations. Fabaceae family has many plants which show potential to contribute towards enriching the cosmetic formulation through their pharmaceutical actions. The plants such as - Acacia, Chickpeas, Cowpeas, Licorice, Soybean & Tamarind, all these are belonging to Fabaceae. It is also known as Leguminosae. This article is a comprehensive review on different source, chemical constituents and its application in cosmetics of these herbs.

Key words : Family, Fabaceae, Leguminosae, Chickpeas, Cowpeas, Licorice, Soybean & Tamarind.

Introduction

A growing trend in cosmetic and pharmaceutical industries is to replace synthetic ingredients in products and revert to the use of natural ingredients. An important set of activities concern the development of new product from natural sources[1]. There are wide number of herbs used in various cosmetics and pharmaceutics products belonging to different family. The herbs belonging to family fabaceae/ Leguminosae have wide use in cosmetics and pharmaceutics.

Family

In biological classification, family is one of the eight major taxonomic ranks, It is classified between order and genus. A family may be divided into subfamilies [2].

It may be defined as "A collection of rings or entities grouped by their common attributes. In taxonomy, a family is more precise than orders but less precise than genera. Organisms belonging to same family would have evolved from the same ancestors and share relatively common characteristics [3].

The families of plants which are used in pharmaceutical and cosmetic industries:-

- *Apiaceae*
- *Lamiaceae*
- *Myrataceae*
- *Fabaceae*
- *Pinaceae & many more*

Fabaceae

In world there are 12000 species of family *Fabaceae* out of which 951 species are in India. This is the second biggest family among the dicotyledons (being only second Compositae), and from the economic standpoint this is probably the second most important family (ranking second to *Gramineae*) because the pulses which are rich in proteins belong to it.

Primarily based on the characters of the corolla and the androecium, *Fabaceae* has been divided into the following three sub-families [4].

a) Papilionaceae
b) Caesalpinieae
c) Mimoseae.

a) Papilionaceae [4]

There are 754 species of *Papilionaceae* in India. Herbs, shrubs, trees and climbers.

Examples:

- Pulses (rich in proteins): Pea, pigeon pea, gram (Cicer arientinum), black gram, soybean (Glycine max), etc.
- Vegetables:- country bean (Dolichos lablab), Sword bean (Canavalia ensiformis), Cowpea (Vigna sinensis) etc.
- Natural fertilizer:- Sesbania cannabina, S. sesban, etc
- Timber trees:- Indian redwood and Indian rosewood.
- Ornamental:- Sweet pea, Lupin, coral tree etc.
- Other common plant:- Indian telegraph plant, wild pea etc.

b) Caesalpinieae [4]

There are 110 species of *Caesalpinieae* in India. Shrubs and trees, rarely climbers or herbs.

Examples:

- Useful plants: Tamarind, Indian laburnum, etc.
- Medicinal: Indian senna, Saraca indica etc.
- Dye: sappan or Brazil woodetc.
- Other common species: Cassia sophera, C.tora, C.auriculata etc.

C) Mimoseae [4]

There are 87 species of *Mimoseae* in India. Shrubs, and trees, sometimes herbs or woody climbers.

Examples:

- Useful plants: A. Arabica, Catechu and A. Senegal yield gums, many species of Acacia are sources of tannin and fuel.
- Other common plants: Sensitive plant (Mimosa pudica), Jerusalem thorn etc [4].

The following is a list of some of the major genera and species in fabaceae/Leguminosae used in cosmetics are as follow [5]:

1. Acacia Senegal (Acacia)
2. Cicer arietinum (Chickpeas)
3. Vigna unguiculata (Cowpeas)
4. Glycyrrhizin glabra (Licorice)
5. Glycine max (Soybean)
6. Tamarindus indica (Tamarind)

1. Acacia Arabica

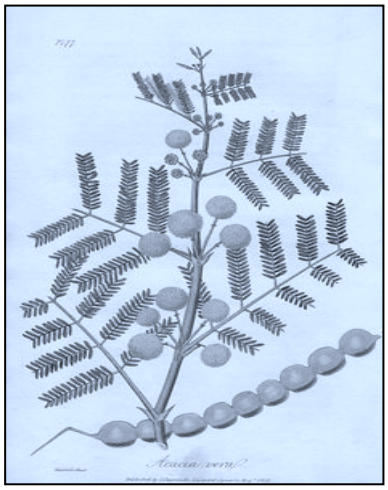

Fig 1: Acacia Arabica

Synonym

Gum acacia, Gum Arabica, Indian gum, acacia[6].

Biological source

It is dried gummy exudation obtained from the stem and branches of acacia Arabica wild, belonging to family *fabaceae* [6]

Geographical source

The plant is found in India, Srilanka, Sudan, Morocco and Africa. In India, it occurs in Punjab, Rajasthan and Western Ghats. About 85% of world supply of gum acacia is from Sudan [6].

Parts used

Bark, gum, leaves, seed and pods[7].

Chemical Constituent

i. Bark: - Tannin, Sucrose, Polyphenolic compounds (Catechin, Epicatechin, Dicatechin) Quercetin, Gallic Acid, Leucocuanidin gallate[8]

ii. Gum: - Arabic acid combined with calcium, magnesium and potassium and small quantity of Malic acid and Sugar[7]

iii. Seeds: - Minerals such as calcium, phosphorous, Iron, Niacin, Ascorbic Acid, Thiamine. The essential amino acids in seeds are Histidine, Tyrosine, Leucine, Isoleucine & Valine[9]

iv. Pods: - Tannin[9]

Uses[7]

i. Bark is used as an astringent because of presence of tannin.

ii. Gum is used as demulcent, emulsifying agent, binder because it contains Arabic acid.

iii. Seeds are used as Demulcent and emollient due to presence of minerals, vitamins and amino acids.

iv. Pods are used as expectorant due to tannin.

2. Cicer arietinum

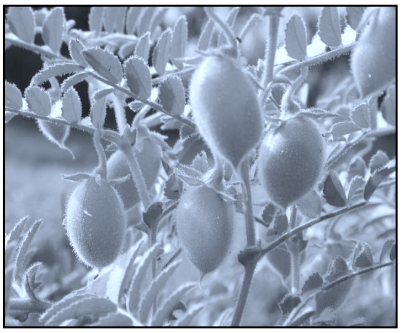

Fig 2. Cicer arientinum

Synonyms

Sanskrit-Chanaka, Eng-chicken-

pea, Bengal gram; common gram. Bom.-Harbarchana. Hind. & Guj.-chana, Ben-Chot abut, Butkalai, chola, Boot. Sind-Chahna[10]

Biological Source

The Cicer arietinum (Chickpea) is a legume of the family *Fabaceae*[10].

Geographical source

Cicer arientinum is commonly known as gram (in India) cultivated as winter crop throughout India especially in Northern State. Gram is considered to have originated in tract lying between the Caucasus and the Himalayas, from where it spread into South Europe, Iran, Egypt & India. The species has also been introduced into parts of America, Australia and Africa but it has not achieved much importance outside its original region[11].

Parts Used

Seeds or Peas, and leaves[10].

Chemical Constituent[11]

i. Gram is an important source of proteins, B-group vitamins and certain minerals.
ii. It contains saccharose, glucose, Fructose, Polysaccharide, including starch, γ-galactan, Levulose and P-galctoaraban, betain, choline, adenine, inositol, phytin, saponins, Citric & Oxalic Acid.
iii. It is rich source of lecithin. The essential amino acids in grams are histidine, lysine, traptophan phenylalanine, threonine, leucine isoleucine, & valine.

Uses[12]

i. It is used to eliminate wrinkles as it contains amino acids.
ii. Prevent hair loss as it is rich in proteins.
iii. Used in products such as under eye cream, serum due to presence of vitamins.
iv. Help to reduce in inflammation as it contains carbohydrates.
v. It can be used in face mask and packs.

3. Vigna unguiculata

Fig 3. Vigna unguiculata

Synonym

Sanskrut-Rajamasha, English-Cowpea, cowgram, Hindi-Lobia, Gujarathi-Chola, Bengali-Barbati, Assam-Urohi, Telgu-Boberlu[13].

Biological source

The Vigna unguiculata is an annual herbaceous legume from genus Vigna- family- *fabaceae*[13]

Geographical source

Cowpea is native in India[14]. It is a plant of great antiquity and has been in cultivation for thousands of years in the tropics of old world. It is commonly cultivated in the West Indies and

Southern states of America. It also grows in Africa[15].

Parts used [13]

Seeds.

Chemical constituents[15]

i. Vitamins- Thiamine, Riboflavin, Niacin, Cholin and Folic acid.
2. Enzymes- hydrolase acting on sucrose, ascorbic acid oxidase, β-amalyase and Phosphorylase.
3. Carbohydrates- Sucrose, raffinose, stachyose, verbascose, starch
4. Protein - globulin and small amount of albumin.

Uses[16]

i. As it contains various enzymes, proteins, and vitamins it improves blood circulation
ii. Fight with free radical as it contains antioxidant property due to Vit-C.
iii. Keeps skin healthy due to presence of vitamins and proteins.
iv. Offers health and shine to hair, boost hair growth and fight with hair loss due to presence of proteins & vitamins.

4. Glycyrrhzia glabra linn

Synonym

Yasti, yashtimadhu (Ayur), Ganco (chin), Russian licorice, Spanish licorice, Turkish licorice (Eng), Kanzo (Jap), Rhizoma Glycyrrhizae nativum (Latin), rub-us-soos, Muethi (Unani)[17].

Fig 4. Glycyrrhzia glabra root

Biological Source

Liquorices is the root of glycyrrhizin glabra from which sweet flavor can be extracted belonging to family *fabaceae[17]* .

Geographical source

Several varieties are native to Mediterranean region, central to southern Russia, and from Asia Minor (turkey) to Iran. The material of commerce exclusively comes from cultivation and is imported mainly from Turkey, China the Russian Federation (Russia & Azerbaijan) as well as from Bulgaria & Italy[17]

Parts Used [18]

Peeled root.

Chemical constituents

i. The major bioactive constituents of the rhizome are a triterpenoid saponins Glycyrrhizin which is 50% sweeter than sugar. The drug contains other Triterpenoid saponins viz., glabranin A & B, glycyrrhetol, glabrolide, Isoflavons viz., formonoetin, glabrone, neoliquiritin, hispaglabridin A & B, Coumarins viz., herniarin, umbelliferone,

Triterpene sterols viz., onocerin, βamyrin, stigmasterol[19].

ii. Glycyrrhizinic acid (Glycyrrhzin is a mixture of potassium and calcium salt of Glycyrrhizinic acid), a saponin glycoside is one of the compounds obtained from the root extract of licorice. The molecule has been well known for centuries, in traditional medicine, for its anti-inflammatory efficacy[20].

iii. Glycyrrhitinic acid is a pentacyclic triterpenoid derivative of the β-amyrin type. Its expectorant and antitissive properties. It is widely used as a flavoring agent to mask the taste of bitter drugs such as aloe and quinine. It has also been reported to possess anti-inflammatory properties[20].

iv. Glabridin is the main compound in the hydrophobic fraction of licorice extract. It is known for its beneficial effects on the skin due to its anti-inflammatory and antioxidant properties. In addition, glabridin inhibits melanogenesis[20].

v. The flavonoids in licorice are mainly responsible for its yellow coloring, however they possess potent properties. The flavonoid components of licorice root exhibit antispasmodic action. Liquirthin the main flavonoid, exhibit anti-inflammatory activity[20].

Uses

i. It is used as anti-inflammatory agent as it contains glycyrrhizin [21].

ii. Tonic & cooling agent[19].

iii. Antioxidant & skin lightening agent as it contains glabridin which inhibit tyrosinase cell cultures without affecting DNA sunthesis[22]

iv. It also used to treat allergic diseases that anti-allergic effect is due to presence of Glycyrrhizin[23].

5. Glycine max

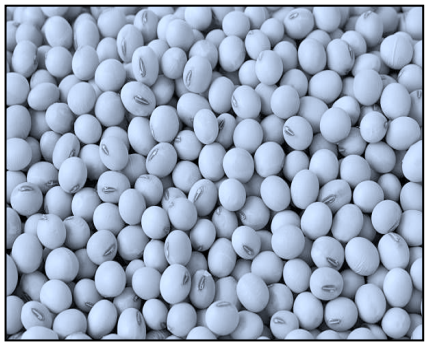

Fig 5. Glycine max seeds

Synonyms

Eng- Soybean, Hindi-Bhat, Bhatwan, Ben-Gari-Kulay, Punj. & Kumaon-Bhut, Eastern Terai.- Khajuwa[24].

Biological source

The glycine max is species of legume belonging to family *fabaceae*[24]

Geographical source:

Soybean or soy; grows only under cultivation, while its congener G. soja grows wild in China, Japan, Korea, Taiwan and Russia. It is annual herbaceous plant indigenous to eastern Asia, which grows creeping on the ground or climbing. It has grown in Asia since prehistoric ages and was introduced to

Western countries in the 1700s and then to Africa[25]

Parts used

Seeds[26].

Chemical composition[25]

i. Dry seeds consist proteins, oil, and carbohydrates.
2. Main soluble sugars are sucrose, raffinose and stachyose.
3. The fiber fraction includes insoluble carbohydrate like cellulose, hemicelluloses and pectin
4. Seeds contain isoflavones like genistein, daidzein, formononetin and biocanin and their glycosides such as genistin and daidzin.
5. The oil extracted from seed contains glycerides consisting of unsaturated fatty acids like linoleic, oleic and linolenic acid and saturated fatty acids like palmitic and stearic acid.

Uses

i. Oil is used as a moisturizing agent as it contains proteins, carbohydrates and fatty acids[25].
ii. It is used as UV protector in sunscreen because it contains Isoflavone inhibits in the mouse the pathogenesis of skin tumors induced by UV radiation, while in human it reduces photoinduced skin damage[25].
iii. Oil is used for smooth, soft and shiny hair as it is rich in proteins and carbohydrates[27].
iv. It has also been reported that Soy extracts would have inhibitory properties on tyrosinase activity, hence suggesting their use in dipigmenting treatments[25]
v. Soy protein hydrolysates and lecithin are also used in cosmetics for their foaming and emulsifying properties[25]

6. Tamarindus indica

Fig 6. Tamarindus indica

Synonyms

Sans-Tintri, Hind-Amli, Eng-Tamarind Tree, Ger-Tamarindi, Mar-Chinch, Punj-Imli, Mal-Puli etc.

Seeds: Eng- Tamarind stone, Mar-Chinchoka, Guj-Amlina chinchora[28]

Biological Source

Tamarindus indica is a leguminous tree in the family *Fabaceae[28]*.

Geographical Source

A monotypic genus of trees, represented by T. indica, indigenous to tropical Africa and probably also to some parts of South India. It is cultivated throughout the tropics and subtropics and has become naturalized at many places[29].

Parts Used

Pulp of fruit, seeds, and leaves [30].

Chemical Composition[29]

i. Fruit: - Moisture, Protein, Fiber, Carbohydrate, Minerals- Ca, K & Iron. Vitamins- Riboflavin, Niacin, and Ascorbic acid. Carotene, Tartaric Acid and Sugar.

ii. Seeds: - Polysaccaride, Malic Acid, Citric Acid, Tartaric Acid, Vitamins- Niacin, Riboflavin and Ascorbic Acid.

iii. Leaves: - Tartaric Acid, Malic Acid, Enzymes like Polyosedepolymerase.

Uses[31]

i. Natural anti-aging agent as it contains antioxidants, fiber, acids and vitamins.

ii. As it consist Niacin it is used as natural skin exfoliating agent.

iii. It is helpful in rid of acne as it is rich in Vitamin- A, C and antioxidant.

iv. It is used as toning and moisturizing agent because of presence malic acid, tartaric acid and citric acid.

