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Editors Desk.....

It happened some time back. An old friend of mine told me about one of those emails he got. The email pleasantly surprised him, telling that he would be getting a few million dollars soon. You should have seen him then. He was so excited that he refused to believe me when I told him that I used to get such emails every other day. He thought I was jealous of him. What remains still a surprise to me is that he was prepared to believe and trust a total stranger and not me. His love of money was so great he could not see the truth. Falsehood is so attractive and gorgeous but the truth is simple and naked. He realized the truth only when the email correspondence led him to a stage where he was asked to send a small initial registration fee of one thousand dollars. However, I always feel that it is the duty of everyone to share one's own experience with others so that others too can profit out of it. Any experience however small, it leads us to new learning and new thinking.

This journal, Indian Journal of Current Research provides us opportunities to share with others the findings of our hard work and labour so that it can be of use to the readers and to the community at large. New thinking and new ideas always keep the world new. We get older every day. But with new thinking, new ideas and new people coming in, the world always remains young and new. Let us contribute what little we can to keep the world young and new and peaceful.

Prof. T. Joseph Pandian
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LONELINESS, DEPRESSION AND SOCIABILITY IN OLD AGE

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ABSTRACT

The elderly population is large in general and growing due to advancement of health care education. These people are faced with numerous physical, psychological and social role changes that challenge their sense of self and capacity to live happily. Many people experience loneliness and depression in old age, either as a result of living alone or due to lack of close family ties and reduced connections with their culture of origin, which results in an inability to actively participate in the community activities. With advancing age, it is inevitable that people lose connection with their friendship networks and that they find it more difficult to initiate new friendships and to belong to new networks. The present study was conducted to investigate the relationships among depression, loneliness and sociability in elderly people. This study was carried out on 55 elderly people (both men and women) in Thanjavur Municipality. The tools used were Beck Depression Inventory, UCLA Loneliness Scale and Sociability Scale by Eysenck. Results revealed a significant relationship between depression and loneliness. Most of the elderly people were found to be average in the dimension of sociability and preferred remaining engaged in social interactions. The implications of the study are discussed in the article.

Keywords: Depression, Loneliness, Old age, Sociability.

Introduction

Aging is a series of processes that begin with life and continue throughout the life cycle. It represents the closing period in the lifespan, a time when the individual looks back on life, lives on past accomplishments and begins to finish off his life course. Adjusting to the changes that accompany old age requires that an individual is flexible and develops new coping skills to adapt to the changes that are common to this time in their lives (Warnick, 1995).

There is a growing body of evidence that suggests that psychological and sociological factors have a significant influence on how well individuals age. Aging research has demonstrated a positive correlation of someone's religious beliefs, social relationships, perceived health, self-efficacy, socioeconomic status

and coping skills, among others, with their ability to age more successfully.

Depression or the occurrence of depressive symptomatology is a prominent condition amongst older people, with a significant impact on the well-being and quality of life. Many studies have demonstrated that the prevalence of depressive symptoms increases with age (Kennedy, 1996). Depressive symptoms not only have an important place as indicators of psychological well-being but are also recognized as significant predictors of functional health and longevity. Longitudinal studies demonstrate that increased depressive symptoms are significantly associated with increased difficulties with activities of daily living (Penninx *et al.*, 1998). Community-based data indicate that older persons with major depressive disorders are at

increased risk of mortality (Bruce, 1994). There are also studies that suggest that depressive disorders may be associated with a reduction in cognitive functions (Speck *et al.*, 1995).

Though the belief persists that depression is synonymous with aging and that depression is in fact inevitable, there has been recent research which dispels this faulty notion. Depression has a causal link to numerous social, physical and psychological problems. These difficulties often emerge in older adulthood, increasing the likelihood of depression; yet depression is not a normal consequence of these problems. Studies have found that age isn't always significantly related to level of depression, and that the oldest of olds may even have better coping skills to deal with depression, making depressive symptoms more common but not as severe as in younger populations.

When the onset of depression first occurs in earlier life, it is more likely that there are genetic, personality and life experience factors that have contributed to the depression. Depression that first develops in later life is more likely to bear some relationship to physical health problems. An older person in good physical health has a relatively low risk of depression. Physical health is indeed the major cause of depression in late life. There are many reasons for this, which include the psychological effects of living with an illness and disability, the effects of chronic pain; the biological effects of some conditions and medications that can cause depression through direct effects on the brain; and the social restrictions that some illnesses place upon older people's life style resulting in isolation and loneliness.

There are strong indications that depression substantially increases the

risk of death in adults, mostly by unnatural causes and cardiovascular disease (Wulsin *et al.*, 1999). Some population-based studies did find that this independent relationship does exist in later life, while others did not.

Loneliness is a subjective, negative feeling related to the person's own experience of deficient social relations. The determinants of loneliness are most often defined on the basis of 2 causal models. The first model examines the *external factors*, which are absent in the social network, as the root of the loneliness; while the second explanatory model refers to the *internal factors*, such as personality and psychological factors.

Loneliness may lead to serious health-related consequences. It is one of the 3 main factors leading to depression (Green *et al.*, 1992), and an important cause of suicide and suicide attempts. A study carried out by Hansson *et al.* (1987) revealed that loneliness was related to poor psychological adjustment, dissatisfaction with family and social relationships.

As people grow old, the likelihood of experiencing age-related losses increases. Such losses may impede the maintenance or acquisition of desired relationships, resulting in a higher incidence of loneliness. Many people experience loneliness either as a result of living alone, a lack of close family ties, reduced connections with their culture of origin or an inability to actively participate in the local community activities. When this occurs in combination with physical disablement, demoralization and depression are common accompaniments. The negative effect of loneliness on health in old age has been reported by researchers (Heikkinen *et al.*, 1995). The death of spouse and friends and social disengagement after leaving work or a familiar neighborhood are some of the ubiquitous

life-changing events contributing to loneliness in older people. Those in the oldest age cohort are most likely to report the highest rates of loneliness, reflecting their increased probability of such losses.

A study by Max *et al.* (2005) revealed that the presence of perceived loneliness contributed strongly to the effect of depression on mortality. Thus, in the oldest old, depression is associated with mortality only when feelings of loneliness are present. Depression is a problem that often accompanies loneliness. In many cases, depressive symptoms such as withdrawal, anxiety, lack of motivation and sadness mimic and mask the symptoms of loneliness.

Sociability and old age

Sociability plays an important role in protecting people from the experience of psychological distress and in enhancing well-being. George (1996) summarized some of the empirically well-supported effects of social factors on depressive symptoms in later life, and reported that increasing age, minority racial or ethnic status, lower socioeconomic status and reduced quantity or quality of social relations are all associated with increased depressive symptom levels. Social isolation is a major risk factor for functional difficulties in older persons. Loss of important relationships can lead to feelings of emptiness and depression. "Persons involved with a positive relationship tend to be less affected by everyday problems and to have a greater sense of control and independence. Those without relationships often become isolated, ignored, and depressed. Those caught in poor relationships tend to develop and maintain negative perceptions of self, find life less

satisfying and often lack the motivation to change" (Hanson & Carpenter, 1994).

Having few social contacts or living alone does not assure a state of loneliness (Mullins, Johnson, & Anderson, 1987). In fact, for elderly people the time spent with family may be less enjoyable than a visit to a neighbor or someone of their age group. This can be attributed to the fact that relationships with family tend to be obligatory whereas those with friends are a matter of choice. This further emphasizes the need for a perceived internal locus of control over social interaction as a means of alleviating loneliness.

Posner (1995) points out that older people tend to make friendships predominantly with those within the same age cohort. Thus with advancing age, it is inevitable that people lose their friendship networks and that they find it more difficult to initiate new friendships and to belong to new networks. However, those with more physical, material and intellectual resources also have more social "capital," which allows them to continue to seek out new relationships and forms of social involvement.

The number of older people is increasing throughout the world. As individuals grow older, they are faced with numerous physical, psychological and social role changes that challenge their sense of self and capacity to live happily. Depression and loneliness are considered to be the major problems leading to impaired quality of life among elderly persons. At the same time, old age can also be an opportunity for making new friends, developing new interests, discovering fresh ways of service, spending more time in fellowship with God. It can be happy and winsome or empty and sad — depending largely on the faith and grace

of the person involved. Therefore, the present study was undertaken with the main purpose of studying the relationships among depression, loneliness and sociability in a group of elderly people and also to determine gender differences with respect to the above relationships of variables.

Objectives of the study

- Examine the relationships among loneliness, depression and sociability in elderly persons
- Study gender differences with respect to sociability, loneliness and depression among elderly persons

Hypotheses

- There will be a positive relationship between loneliness and depression in old age.
- There will be a negative relationship between sociability and loneliness in old age.
- There will be a negative relationship between sociability and depression in elderly persons.
- There will be gender differences with respect to the variables sociability, loneliness and depression in elderly persons.

MATERIALS AND METHODS

Sample

The sample comprised of 55 elderly persons (35 men and 20 women) in the age group of 60-80 years and are literates. The mean age of the sample population was 67 years. The subjects for the sample were selected from the older adults of Thanjavur Municipality. These elderly persons were contacted personally, and the questionnaires were administered to them.

Measures

The revised UCLA (University of California, Los Angeles) loneliness scale (Russell *et al.*, 1980)

The UCLA Loneliness Scale includes 10 negatively worded and 10 positively worded items that have the highest correlations with a set of questions that are explicitly related with loneliness. The revised version of the scale has high discriminative validity. The revised loneliness scale also has a high internal consistency, with a coefficient alpha of 0.94.

Beck depression inventory (Beck *et al.*, 1961)

The Beck Depression Inventory (BDI) is a 21-item self-report scale measuring supposed manifestations of depression. The internal consistency for the BDI ranges from 0.73 to 0.92, with a mean of 0.86. The BDI demonstrates high internal consistency, with alpha coefficients of 0.86 and 0.81 for psychiatric and non-psychiatric populations, respectively. The scale has a split-half reliability coefficient of 0.93.

Sociability subscale of Eysenck personality profiler (Eysenck & Eysenck, 1975)

Eysenck Personality Profiler (EPP V6) is a multidimensional modular personality inventory for 3 dimensions: Extroversion, emotionality (neuroticism) and adventurousness (psychoticism). Each dimension has 7 subscales.

The sociability subscale of extroversion used in this study consists of 20 questions. The response category is either 'yes' or 'no.' There are 10 positive items and 10 negative items. The factorial validity of the EPP V6 holds across different cultures and age groups, with a high equivalent factor structure among these different samples.

Procedure

Initially the participants were personally contacted and rapport was established with them. The participants completed the questionnaires given to them. Standard instructions were written on top of each questionnaire, and the participants were asked to rate themselves under the option they felt relevant to them. It was made clear to the participants that there were no right and wrong answers. If they had any difficulty, they were encouraged to ask questions. After finishing the entire set of questions, they were asked to return the questionnaires. The test administration took about 45 minutes.

RESULTS

Table 1
Means and standard deviations for gender differences for loneliness, depression and sociability

Variables	Men (n=35)M (SD)	Women (n=20)M (SD)	+	Sig (2tailed)
Loneliness	47.43	45.75	0.73	0.47
Depression	18.74	22.6	-1.32	0.19
Sociability	8.98	7.29	2.14	0.035**
**P<α				

The above reveals that there are no significant gender differences in elderly men and women with respect to loneliness and depression. Elderly men, however, were found to be more sociable as compared to elderly women.

Table 2
Correlations among loneliness, depression and sociability

Variables	Loneliness	Depression	Sociability
Loneliness	1.00	-	-
Depression	0.528**	1.00	-
Sociability	-0.010	0.032	1.00
**P<α			

This table shows a significant positive correlation between depression

and loneliness, which is significant at the 0.01 level, i.e., there is an increase in the level of depression with an increase in loneliness among elderly men and women. A negative, though insignificant, relationship was found between sociability and loneliness. No significant relationship was found between sociability and depression.

Table 3
Correlations among loneliness, depression and sociability (men)

Variables	Loneliness	Depression	Sociability
Loneliness	1.00	-	-
Depression	0.557**	1.00	-
Sociability	-0.118	0.050	1.00
**P<α			

The above reveals that in the male elderly persons, a significant positive correlation was found between depression and loneliness. Sociability and loneliness were negatively correlated, though not significantly.

Table 4
Correlations among loneliness, depression and sociability (women)

Variables	Loneliness	Depression	Sociability
Loneliness	1.00	-	-
Depression	0.602**	1.00	-
Sociability	0.165	0.265	1.00
**P<α			

The table above shows that the female elderly persons manifested a significant positive correlation between depression and loneliness.

