



Stress Management in Sport Professionals

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Introduction -

In the past, it was assumed that these skills were genetically based, or acquired early in life. Now, it is commonly accepted that athletes and coaches are capable of learning a broad range of psychological skills that can play a critical role in learning to achieve high performance. Almost a decade ago, technology in Sports was the means of enhancing and improving the Sports via automated technics, Skills, Matches and Competitions. Sport brings development in every sphere of the people life. Advance technologies brought new dimensions in the field of sports also. Current developments are affecting Sports vastly; it results in complexities in Sports. Sports are obliged to focus and maintaining enhancing their player total growth of knowledge and physical activity. New technologies evolve, Sports operations are changing rapidly and Sports Directors need to adapt to new plan of action. Environment pressures of today forcing Sports to focus on accelerating technology, innovation, technical complexities, social and legal issues, cost, risk, competence, skill of staff and technology itself. Therefore, the necessity is to work in a protective manner.

What is stress :-

'Stress' is defined by the "a state of affair involving demand on physical or mental energy". Stress is a measure of the internal force. It is internal forces arise as a reaction to external forces applied to the body. Stress is simply a fact of nature – forces from the inside or outside individual responds to stress in way that affect the individual. Stress is related to both external and internal factors. We think that stress is negative experience. But from a biological point of view stress can be neutral, negative or positive experience

Stress is not something 'outer' rather stress is within the person i.e. response of body or mind. People under stress have a greater tendency to engage in unhealthy behavior. The source of the demand or challenge is referred to as a "stressor". Stress affects the body, mind, behavior and emotion of the stressor.

Types of Stress :- Stress can be divided into 3 types as bellow

- 1) Good Stress : In good stress people do all work smoothly but immediately in pressure. It's good for health. Just the right amount of stress is stimulating and healthy. We perform tasks faster and better.
- 2) Bad stress : In this type of stress a person became lazy and not able to do work perfectly. When we are under distress, we usually change and can even break inside. It hurts! Here are symptoms of distress that prove such a change is happening inside.
- 3) Ugly stress :In case of ugly stress people became hopeless and go to suicide. It's creating an unhealthy environment.

Types of stress in Spots :-

There are many reasons for the creation of stress among sports professionals. Some of the guise has been observed to be severe while others are not but both have observed to be production negative or uncomfortable feeling among the sports.

- 1) Change in spots Environment
- 2) Change rules of Games
- 3) Changing players demand
- 4) Attitude of Sports players
- 5) Technology change



How can you manage your stress :-

Avoid stressful situation, see the situation how Changes, Figure out what is most important, Discover new relaxation, Develop interest in your works, Set priorities, Learn to say no, Reduce intensity of emotional reaction to stress, Take control of the situation, Take sufficient rest

Need of Stress Management :-

Today stress management is important in every one lives. There is no doubt stress is one of the leading factors in illness and absenteeism among employee. It's necessary for long happy lives with less trouble. Stress management is need because when we are in stressed situation the following things happens to us. We do not sleep well, Blood pressure rises, Breathing becomes more rapid, Heart rate rises, Digestive system slows down, Immune system goes down, Muscles become tense.

How to manage stress in a better way?

There are some solutions to Manage Stress for Sports Professionals.

- 1) Become aware of the stress and its emotional and physical reactions
- 2) Recognize what you can change
- 3) Reduce the intensity of your emotional reactions to stress
- 4) Maintain the emotional reserves
- 5) Learn to moderate your physical reactions to stress
- 6) Develop interest in work
- 7) Cooperate with all in the Sports.
- 8) Meditation and yoga classes
- 9) New technology immediately to adopt but sufficient training to be Comfortable with new technology
- 10) Less working hours, more time to home
- 11) Avoid stressful situation
- 12) Take control of the situation
- 13) Discover new relaxation
- 14) Figure out what is more important and set priority
- 15) Learn to say no.

Conclusion :-

People are so developed in sports Knowledge, techniques more development means more work and more work brings stress. To do work in a smooth way it is simply not possible to remove all sources of stress in the Sports.

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A STUDY ON ICTHYOFAUNAL DIVERSITY OF SUKHANA DAM, GARKHRDA, DIST. AURANGBAD, MAHARASTRA, INDIA.

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ABSTRACT :

The present study deals with fish biodiversity undertaken during period July 2011 to June 2012 to survey and commercially important fishes in the Sukhana dam. The Fresh water body of Sukhana dam used for irrigation purposes at Garkheda in Aurangabad district. The present study deals with the variety and abundance of fresh water fishes in Sukhana dam of Garkheda in Aurangabad district (M.S.) India. The results of present study reveal the occurrence of fish biodiversity belong to 4 orders 7 families and 16 species. The members of Order Cypriniformes were dominated by 9 species followed by Perciformes 4 species, Siluriformes 2 species and Synbranchiformes with one species.

KEYWORDS : *Ichthyofaunal diversity, Sukhna dam Garkheda, Economicvalue*

INTRODUCTION

Fishes are one of the most important groups of vertebrate, influencing his life in various ways. Millions of human beings suffer from hunger and malnutrition and fishes form a rich source of food and provide a meal to tide over the nutritional difficulties of man. In addition to serving as an important item of food, fishes provide several by-products to us. Fishes have formed an important item of human diet from time immemorial and are generally caught for this purpose. Fish diet provides proteins, fat and vitamin A and D. A large amount of phosphorous and other elements are also present in it. They have a good taste and are easily digestible. As there is economic importance and scope of fish and fisheries especially in Maharashtra, it is essential to study distribution and the availability of fish from freshwater reservoirs and tanks (More et al., 2018). Biodiversity is essential for stabilization of ecosystem, protection of overall environmental quality for understanding intrinsic worth of all species on the earth (Ehrlich, P.R. and Wilson, E.O. (1991).

Fish constitutes half of the total number of vertebrates in the world. They live in almost conceivable aquatic habitats; 21,723 living species of fish have been recorded out of 39,900 species of vertebrates out of these 8,411 are freshwater species and 11,650 marine. India is one of the mega biodiversity countries in the world and occupies the ninth position in terms of freshwater mega biodiversity (Mittermeier, R.A. and C.G. Mitemeir, 1997). In India there are 2,500 species of fishes of which 930 live in freshwater and 1,570 are marine (Kar, D. A. Kumar, C. Bohra and L.K. Sigh, (Eds) 2003).

The Sukhana dam is an earthfill dam on Sukhana river at village Garkheda in the state of Maharashtra, India near Aurangabad. The dam was constructed in 1968 for irrigation purpose. The height and length of dam is 16.92 meter and 446 meter respectively and the surface area of dam is 6.782 km². Present work was undertaken to study the ichthyofaunal diversity of Sukhana dam at Garkheda in

Aurangabad district. Various indigenous and commercial fishes of economic importance have been noticed and recorded from the said dam.

In the field of ichthyology there is valuable contribution by many workers (Ashashree *et al.*, 2008; Shinde *et al.*, 2009 and Brinda *et al.*, 2010 Ubharhande *et al.*, 2012; Jayabhaye and Lahane 2013, Humbe *et al.*, 2014; sonawane and Barve 2015, More *et al.* 2018).

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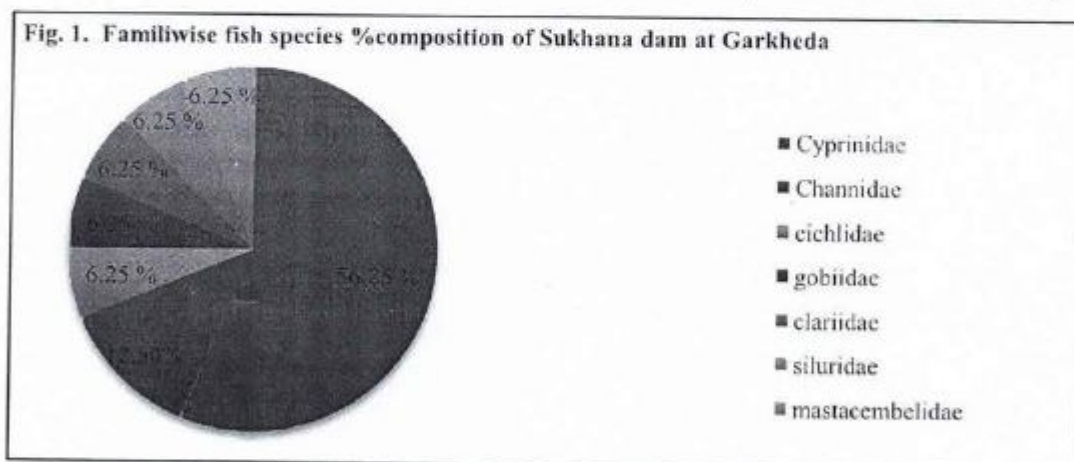
MATERIALS AND METHODS

The present study was carried out on Sukhana, situated at Garkheda in Aurangabad District (M.S) India, from July 2011 to June 2012. Fishes were collected monthly, with the help of local fishermen using different type of nets namely gill nets, cast nets, dragnets, wadap net and Bhor jal. Immediately photographs were taken with help of digital camera.

The collected fishes were brought to laboratory then cleaned with rectified spirit and preserved in 6-10% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the formalin solution. While large fishes were giving an incision in their abdomen and preserved. Fishes were identified up to the species level by using standard keys and books (Day, 1978; Jayaram, 1999 and Talwar and Jhingran, 1991).

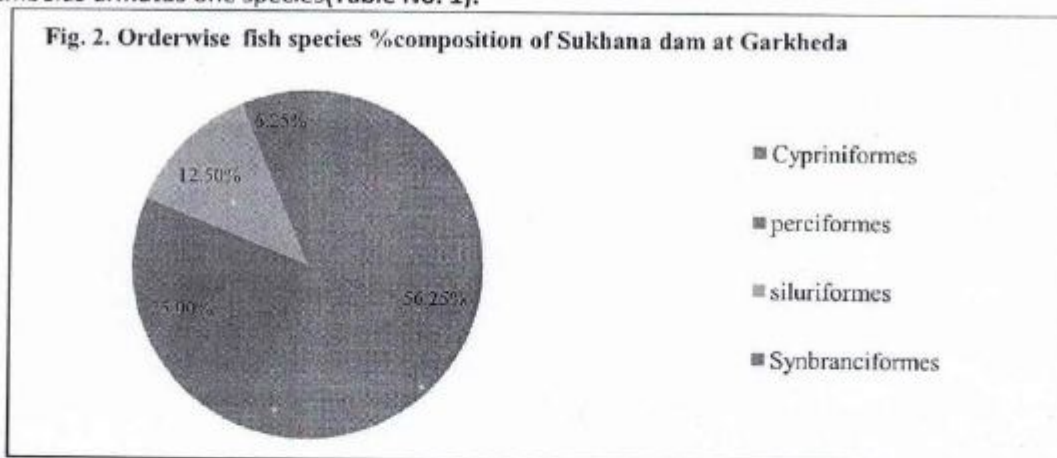
RESULTS AND DISCUSSION

During the present ichthyofaunal study, total 16 species of fresh water fishes belonging to 7 families and 3 orders were recorded from the Sukhana Dam during July 2011 to June 2012. The species found in the Sukhana dam, their taxonomic distribution, scientific name, common name, group of fish, economic value and abundance is given in the table no 1. Order Cypriniformes and family cyprinidae were dominated by 9 species followed by Perciformes 4 species Siluriformes 2 species and Synbranchiformes with one species.



The total 16 species representing by 4 orders, cypriniformes was dominant with 9 species and dominant group in the assemblage composition in which the member of family cyprinidae viz. *Catla-catla*, *Labeorohita*, *cirrhinus mrigala* and *Rasbora daniconius* were found most abundant. *Puntius ticto* were found in abundant form. *Puntius stigma*, *Chela bacaila*, *Garra lamta* and *Thynnichthys sandkhol* were found less abundant. Followed by perciformes in which *Channa striatus*, and *Tilapia mossambica* was found abundant form *Channa punctatus* and *Glossogobius gluris* were found less abundant form Followed by siluriformes in

which one species reported that is *Clarias batrachus* found less abundant and Synbranchiformes reported *Mastacembelus armatus* one species (Table No. 1).



Similar results have been reported by More *et al.*, (2018); Shinde *et al.*, (2011); Kharat *et al.*, (2012); recorded dominance during summer season followed by winter season. In the present study, fishes have been studied under seven families viz., Cyprinidae, Channidae, Cichlidae, Gobiidae, Clariidae, Siluridae. Cyprinidae showed its dominance in Sukhana Dam followed by Channidae, Cichlidae and Clariidae.

The sequence of dominance of encountered order is as follows:

Cypriniformes (57.89%) > Perciformes (25.00%) > Siluriformes (12.50%) > Synbranchiformes (6.25%)

The sequence of dominance of encountered families is as follows:

Cyprinidae (56.25%) > Channidae (12.50%) > Cichlidae (6.25%) = Gobiidae (6.25%) = Clariidae (6.25%) = Siluridae (6.25%) = Mastacembelidae (6.25%)

Similar survey of fish fauna has been done by More *et al.*, (2018) reported 19 species of 12 different genera 7 families and 5 orders were recorded at Harsool Dam, Aurangabad during the period January – December 2012. Among the collected species Cypriniformes Order was dominated by 11 species followed by Perciformes 3 species, Siluriformes 2 species, Saccobrachidae and Angulidae with one species.

Shinde *et al.*, (2009) reported the fish diversity of Pravara River, Pravara Sangam Dist. Ahmednagar (M.S) India. The results of investigation reveal the occurrence of 41 fish species belonging to 7 orders, 14 families and 26 genera. Among the collected species order Cypriniformes was most dominant constituting 50 % followed by order Siluriformes constituting 19 % order Perciformes constituting 14.28 % orders Osteoglossiformes and Synbranchiformes constituting 4.76 % and orders Mugiliformes and Beloniformes constituting 2.38 % of the total fish species.

Nikam *et al.*, (2014) has been done fish survey of Ashti lake Dist. Solapur and reported 23 species belonging to 21 genera, 12 families and 5 orders. Among the collected species order Cypriniformes was dominant.

The Sukhana dam exhibit a good ichthyofaunal diversity represented by 16 species of fishes belonging to 7 families and 4 orders. The fish diversity of Sukhana dam indicates that the pond under taken for study has a well balanced fish community. The maximum population densities of fish were recorded in summer and minimum in winter.

Table 1: - Ichthyofaunal diversity of Sukhana dam Garkheda Dist. Aurangabad (July 2011 to June 2012).

Taxonomical rank	Scientific name	Common name	Group of fish	Economic value	Abundance
I. Order: Cypriniformes					
1. Family: Cyprinidae	1. <i>Catla-catla</i> (Hamilton)	Catla	Carps	FD	***
	2. <i>Labeo-rohita</i> (Hamilton)	Rohu	Carps	LV	***
	3. <i>Rasbora daniconius</i> (Ham - Buch)	Black line Rasbora	Food fish	BT, LV,WF	***
	4. <i>Puntius ticto</i> (Hamilton)	Ticto	Miscellaneous fishes	BT, LV,WF	**
	5. <i>Puntius stigma</i> (Hamilton)	Stigma	Miscellaneous fishes	LV	*
	6. <i>Chela bacaila</i> (Ham - Buch)	Chela	Food fish	FD	*
	7. <i>Cirrhinus mrigala</i> (Hamilton)	Mrigala	Carps	FD	***
	8. <i>Garra lamta</i> (Hamilton)	Garra	Food fish	FD	*
	9. <i>Thynnichthys sandkhol</i> (sykes)	Sandkhol carp	Food fish	LV, PF	*
II. Order: Perciformes					
1. Family: Channidae	10. <i>Channa striatus</i> (Bloch)		Live fish	FD	**
	11. <i>Channa punctatus</i> (Bloch)		Food fish		*
2. Family: Cichlidae	12. <i>Tilapia mossambica</i> (Hamilton)			LV	**
3. Family: Gobiidae	13. <i>Glossogobius giuris</i> (Hamilton)		Live fish	FD	*
III. Order: Siluriformes					
1. Family: Clariidae	14. <i>Clarias batrachus</i> (Linnaeus)		Carps	LV	*
2. Family: Siluridae	15. <i>wallago attu</i>	Wallago / helicopter cat fish	Food fish	BT, LV,WF	*
IV. Order: Synbranchiformes					
1. Family: Mastacembelidae	16. <i>Mastacembelus armatus</i>	Zig zag eel	Miscellaneous fishes	BT, LV,WF	*

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सार : ई-गव्हर्नन्स म्हणजे कोणत्याही नागरिकास सरकारी कामे माहिती तंत्रज्ञानाच्या वापरने त्वरीत व सोप्या पध्दतीने करून देण्याची सोपे उपलब्ध करून देणे. सध्या प्रशासकिय कामात नागरीक हा सामाजिक घटक केंद्रस्थानी ठेवून त्यास तंत्रज्ञान वापरता येईल का ? यावर अभ्यासकाने सदर लेखात भाष्य केले आहे.