Based on above brief information these herbs can be suitably used in skin and hair care as summarized below

Herbs	Chemical constituents	Properties	Skin care products	Hair care product
Acacia Arabica (Acacia):	• Mineral & Amino acids • Polysaccharide Arabin • Tannin	• Demulcent / Emol lient • Emulsifier • Binder • Astringency	• Creams • Gels • Foundation • Astringent	
Cicer arietinum (chickpeas)	• Amino Acids • Vitamins • Carbohydrates, proteins.	• Eliminate wrinkle. • Prevent hair loss. • Natural moisturizer	• Creams- (Antiaging, undereye) • Serum • gel	• Creams • shampoo
Vigna unguiculata (Cowpeas)	• Proteins • Vitamins like Niacin, Ascor bic acid, and many more. • Carbohydrates and Enzymes.	• Improves blood circulation. • Natural exfoliating agent. • Boost hair growth. • Offer shine to hair. • Fight hair loss.	• Creams (night, antiageing) • Facewash • Face mask & packs	• Shampoo • Serum oil

Herbs	Chemical constituents	Properties	Skin care products	Hair care product
Glycyrrhizin glabra (Licorice)	• Glycyrrhizinic acid • Glabridin • Glycyrrhitinic acid • flavonoids	• Moisturizer • Ant-inflammatory • Sweetener • Cooling agent • Skin lightener	• Creams (moisturizing, day) • Anti-inflammatory gel	
Glycine max (Soybean)	• Proteins • Vitamins • Carbohydrates and fatty acids.	• Moisturizing • Reduce blemishes • Gives shine to hair	• Creams (antiaging, dark circle) • Body lotion • Nail cream	• Condi tioner
Tamarindus indi-ca (Tamarind)	• Vitamins like Ascorbic acid, Niacin, Ribofla vin. • Tartaric, malic and citric acid.	• Exfoliating agent • Moisturizing agent • Astringent properties • Prevent hair loss	• Creams (anti-acne) • Toner	• Shampoo • Condi tioner

Conclusion

Fabaceae has many other plants which can have potential to be used in cosmetic formulations. However in this article more commonly used plants from the family are described in view of their current and possible usage in cosmetic industry.

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Anti-acne Property of Symplocos Racemosa Bark

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Abstract

Symplocos racemosa (Lodhra) is a common indigenous drug mentioned in Ayurvedic classics as a remedy for various human ailments. About 68 species of Symplocos are found in India, of which only few are of economic importance. *Symplocos racemosa* is rich source of alkaloids. It also contain glycosides, tannins, steroids and terpenoids. It has varied pharmacological actions like anti-androgenic effect, anticancer activity, antibacterial effect, anti-diabetic effect, antihelmintic effect, anti-inflammatory activity, anti-acne effect. This review article presents the effectiveness of *Symplocos racemosa* as antiacne agents from natural origin.

Key words : *Symplocos racemosa*, Lodhra, Antimicrobial activity, anti- acne effect.

Introduction

Acne is a chronic inflammatory skin condition that causes spots and pimples, especially on the face, shoulder, back, neck, chest and upper arms. It commonly occurs during puberty, when the sebaceous glands activate, but it can occur at any age. Acne is a skin disease involving the oil glands at the base of the hair follicle[1.] The most common form of disease in adolescent is called **acne vulgaris. Propionibacterium acnes** and **Staphylococcus epidermidis** have been recognized as pus forming bacteria triggering an inflammation in acne[2]. Propionibacterium acnes is a tiny microbes that live in the oily region of the skins pores[3.]

Anti acne drugs are the medicines that help to treat the pimples, blackheads, whiteheads and the lesions caused due to acne[4]. Herbal medicines are gaining increased popularity due to their advantage such as better patient tolerance, long history of use, fewer side effects and relatively less expensive[5].

Table 1. List of herbs possible for anti acne property

Common name	Scientific name
Manjistha	Rubia Cordofilia
Neem	Azadirachta Indica
Tea tree	Melaleuca Alternifolia
Hemp	Cannabis Sativus
Chaff flower	Achyranthes aspera
Lodhra	Symplocos racemosa
Peppermint	Mentha puiperita
Indian tulip tree	Thespesia populnea
Nannari	Hemidesmus indicus
Pumpkin	Curcubito pepo
Bhringraj	Eclipta alba

This article present documented evident of anti acne property of Lodhra stem bark.

Symplocos Racemosa Bark (stem)

Lodhra consist of dried stem bark of *Symplocos racemosa* Roxb. An evergreen tree, 6-8.5 m tall, found abundantly in plains and lower hills throughout India[6]. Leaves are dark green above, orbicular, elliptic oblong, 12.5 cm × 5 cm., coriaceous, glabrous above; flowers white, turning yellow, fragrant in axillary, simple or compound racemes: drupes purplish black, subcylindrical, smooth and 1-3 seeded[7].

Habitat - This is a small tree found very commonly in the plains and lower hills of Bengal, Assam and Burma and forest of Chota- Nagpur plateau.[8]

Kingdom :- Plantae Phylum :- Traacheophyta Class :- Magnoliopsida Order :- Ericales Family :- Symplocaceae Genus :- Symplocos Species :- Racemosa Roxb.[9]

Vernacular name

Sanskrit - Lodhra, Marjana, tillaka Hindi – Lodh Bengali – Lodh Marathi – Lodhra, Lodh English – Symplocos bark Telugu – Lodduga, Erralodduga Tamil – Balalodduginamaru, Pachettu Malayalam – Pachotti . Gujarti - Lodar Oriya - Ludhu, Nidu [10].

A large genus of trees & shrubs are distributed in the warmer part of Asia. About 60 species are found in India of which only few are of economic importance[11]. In Sanskrit '*lodhra'* means *'Propitious' & 'Tilaka',* as the bark of the tree was used in making the *Tilaka* mark on the forehead, the plant is named as 'LODHRA'[12].

Table 2. Physical Constants of Symplocos Racemosa Bark [12]

Parameters	Specification (%)
Total ash	12
Acid insoluble ash	1
Alcohol soluble extractive	9
Water soluble extractive	15

Chemical Constituents of Symplocos Racemosa Bark

The bark of Lodhra contains mainly alkaloids along with other metabolites.

Stem Bark of Lodhra contains following alkaloids –

Loutrine - present in large quantity - 0.24%
Colloturine - 0.02%
Loturidine - 0.06% and
Quinovine or Kinovin.[13]

Phytochemical studies on *S. racemosa* have showed presence of many flavanol glucosides like symplocoside, symposide, leucopelargonidine-3 glucoside, ellagic acid, rhamnetin 3-digalactoside and triterpenoids and steroids like 19 α-hydroxyasiatic acid-3, 28-O-bis-β-glucopyranosides, betulin, linoleic acid, β-sitosterol and α-amyrin. Alkaloids like Harmine and red coloring matter is also reported.[14]

Recently, two closely related glycosides have been isolated from the ethanolic extract of stem bark; one of them has been assigned the structure of 3- monoglucofuranoside of 7-o-methyl leucopelargonidinwhich is highly astringent and reported to be probably

responsible for the medicinal properties of the bark[15].

Various researchers have isolated active constituents from this plant and systematically evaluated for the various biological activities.Phenolics are reported to display potent antioxidant, antimicrobial, antiasthmatic, antitumor and central nervous system (CNS) binding activities. Terpenoids have been associated with various pharmacological activities like anti-tumor, anticancer, anti-viral, antibacterial, anti-malarial, anti-inflammatory, anti-cholesteremic activities[16].

Action :- Bark is considered cooling and mild astringent[17].

Properties[18,19]

In Indian therapeutical system-Ayurveda, the properties of lodhra are described as:-

RASA - Khasya (Astringent)
VIRYA - Sheet (Cold)
VIPAKA - Katu (Bitter)
GUNA - Laghu (Light), Grahi (Absorption)
KARMA - Caksusya grahi, Kaphapittanut.

Acne Causing Bacteria

Propionibacterium acne (P. acne) is the causing agent of acne and is generally associated with human skin, where it focus on fatty acid secreted by sebaceous gland[20]. It has been reported that P. acne, Staphylococcus epidermidis and other skin microflora coexist in acne lesions[21].

Anti-microbial activity of Symplocos Racemosa

Kumar et al.[22] investigated the anti acne activity of ethanolic extract of *Symplocos racemosa* bark by disc diffusion and broth dilution method. The dried part of *Symplocos racemosa* bark (19.5% w/w) were made into coarse powder and macerated in ethanol. The antibacterial activity of *Symplocos racemosa* was expressed as

Zone of inhibition (mm)

- For Propionibacteriun acnes - 14
- For Staphylococcus epidermidis - 14

The minimal inhibitory concentration (MIC) of the same extract was determined by broth dilution assay and it was found that

MIC count (mg/ml)

- For Propionibacteriun acnes - 0.685
- For Staphylococcus epidermidis - 0.685

Minimal Bacterial concentration (mg/ml)

- For Propionibacteriun acnes - 1.35
- For Staphylococcus epidermidis - >4

Phytochemical screening of *Symplococ racemosa* extract

Table 3. The chemical constituents identified by ethanolic extract of Symplocos racemosa.

Chemical constituent	
Phenols	--
Tannins	++
Steroids	++
Alkaloids	+++
Glycosides	++
Flavonoids	--
Terpenoids	--

++ = moderate , +++ = abundant , -- = absent

The above result concluded that *Symplocos racemosa* showed good antimicrobial properties against P. acne based on disc diffusion assay.

Devmurarai V P[23] extracted *Symplocos racemosa* bark powder with petroleum ether (60-80ºC) and with ethanol (95%v/v). The chemical constituent identified by phytochemical screening of the two extracts were:

Table 4.

Phytochemical test	Type of extract	
	Petroleum ether (60-80)	Ethanol (95%v/v)
Carbohydrate	--	++
Glycoside	++	++
Alkaloid	--	++
Phytosterol & steroid	++	--
Flavonoid	--	--
Protein & amino acid	--	--
Tannin	--	--
Saponin	--	++
Gum of mucilage	--	--
terpenoid	--	++

++ = Present, -- = Absent

He also demonstrated the zone of inhibition of ethanolic and ether extract of *Symplocos racemosa* against different test microorganism at different concentration. The zone of inhibition of ethanolic extract shows good inhibition against three gram positive bacteria; Staphylococcus Aureus, Bacillus Cereus and Enterococcus Faecaliis at 700 µg/well concentration whereas pet ether extract have good inhibition againt only S. Aures at 700 µg/well concentration. The results also showed that ethanolic extract of *Symplocos racemosa* posses good antibacterial activity as compared to petroleum ether. However *Symplocos racemosa* has poor antibacterial activity against gram negative microorganisms like P. Aeruginosa and E. Coli.

Patel el at[24] estimated that ethanol extract of *Symplocos racemosa* bark was found to exhibit the greatest **antibacterial activity** because of the presence of alkaloid **Harmine**. Harmine is a tri-cyclic beta-carboline type of alkaloid which inhibits protein biosynthesis, microtubule formation and disturbs membrane fluidity.

Soni et al[25] have evaluated safety and efficacy of poly herbal fairness cream containing *Symplocos racemosa.* The result showed significant reduction in dark complexion, increase in skin softness and skin glowing effect.

The ethanol extract of **Symplocos cochichinensis** was studied for in vitro **anti-inflammatory activity** by human red blood cells (HRBC) membrane stabilization method and showed 67% protection in HRBC in hypotonic solution at the concentration of 1000 µg/ml[26].

M. R. Khan et al[27] evaluated the methanolic extract of leaves, root and stem bark of Symplocos cochichinensis and their fration obtained by partition (petrol, dichloromethane and ethyl acetate) were screened for anti-

microbial activity. The result showed that all crude extract and fractions showed a broad spectrum of **antibacterial activity** against both gram positive and gram negative organism, that was enhanced on fractionation.

Sharma et al[28] estimated the **anti-inflammatory activity** by Carrageenan induced hind paw edema model. The result concluded that ethanloic extract of *Symplocos racemosa* suppress the inflammation than aqueous extract. The extract showed significant anti-inflammatory activity (53%) at the dose of 400 mg/ml[15].

Symplocos Racemosa in Ayueveda

Ayurveda acharayas recommended use of lodhra in skin conditions like acne, pimple, eczema and psoriasis[29]. Decoction of Lodhra bark help to reduce acne. Its astringent and antimicrobial properties helps to reduce eruption and infection of acne[30]. In acne, paste of lodhra, dhanyaka and vaca is useful. Being an astringent, it can clear the face blemishes, black and white heads. It also dry up the acne quickly[29].

The paste of bark of *Symplocos racemosa* in combination with red sadder, Indian madder, costus, beautyberry, banyan buds and lentils is used for increasing the attractiveness of face. The bark of *Symplocos racemosa* in combination with barley, white dammar, vetiver and sandal wood mixed with honey, ghee and jiggery heated with cow's urine is used for the treatment of acne and increasing the attractiveness of the face[30]. The application of plaster composed of Kustumburu (Coriandrum sativum Linn.), Vekhanda (Acorus calamus Linn.), Lodhra (Symplocos Racemosa Roxb.) and Kushtha (Saussurea lappa Clarke.) pasted together were recommended to cure pimples[31].

Summary and Conclusion

All the researches done on *Symplocos racemosa* shows that it has good anti microbial activity against acne causing bacteria (Propionibacterium acne and Staphylococcus epidermis). *Symplocs racemosa* have good anti bacterial effect against gram positive microorganisms but it has poor antibacterial effect against gram negative microorganisms. The results also showed that ethanolic extract of *Symplocos racemosa* produces good antibacterial activity as compared to petroleum ether. The bark of this tree has astringent, anti-inflammatory and antimicrobial properties and is used for various Ayurvedic formulations.

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Association of Glycemic Triad with Obesity Indices in Type 2 Diabetics

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Abstract

A fundamental concern in the management of type 2 diabetes is tight glycemic control which is known to reduce cardio vascular disease morbidity and mortality. The present study evaluated the association between the glycemic triad (FBG, PMBG and HbA1c) in diabetic subjects with obesity indices (BMI, WC, WHR and WHtR) under normal and elevated status of each. 400 subjects (200 males and 200 females) were selected through purposive sampling from DCRC, Nagpur. Age wise distribution showed 54.5% of male subjects aged >50 years while 59.5% females were > 50 years of age. The mean FBG, PMBG and HbA1c levels were exceeding the cut off values for each parameter in both sexes reflecting uncontrolled diabetes. However FBG (169.41±58.45) in males was significantly higher (p=0.000) than females (147.68±47.79). PMBG (260.80±86.48) was also significantly higher (p=0.000) in males as compared to females (226.55±69.91). HbA1c showed a significantly higher (p=0.000) level in males (8.84±2.13) than in females (8.11±1.64). No association was observed between the glycemic triad and the mean obesity indices (normal/elevated) in both sexes with respect to BMI status, WC and WHtR. A positive association of the glycemic values was however evident with high WHR. The anthropometric indices used to predict obesity and cardiovascular risk factors specifically in diabetics therefore needs to be validated.

Key words : Glycemic Triad, Obesity Indices, Type 2 Diabetes.

Introduction

Obesity and type 2 diabetes are serious health concerns. The incidence of obesity and diabetes continues to rise by epidemic proportions. The term "diabesity" has been coined to describe obesity-dependent diabetes (Lutsey P., *et al.,*). Obesity is a major potentially modifiable risk factor for type 2 diabetes. While studies have well established the strong epidemiological association between obesity and development of diabetes (Zargar A., et al., Daousi C., et al.,), little attention has been paid to the significance of obesity in clinical population with diabetes.