DISCUSSION

The health and well-being of older adults is affected by the level of social activity and the mood states. Researchers have reported the negative effects of loneliness on health in old age (Heikkinen *et al.*, 1995). Loneliness, coupled with other physical and mental

problems, gives rise to feelings of depression in the elderly persons. Gender differences have been reported in the prevalence of health problems in elderly persons (Arber & Ginn, 1991). Results in Table 1 reveal that there are no significant gender differences in the elderly persons with respect to loneliness and depression, i.e., both the male and female elderly persons equally experience feelings of loneliness and depression. On the dimension of sociability, men were found to be more sociable as compared to their female counterparts. This may have been due to the fact that all the elderly men belonged to the working group, i.e., they were employed in government jobs before retirement and were less hesitant in socializing as compared to their female counterparts who were housewives and were spending their lives at home and finding pleasures by engaging in daily chores. Having both the intellectual and social resources allows elderly men to continue to seek out new relationships. Lack of significant gender differences on loneliness reflects the fact that since both the groups contained elderly married couples, with both partners being alive, the chances of their feeling lonely were low. Moreover, most of the couples were staying with their children and grandchildren, which did not allow them to stay lonely for long. Lack of significant gender differences on depression is contrary to the often held belief and research reports that elderly women are more prone to depression as compared to elderly men (Kessler *et al.*, 1993). This result is not in line with what has been reported in literature. The findings of no significant gender differences with respect to depression may be attributed to the fact that all the women were nonworking ladies before they attained 60 years of age. Hence for them, the transition into

old age was less associated with a change in life style associated with a break in ties with others or a sudden loss of power and status. The transition was very gradual, which prevented any abrupt change in mood states.

A positive correlation between loneliness and depression [Tables 2-4] is in accordance with the results obtained in literature with regard to both male and female elderly persons (Green *et al.*, 1992). No significant relationship between loneliness and sociability [Table 2] reveals that despite being sociable, they experienced increased feelings of loneliness. Possible explanation for this may be that feeling lonely not only depends on the number of connections one has with others but also whether or not one is satisfied with his life style. An expressed dissatisfaction with available relationships is a more powerful indicator of loneliness (Revenson, 1982).

Lack of significant relationship between depression and sociability [Table 2] confirms the fact that depression is multi-causal, i.e., it arises due to a host of factors, like declining health, significant loss due to death of a spouse, lack of social support. Also most of the elderly persons had moderate connections with their friends and family members, and they participated in daily activities.

On the basis of obtained findings, the following conclusions can be made:

1. A significant positive correlation exists between loneliness and depression.
2. No significant relationship was found between loneliness and sociability; depression and sociability.
3. Men are found to be more sociable than women.
4. A significant correlation was found between loneliness and depression in both men and women.

There were certain limitations in the study:

1. The sample size was restricted to few elderly persons. Hence in future, a similar study needs to be conducted on a larger section of the elderly population.
2. For determining gender differences, both male and female constituents of the sample should be equivalent in all respects.
3. Moreover, no formal diagnosis of depression was made in the sample used in the study. Self-report inventory was used for determining the level of depressive symptoms in the elderly persons.

Keeping in view the above limitations, longitudinal studies on a larger group of elderly men and women are needed in future.

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WOMEN, THE TRIGGER AND DRIVING FORCE OF SOCIETIES

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ABSTRACT

The term 'feminism' was first used by the nineteenth century French dramatist Alexander Dumas. This word was derived from the Latin word 'femina'. 'Femina' means having the qualities of a female. The earlier novels by Indian women novelists project the traditional image of a woman. They did not have any freedom to speak or to write or even to stand in front of men. The male chauvinistic society treated them like slaves. The struggle of women in the Indian history cannot be explained. They do not possess any self identity. This paper attempts to trace the tremendous change in the way women are perceived at present and given a new status in our society.

Key words: Feminism, womanhood, male chauvinism, suppression, empowerment.

INTRODUCTION

“Arise awake and stop not till the goal is achieved”.

Swami Vivekanandha

The term 'Feminism' was first used by the nineteenth century French dramatist Alexander Dumas. This word was derived from Latin 'Femina'. Femina means having the qualities of a female. Feminism means utilising the rights for women in political, social, economical and educational level.

Woman means trying to steer clear of hurdles to snatch glory in this competitive world. Our grannies, mother, aunt, sister, wife, daughter and all other ladies of our families suffered for us, suffered because of us, suffered with us to ensure us our smiles with gratitude and apologies for neglecting them in pursuit of our careers. There are different ways of assessing their position of women in any country. One can compare the present with the past; one can compare practice with claims: one can make comparisons with other countries; one can develop a model as a

focus of comparison; or one can use some combination of these approaches.

The earlier novels by Indian women novelists project the traditional image of woman. They do not have any freedom to speak or to write or even to stand in front of man. The male chauvinistic society treated them like slaves. They do not have any priority and they depend upon man in each and every stage. Age long suppression and torture in mental, physical and emotional has forced them to lift the cudgels and stand up to fight the male dominant society. The struggle of women in the Indian history cannot be explained. They do not possess any self identity.

“Day and night, women must be kept in subordination to the Males of the family; In childhood to the father, in youth to her husband in old age to her sons... Even though the husband be destitute of virtue and seek pleasure elsewhere, he must be worshipped as God”.¹

Women liberation movement is not a movement against men. A woman

wants to establish her identity. She has a right to develop her inner potential to the maximum. Women are to be liberated from their own chains. "A wife must not always be a few feet behind her husband" it is the liberation of women from their own psychological fear and enslavement.

What Shashi Deshpande says, "Feminism is not a matter of theory. It is different to apply Kate Millet or Simone de Beauvoir or whoever to the reality of our daily lives in India... They often think it is about burning bras and walking out of your husband. She feels that women have a tremendous winner strength and positive thinking.

In the later part of the twentieth century, the woman writers like **Anita Desai, Kamala Markandaya, Nayantara Sahgal, Shobha De, Uma Vasudev, Ruth Jhabvala and Shashi Deshpande** have focused the emancipation of women.

In those days, women were described in traditional and orthodox aspects. But the time changed, the portrayal has become realistic with trust on her sense of frustration and alienation. The plight of working women was still worse. Her problems are aggravated by marital adjustments. Her identity problems related to employment and vocational advancement are even more serious especially for middle aged woman than for the man. The working women are not free from problems. They face all sorts of harassments by the male authorities in their working place. If she loses her job, she has even less chance of finding another one than a middle age man in the same position. As a result of these practices, working is not always a satisfactory substitute for marriage, with the security it normally brings. In addition to add her adjustment problem, the single woman in a family is expected to assume the responsibility of caring for

elderly parents and this often creates a final burden. She has to adhere to her job, in addition to the physical and emotional burden of caring for an elderly person while holding down her job. Assuming the responsibilities for the care of an ageing parent, generally means limitation in her social life. As a result she often cuts herself off from the social contacts and activities in the community organization. The care of her parents ends drastically. She is lonely and has to find other priorities to keep herself busy.

Women play the major role through their actions, attitudes and values in the way of life, even it is applicable to disabled women. Women and girls with disabilities are denied to access education and employment, transport and housing. Even a disabled man is not ready to marry a disabled woman. They feel like abandoned and facing social stigma, loneliness and poverty. A disabled woman is neglected by her own family. Men do not give any importance to women's suggestions. They are weak physically but not in mental predicament as reflected in the male chauvinist society. Even then they lack recognition.

A woman's happiness is not just by providing everything in terms of comforts and luxuries. There is something beyond materialistic thinking and that is psychological affection. She is deprived of love and affection. So, her life becomes dissatisfied and that leads her to a loveless marital life.

As Kamala Das puts it,

"I who have lost my way and beg now at strangers door to receive love at least in small change".³

The above lines expose how a woman who begs for love and affection from her husband.

Arundhati Roy focuses women in a different way in "The God of small Things". Ammu is the protagonist. She is a selfless lady in a male dominated society. She is suppressed by her own father and ill-treated by her husband. She is insulted by the society. She accepts everything quietly because of her children's future. She projects a typical Indian mother. Roy focuses gender discrimination in her novel. The male chauvinistic society emphasises that "Education is only for Man". Woman education is considered an unnecessary expense. **"If a man is educated it will be useful for him. But if a woman is educated, her family as well as her nation will prosper"**.

In Bharati Mukherjee's novel 'Jasmine', Jasmine is the protagonist. She was born in a small rural village in Punjab. She is an uneducated girl. When she goes to the U.S.A, she faces many difficulties in her life. Yet she is very courageous.

She does not lose her will power even in a pathetic situation. She possesses a strong determination. She deliberately goes on changing her name Jyoti, Jasmine – Jane Jase. The problems in an alien country are language, culture, un-valued visa etc. she experiences more than one life within a single life span. She is forced to move throughout the country. **Jasmine quickly learns and accepts that.**

"In America, nothing lasts. I can say that now and it doesn't shock me, but I think it was the hardest lesson of all for me to learn... Nothing is forever, nothing is so terrible, or so wonderful, that it won't disintegrate".⁴

Though she is uneducated, she tackles every situation bravely in an alien country. She learns to live not for her husband or for her children but for

herself. **"The seeds for the liberation of women were already sown in the end of the 19th century. It gradually started to give a good yield in the beginning of the 20th century"**.

Some women achieved a great fame in the world. They proved their ability in the competitive world. "We are proud of the birth of woman. We thank God for the birth of woman is a boon to the world".

"Let me not be sad because I am born a woman in this world;..."⁵

Madam Mary Curie is an eminent personality. She won the noble prize twice in the field of science. **Agatha Christie** is the most popular detective fiction writer of our times. Her stories became tremendously popular all over the world. Though **Hellen Keller** was visually impaired by birth, she introduced Braille for the visually impaired's education. **Florence Nightingale** is better known throughout the world as "The lady with a Lamp". She is a wonderful woman who rejected the comforts and luxuries of homely life and dedicated herself to the selfless service to the sick person and wounded people. **Mother Teresa** won not only the hearts of the Indians but also the people of the whole world because of her selfless service. She won the noble prize for peace. **Kalpna Chauva** was the young scientist. She got prominent position in the world. She sacrificed her life for her nation. **Lata Mangeshkar** had ruled the hearts of millions of her listeners throughout the world for the last forty years by the magic of her sweet voice.

Indira Gandhi was a powerful and eminent ruler hailed from Nehru's family. She is the one who opened to the world about our country in the U.N.O assembly. She is also the example of Bharati's modern woman. Women like

Kiran Bedi, P.T. Usha, Sarojini Naidu, also proved their identity in the world. These women dead or alive are still remembered by people because of their accomplishments.

Women are excellent at working in teams. They work not only for the development of their family but also for the upliftment of the society. **“God who takes care of the world, presented intelligence in woman”**.

Time has changed and **women have come out of their shells and spread their wings to fly into the sky of achievement**. Women proved their calibre in the field of Science, Art, Literature, Medicine, Political, Economical, Education, Social activities etc. Nothing is spared by women. They are equal to men. They prove themselves in each and every part of the world. Every day we hear the achievements of women around the globe. **“There is a woman behind every successful man”**.

We want to reveal through this paper that once women were very much suppressed in the hands of men. But now everything is changed. They gave good recognition as whole by the male counterparts.

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FUZZY LOGIC CONTROL OF WASHING MACHINE

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ABSTRACT

This project deals with the control of operation of washing machine by using fuzzy logic control of washing machines. This control is with respect to the degree of dirt, amount of load and the type of load, since the wash time is based on the amount of clothes to wash, the type of load and the degree of dirt in clothes. First, the dirt in water is sensed by optical sensor after 5 rotations which gives the output voltage in the range of 0-5 volts .For high level of contamination of water, the voltage range is 0-2 volts and for low level of contamination the range is 4-5 volts approximately. Secondly with respect to load, the supply current drawn increases as the load on the washing machine increases .By sensing the amount of current and optical sensor output voltage, the wash time is determined. So the control is done for both cases. I.e. Based on dirt level and amount of load. For lightly loaded and less dirt requires less wash time. For heavily loaded and more dirt condition the wash time is more. The wash time is varied in order to control the type of load. By giving these signals (current and voltage) as input to arduino us determine the required amount of wash time for which the machine is operated. Thus, Fuzzy logic controlled washing machine controller gives a correct wash time even through a precise model of input and output relationship is not given.

KEYWORDS: Fuzzy, Fuzzy logic, Fuzzy logic control, Voltage drop, operate time, Release time, Maximum switching power, voltage, current.

INTRODUCTION

Washing machines are common features today in the Indian household. The most important utility a customer can derive from a washing machine is that he/she had to put in brushing, agitating and washing the cloth. Most of the people wouldn't depend directly on the degree of dirt, amount of load, type of cloth quality etc.The washing machines that are used today serve all the purpose of washing, but which cloth needs what amount of agitation time is a business which has not been dealt with properly. In most of the cases either the user is compelled to give all the cloth same agitation or is provided

with a restricted amount of control. The thing is that the washing machines used are not as automatic as they should be and can be.