प्रस्तावना :

कोणत्याही सरकारी कामामध्ये नियम व विशिष्ट पध्दती यांना खूप महत्व असते. जोपर्यंत कामासंबंधी दस्तऐवज व्यवस्थित ठेवले जात नाहीत. तोवर नागरिकास एखाद्या अपेक्षित कामा संबंधी माहिती मिळवणे व तिचा मागोबा घेणे हे वेळकाढूपणाचे होते. प्रशासकिय कामातील उशिराचे हे एक मोठे कारण आहे. त्याचप्रमाणे कायदे,नियम व पध्दती यामुळे अनेक कामे खालफितीत अडकून राहतात व ती वेळकाढू होतात. कुटल्याही सरकारी कामात, फार्मान किंवा दस्तऐवजाचा इतका अतिरेक होतो, की त्यामुळे वेळ वाया जातो आणि सरकारी विभागांवर अकार्यक्षमतेचा शिक्का बसतो.

या सर्व समस्येवर उपाय म्हणून कायदे, नियम व पध्दती नागरिकांसाठी पारदर्शक कसे होतील. सरकारी प्रशासनामधील माहिती नागरिकांना सहज उपलब्ध कशी करून देता येईल? सरकारी कामे घटकन व वेगाने करून नागरिकांना दिलासा देता येईल का? व प्रशासकीय कामाची परिणामकारकता माहिती तंत्रज्ञानाच्या वापरने साधता येईल का ? यासारख्या उपाययोजनांना प्राधान्य मिळत आहे. म्हणजेच आपण ई-गव्हर्नन्स पध्दती स्वीकारल्या का ? यासारख्या उपाययोजनांना प्राधान्य मिळत आहे.

ई-गव्हर्नन्सचे महत्व :

प्रशासकीय कामांच्या रचनेत सरकार,गमाज,नागरिक या दुव्यास अनन्यसाधारण महत्व आहे. सक्षम आणि परिणामकारक सरकारी माहितीची साखळी ज्यामध्ये माहिती मिळविण्याच्या सोयी, माहितीची प्रतिप्राप्ती व अद्ययावत दळणवळण यामुळे प्रशासनाचे अनेक फायदे होवू शकतात. त्यामुळे नागरीकांनाही वेगाने व सोयीस्कर अशा सोप्या पध्दतीने सेवा मिळणे शक्य होते. त्याचप्रमाणे प्रशासनास समाजासाठी कोणत्या माहितीच्या स्त्रोतांवर भर घ्यायचा हेही समजते. स्वतःचे काम स्वतः करा, या संस्कृतीच्या स्वीकारामुळे सर्वांचाच वेळ व निधी वाचू शकतो.

ई-गव्हर्नन्सच्या अवलंबनामुळे हे शक्य होवू शकते. हे शक्य व्हावे यासाठी माहिती तंत्रज्ञान व माहितीचे द्रुतगती मार्ग यांच्या मोठ्या प्रमाणात उपयोगावर पडत आहे.

ई-गव्हर्नन्ससंबंधी योजना :

गेल्या काही वर्षात सरकारी कामात माहिती तंत्रज्ञान व त्यासंबंधीत साधने यांच्या वापराची सुरुवात झाल्याचे आपणांस आढळते. नागरिकांना पुर्वीपेक्षा चांगती सेवा देणे रासेच अंतर्गत कार्यक्षमता वाढविणे यावर प्रामुख्याने भर दिला जातो आहे. सरकारी कामामध्ये माहिती तंत्रज्ञान स्विकारणे हे खुपच कठिण आहे. याबद्दल सर्वांचे एकमत दिसते. यामुळे त्यांचे योग्य नियोजन करणे आणि त्यादृष्टीने कार्यप्रणाली ठरविणे हे त्यांच्या परिणामकारकतेच्या दृष्टीने फारच महत्वाचे आहे. सरकारकडून माहिती तंत्रज्ञानामध्ये गुंतवणूक वाढते आहे. इतकेच नव्हे तर भारताच्या पंतप्रधानांनी २०२० मध्ये भारत देश हा माहिती तंत्रज्ञानातील महाशक्ती होवून सॉफ्टवेअर निर्मितीच्या क्षेत्रातही अग्रणी व्हावा यासाठी काम करण्याचे आवाहन केले आहे. हे शक्य व्हावे म्हणून केंद्र सरकारने माहिती तंत्रज्ञान सॉफ्टवेअर निर्मितीसाठी एका उच्च राष्ट्रीय कृती दत्ताची स्थापना केली आहे. माहिती तंत्रज्ञान मंत्रालयही स्थापन झालेले आहे. सरकारने माहिती तंत्रज्ञानासाठी एकूण उत्पन्नाच्या २-३ टक्के निधी अंदाजपत्रकात राखून ठेवला जात आहे.

भारतातील विविध राज्य माहिती तंत्रज्ञानासंबंधी मार्गदर्शक तत्वे बनवून ती अंमलात आणण्याच्या योजना आखत आहेत. याबाबत आंध्रप्रदेशाने बाजी मारल्याचे दिसते. हैद्राबाद हे 'सायबर शहर' बनविणे, अद्ययावत दळणवळण यंत्रणा उभारणे, माहिती तंत्रज्ञान शिक्षित मनुष्यबळाचा विकास करणे, विविध सरकारी कामांचे संगणकीकरण करणे आणि नागरिकांना ऑनलाईन सेवा बहाल करणे इत्यादी गोष्टींचा नियोजनात समावेश केलेला आहे. इतर राज्येही याच पावलवर पाऊल टाकून त्याबाबत योजना आखत आहेत. पारित झालेल्या आय.

टी. विधेयकामुळे इलेक्ट्रॉनिक दस्तऐवजास कायद्याने मान्यता मिळाली आहे. यामुळे पुढील काळात टप्पाटप्प्याने सरकारी कामे इंटरनेटद्वारे करणे शक्य होणार आहे.

माहिती तंत्रज्ञानाच्या साहाय्याने आवश्यक माहिती मिळविण्याचे नवीन मार्ग म्हणजे ई-गव्हर्नन्स.

माहिती तंत्रज्ञान वेगाने विकसित होत आहे. त्याच्या आधारे अनेक नवीन माहिती साधने उदा. इंटरनेट, क्विक्स, टी.व्ही. कॉलसेंटर्स आज कॉर्पोरेट क्षेत्रात उपलब्ध होत आहेत.

माहिती-तंत्रज्ञानाची ही नवनवीन साधने कशी काम करतात ? त्याने व्यवस्थापन कसे केले जाते ? अशा सुविधा सामान्य नागरिकांसाठी एकत्र बसून, चर्चा करून काही प्रक्रिया राबवावी लागेल.

ई-गव्हर्नन्समुळे प्रशासकीय व्यवस्थापनात होणारे बदल

व्यवस्थापनात बदल व बदलाचे व्यवस्थापन अशा दूरदरे मुद्द्यांचा यात सहभाग आहे. उदाहरणार्थ.

- सरकारी कामाचे वितरण नित्य महत्वाची कामे ग्रामीण व शहरी विकासात्मक योजना यासंबंधीत कामांना निचरा, संवादात्मक टी.व्ही., क्विक्स, इंटरनेट किंवा अन्य माहिती साधनाद्वारे करतांना त्वरित निर्णय घेणे, कामे वितरणाच्या पध्दती, यामधील कार्यप्रणाली व कायद्यातील बदलांचा समन्वय साधून व्यवस्थापन करणे आवश्यक ठरते.
- सरकारी कामांमध्ये निर्णय घेण्याच्या नवीन पध्दतीसंबंधी व्यवस्थापनात महत्वाचा बदल अपेक्षित आहे. या निर्णय घेण्याच्या प्रणालीतील बदलामध्ये विविध स्तरांवर निर्णय घेणे आणि त्याबद्दल अधिकार, हस्तांतरित करणे यांचाही समावेश होतो.
- या अत्यावश्यक व अनिवार्य बदलामध्ये तांत्रिक उद्दिष्टे साध्य करण्यासाठी कायद्याची पुरता व्हांवी यासाठी आय.टी. प्रस्नाव पास करणे हे या दिशेने टाकलेले एक पाऊल होय.
- कर्मचाऱ्यांना प्रशिक्षण व नवीन पध्दतीच्या कामाचा सराव खास करून शासकीय कामातील शेवटच्या स्तरवरील कामासंबंधित बदलाचे व्यवस्थापनही महत्वाचे आहे.
- सरकारी अधिकारी व लोकनियुक्त प्रतिनिधी यांच्या मनातील नको ती प्रलोभने व गृहीत धरलेले अधिकार कमी होण्यास कारणीभूत होणारे बदल.
- राज्यस्तरावरील कायद्यात अभ्यासपूर्वक व चर्चात्मक सुधारणा.
- स्वतःची कामे स्वतः करा या पध्दतीच्या अवलंबनासाठी सुयोग्य आधारभूत प्रणाली, तांत्रिक व्यवस्था उपलब्ध करणे, जेणेकरून नागरिकांना या नवीन साधनांचा योग्य उपयोग करता यावा.

ई-गव्हर्नन्सचा स्वीकार करण्याआधी वरील सर्व बदलाचे मुद्दे लक्षात घेता सरकारी कामांमध्ये आनुलाभ सुधारणा अपेक्षित आहेत. हे वेगळ्यापध्दतीने मांडायचे झाल्यास प्रथम कामकाजात सोपेपणा आणणे, पध्दती सर्व संपटित करणे, सरकारी प्रशासनात कामाची पुर्नबांधणी करणे आणि असे बदल स्वीकारण्यासाठी मग माहिती तंत्रज्ञान वापरणे इत्यादी गोष्टी अपेक्षित आहेत.

नागरिक सेवा केंद्राची कार्यप्रणाली

आजकाल नागरिक सरकारी सेवांच्या प्रती खुप जागरूक झालेले आहेत. त्यांना सरकारी कामात पारदर्शकता हवी आहे, ज्यामध्ये कार्यक्षम साह्य्य हवे आहे. त्याचप्रमाणे कामकाजात मंत्रीपुर्ण वातावरण हवे आहे. थोडे लवचिक अशाप्रकारचे वातावरण निर्माण करण्याची मोठी गरज होती. ज्यायोगे सरकारी काम करून घेण्यात नागरिकांचे सर्वतोपरी समाधान लाभणे महत्वाचे होते. ही गरज लक्षात घेऊन एक 'खिडकी' योजना स्वीकारण्यात आली. या योजनेमुळे धुळीने माखलेल्या फाईलस तसेच नोकरशाहीने व्यापलेल्या कार्यालयाचे स्मार्ट ऑफिसमध्ये रूपांतर होत आहे.

नागरिक सेवा केंद्र हे रेल्वे स्टेशन कार्यालयाप्रमाणे काम करणार आहे. ज्यामध्ये नागरिकांच्या सोयीसाठी अनेक काउंटरस असतील, जे संगणक तसेच वेब कॅमेऱ्याने युक्त असतील. नागरिकांना ज्या गोष्टींचा दाखला द्यायचा त्यासंबंधी फॉर्म भरून कर्मचाऱ्यास काउंटरवर द्यायचा आहे. संबंधित कर्मचारी फॉर्म तपासून व बरोबर असल्याची खात्री करून त्याची संगणकात नोंद केले, व्यक्तीचा फोटो घेऊन तो माहितीच्या आराखड्यात अंतर्भूत केला जाईल व केवळ २५-३० मिनिटात हवा असलेला दाखला फोटोसह देण्याची व्यवस्था असेल. अशा दाखल्यावर तात्काळ तहसिलदार सही करतील या पध्दतीमुळे बोगस दाखले देण्याच्या प्रकारांना निश्चितच आवळा बसेल असे वाटते.

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ग्रंथालय आणि माहितीशास्त्र व डेलफी तंत्र

डॉ.शिवाजी नारायणराव सोनटक्के

ग्रंथपाल,

कै.रसिका महाविद्यालय, देवणी जि.लातूर

सार :

भावी काळातील संशोधनामध्ये डेलफी तंत्राचा वापर केला जातो. अभ्यासकाने या लेखात डेलफी तंत्राची वैशिष्ट्ये आणि ग्रंथालय व माहिती शास्त्रातील संशोधनात डेलफी तंत्राचा उपयोग कसा होतो हे सदर लेखात स्पष्ट करण्याचा प्रयत्न केला आहे.

प्रस्तावना :

भविष्यात ग्रंथालयीन सेवेबाबत वाचकांचा दृष्टीकोन कसा असेल आणि वाचकांच्या अपेक्षा कोणत्या असतील त्यावर उपाय म्हणून ग्रंथालयीन सेवा कोणत्या पध्दतीने देता येतील. याचा शोध घेणे आज गरजेचे आहे. कारण दिवसेंदिवस ज्ञानाच्या निर्मितीचा वेग वाढत आहे. त्याचा परिणाम म्हणून संग्रह आणि प्रतीप्राप्तीत बदल होत आहे. यामध्ये संगणकाचा फार मोठ्या प्रमाणावर उपयोग केला जात आहे. येणारा काळ याही पेक्षा वेगवान असेल. वाचक, संशोधकांचा ग्रंथपालाकडे पाहण्याचा दृष्टीकोन हा जास्त अपेक्षांचा असणार आहे.

भविष्यातील समस्यांना तोंड देण्यासाठी आज त्याचा विचार करणे गरजेचे झाले आहे. ग्रंथालय आणि माहितीशास्त्रात अशा प्रकारचे संशोधन चालू आहे. यामध्ये भविष्यकालीन संशोधनासाठी काही पध्दतींचा वापर केला गेला आहे.

संशोधनाची व्याख्या :-

डॉ. भांडारकर पु. ल. यांच्या मते

नव्याने उजेडात आलेल्या तथ्यांच्या आधारे प्रस्थापित स्वीकृत निष्कर्ष व सिद्धांत

पुन्हा तपासून पाहण्यासाठी केलेली सखोल चिकित्सक चौकशी किंवा प्रयोग म्हणजे संशोधन होय.

रोडमन व मोरी यांच्या मते,

नवीन ज्ञान प्राप्तीच्या व्यवस्थीत प्रयत्नाला आपण संशोधन असे म्हणतो.

मोझर यांच्या मते,

सामाजिक घटना व सामाजिक समस्यांच्या बाबतीत नवीन ज्ञान प्राप्त करून घेण्याच्या उद्देशाने केलेले सुत्रबद्ध प्रयत्न म्हणजे संशोधन होय.

डॉ. बोधनकर व प्रा. आलोणी यांच्या मते,

एखाद्या समस्येचे उत्तर शोधण्यासाठी वैज्ञानिक पध्दती आणि तंत्राद्वारे संकलीत केलेल्या माहितीचे वस्तुनिष्ठ मुल्यमापन केल्यानंतर, नवीन तथ्यांचा शोध घेऊन विविध घटकातील कार्यकरण संबंधाच्या आधारे सर्वसामान्य सिद्धांताचे आणि नियमांचे प्रतिपादन करणारी प्रक्रिया म्हणजे संशोधन होय.

संशोधनाचे दोन प्रकार सांगता येतील १. मुलभूत संशोधन २. उपयोजित संशोधन

१) मुलभूत संशोधन :-

ज्या संशोधनाद्वारे एखादे तत्त्व किंवा प्रणाली प्रस्थापित होते त्या संशोधनास मुलभूत संशोधन म्हणता येईल.

उदा. न्युटनचा गुरुत्वाकर्षणाचा सिध्दांत

२) उपयोजित संशोधन :-

मुलभूत संशोधनातून सिध्द झालेल्या स्थायी तत्वाचा, किंवा सिध्दांताच्या आधारे सुविधा आणि उपभोग वस्तु यांची निर्मिती करण्यासाठी किंवा इतर वैज्ञानिक उपक्रम हाती घेण्यासाठी जे संशोधन केले जाते. अशा संशोधनास उपयोजित संशोधन असे म्हणतात.

