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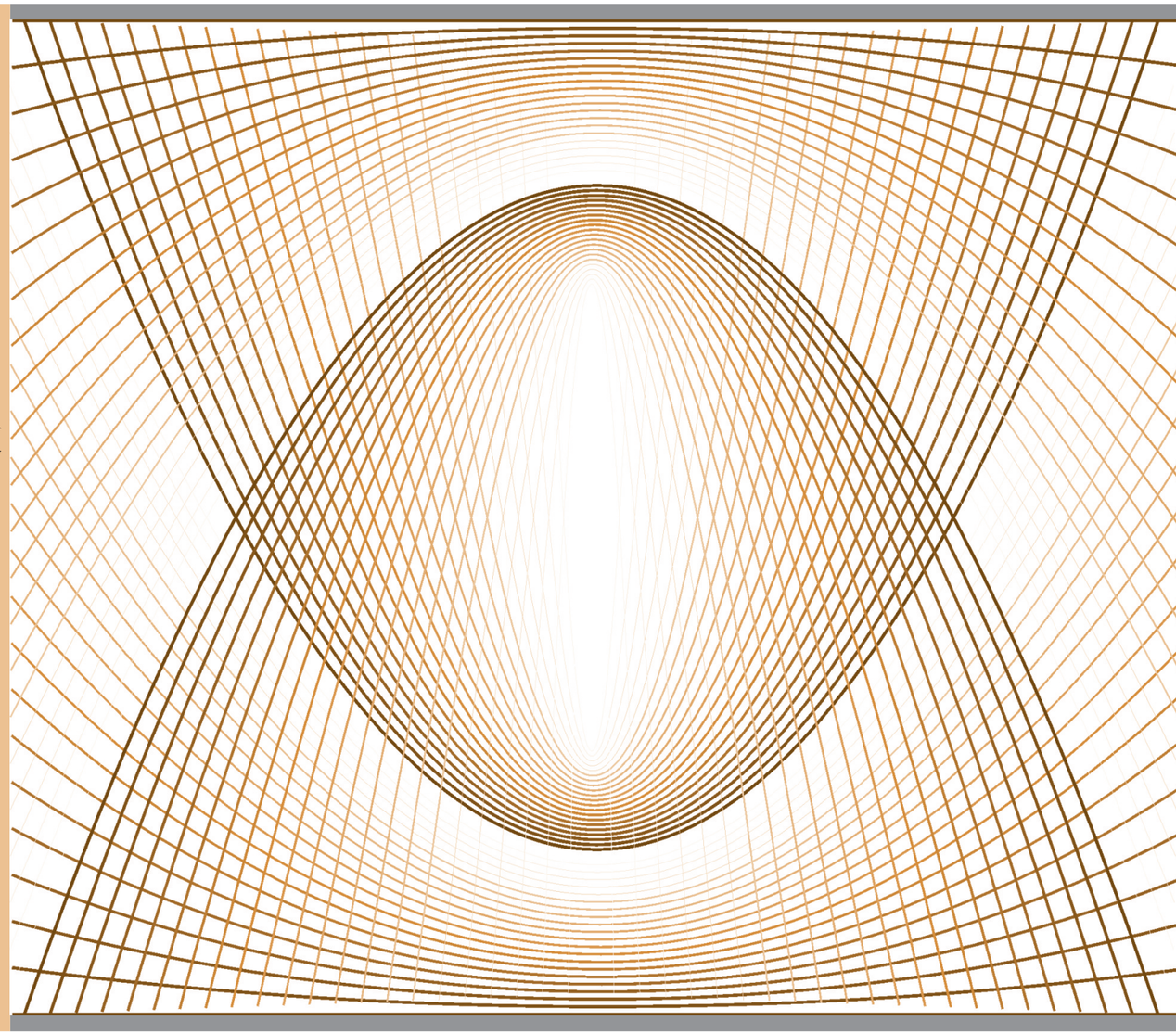

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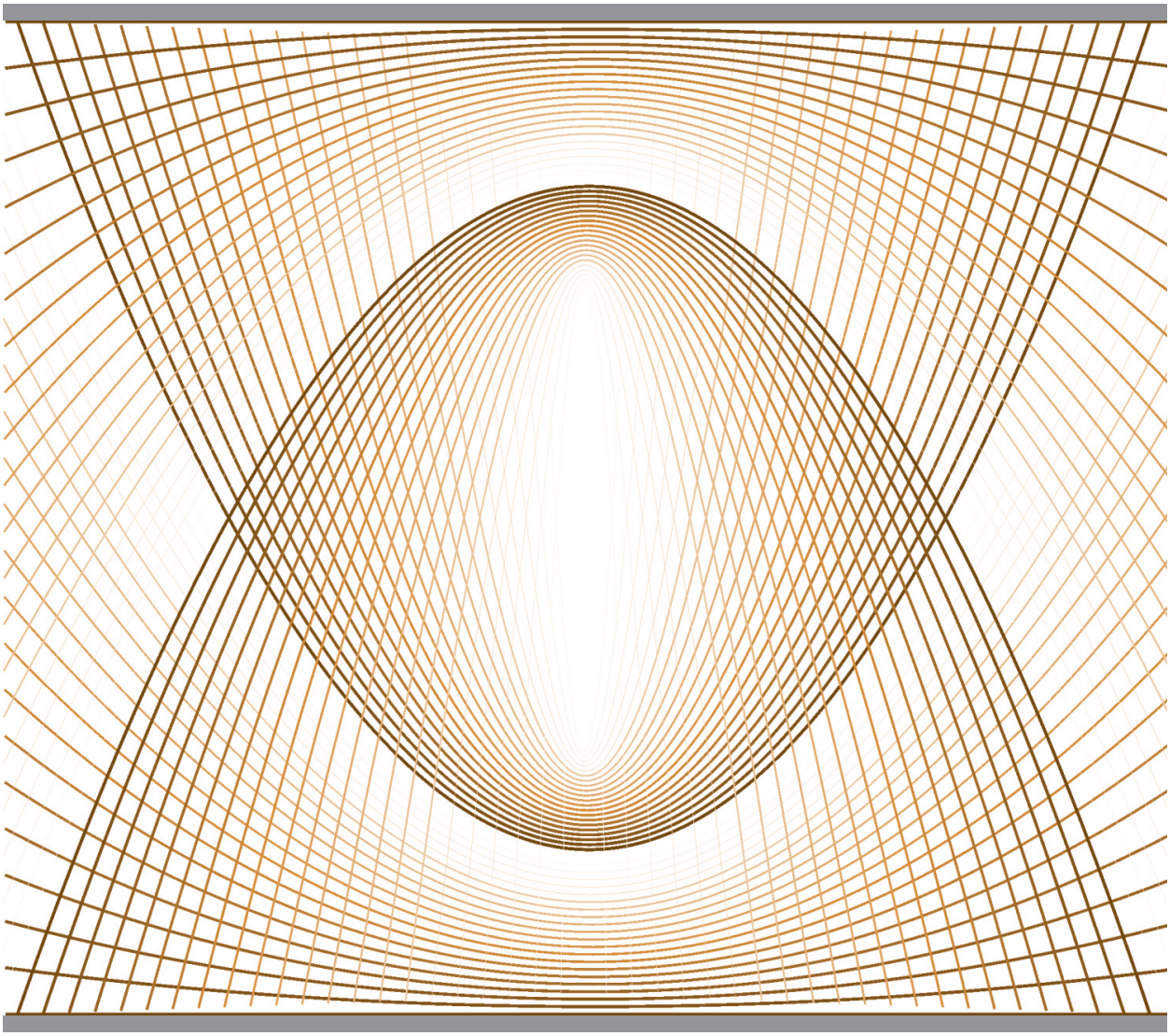

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CONTENTS

Association Rules for Quantitative Data Mining

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Abstract: Detatiled elaborations are presented for the idea on two-step frequent itemsets Apriori Algorrithm of Association Rules. over the years, a variety of algorithms for finding frequent item sets in very large transaction databases have been developed. The problems of finding frequent item sets are basic in association rule mining, fast algorithms for solving problems are needed. This paper presents an efficient version of apriori algorithm for mining association rules in large databases to finding maximum frequent itemset at lower level of abstraction. We propose a new, fast and an efficient algorithm with single scan of database for mining complete frequent item sets. To reduce the execution time and increase throughput in new method. Our proposed algorithm works well comparison with general approach of improved association rules. Apriori is the best-known algorithm to mine association rules. It uses a breadth-first search strategy to counting the support of itemsets and uses a candidate generation function which exploits the downward closure property of support. An improved method is called Improved Apriori Algorithm is brought forward owing to the disadvantages of Apriori Algorithm. Moreover,based on Improved Apriori Algorithm,data mining for market-basket analysis is carried out for the relationship between customers' transactions recurrences and products& attributes by making use of SQL Server 2005Analysis Services.
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Key words: Data Mining, Apriori Algorithm, Improving Apriori Algorithm, Market Basket .