This project aims at presenting the idea of controlling the washing time using fuzzy logic control and arduino. This project describes the procedure that can be used to get a suitable washing time for different cloths. The process is based entirely on the principle of taking non-precise inputs from the sensors, subjecting them to fuzzy arithmetic and obtaining a crisp value of the washing time. This method can be used in practice to further automate the washing machines. Never the less, this

method, through with much larger number of input parameters and further complex situations, is being used by the giants like LG Samsung.

The concept of Fuzzy Logic (FL) was conceived by Lotfizadeh, a professor at the University of California at Berkley, and presented not as a control methodology, but as a way of processing data by allowing partial set membership rather than crisp set membership or non-membership.

This approach to set theory was not applied to control systems until the 70's due to insufficient small-computer capability prior to that time. Professor Zadeh reasoned that people do not require precise, numerical information input, and yet they are capable of highly adaptive control.

If feedback controllers could be programmed to accept noisy, imprecise input, they would be much more effective and perhaps easier to implement. Unfortunately, U.S. manufacturers have not been so quick to embrace this technology while the Europeans and Japanese have been aggressively building real products around it.

Definition

In this context, Fuzzy Logic is a problem-solving control system methodology that lends itself to implementation in systems ranging from simple, small, embedded micro-controllers to large networked, multi-channel PC or workstation-based data acquisition and control systems. It can be implemented in hardware, software, or a combination of both. Fuzzy Logic provides a simple way to arrive at a definite conclusion based upon vague, ambiguous, imprecise, noisy, or missing input information. Fuzzy Logic's approach to control Problems mimics how a person would make decisions.

How is fuzzy logic different from conventional control methods

Fuzzy Logic incorporates a simple, rule-based IF X AND Y THEN Z approach to a solving control problem rather than attempting to model a system mathematically. The Fuzzy Logic model is empirically-based, relying on an operator's experience rather than their technical understanding of the system.

For example, rather than dealing with temperature control in terms such as "SP =500F", "T <1000F", or "210C<TEMP<220C", terms like "IF (Process is too Cool) AND (Process is getting colder) THEN (add heat to the process)" or " IF (process is too hot) AND (process is heating rapidly)THEN (Cool The Process Quickly)" are used. These terms are imprecise and yet very descriptive of what must actually happen. Consider what you do in the shower if the temperature is too cold: you will make the water comfortable very quickly with little trouble. Fuzzy Logic is capable of mimicking this type of behavior but at very high rate.

Working of Fuzzy logic

Fuzzy Logic requires some numerical parameters in order to operate such as what is considered significant error and significant rate-of change-of error, but exact values of these numbers are usually not critical unless very responsive performance is required in which case empirical tuning would determine them.

For example, a simple temperature control system could use a single temperature feedback sensor whose data is subtracted from the command signal to compute "error" and then time-differentiated to yield the error slope or rate-of-change-of-error, hereafter called "error-dot". Error might have units of

degree F and a small error considered to be 2F while a large error is 5F.

The “error-dot” might then have units of degrees/min with a small error-dot being 5F/min and a large one being 15F/min. These values don't have to be simple. Generally, Fuzzy Logic is so forgiving that the system will probably work the first time without any tweaking.

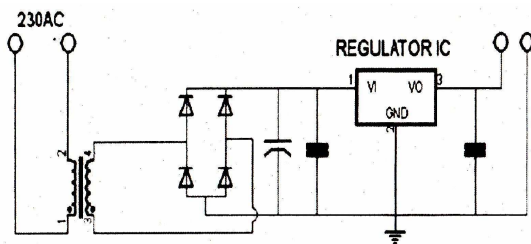


Fig. Basic Power Supply Circuit

Power supply block consists of following units

1. Step down transformer.
2. Full wave rectifier circuit.
3. Input filter.
4. Voltage regulators.
5. Output filter.
6. Indicator unit.

Step down transformer

The step-down transformer is used to step down the supply voltage of 230v ac from mains to lower values, as the various devices used in this project require reduced voltages. The outputs from the secondary coil are the ac values of 0V, 18V. The conversion of these ac values to dc values is done using the full wave rectifier unit.

Rectifier Unit

The rectifier circuit is used to convert the ac voltage into its corresponding dc voltage. The most important and simple device used in rectifier circuit is the diode. The simple function of the diodes is to conduct when forward biased and not to conduct in reverse bias.

Regulator unit

Regulator regulates the output voltage to a specific value. The output voltage is maintained irrespective of the fluctuations in the input dc voltage. Whenever there are any ac voltage fluctuations, the dc voltage also changes.

Regulators used in this application are

1. 7805 Which Provides 5VDC

Implementation of fuzzy logic in washing machine

The most important utility a customer can derive from a washing machine is that he/she had to put brushing, agitating and washing the cloth. Most of the people wouldn't have noticed (but can reason out very well) that different type of cloth need different amount of washing time which depends directly on the type of dirt, amount of dirt, cloth quality etc.

The washing machines that are used today (the one not using fuzzy logic control). serves all the purpose of washing, but which cloth needs what an amount of agitation time is a business which has not been dealt with properly. In most of the cases either the user is compelled to give all the cloth same agitation or is provided with a restricted amount of control. The thing is that the washing machines used are not as automatic as they should be and can be.

This paper aims at presenting the idea of controlling the washing time using fuzzy logic control⁽⁵⁾. The project describes the procedure that can be used to get suitable washing time for different cloths. The process is based entirely on the principle of taking non-precise inputs from the sensors, subjecting them to fuzzy arithmetic and

obtaining a crisp value of the washing time.

Problem definition

When one uses a washing machine, the person generally selects the length of wash time based on the amount of clothes he/she wishes to wash and the type and degree of dirt cloths have.

To automate this process, we use sensors to detect these parameters (i.e. volume of clothes, degree and type of dirt). The wash time is then determined from this data. Unfortunately, there is no easy way to formulate a precise mathematical relationship between volume of cloths and dirt very recently.

Conventionally, people simply set wash times by hand and from personal trial and error experience. Washing machines were not as automatic as they could be. The sensor system provides external input signals into the machine from which decisions can be made.

It is the controller's responsibility to make the decisions and to signal the outside world by some form of output. Because the input/output relationship is not clear, the design of a washing machine controller has not in the past lent itself to traditional methods of control design.

We address this design problem using fuzzy logic. Fuzzy logic has been used because of fuzzy logic controlled washing machine controller gives the correct wash time even though a precise model of input/out relationship is not available.

Details about the problem

The Problem ⁽⁶⁾ in this project has been simplified by using only two variables. The two inputs are:

1. Degree of dirt
2. Type of dirt

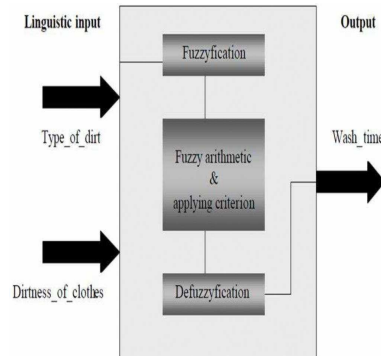


Figure 5.1: Fuzzy Logic Block Diagram

The fuzzy controller takes two inputs, processes the information and outputs a wash time. How to get these two inputs can be left to the sensors (optical, electrical or any type).

The working of the4 sensors is not a matter of concern in this per. We assume that we have these inputs at out hand. Anyway the two stated points need a it of introduction which follows. The degree of dirt is determined by the transparency of the wash water. The dirtier the clothes, less transparent the water being analyzed by the sensors is.

On the other hand, type of dirt is determined by the time of saturation, the time it takes to reach saturation. Saturation is a point, at which there is no more appreciable change in the color of the water. Degree of dirt determines how much dirty a cloth is. Whereas type of dirt determines the Quality of dirt. Greasy cloths.

For example, take longer for water transparency to reach transparency because grease is less soluble in water than other forms of dirt. Thus a fairly straight forward sensor system can provide us the necessary input for our fuzzy controller.

Before the details of the fuzzy controller are dealt with, the range of possible values for the input and output variables are determined. These (in language of Fuzzy Set theory) are use

membership functions used to map the real world measurement values to the fuzzy values, so that the operations can be applied on them.

Values of the input variable `degree_of_dirt` and `type_of_dirt` are normalized range – (1 to 100) over the domain of optical sensor. The decision which the fuzzy controller makes is derived from the rules which are stored in the database. These are stored in a set of rules. Basically the rules are if-then statements that are intuitive and easy to understand, since they are nothing but common English statements. Rules used in this project are derived from common sense, data taken from typical home use, and experimentation in a controlled environment.

The sets of rules used here to derive the output are

1. If dirtiness_of_clothes is Large and type_of_dirt so Greasy then wash time is Very Long;
2. If dirtiness_of_Clothes is Medium and type_of_dirt is Greasy then wash_time is long;
3. If dirtiness_of_clothes is Small and type_of_dirt is Greasy then wash_time is long;
4. If dirtiness_of_clothes is Large and type_of_dirt is Medium then wash_time is long
5. If dirtiness_of_clothes is Medium and type_of_dirt is Medium then wash_time is Medium;

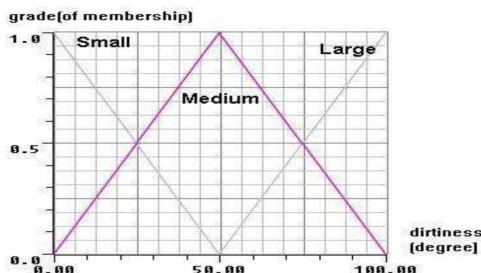


Figure 5.2: Membership Function for dirtiness of clothes

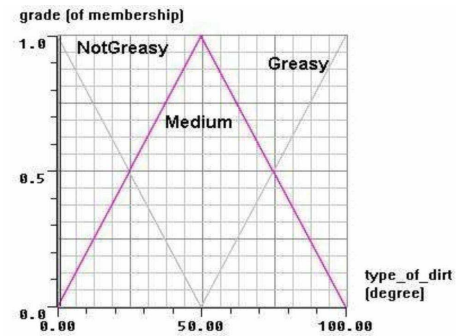


Figure 5.3: Membership function of type of dirt

The rules too have been defined in imprecise sense and hence they too are not crisp but fuzzy values. The two input parameters after being read from the sensors are fuzzified as per the membership function of the respective variables. These in additions with the membership function curve are utilized to come to a solution (using some criteria). At last the crisp value of the wash time is obtained as an answer.

CONCLUSION

By the use of fuzzy logic control along with manual control options using a selector dial we have been able to obtain a wash time for different type of load and different degree of dirt. The conventional method required the human interruption to decide upon what should be the wash time for different cloths. In other words this situation analysis ability has been incorporated in the machine which makes the machine much more automatic and represents the decision taking power of the new arrangement. Though the analysis in this project has been very basic, but this clearly depicts the advantage of adding the fuzzy logic controller in the conventional washing machine.

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JOB SATISFACTION AMONG WORKING WOMEN WITH REFERENCE TO POLICE PERSONNEL – A STUDY IN THANJAVUR DISTRICT

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ABSTRACT

Women can play a more creative, positive and challenging role in the nation building. Women's participation in plans and policy formulation is vital to their success, women are intimately connected with the basic needs of their families. Today, the status of the Indian women has totally changed. The number of educated women including the number of working women is increasing. At present, women are in position to compete with men in all walks of life. Job Satisfaction is the combination of psychological, physical and Environmental circumstances that comes to a person. The nature of job of Police is very complex to work. It requires fullest dedication and commitment on employing people. Even though, being a woman they spend most of their time, energy to their duty. As such there is a need in knowing the satisfaction and the dissatisfaction of the women police in their job. This study is an attempt to find out the satisfaction of the Women police personnel. The study is Descriptive in nature and a sample of 75 women police was selected from a Universe of 145 (constable & Grade-I PC) by using Stratified Proportionate Random Sampling method. The major findings of the study reveal that the majority (69%) of the respondents is satisfied with the job and half of the respondents (52%) are satisfied with the salary. The researchers have also suggested various measures to increase the level of the job satisfaction.

Key words: Job satisfaction, Women Police Personnel, Family adjustment Problems etc.

INTRODUCTION

Women can play a more creative, positive and challenging role in nation building. It is imperative to note that men alone cannot break the shackles of poverty, unemployment, inequality, population explosion, active and equal participation of women in accomplishment of the herculean task is indispensable.