उदा :- अमेरिकेच्या नासा या संस्थेचे सर्व प्रकल्प आणि उपक्रम मुलभूत संशोधनावर आधारित उपयोजित संशोधनाद्वारे पार पडत आहेत.

भविष्यकालीन संशोधनाची तंत्रे :

१) सिनेरिओ रायटींग २) डेलफी

३) फोरकॉस्टिंग

वरील तंत्रापैकी आपण डेलफी या तंत्रा विषयी जाणून घेऊ.

डेलफी तंत्राचा उगम :

डेलफी तंत्र हे एक भविष्यकालीन संशोधनाचे तंत्र आहे. एखाद्या समस्येबाबत एकमत घडवून आणणारे तंत्र आहे. या तंत्राला डेलफी हे नाव एका गावाच्या नावावरून पडले आहे. डेलफी हे प्राचीन ग्रीसमध्ये पार्नेस पर्वताच्या दक्षिणेकडील उतारावर वसलेले गाव आहे. या गावात ऋषितुल्य भविष्यवेत्यांचे (Oracle) मठ होते. त्या वेळेचे ग्रीक राज्यकर्ते प्रत्येक महत्वाच्या बाबतीत या भविष्यवेत्यांचा सल्ला घेत असत. या त्यांच्या तंत्राला डेलफी म्हटले आहे. एखाद्या समस्येबाबत एकमत घडवून आणणाऱ्या या तंत्राला डेलफी हे नाव प्रथम १९५३ मध्ये अमेरिकेतील रँड कार्पोरेशनने आपल्या संशोधनासाठी निवडले होते.

डेलफी तंत्राची कार्यपध्दती :

डेलफी तंत्र हे पॅनल तंत्र म्हणूनही ओळखले जाते. यामध्ये पॅनल म्हणजे तज्ञांचा एक गट. एखाद्या मुतागुतीच्या समस्येवर चर्चा करण्यासाठी तयार करण्यात येतो. या ठिकाणी

अपेक्षा अशी असते की, या चर्चेतून या समस्येवर तोडगा निघू शकेल किंवा ती समस्या निवारण्याचा पर्यायी मार्ग दिसू शकेल. पयुचर्स रिसर्च मधील डेलफी तंत्रात नियुक्त झालेल्या पॅनेलचे वैशिष्ट्ये असे की याचे सदस्य समोरा समोर ही चर्चा करत नाहीत. या पॅनलच्या सदस्यांना एकमेकांच्या सदस्यत्वाची कल्पनासुध्दा नसते. होणारी चर्चा संशोधकाच्या माध्यमातून एकमत होण्यासाठी मते अजमावण्याच्या अनेक फेऱ्या होऊ शकतात.

संशोधक समस्येचा सांगोपांग विचार करून त्या संबंधी विधानाची एक मालिका तयार करतो. ही त्यांची विधाने पॅनलच्या प्रत्येक सदस्यांकडे त्यावर त्यांची मते आजमावण्यासाठी पाठविण्यात येतात. जी विधाने फार मोठ्या मताधिक्याने स्विकारली गेली ती बाजूला ठेऊन बाकीची विधाने दुसऱ्या फेरीच्या चर्चेसाठी परत सदस्यांकडे पाठविण्यात येतात. या बरोबर सदस्यांना प्रश्नावली पण पाठवण्यात येते. त्यात बहुसंख्य सदस्यांचे मत काय पडेल ते सांगून आपले मत परत मांडणार का ? व मांडायची नसल्यास त्याची कारणे काय ? वगैरे प्रश्न विचारण्यात येतात. ही प्रक्रिया तिसऱ्या फेरीपर्यंत किंवा एकमत होईपर्यंत चालते. एकमत हे डेलफी तंत्रात साध्या अंकगणिताने ठरत नाही. तर प्रत्येक फेरीनंतर विधानांना सदस्यांकडून मिळालेला गुणांचे विश्लेषण संख्याशास्त्रानुसार केले जाते. हे विश्लेषण संख्यात्मक असल्याने त्याची निष्पत्ती विश्वासार्थ व स्विकारणीय ठरते.

बुशा आणि हर्टर यांच्या मते अत्यंत काळजीपूर्वक नियुक्त केलेल्या आणि एकमेकांची ओळख न पटलेल्या तज्ञांच्या एका गटाचे एखाद्या प्रश्नाबद्दल एकमत घडवून आणण्यासाठी डेलफी तंत्र हा एक उत्तम मार्ग आहे. संशोधकाची अशी भावना असते की, बहुमताची विश्वासाहता आणि अधिकार या गोष्टी निष्कर्षाप्रत पोहंचण्यास जास्त सहाय्यभूत होतील. पॅनलच्या तज्ञ

सदस्यांच्या नावाबद्दल पाळण्यात येणाऱ्या गुप्ततेखेरीज प्रत्येक फेरीनंतर कळणारी सदस्यांची विधानासंबंधीची प्रतिक्रिया हे डेलफी तंत्राचे आणखी एक वैशिष्ट्ये आहे.

डेलफी तंत्राची वैशिष्ट्ये :

- १) पॅनलमधील सदस्यांची चर्चा समोरासमोर होत नसून संशोधकामार्फत होते व या सदस्यांना एकमेकांच्या सदस्यत्वाची कल्पनाही नसते.
- २) पॅनलमधील सदस्य हे वेगवेगळ्या क्षेत्रातील तज्ञ असतात.
- ३) समस्येबाबत एकमत होण्यासाठी सदस्यांची मते आजमावण्याच्या अनेक फेऱ्या होऊ शकतात.
- ४) पॅनलमधील सदस्यांकडून विधानांना मिळालेल्या गुणांचे विश्लेषण संख्याशास्त्रानुसार केले जाते. हे विश्लेषण संख्यात्मक असल्याने त्याची निष्पत्ती विश्वासाहर् आणि स्विकारणीय ठरते.

ग्रंथालय आणि माहितीशास्त्रामध्ये डेलफी तंत्राचे उपयोजन :

याचे एक उत्तम उदारहण पुढील प्रमाणे देता येईल, पुणे विद्यापीठाच्या डॉ.शिवानी सेनगुप्ता यांनी डेलफी तंत्राचा अवलंब त्यांच्या पीएच.डी.च्या संशोधनात केला. संशोधनाचा त्यांचा विषय होता स्पडतंतल 'दक पदवितउंजपवद' बपमदबम म्कनबंजपवद पद प्दकं पद जीम १९९०७ हा त्यांचा प्रबंध त्यांनी १९९१ मध्ये विद्यापीठाला सादर केला. १९९० पासून होणारा दशकात ग्रंथालय आणि माहितीशास्त्राचे अभ्यासक्रम असे असावेत की, जेणे करून ग्रंथपाल विविध क्षेत्रामध्ये उत्तम ग्रंथालयीन सेवा प्रदान करू शकते. याचा शोध घेणे हा सेनागुप्ता यांचा या संशोधनामागील उद्देश होता. डेलफी तंत्राच्या सहाय्याने सेनगुप्ता यांनी तज्ञांच्या मतांच्या आधारे जे अभ्यासक्रम योग्य दिसले ते प्रबंधात सादर केले. तज्ञांच्या विचारात एकुण ४१ विधाने तयार करण्यात आली. सामाजिक परिस्थिती,

अभ्यासक्रमाची उद्दीष्टे, मुलभूत शिक्षण, अभ्यासक्रमांना देण्यात येणारी मान्यता आणि ग्रंथालय व माहितीशास्त्र प्रसारणाविषयी राष्ट्रीय धोरण या सर्व विषयांच्या संदर्भात ही विधाने तयार करण्यात आली. ३६ सदस्यांचे पॅनल तयार करण्यात आले. त्यामध्ये ग्रंथपालाबरोबर इतर विषयातील तज्ञ पण नियुक्त केले. या ३६ जनांना पहिल्या फेरीत पाठवलेल्या प्रश्नावलीपैकी २५ प्रश्नावल्या उत्तरासह परत आल्या. प्रश्नावलीतील प्रत्येक विधानाला तज्ञांनी दिलेल्या गुणांचे विश्लेषण करण्यात आले. यासाठी प्रथम प्रश्नावली रेटिंग स्केल सुचविण्यात आले होते. संख्याशास्त्रातील तंत्रानुसार ज्यांचे मिडीयन रेटिंग मिडीयन गुणांपेक्षा फार वेगळे होते. अशा प्रश्नावल्या दुसऱ्या फेरीत त्यांच्या सदस्यांकडे फेरविचारासाठी पाठविण्यात आल्या. या दुसऱ्या फेरीत सदस्य आपले प्रथम प्रदर्शित केलेले मत पुर्णपणे बदलत असत असे नाही. या संशोधनात असे दिसून आले की, त्यांचे रेटिंग या फेरीत बरेच बहुमताकडे झुकले. दोन फेऱ्यामधील फरक संख्याशास्त्रानुसार जेव्हा नगण्य ठरतो. तेव्हा सर्वसाधारणपणे एकमत झाले असे मानण्यात येते. सेनगुप्ता यांच्या संशोधनाची निष्पत्ती हीच होती. या तज्ञांनी प्रदर्शित केलेल्या एकमताच्या अनुषंगाने सेनगुप्तांनी पर्यायी अभ्यासक्रम सुचवले. त्या विश्लेषणात दिसून आलेली महत्वाची गोष्ट म्हणजे ग्रंथपाल आणि पॅनलमधील इतर विषयातील तज्ञ यांनी प्रश्नावलीतील विधानांना दिलेल्या गुणांमध्ये फारशी तफावत नव्हती.

निष्कर्ष :

ग्रंथालय व माहिती शास्त्रात भावी काळा संबंधीचे संशोधन केले जाते. अभ्यासक संभाव्य गोष्टी सुचित करीत असतो, काय घडू शकेल या संबंधीचे अभ्यासकाने केलेले ते भाष्य असते. ग्रंथालय व माहितीशास्त्रातील पुढील काळात

होणाऱ्या बदलाचा अंदाज घेता येतो. यामधून झालेले संशोधन वस्तुनिष्ठतेला धरून असते.

डेल्फी तंत्राचे गुण/दोष :-

पॅनेल अध्ययन पध्दतीचे पुढील गुण आहेत.

१) वस्तुनिष्ठ तथ्य संकलन :-

कोणत्याही घटनेसंबंधी व्यक्तीच्या मतामध्ये, अभिवृत्ती मध्ये किंवा स्थितीमध्ये काळानुसार परिवर्तन होत असते. त्याच व्यक्तीचे किंवा गटांचे वारंवार निरीक्षण केल्यामुळे हा फरक कोणत्या कारणावरून पडला हे संशोधकाला समजु शकते. त्यामुळे त्याला तथ्य संकलनासाठी उत्तरदात्याच्या स्मरणशक्तीवर विसंबुन रहावे लागत नाही.

२) विश्वसनीयता :-

एकाच व्यक्तीकडून मिळणाऱ्या माहितीपेक्षा पॅनेल अध्ययनानुसार वेगवेगळ्या वेळी पॅनेल मधील प्रत्येक व्यक्तीकडून मिळणारी माहिती ही अधिक विश्वसनीय सविस्तर आणि सखोल स्वरूपाची असते.

३) अद्यावत माहितीचे संकलन :-

या अध्ययनात अभ्यासासाठी निवडलेल्या गटांचे वेळोवेळी अध्ययन केले जाते. त्यामुळे व्यक्तीच्या मतामध्ये भावनामध्ये आणि अभिवृत्तीमध्ये होणारे परिवर्तन कोणत्या कारणामुळे होते या संबंधीची माहिती मिळते. परंतु पॅनेल अध्ययनामध्ये अध्ययनासाठी निवडलेल्या गटांनी सहाकार्य दिले तरच त्यांच्यावर असा प्रयोग करता येतो.

४) आवश्यक माहितीचे संकलन :-

पॅनेल अध्ययनासाठी निवडलेल्या गटातील व्यक्तीच्या पुन्हा पुन्हा मुलाखती घेतल्या जातात. त्यामुळे विशिष्ट घटनेसंबंधी नेमक्या शब्दात आपल्या भावना विचार, मते व्यक्त करण्याची कला आणि सामर्थ्य अध्ययन गटातील व्यक्तींना प्राप्त होते त्यामुळे संशोधकाला संशोधनाच्या दृष्टीने आवश्यक आणि महत्त्वपूर्ण माहिती मिळण्याची शक्यता असते.

दोष (गर्वादा) :-

१) अनेकदा अध्ययनासाठी निवडलेल्या व्यक्तीची मते पॅनेलमध्ये सहभागी झाल्यामुळे बदलतात. म्हणजेच अशा व्यक्ती आता अत्यंत सावधपणे आणि जाणिवपूर्वक माहिती देऊ लागतात. त्यामुळे त्यांच्या मनातील सत्य समजू शकत नाही. अभ्यासकाला कृत्रिम स्वरूपाची माहिती मिळू लागते. म्हणुन अशा माहितीच्या आधारे संशोधकाने काढलेले निष्कार्ष सर्वमान्य आणि विश्वसनीय स्वरूपाचे राहतील असे म्हणता येत नाही.

२) संपर्काची समस्या :-

पॅनेल अध्ययनासाठी निवडलेल्या गटात भटक्या जाती आणि जमातीचा समावेश असेल तर काही काळानंतर अशा लोकांशी वारंवार संपर्क कसा प्रस्थापित करावा ही समस्या निर्माण होते. प्रत्येक संशोधकाला पॅनेल अध्ययनाच्या संशोधनासाठी उपयोग करताना प्रत्यक्ष संशोधन काळात वरील मर्यादांचा अनुभव येतो. या मर्यादांवर आणि अडचणीवर योग्यप्रकारे मात करून संशोधन कार्य पुर्ण करण्यातच संशोधकाचे यश असते.

३) संशोधकाचा प्रभाव :-

पॅनेल अध्ययनात सहभागी झालेल्या व्यक्तींची मते अभिवृत्ती ही संशांधान विषय व संशोधकाच्या संपर्कात असल्यामुळे बदलू शकतात. त्यामुळे त्यांचे मुळ स्वरूप कायमचे बदलून जाते. अशा स्थितीत एकदा तयार झालेली मत आणि अभिवृत्ती यामध्ये कशाप्रकारे बदल घडवून आणावा ही समस्या निर्माण होते.

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HYSTERESIS CURVE OF COMPOSITE MATERIAL

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ABSTRACT

The ferrite (magnetic material) - ferroelectric (electric material) composites with general formula $(1-x)\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4 + (x)\text{BaTiO}_3$ in which $x = 0, 0.20, 0.40, 0.60, 0.80, 1$ mol are prepared by conventional solid state reaction. The Hysteresis loop of above mentioned sample is obtained by using Vibrating Sample Magnetometer (VSM) at room temperature. The presence of ferroelectric phase (BaTiO_3) affects the values of Saturation magnetization (M_s), magneton number and Remanent magnetization (M_r). From VSM study it is observed that the values of saturation magnetization and remanent magnetization decreases as the content of ferrite i.e. magnetic material decreases.

Keywords: Coercivity, Composite, Ferrite, Ferroelectric, Hysteresis loop.

1. INTRODUCTION

The material containing ferrite and ferroelectric composition this type of material is called magnetoelectric (ME) composites. ME composite possess magnetoelectric effect in which the two effect i.e. electric and magnetic field coupled together. This effect would make the conversion between electric energy and magnetic energy possible, which provides opportunities for potential applications as ME memories, waveguides, transducer, actuators and sensors [1-5]. This effect in composites is due to strain induced in the ferrite phase, thereby resulting in polarization of the ferroelectric phase due to piezoelectric effect [6]. Thus the ME effect is result of inherent properties such as magnetostriction and piezoelectric effect of the constituent phases present in the composite. In spite of the low value observed in dE/dH , these composites are of scientific and technological interest. The study of such composites provides a unique tool to characterize the material simultaneously in single phase and in composite form. This effect also gives auxiliary information for determining the magnetic point groups and space groups [7,8]. This means that they provide a complementary tool to neutron diffraction, which seldom allows us to determine the magnetic point group and space group unequivocally, other scientific interests are accurate determination of magnetic phase transitions, electric field induced magnetic phase transitions, etc.