1. Introduction

In data mining, **association rule learning** is a popular and well researched method for discovering interesting relations between variables in large databases. Piatetsky-Shapir analyzing and presenting strong rules discovered in databases using different measures of interestingness. Data mining, or the efficient discovery of interesting patterns from large collections of data, has been recognized as an important area of database research. The most commonly sought patterns are association rules. Association rule mining is an important data mining technique to generate correlation and association rule. The problem of mining association rules could be decomposed into two sub problems, the mining of large itemsets (i.e. frequent itemsets) and the generation of association rules. Based on the concept of strong rules, Agrawal et al introduced association rules for discovering regularities between products in large scale transaction data recorded by point-of-sale (POS) systems in supermarkets. By using Association rules algorithm to perform market-basket analysis on customers' transactions and also can learn which products are commonly purchased together , and how likely a particular product is is to be purchased along with another. For example, the rule $\{milk,cake\ mix\} \Rightarrow \{frosting\}$ found in the sales data of a supermarket would indicate that if a customer buys milk and cake mix together, he or she is likely to also buy frosting. Such information can be used as the basis for decisions about marketing activities such as, e.g., promotional pricing or product placements. In addition to the above example from market basket analysis association rules are employed today in many application areas including Web usage mining, intrusion detection and bioinformatics.

Market-Basket data mining based on Quantitative Association Rule

In data mining ,association rule learning is a popular and well researched method for discovering interesting relations between variables in large databases. Many algorithms for generating association rules were presented over time. Some well known algorithms are Apriori ,DHP and FP-Growth .Apriori is the best known algorithm to mine strong association rules.

Apriori Algorithm

The problem of association rule mining is defined as: Let $I = \{i_1, i_2, \ldots, i_n\}$ be a set of *n* binary attributes called items. Let $D = \{t_1, t_2, \ldots, t_m\}$ be a set of

transactions called the *database*. Each transaction in *D* has a unique transaction ID and contains a subset of the items in *I*. A *rule* is defined as an implication of the form $X \Rightarrow Y$ where $X, Y \subseteq I$ and $X \cap Y = \emptyset$. The sets of items (for short *itemsets*) *X* and *Y* are called *antecedent* (left-hand-side or LHS) and *consequent* (right-hand-side or RHS) of the rule respectively.

To illustrate the concepts, we use a small example from the supermarket domain. The set of items is *I* = {milk,bread,butter,beer} and a small database containing the items (1 codes presence and 0 absence of an item in a transaction) is shown in the table to the right. An example rule for the supermarket could be $\{\text{butter}, \text{bread}\} \Rightarrow \{\text{milk}\}$ meaning that if butter and bread is bought, customers also buy milk.

Example Of Database with 4 items and 5 transactions.

Transaction Id	Milk	Bread	Butter	Beer
1	1	1	0	0
2	0	0	1	0
3	0	0	0	1
4	1	1	1	0
5	0	1	0	0

To select interesting rules from the set of all possible rules, constraints on various measures of significance and interest can be used. The best-known constraints are minimum thresholds on support and confidence.

- The *support* supp(*X*) of an itemset *X* is defined as the proportion of transactions in the data set which contain the itemset. In the example database, the itemset {milk,bread,butter} has a support of1 / 5 = 0.2 since it occurs in 20% of all transactions (1 out of 5 transactions).
- The *confidence* of a rule is defined $\text{conf}(X \Rightarrow Y) = \text{supp}(X \cup Y)/\text{sup}$. For example, the rule $\{\text{milk}, \text{bread}\} \Rightarrow \{\text{butter}\}$ has a confidence of 0.2 / 0.4 = 0.5 in the database, which means that for 50% of the transactions containing milk and bread the rule is correct.
- Confidence can be interpreted as an estimate of the probability $P(Y \mid X)$, the probability of finding the RHS of the rule in transactions under the condition that these transactions also contain the LHS.
- The lift of a rule is defined as $\text{lift}(X \Rightarrow Y) = \frac{\text{supp}(X \cup Y)}{\text{supp}(Y) \times \text{supp}(X)}$ or the ratio of the observed support to that expected if X and Y were independent. The rule $\{\text{milk}, \text{bread}\} \Rightarrow \{\text{butter}\}$ has a lift of $\frac{0.2}{0.4 \times 0.4} = 1.25$.
- The conviction of a rule is defined as $\text{conv}(X \Rightarrow Y) = \frac{1 - \text{supp}(Y)}{1 - \text{conf}(X \Rightarrow Y)}$. The rule $\{\text{milk}, \text{bread}\} \Rightarrow \{\text{butter}\}$ has a conviction of $\frac{1 - 0.4}{1 - .5} = 1.2$, and can be interpreted as the ratio of the expected frequency that X occurs without Y (that is to say, the frequency that the rule makes an incorrect prediction) if X and Y were independent divided by the observed frequency of incorrect predictions. In this example, the conviction value of 1.2 shows that the rule $\{\text{milk}, \text{bread}\} \Rightarrow \{\text{butter}\}$ would be incorrect 20% more often (1.2 times as often) if the association between X and Y was purely random chance.
- The property of succinctness(Characterized by clear, precise expression in few words) of a constraint. A constraint is succinct if we are able to explicitly write down all Item-sets,that satisfy the constraint.

Example : Constraint C = S.Type = {NonFood}
Products that would satisfy this constraint are for ex. {Headphones,Shoes,Toilet paper}

Process

Association rules are usually required to satisfy a user-specified minimum support and a user-specified minimum confidence at the same time. Association rule generation is usually split up into two separate steps:

1. First, minimum support is applied to find all *frequent itemsets* in a database.
2. Second, these frequent itemsets and the minimum confidence constraint are used to form rules.

Notation and Basic Concepts

The most common frame-work in the association rule generation is the "Support-Confidence" one. In [13], authors considered another frame-work called correlation analysis that adds to the support-confidence. In this paper, they combined the two phases (mining

frequent itemsets and generating strong association rules) and generated the relevant rules while analyzing the correlations within each candidate itemset. This avoids evaluating item combinations redundantly. Indeed, for each generated candidate itemset, they computed all possible combinations of items to analyze their correlations. At the end, they keep only those rules generated from item combinations with strong correlation. If the correlation is positive, a positive rule is discovered. If the correlation is negative, two negative rules are discovered.

Let _ = {*i*1, *i*2 … *im*} be a universe of items. Also, let *T* = {*t*1, *t*2 …tn} be a set of all transactions collected over a given period of time. To simplify a problem, we will assume that every item *i* can be purchased only once in any given transaction *t*. Thus *t* _ _ ("t is a subset of omega"). In reality, each transaction *t* is assigned a number, for example a transaction id (TID).

Support

The *support* of an itemset is the fraction of the rows of the database that contain all of the items in the itemset. Support indicates the frequencies of the occurring patterns. Sometimes it is called *frequency*. Support is simply a probability that a randomly chosen transaction *t* contains both itemsets *A* and *B*.

Confidence

Confidence denotes the strength of implication in the rule. Sometimes it is called *accuracy*. Confidence is simply a probability that an itemset *B* is purchased in a randomly chosen transaction *t* given that the itemset *A* is purchased In general, a set of items (such as the antecedent or the consequent of a rule) is called an itemset. The number of items in an itemset is called the length of an itemset. Itemsets of some length k are referred to as k-itemsets. Generally, an association rules mining algorithm contains the following steps:

Quantitative rule mining approaches

Adaptation of the APRIORI algorithm for mining quantitative association rules was identified shortly after the introduction of APRIORI algorithm, the necessity for quantity in mining association rules was first identified in [14]. It proposed rules of the form x=qx=>y=qy i.e. it associated a single quantity q to the antecedent and the consequent. This was done by decomposition of one quantitative attribute into several binary attributes. In almost all works dealing with mining quantitative attributes, discretization is considered as the tool for reducing the time complexity associated with mining quantitative association rule mining algorithms as the number of quantities can be infinite. Discretization was first proposed in [16]. Mere reduction of quantitative values into Boolean values was also proposed by some authors [11][15]. In [7] it was argued that discretization leads to information loss and hence completely omitting discretization step in mining QAR was proposed. It proposed a representation of the rules based on half-spaces. But the rules generated with such method are different from the classical rules and their understandability is questioned. A new measure of quality for mining association rules is proposed in [9]. Here a new kind of rule called ordinal association rule is used to mine QAR, it removes the step of discretization and complete disjunctive coding and aims at obtaining variable discretization of numerical attributes. Usage of statistical values, like mean as the measure of quality for mining quantitative association rules was proposed in [8] and [12]. The time complexity of QAR mining increases exponentially as the number of possible attributes values grows. This time consumption is another important and discussed issue addressed mainly in [12] and [13]. Quantitative attributes result in lots of redundant rules, most algorithms generate rules that provide almost the same identical information. Such redundancy issue has been partially mentioned in [10], where optimized support and confidence measures are defined and used.