Women's Participation in plans and policy formulation is vital to their success, for it is; women are intimately connected with the basic needs of their families be it food, firewood or water. They can even make a vital in the process of implementation of plans. A

women as mother, in the households is possibly the best example of a manager. She performs the function of finance management while preparing and following the domestic budget, marketing function and making purchase decision, production, function in providing food to the family members, personnel function in keeping peace at home and harmonious relationship among members of the house. Women in the society, therefore has to be accorded the status of the mother in the sense, if it stands for promoting peace and prosperity. No wonder how much progressive a men, he cannot succeed completely enterprise

unless he is aided and supplemented properly by a women.

Working women

Since ages, women continue to feel to be a weaker section of society. During the last few decades, industrialization, urbanization, increasing level of education, awareness of rights, wider influence of media and westernization has changed the status and position of women. Today, the status of Indian women has totally changed. The number of educated women including the number of working women is increasing. At present, women are in a position to compete with men in all walks of life.

Meaning of police

The term 'POLICE' stands for Protective Organization for Life and Investment in Civil Establishment. The term police is derived from the Latin word 'POLITIA' which connotes a system of regulation of the state. Women were used for the first time as police officials to control women labourers who blocked the entrance to textile mills during a labour struggle in Kanpur in 1938. In 1939, the state of Travancore made use of women in police duty. In 1947 with partition of India, misery and moral degradation became eminent due to heavy influx of refugees from Pakistan. To protect women and children, the Ministry of Relief and Rehabilitation used the services of women police (Bhardwaj: 1970). Their services were mostly utilized in relief camps. After Independence, social legislations such as Hindu Marriage Act, (1956) were passed to protect women. Implementation of such legislations required the services of women police. They have to deal with delinquents

protect girls and women from committing crimes from dowry deaths and from other social evils. The first high grade women police officer (on IPS cadre) was appointed in 1972. In 1988 there were seven women in a group of 125 IPS trainees at Hyderabad who underwent the same rigorous training as men.

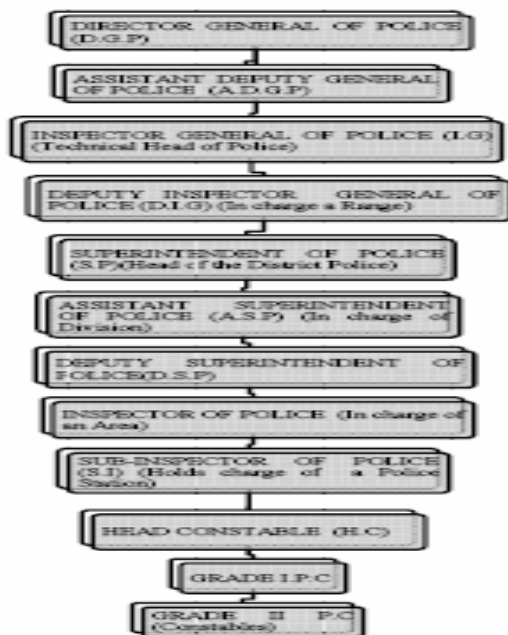
A police station fully manned by women police alone was set up in 1973 in Kerala. It was the first of its kind thought out the world and it was functioning with one Sub-Inspector, two Head-constable and ten Constables. It was inaugurated by the Prime Minister of India, Mrs. Indira Gandhi. Its main duty was to tackle dowry case especially came under this police station. On an average 600 petition per year were enquired by the police stations. The second All women police station was set up in 1989 at Jaipur.

While addressing the first batch of police women on the completion of their training in 1974, the Chief Minister of Tamil Nadu has stated that the Government of Tamil Nadu had introduced women in police force because there had been a persistent demand for women police wings. This implies that the first women police wing was set up in Tamil Nadu in 1973. It was started in Madras on 27.12.1973, with one Sub-Inspector, one Head constable and twenty women Constables, after a year of training the first batch of 22 women police personnel joined service.

Women in police force perform the dual duties of women in society and women police department. The former has the image of a social worker and later is the work of a police officer. As social workers, they protect the honour of women and help women and children in the rehabilitation

centers. They try to prevent crime occurrence, dowry death a harassment of women eve teasing, immoral activities and deal with juvenile delinquents and implement social laws. They get the help of social service organization in discharging the duty.

The following is the hierarchical set up of Police Administration in Tamil Nadu



Literature review

Mahajan (1982) explains the role conflict faced by police women as they perform dual role and he points out that the male colleagues and officials have low opinion about women police. These two along with status inconsistency are the problems of police women. He lists general opposition to women as police personnel, men's prejudices, structure of police roles and organizational apathy as causes for the marginal position of police women.

Shamin Aleem (1991) points out the working condition of police women in India and she feels that the

distribution of women police in that states is not rational. She regrets that the annual reports of the police department do not mention about police should be given independent powers and responsible jobs.

Dantzker's (1994) Job Satisfaction survey of twelve police departments in six states (N=552) indicated that the police officer participants had low overall job satisfaction levels. They reported the greatest dissatisfaction with the pay and the least dissatisfaction with supervisory support. Police officers between the ages of 20 and 25 were more satisfied than other age groups. The male police officers had higher job satisfaction levels than female police officers. The men were more likely to change Police departments, while the women were more likely to accept a job offer different from policing.

Mangai Natarajan (1996) reveals that twenty nine- All women police units have been established by the Tamil Nadu State police and these units generally consist of 15 women constables and 2 Sub-inspectors under the command of an Inspector. They mainly deals with family – related disputes and cases involving women and children, but also serve the full range of general police functions. The units were established for two main reasons.

- i) To engender trust in the police among women victims and
- ii) To provide an independent carrier structure for women police officers.

Interviews with officers in five of these units revealed a high level of satisfaction with the work and the career prospectus.

Objectives of the study

- To study the Socio-Economic condition of the women police personal.

- To know the Occupational Status and Job Satisfaction of the women police.
- To assess the Family Adjustment problems among the women police.
- To offer a few suggestive measure to overcome the family adjustment problems and to recommend positive ways about the overall satisfaction of the women police.

Hypotheses of the study

- There is an association between the cadre of the women police and their marital status.
- There is an association between the cadre of the women police and their job satisfaction.
- There is an association between the cadre of the women police and the satisfaction with the salary.
- There is an association between the cadre of the women police and their years of experience.
- There is an association between the cadre of the women police and their recreation habits.

METHODOLOGY

The study explained the working status, description of the socio-economic characteristics and job satisfaction of women police personnel. Hence the researcher adopted the Descriptive Design. In Thanjavur there were 145 women police working in the cadre of Constable and Grade- I PC in Armed Reserve wing. By using Stratified Proportionate Random Sampling method, 75 police women have been selected as the respondents. The data was collected with the help of Interview Schedule prepared by the researcher.

ANALYSIS AND INTERPRETATION

TABLE -1. FAMILY TYPE

S. No.	Particulars	No. of Respondents N=75	Percentage (100%)
1.	Nuclear	53	70.7%
2.	Joint	22	29.3%

The table-1 indicates that 70.7% of the respondents belongs to the Nuclear family, 29.3% of the respondents belongs to the joint family. It is observed that majority of the respondents belongs to the Nuclear family.

TABLE- 2. WORKING ATMOSPHERE

S. No.	Particulars	No. of Respondents N=75	Percentage (100%)
1.	Good	32	42.7%
2.	Not good	43	57.3%

The table-2 indicates that 57.3 % of the respondents revealed that their working atmosphere is not good and 42.7% of the respondents said that their working atmosphere is good.

TABLE- 3. CHILDREN LONELINESS

S. No.	Particulars	No. of Respondents N=75	Percentage (100%)
1.	Yes	32	42.7%
2.	No	17	22.7%
3.	None	26	34.6 %

The table- 3 indicates that 42.7% of the respondents' children feel aloof because of their job, 22.7% of the respondents' children did not feel aloof because of their job and 34.6% of the respondents are unmarried. It clearly shows that 42.7% of the respondents' children feel aloof because of their job.

TABLE -4. MARITAL STATUS

S. No.	Cadre	Marital Status		Statistical Inference
		Married	Unmarried	
1.	Grade I.P.C	22	5	X ² =4.15 df:1 E value at 0.05%= 3.841 Significant
2.	Constable	28	20	

The table- 4 shows that there is a significant association between the cadre of the women police and their marital status. Hence the research hypotheses is accepted.

TABLE -5. JOB SATISFACTION

S. No.	Cadre	Job satisfaction		Statistical Inference
		Yes	No	
1.	Grade I.P.C	18	9	X ² =0 df=1 E value at 0.05%= 3.841 Insignificant
2.	Constable	22	6	

The table-5 shows that there is no significant association between the cadre of the women police and their job satisfaction. Hence the research hypothesis is rejected.

Findings of the study

Socio-economic characteristics

Majority (63%) of the women police were between the age group of 26-30 years. Majority (65%) of the respondents are married. 45 % of the respondents completed their UG level. Majority (71%) of the respondents are from Nuclear family. Majority (67%) of the respondents have good health. A vast majority (85%) of the respondents are earning up to Rs.10,000 to 15,000/- in a month.

Job condition and job satisfaction

All the respondents revealed that they felt happy when they joined the job. Majority (72%) of the respondents chose

their job for the economic necessity to maintain their family. A vast majority (92%) of the respondents said that they are involved in their job. More than half (57%) of the respondents said that their working atmosphere is not good. Majority (69%) of the respondents revealed that they are satisfied with their job. More than half (52%) of the respondents are satisfied with their salary.

Majority (63%) of the respondents revealed that they are encouraged by their higher officials. A vast majority (79%) of the respondents said that they received help from the co-workers. Majority (69%) of the respondents did not get punishment by their superior for mistakes. 28% of the respondents' problem is both shift system and the overtime during the political meetings. 33% of the respondents expect leave facility in their job, 24% of the respondents expect promotions in their job.

Family adjust mental problems

A vast majority (96%) of the respondents said that they take decisions in their family matters. A vast majority (93%) of the respondents revealed that they have enough time to attend their personal work. More than half (55%) of the respondents opined that they did not face any inner conflict due to the dual responsibilities at home and work. A vast majority (97%) the respondents said that they get affection and sympathy from their family. 43% of the respondents said that their children feel aloof because of their job. 35% of the respondents revealed that they have no time to spend with their children. 39% of the respondents revealed that their husband help them in the household

work and 35% of the respondents are unmarried.

Other opinions

All the respondents opined that their employment has raised their status of the family. All the respondents expressed that their family members feel proud of their job. More than half (59%) of the respondents did not accept the Govt. 33% of Reservation for women and request the Govt. to increase the percentage of Reservation for women. Majority (77%) of the respondents accepts the recognition of the working women in the society.

Findings related to statistical analysis

- There is a significant association between the cadre of the women police and their marital status.
- There is no significant association between the cadre of the women police and their job satisfaction.
- There is no significant association between the cadre of the women police and their salary satisfaction.
- There is no significant association between the cadre of the women police and their years of experience.
- There is no significant association between the cadre of the women police and their recreation habits.

SUGGESTIONS

- A Separate counseling centre must be set up at each district to overcome some problems of the women police.
- The living conditions of the women police could be improved by offering more incentives and extra benefits to them.

- The working hours for the women police may be reduced.
- The Govt. may recruit more police to reduce the work load of the women police.
- Some basic facilities such as drinking water, separate dressing room, toilet, canteen etc. must be made more available to the women police.
- With regard to job satisfaction the authority must have the provision to conduct job satisfaction survey regularly and take appropriate action.

CONCLUSION

Job satisfaction appears to be intrinsic to an employee's work environment. In addition, the importance of the work environment, particularly autonomy and feedback, is consistent with the premise of the behavioral school of management theory. Factors important to increased Job satisfaction are evenhanded recompense and remuneration, personnel development panorama, supple hours and develop intellectual capacity and compassionate administration. In accordance with the observations of other policing scholars (e.g., Crank 1997b; Kappeler, Sluder, and Alpert 1995; Skolnick 1966) this finding suggests that police officers like to work in an environment where they enjoy considerable freedom to decide what they will do. The most powerful predictor of job satisfaction is involvement, the sense of personal accomplishment and self reward. It is known that the women police personnel are leading their life somewhat better status. It is also essential that modifying jobs to make them more interesting which can enhance the values of work and increased motivation.

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MEDICINAL PRODUCTS FOR BABIES USING HERBS

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ABSTRACT

The word 'textile' has been derived from the Latin word 'textile' means to weave. Microorganisms i.e., bacteria, fungi, mildew, mold and yeasts, are found everywhere in nature, even in hostile environments. The human skin is usually crowded with innumerable microorganisms. A suitable temperature, moisture, dust and receptive surface provide perfect conditions for their growth. They can double every 20 to 30 minutes in a warm and moist microclimate that has plenty of food for them, e.g. perspiration and other body secretions, skin particles, fats and leftovers from worn-out threads.