As reported the some ferrite is highly resistive and magnetostrictive [9] and BaTiO_3 has high dielectric permittivity. If the two compounds can be successfully incorporated into a composite, it is expected that the composites might have interesting properties. Hence we have chosen $\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4$ as a ferrite phase and BaTiO_3 as a ferroelectric phase to form the composites. There are different methods use to prepare composite material like molten-salt synthesis [10], situ grown [11] and Hydrothermal synthesis [12]. Here the composite of ferrite $\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4 +$ ferroelectric BaTiO_3 prepared by solid state reaction. The structural and magnetic properties of composite material having general formula $(1-x)\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4 + (x)\text{BaTiO}_3$, where $x=0.0, 0.2, 0.4, 0.6, 0.8$ and 1 studied.

2. EXPERIMENTAL

The components of present composites are BaTiO_3 as ferroelectric phase and $\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4$ as a ferrite phase with general formula $(1-x)\text{Ni}_{0.5}\text{Cu}_{0.3}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4 + (x)\text{BaTiO}_3$ in which $x = 0, 0.20, 0.40, 0.60, 0.80, 1$ mol were prepared by conventional solid state reaction. The ferrite phase was prepared by NiO , CuO , MgO , and Fe_2O_3 in required molar proportions. These oxides were mixed and grind in agate mortar for couple of hours. The ferroelectric phase was prepared by using BaO and TiO_2 as starting materials. These oxides are also mixed and grind in agate mortar. The ME composites were prepared by mixing 0.8, 0.6, 0.4 and 0.2 mol of ferrite phase with 0.2, 0.4, 0.6, and 0.8 mol of ferroelectric phase respectively. The required molar proportions were mixed and grind for 3 hour. The grind powder mixture was pressed into pellets using hydraulic press. The pelletized sample was final sintered in programmable furnace and slow cooled to room temperature to yield the final product. The crystal structures of prepared sample and their constituent phases were determined by XRD technique using Philips X-ray diffraction using Cu-K_α radiation. The Hysteresis curve is obtained by VSM at room temperature.

3. RESULT AND DISCUSSION

3.1 X-ray Diffraction

The X-ray diffraction patterns are shown in Fig.1. and Fig. 2 for a sample with $x=0.40$ and $x=0.80$ respectively. Fig.1 and Fig.2 displays the formation of spinel cubic-perovskite mixed structure. They exhibit strong and broadened peaks around 2θ angles of 22.14° , 32.55° , 38.85° , 45.14° , and 56.14° together with weak and broadened peaks around 2θ angles of 50.72° , 65.67° , 69.79° and 74.44° indicating the perovskite ferroelectric with tetragonal structure. The peaks around the 2θ angles of 30.41° , 35.78° , 43.45° , 57.42° and 63.01° appear, indicating that the spinel Ni-Cu-Mg ferrite with cubic structure have been formed in the composite. It is also observed that the peak intensity of higher intensity peak of ferrite (311) plane decreases as the ferrite composition decreases and the peak intensity of higher intensity peak of ferroelectric (101) plane increases with increase in ferroelectric composition in the composites.

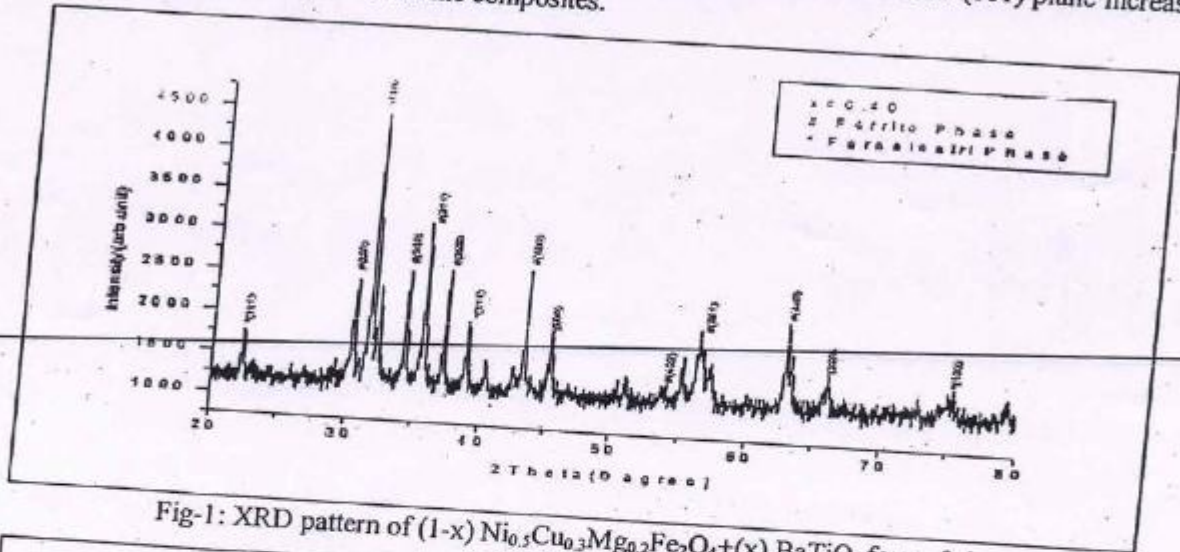


Fig-1: XRD pattern of $(1-x) Ni_{0.5}Cu_{0.3}Mg_{0.2}Fe_2O_4+(x) BaTiO_3$ for $x=0.4$.

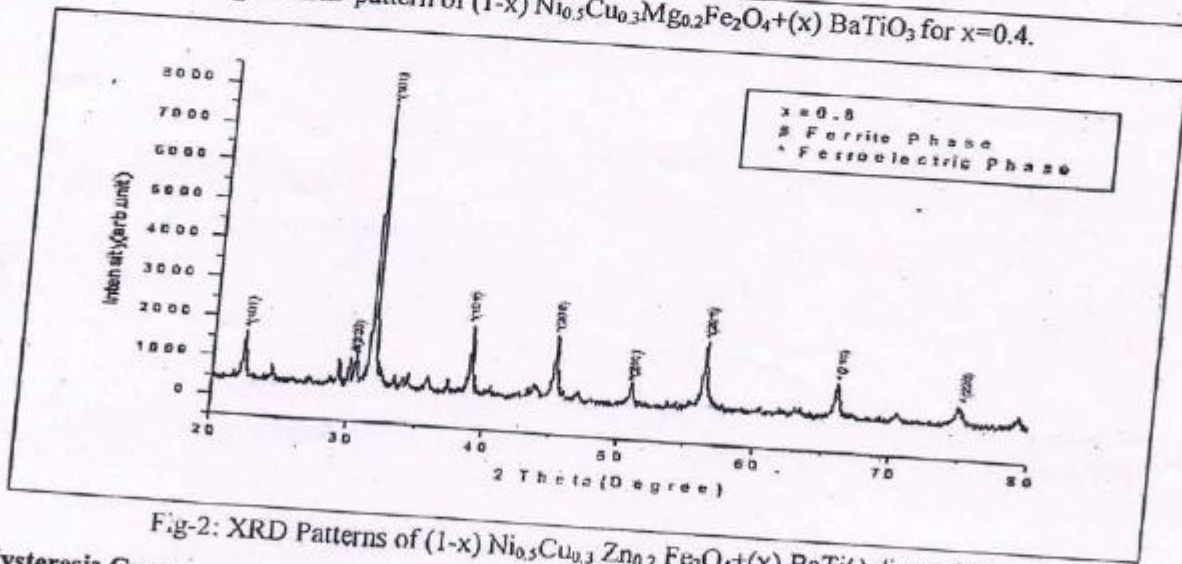


Fig-2: XRD Patterns of $(1-x) Ni_{0.5}Cu_{0.3}Zn_{0.2}Fe_2O_4+(x) BaTiO_3$ for $x=0.8$.

3.2 Hysteresis Curve

From hysteresis loop magnetic parameters are studied as a function of both magnetic field and ferroelectric content. Magnetic hysteresis loop measurements were carried out using a vibrating sample magnetometer (VSM). The saturation magnetization (M_s) was obtained from magnetic hysteresis loops. The saturation magnetization (M_s) is a measure of the maximum amount of field that can be generated by a material. It will depend on the strength of the dipole moments on the atoms that make up the material and how densely they are packed together.

The hysteresis curve of the present composite $(1-x) Ni_{0.5}Cu_{0.3}Mg_{0.2}Fe_2O_4+(x) BaTiO_3$, where $x=0.0, 0.4, 0.6, 0.8$ and 1.0 , sample are shown in Fig.3. The values of saturation magnetization (M_s), remanent magnetization (M_r) and coercive field (H_c) are obtained from hysteresis curve. From Fig.1 it is clear that all composite possess magnetic hysteresis loop, it shows that the composites are magnetically ordered. It can be understood from

hysteresis loop that the composite hysteresis loops shift towards the field axis as ferrite content decreases. The magnetic moment per atom in Bohr magnetron for each composition is calculated using the experimental value of saturation magnetization. The formula for magnetic moment is given by

$$\mu_B = \frac{M_{saxM}}{N \times \beta} \quad (1)$$

M_s is Saturation magnetization, M is molecular weight and N is Avogadro's number (6.024×10^{23} gm/mol), β is the conversion factor to express the magnetic moment per atom in Bohr magnetron (9.273×10^{-21} erg/gauss)

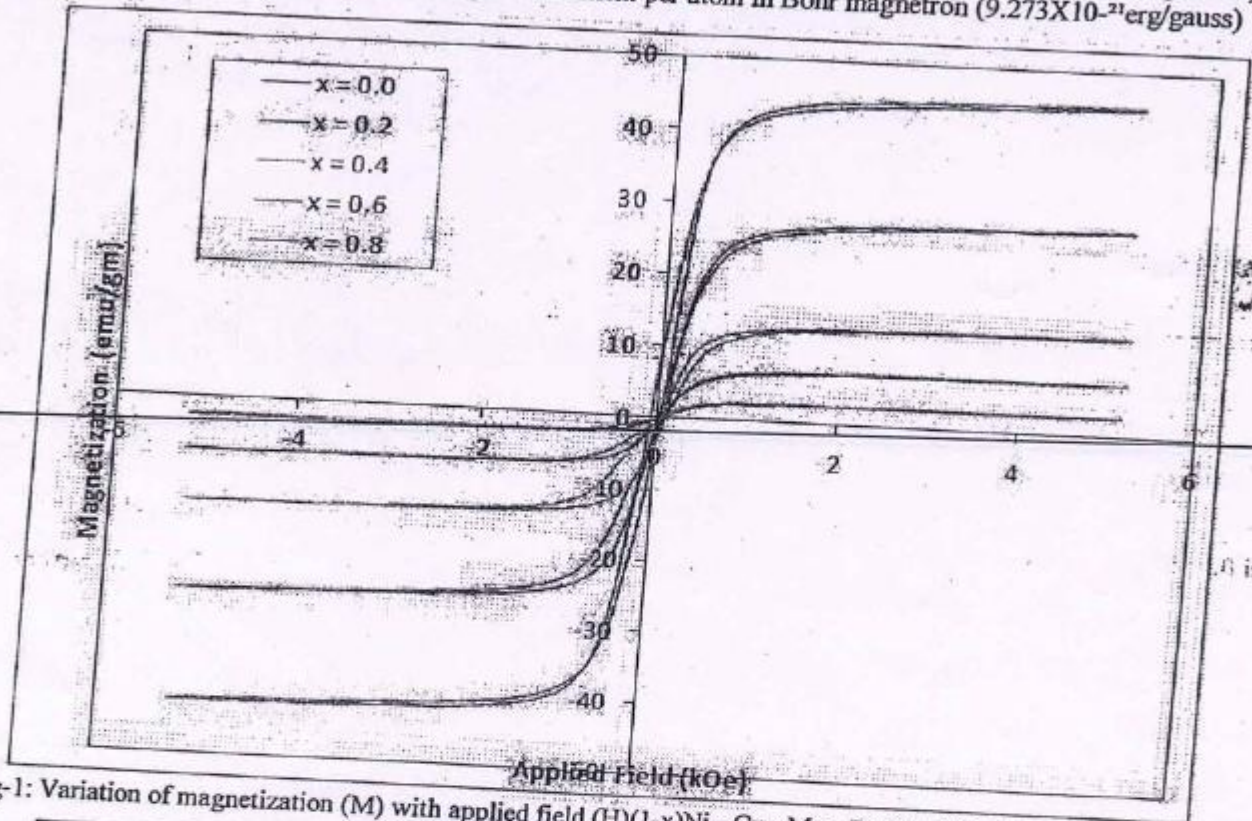


Fig-1: Variation of magnetization (M) with applied field (H) $(1-x)Ni_{0.5}Cu_{0.3}Mg_{0.2}Fe_2O_4+(x)BaTiO_3$ for $(x = 0.0-1.0)$

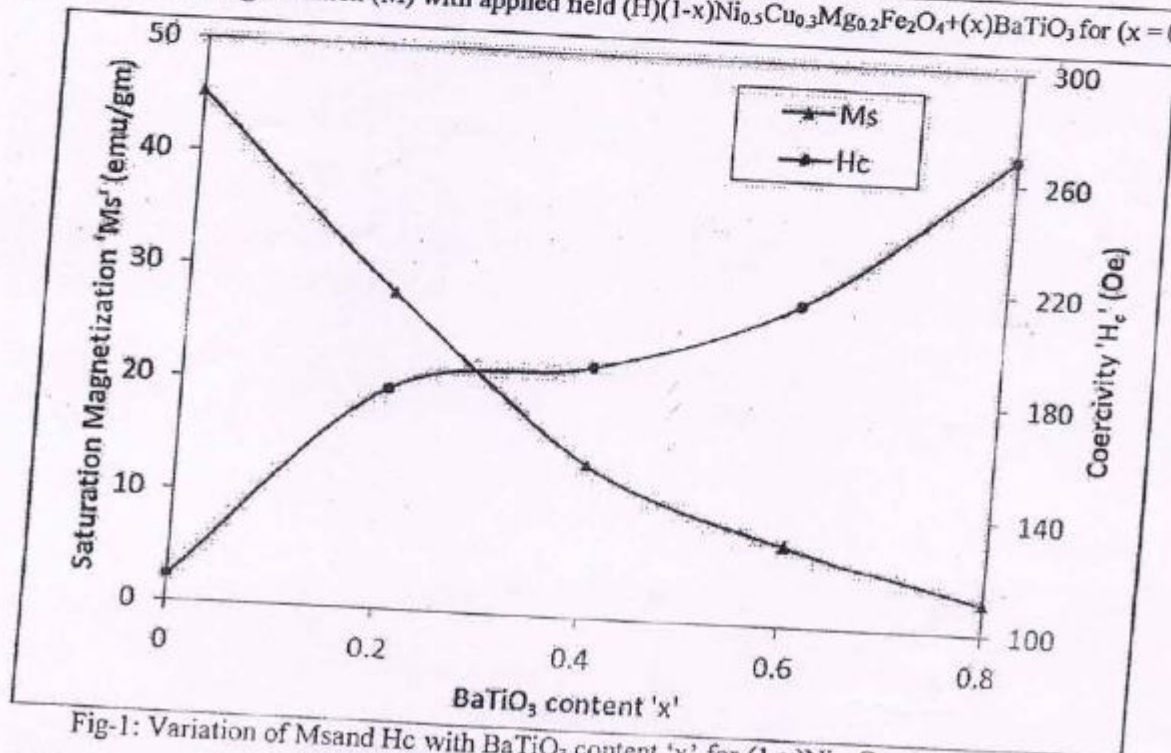


Fig-1: Variation of M_s and H_c with $BaTiO_3$ content 'x' for $(1-x)Ni_{0.5}Cu_{0.3}Mg_{0.2}Fe_2O_4+(x)BaTiO_3$

(x)BaTiO₃ for (x = 0.0-1.0)

Table 1 shows the values of saturation magnetization, remnant magnetization, rem-nance ratio and magneton number. From Table 1 it is observed that the highest value of saturation magnetization is 45.2 emu/gm is obtained for sample with x=0.00 sample. The values of saturation magnetization and remanent magnetization decreases as the content of magnetic material i.e. ferrite decreases. It is also observed that the value of remanence ratio lies in the range of 0.31-0.74. Remnace ratio increases as ferrite content decreases. The decrease in value of saturaton magnetization and remanent magnetization (M_r) is due to increasing nonmagnetic ferroelectric BaTiO₃ content of the composite sample. It is also observed that the magnetron number decreases as ferrite content decreases.