Improved Apriori Algorithm

In Apriori algorithm all the candidate itemsets with the same length must be stored in the memory ,which results in a waste of space. To generate large itemsets, the database passed as many times as the length of the longest large itemsets. Namely, the database is scanned and the support of each candidate itemsets is counted after the new candidate itemsets are generated , which results in a waste of time for large database. This is the performance bottleneck of Apriori Algorithm.

The basic idea of Improved Apriori Algorithm is proposed according to the above deficiencies. In the Improved algorithm , which is fundamentally different from Apriori , we need not store all candidate itemsets in the memory and pass over the database only once. Find out all the high frequency 1-diamensional data itemsets L_1 and then L_1 is used to identify all the high frequency 2-diamensional data itemsets L_2, what's more , use L_2 to find C_2 , the rest may be deduced by analogy until no new high frequency itemset exist. Te realization from L_{k-1} to L_k is connecting L_{k-1} and its own to generate a candidate set of k-dimensional set of data itemsets, denoted by C_k ,and then counting the frequency of C_k's data itemsets, discarding low-frequency data itemsets, forming L_k . The connecting process is taking out p and q from L_{k-1}. If p and q are the same as the pre-k-2 items, make a connection (S. Muggleton 1992). The Improved function apriori-gen is as follows.

Procedure
apriori_gen (L_{k-1}:frequent (k-1)_item sets; minsup)
for each itemset pϵ L_{k-1}
for each itemset qϵ L_{k-1}
if ($p.item_1$=$q.item_1$) ∧ ($p.item_2$=$q.item_2$) ∧…..∧ ($p.item_{k-2}$=$q.item_{k-2}$) then
{ c= p∪q
for each itemset pϵ L_{k-1} //scan all elements of L_{k-1}
for each itemset cϵ C_k //scan all elements of C_k
if p is the subset of c then
c.count++;
C_k= {cϵ C_k | c.count =k};
}
Return C_k;

In order to reduce the size of candidate sets , the improvement is set proposed. The improved algorithm has the excellent property that the database is not used repeatedly. Obviously the improved algorithm is superior when the number of data itemsets continuously increases.

Group items into higher conceptual groups, e.g. white and brown bread become "bread."Reduce the number of scans of the entire database (Apriori needs n+1 scans, where n is the length of the longest pattern)

- Partition-based apriori
- Take a subset from the database, generate candidates for frequent itemsets; then confirm the hypothesis on the entire database.

Analysis of the mining results

Realize Association Rules algorithm by making use SQL Server 2008 Analysis Services. Association Rules are brought forward.

1- Probability is put to use instead of Confidence.
2- How to calculate the importance of Association Rules?

$$IMPORTANCE_{A->B}=\log\frac{p(B|A)}{p(B|notA)}$$

3- Set the parameters of the algorithm.

The mining rules are shown above ,which sort on the basis of importance and probability of association.

CONCLUSION

An Improved Apriori Algorithm is proposed to reduce the size of candidate sets by studying on Apriori Algorithm of Association Rules and the deficiencies of Apriori Algorithm. Conclusions are made on association rules between product recurrence and other attributes by doing data mining using SQL Server 2008 Analysis Services.

FUTURE SCOPE

The work presented in this paper points to several directions for future research. A natural next step is to experiment with other kinds of mining operations (e.g. clustering and classi_cation [8]) to verify if our conclusions about associations hold for these other cases too. We experimented with generalized association rules [22] and sequential patterns [23] problems and found similar results. In some ways associations is the easiest to integrate as the frequent itemsets can be viewed as generalized group-bys. Another useful direction is to explore what kind of a support is needed for answering short, interactive, adhoc queries involving a mix of mining and relational operations. Howmuch can we leverage from existing relational engines? What data model and language extensions are needed? Some of these questions are orthogonal to whether the bulky mining operations are implemented using SQL or not. Nevertheless, these are important in providing analysts with a well-integrated platform where mining and relational operations can be inter-mixed in flexible ways.

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12/12/2011

Measuring the Performance for wireless Communication Networks in Admission Control System

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Abstract: In This paper we describe the wireless communication networks for measuring the performance of cellular wireless communication networks. And we study the problems of resource of measuring and performance of admission control system in channelized wireless communication networks. For identifying research issues systematically, we propose a research framework system which consists of two modules: optimization of performance for cellular wireless communication networks and network servicing modules. For an in-service communication network, performance optimization module manages audio resources to ensure communication quality of service and optimize system performance. For channelized wireless admission control system, the real-time issues of performance optimization are admission control, channel assignment, power control. The communication network servicing module is event-driven or a periodically resource augmentation plan, which alleviates the performance exceptions and optimizes long-term admission control system revenue by using corrective mechanisms consisting of resource augmentation, channel reassignment, cell rearrangement, and reforming issues.
[Sumit Saxena. Measuring the performance for wireless Communication Networks in Admission Control System. Academia Arena, 2012;4(1):6-8] (ISSN 1553-992X). http://www.sciencepub.net.

Keywords: Wireless Communication networks, cellular wireless networks, Information and Communication Technology (ICT).

Introduction:

The issues on efficient and fair resource allocation have been well studied in economics, where utility functions are used to quantify the benefit of usage of certain resources. Similarly, utility theory can be used in communication networks to evaluate the degree to which a network satisfies service requirements of users' applications, rather than in terms of system-centric quantities like throughput, outage probability, packet drop rate, power, etc. [1]. In wire line networks, utility and pricing mechanisms have been used for flow control [2], [3], congestion control [4], and routing [5]. Home broadband routers are remarkably complex devices that few ever take the time to truly understand. As long as the lights are blinking, and WebPages load, most people are inclined to leave them be. The few brave souls who venture into the firmware are often rewarded with a maze of menus that betray the true complexity of these underappreciated appliances. Wireless channels, security modes, and even port forwarding can be frustrating concepts for those without a networking background, but are absolutely critical to understanding how to optimize your home network. In this guide we will teach you the finer points of security, as well as give you surefire ways to boost your router's wireless range and optimize performance. [6] Prior to the days of Windows XP SP2, machines plugged directly into the internet would often fall prey to these exploits, and would become infected simply because they were left on, and were connected to the internet. With the introduction of the firewall in SP2 the world literally changed. Windows now comes with this feature on by default, and drops unsolicited traffic coming into your connection. The Windows firewall isn't perfect, but it was still a huge improvement. Efficient resource utilization is a primary problem in cellular communications systems Resource issues includes determining with which users to establish connections and assigning transmit power levels to connected users subject to acceptable signal quality. In this paper we consider the problem of optimal admission control given a particular configuration of users of various classes in various regions determine whether or not to accept a new call request We assume we have available an algorithm that can determine for any distribution of users of various classes in various regions whether there is a feasible power assignment satisfying the signal to noise requirements for all users and if so provides a unique power assignment for the distribution Our goal is to formulate the problem as a Markov decision process and to provide a solution method that is general enough to be widely applicable and can be implemented in real time.

The Admission Control Problem:

In this section we develop a control system framework model for the admission control problem for a two or multi- dimensional system of cells with multiple user classes We first provide a general description of the system which we consider and then formulate the problem as a Markov decision process.

Background and Relate Work:

The need to increase data service revenue by cellular communication data network providers has created an opportunity for application developers to create a "value chain" connecting customers, mobile applications, and network providers. The performance of mobile commerce is also affected by high latency and security network considerations. High latency caused by naive protocol design results in long wait times, reducing an application's attractiveness in today's fast paced world. On the other hand, a communication protocol that is needlessly terse might deprive users of a richer experience, also reducing the attractiveness of the application.

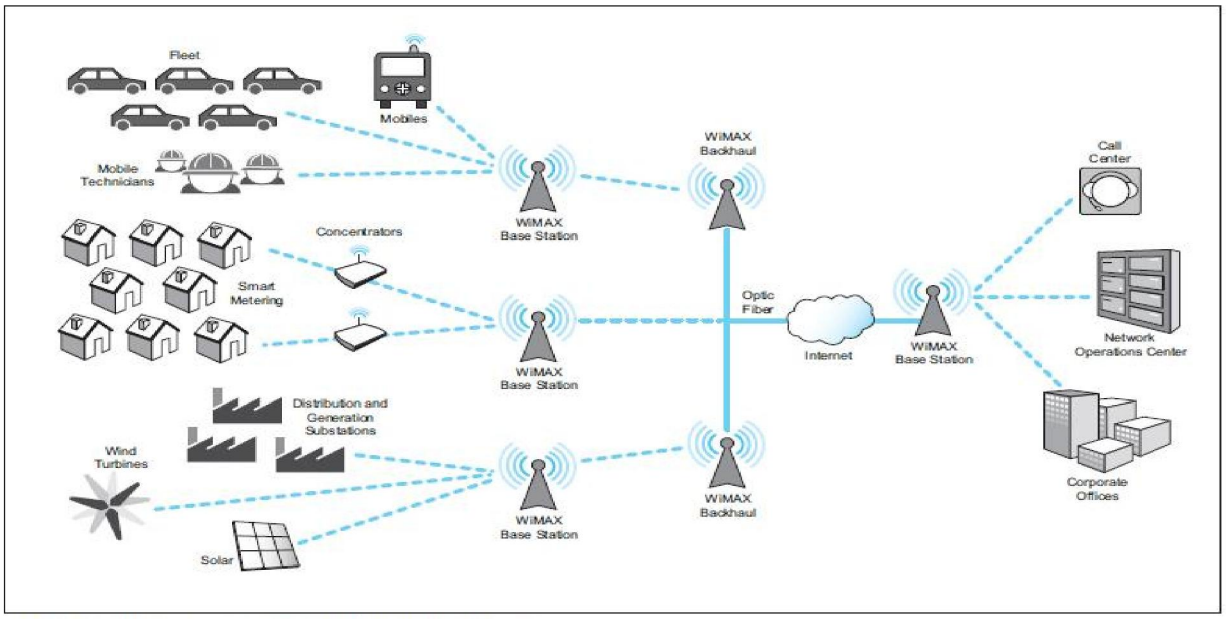

Figure 1. Smart grid connectivity supported by WiMAX

Data Analysis:

To demonstrate admission control system data capabilities of providing insight into the performance of cellular data services as experienced by a particular device, we present the analysis of a small data set collected. We measured throughput values based on 10,000 byte packets. We found this value to be large enough to measure throughput bandwidth, but small enough such that it did not overflow mobile device memory. The 10,000 byte packet is representative of application sizes users download, but also allow developers to estimate the download time of streams while keeping the throughput test duration small. We prefer to measure throughput directly, by measuring bulk data transmission time, rather than estimating network performance using packet pair throughput estimation. We measured the data communication performance over two cellular net works as seen by application programs. The wireless networks are very useful for admission control system. It is provide the data for communicate to each other. The networks examined w ere a digital GSM-net work and an analogue NMT-net work. In the GSM measurements we used the asynchronous, non-transparent bearer service with a line speed of 9600 bps. NMT offers a plain physical-layer connection, where the line speed is set by modems. T o accomplish an application point of view to wireless net working w e used a standard TCP/IP protocol suite in our experiments.[7]

CONCLUSIONS:

We have discussed measuring the admission control system for wireless cellular communication networks, a first-of-its-kind cellular data communication network measurement platform, focusing on the needs of wireless application for developers, rather than network infrastructure optimization and provisioning. We have analyzed and measuring the sample data collected with our network tool, showing large variability in cellular data communication network characteristics.

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8. And more data from www.google.co.in it is very useful for researchers.

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Prevalence of Antibiotic-Resistant Bacteria in Dried Cassava Powder (Garri) Circulating in Ogun State, Nigeria.

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ABSTRACT: Background: Antimicrobial resistance is a serious and complex worldwide problem requiring the creation of a global surveillance system.AIM:The aim of this research was to determine the prevalence of antibiotic – resistant bacteria in dried cassava powder (garri) circulating in Ogun State, Nigeria. METHODS: Sixty three bacterial strains isolated from dried cassava powder (garri) were analyzed using the disc diffusion method. RESULTS: Based on standard zones of inhibiton ranging from 17mm – 37mm in diameter exhibited by the bacterial isolates, most of the isolates were sensitive to the selected quinolones and cephalosporines. The antibiogram studies also showed that *Bacillus subtilis* was the most susceptible to all the antibiotics with 100% susceptibility to perfloxacin, ciprofloxacin levofloxacin and cefotaxime, 50% to cefuroxime and 71.4% to ceftriaxone. *E. coli* was however found to show 100% resistance to all the tested antibiotic. In an investigation to determine the most effective antibiotic against the bacterial isolates from dried cassava powder (garri), Levefloxacin was the most effective ($P<0.05$) followed by ciprofloxacin and cefuroxime. The Gram negative also showed an alarming resistance rate of 100% to all the tested cephalosporines while ceftriaxone was the mostly resisted by the Gram positive bacteria. The prevalence rate of antibiotic resistant bacteria in this study was found to be 49.21%.CONCLUSION: The finding of this study confirm the presence of Antibiotic resistant bacterial in this food thus suggesting proper evaluation and monitoring of antibiotic resistant bacterial in food to safeguard public health.
[Thomas Benjamin Thoha, Effedua Hyacinth Izuka, Agu Georgina, Musa Oluwaseunfunmi Sikirat, Odunsi Olayinka Davies Ogueri Queeneth Chigozie, Raheem – Ademola Ramota, A. Oluwadun. **Prevalence of Antibiotic-Resistant Bacteria in Dried Cassava Powder (Garri) Circulating in Ogun State, Nigeria.** Academia Arena, 2012;4(1):9-13] (ISSN 1553-992X). http://www.sciencepub.net.

Keywords: Prevalence, Antibiotic-Resistant Bacteria, Dried Cassava Powder (garri)

1. Introduction

Antimicrobial resistance refers to failure of a given antimicrobial treatment. It is defined as the ability of microorganisms to grow either temporarily or permanently in the presence of an antimicrobials (IFT, 2005). These antimicrobials themselves includes antibiotics, food antimicrobial agents sanitizers, and other substance that act against microorganisms. Antimicrobial resistance no doubt remain a phenomenon of increasing importance as demonstrated by the emergence of different international antimicrobial resistance surveillance programs (Betty *et al*., 2005). The problem associated with resistance cannot be overemphasized, this is because of its increasing burden to human health. Antibiotics resistant food borne pathogens may develop increased virulence. This preponderance of evidence strongly support the suggestion that antibiotic resistance results in a larger number of human infections than would otherwise be the case by increasing the risk of infection in people who have had prior antibiotic exposure (IFT, 2005). It is true that bacterial resistance is gaining popularity world wide due to the problem is posing to the medical and veterinary world. However, outbreaks of infectious diseases all the over the globe picture multi drug resistant organisms as a threat to human health (Singh *et al*., 2007; Okeke *et al*., 2007; Okonkwo *et al*., 2009).

Garri is a roasted granule of cassava that is widely accepted in both rural and urban areas (FAO, 2010). It is by far the most popular form in which cassava is consumed in Nigeria and indeed in West Africa (Ikediobi *et al*., 1980). It is consumed by both young and old more especially from the bulk of Nigerian population (Ugwu and Odo, 2008). However, practices associated with production, processing and post process handing of garri such as spreading on the floor, display in open bowl in the markets and sales points and use of various packaging materials to haul finished products from rural to urban areas may exacerbate contamination (Ogiehor and Ikenebomeh, 2006). Some of these microbial contaminant are capable of surviving in dried cassava powder (garri) (Thomas, 2011). The importance of these bacteria is their ability to acquire and disseminate resistance that could be transmitted to pathogenic or zoonotic bacteria

(Betty *et al*., 2005). These resistant and multi drug resistant organisms are also capable of spreading from animal to man through food and even become more easy to acquire through garri since this food is consumed raw with or without additives in south western Nigeria. Therefore, the present study considered determining the prevalence of antibiotics resistant bacteria in dried cassava powder (garri) in Ogun State, Nigeria.

2. Materials and Methods

2.1 Study Areas:

The study area "Ogun State" is a state in South-Western Nigeria. It borders Lagos State to the south, Oyo and Osun State to the north, Ondo State to the east and the Republic of Benin to the west. The State is made up of twenty local government areas and it have a total area of 16,762km^2 with over four million people.

2.2 Bacterial Isolates and Antibiotic Susceptibility Testing

The isolates were recovered from dried cassava powder (garri) in Ogun State, Nigeria and were identified based on standard microbiological techniques (Cheesborough, 2005). An inoculums size of 10^5 CFU/ml of each of the organisms were prepared according to Bauer *et al.,* 1996. A loopful of each of the inoculums corresponding to 10^5 CFU/ml was streaked evenly on Mueller Hinton Agar (Difco, USA). The plates were then incubated aerobically at 37°C for 24hours. The interpretation of the zones of inhibition were done using standard interpretative chart (NCCLS,2002).

Statistical Analysis

Frequency percentage were used for the determination of distribution rate of the organisms while analysis of variance was used for comparing the means of susceptibilities and resistance of each of the bacterial isolates to the tested antibiotics using SPSS Version 15.

3. Results

Out of the sixty three bacterial isolates recovered from dried cassava powder (garri) examined in this study, *Bacillus subtilis* 28(44.4%) was the most prevalent followed by *Enterococcus faecalis* 17(27%) and *Staphylococcus aureus* 11(17.5%). The least isolated organisms was *Escherichia coli* 2(3.2%). Table 2 and 3 depicts the sensitivity and resistant patterns of these organisms with Levofloxacin showing a markedly significant activities against the bacterial flora of dried cassava powder (garri) than other tested antibiotics. This was followed by Ciprofloxacin and Cefuroxime respectively ($P<0.05$) (Table 4). While Gram negative showed hundred percent resistance to all the tested Cephalosporins, Ceftriaxone was the most resisted antibiotics by the Gram positive organisms. The prevalence rate of antibiotic resistant bacteria in our study was however found to be 49.21%.