The frequently used obesity indices calculated based on anthropometric measurements include Body Mass Index (BMI), Waist Hip Ratio (WHR) and Waist Height Ratio (WHtR). Waist Circumference (WC) is generally recommended as the most informative index for abdominal fat distribution. BMI has been used as a proxy for obesity for several years, but in recent

years, indices of abdominal obesity (WHR and WC) have increasingly being associated with cardio metabolic risk. WHR above 0.9 for men and 0.85 for women was used as defined by WHO.

The present study therefore explores whether the increase in BMI, WHR, WHtR and WC can predict higher risk of hyperglycemia in diabetic subjects.

Aim and Objectives

Aim : To evaluate the association between the glycemic triad (FBG, PMBG and HbA1c) of diabetic subjects with selected obesity indices (BMI, WC, WHR and WHtR).

1. To determine the anthropometric measurements of the subjects.
2. To screen the subjects for prevalence of obesity using different obesity indices.
3. To analyze the glycemic triad (FBG, PMGB and HbA1c) in diabetic subjects.
4. To study the association between the glycemic triad and obesity indices in the subjects.

Methodology

400 diabetic subjects comprising of 200 male and 200 females each were selected by purposive sampling from Diabetes Care and Research Centre, Nagpur. Height, Weight, Waist and Hip Circumference were measured by standard techniques. BMI is the ratio of body weight in kg divided by the height in metres^2. The BMI classification of International Obesity Task Force (IOTF) was used to classify subjects. International Diabetic Federation (IDF) cut off was used for measuring central obesity using waist circumference measurements.WHR was calculated by dividing WC in cms by HC in cms.WHR above 0.9 for men and 0.85 for women was used for identifying obesity risk. Waist height ratio is measured by dividing the waist circumference by height, both measured in the same unit. Universally healthy cut off for WHtR is recommended as 0.50, while values above 0.6 indicate substantial risk.

Fasting Blood Sugar (FBG), Post Meal Blood Sugar (PMBG) and Glycosylated Hemoglobin (HbA1c) were assessed in an auto analyzer through trained laboratory technicians.

The data obtained on glycemic triad was compiled and tabulated for statistical testing of all variables on original scores. The statistical program for Social Science, version 18 .0 was used for statistical analysis. Subjects were classified based on normal and elevated cut off levels of BMI, WC, WHR and WHtR. An association was studied between the glycemic triad and obesity indices.

Results and Discussion

Age

The predominance of age in the subjects was assessed in the present research and the observations are represented in Figure 1.

A higher percentage of females (59.5%) were above 50 years of age as compared to males (54.5%). The

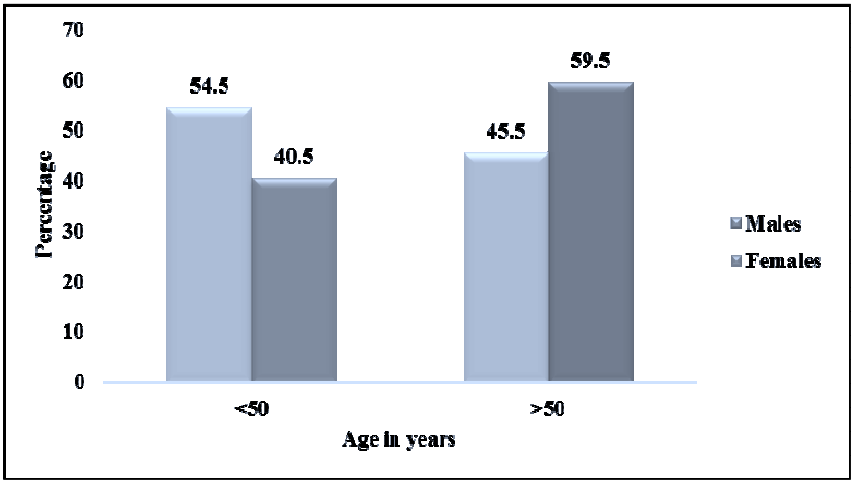

Fig 1. Agewise Distribution of Subjects

percentage of male subjects was higher (54.5%) in the age group below 50 yrs of age.

A higher percentage of females (59.5%) were above 50 years of age as compared to males (54.5%). The percentage of male subjects was higher (54.5%) in the age group below 50 yrs of age.

Wenying Yang., et al., 2010 reported increased prevalence of diabetes with increasing age.

Glycemic Triad

The study subjects were known diabetics. FBG, PPBG and HbA1C were analyzed for each subject in order to assess the glycemic control. The mean levels of glycemic triad of both sexes with statistical inference are presented in Table 1.

(a) Fasting Blood Glucose (FBG)

Observation from the table reveals an extremely high FBG in both sexes. The male subjects had a FBG of

Table 1. Glycemic Profile of Subjects with Statistical Inference

Variables	Gender	n	Mean	Std. Deviation	Std. Error Mean	t value	Sig (2-tailed)
Fasting blood glucose (mg/dl)	Male	200	169.41	±58.45	4.13	4.070	0.000*
	Female	200	147.68	±47.79	3.38		
Post meal blood glucose (mg/dl)	Male	200	260.80	±86.48	6.11	4.355	0.000*
	Female	200	226.55	±69.91	4.94		
HbA1C (%)	Male	200	8.841	±2.13	0.15	3.829	0.000*
	Female	200	8.110	±1.64	0.11		

*highly significant

169.41 ± 58.45 which is significantly higher (p=0.000) than FBG noted in females (147.68 ± 47.79). The FBG levels of both sexes are above the target value for diabetics which is <125mg/dl.

(b) Post Meal Blood Glucose (PMBG)

PMBG of male subjects reflect a similar trend as observed in case of FBG. The mean PMBG is significantly higher (p=0.000) in males (260.80± 86.48) as compared to female subjects (226.55 ± 69.91).). The PPBG levels of both sexes are above the target value for diabetics which is <180 mg/dl.

(c) Glycosylated Hemoglobin (HbA1c)

HbA1c is a measure of the beta-N-1-deoxy fructosyl component of hemoglobin. In diabetes mellitus, higher amounts of glycosylated hemoglobin, indicating poorer control of blood glucose levels, have been associated with cardiovascular disease, nephropathy, neuropathy and retinopathy (ADA 2006).

The data on HbA1C presented in Table 1 shows a significantly higher (p=0.000) level in males (8.84 ±2.13) when compared to females (8.11 ±1.64) indicating uncontrolled diabetes in both sexes. The HbA1C levels of both sexes are above the target value for diabetics which is <6.5%.

Association of Obesity Indices with Glycemic Triad

An association of the glycemic parameters to different indicators of obesity under normal and elevated category is done. The data is presented in Tables 2 to 4.5 for BMI, WC, WHR and WHtR respectively.

(i) Glycemic Profile vs. BMI

Glycemic profile of subjects in relation to BMI is presented in Table 2.

In spite of differences in the BMI status of the individuals, none of the parameters viz., FBG, PMBG and HbA1c showed any association. However, all the three glycemic parameters

Table 2. Association of Glycemic Profile with Normal and Elevated BMI

Variables		Males		Females	
		Normal BMI (n=51)	Elevated BMI (n=149)	Normal BMI (n=25)	Elevated BMI (n=175)
	%	25.5	74.5	12.5	87.5
FBG (mg/dl)	Mean	190.29	161.29	170	144.28
	S.D.	±68.12	±52.64	±70.96	±41.75
PMBG (mg/dl)	Mean	289.63	246.93	251.04	221.48
	S.D.	±87.01	±83.34	±95.71	±63.92
HbA1C (%)	Mean	9.56	8.6	8.3	8.08
	S.D.	±2.20	±2.06	±1.84	±1.62

Table 3. Association of Glycemic Profile with Normal and Elevated WC

Variables		Males		Females	
		Normal WC (n=62)	Elevated WC (n=138)	Normal WC (n=11)	Elevated WC (n=189)
	%	31	69	5.5	94.5
FBG (mg/dl)	Mean	179.85	163.67	160.82	146.72
	S.D.	±65.99	±53.84	±79.91	±44.53
PMBG (mg/dl)	Mean	276.84	249.84	230.64	224.86
	S.D.	±84.97	±85.56	±84.26	±68.36
HbA1C (%)	Mean	8.97	8.78	8.52	8.09
	S.D.	±1.99	±2.203	±2.21	±1.62

irrespective of the BMI status reflected higher mean values as compared to their standard criteria.

(ii) Glycemic Profile vs. WC

Data on association of glycemic parameters with WC is presented in Table 3.

Male and female subjects irrespective of normal and elevated WC do not reflect differences in FBG, PMBG and HbA1c. Hence no association between glycemic parameters and WC is observed.

Ashwin K., et al., also reported that increased WC was more common in females.

(iii) Glycemic Profile vs. WHR

The glycemic parameters of the subjects associated with WHR is shown in Table 4.

Data from the table values shows that with an elevated WHR, higher mean values are observed in all the three glycemic parameters viz: FBG, PMBG and HbA1c in both the sexes. The data therefore points out to an association between the elevated WHR and an increase in glycemic parameters

Table 4. Association of Glycemic Profile with Normal and Elevated WHR

Variables		Males		Females	
		Normal WHR (n=7)	Elevated WHR (n=193)	Normal WHR (n=13)	Elevated WHR (n=187)
	%	3.5	96.5	6.5	93.5
FBG (mg/dl)	Mean	145.86	169.51	133.92	148.44
	S.D.	±54.61	±59.29	±34.63	±47.62
PMBG (mg/dl)	Mean	238.14	258.53	209.69	226.25
	S.D.	±99.74	±85.79	±66.89	±69.29
HbA1C (%)	Mean	7.93	8.87	7.62	8.14
	S.D.	±1.51	±2.15	±1.43	±1.66

Table 5. Glycemic Profile of Subjects in Relation to Waist Height Ratio (WHtR)

Variables		Males		Females	
		Normal WHtR (n=20)	Elevated WHtR (n=180)	Normal WHtR (n=2)	Elevated WHtR (n=198)
	%	10	90	1	99
FBG (mg/dl)	Mean	202.25	164.96	138	147.59
	S.D.	±72.42	±55.40	±38.18	±47.10
PMBG (mg/dl)	Mean	297.2	253.44	243.5	224.99
	S.D.	±89.61	±84.85	±61.51	±69.28
HbA1C (%)	Mean	10.26	8.68	8.65	8.1
	S.D.	±1.85	±2.11	±0.49	±1.65

of the subjects of the present study. However, the mean values of all the glycemic parameters were above cut off values even with normal WHR.

(iv) Glycemic Profile vs. WHtR

Data on glycemic profile in relation to WHtR of subjects is presented in Table 5.

The mean glycemic parameters do not reflect an increase with elevated WHtR. It is surprising to note that the glycemic parameters show a decreased mean value with increased WHtR. No specific associations could be therefore drawn.

Diabetes is associated mainly with central obesity in the maximum study subjects. The results presented with respect to mean values derived in each parameter falling either in the normal or elevated category as per the criteria however show that only an increase in WHR has reflected in higher mean values in all three glycemic parameters.

Dalton M., *et al.,* from their study on comparison of BMI,WC and WHR as indices of obesity and assessment of their respective association with T2D concluded that given appropriate cut off points, WHR is the most useful measure to identify individuals with CVD risk factors.

Conclusion

The high prevalence of obesity in diabetes suggests a structured weight reduction to achieve glycemic control. The anthropometric indices used to predict obesity and cardiovascular risk factors specifically in diabetics needs to be validated. An effective obesity index for predicting diabetes associated risks is of significance for public health. Intersectional action to manage and prevent diabesity is urgently required to reverse the current trends.

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Working Pattern of Social Workers

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Abstract

Social work aims at creating conditions for individuals and groups under which they are able to utilize their potentialities and existing resources to remove the handicaps of the society and to overcome them by proper adjustments in order to live more adequately and creatively. The tradition of social service was influenced by various social and cultural factors. Stress is now being laid on application of scientific method to diagnose and solve social problems. The study was conducted in 3 organization of Nagpur city. Fifty samples were selected by Convenience Sampling techniques. Data was gathered by the tool Interview Schedule through Survey method and was analyzed by Percentages. Social workers are committed towards community development work but face interference from co-workers which lowers their morale and act as a barrier in their work.

Key words : Social work, Social workers, Community development, Working pattern.

Introduction

Social work in India is as old as the Indian society itself. Every aspect of Indian society and culture is dominated by humanitarian philosophy. The community and the rulers took the responsibility of assisting the individual in needs. Devotion and services towards ones fellowmen, love for charity and brotherhood existed even in ancient times. The tradition of social service was influenced by various social and cultural factors. People therefore have started moving from charity towards organized self improvement. Stress is now being laid on application of scientific methods to the diagnosis and solutions of social problems, by studying the social and economic factors of the problem and acquiring special skills and techniques in dealing with them.

As it is described in the following definition, "social work is a profession concerned with helping individuals, families, groups and communities to enhance their individual and collective well being. It aims to help people develop their skills and their abilities to use their own resources and those of the community to resolve problems. Social work is concerned with individual and personal problems but also with broader issues."[1] As it is clear from the above definition, social work is helping people of the community to identify their problems and assist them to solve these problems by using their own available resources.

The concept of social work has

undergone changes along with the change in the socio-economic structure. Social works aims at creating conditions for individuals and groups under which they are able to utilize their potentialities and existing resources to remove some of the handicaps and to overcome them by proper adjustment in order to live life more adequately and creatively. Chaudhary D. P. defines Social work as, "the professional service to people for the purpose of assisting them as individual or in group to attain satisfying social relationship and economic standard of life in accordance with their wishes and capacities and in harmony with those of the community." [2] As it is correctly said in the above definition that if we want to have a good social relation and raise the standard of living of people we should assist them through our services.

The people who give their services to the community to improve and develop the standard of living are known as Social Workers. These people work in various fields covering the following areas:

- Child welfare
- Women welfare
- Youth welfare
- Welfare of Specially abled
- Services for the Aged
- Medical services
- Community development

The same is concluded in the following study, "social workers help people overcome social and health problems such as poverty, mental illness, child abuse and neglect, emotional instability, economic uncertainty, domestic violence, homelessness and drug abuse. They work directly with individuals, couples, families and groups to identify and overcome these problems. Such social workers also work for some community organization and health programmes." [3] As it is seen from the above definition social worker, work in various organizations and in different fields for betterment of community people.

Objectives

The present study "Working Pattern of Social Workers" has the following objectives

1. To observe the participation of social workers in community work.
2. To study the type of response received from the community to the social workers.
3. To find out about the materials and infrastructure made available to social workers.
4. To discuss the cooperation received and interference of co-workers of the department.

Need and Importance of the Study

The basic need and importance of the present study is to find out the working pattern of the social workers. The study also focuses on the participation received to the social workers from community people. Cooperation and interference of co-workers in social work and community development is also focused.

Methodology

The present study was conducted in 3 different organizations in Nagpur city (Indian Institute of Youth Welfare, Matru Seva Sangh & Sankalp). Convenience Sampling was used to select the samples who were working in these 3 organizations. Survey method was used to collect data which comprised of 50 sample. Interview Schedule was the tool used for data collection.

Results

Characteristics of Social Workers

Maximum respondents were found to be of 30-40 years of age, were female (68%) and were married (65%). Most of them stayed in nuclear families (56%). Many of the respondents were Post Graduate (58%) and had specialization in Social Work (46%). Thirty six percent of respondents had experience in Research. Maximum respondents earned a monthly income of rupees 4000/- to 5000/- (36%).