Table-1: Saturation magnetization (M_s), remanent magnetization (M_r), remanence ratio (R) and magneton number for (1-x)Ni_{0.5}Cu_{0.3}Mg_{0.2}Fe₂O₄+(x) BaTiO₃ for (x = 0.0-1.0).

Comp. 'x'	Saturation Magnetization M _s (emu/g)	Remanent Magnetization M _r (emu/g)	Remnace Ratio R=(M _r / M _s)	Magneton Number η _B
0	45.2	14.33	0.31	1.85
0.2	28.07	9.51	0.33	1.16
0.4	13.56	4.89	0.36	0.56
0.6	7.27	3.48	0.47	0.30
0.8	2.73	2.03	0.74	0.11

4. CONCLUSION

The ME composites have been prepared successfully by conventional solid state reaction. The X-ray diffraction peaks are characteristics of both ferrite and ferroelectric phases. The intensity as well as number of ferroelectric peaks increases with increase in ferroelectric content in composites. It may be due to increase of molar percentage of ferroelectric. The magnetic properties of composites are investigated by using Vibrating Sample Magnetometer (VSM) at room temperature. The presence of hysteresis loop for all the sample of composite material under investigation indicates that the composites are magnetically ordered. The values of remanence ratio increases as ferrite content decreases, this is due to decrease in magnetic content. The saturation magnetization, remanent magnetization and magneton number decreases as the ferrite content decreases. Dielectric constant, dielectric loss and dielectric loss tangent were decreases with increase in frequency.

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Car Selection Problem using Assignment Problem

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Abstract — In this paper, we tried to solve real life problem i.e. Car selection problem (by taking information of car details through google) is carried out as per user requirement by using Assignment problem as well Revised one's Assignment method.

Keywords— Assignment problem, ROA, Car Selection problem, Assignment Problem.

I. INTRODUCTION

Now a day's car selection as per user requirement is difficult task for us, by using Assignment Problem it is possible to trace one – to – one match of given "users" to "cars". In this paper we tried to find out ideal solution as possible as real, which will find minimum cost value for cars.

Assignment problem is completely degenerated form of transportation problem. It appears in some decision – making problem. In general, it is concerned with one to one basis when 'n' jobs are to be assigned to 'n' facilities.

II. MATHEMATICAL FORMULATION OF ASSIGNMENT PROBLEM

		Activity/ Destination				Availability
		A ₁	A ₂	...	A _n	
Resource	R ₁	C ₁₁	C ₁₂	...	C _{1n}	1
	R ₂	C ₂₁	C ₂₂	...	C _{2n}	1

	R _n	C _{n1}	C _{n2}	...	C _{nn}	1
Requirement		1	1	...	1	

Let (X_{ij}) denote the assignment of ith resources to jth activities such that,

$$X_{ij} = \begin{cases} 1; & \text{if resource } i \text{ is assigned to activity } j. \\ 0; & \text{otherwise.} \end{cases}$$

Then the mathematical formulation of the assignment problem is,

$$\text{Minimize } Z = \sum_{i=1}^n \sum_{j=1}^n C_{ij} X_{ij} \quad \dots\dots (1)$$

Subject to the constraints,

$$\sum_{i=1}^n X_{ij} = 1 \text{ and } \sum_{j=1}^n X_{ij} = 1 ; X_{ij} = 0 \text{ or } 1 \quad \dots\dots(2)$$

for all i = 1, 2, ..., n and j = 1, 2, ..., n.

III. REVISED ONES ASSIGNMENT METHOD (ROA) FOR SOLVING ASSIGNMENT PROBLEM [1],[2], [3].

To solve car selection problem, we have analyse car data as per user requirement i.e. car cc, mileage, ground clearance etc. After that data is converted into numbers using given credit points and lastly by applying ROA method we tried to find optimum solution.

Now, consider the assignment matrix where is the cost or effectiveness of assigning i^{th} machine.

$$\begin{matrix} & 1 & 2 & \dots & n \\ \begin{matrix} 1 \\ 2 \\ \vdots \\ n \end{matrix} & \begin{pmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ c_{n1} & c_{n2} & \dots & c_{nn} \end{pmatrix} \end{matrix}$$

The algorithm is as follows.

Step 1

Find maximum element from each row (say a_i), and note it on RHS of the matrix

$$\begin{matrix} & 1 & 2 & \dots & n \\ \begin{pmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ c_{n1} & c_{n2} & \dots & c_{nn} \end{pmatrix} & \begin{matrix} a_1 \\ a_2 \\ \vdots \\ a_n \end{matrix} \end{matrix}$$

Then divide a_i to each corresponding row, hence at least one ones form in each row. If one is identical for each row and column then do assignment. Otherwise go for step 2.

Step 2

Similarly, for column find max element from each column (say b_j), and note it down of the matrix.

These operation will create one ones in each column. If one is identical for each row and column then do assignment.

2Make assignment in terms of ones. If no feasible assignment can be achieved from step (1) and (2) then go to step 3.

$$\begin{matrix} & 1 & 2 & \dots & n \\ \begin{matrix} 1 \\ 2 \\ \vdots \\ n \end{matrix} & \begin{pmatrix} c_{11}/a_1 & c_{12}/a_1 & \dots & c_{1n}/a_1 \\ c_{21}/a_2 & c_{22}/a_2 & \dots & c_{2n}/a_2 \\ \vdots & \vdots & \ddots & \vdots \\ c_{n1}/a_n & c_{n2}/a_n & \dots & c_{nn}/a_n \end{pmatrix} \\ & \begin{matrix} b_1 & b_2 & \dots & b_n \end{matrix} \end{matrix}$$

Step 3

Cover all ones of the matrix by drawing minimum number of lines. If $n <$ max number of rows or column then assignment is not possible, while n is equal to max number of rows or column then complete assignment is possible.

Step 4

In case step 3 is fail or complete assignment is not possible, then select max element (say d_{ij}) from drawn uncovered lines of the above matrix. divide by d_{ij} from each element of drawn uncovered lines, thus create new one ones in the matrix.

If still assignment fail to optimize solution, the repeat step 3 and 4.

(To assign one we have add Step 5 which is mentioned below.)

Step 5 (Ghadle and Muley Rule)

- For minimization problem select max number from calculated matrix and write it on RHS as well as bottom side.
- To assign one, start from min number of columns (bottom side) and select ones.

- If there are more than one ones in any column then ignore temporarily, and give last priority to that column.
- If still there are identical ones in column then give the priority to max number of rows (RHS).
- If there are more than one ones in any row then give first come priority.

and Vice - versa

Priority rule

One question arises here. What to do with non square matrix? To make square, a non square matrix, we add one artificial row or column which all elements are one. Thus we solve the problem with the new matrix, by using the new method. The matrix after performing the steps reduces to a matrix which has ones in each rows and columns. So, the optimal assignment has been reached.

IV. APPLICATIONS: CAR SELECTION PROBLEM

	General	City	Long drive	Tourist
Particulars\Users	2- 3.99 lac	4- 5.99 lac	6- 7.99 lac	8-9.99 lac
CAR PRICE				
2 lakh	5	0	0	0
3 lakh	4	0	0	0
4 lakh	3	5	0	0
5 lakh	0	4	0	0
6 lakh	0	3	5	0
7- 8lakh	0	0	4	5
9lakh - Above	0	0	0	4
BODY TYPE				
HATCHBACK	3	3	2	0
SEDAN	0	2	3	2
SUV	0	0	0	3
CC				
700 - 999	3	2	0	0
1000 - 1299	0	3	2	2
1300 - 1599	0	0	3	3
1600 - above	0	0	4	4
Mileage				
12 - 14 KMPL	1	1	1	1
14 - 16 KMPL	2	2	2	2
16 - 18 KMPL	3	3	3	3
18 -20 KMPL	4	4	4	4
Ground				
160 - 169	1	1	1	1
170 - 179	2	2	2	2
180 - 200	3	3	3	3

Particulars	Credit Points
Essential	5
Fairly High	4
High	3
Moderate	2
Low	1
Fairly Low	0

In the above table specific credit points are mentioned as per their types and * vehicle details are given at the last where A1, A2 and so on are the variable names given to each car, finally by adding all credit point for each car the table is shown as follows.

By using Revised Ones Assignment Method (ROA) for Solving Assignment Problem the final solution obtained was,

Use \ Model	A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
User 1 General	16	15	14	15	13	10	9	13	12	6	14	6	10	7
User 2 City	10	10	9	10	14	19	14	14	13	13	15	13	13	14
User 3 Long Drive	7	7	6	7	6	8	7	6	5	8	7	7	6	8
User 4 Tourist	5	5	4	5	4	6	5	4	3	7	5	5	4	6

Use \ Model	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	D1	D2	D3	D4	D5	D6	D7	D8
User 1 General	7	3	7	5	5	7	4	5	5	3	3	4	6	6	5	3	5	3	3
User 2 City	13	8	13	8	13	13	9	7	5	5	5	9	9	9	5	8	7	5	5
User 3 Long Drive	13	14	13	12	15	13	13	15	12	13	13	13	11	11	12	14	11	9	9
User 4 Tourist	6	8	6	5	9	6	13	15	16	13	13	13	10	10	16	14	14	17	17

The ideal solution for minimal cost for cars (User 1, A1), (User 2, B2), (User 3, C5), (User 4, C9).

V. CONCLUSION

In this paper, a Revised Ones Assignment Method (ROA) used to solve car selection problem using assignment problem. This method can be used for maximize as well as minimized objective functions.

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* VI. VEHICLE DETAILS

The given vehicle information is up to 2014-15 and price of vehicle may be vary, this problem is choose only practical problem solving purpose.

Version	Maruti Suzuki 800 AC BS-III	Maruti Suzuki Alto 800 VXi Airbag	Maruti Suzuki Alto K10 VXi	Hyundai ian Magna +	Chevrolet Spark LT 1.0 BS 4	Hyundai Santro King GLS	Maruti Suzuki Alto 800 LXI CNG	Maruti Suzuki Zen Estilo VXi (ABS) BS-IV	Maruti Suzuki Wagon R 1.0 MC VXi (ABS-Airbag)	Tata Indigo eCS GLS	Maruti Suzuki A Star AUTOMATIC
	255397	354793	357940	375907	406529	410096	381175	460465	460369	478737	488197
Body Type	Hatchback	Hatchback	Hatchback	Hatchback	Hatchback	Hatchback	Hatchback	Hatchback	Hatchback	Sedan	Hatchback
Segment	A	A	A	A	A	A	A	B	B	C	A
Displacement (cc)	796	796	998	814	995	1068	796	998	998	1193	998
Mileage (City/Highway in KMPL)	16/18	18/20	16/18	16/18	14/16	14/17	18/20	16/18	14/16	13/15	16/18
Ground Clearance (mm)	170	160	160	170	170	172	160	165	165	165	170
	A1	A2	A3	A4	B 1	B 2	B 3	B 4	B 5	B 6	B 7

Version	Ford Figo Duratec Petrol Titanium 1.2	Chevrolet Beat 1.2 LT Opt Petrol	Honda Brio VX MT	Maruti Suzuki Swift ZXI	Tata Indigo eCS VX CR4 BS 4	Hyundai i10 Asta 1.2 AT WS GLS Kappa with Sunroof	Skoda Fabia Elegance 1.6 MPI	Chevrolet Sail LT ABS Petrol	Honda Jazz X	Maruti Suzuki New Swift Dzire Automatic	Toyota Erios V SP
	511464	537226	567590	609737	616126	645070	669816	673185	696290	704125	704773
Body Type	Hatchback	Hatchback	Hatchback	Hatchback	Sedan	Hatchback	Hatchback	Sedan	Hatchback	Sedan	Sedan
Segment	C	B	B	B	B	B	C	B	C	B	C
Displacement (cc)	1196	936	1198	1197	1396	1197	1598	1199	1198	1197	1496
Mileage (City/Highway in KMPL)	14-Dec	14/16	16/18	14/16	13/15	14/18	14/16	16/18	16-Dec	14/16	15/17
Ground Clearance (mm)	168	175	165	170	155	165	158	174	160	170	170
	B 8	B 9	B 10	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8

Version	Toyota Etios V SP	Maruti Suzuki Ertiga VXI BS IV	Chevrolet Aveo CNG 1.4	Maruti Suzuki Ritz MC VDI ABS	Chevrolet Aveo LT 1.4 ABS BS4	Maruti Suzuki Swift VDI	Maruti Suzuki New Swift DZire LDI	Tata Manza GEX Safire90 BS IV	Honda Amaze VX AT Petrol	Volkswagen Polo GT TSI	Hyundai i20 Sportz AT Petrol
	704773	709418	620828	620833	745370	640506	641350	773832	800292	803494	825471
Body Type	Sedan	SUV	Sedan	Hatchback	Sedan	Hatchback	Sedan	Sedan	Sedan	Hatchback	Hatchback
Segment	C	C	A	C	C	B	B	C	B	B	C
Displacement (cc)	1496	1373	1399	1248	1399	1248	1218	1368	1198	1197	1197
Mileage (City/Highway in KMPL)	15/17	14/16	14-Dec	18/20	14/16	16/18	16/18	13/15	15/17	14/16	14/16
Ground Clearance (mm)	170	185	180	170	165	170	170	165	165	168	165
	C 8	C 9	C 10	C 11	C 10	C 13	C 14	C 11	D 1	D 2	D 3

Version	Ford EcoSport 1.5 Ti-VCT Titanium (AT) Petrol	Chevrolet Optra Magnum LT 1.6 ABS BS 4	Maruti Suzuki SX4 MC ZXi (O)	Skoda Rapid Elegance 1.6 MPI AT	Honda City 1.5 S AT
	886077	890737	935263	956856	870114
Body Type	SUV	Sedan	Sedan	Sedan	Sedan
Segment	B	C	C	D	C
Displacement (cc)	1499	1991	1586	1398	1497
Mileage (City/Highway in KMPL)	13/16	14/16	14/16	14/16	13/15
Ground Clearance (mm)	200	165	180	168	165
	D 4	D 5	D 6	D 7	D 8

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Section A: Green Chemistry



Research Article

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Tannic acid: An Efficient Catalyst for the Synthesis of Bis-(4-hydroxycoumarin-3-yl)methanes

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Abstract: Tannic acid catalyzed one-pot synthesis of bis-(4-hydroxycoumarin-3-yl)methanes, from aromatic aldehyde, and 4- hydroxycoumarine in the presence of tannic acid (5mol %) as a catalyst was stirred at reflux temperature in ethanol:water (1:1) for specified period of time. The notable advantages of this method are the experimental simplicity, inexpensive reagents, short reaction times and easy workup procedure.

Keywords: Multi-component reactions, aromatic aldehyde, Bis-(4-hydroxy coumarin-3-yl)methanes, Tannic acid.

INTRODUCTION

Recently, coumarin derivatives have received attention because of their biological importance and numerous pharmacological activities like anticoagulant, anti-HIV and anticancer agents¹. Coumarin and its derivatives are widely used as additives to food, cosmetics, and optical brightening agents².

These compounds are also utilized as urease inhibitors³. A number of methods have been reported for the synthesis of these compounds in the presence of various catalysts like molecular iodine like molecular iodine⁴, tetrabutylammonium bromide (TBAB)⁵ Manganous chloride ($\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$)⁶ sodium dodecyl sulfate (SDS)⁷, tetrabutylammoniumhexatungstate ($[\text{TBA}]_2[\text{W}_6\text{O}_{19}]$)⁸, sulfated titania (TiO_2/SO_4)⁹, ruthenium(III) chloride hydrate ($\text{RuCl}_3 \cdot n\text{H}_2\text{O}$)¹⁰, Cobalt(II) chloride hexahydrate¹¹, tungstate sulfuric acid¹², $\text{NaHSO}_4 \cdot \text{SiO}_2$ / Indion 190 resin¹³, Fe_3O_4 nanoparticles¹⁴ Nano TiO_2 @KSF¹⁵ Boron Sulfonic Acid¹⁶. Although various procedures are reported for the synthesis of bis-(4-hydroxycoumarin)methanes, disadvantages including low yields of products, long reaction times, nonrecyclable catalyst, use of an excess of reagents or catalysts, and harmful and corrosive solvents.