Key words: microorganisms, germs, environment

Introduction

Textiles have such an important bearing on our daily lives that everyone needs to know something about them. From earliest times, people have used textiles of various types for covering, warmth, personal adornment, and even to display personal wealth. Today, textiles are still used for these purposes and every consumer prefers hygienic textiles. The effects of microbes on textiles and humans have been increased nowadays, A microbe or microorganism is an organism that is too small that it is microscopic (invisible to the naked eye). Herbal Textile is dyed entirely with herbal extractions, without using any sort of chemicals.

The herbs used are different from vegetable dyes as they are not only natural but also have medicinal value. These herbs are applied directly to the fabric with the help of natural ingredients, so that the medicinal value of the herbs can be kept intact. Clothes that convey a good feeling, comfort,

poise and confidence are the clothes that tell others about the best of the wearer.

Experimental Procedure

Selection of fabric

Cotton is a vegetable fibre which gives warmth, feel and comfort especially to babies. Cotton fibre also has good affinity towards the herbals. So 100% cotton fabric was selected for this study.

Selection of Herbals

The available herbals like Turmeric, Neem, Aloe vera, Tulasi and Camphour were selected for this study. The herbals were collected from nursery garden and also from agri market.

Preparation of Fabric

Neutralization of Fabric

The impurities and chemical contents may accumulate in the fabric during any chemical processing or during manufacturing. The fabric may suffer while treating with natural herbals. Thus, the fabric was neutralised by using hot water for 30 minutes duration.

Desizing

The removal of excess sizing paste from the fabric is referred as "Desizing". The cotton material was soaked in warm soap water solution for about two hours, washed thoroughly, rinsed and dried. For 1 meter of fabric 2 spoons of soap powder was used.

Scouring

The removal of dust particles like seed bits, leaf bits and foreign matter from the fabric is referred as "Scouring". The cotton material was soaked in soda ash with water for about three hours, washed thoroughly, rinsed and dried.

Weight of the fabric

The weight of the fabric was noted carefully for each sample. According to the fabric weight the herbal was taken for further process.

Preparation of herbals

Filtration

The herbals were filtered by using pure cotton fabric to remove the dust particles and herbal bits. From that filtration the herbal solution was extracted.

Boiling Process

The herbals were boiled well for deep penetration into the fabric. Each sample was treated in different concentration, temperature and duration. For the purpose of deep penetration NaCl is added to the herbal solution while boiling process.

Dip & dry Process

The selected herbals were boiled separately in vessel and the materials were dipped into the herbal solution while the bubble comes in the water. The solution was stirred well for better fixation for every 15 minutes. The fabric was in the solution for about 10 hrs.

Then the fabric sample was taken out and dried in sunlight for 12 hrs.

Table – 1
Nomenclature of Finished Samples

S. No.	Herbal Used	Cotton Fabric
1.	Turmeric	1
2.	Neem	2
3.	Aloevera	3
4.	Tulasi	4
5.	Camphor	5
6.	Hill neem	6

Results and Discussion

Fabric Count

The EPI of cotton is increased for the samples 1, 2, 4, 5, 6 and decreased for the sample 3. The PPI of cotton is increased in the samples 5 & 6 and decreased for the samples 1, 2, 3 & 4. **Fabric Weight:** The weight of the cotton is increased for the samples 1, 3, 4 & 5 and decreased for the samples 2 & 6. **Fabric Stiffness:** The bending length of the fabric are decreased for all the samples in both warp and weft direction.

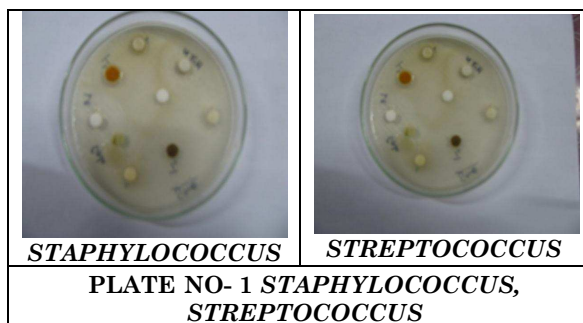
Crease Recovery

The crease recovery of cotton in warp direction is increased for all the samples and in weft direction sample 1 only increased and the remaining samples shows decreased value. **Drapability:** The drapability of cotton is increased for the samples 1 & 3 and all the other samples were decreased in drapability. **Thickness:** the thickness of the samples was increased for all the samples.

MICROBIOLOGY TEST

Test Organisms

- *Staphylococcus*
- *Streptococcus*



- Turmeric **resistant** for *Streptococcus*.
- Neem **resistant** for *Streptococcus*.
- Aloe Vera **resistant** for *Staphylococcus*.
- Tulasi **resistant** for *Staphylococcus*.
- Camphor **sensitive** for *Streptococcus*.
- Hill Neem **resistant** for *Streptococcus*.

Product Development

Herbs are the basic contaminants of all medicines. Hence, the herbal finished fabric gives protection, comfort, prevention, hygiene and eco-friendly too. Germs are attacked through physical activities and by air. Turmeric has anti-allergic property. The frock which is finished by turmeric prevents the baby from germs. It is also used for natural dyeing for both babies and adults garments. The turmeric finished frock shows good result in fabric count, fabric weight, crease recovery, drapability, and fabric thickness by increasing its value.

The germs are controlled by gloves which are finished by neem and it has anti-bacterial property and shows good result in increasing fabric count, crease recovery, and fabric thickness. The panty finished by aloe Vera gel gives cooling effect to the baby when it is in incubator during the period of jaundice. Aloe Vera has anti-inflammatory property and this fabric also comes under natural dyeing. It shows good result by increasing crease recovery, drapability, and fabric thickness. Generally, the towel is in wet condition and causes

air related diseases to the babies. The towel finished by tulasi give protection and it shows good result by increasing fabric count, fabric weight, crease recovery, fabric thickness. During cold, the running nose is unhygienic to the baby. It can be immediately cured by using camphor finished bib and it shows good result by increasing fabric count, fabric weight, crease recovery, fabric thickness. Nowadays the majority of the diseases caused by mosquito e.g., dengue, malaria, chikungunya etc, it may cause death to the baby. Hill Neem has mosquito repellent property. The blanket finished by hill neem gives good result by increasing fabric count, crease recovery, and drapability.

CONCLUSION

Health and hygiene plays an important role in human life. People need preventive measures to save their life. Many innovative products from medical textiles help both adults and children. Diseases increase today particularly for children by many ways especially by germs. Many medicines are available chemical contents but that may cause side effect to the children.

Cotton fabric selected for this study gives absorption and comfort. The herbs penetrate into the fabric well and it shows the results clearly in the plates of micro-biology test. In medical practitioner certificate, it is mentioned, that the herbal finished fabrics give good result to the babies and suggest that the sample finished by camphor may not cause any side effect. Hence, it is concluded that the herbal finished innovative products gives good result to the babies and may be used commercially. The fabric prepared by using turmeric and aloe vera gel + rose petals are natural dyed fabric which replaces chemical dyeing. The merit of this study is that herbs are the major source which is naturally and eco-

friendly, and make our earth healthier without diseases.

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NOISE REDUCTION OF IMAGES CORRUPTED WITH ADDITIVE NOISE

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ABSTRACT

The main objective of this system is to focus on fuzzy techniques for image filtering. The filter consists of two stages. The first stage computes a fuzzy derivative for eight different directions. The second stage uses these fuzzy derivatives to perform fuzzy smoothing by weighting the contributions of neighboring pixel values. Both stages are based on fuzzy rules which make use of membership functions. The filter can be applied iteratively to effectively reduce heavy noise. In particular, the shape of the membership functions is adapted according to the remaining noise level after each iteration, making use of the distribution of the homogeneity in the image. Statistical model for the noise distribution can be incorporated to relate the homogeneity to the adaptation scheme of the membership functions. Experimental results are obtained to show the feasibility of the proposed approach. These results are also compared to other filters by numerical measures and visual inspection.

Keywords: Fuzzy Approximation Theorem, Math-free system, Rule evaluation, Data Flow Diagram, Fuzzy Filters.

INTRODUCTION

The application of fuzzy techniques in image processing is a promising research field. Fuzzy techniques have already been applied in several domains of image processing (e.g., filtering, interpolation, and morphology), and have numerous practical applications (e.g., in industrial and medical image processing). This project focuses on fuzzy techniques for image filtering. Already several fuzzy filters for noise reduction have been developed, e.g., the well-known FIRE-filter from, the weighted fuzzy mean filter from, and the iterative fuzzy control based filter from. Most fuzzy techniques in image noise reduction mainly deal with fat-tailed noise like impulse noise. These fuzzy

filters are able to outperform rank-order filter schemes (such as the median filter). Nevertheless, most fuzzy techniques are not specifically designed for Gaussian (-like) noise or do not produce convincing results when applied to handle this type of noise.

Therefore, this project presents a new technique for filtering narrow-tailed and medium narrow-tailed noise by a fuzzy filter. Two important features are presented: first, the filter estimates a “fuzzy derivative” in order to be less sensitive to local variations due to image structures such as edges; second, the membership functions are adapted accordingly to the noise level to perform “fuzzy smoothing.” For each pixel that is processed, the first stage computes a

fuzzy derivative. Second, a set of 16 fuzzy rules is fired to determine a correction term. These rules make use of the fuzzy derivative as input. Fuzzy sets are employed to represent the properties and while the membership functions for and are fixed, the membership function for is adapted after each iteration.

Fuzzy Rules

Human beings make decisions based on rules. Although, I may not be aware of it, all the decisions I make are all based on computer like if-then statements. If the weather is fine, then I may decide to go out. If the forecast says the weather will be bad today, but fine tomorrow, then I make a decision not to go today, and postpone it till tomorrow. Rules associate ideas and relate one event to another.

Fuzzy machines, which always tend to mimic the behavior of man, work the same way. However, the decision and the means of choosing that decision are replaced by fuzzy sets and the rules are replaced by fuzzy rules. Fuzzy rules also operate using a series of if-then statements. For instance, if X then A, if y then b, where A and B are all sets of X and Y. A machine is made smarter using a concept designed by Bart Kosko called the Fuzzy Approximation Theorem (FAT). The FAT theorem generally states a finite number of patches can cover a curve as seen in the figure below. If the patches are large, then the rules are sloppy. If the patches are small then the rules are fine.

Fuzzy Patches

In a fuzzy system this simply means that all our rules can be seen as patches and the input and output of the machine can be associated together using these patches. Graphically, if the rule patches shrink, our fuzzy subset

triangles get narrower. Simple enough? Yes, because even novices can build control systems that beat the best math models of control theory. Naturally, it is *math-free* system.

Fuzzy Control

Fuzzy control, which directly uses fuzzy rules, is the most important application in fuzzy theory. Using a procedure originated by Ebrahim Mamdani in the late 70s, three steps are taken to create a fuzzy controlled machine:

- 1) Fuzzification (Using membership functions to graphically describe a situation)
- 2) Rule evaluation (Application of fuzzy rules)
- 3) Defuzzification (Obtaining the crisp or actual results)

SYSTEM REQUIREMENTS

Hardware specifications

Processor	: Intel Pentium III and above
RAM	: 128 MB and above
Hard disk	: 20 GB
CD drive	: 40 x Samsung
Monitor	: 15' color
Keyboard	: 108 keyboard
Mouse	: Logitech mouse

Software Specification

Operating System	: Windows XP/2000
Language used	: J2sdk1.4.0
Front End Tool	: Swing

Technical Requirements

The front end is designed and executed with the J2SDK1.4.0 handling the core java part with User interface Swing component. Java is robust, object oriented, multi-threaded, distributed, and secure and platform independent language. It has wide variety of package to implement our requirement and number of classes and methods can be utilized for programming purpose. These features make the programmer's to

model for the noise distribution can be incorporated to relate the homogeneity to the adaptation scheme of the membership functions. Experimental results are obtained to show the feasibility of the proposed approach. These results are also compared to other filters by numerical measures and visual inspection.

SYSTEM DESIGN

Design Overview

Once the analysis of the system is completed in the analysis phase and the requirements of the proposed system is understood, the detailed design of the system

It was decided upon in the study phase. This detailed design is what is going to be expanded and coded in the coding phase. The various activities in the design phase include the input design, output design, code design, table design etc.

During this phase, analysis and design of the various modules of the system was done. The Context Analysis Diagram and DFDs were prepared to identify how the system is to function. Context Analysis Diagram projects the overall functionalities of the system in terms of interaction with the external entities. Data Flow Diagram projects the interact with the system and the information flows in the system.

MEAN FILTER

mean filtered		
*	*	*
*	5	*
*	*	*

Mean filtering is a simple, intuitive and easy to implement method of smoothing images, *i.e.* reducing the amount of intensity variation between one pixel and the next. It is often used to reduce noise in images.