Table 1. Antibiotics Sensitivity Pattern of Bacterial Isolated from Dried Cassava Powder (garri) in Ogun State, Nigeira to the cephalosporins and quinolones

	No of strains sensitive to the Antibiotics							
Isolates	N	%	PEF	CIP	LEV	CEF	CFX	CFT
S. aureus	11	17.5	11(100)	5(45.6)	11(100)	5(45.5)	7(63.6)	9(81.8)
E. faecalis	17	27.0	17(100)	12(70.5)	17(100)	10(58.8)	6(35.3)	10(58.8)
P. vulgaris	5.0	7.9	3(60)	2(40)	5(100)	0(0)	0(0)	0(0)
E. coli	2.0	3.2	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
B. subtilis	28	44.4	28(100)	28(100)	28(100)	14(50)	28(100)	20(71.4)
Total	63	(100)	59(93.7)	47(65.1)	61(96.8)	29(46)	41(65.1)	39(61.9)

Table 2. Antibiotics Resistant Patterns of Bacterial Isolates from Dried Cassava Powder (garri) in Ogun State, Nigeria to Cephalosporins and Quinolones

	No of strains resistant to the Antibiotics							
Isolates	N	%	PEF	CIP	LEV	CEF	CFX	CFT
S. aureus	11	17.5	0(0)	6(54.4)	0(0)	6(54.5)	4(36.4)	2(18.2)
E. faecalis	17	27.0	0(0)	5(29.5)	0(0)	7(41.2)	11(64.7)	7(41.2)
P. vulgaris	5.0	7.9	2(40)	3(60)	0(0)	5(100)	5(100)	5(100)
E. coli	2.0	3.2	2(100)	2(100)	2(100)	2(100)	2(100)	2(100)
B. subtilis	28	44.4	0(0)	0(0)	0(0)	14(50)	0(0)	8(28.6)
Total	63	(100)	4(6.3)	22(34.9)	2(3.2)	34(54)	22(34.9)	24(38.1)

KEYS: PEF; Perfloxacin CIP; Ciprofloxacin LEV; Levofloxacin CEF; Cefuroxime CFX; Ceftazidime CFT; Ceftriaxone

Table 3.Determination of the most effective antibiotics against Bacterial flora of DCPs (garri)

Antibiotics	**N**	**% of Sensitive Organisms Mean ± SEM**
Perfloxacin	2	93.7 ± 0.00
Ciprofloxacin	2	65.1 ± 0.10
Levofloxacin	2	96.8 ± 0.10
Ceftriaxone	2	46.0 ± 0.00
Cefuroxime	2	65.1 ± 0.10
Ceftazidime	2	61.9 ± 0.90

F value = 2796.05, P<0.05

Table 4.Determination of the most effective antibiotics against Gram positive bacteria

Antibiotics	**N**	**% of Sensitive Organisms (Mean ± SEM)**
Perfloxacin	2	100 ± 0.00
Ciprofloxacin	2	80.3 ± 0.01
Levofloxacin	2	100 ± 0.00
Ceftriaxone	2	51.8 ± 0.03
Cefuroxime	2	73.2 ± 0.30
Ceftazidime	2	69.2 ± 0.40

F value = 67856.2, P<0.05

Table 5. Determination of the most effective antibiotic against Gram negative bacteria.

Antibiotics	**N**	**% of Sensitive Organisms Mean ± SEM**
Perfloxacin	2	42.8 ± 0.00
Ciprofloxacin	2	28.6 ± 0.01
Levofloxacin	2	71.4 ± 0.10
Ceftriaxone	2	00.0 ± 0.00
Cefuroxime	2	0.00 ± 0.00
Ceftazidime	2	0.00 ± 0.00

F value = 260947.2, P<0.05

Table 6. Prevalence of Antibiotic Resistant Bacterial in Dried Cassava powder (garri)

	Sensitivity test result		
Type of organisms based on Gram reaction	Sensitive Organisms	Resistant organisms	Total
Gram negative organisms	3	4	7
Gram positive organisms	29	27	56
Total	32	31	63

Prevalence of resistant bacteria

$$= \frac{\text{total number of resistant organisms}}{\text{Total number of organisms isolated}} \times \frac{100}{1}$$

$$= \frac{31}{63} \times \frac{100}{1} = 49.21\%$$

4. Discussion

With increased consumption of garri in West Africa including Nigeria, more information is needed regarding the safety of this food. Although garri is the most popular form in which cassava is consumed in Nigeria and indeed in West Africa(Ikediobi *et al*., 1980). It may not be free of contamination (Ogiehor and Ikenebomeh, 2006).Frequently,low levels of microbial contaminant are found in this dried product because of the lack of sufficient moisture necessary for microbial growth and survival (Brown and Jiang, 2008). In our study, garri samples were variously contaminated with different levels of Quinolones and Cephalosporine resistant bacteria.This observation may not be unconnected to the widespread use of these antibiotics in both human and animal health (Chikwendu *et al*., 2008). Ceftriaxone which was the most resisted antibiotic by the Gram positive organisms in our study has been formerly reported as the most resisted antibiotics by salmonella in a study conducted by the National Antimicrobial Resistance Monitoring system (CDC, 2004). 100% resistance of the Gram negative organisms to all the tested cephalosporines noticed in our study may be due to the extensive use in human, animal and Agricultural products (Fey *et al*., 2004). *Escherichia coli* solated in this study was resistant to all the tested groups of quinolones and cephalosporines. These multi drug resistant *Escherichia coli* might have originated from poultry or from susceptible poultry source precursors (Johnson *et al*., 2007).

The multi drug resistant pattern of *Escherichia coli* observed in this study is comparable to previous studies (Doleijska *et al*., 2007). The presence of quinolones resistant organisms in our study is similar to the findings of Karlowsky *et al* (2004). It is estimated that nearly 90% of all antibiotic agents is used in food and animals are given this agent at subtherapeutic concentrations prophylactically or to promote growth (Abdellah *et al*., 2009). The reduced susceptibility of *Proteus vulgaris* in our study may be due to the acquisition of quinolones resistant gene, by the organisms (Van dan-Bogaard and stobberingh, 2002). The presence of multi drug resistance *Proteus* species are known to cause significant clinical infections and occupy multiple environmental habitats (Mordi and Momoh, 2009). *Bacillus subtilis* showed 100% sensitivity to quinolones and the least resistance to cephalosporines. The ability of this organisms to resist ceftriaxone and cefuroxime may be due to their spore forming potential (Okonkwo *et al*., 2010). The multi drug resistant *Enterococcus faecalis* observed in this study corroborates the findings of Klare (2003) that reported food enterococci as reservoirs and/or vehicles of antibiotic resistance (AR) and possibly virulence factors. During the antibiotic era, an increasing number of food enterococci have developed resistance to various therapeutic agents including vancomycin (Rorbredo *et al*., 2000) Gentamicin (Donabedian, 2003) and Streptogramines (Simjie *et al*., 2002). *Staphylococcis aureus* resistance to the tested antibiotic is similar to that of Motlava *et al* (2004). The high level of resistance in *S. aureus* may be connected to the presence of extended spectrum Beta lactamase enzyme in them (Efuntoye and Amuzat, 2007). The bacterial found in this food may have been the result of contamination before, during or after processing however various levels of antibiotic – resistant bacteria were detected in garri. With greater demand for this food and an increase in the occurrence of multi drug resistant bacterial, there is need to determine the molecular mechanism of resistance of these organisms in order to find the possible way of antagonizing their growth and survival in this mostly consumed food in West Africa.

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Studies on the Nutritional Requirements of an Ochratoxin A-Degrading *Rhizopus* sp.

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Abstract: Studies were conducted on the carbon, nitrogen, carbon/nitrogen ratio (C:N), and vitamin requirements of a recently isolated *Rhizopus* sp. that is capable of degrading ochratoxin A *in vitro*. The results obtained showed that glucose supported the best growth of 57.0 mg followed by fructose (51.7 mg) while the poorest growth (1.16 mg) was supported by lactose. Urea was the most utilized of all the nitrogen sources investigated, producing a mycelial dry weight of 90.0 mg while DL-citrulline supported the poorest mycelia growth of 13.0 mg. Results on the effect of various carbon to nitrogen ratio revealed that a C:N ratio of 3:1 produced the best mycelia weight of 28.0 mg while a C:N ratio of 1:2 produced the poorest mycelia weight of 1.7 mg. Among the vitamins studied, pyridoxine was the most utilized with a mycelial dry weight of 60.0 mg followed by cobalamine (43.3 mg) while riboflavin and biotin stimulated the poorest growth (35.0 mg) each.
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Key words: *Rhizopus* sp., carbon, growth, nitrogen, vitamins.