Table 1. Participation of Social Workers in Community Work

n=50

Sr. No.	Involvement	Number	Percentage
1	Full involvement	46	92
2	Partial involvement	04	8
	TOTAL	50	100

As it is seen from Table 1 majority of respondents (92%) are participating in community work in the form of project and development programme undertaken by their respective organiza-tion. While a minimum of 8% are partially involved.

Table 2. Response received from community members to social workers

n=50

Sr. No.	Responses	Number	Percentage
1.	Positive	42	84
2	Negative	08	16
	TOTAL	50	100

It is seen from the above Table 2, that 84% of respondents have received positive response from community people, while 16% have received negative response. This negative is due to unavailability of material benefits to the community people.

Table 3. Infrastructure made available to the respondents

n=50

Sr. No.	Responses	Number	Percentage
1	Sufficient	35	70
2	Insufficient	15	30
	TOTAL	50	100

As seen from Table 3, 70% of respondents said that the material resources and infrastructure which was provided from the organization was sufficient for them, while for 30% it was not sufficient.

Table 4. Co-operation Received and Interference of Co-workers of Department

n=50

Sr. No.	Replies	Number	Percentage
	Co-operation		
1	Co-operation received	38	76
2	Co-operation not received	12	24
	Interference of co-workers		
1	Interference	33	66
2	No interference	17	34

It can be concluded from the above Table no. 4, that 76% of respondents have received co-operation from their co-workers, while 24% do not receive any form of co-operation. On the other hand 66% of respondents feel that there is lot of interference of co-workers in their work and for 34% there is no interference from anyone.

Conclusion

Maximum respondents participated fully and had full involvement in community development work undertaken by their department and organization. Many respondents received positive response from community members. Maximum respondents were satisfied with sufficient amount of material resources and infrastructure made available to them from their department. Many respondents were in the opinion that they received co-operation from their co-workers but faced a lot of interference in their work which was highly demotivating and created mental tensions to the social workers.

It can be inferred that social workers are committed towards community work but face interference from co-workers which lowers their morale and act as a barrier in their work.

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Use of Solar Energy in Hotels

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Abstract

Every organisation and individual can contribute towards green environment which is the urgent call by nature. Solar energy is one of the sources which helps in reducing consumption of electricity. The present study deals with the issues by undertaking a survey on the various ways in which hotels are using solar energy for it's daily operations . The study revealed that in the city of Nagpur the hotel's are using this source of energy to a limited extend . The study identifies the gaps and suggest more ways and areas of operation where the solar energy could be used.

Key words : Solar energy, Hotels, Conservation.

Introduction

India is rapidly becoming a preferred destination for tourism both international as well as domestic with annual growth of 15%. The hospitality sector is a major consumer of energy in different forms of various end uses. There is a significant scope as well as complementary its energy supply through the installation of solar water heating system and other renewable energy technologies (RETs)[1]. Out of the various eco-friendly energy resources solar energy is one of them.

Solar Energy means the energy getting through natural resources like Sun, Wind, Gas, Coal, Oil, Wood etc. There are two types of solar energy;

Photovoltaic Solar Power

The Energy generated by incident solar energy (light) into electricity is termed as Photovoltaic Solar Power. This is done using Photovoltaic Solar Cells.

Every one of us can get the benefits of the applications of photo-voltaic solar power. Solar Power

- Photovoltaic Solar Lighting
- Photovoltaic Cooling

Solar Thermal Energy

Solar Thermal Energy is the heat energy derived from the incident solar energy (sunlight). This is used by Solar Heating Panels.

Solar Thermal Energy does have advantages like other forms of solar energy.

- Solar Water Heating
- Solar Pool Heating
- Solar Space Heating

These are the common uses of Solar Thermal Energy. By taking advantage of these you can get plenty of benefits. Electricity can be generated using solar energy commonly this is known as Solar Thermal Electricity.[2]

The concept of energy monitoring and management is growing fast in the country but a large chunk of hotel industries still lack these latest technology. "says Dr. Kumar in Technology Focus" As prof. Bhave says that it is obvious that all required technology is here and what we need is a change in mind set for our Hospitality Industry.

The study related that there is a substantial scope of implementation of solar system and other renewable energy technologies in the hospitality sector. There is a significant level of energy in hotel industries of renewable energy technology[3].

Importance of Solar Energy Utilization in Indian Hospitality in Industry

Solar energy consumption by hotels has a major environmental impact and long lasting way to stabilize rising fuel cost. Sunlight is free and once installed the system, operating cost become minimal, including periodic maintenance and a small electric load. The accrued saving will pay for the system is relatively short period of time. From that point of view the energy will be free. There are various solar applications used in hospitality industry and they are as follows

- Solar street/Garden/Corridor/Light
- Solar Illuminating Hoarding
- Solar Power tacks
- Solar Blinkers
- Building Integrated SPV Systems[4]

Energy Data of Hotel and Scope

The pioneer in the industry: ITC, The Maurya In India, ITC, The Maurya has set an example by pioneering the successful use of solar technology for satisfying its thermal energy needs in laundry, cooking, bathing and other applications. ITC Lim credited with being a pioneer in initiating a number of environment friendly changes. It is one of the few carbon positive companies in India. It is a classic example of ITC's philosophy - when not many hotels in the world are even thinking of the negative impact they have on the environment, ITC is already reaping the benefits of solar energy for over two years now. There are great opportunity for the hotel sector to save and operational cost by taking advantage of the potential energy about 40% of energy used by hotels is electricity and 60% comes from natural fuels. 3 quarter of this energy is used for

1. Space heating
2. Hot water production
3. Air Conditioning and Ventilations
4. Lightings[5]

Global Market Scenario

Solar electric energy demand has grown by an average 30% per annum over the past 20 years against a backdrop of rapidly declining costs and prices**.** This decline in cost has been driven by economies of manufacturing scale**,** manufacturing technology improvements**,** and the increasing efficiency of solar cells.[6]

Department Structure and Characteristics of Hotels

General characteristics of departments of typical hotels are shown below -

Guest room service department

The department generally has the largest energy consumption although its energy intensity is relatively small. It also has the largest usage of water and hot water. The usage grows especially in winter when outside air temperature goes lower.

Banquet service department

The department has large energy intensity.

Food and drink service department

The department has large energy intensity[7]

Aim

To study the utilization of solar energy in Indian hospitality Industry.

Objectives

1. To study the importance of solar energy in hospitality industry.
2. To study the energy cost incurred in the use of solar power.
3. To find out the departments where solar power is used.
4. To find out the advantages of using solar power.

Limitations

The study is limited to the hospitality industry in Nagpur.

Research Methodology

Research Purpose

The present research aims to promote and accelerate the application of solar power utilization in hospitality industry.

Research approach and Strategy

The reason that the researcher decided to study about this is to introduce a energy to the organization specially hotels because of the benefits of this system.

Selection of Area

The area that have been selected for conducting this research is Nagpur in Maharashtra. The reason for selecting the city of Nagpur is that Radisson Blu Hotel which has established the highest standard in the use of R. E to support their operations.

Sample Selection

The sample for the study was selected by purposive sampling method.

Sample size

The samples were :- 15 from the hotels of Nagpur

Data Collection

To collect the data for this research the relevant industry were consulted for this purpose. The researcher collected the data from two sources which were -

A. Primary data : Primary discussion was held with H.R. manager to introduce the research topic. The researcher took help from chief engineers and engineering and maintenance heads. A QUESTIONNAIRE was

designed to collect data with respect to utilization of solar energy in Indian hospitality industry. Questionnaire was so designed that all the queries were in form of mostly multiple choice of question, in simple language and to the point. This helped gathering maximum information within stipulated time. Personal interview and observation method helped the researcher to acquire the relevant data. For this the researcher took prior appointment with the H. R Manager.

B. Secondary data: Secondary data was also collected from previous published material on solar energy technologies. This helped in understanding global scenario as far as solar energy and their utilization was concerned. The data also was collected from news paper, magazines, articles, journals and information on internet.

This research also aimed to understand the support available from Govt. agency for utilization of solar energy in Hospitality Industry.

Data analysis

The collected data as per the requirement of the study carried was tabulated and analyzed and result was discussed by means of figures and graphs followed by interpretation.

Result and Discussion

The data collected for the study is further graphically represented.

From Fig. 1 it is evident that of the surveyed hotels 100% hotels are using solar energy, whereas in addition 6% hotels are using wind power and 13% hotels are using Bio fuels.

From Fig. 2 it is evident that of the surveyed hotels 100% are using solar energy for heating water, whereas in addition 13% of hotels are using solar energy for space cooling, 6% of hotels are using solar energy for Laundry

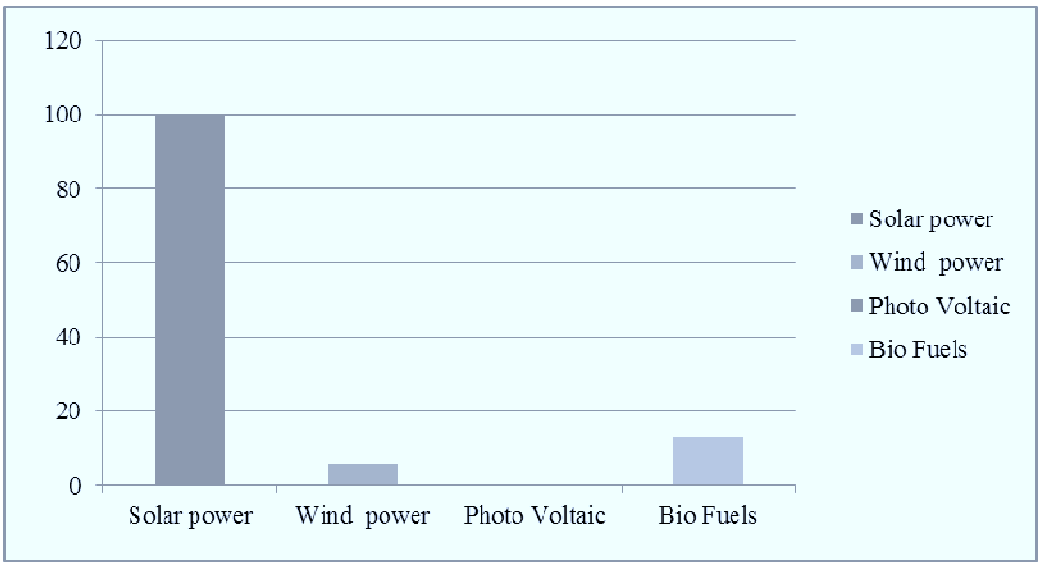

Fig. 1. Forms of Renewable Energy used in hotels

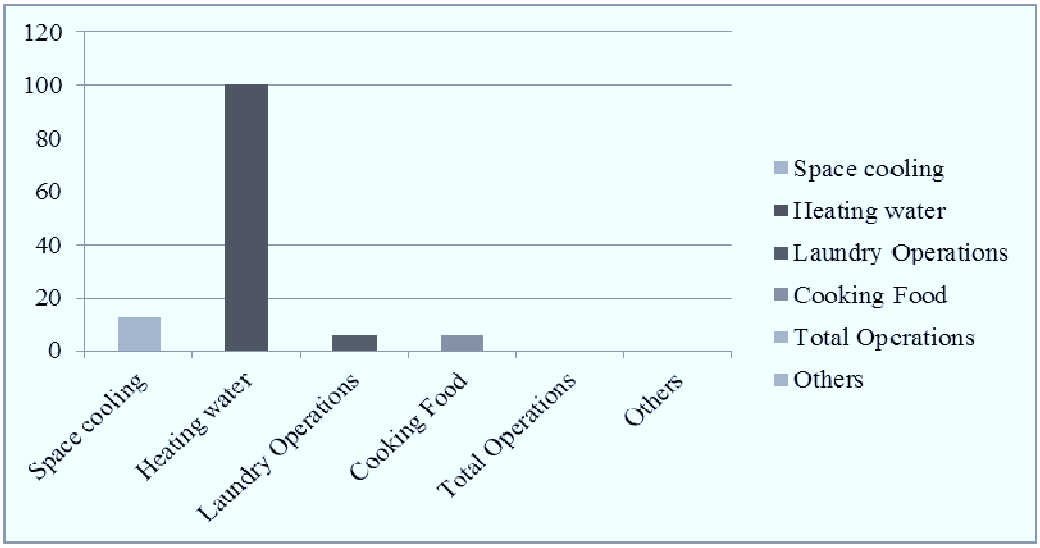

Fig. 2. Operation Supported by the use of solar energy

operations, 6% of the hotels for cooking food.

From Fig. 3 it is evident that of the surveyed hotels, 94% of hotels have got subsidies like tax rebates through government for the use of solar power system, whereas 20% of hotel have got subsidies like low interest for loan through government for the use of solar power system and 40 % of hotels have got subsidies like Installation of solar power system through government.

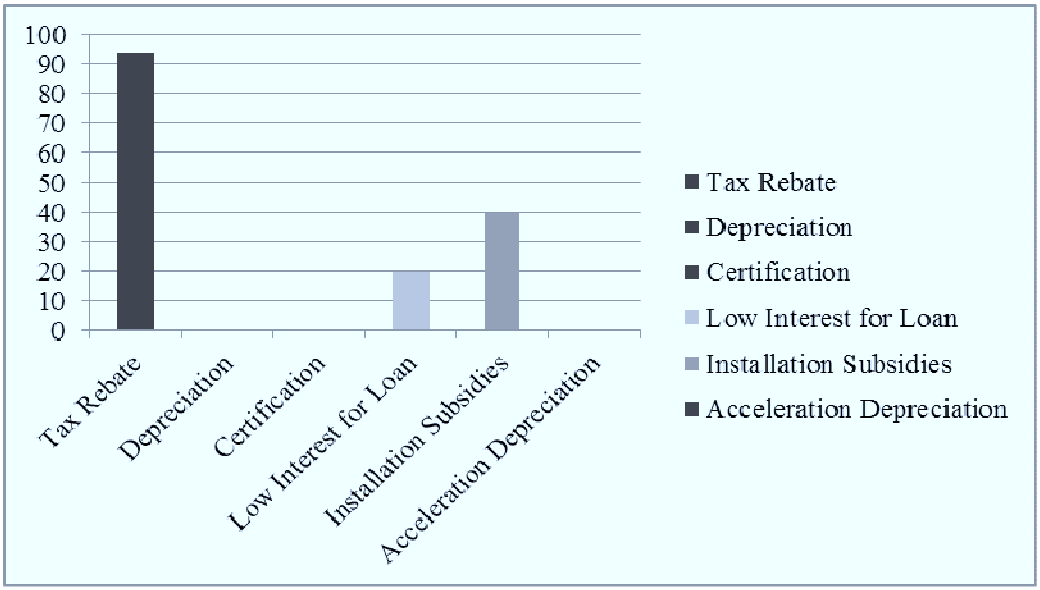

Fig. 3. Types of subsidies are available for the use of solar power system through government

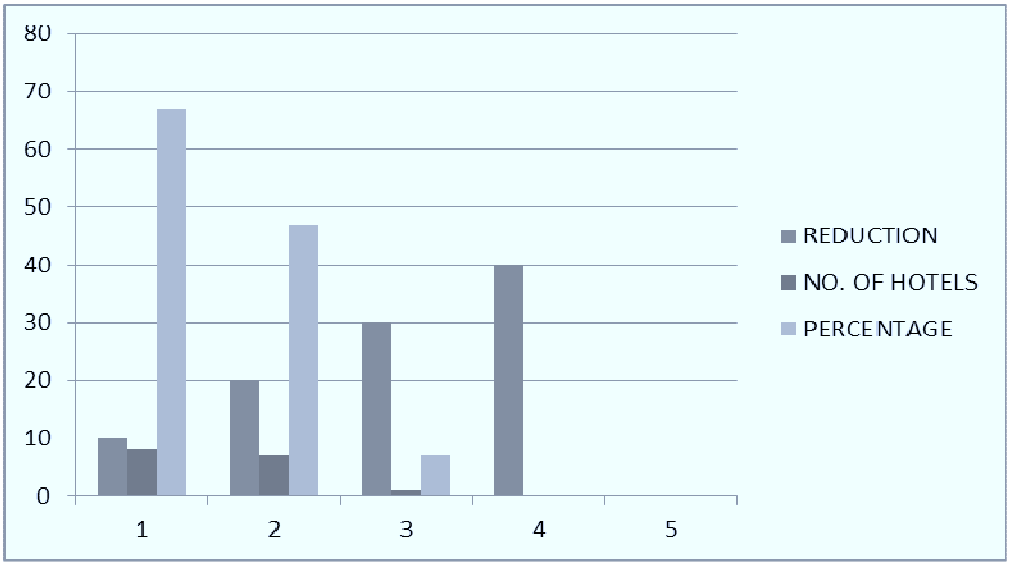

Fig. 4. Reduction in operating cost due to the use of solar energy

From Fig. 4. it is evident that of the surveyed hotels out of 15 hotels 67% of hotels agreed that there is 10% reduction in operating cost due to the use of solar energy, whereas 47% of hotels surveyed opined that there is 20% reduction in operating cost due to the use of solar energy and 7% hotel surveyed there is 30% reduction in operating cost due to the use of solar energy.