The idea of mean filtering is simply to replace each pixel value in an image with the mean ('average') value of its neighbors, including itself. This has the effect of eliminating pixel values which are unrepresentative of their surroundings. Mean filtering is usually thought of as a convolution filter. Like other convolutions it is based around a kernel, which represents the shape and size of the neighborhood to be sampled when calculating the mean. Often a 3×3 square kernel is used, as shown in Fig, although larger kernels (*e.g.* 5×5 squares) can be used for more severe smoothing.

unfiltered values		
5	3	6
2	1	9
8	4	7

$$\begin{aligned}
 &5 + 3 + 6 + 2 + 1 + 9 + 8 \\
 &+ 4 + 7 = 45 \\
 &45 / 9 = 5
 \end{aligned}$$

Center value (previously 1) is replaced by the mean of all nine values (5).

MEDIAN FILTER

The median filter is normally used to reduce noise in an image, somewhat like the mean filter. However, it often does a better job than the mean filter of preserving useful detail in the image.

Like the mean filter, the median filter considers each pixel in the image

in turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. Instead of simply replacing the pixel value with the *mean* of neighboring pixel values, it replaces it with the median of those values. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order and then replacing the pixel being considered with the middle pixel value. (If the neighborhood under consideration contains an even number of pixels, the average of the two middle pixel values is used.) Fig illustrates an example calculation.

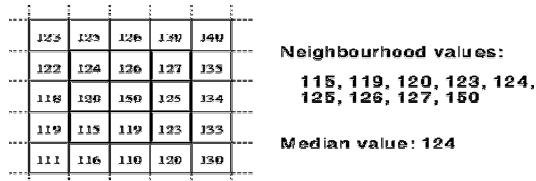


Fig. Calculating the median value of a pixel neighborhood. As can be seen the central pixel value of 150 is rather unrepresentative of the surrounding pixels and is replaced with the median value: 124. A 3×3 square neighborhood is used here larger neighborhoods will produce more severe smoothing.

Fuzzy filter

The general idea behind the filter is to average a pixel using other pixel values from its neighborhood, but simultaneously to take care of important image structures such as edges. The main concern of the proposed filter is to distinguish between local variations due to noise and due to image structure. In order to accomplish this, for each pixel i derive a value that expresses the degree in which the derivative in a certain direction is small. Such a value is derived for each direction corresponding

to the neighboring pixels of the processed pixel by a fuzzy rule.

The further construction of the filter is then based on the observation that a small fuzzy derivative most likely is caused by noise, while a large fuzzy derivative most likely is caused by an edge in the image. Consequently, for each direction i will apply two fuzzy rules that take this observation into account (and thus distinguish between local variations due to noise and due to image structure), and that determine the contribution of the neighboring pixel values. The result of these rules (16 in total) is defuzzified and a “correction term” is obtained for the processed pixel value.

Fuzzy Derivative Estimation

Estimating derivatives and filtering can be seen as a chicken-and-egg problem; for filtering I want a good indication of the edges, while to find these edges i need filtering. In our approach, i start by looking for the edges. I try to provide a robust estimate by applying fuzzy rules.

Consider the neighborhood of a pixel as displayed in Fig. 1(a).

A simple derivative at the central pixel position (x,y) in the direction D (D ∈ dir= {NW,W,SW,S,SE,E,NE,N}) is defined as the difference between the pixel at (x,y) and its neighbor in the direction D. This derivative value is denoted by D(x,y).

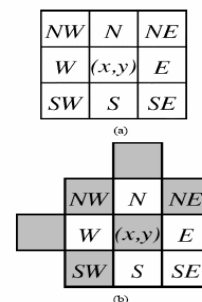
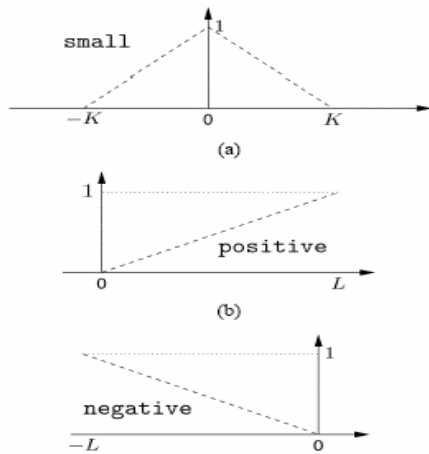


Fig. 1. (a) Neighborhood of a central pixel (x, y). (b) Pixel values indicated in gray are used to compute the “fuzzy derivative” of the central pixel (x, y) for the NW-direction.



Membership function

PIXELS INVOLVED TO CALCULATE THE FUZZY DERIVATIVES IN EACH DIRECTION

direction	position	set w.r.t. (x, y)
NW	(x - 1, y - 1)	{{(-1,1),(0,0),(1,-1)}
W	(x - 1, y)	{{(0,1),(0,0),(0,-1)}
SW	(x - 1, y + 1)	{{(1,1),(0,0),(-1,-1)}
S	(x, y + 1)	{{(1,0),(0,0),(-1,0)}
SE	(x + 1, y + 1)	{{(1,-1),(0,0),(-1,1)}
E	(x + 1, y)	{{(0,-1),(0,0),(0,1)}
NE	(x + 1, y - 1)	{{(-1,-1),(0,0),(1,1)}
N	(x, y - 1)	{{(-1,0),(0,0),(1,0)}

Table for calculating for fuzzy derivatives

$$m_K(u) = \begin{cases} 1 - \frac{|u|}{K}, & 0 \leq |u| \leq K \\ 0, & |u| > K \end{cases}$$

Method used to find the small value PGM images

The PGM images are a unique and different type of extensions used

For example, the value of the fuzzy derivative $\nabla_{NW}^F(x, y)$ for the pixel (x, y) in the NW-direction is calculated by applying the following rule:

$$\begin{aligned} &\text{if } (\nabla_{NW}(x, y) \text{ is small and } \nabla_{NW}(x - 1, y + 1) \\ &\quad \text{is small)} \text{ or} \\ &(\nabla_{NW}(x, y) \text{ is small and } \nabla_{NW}(x + 1, y - 1) \\ &\quad \text{is small)} \text{ or} \\ &(\nabla_{NW}(x - 1, y + 1) \text{ is small and } \nabla_{NW}(x + 1, y - 1) \\ &\quad \text{is small)} \\ &\text{then } \nabla_{NW}^F(x, y) \text{ is small.} \end{aligned} \tag{3}$$

These types of images are being used in our project. Our project basically deals with only the gray scale pictures. Gray scale pictures are nothing but black and white images, just for information. PGM is a standard bitmap based format consisting of a 4 lines header, and data stored in the *unsigned char* type, providing a maximum of 256 gray scale levels or 8-bit data per pixel.

The general structure of a PGM image file

The header of a PGM image file consists of:

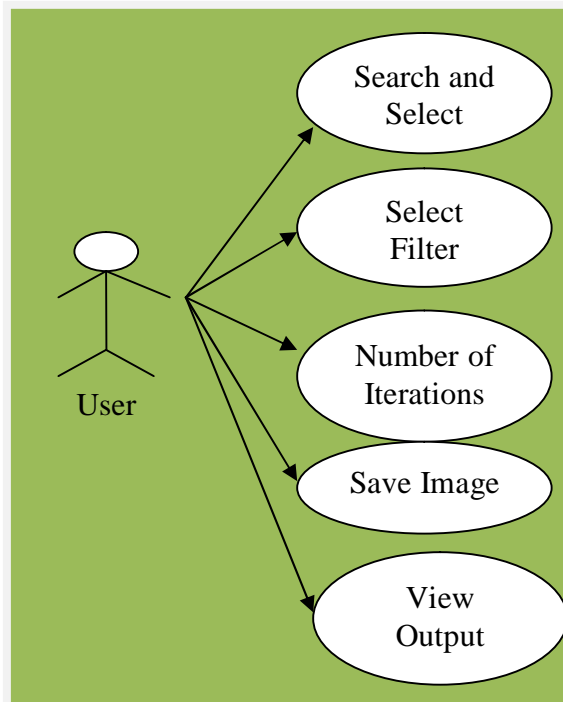
Integration testing for input

The main class which consists of the designing of the main window should consist of linking of the sub class .The Pgm image which are loaded in image folder that is being readed by pgm file where format of reading of data is done. The iteration should be called through the filter to do the clear picture the message window should shown. The chosen of filter from the main class should be shown from the combo box

- First line containing the *signature* of the image file and identifies the file as PGM
- Second line is the *comment line*
- Third line provides information about the *number and rows and columns* of data stored in the file, and
- Fourth line *specifies maximum gray level* contained in the image

Data follows the header information and is written in pixel values (in text or binary format). Data is in raster order, which indicates that all data for the first row of the image is written first, then for the second row, and so on. The origin of the coordinate system for a PGM image is located on the top left corner.

USE-CASE MODEL



Integration Testing

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or one step up software applications at the company level interact without error.

Integration testing for output

The main class which consists of the designing of the main window should consist of linking of the sub class. The PGM image which are loaded for output image

CONCLUSION

The future enhancement of this project can be that it can be integrated with the downloading systems that download the images from the internet

and apply the filters with the consent of the user and provide a better image to the user. This project can also be updated and made a little more accurate with use of other complex technologies and methodologies and implemented for use of analyzing the satellite imagerys.

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A STUDY ON BEST APPROXIMATION THEORY

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ABSTRACT

The subject of this work is the approximation theory is optimal. The theory of best approximation is a very extensive field which has various applications. In this subject we give an introduction to fundamental ideas and accept of approximation theory use normed and Hilbert space. A great deal of information about approximation theory is concerning polynomials and rational functions. There are many important topics of approximation theory.

Keywords: Best Approximation theory, Hilbert Space, Polynomials and rational functions.

INTRODUCTION

The subject of this work is the approximation theory is optimal. The theory of best approximation is a very extensive field which has various applications. In this subject we give an introduction to fundamental ideas and accept of approximation theory use normed and Hilbert space. A great deal of information about approximation theory is concerning polynomials and rational functions. There are many important topics of approximation theory. We have given some general preliminaries regarding best approximations in general normed linear spaces. We also introduced Haar uniqueness theorem in $C[a, b]$. Chebyshev polynomials and Kolmogorov theorems are discussed we also introduced. Chebyshev approximation theorem and some related results are discussed. At the end we have given the bibliography. The study is not complete in any sense of the term and we have selected theorem and ideas so as to have the continuity of reading.

Haar uniqueness theorem

Let y be a finite dimensional subspace of the real space $c[a, b]$. Then the best approximation out of y is unique for every $x \in c[a, b]$ if and only if y satisfies the Haar condition.

Proof

(a) Sufficiency

Suppose Y satisfies the Haar condition but both $y_1 \in Y$ and $y_2 \in Y$ are best approximations to some fixed $x \in c[a, b]$.

Then,

$$\begin{aligned}v_1 &= x - y_1 \\v_2 &= x - y_2\end{aligned}$$

We have

$$||v_1|| = ||v_2|| = \delta.$$

Where δ is the distance from x to y .

$y = \frac{1}{2}(y_1 + y_2)$ is also best approximation to x .

The function

$$v = x - y = x - \frac{1}{2}(y_1 + y_2) = \frac{1}{2}(v_1 + v_2) \quad (1)$$

has atleast $n + 1$ extremal points t_1, \dots, t_{n+1} .

At such a point we have $|v(t_j)| = ||v|| = \delta$.

$$2v(t_j) = v_1(t_j) + v_2(t_j) = +2\delta \text{ or } -2\delta$$

Now $|v_1(t_j)| \leq ||v_1|| = \delta$ and similarly for v_2 . Hence there is only one way in which the equation can hold, namely both terms must have the same sign and the maximum possible absolute value.

$$v_1(t_j) = v_2(t_j) = +\delta \text{ or } -\delta$$

Where $j = 1, \dots, n+1$. But this implies that $y_1 - y_2 = v_2 - v_1$ has $n+1$ zeros in $[a, b]$.

Hence $y_1 - y_2 = 0$ by the Haar condition. Thus $y_1 = y_2$ the uniqueness.

(a)Necessity

We assume that Y does not satisfy in the Haar condition and show that then we do not have uniqueness of best approximations for all $x \in c[a, b]$.