Introduction

Ochratoxin A (OTA) is a 7-carboxy-5-chloro-8-hydroxy-3, 4-dihydro- 3*R*-methylisocoumarin compound, linked through its 7-carboxy group to L-*â*-phenylalanine by an amide bond (Rigot *et al*., 2006), produced by several species of *Peniciliium* and *Aspergillus* as their secondary metabolite (Khoury and Atoui, 2010). It is frequently found contaminating a wide array of food and feed commodities such as rice and rice products (Gonzalez *et al*., 2006), coffee (Pittet *et al*., 1996), beer and wine (Visconti *et al*., 1999). OTA is a nephrotoxin whose principal target organ is the kidney (Ribelin, 1978) and epidemiological studies have reported its potential implication in the human fatal disease known as Balkan Endemic Nephropathy (BEN) (Pfohl-Leszkowicz, 2009). OTA has also been experimentally shown to be teratogenic, a potent renal carcinogen, immunosuppressive, an enzyme inhibitor and has effects on lipid peroxidation, it is listed as a possible carcinogen of group 2B by the International Agency for Research on Cancer (IARC, 1993).

The prevention of OTA contamination in the field is the main goal of agricultural and food industries, however, the contamination of commodities with *Aspergillus*, and *Penicillium* sp. and possibly ochratoxins is unavoidable under certain environmental conditions (Varga *et al*., 2005), hence certain decontamination/detoxification procedures have been suggested in order to reduce to the barest minimum, problems associated with exposure to OTA contamination. Such strategies are in three categories: physical, chemical and biological. Physical and chemical decontamination strategies involve the use of different absorbent and chemicals which bind with the mycotoixns and make them unavailable to animals and humans. Biological detoxification, on the other hand, involves the use of microorganisms and (or) their enzymes and this has led to the isolation and screening of various microorganisms that can degrade mycotoxin (Hult *et al*., 1976; Cheng and Draughon, 1994; Bejaouii *et al*., 2006; Baptista *et al*., 2004; Fuchs *et al*., 2008; Mateo *et al*., 2010).

In this study we report the nutritional requirements of an OTA-degrading *Rhizopus sp*. The studies of the nutritional requirements will acts as additional information which can be employed to improve the use of this *Rhizopus* sp. in the decontamination of OTA contaminated food and feed commodities.

Materials and Methods

Microorganism

A recently OTA- degrading *Rhizopus* sp. isolated from spoilt 'Ori' (Garuba, unpublished data) obtained from the culture collection centre of the Department of Biological Sciences, Bowen University Iwo, was used in this study. The organism was maintained on Potato Dextrose Agar slants supplemented with chloramphenicol 50 ppm at 4 ^{0}C. This study was carried out at the Microbiology Laboratory, Department of Biological Science, Bowen University Iwo, between January and December 2010.

Inoculum preparation

Inoculum used in this study was prepared using the method of Nahar *et al*. (2008).

Effect of different carbon sources

Different carbon sources used were Arabinose, Fructose, Galactose, Glucose, Mannose, Sorbose, Rhamnose, Xylose, Lactose, Maltose, Mellibiose, Raffinose, Starchyose, Sucrose, Cellibiose, Inositol, Mannitol Sorbitol, Cellulose, Dextrin and Soluble starch. Sterile basal medium, containing (g l^{-1}) yeast extract (2.0), KH_2PO_4 (1.0), $MgSO_4.7H_20$ (0.5), was dispensed in 30 ml amount into Erlenmeyer's flask and sterilized at 121 ^{0}C for 15 min and allowed to cool. The media were later supplemented with 0.8% (w/v) of each of the sterile carbon sources and inoculated with 1 ml of the inoculum (containing 20 X 10^{10} spores) of the *Rhizopus* sp. Incubation was done at 35 ^{0}C for 120 h. A control without any carbon source was also set up. The mycelia were harvested by filtration using a pre-weighted filter paper and then dried to constant weight in an oven at 80 ^{0}C to obtain the dry weight of the mycelia. Each treatment was done in triplicates.

Effect of different nitrogen sources

The utilization of different nitrogen sources by the organism was determined using 0.1% of different nitrogen sources in a basal medium containing (g l^{-1}) $MgSO_4.7H_20$ (0.5), KH_2PO_4 (0.5) and glucose (10). The nitrogen sources used: $NaNO_3$, KNO_3, $Ca(NO_3)_2$, NH_4NO_3, $(NH_4)_2SO_4$, L-Aspartic acid, L-Asparagine, DL-Citrulline, D-Cysteine, L-Glutamine, L-Glutamic acid, L-Histidine, L-Arginine, DL-Leucine, DL-Methionine, L-Tryptophan, DL-Valine, Casine, Malt extract, Peptone, Urea and Yeast extract were sterilized by millipore filtration. A control experiment, made up of basal medium and glucose without any nitrogen source was also set up. Set up were inoculated with 1 ml of the inoculum (containing 20 X10^{10} spores) of the *Rhizopus* sp. Incubation was done at 35 ^{0}C for 120 h and the mycelia were harvested and dried to a constant weight as described previously.

Effect of different C:N

The effect of different C:N on the mycelia growth of the organism was studied by varying the different concentration of the best utilized carbon and nitrogen sources in a basal medium containing (g l^{-1}) KH_2PO_4 (0.05), $MgSO_4.7H_20$ (0.05), KNO_3 (1.55). Set ups were inoculated with 1 ml of the inoculum (containing 20 X10^{10} spores) of *Rhizopus* sp. and incubated at 35 ^{0}C for 120 h. Mycelia were harvested and dried as described above.

Effect of different vitamins

The vitamins used were Ascorbic acid, Biotin, Cobalamine, Folic acid, Nicotinic acid, pyridoxine, Riboflavin, Thiamine. These were supplemented (at a concentration of 500 µg l^{-1}) in a basal medium containing (g l^{-1}) fructose (10.0), peptone (1.0), $MgS0_4$. $7H_20$ (0.5), KH_2P0_4 (0.05). A basal medium containing all the vitamins served as control 1, while a basal medium without any vitamins served as control 2. A 30 ml quantity of the medium supplemented with each of the vitamins was inoculated with 1 ml of the inoculum (containing 20 X10^{10} spores) of the *Rhizopus* sp and incubated as described above. The vitamins were sterilized by millipore filtration and special care was taken to avoid the destruction of riboflavin by strong light.

Statistical analysis

Results obtained in this study were subjected to analysis of variance using ANOVA and separation of means was carried out by Duncan's Multiple Range Test (Duncan, 1955).

Results

The results of the effect of various carbon sources on the vegetative growth of *Rhizopus sp.* are presented in table 1. The results indicated that this species of *Rhizopus* is able to utilize all the carbon sources investigated in this study. However, glucose was found to stimulate the best mycelial growth of 57.0 mg when incorporated into the basal medium followed by fructose (51.8 mg) while the lowest mycelial weight of 1.1 mg was recorded with lactose as the carbon source.

Table 2 shows the results of the effect of nitrogen sources on the vegetative growth of *Rhizopus* sp. The results revealed that the organism was able to utilize all the nitrogen sources investigated in this study. Of all the inorganic nitrogen sources investigated, ammonium sulphate was the most utilized, producing a mycelia weight of 60.0 mg while the lowest weight was recorded by potassium nitrate. Of the amino acids investigated, L-arginine produced the highest mycelia weight of 65.0 mg while DL-citruline produced the lowest mycelia weight of 13.0 mg. Urea was found to support the best growth of all the complex nitrogen sources (and the overall best) with a mycelial weight of 90.0 mg while the poorest growth (28.5 mg) was obtained in a medium containing casine.

Among the various C:N investigated in this study a C:N of 3:1 was found to stimulate the best growth (28.0 mg), followed by ratios 3:2 and 2:5 with growths 25.0 mg and 17.0 mg respectively while a ratio of 1:2 supported the least growth of the organism (table 3).

Among the vitamins investigated in this study, pyridoxine stimulated the best growth of 60.0 mg, followed by cobalamine and both ascorbic acid and thiamine with growths of 43.3 mg (table 4) and 41.7 mg respectively. Riboflavin supported the poorest growth (34.0 mg) among all the vitamin sources investigated.

Table 1: Effect of carbon sources on the vegetative growth (mg) of *Rhizopus sp.*

Carbon Compounds	Mycelia weight (mg)
Monosaccharides	
Arabinose	22.7±1.4530[a]
Fructose	51.8±0.7126[bcd]
Galactose	11.7±1.6667[a]
Glucose	57.0±1.5507[a]
Mannose	30.3±2.4841[a]
Sorbose	26.0±3.0551[abc]
Rhamnose	2.60±0.8819[a]
Xylose	40.0±1.7735[b]
Oligosaccharides	
Lactose	1.16±3.3333[ab]
Maltose	13.3+3.1798[b]
Mellibiose	17.6±0.8819[ab]
Raffinose	10.3±1.2019[a]
Starchyose	20.8±2.9627[c]
Sucrose	50.4±1.4874[c]
Cellibiose	15.7±0.6667[bc]
Sugar alcohols	
Inositol	21.0±2.0817[bc]
Mannitol	3.7±0.2019[a]
Sorbitol	21.8±0.4096[b]
Polysaccharides	
Cellulose	10.0±0.000[a]
Dextrin	2.0±1.6000[a]
Soluble starch	1.6±0.3333[a]
Control	1.0±0.1667[a]

Data are means of three replicates ± SEM. Values followed by the same letters are not significantly different by Duncan's multiple range test ($P = 0.01$).