Hence, many organic reactions have been carried out using tannic acid as catalyst, such as in the synthesis of Synthesis of 2,4,5-Triaryl-1H-Imidazole¹⁷, 12-aryl-8,9,10,12-tetrahydrobenzo[a]xanthene-11-one¹⁸, 1-amidoalkyl-2-naphthols catalyzed¹⁹, 2,3-dihydroquinazolin-4(1*H*)-ones²⁰. Tannic acid was found to be non-toxic, cheap and efficient catalyst for many organic reactions. In view of the emerging importance of tannic acid as a catalyst, we wish to report a mild and highly efficient method for the synthesis of Bis-(4-hydroxycoumarin-3-yl) methane.

EXPERIMENTAL

Chemicals were purchased from Merck, Fluka and Aldrich chemical companies. All yields refer to isolated products unless otherwise stated. Melting points were determined in an open capillary. ¹H nuclear magnetic resonance (NMR) (500 MHz) with tetramethylsilane as internal standard and dimethylsulfoxide $\text{DMSO}-d_6$ as solvent. Fourier transform infrared (IR) spectra were obtained as KBr discs on a Shimadzu spectrometer. Mass spectra (MS) were determined on a Varian-Saturn 2000 GC/MS instrument.

General Procedure: A mixture of substituted aromatic aldehyde (1mmol), and 4-hydroxycoumarin (1mmol) in the presence of tannic acid (5mol %) as a catalyst was stirred at reflux temperature in ethanol: water (1:1) (10 ml) for 25-40 minutes. After the appropriate time, the mixture was cool than pour on ice cold water solidified the product filtered its 3(a-o). The crude solid material was purified by recrystallization from ethanol.

RESULTS AND DISCUSSION

In continuation of our previous studies on catalysed organic reactions, we found that the condensation reaction of 4-hydroxycoumarin (**1**) and aromatic aldehyde, (**2**) in the presence of catalytic amounts of tannic acid leads to bis-(4-hydroxycoumarin-3-yl) methanes derivatives (**3**) (Scheme 1).

Initially, we used 4-hydroxycoumarin (**1**) and 4-chlorobenzaldehyde as the model reaction system to investigate the reaction at 0, 2.5, 5, 7.5 and 10 mol% of tannic acid in ethanol:Water (1:1 v:v) at reflux temperature. The product was obtained in 0, 65, 96 and 96% yield, respectively. This indicates that the use of 5 mol% of tannic acid is sufficient to promote the reaction forward (Table I) conditions.

To determine the effect of solvent, various solvents such as dioxane, tetrahydrofuran, dichloromethane, acetonitrile, methanol, ethanol, water, ethanol: water (1:3,v:v), ethanol:water (1:2,v:v) and ethanol: water (1:1,v:v) were used for the model reaction. Ethanol: water (1:1) stand out as the solvent of choice among the solvents tested because of the rapid conversion and excellent yield

(96%) of desired product, whereas the product formed in lower yields (0~90%) by using other solvents (Table 2, Entry 1~9).

To study the generality of this process, variety of examples were illustrated for the synthesis of bis-(4-hydroxycoumarin-3-yl) methane and the results are summarized in Table 3. The reaction is compatible for various substituents such as -CH₃, -OCH₃, -OH, -N(CH₃)₂, -Br, -Cl and hetroaldehyde. The formation of desired product has been confirmed by ¹H NMR and IR spectroscopic analysis techniques and compared with the corresponding literature data.

Table 1: Optimization of the amount of tannic acid for the synthesis of bis-(4-hydroxycoumarin-3-yl)methanes.

Entry	Amount of catalyst (mol%)	Time (min)	Yield(%)
1	0	30	0
2	2.5	30	65
3	5	30	96
4	7.5	30	96
5	10	30	96

Table 2: Screening of solvents for the synthesis of of bis-(4-hydroxycoumarin-3-yl)methanes.

Entry	Solvent	Yield (%)
1	Dioxane	Trace
2	Tetrahydrofuran	Trace
3	Dichloromethane	Trace
4	Acetonitrile	25
5	Methanol	75
6	Ethanol	86
7	Water	65
8	Ethanol: water (1:3,v:v)	77
9	Ethanol: water (1:2,v:v)	90
10	Ethanol: water (1:1,v:v)	96

Table 3. Synthesis of bis-(4-hydroxycoumarin-3-yl)methanes using tannic acid

Entry	Ar-CHO	Product	Time (min)	Yield (%)	M.P °C
1	C ₆ H ₅	3a	30	93	228-230
2	4-ClC ₆ H ₄	3b	25	96	252-254
3	4-NO ₂ C ₆ H ₄	3c	20	96	232-234
4	4-CH ₃ OC ₆ H ₄	3d	30	95	242-244
5	4-CH ₃ C ₆ H ₄	3e	35	94	271-273
6	4-BrC ₆ H ₄	3f	30	92	266-268
7	2-ClC ₆ H ₄	3g	30	90	224-226
8	3-NO ₂ C ₆ H ₄	3h	25	91	234-236
9	4-(CH ₃) ₂ NC ₆ H ₄	3i	40	90	222-224
10	4-HOC ₆ H ₄	3j	35	92	222-224
11	2-HOC ₆ H ₄	3k	30	94	254-256
12	2-BrC ₆ H ₄	3l	25	90	257-259
13	3-CH ₃ OC ₆ H ₄	3m	35	91	238-240
14	Furan-2-carbaldehyde	3n	30	95	199-201
15	Thiophene-2-carbaldehyde	3o	25	93	212 (d)

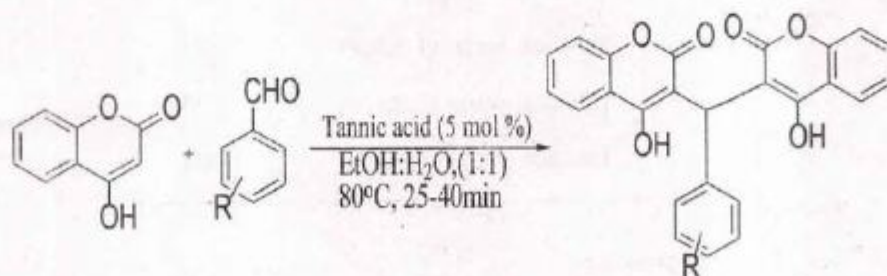
^aReaction conditions: 1 (2 mmol), 2 (1 mmol), Tannic acid (5%) ethanol at reflux temperature;

^bIsolated yields

Spectral data

Compound 3a: ¹H NMR: (DMSO-*d*₆): δ= 6.30 (s, 1H), 6.82–7.42 (m, 13H). ¹³C NMR: (DMSO-*d*₆): δ= 15.0, 92.0, 106.2, 107.1, 115.0, 117.2, 125.0, 124.4, 127.1, 128.0, 128.7, 131.0, 132.4, 140.0, 164.1, 166.3. IR (KBr): 3040, 1660, 1615, 744.

Compound 3b: ¹H NMR: (DMSO-*d*₆): δ = 6.17(s,1H), 7.22–7.92 (m, 12H). ¹³C NMR: (DMSO-*d*₆): δ = 16.7, 91.2, 105.3, 107.5, 115.5, 118.7, 124.5, 125.5, 126.1, 127.3, 128.1, 131.0, 134.4, 139.6, 163.0, 167.1. IR (KBr): 3038, 1660, 1607, 755.



Scheme: synthesis of Substituted Bis-(4-hydroxycoumarin-3-yl)methanes

CONCLUSION

Tannic acid is an easily available, inexpensive and efficient catalyst for the synthesis of Bis-(4-hydroxycoumarin-3-yl)methanes derivatives from various aryl aldehyde and 4-hydroxycoumarin (1mmol) in the presence of tannic acid (5mol %) as a catalyst was stirred at reflux temperature in ethanol: water (1:1) (10 ml) for 25-40 minutes. The remarkable advantages offered by this method are the use of safer catalyst, short reaction times, ease of product isolation, and high yields. We believe that this method is a useful addition to the present methodology for the synthesis of Bis-(4-hydroxycoumarin-3-yl)methanes.

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Abstract

The fusion of virus and endosome membranes is an essential early stage in chikungunya virus infection. The low pH-induced conformational change which promotes the fusogenic activity of the hemagglutinin (HA) is thus an attractive target as an antiviral strategy. The anti-chikungunya drug, Arbidol is representative of a class of antivirals which inhibits HA-mediated membrane fusion by increasing the acid stability of the HA. In this study two series of indole derivatives structurally related to Arbidol were designed and synthesized to further probe the foundation of its antiviral activity and develop the basis for a structure-activity relationship (SAR). Ethyl 5-(hydroxymethyl)-1-methyl-2-(phenylsulphonylmethyl)-1H-indole-3-carboxylate was identified as one of the most potent inhibitors and more potent than Arbidol against certain subtypes of chikungunya viruses.

Keywords: Arbidol derivatives, Antiviral action, Chikungunya

Introduction: Chikungunya infection is commonly an acute disease marked by febrile arthralgia and a frequent rash; persisting arthralgia has been reported in a significant number of cases.¹ Chikungunya virus (CHIKV) is an arthropod-borne viral disease, this is usually found in tropics and hence the reason why Chikungunya is predominantly seen in Asian countries. First described in Tanzania in 1952 which has reemerged since 2005 in Eastern Africa, the Indian Ocean, India and South-East Asia and even reached Europe in 2007.² From 2005, this new variant has been responsible for millions of cases of CHIKV disease. Lethal infections are rare but severe cases have been described including neurological presentations and neonatal contaminations which were documented during the outbreak in Reunion Island.³ Current treatments of Chikungunya fever are for symptoms with no effective licensed vaccine nor specific antiviral drug available. The utilization of the antimalarial chloroquine proved to be poorly active *in vivo* despite it's in cellulo antiviral effect on CHIKV infection.^{4,5} Similarly, it has been shown that the combination of interferon-alpha and ribavirin is effective on CHIKV replication *in vitro* but these compounds have not been tested in animal models and/or clinical trials.⁶⁻¹⁰

Present work:

Arbidol derivatives: By its tropism for membranes and its inhibitory effect on viruses entry, fusion and replication, Arbidol opens promising perspectives in the search for new and efficient antiviral compounds,¹⁴ but since it has a relatively high CC₅₀ value and it means toxic, its clinical application is forbidden.¹² So with the aim to reduce its toxicity and improve its antiviral properties a series of novel arbidol derivatives were designed and synthesized focusing our attention on different positions of the indole nucleus (Figure 1). First of all the *N,N*-dimethylamino methyl group in position 4 was removed (compound 1 and 2). Then phenolic OH in position 5 was homologated in hydroxyl methyl group (compounds 3 and 6) and subsequently with the aim to investigate the role of phenyl sulfonyl methyl group on the antiviral activity, we introduced a methyl group at the position 2 (compounds 4 and 5).

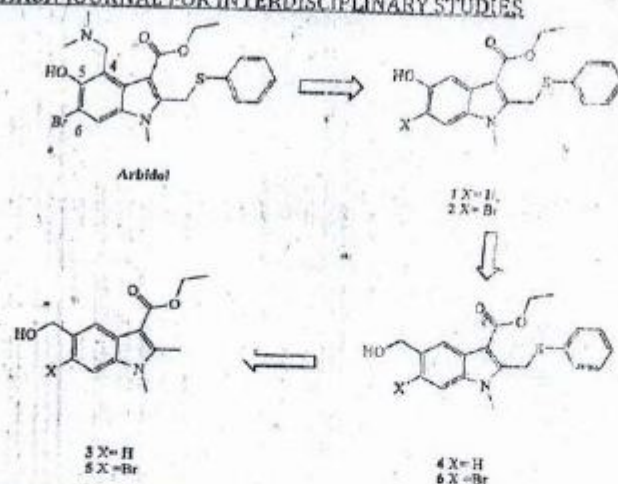
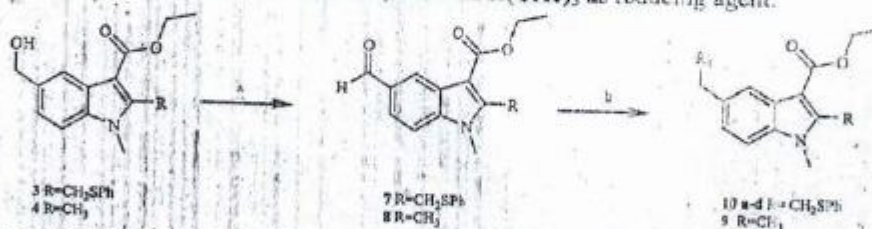


Figure 1. Structural modification on Arbidol, chosen as our lead compound

In addition, to evaluate the role of hydroxyl group of compound 3 and 4 in position 5, a new series of compounds were prepared replacing this group with several aliphatic amines and cyclic amines (Table 1).

Results and Discussion: All the other amines derivatives (23 f-n, 28 a-h) were prepared as reported in Scheme 5 starting from intermediate 3 and 4 respectively, which were oxidized to aldehydes using a solution of pyridinium dichromate in CH_2Cl_2 . Then reductive amination was carried out in dry 1, 2-dichloroethane, in the presence of acetic acid, and $\text{NaBH}(\text{OAc})_3$ as reducing agent.



Reagents and conditions: a) Pyridinium dichromate, CH_2Cl_2 , 1h , r.t.; b) Aliphatic amines, Acetic acid, $\text{NaBH}(\text{OAc})_3$, dry 1,2 dichloroethane, r.t.

Biological Activity of Synthesized Compounds: The effect on the replication of Chikungunya virus of Arbidol and its analogues were tested *in vitro* cells. The cytotoxicity assays were performed in the same cell line. The results are reported in Table 1. Most of the compounds didn't show any inhibitory effect on Chikungunya virus replication. In the alcohol series, no activity was found and only compound 3 showed $\text{EC}_{50} = 56 \text{ mg/mL}$, higher than our lead compound. Four compounds in the amine series (10 a-d) showed an interesting activity when compared to Arbidol, but unfortunately they have very high cytotoxicity in the host cells. It is worthy to note that all these compounds possess a thiophenol moiety in position 2 of the indole nucleus, and when we compared the same compounds in which thiophenol moiety was removed (for example compounds 10 c and 9) it was possible to note absence of effect and cytotoxicity.

Table 1: Anti-CHIKV activities and cytotoxicity of synthesized compounds in vero cells

Comps	X	n	R	R ₁	CC ₅₀	EC ₅₀	SI
Arbidol					83	18.4	4.5
9	H	1	-CH ₃	-N(CH ₂)CH ₂ CH ₂ CH ₂ N(CH ₂ CH ₃) ₂	ND	>258	ND
10a	H	1	-CH ₂ SPh	-N(CH ₂ CH ₃) ₂	21.6	4.16	5.1
10b	H	1	-CH ₂ SPh	-N(CH ₂)CH ₂ CH ₂ CH ₂ N(CH ₂ CH ₃) ₂	2.93	<1.61	1.8
10c	H	1	-CH ₂ SPh	-pyrrolidine	16.6	5.41	3.6
10d	H	1	-CH ₂ SPh	-N-tert-butoxycarbonyl piperazine	15.5	4.3	3.6

CC₅₀ (mg/ml) = 50% Cytostatic/Cytotoxic Concentration (concentration at which 50% adverse effect is observed in the host cells. EC₅₀ (mg/ml) = Effective Concentration (concentration at which 50% inhibition of virus replication is observed. SI = safety index (CC₅₀/EC₅₀). ¹H and ¹³C-NMR's compared with reported literature.¹⁶ This suggested that the introduction of thiophenol moiety is essential for the activity on virus replication but also responsible of cytotoxicity in the host cells. Thus structural modifications are desirable to converting them in sulfoxides as previously reported.¹¹

Conclusion: In conclusion a library of indole Arbidol like derivatives have been designed and synthesized for testing their antiviral activity on chikungunya virus (CHIKV).

Experimental Section:

General procedure for the synthesis of amines derivatives (9)¹⁶ and 10a-d¹⁶

Ethyl-5-[[[4-(diethylamino)-1-methyl-butyl]amino]methyl]-1-methyl-2-methyl-1H-indole-3-carboxylate (9)

Elution with Hexane/Ethyl acetate 7/3.

Nature of compound: Yellow oil; Yield: (0.080 g) 96%.