Assumption there is a basis for y and values t_j in $[a, b]$ such that the determinant in

$$\begin{vmatrix} y_1(t_1) & y_1(t_2) & \dots & y_1(t_n) \\ y_2(t_1) & y_2(t_2) & \dots & y_2(t_n) \\ \vdots & \vdots & \dots & \vdots \\ y_n(t_1) & y_n(t_2) & \dots & y_n(t_n) \end{vmatrix} \text{ is zero.}$$

Hence the Homogeneous system

$$\gamma_1 y_k(t_1) + \gamma_2 y_k(t_2) + \dots + \gamma_n y_k(t_n) = 0 \quad (K = 1, 2, \dots, n) \text{ has a nontrivial solution } \gamma_1, \dots, \gamma_n. \text{ Using this solution and any } y = \sum \alpha_k y_k \in Y.$$

We have

$$\sum_{i=1}^n \gamma_i y(t_j) = \sum_{k=1}^n \alpha_k \left[\sum_{j=1}^n \gamma_j y_k(t_j) \right] = 0. (2)$$

The transposed system.

$$\beta_1 y_1(t_j) + \beta_2 y_2(t_j) + \dots + \beta_n y_n(t_j) = 0. \quad (j = 1, 2, \dots, n) \text{ also has a nontrivial solution } \beta_1, \beta_2, \dots, \beta_n. \text{ using this solution, we define } y_0 = \sum \beta_k y_k.$$

Then $y_0 \neq 0$ and y_0 is zero at t_1, \dots, t_n .

Let λ be such that $||\lambda y_0|| \leq 1$.

Let $z \in c[a, b]$ be such that $||z|| = 1$ and

$$z(t_j) = \text{sgn } \gamma_j = \begin{cases} -1 & \text{if } \gamma_j < 0 \\ 1 & \text{if } \gamma_j \geq 0 \end{cases}$$

Define $x \in c[a, b]$ by

$$x(t) = z(t) (1 - |\lambda y_0(t)|)$$

Then $x(t_j) = z(t_j) = \text{Sgn } \gamma_j$.

Since $y_0(t_j) = 0$.

Also $||x|| = 1$. We show that this function x has infinitely many best approximations out of Y .

Using $|z(t)| \leq ||z|| = 1$ and $|\lambda y_0(t)| \leq |\lambda y_0| \leq 1$ for every $\epsilon \in [-1, 1]$.

We obtain,

$$\begin{aligned} |x(t) - \epsilon \lambda y_0(t)| &\leq |x(t)| + |\epsilon \lambda y_0(t)| \\ &= |z(t)| (1 - |\lambda y_0(t)|) + |\epsilon \lambda y_0(t)| \\ &\leq 1 - |\lambda y_0(t)| + |\epsilon \lambda y_0(t)| \\ &= 1 - (1 - |\epsilon|) |\lambda y_0(t)| \\ &\leq 1 \end{aligned}$$

Hence every $\epsilon \lambda y_0 - 1 \leq \epsilon \leq 1$ is a best approximation to x , provided

$$||x - y|| \geq 1 \text{ for all } y \in Y.$$

$$y = \sum \alpha_k y_k \in Y.$$

Suppose that $||x - \tilde{y}|| < 1$ for a $\tilde{y} \in Y$. Then the conditions

$$\begin{aligned} x(t_j) &= \text{sgn } \gamma_j = \pm 1 \\ |x(t_j) - \tilde{y}(t_j)| &\leq ||x - \tilde{y}|| < 1 \end{aligned}$$

together imply that for all $\gamma_j \neq 0$.

$$\begin{aligned} \text{sgn } \tilde{y}(t_j) &= \text{sgn } x(t_j) \\ &= \text{sgn } \gamma_j \end{aligned}$$

But this contradicts (2) with $y = \tilde{y}$ because $\gamma_j \neq 0$ for some j .

$$\sum_{j=1}^n \gamma_j \tilde{y}(t_j) = \sum_{j=1}^n \gamma_j \text{sgn } \gamma_j = \sum_{j=1}^n |\gamma_j| \neq 0.$$

CONCLUSION

We will discuss in the dissertation some preliminaries of approximation theory, Chebyshev polynomials and

Chebyshev approximation theorems with related some results.

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PHYTOCHEMICAL ANALYSIS AND WOUND HEALING ACTION OF *SOLANUM NIGRUM* LEAF EXTRACTS

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ABSTRACT

Medicinal plants synthesize a vast array of secondary metabolites that are important for human life. Phytochemical constituents with known antimicrobial properties can be of great significance in therapeutic treatments. Wound healing agent is one of the developing areas in modern biomedical sciences. Many medicinal plants are claimed to be useful for wound healing. *Solanum nigrum* is one such medicinal herb traditionally used to treat various ailments such as pain, inflammation and fever. Hence in this present study, the leaf extracts of *Solanum nigrum* was prepared by using ethanol and ethyl acetate solvents. These extracts were further subjected for phytochemical analysis, antimicrobial and wound healing activity. The preliminary phytochemical analysis revealed the presence of secondary metabolites in both ethanol and ethyl acetate extracts. The antibacterial activities of crude and purified extracts were performed against the pathogens. A highest inhibition zone of 19mm was observed in crude ethanol extract against *Klebsiella pneumonia* and 12mm in crude ethyl acetate extract against *Enterobacter* sp. The pure compound obtained from the ethanol extract possessed only mild activity (12mm) but ethyl acetate extract possessed (16mm) a high inhibition zone against the pathogens when compared to crude extract. Wound healing activity of the crude and purified extracts were carried out in 6 batches of mice. The results revealed that the wounded mice treated with purified ethanol extract showed healing on the 5th day of the experiment. Others showed very slow response. Hence we conclude that *Solanum nigrum* leaf extracts has a potential for high antibacterial activity and a significant role in wound healing activity.

Keywords: *Solanum nigrum*, wound healing activity, secondary metabolites, antibacterial activity.

Introduction

Nowadays the increasing failure of synthetic drugs and development of multidrug resistance pathogens leads to the identification and screening of several medicinal plants for their potential antimicrobial activity (Iwu *et al.*, 1999). Medicinal plant parts, extracts, infusions, decoctions and powders are used in the treatment of different diseases of humans, plants and animals (Nascimento *et al.*, 2000). The

use of plant extracts and phytochemicals, both with known antimicrobial properties, can be of great significance in therapeutic treatments (Prusti *et al.*, 2008). Herbal medicines are also crucial in wound healing since they provide a moist environment for natural healing process (Purna and Babu, 2000). *Solanum nigrum* is one such medicinal herb with rich medicinal values, commonly called as black night shade, which belongs to the family Solanaceae. It has been used

traditionally to treat various ailments such as pain, inflammation and fever. *S. nigrum* elaborated a wide spectrum of medicinal properties such as anticancer, antioxidant (Al-Qirim *et al.*, 2008), neuroprotective (Jainu, 2005), antimicrobial and antipyretic properties. But the active constituents responsible for these activities were not fully resolved so far. In this present study, the phytochemical constituents, antimicrobial activity and wound healing activity of *Solanum nigrum* leaves were studied.

Materials and Methods

Collection of Plant Sample and Preparation

Leaves of *Solanum nigrum* were collected from a green cover area near Kanyakumari District, Tamil Nadu. Leaves were rinsed in clean water and air-dried for three weeks and pulverized using motorized bender. Crude extract was made by mixing the powdered sample with the solvent ethanol and ethyl acetate and left for 72 hours. The extract was filtered using Whatman No.1 filter paper and the solvent was evaporated and the crude extract was used for screening.

Phytochemical Analysis

The ethanol and ethyl acetate extract was subjected to the preliminary phytochemical investigation for detection of specific compounds, such as alkaloids, glycosides, steroids, carbohydrates, proteins, flavanoids, tannins, phenolic compounds and saponins. The screening process was undertaken by following standard qualitative methods as described by Vogel, 1958; Kapoor *et al.*, 1969; Rizk and Bashir, 1980; Fadeyi *et al.*, 1989; Odebiyi and Sofowora, 1990. And then the crude extracts were subjected for purification in silica gel (20-120 mesh size) column chromatography. The

fractions containing single compound was confirmed by TLC and selected for further process.

Antibacterial activity (Bayer *et al.*, 1986) The antibacterial activity of crude and purified extracts of *Solanum nigrum* leaf samples were tested against the pathogens *Escherichia coli*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, *Streptococcus* sp, *Enterobacter* sp, *Proteus vulgaris*, *Pseudomonas aeruginosa*, by disc diffusion method. The antibacterial activity was recorded by measuring the width of the clear inhibition zone around the disc. Commercial antibiotic Gentamycin (100mg/ml) was used as positive control.

Wound healing activity in mice

Screening for wound healing activity was performed with inbred strains of 6 to 8 weeks old albino mice of 25±2.4 g with a gender ratio of 1:1. All animals were fed with standard pellet diet and water *ad libitum* freely. The animal study was conducted following approval of protocol by the institutional animals ethical committee (Inbiotics IEC- 218 032012). Tests were performed only after the mice had acclimated to the local environment for at least 7 days. Animals were divided into Six batches. Group I – VI, each group contains 3 animals and all the animals were subjected for excision of wound. The mice were anesthetized and shaved on the dorsal side of the posterior region. The wounds were induced by a 2-mm punch biopsy, in the dorsal thoracic central region of anaesthetized mice. The progressive changes in wound area were monitored. Anterior to posterior measurements of the wounds were recorded using a scale on days 1, 3, 5 and 7. The wound was left undressed to the open environment. And then the mice were classified for wound healing activity in the following order. Group I

and II -non-treatment control; Group III – Commercial antiseptic, Group IV – Crude Ethanol extract, Group V- Crude Ethyl acetate, Group VI – Purified Ethanol extract. Group II – VI animals were also swabbed with a loop of 24 h cultured *E.coli* strain.

Results and Discussion

Phytochemical analysis

The preliminary qualitative phytochemical analysis revealed the presence of glycosides, steroids, alkaloids and saponins in ethanol extract and presence of carbohydrates, proteins, steroids, alkaloids, flavanoids, tannin, phenolic compounds and saponins in ethyl acetate extract (Table 1). Most of the phytochemicals classified as secondary metabolites are produced mainly by the shoot part of the plant, often their function are unknown, but certain phytochemicals have structural, functional and general defense against plant pathogens. The preliminary phytochemical studies received pronounced importance, as the crude drugs possess varied composition of secondary metabolites (Balandrin *et al.*, 1985).

Column chromatography

The fractions obtained from ethanol and ethyl acetate extracts were performed for TLC, the bands showing same R_f value were combined together and again subjected to column chromatography. Thus the single compound from fractions 11 and 8 were obtained from ethanol and ethyl acetate extracts respectively. These fractions were analyzed through TLC (Table 2).

Antibacterial Activity of Crude Extracts

Antibacterial activity of crude ethanol extract: Among the seven organisms tested, highest inhibition

zone of 19mm was obtained against *K. pneumoniae*. Following this, 14mm zone of inhibition was observed against *E. coli*. While the other organisms showed mild inhibitory effect (Table 3).

Antibacterial activity of crude ethyl acetate extract: The ethyl acetate extract showed moderate activity against all organisms used. Among them the highest zone of inhibition was 12mm against *Staphylococcus* sp and *Enterobacter* sp, followed by 10mm zone against *E.coli* (Table 4).

Antibacterial Activity of Purified Extracts

Antibacterial activity of purified ethanol extract: The antibacterial activity of purified ethanol extract of *S.nigrum* showed very weak inhibitory effect against all the seven microbes. In purified ethanolic extract the highest inhibition zone was 12mm against *K.pneumoniae* and *P.aeruginosa*. Others showed poor activity (Table 5).

Antibacterial activity of purified ethyl acetate extract: In purified Ethyl acetate extract, the highest activity of 16mm against *P.vulgaris* and *E.coli* was observed. Others showed mild activity (Table 6).

S. nigrum leaves extract and fractions exhibited mild antibacterial activity (Aruna *et al.*, 2012). Previously it has been reported that the most susceptible bacterial strain was *B. subtilis* and *S. aureus* to extract and fractions of *S. nigrum* leaves (Muhmmad *et al.*, 2011), however, similar results were obtained for *S. typhi* and *K. pneumonia* also. This indicates that phytochemicals in *S. nigrum* leaf extracts are active against both Gram positive and Gram Negative bacterial strains tested (Aruna *et al.*, 2012).

Wound Healing Activity

The results of wound healing activity of *S.nigrum* in mice shows (Table 7) some significant role in bacterial clearance and wound healing ability. The animals grouped under six batches which were subjected to the study, survived all during the experimental period.

- It was observed that the excised wound started recovering from the 4th day onwards in group III (Burnol). Group VI (Purified ethanol extract) and group IV (Crude Ethanol extract) and was completely healed on the 5th and 6th day of the study respectively.
- Group I (Control) and group V (Crude Ethyl acetate) recovered from the wound on the 7th day while group II (*E.coli* induced) was not recovered till the end of the experiment.