Summary and Conclusion

Our country is having a big problem that is the load shedding for 8-10 hours per day, hence hospitality industry is facing some problem because of this. Tourists coming from other country or the guest in the hotels faces this same problem . To overcome this problem researcher feels that every hospitality industry ought to be installed with a solar system because the international tourism is increasing 15% per year.

There are two types of solar energy. First is photovoltaic (pv) and solar thermal. Pv cells converts sunlight directly into electricity and can be connected to the grid. Another advantage is that solar panels do not install on vistas like wind turbines which makes them more palatable to hospitality industry. Solar thermal technologies utilize the heat generated by sun which is backbone behind the solar hot water system campaign. Solar power heat water in storage tank used in building rather than water boiler or electric system.

Installation of solar system can produce or generate electricity from solar energy which is used in hotels for heating water, space cooling, laundry operations, cooking food, etc. Solar system saves the electricity bills. Not to worry of power cuts, maintenance are also negligible and work auto-

matically without attention.

During this research, researcher found that for the use of solar energy 30% subsidy is granted by the state government. To get the subsidized amount a performance assessment is done for a period of 3 months as to how effectively the technology is being utilized in the hotel. The energy cost incurred in the use of solar power depends upon the property of hospitality industry. In most of the hotels surveyed it was found that Rs. 1,00,000-4,00,000 is required for installing solar system.

In hotels there are various department where solar power is used like in kitchen for cooking food, in laundry for laundry operation, in guest room, banquet halls, restaurants, lobby etc. area where solar energy is used for space cooling , for heating water also solar energy is used.

There are various advantage of solar system in hospitality industry. It can generate power even on cloudy days, does not produce noise, harmful emissions or polluting gases, equally well suited for installation in high density, minimal maintenance required to keep system running and most important it is environment friendly by reducing carbon footprints.

Conclusion

- Solar energy system have one thing in common namely the fact that they are harnessed from nature.
- It is Eco-Friendly and does not emit any dangerous emissions.
- The Hospitality Industry is one of the largest consumers of energy for its day to day operations and mostly use Solar Energy for their operations.
- It is because of the advantages of installing Solar Energy system in hospitality industry researcher feel that Solar Energy system ought to be installed in every Hospitality Industry.
- The scope of installing solar energy in future is very high.

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LITERATURE REVIEW PAPER

Environmental Psychology of Workspace

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Abstract

The environmental psychology of workspace is a rich and diverse field of study that is growing fast and gaining popularity. As the human beings are spending major time in these areas, the effect of the environment on occupant's performance, health urgently needs to be taken care of. The review paper studies the objectives and themes of basic parameters of functional comfort criteria leading to the enhancement of productivity and efficiency of the user of the workspace. The criteria are space planning, air, thermal and lighting, aural comfort, furniture and ergonomics and energy efficiency. The analysis is performed qualitatively and quantitatively.

Key words : Comfort criteria, Space planning, Air quality, Thermal quality, Acoustical comfort, Energy efficiency.

Introduction

Human beings in all parts of the world are constantly associated with built environment and spend major time in various interior spaces as homes, workspaces, recreational, entertainment etc. These spaces in turn create an impact on occupant's performance, productivity and comfort. The focus is on the study of human behavior in a physical setting (built environment) as enclosed spaces and how these spaces are responsible for creating an impact on the user. Spaces are designed for human activity and as per user's requirements, needs and aspirations. User as a human being plays a vital role and reacts in termsof responses to any kind of situation.

It is not only the functional comfort but also the quality of space which creates an impact on human behavior. The various parameters are shape, scale, proportion, volume, colour, texture, light and sound leading to spatial, thermal, air quality, and aural comfort to be achieved in the design. It is the relationship between the individual and the environment that determines how they perceive space and react to it. Both mental and physical stimuli affect behavioral responses. Perception of one's environment is affected by sociological needs, psychological state and individual differences.

Sociological Needs: This encompasses privacy, personal interactions levels, territoriality, crowding, intimate

space, social space and public space.

Psychological State: This encompasses perception, cognition, spatial behavior, environmental expectation.

Physiological Needs: This encompasses functionality, ergonomics, life safety, vision, hearing, comfort and efficiency.

For every need and want, there must be an adaptive response, an adaptive design strategy. These needs are satisfied by every human being through exploitation of the environment, processes that form the complex varieties of human environmental relationships. These needs are satisfied by every human being through exploitation of the environment, processes that form the complex varieties of human environmental relationships. Creative design and planning, integrated design process established a proper relationship between human beings and construct of built environment.

Scienfific Context and Purpose

Though the typology covers spaces as residential, commercial, workspaces, recreational and hospitality, this literature review focuses on the inquiry how people experience environmental conditions at workplace. The main objective is to define basic parameters and theories of environmental psychology of workspace as the impact factors as efficiency, productivity and comfort is easy to get correlated. This review studies the various parameters which can have an implication on the overall performance of the users of the space. The space explained as workspace has no clear cut demarcation as working hours or non-working hours. In today's scenario, workspace is diversified, mobile, and non-territorial. Companies are applying quality, comfort and cost criteria to workspace design.

The literature review deals with various themes and parameters in detail with qualitative and quantitative approach leading to establishment of correlation between the work space design and its impact on the comfort, efficiency and productivity of the worker. A workspace can be defined as the place to meet, to use technology, public places where work occurs and the amenities to support workers.The productivity and performance is individual, group or organizational which leads to Positive or Negative impact. Positive is imposed speed and accuracy of task performed and Negative is higher error rate, slower time for task completion and adverse effect on health of workers (Jacquie 2008).

Individual performance: Workspace desk and office, micro environment, lighting and visual conditions, variations in temperature and humidity, furniture ergonomics and acoustics.

Group Performance: Work group size, proximity of team members, position of work group area, shared space, access to shared tools and equipment, floor layout and furniture, height and density of workstation partitions, accessibility to file and work storage, furniture design and dimension.

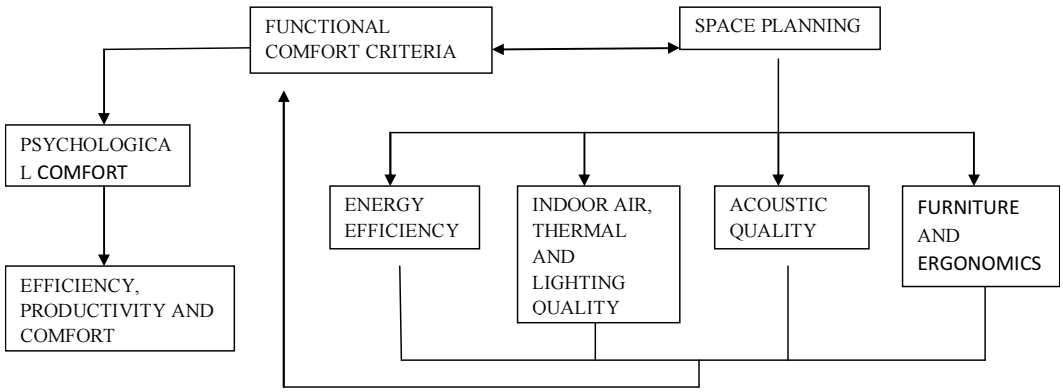

Fig 1.

Organizational Performance: Ease of access, manageable distances, fast elevators, convenient bathrooms, adequate parking and attractive eating areas (Jackie 2008).

Functional Comfort Criteria of Workspace

To establish the correlation of workspace design and its impact on the user, the workspace design needs to follow various parameters and a thorough qualitative (Subjective) and quantitative (objective) analysis is dealt systematically and efficiently. The environmental aspects of workspace include ambient environmental conditions. The conditions include proper lighting, air and thermal quality, placement of activities, furniture layout, ergonomics and acoustical comfort. The literature review discusses about the major functional comfort criteria thematically as - Space Planning Considerations, Energy Efficiency, Indoor Thermal and Air Quality, Acoustical Comfort, Furniture Layout and Illumination.

Space Planning as Functional Comfort Criteria

The location, orientation and placement of activities play a major role in achieving functional comfort. The results of a post occupancy evaluation of qualitative analysis were studied of a US based office in terms of 'perceived quality' of space. At the time of survey it was found that office workers are dissatisfied with open plan' office, (Jackvie 2008). The reasons attributed are noise levels, distraction lack of privacy and sameness of cubicles. Open plan has an advantage of facilitating communication and exchange of information is rapid and informal. Whereas it is also stated that open plan office is cheaper to construct and more flexible to recon figurate than a conventional or cellular office layout (Filbert 2007). It has been observed that space planning, utilization pattern and system control strategies that deviate from those designated during the design stages of offices results into discomfort for office workers. Changes in interior planning frequent-

ly create a negative impact on the user (Filbert 2007). These planning considerations have an overall impact on productivity and performance at work and leads to either a positive impact or negative impact.

Energy Efficiency (Air, Thermal and Light) as Functional Comfort Criteria

Various simulation programs were used with a quantitative approach for a UK based office layout (five types), utilization densities and intensities using software packages as TAS (Thermal Analysis Software), Lightscape and Excel Software Package. TAS simulates the dynamic thermal performance of buildings and their systems. TAS Ambians is a 2D CFD package that produces the microclimatic variation in space. Lightscape simulates the physical properties of light and materials. It quantifies the photometric performance of lighting designs.

Another two simulation programs were used as archiCAD and RADIANCE, the most advanced lighting simulation program, it has tried to find whether width or height has a stronger influence on the size impression of the room. Psychological aspects of lighting were taken in to consideration as perceptual clarity, evaluative impression and spaciousness. In the analysis of perception of crowding related to a bank space a survey of employees of 49 banks and outside volunteers has given an adverse result that higher illumination meant higher crowdedness and unpleasantness for both the groups (Ananthakrishna 2008).

Acoustical Efficiency as Functional Comfort Criteria

The review deals the issue of aural comfort in an office space. It gives importance to planning consideration for design and construction of office buildings from acoustical point of view. Even though (USGBC 1996) i. e. US green building has given specifications of levels of background noise, privacy and guidelines are provided by ASHRAE–HVAC and BCA green mark design, the problem is dealt qualitatively and quantitatively.

The background study tells:

- The performance and comfort criteria of office workers depend upon the control of noise levels in the building.
- The elevated noise levels are capable of distracting the concentration of the workers.
- The acoustic performance of the building affects the users psychologically, physiologically, sociologically.

Objective being to achieve acoustic performance of an office area for ease of communication, privacy and reducing effect on user to achieve productivity, team performance and satisfaction (Alam Sheikh 2010). The post occupancy evaluation (POE) of a three storied office building is conducted by adopting a scientific approach of Total Building Performance (TBP). Guidelines were followed for

weighted sound pressure level (SPL), background noise criteria (NC) and reverberation time (RT).

The success of any research depends upon how data is collected and the subjects are sampled. Use of qualitative methods, in which research investigates subjects without using formal psychometric instruments (questionnaire) and quantitative methods in which biological and behavioral variables are measured with instruments and techniques of known validity and reliability. And effective total building performance evaluations is done with an excellent combination of both the methods.

Furniture Placement as Functional Comfort Criteria

There is an impact of physical and manmade environment on the socio-psychological processes in the interior environment. The placement of tables and chairs in the classrooms and libraries may influence the interaction among the users. Architectural environments encourage behavior with which they are congruent (Ananthakrishna 2008). It was found that office workers are dissatisfied with open plan' office, (Jackvie 2008). The reasons attributed are noise levels, distraction lack of privacy of sameness of cubicles whereas it is also stated that open plan has an advantage of facilitating communication and exchange of information is rapid and informal. The office layouts differ and there is a dynamics of change in office density. They are classified on the basis of user's interaction and autonomy. Interaction refers to the face to face contact that is necessary to carry out office task. Autonomy is the degree of control, responsibility and discretion each office worker has over the context, method, location and tools of work process (Filbert 2007).

Conclusions

- The major functional comfort criteria has a direct correlation between space planning, space utilization, indoor air thermal and lighting conditions, acoustical conditions and energy efficiency.
- The environmental psychology of workspace encompasses the sociological, psychological and physiological needs of the user.
- If all these criteria fulfilled this leads to psychological comfort of the user and enhances the productivity and efficiency.
- The quantitative approach of using computer simulation program as TAS, Lightscape, archiCAD and Radiance gives the desired results for enhancing the air, thermal and lighting conditions of a workspace.
- In two studies the qualitative and quantitative approach shows the use of computer simulation programs. The third case gives the post occupancy evaluation by adopting a scientific approach of Total Building Performance (TBP).
- In two studies the qualitative and quantitative approach shows the use of computer simulation programs.

The third case gives the post occupancy evaluation by adopting a scientific approach of Total Building Performance (TBP).

- It can be concluded that POE of every workspace should follow the Total Building Performance (TBP) approach to get the desired functional comfort results of any workspace.

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Formulation and Validation of Topical Herbal Cream for Antimicrobial Activity

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Abstract

The study was aimed to formulate and validate a cream for antimicrobial activity using extracts of Tinospora cordifolia, Ocimum sanctum, Glycyrrhiza glabra, Punica granatum. The phytochemical screening reveals that the major constituents of the ethanolic extracts were flavonoids, saponins, alkaloids, carbohydrates, glycosides, triterpenoid, tannins etc. The TLC of different ethanolic extracts showed different spots having Rf values such as Tinospora cordifolia (0.22, 0.24, 0.96), Ocimum sanctum(0.22,0.72,0.80,0.86,0.92.),Glycyrrhiza glabra (0.51, 0.64, 0.85,0.88), Punica granatum (0.55,0.65,0.83). The parts of respective plants possess broad spectrum of biological activity. Many of the plant products used in treatment of skin diseases. Till now no such combination was found in antimicrobial preparations. From the results of antimicrobial assays, it was observed that the 1.2% of Tinospora cordifolia, Ocimum sanctum, Glycerrhiza glabra, Punica granatum extracts, had zone of inhibition close to that of standard. Validation of cream was done for three parameters and was found within limits. The pH of cream was found to be in range of 6.5-7.0 which is good for skin pH. The viscosity of cream was in the range of 27000-28000 cps. This indicates that the cream is easily spreadable by small amount of shear. Rheological behavior of cream was studied and the results and graph confirmed the pseudoplastic flow behaviour of cream. The results of stability study of the cream showed that at the temperature 37º, 45º, and 4º, the appearance of the cream did not change. The pH, viscosity, and spreadability did not show significant change at 25ºC. Hence it can be said that the cream has good stability.