Table 2: Effect of nitrogen sources on the vegetative growth (mg) of *Rhizopus sp.*

Nitrogen sources	Mycelia dry weight (mg)
Inorganic nitrogen	
$NaNO_3$	38.0±6.0093[a]
KNO_3	15.0±2.8868[a]
$Ca(NO_3)_2$	25.0±2.8868[b]
NH_4NO_3	60.0+0.4096[a]
$(NH_4)_2SO_4$	37.0±0.000b[c]
Amino acids	
L-Aspartic acid	45.0+0.000[b]
L-Asparagine	23.0±63596[a]
DL-Citrulline	13.0±0.333[a]
D-Cysteine	35.0±0.6667[de]
L-Glutamine	45.0±0000[d]
L-Glutamic acid	43.0±1.6606[b]
L-Histidine	30.0±0.0000[a]
L-Arginine	65.0±2.8868[b]
DL-Leucine	15.0±2.8868[c]
DL-Methionine	30.0±0.0000[a]
L-Tryptophan	15.0±0.6667[a]
DL-Valine	30.0±5.7735[ab]
Complex nitrogen	
Casine	28.5±1.6667[abc]
Malt extract	42.0±0.4096[d]
Peptone	37.0±3.3330[b]
Urea	90.0±5.7735[bc]
Yeast extract	52.0±4.4096[cd]
Control	3.7±0.0000[e]

Data are means of three replicates ± SEM. Values followed by the same letters are not significantly different by Duncan's multiple range test ($P = 0.01$).

Table 3: Effect of C:N ratio on the vegetative growth of *Rhizopus sp.*

Carbon:Nitrogen	Mycelia dry weight(mg)
1:1	8.0±3.333[a]
1:2	1.7±1.6667[a]
1:3	5.0±2.8868[a]
1:4	15.0±2.8867[b]
1:5	8.0±1.6667a
2:1	6.7±1.6667a
2:3	13.0±3.3333[abc]
2:5	17.0±3.3333[ab]
3:1	28.0±2.8868[b]
3:2	25.0±0.333[a]
3:4	8.7±4.4096a
3:5	3.6±1.3333[a]
4:1	6.7±1.6667[ab]
4:3	8.0±1.6667[a]
4:5	11.6±4.4096[abc]
5:1	6.7±1.6667[a]
5:2	4.0±3.0000[a]
5:3	15.0±2.8868[a]
5:4	8.0±1.6667[ab]
Control Basal medium	1.5±0.0000[bc]

Data are means of three replicates ± SEM. Values followed by the same letters are not significantly different by Duncan's multiple range test ($P = 0.01$).

Table 4: Effect of vitamins on vegetative growth of *Rhizopus sp.*

Vitamins	Mycelia dry weight(mg)
Ascorbic acid	41.7+7.265[b]
Biotin	35.0+5.000[ab]
Cobalamine	43.7±0.667[bc]
Folic acid	36.7±6.667[a]
Nicotinic acid	38.3±1.667[c]
Pyridoxine	60.0±2.887[c]
Riboflavin	34.0±2.887[ab]
Thiamine	41.7±4.410[ab]
Basal medium + all vitamins (control 1)	50.0±5.774[a]
Basal medium only (control 2)	36.7±3.333[b]

Data are means of three replicates ± SEM. Values followed by the same letters are not significantly different by Duncan's multiple range test ($P = 0.01$).

Discussion

All the carbon sources studied in this work supported the growth of *Rhizopus* sp. This observation has also been reported for various filamentous fungi by various researchers (Nout and Rabouts 1990; Rehms and Barz, 1995; Amadioha, 1998). Glucose supporting the highest mycelial growth (57.0 mg) could be as a result of the ease with which it is broken down and ease of oxidation in generating cellular energy within the cells (Schlegel, 2002). Fructose which supported mycelial growth (51.7 mg) next to glucose has also been reported by Garraway and Evan (1984). Griffin (1994) also observed that the best carbon source after glucose is fructose. This could be as a result of the fact fructose is an isomer of glucose and can be chemically converted to glucose during cellular respiration (Moat *et al*., 2002). The poor utilization of lactose (a disaccharide) by this specie of *Rhizopus* could be as a result of the *Rhizopus* sp.'s inability to produce adequate enzyme that is necessary for the breakdown of lactose sugar (Seyis and Aksoz, 2004).

Nitrogen is needed for the synthesis of amino acids, purines, pyrimidines, some carbohydrates and lipids, enzyme cofactors and other substances by the cells (Zang *et al*., 2007). The utilization of all the nitrogen sources investigated in this study by the *Rhizopus* fungus is in agreement with earlier reports of Oso (1974), Olutiola (1976), and Medwid and Grant (1984) from studies on the utilization of nitrogen sources by fungi. The preferential utilization of ammonium sulphate compared to all the inorganic nitrogen sources by this organism is in agreement with the report of Prescott *et al*. (1996) and this could be due to its relatively ease of incorporation into organic material compared to nitrate and nitrite salts, which must first be reduced to ammonium before the nitrogen can be converted to an organic form (Prescott *et al*., 2008). The preferential utilization of L-arginine by this *Rhizopus* sp. could be as a result of its ease of transport across the fungal cell membrane (Griffin, 1994). Urea was observed to be the most utilized of all the complex nitrogen sources studied in this work. This is in agreement with the report of Nahar *et al*. (2008). The preferential utilization of urea could possibly be attributed to its hydrolysis to ammonia (by urease) (Raimbault, 1998) which is easily and directly incorporated into organic material (Prescott *et al*., 1996). Gbolagade *et al*. (2006) also suggested that complex nitrogen sources supporting better growth in higher fungi might be due to the fact that these complex nitrogen compounds contain combined amino acids and carbohydrate which also will support fungal growth.

The ratio of carbon to nitrogen of 3:1 which supported the highest mycelia growth is different from that obtained for other higher fungi (Engelkes *et al*., 1997; Li and Liu, 2010). Gbolagade *et al*. (2006) suggests that the variation could be as a result of the difference in the carbon to nitrogen ratio of different organisms.

Pyridoxine was found to stimulate the highest growth of all the vitamins investigated in this study. This is in support of the reports of Fasidi and Olorunmaiye (1994), Jonathan and Fasidi (2001), Jonathan *et al*. (2004) which observed similar utilization of pyridoxine in higher fungi. Jonathan *et al*. (2004) suggested that pyridoxine supporting the best growth could be attributed to its conversion to functional phosphate which is important in the synthesis of tryptophan which is an amino acid needed for growth.

In conclusion, it is clear from this work that for the cultivation of this OTA-degrading *Rhizopus* sp. on synthetic medium, glucose or fructose will be the appropriate carbon source and urea as the nitrogen source in the C:N ratio of 3:1. Vitamins such as pyridoxine, ascorbic acid and cobalamine also need to be incorporated into the synthetic medium for optimum growth of the organisms. Since the contamination of food and feed commodities by OTA-producing strains in certain areas seems to be inevitable, information on the nutritional requirements of this Ochratoxin A-degrading *Rhizopus* sp. can be employed to improve the use of this organism in the decontamination and detoxification of OTA-contaminated food and feed commodities hence, reducing the problems associated with the exposure of humans and animals to OTA-

contaminated food and feed commodities in these areas.

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Personal problems of adolescent students of earthquake affected areas of District Baramulla, Jammu and Kashmir with reference to academic achievement.

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Abstract:-The study was undertaken to study the personal problems of adolescent students of earthquake affected areas of District Baramulla, Jammu and Kashmir. The investigator took two hundred (200) adolescent students (100 male and 100 female) reading in 9th and 10th grades as sample for the study. Nadeem and Ahanger's (2001) urdu Adaptation of California Test of Personality (CTP) for the measurement of personal problems was administered.The analysis of the data revealed that the male adolescent students of earthquake affected areas and female adolescent students of earthquake affected areas of Uri (District Baramulla, Jammu and Kashmir) differ from each other on certain dimensions of personal adjustment like self reliance, sense of personal worth, feeling of belongingness, withdrawing tendencies and nervous symptoms. It was found that female adolescent students were personally well adjusted than male adolescent students of earthquake affected areas of Uri (District Baramulla).Correlation between various dimensions of personal adjustment and academic achievement of male and female adolescent students were found positive and significant.