The result of bacterial load clearance ability also showed some significant results positively towards the plant extract. The wound area were scrapped using a sterile cotton swab on the 6th day of the study and plated in appropriate medium to understand the bacterial load. The result implies that *E.coli* was cleared moderately in 3rd, 4th and 6th group whereas scanty *E.coli* growth was observed in 1st and 5th group and marked *E.coli* growth in 2nd group. The overall results suggest that the Ethanolic extracts of *S.nigrum* possessed promising wound healing activity. Wounds are the physical injuries that result in an opening or breaking of the skin. Appropriate method for healing of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional status of the skin (Meenakshi *et al.*, 2006). Phytomedicines induce the healing and regeneration of tissue by

multiple mechanisms (Manoj and Murugan, 2012). The wound healing activity of the ethanolic extract may be due to the individual or combined effect of the above phytochemicals. Comprehensive evaluation on the plants with wound healing activity on the basis of traditional medicine may possibly give new compounds that could be used as prominent drugs in wound healing therapy. Further investigations are needed for identification of active principles responsible for the wound healing activity (Hiranand *et al.*, 2012).

Table 1: Results of Phytochemical analysis

Compounds	Crude Plant Extract of <i>S.nigrum</i>	
	Ethanol	Ethyl Acetate
Carbohydrates	-	+
Protein	-	+
Glycosides	+	-
Steroids	+	+
Alkaloids	+	+
Flavanoids	-	+
Tannins	-	+
Phenolic compounds	-	+
Saponin	+	+

Table 2: Rf values of the fractions in TLC

Leaf Extracts	Fraction	Rf value	Mobile Phase
Ethanol	11	0.833	Methanol, Chloroform (1:1)
Ethyl Acetate	8	0.957	Methanol, Chloroform (75:25)

Table 3: Antibacterial Activity of Solanum nigrum Ethanolic Extract

Concentration (mg/ml)	<i>E. coli</i> (mm)	<i>Streptococcus</i> Sp. (mm)	<i>S. aureus</i> (mm)	<i>K. pneumoniae</i> (mm)	<i>P. aeruginosa</i> (mm)	<i>Enterobacter</i> sp. (mm)	<i>P. vulgaris</i> (mm)
20	13	7	7	11	12	7	10
50	14	8	11	19	8	9	8
100	14	10	8	10	9	8	7
Positive control	26	19	24	22	20	20	21

Table 4: Antibacterial Activity of Solanum nigrum Ethyl Acetate Extract

Concentration (mg/ml)	<i>E. coli</i> (mm)	<i>Streptococcus</i> Sp. (mm)	<i>S. aureus</i> (mm)	<i>K. pneumoniae</i> (mm)	<i>P. aeruginosa</i> (mm)	<i>Enterobacter</i> sp. (mm)	<i>P. vulgaris</i> (mm)
20	10	7	8	9	9	7	8
50	11	9	8	8	8	10	8
100	10	9	12	11	10	12	8
Positive control	21	21	27	22	20	19	21

Table 5: Antibacterial Activity of Solanum nigrum – Purified Ethanolic Extract

Fraction No	<i>E. coli</i> (mm)	<i>Streptococcus</i> Sp. (mm)	<i>S. aureus</i> (mm)	<i>K. pneumoniae</i> (mm)	<i>P. aeruginosa</i> (mm)	<i>Enterobacter</i> sp. (mm)	<i>P. vulgaris</i> (mm)
11	8	10	8	12	12	8	11
Positive control	21	20	21	22	20	20	24

Table 6: Antibacterial Activity of Solanum nigrum – Purified Ethyl Acetate Extract

Fraction No	<i>E. coli</i> (mm)	<i>Streptococcus</i> Sp. (mm)	<i>S. aureus</i> (mm)	<i>K. pneumoniae</i> (mm)	<i>P. aeruginosa</i> (mm)	<i>Enterobacter</i> sp. (mm)	<i>P. vulgaris</i> (mm)
8	16	8	9	8	10	7	16
Positive control	19	20	19	23	18	18	25

Table 7: Wound Healing Efficacy of Solanum nigrum Leaf Extract in Mice

DAY	Group I	Group II	Group III	Group IV	Group V	Group VI
DAY 1	Wound created	Wound + <i>E. coli</i> Swabbing	Wound + <i>E. coli</i> + Burnol	Wound + <i>E. coli</i> + SAMPLE A	Wound + <i>E. coli</i> + SAMPLE B	Wound + <i>E. coli</i> + SAMPLE C
DAY 2	Cleaned with Normal saline	Cleaned with Normal saline	Cleaned with N.S + <i>E. coli</i> swab + Burnol	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE A	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE B	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE C
DAY 3	Cleaned with Normal saline	Cleaned with Normal saline	Cleaned with N.S + <i>E. coli</i> swab + Burnol	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE A	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE B	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE C
DAY 4	Cleaned with Normal saline	Cleaned with Normal saline	Wound healed	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE A	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE B	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE C
DAY 5	Cleaned with Normal saline	Cleaned with Normal saline	-	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE A	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE B	Wound healed
DAY 6	Cleaned with Normal saline	Cleaned with Normal saline	-	Wound healed	Cleaned with N.S + <i>E. coli</i> swab + SAMPLE B	-
DAY 7	Wound healed	Cleaned with Normal saline	-	-	Wound healed	-

N.S – Normal Saline; Sample A – Crude ethanol extract; Sample B – Crude ethyl acetate extract; Sample C - Purified ethanol sample.

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PHYTOCHEMICAL SCREENING OF SIVANAR VEMBU (*INDIGOFERA ASPALATHOIDES*)

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ABSTRACT

Inflammation occurs after injury of infection as white blood cells rush to the area and initiate the immune response. Chronic inflammation, however, causes imbalances in the body's stores of immune system chemicals, both complements and cytokines, and contributes to autoimmune and other disease. One of the easiest ways to alleviate the pain and discomfort caused by inflammation of arthritis or due to wear and tear of aging process naturally is to follow an anti-inflammatory diet. This consists eating more fruits and vegetables and suitable herbs. The consumption of anti-inflammatory foods helps to control inflammation. Antioxidants, such as selenium and vitamin E and A, are very helpful in reducing inflammation. Some of the anti-inflammatory phytochemicals rich in herbals are Alkaloids, Unsaturated fatty acids, polyphenols, Terpene, sulphur compounds, Flavonoids and anthocyanins. Combining diet with natural anti-inflammatory supplements to control inflammation adds to the ability of managing the inflammation under our control. For centuries, people have used natural chemicals found in plants to reduce the inflammatory process in our body and inflammation due to injury or wear and tear of body joints.

Sivanar vembu (*Indigofera aspalathoides*) had many medicinal uses and most famously used for skin diseases.

Keywords: *Indigofera aspalathoides*, leaf extract, phytochemicals, HPLC.

Introduction

The plant *Indigofera aspalathoides* (Leguminosae) is commonly known as Shivanarbembu in Tamil. In the traditional medicinal system, the leaves, flowers and tender shoot are said to be cooling and demulcent; Phytochemical and Pharmacological researchers have screened it for its anti-cancerous and antioxidant property.

Materials and methods

Collection of plant sample

The dried herb of *Indigofera aspalathoides* (Sivanar Vembu) was purchased in Tamilnadu Agricultural University, Coimbatore. It was dried

and powdered. The powder was kept in polythene containers for further use.

Qualitative analysis of the phytochemicals

Chemical test were carried out on the aqueous extract using standard procedures to identify the phyto constituents as described by Sofowara (1993) Trease and Evans (1998) and Harbone (1973).

Test for tannins (Mace, 1963)

About 0.5gm of dried powdered sample was boiled in 20 ml of water in a test tube and then filtered a few drops of 0.1% ferric chloride was added.

Appearances of brownish green color indicate the presence of tannins.

Test for phlobatannins (Iyenger, 1995)

An aqueous extract of the plant sample was boiled with 1% aqueous hydrochloric acid. Red precipitate was formed which indicates the presence of phlobatannins.

Test for saponin (Ramakrishnan, 1994)

About 2 gm of the powdered sample was boiled in 20ml of distilled water in a water bath filtrate was mixed with 5ml of distilled water and shaken vigorously for a stable persistent froth. The frothing was mixed with 3 drops of olive oil and shaken vigorously. Formation of emulsion shows the presence of saponins.

Test for flavanoids (Iyenger, 1995)

5ml of the diluted ammonia solution was added to a portion of aqueous filtrate of plant Extract followed by the addition of concentrated sulphuric acid. Appearance of yellow coloration shows the presence of flavonoids.

Test for steroids

2ml of acetic anhydride was added to 0.5gm ethanolic extract of the plant sample and 2ml sulphuric acid. The colour change from violet to green indicates the presence of steroid.

Test for terpenoids: (Salkowski test)

5ml of the plant extract was mixed with 2ml of chloroform and 3ml of concentrated sulphuric acid was added carefully to form a layer. Formation of reddish brown coloration at the interface indicates the presence of terpenoids.

Test for cardiac glycosides: (Keller – Killani Test)

2ml of glacial acetic acid containing one drop of ferric chloride was added to 5ml of the plant extract. This was under layer with 1ml of concentrated sulphuric acid. Formation of a brown ring at the interface indicates the presence of cardiac glycosides.

Test for anthroquinones:

0.5gm of the extract was boiling with 10ml of sulphuric acid and filtered while hot. The filtrate was shaken with 5ml of chloroform. The chloroform layer was pipette out into another test tube & 1ml of diluted ammonia was added. The resulting solution was observed for color change.

Results and Discussion

In the present study, *Indigofera aspalathoides* (Sivanar Vembu) have been taken for the qualitative screening. In this phytochemical screening tannin, phlobatannins, Saponin, flavonoids, terpenoids, cardiac glycosides and anthroquinones were present.

Qualitative Analysis of the phytochemicals in *Indigofera Aspalathoides* (Sivanar Vembu)

No.	Test for	Appearance	Status of the Compound
1.	Tannin	Brownish green colour	Present
2.	Phlobatannins	Red Colour precipitation	Present
3.	Saponin	Emulsion formed on the top	Present
4.	Flavonoids	Yellow colour change	Present
5.	Steroids	colour change	Present
6.	Terpenoids	Reddish brown colour	Present
7.	Cardic glycosides	Brown ring formed	Present
8.	Anthroquinones	Formation of cloudiness	Present

Flavonoids Analysis by HPLC: HPLC Shimadzu CLASS-VP V6.14 SP2 Area % Report

Standards : Gallic acid, caffeic acid,
Rutin, Quercetrin and
Ferulic acid
Sample : Plant extract

GENERAL METHOD PARAMETERS

Colum : C18

Mobile Phase Solvent A - Water - Acetic acid (25:1), Solvent B – Methanol

Pumps(Binary Gradient)

T.Flow: 1.000 mL/min

B.Curve: 0.0

P.Max: 400.0 kgf/cm²

P.Min: 0.0 kgf/cm²

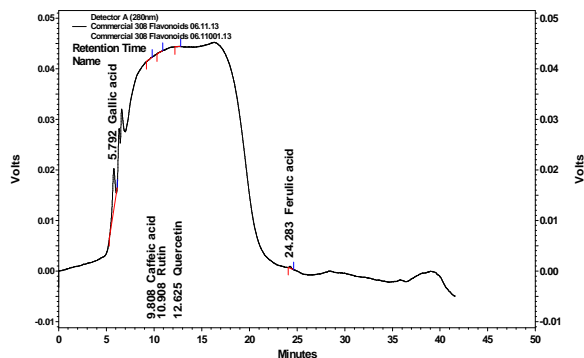
CTO-10ASvp

Temperature: 40°C

Polarity: +

Wavelength Ch 1: 280 nm

HPLC Chromatogram of *Indigofera aspalathoides* sample – No. 308



Detector A (280nm)				
Retention Time	Area	Height	Concentration (mg/g)	Name*
5.792	141267	8014	0.025	Gallic acid
9.808	81	10	Below Detection Limit	Caffeic acid
10.908	882	3	Below Detection Limit	Rutin
12.625	355	52	Below Detection Limit	Quercetin
24.283	4633	369	0.003	Ferulic acid

*Parameter analyzed is not under the scope of NABL Accreditation

Conclusion

Indigofera aspalathoides (Sivanar Vembu) is a medicinal herb used in the treatment of skin diseases in traditional treatment due to the presence of useful secondary metabolites having the properties of antimicrobial, anti-inflammatory and antioxidant properties. Screening of the plant herb reveals the presence of phytochemicals which are known to play the role of anti-inflammatory activities which are essential in the inflamed skin diseases cure. Tannin, Phlobatannins, Saponin, Steroids, Flavonoids, Terpenoids, Cardic glycosides and Anthroquinones are the Phytochemicals identified by qualitative test and they are the active compounds in the preparation of skin cure formulations. Ferulic acid and Gallic acid are the two flavonoids identified in the herbal plant by HPLC which act as useful antimicrobial and anti-inflammatory compounds. Hence it was confirmed that *Indigofera aspalathoides* is suitable for the preparation of skin cure ointments in herbal medicine.

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