Key words : Journalists, Media, Gender issues, Gender transformation.

Introduction

During the last few decades there has been an increasing interest in the study of traditional plants and their medicinal value in different parts of the world. The medicinal properties of plants have been investigated due to their potent pharmacological activities, low toxicity and economic viability. This revival of interest in plantderived drugs is mainly due to the current widespread belief that green medicine is safe and more dependable than the costly synthetic drug, many of which may have adverse side effects. This development could lead to new drug

discovery or advance the use of indigenous herbal medicines. The preservative effect of many plant spices and herbs suggests the presence of antimicrobial constituents in their tissues. In recent years, multiple drug resistance in human pathogenic microorganisms has developed due to indiscriminate use of commercial antimicrobial drugs commonly used in treatment of infectious diseases. This situation forces to search for new antimicrobial substances from various sources like medicinal plants which are good sources of novel antimicrobial agents.

Plant Profile

1. *Tinospora cordifolia* Biological Source: *Tinospora cordifolia* belonging to the family Menispermaceae Common name: Guduchi Part used: stem. The plant of *Tinospora cordifolia* typically growing in deciduous and dry forests. Phytochemistry Leaves of this plant are rich in protein (11.2%) and are Alkaloids, Berberine, Palmatine, Tembetarine, Magnoflorine (0.075%), norclerodane glucoside, Sesquiterpenoid, giloinine, geloin, tinosporine. Uses: Anti-Inflammatory, rheumatoid arthritis, antimicrobial.[1,2]

2. *Ocimum sanctum* Biological source: Ocimum sanctum Family: Labiatae Common name: Tulsi Part used: leaves. It is native to the Indian subcontinent and widespread as a cultivated plant throughout the Southeast Asian tropics. Tulsi is cultivated for religious and traditional medicine purposes, for its essential oil. Phytochemical constituents are oleanolic acid, ursolic acid, rosmarinic acid, eugenol (70%), caryophyllene (8%), germacrene (2%) with the balance being made up of various trace com-pounds, mostly terpenes. Uses: headache, fever, antimicrobial, anticancer, antistress, used in lung diseases, oral health, heart problems, skin infections.[3,4,5]

3. *Glycyrrhiza glabra* Biological source: *Glycyrrhiza glabra* belonging to the family *Glycyrrhiza glabra* linne. Common name: Liquorice root Part used: root. The liquorice plant is an herbaceous perennial legume native to southern Europe and parts of Asia, such as India. Phytochemical constituents are Starches (30%), pectins, polysaccharides, simple sugars, gums, mucilage (Rhizome), amino acids, triterpene saponin, flavonoids, mineral salts, bitters, essential oil, fat, asparagines, female hormone estrogen, tannins, glycosides, protein, resins, sterols, volatile oils and various other substances are components of this complex . The primary active ingredient, Glycyrrhizin (glycyrrhizic acid; glycyrrhizinate) constitutes 10–25% of liquorice root extract. Uses: gastric and duodenal ulcers, dyspepsia, anti-inflammatory, contraceptive, laxative, anti-asthmatic, cough etc.[6]

4. *Punica granatum*: Biological source: Punica granatum is a fruit bearing deciduous shrub or small tree in the family Lythraceae. Common name: pomegranate. Part used: fruits, arils and seeds. The pomegranate originated in the region extending from modern-day Iran through Afghanistan and Pa-

kistan to northern India, and has been cultivated since ancient times throughout the Mediterranean region. Uses: heart problem, stomach disorder, dental care, cancer, diabetis, osteoarthritis, anemia etc.[7]

Material and Method

Plant material

Stems of *Tinospora cordifolia*, leaves of *Ocimum sanctum*, roots of *Glycyrrhiza glabra*, and peels of *Punica granatum* plant were collected from the market and sundried (for 2 week). The parts of plants from the authenticated plants were procured from the Herbal medicinal shop and air dried in shade, under normal environmental condition and then subjected to size reduction by electrical grinder.Finally it is stored in a clean bottle.

Extract preparation

Coarse powders of stems of *Tinospora cordifolia*, leaves of *Ocimum sanctum*, roots of *Glycyrrhiza glabra*, and peels of *Punica granatum* plantwere charged into the soxhlet apparatus, Defatting of parts of plants were done by using petroleum ether and the extraction were carried out using ethanol as solvent.

Preliminary phytochemical screening[8]

Phytochemical analysis of different Crude extracts Extracts were tested for the presence of active principles such as Triterpenoids, Steroids, Glycosides, Saponins, Alkaloids, Flavonoids, Tannins, Proteins, Free Amino Acids, Carbohydrate and Vitamin C.

Following standard procedures were used.

Test for Steroids and Triterpenoids

Liebermann Burchard test - Crude extract was mixed with few drops of acetic anhydride, boiled and cooled. Concentrated sulphuric acid was then added from the sides of the test tube and observed for the formation of a brown ring at the junction of two layers. Green coloration of the upper layer and the formation of deep red color in the lower layer would indicate a positive test for steroids and triterpenoids respectively.

Test for Glycosides

Keller Killiani Test – Test solution was treated with few drops of glacial acetic acid and Ferric chloride solution and mixed. Concentrated sulphuric acid was added, and observed for the formation of two layers. Lower reddish brown layer and upper acetic acid layer which turns bluish green would indicate a positive test for glycosides. Bromine water test - Test solution was dissolved in bromine water and observed for the formation of yellow precipitate to show a positive result for the presence of glycosi.

Test for Saponins

Foam Test – Test solution was mixed with water and shaken and observed for the formation of froth, which is stable for 15 minutes for a positive result.

Test for Alkaloids

Hager's Test – Test solution was

treated with few drops of Hager's reagent (saturated picric acid solution). Formation of yellow precipitate would show a positive result for the presence of alkaloids. Test for Flavonoids: Ferric chloride test – Test solution when treated with few drops of Ferric chloride solution would result in the formation of blackish red color indicating the presence of flavonoids. Alkaline reagent Test – Test solution when treated with sodium hydroxide solution, shows increase in the intensity of yellow color which would become colorless on addition of few drops of dilute Hydrochloric acid, indicates the presence of flavonoids. Lead acetate solution Test – Test solution when treated with few drops of lead acetate (10%) solution would result in the formation of yellow precipitate.

Test for Tannins

Gelatin Test – Test solution when treated with gelatin solution would give white precipitate indicating the presence of tannins.

Test for Proteins: Biuret Test – Test solution was treated with 10% sodium hydroxide solution and two drops of 0.1% copper sulphate solution and observed for the formation of violet/pink color.

Test for Free Amino Acids: Ninhydrin Test – Test solution when boiled with 0.2% solution of Ninhydrin, would result in the formation of purple color suggesting the presence of free amino acids.

Test for Carbohydrate: Benedict's test – Test solution was mixed with few drops of Benedict's reagent (alkaline solution containing cupric citrate complex) and boiled in water bath, observed for the formation of reddish brown precipitate to show a positive result for the presence of carbohydrate.

Test for Vitamin C: DNPH Test – Test solution was treated with Dinitrophenyl hydrazine dissolved in concentrated sulphuric acid. The formation of yellow precipitate would suggest the presence of vitamin C.

Thin Layer Chromatography of Different Extracts [9]

A number of developing solvent systems were tried, but the satisfactory resolution was obtained in the solvent systems mentioned in table 1 After development of plates, they were air-dried. Bands were visualized by Iodine vapor and numbers of bands were noted and their Rf (Retention Factor) values were calculated follows.

$$Rf = \frac{\text{Distance travelled by the sample}}{\text{Distance travelled by the solvent}}$$

Evaluation of Antimicrobial Activity[10]

Evaluation of antimicrobial activity The in-vitro antimicrobial activity of ethanolic extracts of plant materials (*Punica granatum* peels, *Glycyrrhiza glabra* bark, *Tinospora cordifolia* stem and *Ocimum sanctum* leaves) and formulated herbal cream were carried out using cup-plate agar well diffusion method. All the samples were separately dissolved in water medium in different concentrations and tetracycline (5ug/ml) was used as a standard

antimicrobial agent. The antimicrobial activity was investigated by using micro-organisms (bacteria) E.coli. The characterized bacteria 0.1 ml (a loopful) was aseptically seeded in sterile nutrient agar media and allowed to solidify four wells were bored into each agar plate using a sterile 8 mm diameter cork borer. 5g of each concentration of samples was introduced aseptically into the agar wells. The plates were left on the bench for 1 hr to allow for diffusion of the sample into the agar medium. All the plates were incubated at 37°±1°C for 24 hrs and zones of inhibition measured using an accurately calibrated transparent ruler. The mean diameter of the zone of inhibition was calculated.

Procedure

Formulation of cream: The cream base were used. The oil soluble components were dissolved in oil phase and heated to 75º. The preservatives and other water soluble components were dissolved in aqueous phase and heated to 75ºC. After heating, aqueous phase was added in portions to the oil phase with continuous stirring. It was then cooled and filled in suitable container. Oil (5%) was used in the formulation, using same method. Four different formulations were prepared by changing the percentage of emulsifier from 1%to 3%.[11]

Evaluation of Physical Parameter[12]

1. Formulation Properties Color, texture, consistency, Spreadability was evaluated by panel study.

2. pH of cream: The pH meter was calibrated using buffer solution of pH 7.4 and 9.2. About 1.0g of cream was weighed and dissolved in 50.0 ml of distilled water and pH was noted.

3. Viscosity: Viscosity of the formulation was determined by Brookfield viscometer at 100rpm, spindle no.7.

4. Homogeneity: The developed cream was tested for homogeneity by visual inspection. It was observed for the presence of any lumps.

5. Spreadability of cream: was measured with the glass slide apparatus, excess of cream was placed between two slides and heavy weight (1kg) was placed on slide for 5 min to compress the sample to uniform thickness. Time in seconds to separate two slides was taken as measure of spreadability.

$$S = wl/t$$

where, S - spreadability (g cm/sec)
w - Weight of upper slide (g)
l - length of slide (cm)
t - time taken in sec (sec).

6. Rheological behaviour of cream: The rheological property was determined to know the flow behavior of formulation. The viscosity at different rpm was measured using Brookfield viscometer (model no. RVT). The rheological behavior of formulation was studied by taking 100g of cream in a beaker. The rate of shear was increased gradually to maximum i.e. 100 and corresponding dial reading was noted, then the rate of shear was decreased gradually to lowest value i.e. 05, and the dial reading was recorded.

7. Stability studies: Stability studies are essential to ensure that the product is stable over its designated shelf life and provides medication for absorption as the same rate as formulated. Stability studies are done both in normal and exaggerated condition of temperature, humidity, light, etc. The stability study was carried out for 4 weeks at three different temperatures such as 37º, 45º, and 4º.

Validation of Cream[13]

Four batches of cream were prepared for validation studies.

Statistical analysis

The various steps involved in the one way ANOVA method were as under:

1. The total of the values of individual items in all the samples was taken i.e. worked out Xij
   i = 1,2,3…
   j = 1,2,3…..
   And called it as T.
2. The correction factor was worked out as under; correction factor = (T)/n
3. The square of all items was done one by one and its total was taken. The correction factor was subtracted from this total and the result was the sum of squares (ss) for total variance. Symbolically written as:

   Total SS= <X2ij - (T)/n

   i = 1, 2,3…

   j = 1, 2,3….. 4.

   The squares of each sample total (Ti)2 was obtained and such square value of each sample was divided by the no. of items in the concerning sample and the total of result thus obtained was taken. The correction factor was subtracted from this total and the result was the sum of squares (ss) for total variance. Symbolically written as:

   SS between = (Tj)2 /nj – (T) 2 /n

   Where, subscript j represents different samples.
5. The sum of squares within the sample was found out by subtracting the result of step 4 from the step 3 stated above written as under :

   $$\text{SS within} = (\sum X2ij - (T)\ 2/n\ ) - \sum (Tj)2\ /nj - (T)\ 2\ /n$$

   $$= \sum X2ij - \sum (Tj)2\ /nj$$

After doing all this, the ANOVA table was set up. For the sake of convenience the information obtained through various steps stated above was taken. The parameter studied were,

1. Statistical ANOVA analysis for pH and viscosity of cream
2. Antimicrobial activity of cream.

In order to reveal reproducibility of process, four batches of selected formulations were prepared. The data obtained was subjected to ANOVA.

Results

Table 1. Phytochemical screening of ethanolic extracts of *Punica granatum*, *Glycyrrhiza glabra*, *Tinospora cordifolia* and *Ocimum sanctum*.

Plant constituent	Test Reagent	*Punica granatum*	*Glycyrrhiza glabra*	*Tinospora cordifolia*	*Ocimum sanctum*
Tannins	Ferric chloride test	+	+	+	+
	Lead acetate test	+	+	+	+
	Potassium permagnate test	+	+	+	+
Flavonoids	Shinoda test	+	+	+	+
Carbohydrates	Molisch's test	+	+	+	−
	Fehling's test	+	+	+	−
Alkaloids	Dragendroff's test	+	+	+	+
	Mayer's test	+	+	+	+
	Hager's test	+	+	+	+
	Wagner's test	+	+	+	+
Saponins	Foam test	−	+	−	+

Thin Layer Chromatography

Fig 1. *Punica granatum*

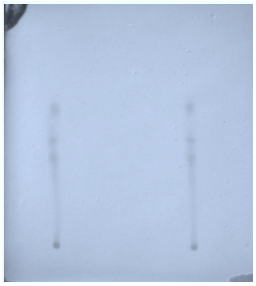

Table 2: TLC OF *Punica granatum*

Sample	Solvent system used	No. of spots obtained	Rf values
Punica granatum extract	Chloroform: Ethylacetate: Formic acid (5:4:1)	3	0.55, 0.65, 0.85

Fig 2. *Glycyrrhiza glabra*

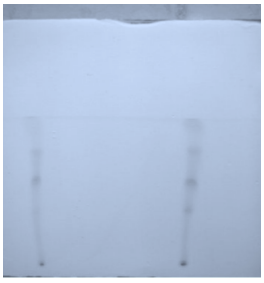

Table 3: TLC of *Glycyrrhiza glabra*

Sample	Solvent system used	No. of spots obtained	Rf values
Glycyrrhiza glabra extract	Ethyl acetate: Ethanol: Ammonia (5:4:9:0.1)	4	0.51 0.64 0.85 0.88

Fig. 3. *Tinospora cordifolia*

Table 4. TLC of *Tinospora cordifolia*

Sample	Solvent system used	No. of spots obtained	Rf values
Tinospora cordifolia extract	Ethyl acetate: Ammonia: Ethanol (6.2:7.1:3)	3	0.22 0.24 0.96

Fig. 4. *Ocimum sanctum*

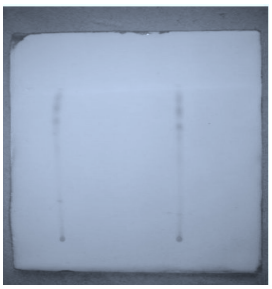

Table 5. TLC of *Ocimum sanctum*

Sample	Solvent system used	No. of spots obtained	Rf values
Ocimum sanctum	Toluene: Ethyl acetate (9:1)	5	0.22 0.72 0.80 0.86 0.92