¹H NMR (300 MHz, CDCl₃): δ 7.99 (s, 1H), 7.21 (s, 2H), 4.35 (q, J = 7.2 Hz, 2H), 3.89 (app q, J = 11.7 Hz, 2H, AB system), 2.70 (s, 3H), 3.62 (s, 3H), 2.36-2.48 (m, J = 7.2 Hz, 7H), 1.36-1.50 (m, 5H), 1.11 (d, J = 5 Hz, 3H), 0.99 (t, J = 7.4 Hz, 6H).

¹³C NMR (75 MHz, CDCl₃): δ 166.2, 140.3, 136.2, 124.4, 123.1, 120.7, 118.7, 111.3, 103.2, 62.8, 61.1, 54.2, 51.8, 49.1, 43.3, 35.6, 25.2, 14.1, 13.4, 5.3.

MS (ESI): m/z = 374.87 [M + H]⁺.

Anal. calcd for C₂₂H₃₅N₃O₂: C, 70.74; H, 9.44; N, 11.25. Found: C, 70.93; H, 9.77; N, 10.87.

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E-Resources And Digital Academic Libraries

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Abstract

Today availability of electronic resources in academic libraries is common. The paper discusses various e-resources available in the academic libraries as well as advantages of electronic resources. Due to growth of IT most of the documents publish in e-format. Publishers are also moving towards e-publishing. There are number of e-books and e-journals available on internet. Now a day's use of e-books in modern libraries cannot be ignored.

Introduction

The main purpose of academic Library is to support education and research. E-resources are digital version of printed material accompanied by extensive hyper linking, apart from textual matters, graphs, charts, illustrations etc. e-resources plays an important role in all types of library throughout the world. Libraries are aggressively switching over to the digital libraries by adding more e-resource to their users. The web revolution had a tremendous impact on libraries with the success of full text online journals and e-books. The users started demanding addition of more e - resources to the libraries. Now a day's libraries have become hybrid libraries in collection development by procuring the e-collections either in the form of CD-ROM or access permissions for the e-resources like e-books, e-journals and data bases. Due to growth of ICT most of the textual documents are available in e-format; publishing companies are also moving rapidly into the digital age.

E-Resources

E - Resources refer to that information which requires computer access and that may either be locally accessed or accessed remotely through the Internet. E-resources are available in HTML & PDF format for online reading. The preferred format for off-line viewing is CD-ROM, e-readers are developed for viewing the e-books and Hardware is no barrier to access e-books, e-resources can be conveniently and comfortably read on any computer starting from pc's to palm tops many of printed books are being converted to e- books subject to copyright restrictions. Now a day's many e-resources are available on web in open source and pay option.

Types of e-resources

1. e-Books
2. e-Journals
3. Patents
4. Conference proceeding
5. Full text data bases.
6. Multimedia products
7. Standard specification
8. Technical Reports
9. Bibliographic data bases
10. e-Reference books
11. Directories
12. Encyclopedias

13. Bibliographical Information sources
14. Dictionaries
15. Yearbooks
16. Current event sources
17. Geographic Information sources

Now a day's students are giving preference to online resources because of its easy access.

E-journals

Journals are primary source of information and very important for researchers. Latest technological innovations are immediately published in journals are brought out on internet and offered on subscription basis. A combined subscription for print as well as e-version is also available on network. Most remarkable aspect of e-journals is that, it retrieves the desired output very fast. Most of the journal publishers are bringing out their current journals directly in e-forms. E-resources are money saving matters. No need to purchase multiple copies. Hence use of e-resources is increasing in all types of libraries over traditional libraries.

Advantages of e-resources

Natrajan has given advantages of e-books in his book entitled e-Libraries: Problems and Perspective.

1. Available as soon or even before the print version is published
2. Accessible via Internet on the computer
3. E-publishing May be less costly than paper
4. Available for 24 hours a day.
5. Economy in maintenance (replacement wear and tear)
6. It is Interactive (Online exchange of ideas by e-mail, interaction with author, allow readers to comment on article that appear in the journals.)
7. It saves printing and mailing costs
8. The content can be reproduced, forwarded, modified and leading to problems with copyright protection and preserving authenticity
9. Space savings to libraries
10. No risk of damage

Importance of E - Resources

E-resources can be stored into hard disk, CD-ROM, DVD-ROM, Pen drive and USB HDD etc. One important features of e -resources are easily available and are searchable as well as modifiable. Uses can search Micro information with the help of keywords and phrases. E-resources need not go under physical processing work and very important thing is it consumes less space in the library.

Use of E - Resources in Academic Libraries

In academic libraries, where parent institution is having PG and doctoral courses, e - resources optimally used by the users, undergraduate students also use information available in electronic form more easily and accurately. Almost all the academic libraries are providing internet access to their users.

Conclusion

E - Resources can't replace print formats yet because only a fraction of scholarly materials is available electronically. E-resources are very good tool for digital academic libraries. Use of e-resources is increasing. Libraries are giving preference to subscribe e-journals and e-books. The need for e-resources in digital libraries has been well established. Management of e- resources is easier in case of digital library. Users are preferring use of e-resources. The development of systematic library services and collection development in a hybrid library i.e. a library of the current times which houses both printed and electronic documents, it reflects growing expectations of the end users in relation to services. E-based information services are essential for research scholars in academic libraries. The transfer of library services to the e-based environment helps the users to find, evaluate and use information effectively. The libraries hold the hands of the users who are moving towards new communication paradigm a shift from face to face human contact to human machine interaction, from paper to electronic delivery, from text centered mode to multimedia and from physical presence to virtual presence.

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Ichthyofaunal Diversity of Harsool Dam Dist. Aurangabad (M.S.) India

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Abstract

Ichthyofaunal studies were carried out during the period, January to December 2013. The present study deals with the ichthyofaunal diversity of Harsool dam Dist. Aurangabad, Maharashtra. The results of present study reveal the occurrence of ichthyofauna belong to 5 orders 07 families, different and 15 species. The Cypriniformes Order was dominated by 11 species followed by Perciformes 3 species, Siluriformes 2 species, Saccobranhidae and Angulidae with one species.

KEYWORDS: ichthyofaunal diversity, Cypriniformes, Harsool dam.

INTRODUCTION

Ichthyofaunal refers to the variety of fish species; depending on context and scale, it could refer to alleles or genotypes within fish population to species of life forms within a fish community and to species or life forms across aqua regimes (Burton et al., 1992). Biodiversity is essential for stabilization of ecosystems, protection of overall environmental quality for understanding intrinsic worth of all species on the earth (Ehrlich and Wilson, 1991). Positive correlations between biomass production and species abundance have been recorded in various earlier studies (Nilkolsky, 1978). The species diversity of an ecosystem is often related to the amount of living, non living and organic matter present in it.

Fishes are one of the most important groups of vertebrate, influencing his life in various ways. Millions of human beings suffer from hunger and malnutrition and fishes form a rich source of food and provide a meal to tide over the nutritional difficulties of man. In addition to serving as an important item of food, fishes provide several by-products to us. Fishes have formed an important item of human diet from time immemorial and are primarily caught for this purpose. Fish diet provides proteins, fat and vitamin A and D. A large amount of phosphorous and other elements are also present in it. They have a good taste and are easily digestible. As there is economic importance and scope of fish and fisheries especially in Maharashtra, it is essential to study distribution and the availability of fish from freshwater reservoirs and tanks (Shinde *et al.*, 2009).

Biodiversity is essential for stabilization of ecosystem, protection of overall quality environment for understanding intrinsic worth of all species on the earth Ehrlich *et. al.*, (1991). Present work was undertaken to study the fish diversity of Harsool dam Aurangabad district. Various indigenous and commercial fishes of economic importance have been noticed and recorded from the said dam.

MATERIALS AND METHODS

Fishes were collected from Harsool Dam, geographical coordination $19^{\circ} 56' 14''$ N and $75^{\circ} 21' 30''$ E Aurangabad, (M.S) India, with the help of local fishermen using different type of nets namely gill nets, cast nets, dragnets, wadap net and Bhorjal. Immediately photographs were taken with help of digital camera.

Fishes were brought to laboratory and preserved in 6% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the 6% formalin solution. While large fishes were giving an incision in their abdomen and preserved.

The Meristic and morphometric characters were measured and identified up to the species level, with the help of standard keys and books (Jayaram, 1999).

RESULTS AND DISCUSSION

In the ichthyofaunal study, 19 species of 12 different genera 7 families and 5 orders were recorded at Harsool Dam, Aurangabad during the period January –December 2012. The Cypriniformes Order was dominated by 11 species followed by Perciformes 3 species, Siluriformes 2 species, Saccobranchidae and Angulidae with one species.

19 fish species representing by 5 orders, cypriniformes was dominant with 11 species, it was dominant group in the assemblage composition in which *Catla-catla*, *Labeo rohita*, *Cirrhinus mrigala*, *cyprinus carpio* and *Rasbora daniconius* were found most abundant. *Hypothalmichthys molitrix* and *Puntius ticto* were found in abundant form. *Puntius stigma*, *Chela bacaila*, *Garra lamta* and *Thynnichthys sandkhol* were found less abundant. Followed by perciformes in which *Channa striatus* and *Channa gaucha* was found abundant form whereas *Channa punctatus* and *Oreochromis mossambica* were found less abundant form Followed by siluriformes in which *Clarias batrachus*, and *Ompak bimaculatus* both were found less abundant form where as Saccobranchidae and Anguliformes in which one species reported that is *Heteropneustus fossilis* and *Anguila bengalensis* respectively was found rare (Table No. 1).

Seasonally, fishes showed dominance during summer season and followed by winter. During summer, increasing temperature enhances the rate of decomposition due to which the water became nutrient rich similarly due to concentration followed by evaporation in summer season the nutrient concentration increases and abundant food present in the form of phytoplankton, zooplankton and micro-organism to fishes that's why high fish population density during the summer season could be related to stable hydrological factors and low water level, while low density during the winter season attributed to heavy flood and fresh water inflow. They were resumed again in winter due to dilution and high water level.

In the present study, Ichthyofaunal diversity has been studied under seven family viz., Cyprinidae, Channidae, Cichlidae, Clariidae, siluridae, Cyprinidae, and Angulidae. Among the collected species family Cyprinidae showed its dominance in Harsool Dam followed by Channidae, Cichlidae, siluridae, Cyprinidae and Angulida. Among the collected Species order Cypriniformes was most dominant constituting followed by order Perciformes, Siluriformes, saccobran chidethen Anguli formes fish species.

The sequence of dominance of encountered Order is as follows:

Cypriniformes (57.89%) > Persiformes (21.05%) > Siluriformes (10.5%) > Saccobranchidae (5.26%) = Anguliformes (5.26%)

The sequence of dominance of encountered families is as follows:

Cyprinidae (57.89%) > Channidae (15.79%) > cichilidae (5.26%) = Saccobranchidae (5.26%) = Siluridae (5.26%) = Cyprinidae (5.26%) = Angulidae (5.26%).

Bhalerao (2012) recorded 15 species of fishes from Kasar Sai dam, Hinjewadi, Pune in Maharashtra. Shinde *et al.* (2009) recorded 15 species of 12 different genera 4 families and 3 orders were recorded from the Harsool- Savangi dam. Chintaman Khune (2012) recorded 40 fish species belonging to 15 families, 06 ordered and 23 genera of which cypriniformes was dominant and order beloniformes less dominant with two species in Chulbandh reservoir dist. Gondia (MS) India. Umbarhande *et al.* (2016) recorded 23 fish species under 21 genus 12 families and 07 orders were recorded. Cyprinidae family was dominant with 11 fish species. Sonawane and Barve (2015) recorded 23 species of 20 different genera, 10 families and 8 orders from the Lower dudhana dam Dist. Parbhani (M.S.) India of which Cypriniformes was dominant with 09 species. Pawara and Patel (2014) have reported 165 fish species in which Family cyprinidae was dominant with 87 fish species from Maharashtra. Rankhamb (2011) reported the occurrence of 26 fish species belonging to 5 orders, 7 families and 15 genera in Godavari River at Mudgal. The members of the order Cypriniformes were dominated by 15 species, followed by Siluriformes with 5 species, Channiformes with 4 species and Mastacembeliformes and Perciformes 1 species each.

In the field of ichthyology there is valuable contribution by many workers (Ashashree *et al.*, 2008; Brinda *et al.*, 2010; Jayabhaye and Lahane 2013, Humbe *et al.*, 2014; sonawane and Barve 2015,

Conclusion

The present study represents fish's diversity of Harsool dam, Aurangabad (M.S) India.

The summer and winter season shows different seasonal fluctuations in fish population density.

Maximum population densities of fish were recorded in summer and minimum in winter.

The fish diversity indicates that the pond under taken for study have a well balanced Fish community. The work will provide future strategies for development and biodiversity conservation in Harsool Dam.

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Table 1: - The ichthyofaunal diversity of Harsool dam (January – December 2012).

Order	Family	Scientific name	Common name	Groups of food fish	Status
Cypriniformes	Cyprinidae	<i>Catla-catla</i> (Hamilton)	Catla	Carps	***
		<i>Labeo-rohita</i> (Hamilton)	Rohu	Carps	***
		<i>Cyprinus carpio</i> (Linnaeus)	Common carp	Carps	***
		<i>Rasbora daniconius</i> (Ham - Buch)	Black line Rasbora	Food fish	***
		<i>Hypothalmichthys molitrix</i> (Valenciennes)	Silver carp	Food fish	**
		<i>Puntius ticto</i> (Hamilton)	Ticto	Miscellaneous fishes	**
		<i>Puntius stigma</i> (Hamilton)	Stigma	Miscellaneous fishes	*
		<i>Chela bacaila</i> (Ham - Buch)	Chela	Food fish	*
		<i>Cirrhinus mrigala</i> (Hamilton)	Mrigala	Carps	***
		<i>Garra lamta</i> (Hamilton)	Garra	Food fish	*
		<i>Thynnichthys sandkhol</i> (sykes)	Sandkhol carp	Food fish	*
		Perciformes	Channidae	<i>Channa striatus</i> (Bloch)	Banded snake head
<i>Channa punctatus</i> (Bloch)	Spotted snake head			Live fish	*
<i>Channa gaucha</i>	Dhoke			Predatory fish	***
Cichlidae	<i>Oreochromis mossambica</i> (Hamilton)		Tilapia	Food fish	*
Siluriformes	Clariidae	<i>Clarias batrachus</i> (Linnaeus)	mangur /cat fish	Live fish	*
	Siluridae	<i>Ompak bimaculatus</i>	Pobda	Food fish	*

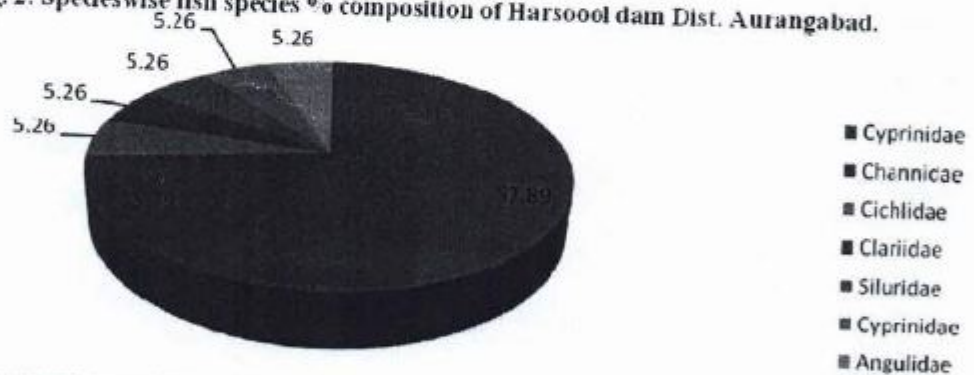
Saccolbranchidae	Cyprinidae	<i>Heteropneustus fossilis</i>	magur	Food fish	#
Anguiliformes	Anguilidae	<i>Anguila bengalensis</i>	Anguila	Anguila	#

*** Most abundant. ** Abundant, * less abundant # Rare

Fig. 1. Ordewise fish species % composition of Harsoool dam Dist. Aurangabad.



Fig. 2. Specieswise fish species % composition of Harsoool dam Dist. Aurangabad.