Table 6. Antibacterial activity of ethanolic extracts

Ethanolic extracts	Microrganism used	Zone of inhibition (in mm)				
		Standard (2 ppm)	0.3%	0.6%	0.8%	1.2%
Punica granatum	E.coli	26	22	23	-	25
Glycyrrhiza glabra	E.coli	22	17	18	20	20
Tinospora cordifolia	E.coli	24	22	24	-	24
Ocimum sanctum	E.coli	22	16	18	20	21

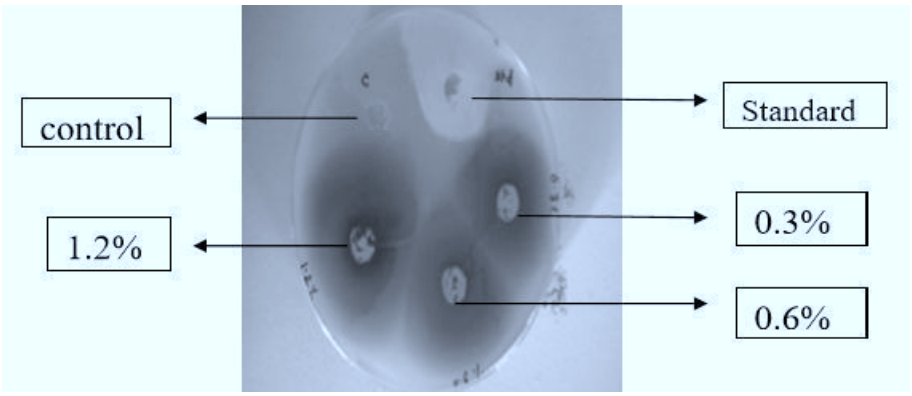

Fig 5. Zone of inhibition of E.coli shown by ethanolic extract of *Punica granatum*

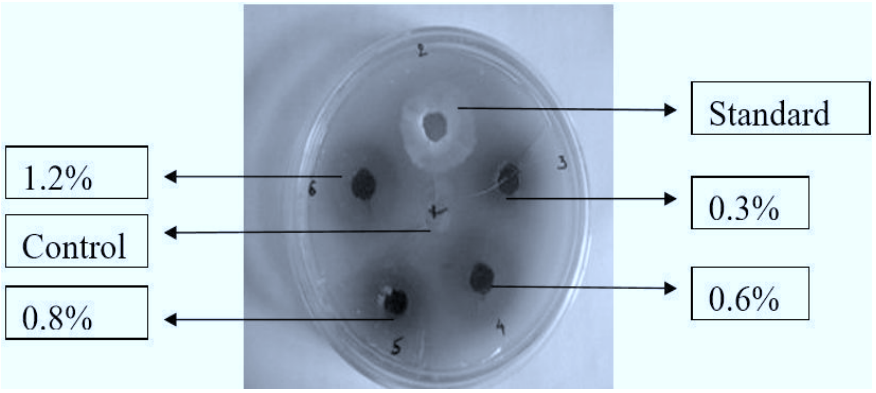

Fig 6. Zone of inhibition of E.coli shown by ethanolic extract of *Glycyrrhiza glabra*

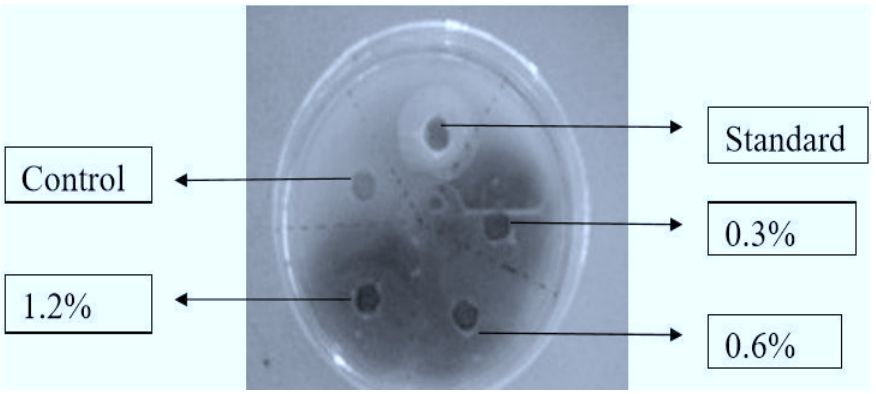

Fig 7. Zone of inhibition of E.coli shown by ethanolic extract of *Tinospora cordifolia*

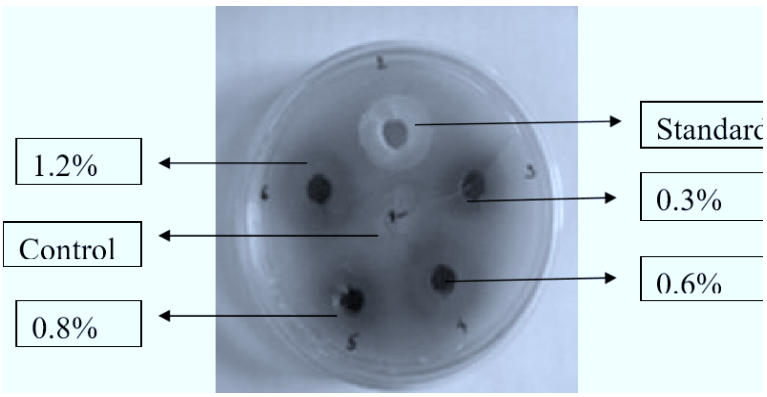

Fig 8. Zone of inhibition of E.coli shown by ethanolic extract of *Ocimum sanctum*

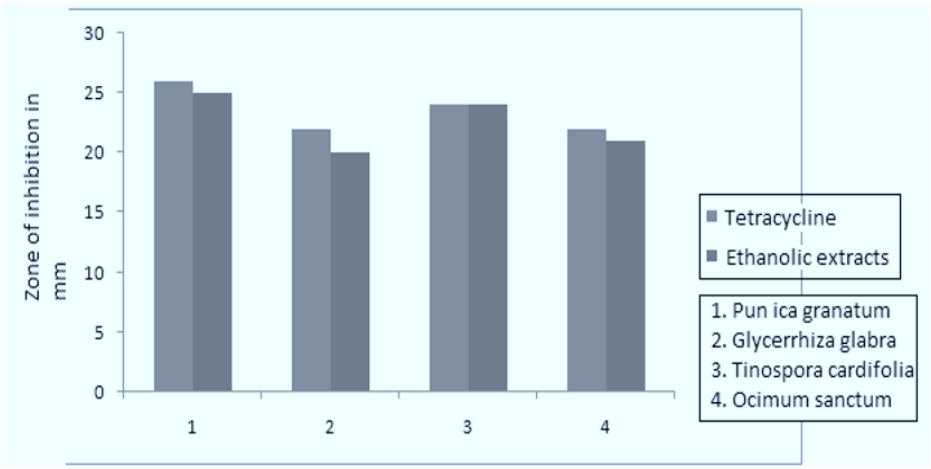

Fig 9. Zone of inhibition obtained by ethanolic extracts

Fig 10. Formulated herbal cream

Table 7. Antimicrobial cream base formulae used

Oil phase					Water phase				
Ingredients	Percent				Ingredients	Percent			
	I	II	III	IV		I	II	III	IV
Stearic acid	7.0	6.0	3.5	2.5	Triethanol-amine	5.0	5.0	5.0	5.0
Stearyl alcohol	3.5	2.5	1.5	1.5	Propylene glycol	2.0	2.0	2.0	2.0
Cetyl alcohol	4.0	5.0	5.5	5.0	Methyl paraben	0.40	0.40	0.40	0.40
White beeswax	5.0	5.0	5.5	5.5	Ethanolic extract	1.2	1.2	1.2	1.2
Mineral oil	5.0	5.0	5.0	5.0					
Propyl paraben	0.04	0.08	0.08	0.08	Water	Up to 100%			

Table 8. Antibacterial activity of formulated cream

Formulated cream (0.5g)	Zone of inhibition (in mm)
Standard	27
Batch I	24
Batch II	25
Batch III	26
Batch IV	24

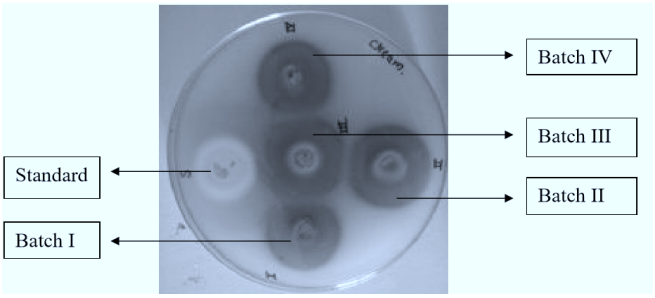

Fig 8. Zone of inhibition of E.coli shown by different batches of formulated herbal cream

Table 9. Evaluation of formulation

Formulation Properties	Cream			
	Formula I	Formula II	Formula III	Formula IV
Color	Brownish	Brownish	Brownish	Brownish
Texture	smooth	smooth	smooth	Fine bubble
pH	6.6	6.9	7.02	7.2
Homogeneity	No lumps	No lumps	No lumps	Lumps
Skin irritation	No	No	No	No
Spreadability (g cm/sec)	5.52	6.8	5.42	5.73
Viscosity (cp)	22,457	27,380	27,060	38,200

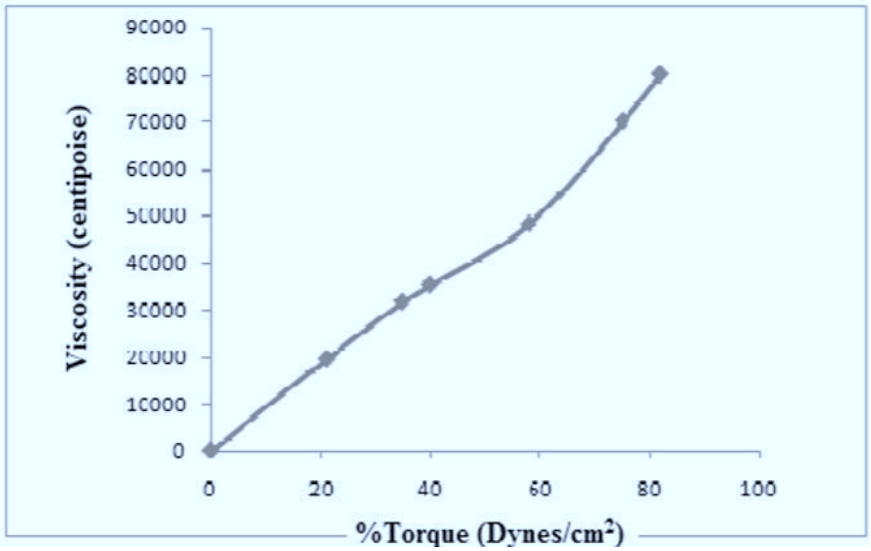

Fig 9. Pseudo plastic flow of cream

Table 10. Stability data of cream

Temp. condition	Week	Organoleptic characters	pH	Viscosity	Spreadability
Room temperature	1	No change	7.02	27,380	7.2
	2	No change	7.0	27,383	6.8
	3	No change	6	27,380	6.7
	4	No change	6.9	27,381	5.7
45˚	1	No change	6.9	27,380	7.6
	2	No change	6.9	27,384	6.5
	3	No change	6.8	27,383	5.6
	4	No change	6.8	27,384	5.8
4˚	1	No change	6.9	27,380	6.8
	2	No change	6.9	27,382	5.6
	3	No change	6.8	27,380	5.7
	4	No change	6.7	27,381	5.8

Table 11. ANOVA for pH

Sources of variation	Sum of squares	Degree of freedom	Mean of squares	F ratio	Table F value
Between batches	0.0208	3	0.0069	1.2105	6.0525
Within batches	0.063	11	0.0057		
Total	0.0838	14	0.0126		

Table 12. ANOVA for viscosity

Sources of variation	Sum of squares	Degree of freedom	Mean of squares	F ratio	Table F value
Between batches	140.92	3	46.9733	18.2910	91.4550
Within batches	28.25	11	2.5681		
Total	169.17	14	49.5414		

Discussion

Tinospora cordifolia, *Ocimum sanctum*, *Glycyrrhiza glabra* and *Punica granatum* are well known for its medicinal value in Indian traditional systems of medicine and thus used in several Ayurvedic preparations. The phytochemical screening reveals that the major constituents of the ethanolic extracts were flavonoids, saponins, alkaloids, carbohydrates, glycosides, triterpenoid, tannins etc. The results of Thin layer chromatography of extracts showed that they contain different constituents. The TLC of different ethanolic extracts showed different spots hav-

ing Rf values such as *Tinospora cordifolia* (0.22, 0.24, 0.96), *Ocimum sanc-sanctum*(0.22,0.72,0.80,0.86,0.92.),*Glycyrrhiza glabra* (0.51, 0.64, 0.85,0.88), *Punica granatum* (0.55,0.65,0.83). The antimicrobial assays were carried out to check the activity of the extracts to be incorporated into the cream, against the bacteria to calculate their respective concentrations. From the results of antimicrobial assays, these were observed that 1.2% of *Tinospora cordifolia*, *Ocimum sanctum*, Glycerrhiza glabra, *Punica granatum* extracts, had zone of inhibition close to that of standard. The values of zone of inhibition of 0.3%, 0.6%, and 0.8% and 1.2% were *Tinospora cordifolia* (22, 24, 24), *Ocimum sanctum* (16, 18, 20, 21), *Glycyrrhiza glabra* (17, 18, 20, 20), *Punica granatum* (22, 23, 25). It was observed that the value for 1.2% was much closer to that of standard and hence, it was decided to use 1.2%. For the incorporation of the drugs four formulae for cream base were tried. Cream prepared by using different combinations and when compared for the suitability, it was observed that the cream prepared using formula 3 showed desired characteristics such as smooth texture, optimum pH and good spreadability Validation of cream was done for three parameters and was found within limits. The pH of cream was found to be in range of 6.5-7.0 which is good for skin pH. The viscosity of cream was in the range of 27000-28000 cps. This indicates that the cream is easily spreadable by small amount of shear. Rheological behavior of cream was studied and the results and graph confirmed the pseudoplastic flow behaviour of cream. The results of stability study of the cream showed that at the temperature temperature 37º, 45º, and 4º, the appearance of the cream did not change. The pH, viscosity, and spreadability did not show significant change at 25ºC. Therefore, it can be concluded from the present study that the ethanolic extracts of *Tinospora cordifolia*, *Ocimum sanctum*, *Glycyrrhiza glabra*, *Punica granatum* possesses significant antimicrobial activity.

Conclusion

The formulated herbal cream is effective in antimicrobial action. Therefore, it can be concluded from the present study that the flavonoids and tannins from *Tinospora cordifolia*, *Ocimum sanctum*, *Glycyrrhiza glabra*, *Punica granatum* plants are responsible for antimicrobial activity.

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Issues Faced by Women Journalists in Print Media

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Abstract

The motive of this research is to understand basis of the struggle for gender transformation and curbing the gap that forms between the social identities of women and men. The mass media has been very rapt in its response to women as a new growth industry. The relationship shared between the Women and Media has a complex structure where women are looked upon as an object. The women's role in media decision making is clearly shown in the ill represented women's issues and concerns. The changing print media has become market oriented in the post liberalization period. This media market on one hand has extended opportunities for women but the kind of "beats" or "job" that are assigned to women journalists have been designed in a manner to keep them confined to soft beats like feature writing or shallow writing. The restoration and depiction of Gender issues is dealt within patriarchal set up of the media. And a very vital issue to note is of professional inequality which is deeply engraved in the media that is weaved around and strongly based on social differences between man and woman.

Key words : Journalists, Media, Gender issues, Gender transformation.

Introduction

Gender operates at all levels of social life and is deeply embedded in how work is organized, rewarded, and experienced. The sociological study of gender and work emerged during the 1960s and 1970s, as women's labour force participation rates rose and as the Women's Movement began calling attention to gender inequality at home and on the job. The field has evolved over time; conceptual frameworks have expanded and empirical foci have shifted in response to economic and societal changes.

As Bhasin (2000)[1] has said, Women's work outside the home is often an extension of their work in the family. Women are subservient at home, they continue to be subservient outside. Men are in a position of power and control at home, they continue to be in similar positions in the outside world. Jobs which entail authority, power and control are considered men's jobs and jobs involving caring, nurturing, servicing are seen as women's job.

It is important to look at the processes and dynamics within the institutional space to understand how gender as a vital factor mediates the experiences of women, as they consti-

tute minority group in various organizations and institutions all over the world. Women make up less than 5 per cent of the world's heads of state, heads of major corporations and top executives in international organizations (Bullock, 1994)[2]. More and more women all over the world are entering public space that has been dominated by men and male traditions. Laws and regulations governed by democratic norms have been adopted in various parts of the world to avoid exploitation of employees in general and minority groups in particular. Women do not get equal treatment in the job market despite the fact that women are equally or more successful than their male counterparts in their student days. Women do not get selected in all occupations unlike their male counterparts. General assumption is that the secondary status of women and the treatment they receive in the workplace come from the family spill over into the corporate world.

The motive of this research is to understand basis of the struggle for gender transformation and curbing the gap that forms between the social identities of women and men. The mass media has been very rapt in its response to women as a new growth industry. The changing print media has become market oriented in the post liberalization period. This media market on one hand has extended opportunities for women but the kind of "beats" or "job" that are assigned to women journalists have been designed in a manner to keep them confined to soft beats like feature writing or shallow writing. The restoration and depiction of Gender issues is dealt within patriarchal set up of the media. And a very vital issue to note is of professional inequality which is deeply engraved in the media that is weaved around and strongly based on social differences between man and woman.

Review of Literature

The most significant change in the relationship of gender and work is numerical - the enormous shift in the gender composition of the labour force. In the twentieth century, women entered every area of the labour force, and in unprecedented numbers. The impact has been enormous. Women's entry into the labour force has taken place at every level, from low-paid clerical and sales work through all the major professions. In 1962, women represented less than 1 percent of all engineers, 6 percent of all doctors, and 19 percent of all university professors. By 1990, women made up over 7 percent of all engineers, 20 percent of all, and almost 40 percent of all university professors. From 1970 to 1995, women's shares of doctoral degrees jumped from 25 percent to 44 percent among whites and from 39 percent to 55 percent among blacks. "The increasing representation of women among the ranks of managers in organizations:' writes sociologist Jerry Jacobs, "is perhaps the most dramatic shift in the sex composition of an occupation since clerical work became a female domi-

nated field in the late 19th century:' Outright gender discrimination is extremely difficult to justify. But far more subtle and pervasive mechanisms maintain gender inequality. Perhaps the most ubiquitous of these is sex segregation. Sex segregation, writes sociologist Barbara Reskin, "refers to women's and men's concentration in different occupations, industries, jobs, and levels in workplace hierarchies:' Thus sex segregation becomes, itself, a "sexual division of paid labour in which men and women do different tasks, or the same tasks under different names or at different times and places:' Different occupations are seen as more appropriate for one gender or the other, and thus women and men are guided, pushed, or occasionally shoved into specific positions. One consequence of sex segregation is discrimination against women in promotion. Women face the twin barriers of the "glass ceiling" and the "sticky floor:' which combine to keep them stuck at the bottom and unable to reach the top. The sticky floor keeps women trapped in low-wage positions, with little opportunity for upward mobility. The glass ceiling consists of "those artificial barriers, based on attitudinal or organizational bias, that prevent qualified individuals from advancing upward within their organization into management level positions.

Objectives

The objective of this study is to understand the issues faced by women journalists in mainstream print media. In order to address the above objective, the study will explore in to the following –

1. To study the opinions of male and female journalists regarding scope of journalism for women.
2. To explore the extent to which the news organizations have adopted pro-equality policies for their newsrooms.
3. To find out whether women journalists have a fair knowledge and understanding of laws of the land at the workplace.

Methodology

In the course of this study, it was expected that the methodological approach would overcome the methodological limitations observed. A sample survey was conducted among the women journalists for the primary data collection. The primary data is based on survey and interviews. The secondary sources of data includes reports, acts, books, news reports, journal articles, newspaper clipping and various academic papers. The field survey covered 100 women journalists employed in English language print media in Mumbai region.

Data Ananlysis and Interpretation

Introduction

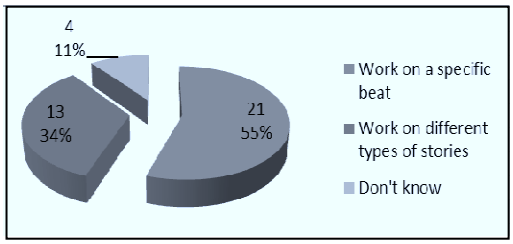
The data was collected in the City of Mumbai from the Female Journalists. The study was carried out on the Issues faced by women journalists, with special focus to print media. Most of the respondents were employed in leading newspapers like Times of In-

dia, Hindustan Times, DNA, Indian Express and few were freelancers. At the commencement of the study it was targeted to collect 150 responses across the city with weighted average of population as base. During the period of data collection 51 respondents participated in the study, 9 responses were dropped due to incompleteness and error in data recording. Final analysis of 42 respondents was carried out. First, the data collected were tabulated in excel and coded appropriately to arrive at group mean. The responses expressed in mean scores were measured on 5-point Likert like scale ranging from 'strongly agree' to 'strongly disagree'. The displaying methods of data are narrative text, tables and charts. The results obtained during analysis were then discussed in relation to the practical and theoretical insights as per the objectives of the study.

Methodological Assumptions

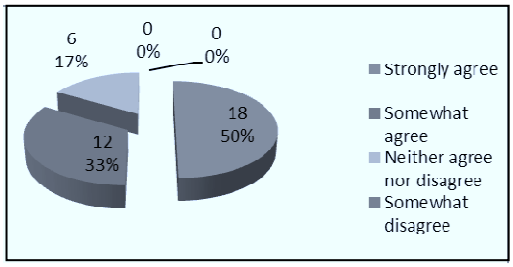
In the course of this study, it is expected that the methodological approach would overcome the methodological limitations observed. The study required to take some assumption as under. The respondents are having the same exposure to the external variables like use of laws in case of sexual harassment, unbiased treatment in terms of remuneration, laws & policies on gender discrimination. Therefore the effects of these factors will be common to all journalists, regardless of how they responded in the study. The study is aimed at increasing understanding of how the independent variables influence the effectiveness of the dependent variables.

Journalists Professional Situation



Media-market on one hand has expanded opportunities for women but the kind of beats 'or job' are assigned to women journalists is to keep them confined to soft-beats like handling feature writing or shallow writings. The job assigned to them is always not of their choice. Despite having certain efforts to promote gender equality in media, ground reality is little away that is quite visible. The study shows that more than half (55%) of the journalists work on a specific beat whereas 34% work on different types of stories and 11% do not know exactly as in which beat or story they will be given to work.

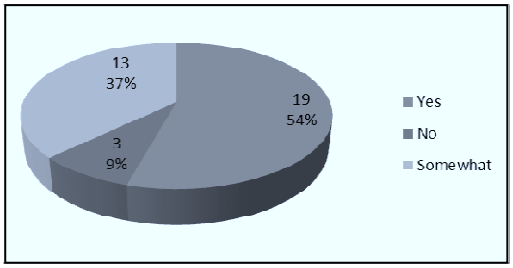
Women Journalists are Courageous & Dynamic



Women has to constantly excel in every field. Women's role in media,

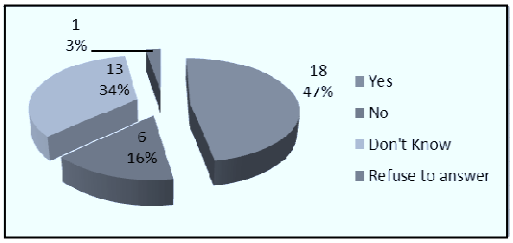
specifically in journalism, has a bright future. But, as in every profession women again have to prove their worth in every sphere of life, so, in this profession also. There was a belief that male members would overpower this profession. But, with the passage of time, the thoughts of the people have changed and women journalists have occupied space in this profession. It is observed from the study that 50% of journalists strongly agree that women in journalism profession are courageous and dynamic whereas 33% somewhat agree and 17% of them neither agree nor disagree.

Gender Inclusive Culture in News Organization



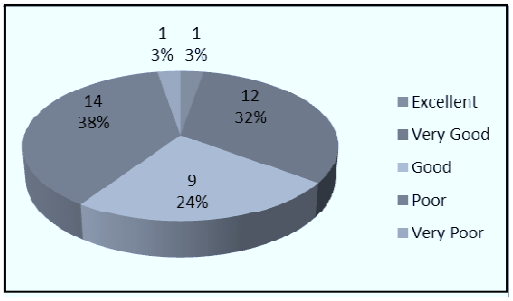
The most significant change in the relationship of gender and work is numerical, that is, the enormous shift in the gender composition of the labour force. Women have entered every area of the labour force, and in unprecedented numbers. Recently, women journalists have proved themselves as dynamic and courageous , thus making it a new force for many developments and achievements. From the study it is observed that half (54%) journalists agree that their news organization has gender inclusive culture whereas only 9% of them disagree to this and rest 37% somewhat agree to this.

Unbiased Treatment in terms of Renumeration



Equality in the gender can be achieved when people are able to access and enjoy the same rewards, resources and opportunities regardless of whether they are women or men. As women are increasingly more, highly qualified, a workplace that is not attractive to women risks losing the best talent to competitors. From the study it is observed 47% of journalists agree that male and female journalists are treated equally in terms of salary whereas 16% disagree. 34% of journalists do not know anything regarding this and 3% refused to answer this question.

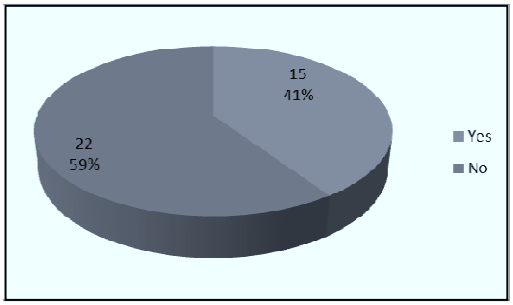
Laws and Policies on Gender Discrimination



The gender-bias is not observed by many of the female journalists now in the present scenario. But at the same time it does not assure that discrimination is not there. From the study it is

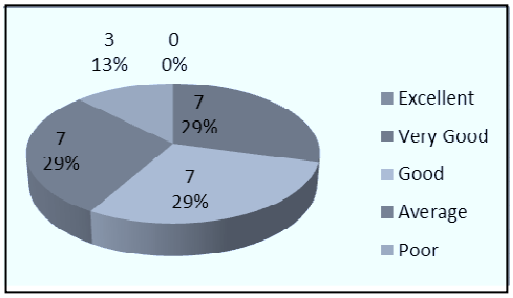
revealed that only 3% of the journalists have excellent knowledge of laws and policies which prohibit discrimination on the grounds of gender whereas 32% have very good knowledge and 24% have good knowledge. At the same time 38% have poor knowledge on this and 3% have very poor knowledge.

Knowedge of Organizations that Aim to Promote Equality



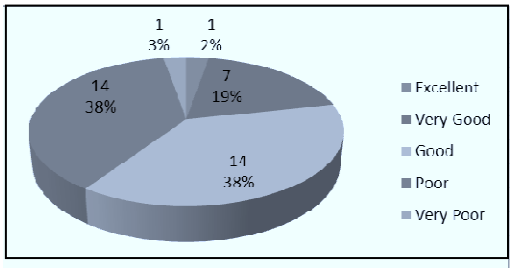
ILO considers gender equality as a key element in its vision of **Decent Work for All Women and Men** for social and institutional change to bring about equity and growth. It is observed from the study that 59% of the journalists do not know any bodies or organizations that aim to promote equality whereas only 41% of them know about this.

Redressal Committee



Grievance redressal committee is that committee in an organization which deals with or sorts out the disputes or issues or complaints arising within the organization. According to a recent amendment passed by the Parliament of India every industrial organization/establishment employing more than 20 workers/employees should have one or more grievance redressal committee. The study reveals that 29% of journalists agree that the organization in which they work has a gender development cell or any other redressal committee to deal with allegations of sexual harassment in terms of efficiency which is very good whereas again 29% of them rate it as good . 29% again rate it as average and 13% rate it as poor.

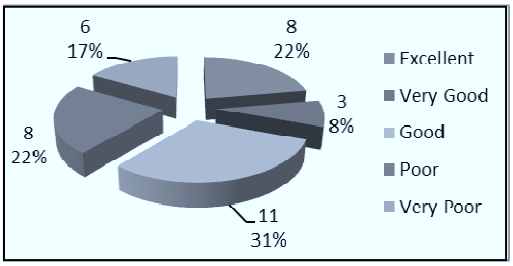
Use of Existing Laws in case of Sexual Harassment



The protection against sexual harassment and the right to work with dignity are universally recognized human rights by international conventions and instruments such as Convention on the Elimination of all Forms of Discrimination against Women, which has been ratified on 25th June, 1993 by the Government of India. From the study it was observed that only 2% of journalists have excellent knowledge of existing laws in India that can be used in cases of sexual harassment

whereas 19% have very good knowledge and 38% have good knowledge. At the same time 38% of them agreed that they have poor knowledge and 3% have very poor knowledge.

Conditions of Service Provisions Rules, 1975



According to the Working Journalists & other Newspaper Employees (Conditions of service) and Miscellaneous Provisions Act, 1975**,** subject to any rules that may be made under this Act is : No working journalist shall be required or allowed to work in any newspaper establishment for more than 144 hours during any periods of 4 consecutive weeks, exclusive of time for meals. The study reveals that 22% of journalists have excellent knowledge of Newspaper Employees (Conditions of Service) & Miscellaneous Provisions Rules, 1975 and at the same time 22% have poor knowledge regarding this. Only 8% have very good knowledge and 31% have good knowledge whereas 17% have very poor knowledge.

Research Findings and Conclusion

The study arose out of interest in enquiring the issues faced by women journalists especially in print media. It started with the inquisitiveness of the problems and issues confronting to women working in the media, to gauge the extent of direct and indirect discrimination in the workplace to identify contemporary issues that need to be addressed.

The data revealed that women journalists have a very good knowledge of laws pertaining to sexual harassment at workplace. They also have a good knowledge of conditions of service provisions rules, 1975. A positive correlation was found out here through analyzing the data. Women journalists are aware of the laws of land. But they are not bold enough to take action against such atrocities. Only handful of them are courageous to fight against sexual harassment. Many media groups are not setting up anti-sexual harassment cells. Women have now learnt to “manage” sexual harassment instead of seeking redressal. Despite the Supreme Court order, several media organizations still have not set up the committee required to look into the cases of sexual harassment. When the argument arises on the matter like leave or hours of work or payment of gratuity or termination from services without notice, majority of them do not fight for their right. Even though equality of opportunity has been increasingly promoted in the workplace but many feel this profession is still dominated by men. Pro-equality policies are not incorporated to the extent it should be. The news organizations must come up with desired transparent procedures and policies and with regard to remunera-

tion, recruitment, promotion, work assignment and other matters that affect professional access, employment and advancement, in keeping with essential principles of gender and equity.

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