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Digital India: An Emerging Economy

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Abstract-It is a well-known fact that digital India is the outcome of many innovations and technological advancements. These transform the lives of people in many ways and will empower the society, economy in a pretty better manner. The Digital India drive is a dream project of the Indian Government to remodel India into a Knowledgeable, economically strong, digitally empowered society, with good governance for citizens by bringing synchronization and coordination in public accountability, digitally connecting and delivering the government programs and services to mobilize the capability of information technology across government departments. The 'Digital India' programme, an initiative of honourable Prime Minister Mr.NarendraModi, will emerge new progressions in every sector of economy and generates innovative endeavours for Next, and this campaign started by PM is very impressive in economic development. So, Digital India is a step by the government to inspire and connect Indian Economy to such a knowledge savvy world. The program motto is "Power To Empower".The program targets to make Government services available to people digitally and enjoy the benefit of the newest information and technological innovations, and provide all services to people in paperless mode. The program run under The Ministry of Electronics and Information Technology. Hence, an attempt has been made in this paper to understand Digital India – as a campaign where technologies and connectivity will come together to make an impact on all aspects of e-governance and improve the quality of life of citizens.

Keywords - *Digital India, Digital Technology, E-governance, Innovations, Paperless.*

I. INTRODUCTION: Digital India is an ambitious programme to transform India into a digitally empowered economy. Our honourable Prime Minister Mr.NarendraModi has introduced this programme from 1 July 2015. The motive behind this concept is to build participative, transparent & responsible system. It focuses on providing high speed internet services to its citizens & make services

available in relative both for online & mobile platform. This programme has been envisaged and coordinated by the department of electronics and information technology in collaboration with central and state governments. Digital India mission's main aim is to bridge the connectivity gap between rural and urban areas. Digitization is an inclusive technique of preservation and access to knowledge contents, also it changes the ways in which collections are used and accessed. It is a social transformation started by the massive adoption of digital technologies to generate process, store and manage digital information. An attempt has been made in this paper to understand Digital India as a campaign where technologies to connectivity will come together for good governance. Digital India is set of revolutionise the nation through electronic delivery of services including e-education, e-healthcare and technology for planning.

II. OBJECTIVES & IMPORTANCE

1. Providing information on government policies, services and programmes to citizens.
2. Focuses on achieving the government stated target of zero imports.
3. To provide transparency in economic transactions and proper regulatory environment.

III. PROJECTS UNDER DIGITAL INDIAPROGRAMME

1. Digital Locker System: - aims to minimize the usage of physical documents and enable sharing of e-documents across agencies, it provide safe custody of documents electronically.
2. Swachh Bharat Mission: - used by people and government organizations for achieving the goals of swachhbharat mission.
3. Universal Mobile Access: - in the coming years, network technologies like 3G, 4G and upcoming 5G will storm the speed. General public will access the online government services with the help of handheld devices. Nation is ready to be well-connected, efficient and more productive in every aspect.
4. The Online Registration System: - this application provides online registration, payment of fees and appointment, online diagnostic report etc.

5. Bharat Net:- a high speed digital highway to connect all 2.5 lakh gram panchayats of the Country.

6. National Scholarship Portal: - this initiative aims at making the scholarship process easy. From submitting the application, verification, sanction, everything related to government scholarship can be done on this single portal online.

7. Electronics Development Fund: - this policy aims to promote research and development, innovation and product development.

8. Ekranti: - this kranti will fully focused on digital knowledge programme where education, health, rights, financial and many more services will be delivered on very high bandwidth. Physical boundaries no longer are a limitation when almost everyone and everything is a digital.

9. Electronics Manufacturing: - this milestone will create a huge base for electronics manufacturing in India with the aid of digital technologies and skills. The empowerment of manufacturing through the internet of things will enable intelligent workshops that demonstrate data driven operational excellence and decentralised production control system within and beyond the physical factory walls.

10. Information for All: - websites and mobile apps will convey data and realistic participation and through social media. Everything is connected through virtual networks. Swift work flow and no delays due to wait in queues.

India ranks 91 on the networked readiness index 2016, a key component of the world economic forum's. The global information technology report 2016. This report assesses the factors, policies and institutions that enable a country to fully leverage ICT for increase prosperity and crystalizes them into a global ranking of network readiness. Challenges in the way of digital India are:- Telecom infrastructure, IT infrastructure in the form of apps, software is insufficient. Illiteracy level is still high in India and similar share of youth is not enrolled in secondary education. Only 15 out of 100 household have access to the internet. "Universal access" does not, however, guarantee a working network. Even in its major cities, India's mobile network so stressed that many times its broken, with call failures and drop a common complaint. Integration of technology and language is one of the main challenge the mission would face in its implementation. Cyber

security is a major issue in the way of digital payments a wider adoption of digital payments will invariably change the dimensions of risk, crime and security as well. Digital pickpockets pose a range of threats to individuals, institutions and economic stability itself.

Today digitalization can be seen as a tool of transformation which extends beyond over lifestyle to the way we transact across all sectors, be this communication, media, healthcare, retail and manufacturing. We are increasingly seeing the use of digital technology. The cabinet approved a blueprint for the digital India programme, which envisages all government services be delivered electronically by 2018. It will also provide high speed internet as a core utility down to the gram panchayat level. Actual programmes and road maps like Bharat Net and National Optic Fibre Network (NOFN) have delivered quantifiable objectives and milestones. The fibre optic cables and the trenching have been covered around 80000 km during this time while optic fibre has reached till 24000 GPS. There are many projects under e-governance which are doing really well. E-passport, online land registration projects like Bhumi in Karnataka, ration cards and food distribution services in some states are good examples. Land registration, college admissions, commercial tax department, driving licences, vehicle registration certificates and processing of intra-department files at the state secretariat have been digitised. Various projects like DigiLocker, MyGov.in, e-Sign framework, Swachh Bharat Mission mobile app, National Scholarship Portal, e-Hospital, Digitize India platform, Bharat Net, Electronic Development Fund, Centre of Excellence on Internet of Things (IOT) have been formed under the Digital India programme.

IV. IMPACT ON EMPLOYMENT

The introduction and advancement in Information and Communication Technology has a greater impact on employment, as it creates more jobs in the IT sector, which may be related to software development, Outsourcing, hardware manufacturing and other IT related businesses. In addition, the impact of these technologies has been realized on other service sectors, like in trade, industry, financial and health care services.

V. ECOLOGICAL IMPACTS OF DIGITIZATION:

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EFFECT OF INTEGRATED EXERCISE TRAINING PROGRAM ON SELECTED HEALTH RELATED AND SKILL RELATED PHYSICAL FITNESS COMPONENTS OF INTERMEDIATE FENCING PLAYERS OF LATUR DISTRICT

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ABSTRACT:

Context: An intermediate fencing player is the one who has learnt the basic stance, stepping, basic skills and is going through process of becoming an elite fencing player. Researcher feels that more focus should be given on selected health related and skill related fitness components through integrated training program which will help players to improve specific health and skill related fitness components which are required to perform at elite level. *Aims:-* The review of literature does not reveal any studies investigating effect of integrated training program consist of combination of variety of speed, agility, strength and power exercises along with yoga session. So the researcher intends to find the effect of this training on intermediate fencing players of Latur DISTRICT. *Settings and Design:-* Fifty intermediate fencing players were randomly assigned to experimental (n=25) and control (n=25) groups. The experimental subjects underwent an integrated exercise training program consist of strength, speed, agility, power & yoga for six days in a week for twelve weeks whereas control group went through regular fencing training. *Materials and Method:-* Standardized fitness tests were conducted on both groups pre and post training program to assess the selected health and skill related fitness components of the experimental and the control group. *Statistical Analysis Used:-* Data were analyzed by using Paired T-Test test. *Results:-* The results revealed that effect of integrated exercise training program helped to improve muscular strength, speed, agility, flexibility and power as compared to control group. *Conclusion:-* The findings conclude that effect of integrated exercise training program helped to improve muscular strength, speed, agility and power of intermediate fencing players.



KEY WORD: Muscular strength, speed, power, agility and yoga.

INTRODUCTION :-

Fencing was on the programme of the Games of the I Olympiad in Athens in 1896, and has been on the programme ever since. The different types of weapon used by men are the foil (since 1896), the sabre

RESEARCH DESIGN:(Non-equivalent control groups pretest/post-test)

The design of the experiment had been planned in three phase's viz., Phase – I: Pre-test, Phase – II: Training or Treatment, and Phase – III: Post-test. The subjects in the experiment were divided into two groups one experimental group and one control group; each group consisted of 25 subjects. Experimental group was given integrated exercise training program consist of strength, speed, agility, power and yoga for the period of 12 weeks.

Selected Variables: Muscular strength, speed, agility, flexibility and power.

Tools/ Instruments: The following criterion measures were included to record the reading of various test items of motor fitness.

- The score of standing broad jump measured in meter.
- The score of standing vertical jump measured in centimeter.
- The score of shuttle run measured in seconds.
- The score of 30 meter acceleration test measured in seconds.
- The score of Sit & Reach Flexibility Test measured in centimeter.
- The score of Medicine ball throw Test measured in meter.

Treatment: The Integrated Exercises Training Program consist of combination of strength, speed, agility, power exercises and yoga was imparted to the experimental group for 60 minutes for six days in a week except Sundays and holidays.

Training Schedule:

Integrated Exercises Training Program

Day	Training	Time
Monday	Body Weight + Agility	60 Minutes
Tuesday	Power + Speed	60 Minutes
Wednesday	Strength + Speed + Agility	60 Minutes
Thursday	Games + Yoga	60 Minutes
Friday	Strength + Reaction Time	60 Minutes
Saturday	Speed + Agility	60 Minutes

Statistics: Since, there were two groups for this experimental study viz. Experimental and Control group, wherein the researcher has decided to compare Mean Scores of selected Health Related Physical Fitness and Skill related physical fitness Variable (speed, agility, power, muscular strength and flexibility) in order to see the effect integrated exercise training program. Paired t-test was appropriately used for the data analysis.

(since 1896) and the epee (since 1900). Women competed for the first time at the Games of the VIII Olympiad in Paris in 1924. The foil was the only weapon used by women until the 1996 Games in Atlanta, which saw the introduction of the women's epee. The women's sabre featured on the programme for the first time at the Games in Athens in 2004.

The present study is aimed at developing selected health and skill related fitness components of intermediate fencing players in order to become an elite player. The intermediate fencing player is the one who has developed interest for the game and has learnt basic skills, stance, stepping as well as basic rules and regulations of the game.

Physical fitness is a general state of health and well-being and, more specifically, the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, exercise, hygiene and rest. It is a set of attributes or characteristics seen in people and which relate to the ability to perform a given set of physical activities. Health-related fitness is a physical state encompassing cardio respiratory endurance, muscular strength and endurance, flexibility, and body composition are defined respectively whereas skill related physical fitness consists of power, speed, agility, reaction time, coordination and balance.

An integrated training program is combination of different exercises and drills focused upon developing components or variables which the researcher intends to find out. In other words an integrated training refers to a training program that incorporates, or integrates multiple types of exercise together into a single program. So the researcher has included combinational exercises and drills in this integrated training program which is focused on developing fencing specific movements and fitness.

OBJECTIVES OF THE STUDY:

- To compare mean scores of standing broad jump of the experimental group and control group.
- To compare mean scores of standing vertical jump of the experimental group and control group.
- To compare mean scores of medicine ball throw test of the experimental group and control group.
- To compare mean scores of 10 meter Shuttle run test of the experimental group and control group.
- To compare mean scores 30 meter acceleration test of the experimental group and control group.
- To compare mean scores of sit & reach test of the experimental group and control group.

HYPOTHESES OF THE STUDY:

- H_{01} : There is no significant difference in mean scores of standing broad jump of the experimental group and control group.
- H_{02} : There is no significant difference in mean scores of standing vertical jump of the experimental group and control group.
- H_{03} : There is no significant difference in mean scores of medicine ball throw test of the experimental group and control group.
- H_{04} : There is no significant difference in mean scores of 10 meter Shuttle run test of the experimental group and control group.
- H_{05} : There is no significant difference in mean scores of 30 meter acceleration test of the experimental group and control group.
- H_{06} : There is no significant difference in mean scores of sit & reach test of the experimental group and control group.

MATERIALS AND METHOD

Population and Sampling: Fifty (n=50) Intermediate fencing players were identified as subjects from Latur district.

RESULTS AND DISCUSSION

Table no. 1
Sit & Reach Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-1.472	-12.89	24		two-tailed	<.0001

From table no. 1 it is seen that there is a significant difference of -1.472 in the mean scores of sit & reach test of the experimental group. The calculated t score is -12.89 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 2
Sit & Reach Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-0.24	-1.81	24		two-tailed	0.041418

From table no. 2 it is seen that there is no significant difference between the mean scores of sit & reach test of the control group. The calculated t score is -1.81 and the degree of freedom is 24. The calculated one-tailed is 0.041418 and two tailed score is 0.082836 in the control group.

Table no. 3
Standing Broad Jump Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-0.0764	-7.94	24		two-tailed	<.0001

From table no. 3 it is seen that there is a significant difference of -0.0764 in the mean scores of SBJ test of the experimental group. The calculated t score is -7.94 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 4
Standing Broad Jump Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-0.014	-2.03	24		two-tailed	0.026791

From table no. 4 it is seen that there is no significant difference between the mean scores of standing broad jump test of the control group. The calculated t score is -2.03 and the degree of freedom is 24. The calculated one-tailed is 0.026791 and two tailed score is 0.053582 in the control group.

Table no. 5
Standing Vertical Jump Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-2.136	-6.76	24		two-tailed	<.0001

From table no. 5 it is seen that there is a significant difference of -2.136 in the mean scores of SVJ test of the experimental group. The calculated t score is -6.76 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 6
Standing Vertical Jump Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-0.24	-1.3	24		two-tailed	0.102974

From table no. 6 it is seen that there is no significant difference between the mean scores of standing vertical jump test of the control group. The calculated t score is -1.3 and the degree of freedom is 24. The calculated one-tailed is 0.102974 and two tailed score is 0.205948 in the control group.

Table no. 7
Medicine Ball Throw Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	
-0.2308	-5.65	24		two-tailed	< .0001

From table no. 7 it is seen that there is a significant difference of -0.2308 in the mean scores of medicine ball throw test of the experimental group. The calculated t score is -5.65 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 8
Medicine Ball Throw Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	
0.0096	+1	24		two-tailed	0.1636435

From table no. 8 it is seen that there is no significant difference between the mean scores of medicine ball throw test of the control group. The calculated t score is +1 and the degree of freedom is 24. The calculated one-tailed is 0.1636435 and two tailed score is 0.327287 in the control group.

Table no. 9
Shuttle Run Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	
0.284	+3.95	24		two-tailed	< .0001

From table no. 9 it is seen that there is a significant difference of 0.284 in the mean scores of shuttle run test of the experimental group. The calculated t score is +3.95 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 10
Shuttle Run Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	
				0.3142915	

0.004	+0.49	24		two- tailed	0.628583
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From table no. 10 it is seen that there is no significant difference between the mean scores of medicine ball throw test of the control group. The calculated t score is +0.49 and the degree of freedom is 24. The calculated one-tailed is 0.3142915 and two tailed score is 0.628583 in the control group.

Table no. 11
30 meter Acceleration Test (Experimental Group)

Mean _a - Mean _b	t	df	p	one-tailed	< .0001
0.1376	+6.86	24		two- tailed	<.0001

From table no. 11 it is seen that there is a significant difference of 0.1376 in the mean scores of 30 meter acceleration test of the experimental group. The calculated t score is + 6.86 and the degree of freedom is 24. The calculated one-tailed and two tailed score is 0.001 in the experimental group.

Table no. 12
30 meter Acceleration Test (Control Group)

Mean _a - Mean _b	t	df	p	one-tailed	0.180816
-0.0056	-0.93	24		two- tailed	0.361632

From table no. 12 it is seen that there is no significant difference between the mean scores of medicine ball throw test of the control group. The calculated t score is -0.93 and the degree of freedom is 24. The calculated one-tailed is 0.180816 and two tailed score is 0.361632 in the control group.

CONCLUSION

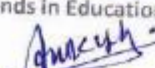
Effect of Integrated exercise training program consist of twelve weeks of combination of strength, power, speed , agility and yoga intervention has potential benefits to improve Muscular strength, power, speed, agility and flexibility of intermediate fencing players of Latur DISTRICT.

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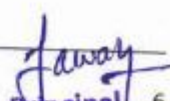
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