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Key words:- Personal problems, Adolescent students, Earthquake affected areas, Academic achievement

1. Introduction

Every individual is said to have a personality of his own which is unique and distinct from every other personality. In a proper sense, by personality we mean that an individual has some striking qualities or traits in which he differs from others,i.e; in appearance, in aggressiveness or pleasant manner etc. But these are not the only points that make up the person. Every individual has a typical and distinctive style of behaving. This unique quality of his behaviour constitutes shape to his personality. i.e, feelings, values, reactions, prejudices, attitudes, perceptions etc. are the basis of ones behaviour. Thus personality includes physique, habits, temperaments, sentiments, will and intelligence etc.

Adolescence is a stage of development, which in most societies presents many problems. It is a phase of development, which parents and teachers fear. Often it is considered a terrible period. The behaviour of pupil during this period is frequently found to be "unbalanced" , "unpredictable" ,and "unstable" . Often the child becomes unreasonable. Sometimes they are difficult and they challenge authority. For these reasons most societies have regarded this stage as difficult phase of growth and have shown degree of anxiety over the development of the child during this period. It is the period during which radical changes takes place within the individual as he/she emerges as from childhood into maturity. Learning and appropriate sex-role getting along with the age mates and developing the conscience are considered important at this stage in almost all the progressive societies, but these behaviours are not easy to learn and present many problems. It is these and many others situations out of which turbulence of this arise.

Academic achievement of pupils is of vital importance, particularly in the present socio-economic and cultural context. In the schools great emphasis is placed on academic achievement right from the beginning of formal education. The school has its own systematic hierarchy, which is already based on achievement and performance. The school performs the function of selection and differentiation among students and opens avenues for advancement, again, primarily in terms of academic achievement. The effectiveness of any educational system is gauged to the academic achievement within a given setup is, therefore, the goal of every educationist, researcher, teacher or an educational administrator.

Disaster struck Kashmir on the 8th of October 2005 Mw 7.6 at a depth of 26km from the surface with its epicenter located at 34.493 N, 73.629 E, 19 km North East from Muzaffarabad and 170 km West-N-West of Srinagar, Jammu and Kashmir. The worst affected major towns on the Indian side of Line of Control are Tangadhar in Kupwara district and Uri in Baramulla district. At least 22 after shocks followed within 24 hours including a magnitude temblor. Although the United States Geological Survey's Richter Scale

measured it as 7.6 degree, the Japanese metrology office gauged it at 7.8 like other walks of life, education system in above mentioned areas are resulted in the miserable plight of the inherent. Whereas on the other hand, it completely degraded multifaceted existence-economics, social and psychological etc. of those people ; on the other hand it diversely affected the cultural and traditional life of people. In such conditions the flourishment of educational setup suffered set-back which in the long run could obstacle in the over all progress and development of victims or affected population. Around 89.4% of the villages of uri had educational facilities prior to the earthquake.96% of the schools in uri were devastated by the earthquake ; ICDS and aganwadi centers in nearly 90% of the villages which reported having these having these facilities have been destroyed in the earthquake.

The primary objectives of this study was to study the personal problems of adolescent students and to compare male and female adolescent students of earthquake affected areas of Uri (District Baramulla) on personal problems and academic achievement.

2.Hypotheses

The following hypotheses have been formulated for the present investigation:

1. There is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) on personal problems.
2. To find the correlation between social adjustment and academic achievement of adolescent students of earthquake affected areas of Uri (District Baramulla).

3. Materials and methods:-

The investigator took two hundred (200) adolescent students (100 male and 100 female) reading in 9th and 10th grades as sample for the study.

3.1Tools used:

Nadeem and Ahanger's (2001) urdu Adaptation of California Test of Personality (CTP) for the measurement of personal problems.

3.2 Stastical treatment:

After the scoring of the test was completed ,the data was subjected to statistical analysis by applying t-test.

3. Analysis and interpretation:-

In order to prove the hypotheses, the data was stastically analyzed by employing t-test

Table 1. Showing the mean comparison between male and female adolescent students on self-reliance dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	6.19	1.51	2.08	Significant at 0.05 level of significance
Female adolescent students	100	9.73	1.69		

The table 1 shows that the two groups differ significantly on self-reliance dimension of personal adjustment. The calculated t-value (2.08) is greater than the tabulated t-value (1.95) and falls in the acceptance zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands accepted at 0.05 level. Since the mean difference favours the female adolescent students (9.73) so, female adolescent students exhibit more sense of reliance than male adolescent students. It is because that female adolescent students are confident enough than male adolescent students in every sphere of life now a days. They can recover immediately after any disaster.

The table 2 shows that the two groups differ significantly on sense of personal worth dimension of personal adjustment. The calculated t-value (2.07) is greater than the tabulated t-value (1.95) and falls in the acceptance zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands accepted at 0.05 level. Since the mean difference favours the female adolescent students (9.73) so, female adolescent students exhibit more sense of personal worth than male adolescent students.

Table 2. Showing the mean comparison between male and female adolescent students on sense of personal worth dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	6.07	1.36	2.07	Significant at 0.05 level of significance
Female adolescent students	100	9.66	1.73		

Table 3. Showing the mean comparison between male and female adolescent students on sense of personal freedom dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	9.59	1.07	0.93	Not Significant
Female adolescent students	100	7.96	1.76		

The table 3 shows that the two groups differ significantly on sense of personal freedom dimension of personal adjustment. The calculated t-value (0.93) is less than the tabulated t-value (1.95) and falls in the rejection zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands rejected. On this dimension, both male and female adolescent students of earthquake affected areas of Uri (District Baramulla) are sailing in the same boat.

Table 4. Showing the mean comparison between male and female adolescent students on feeling of belongingness dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	5.73	1.69	3.36	Significant at 0.01 level of significance
Female adolescent students	100	10.27	1.34		

The table 4 shows that the two groups differ significantly on feeling of belongingness dimension of personal adjustment. The calculated t-value (3.36) is greater than the tabulated t-value (2.58) and falls in the acceptance zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands accepted at 0.01 level. Since the mean difference favours the female adolescent students (10.27) so, female adolescent students exhibit more feeling of belongingness than male adolescent students.

Table 5. Showing the mean comparison between male and female adolescent students on withdrawing tendencies dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	5.22	1.36	2.59	Significant at 0.01 level of significance
Female adolescent students	100	9.51	1.65		

The table 5 shows that the two groups differ significantly on withdrawing tendencies dimension of personal adjustment. The calculated t-value (2.59) is greater than the tabulated t-value (2.58) and falls in the acceptance zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands accepted at 0.01 level. Since the mean difference favours the female adolescent students (9.51) so, female adolescent students more satisfactorily adjusted than male adolescent students. This justifies that they are being discouraged and sometimes they come across the people who are often unkind and unfair to them and who often try to deceive them. With the result they develop introvert tendencies and prefer to choose isolation from others which ultimately becomes the cause of their low academic achievement and leads them to the personal problems.

Table 6. Showing the mean comparison between male and female adolescent students on nervous symptoms dimension of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	5.51	1.18	2.61	Significant at 0.01 level of significance
Female adolescent students	100	9.78	1.63		

The table 6 shows that the two groups differ significantly on nervous symptoms dimension of personal adjustment. The calculated t-value (2.61) is greater than the tabulated t-value (2.58) and falls in the acceptance zone ,so the hypotheses which reads as there is a significant difference between male and female adolescent students of earthquake affected areas of Uri (District Baramulla) stands accepted at 0.01 level. Since the mean difference favours the female adolescent students (9.78) so, female adolescent students are more adjusted than male adolescent students.

Table 7. Showing the mean comparison between male and female adolescent students on total dimensions of personal adjustment

Group	N	Mean	S.D	t-value	Level of significance
Male adolescent students	100	38.31	6.89	2.11	Significant at 0.05 level of significance
Female adolescent students	100	56.91	8.79		

Table 8. Correlation between various dimensions of personal adjustment and academic achievement of male adolescent students

Various dimensions of personal adjustment and academic achievement	Correlation
Self-reliance and academic achievement	.68**
Sense of personal worth and academic achievement	.71**
Sense of personal freedom and academic achievement	.49**
Feeling of belongingness and academic achievement	.59**
Withdrawal tendencies and academic achievement	.65**
Nervous symptoms and academic achievement	.37**

**= Significant at 0.01 level

Table 9. Correlation between various dimensions of personal adjustment and academic achievement of female adolescent students

Various dimensions of personal adjustment and academic achievement	Correlation
Self-reliance and academic achievement	.68**
Sense of personal worth and academic achievement	.69**
Sense of personal freedom and academic achievement	.69**
Feeling of belongingness and academic achievement	.51**
Withdrawal tendencies and academic achievement	.64**
Nervous symptoms and academic achievement	.57**

**= Significant at 0.01 level

Conclusion:-

I. Male adolescent students of earthquake affected areas and female adolescent students of earthquake affected areas of Uri (district Baramulla) differ from each other

on certain dimensions of personal adjustment like self-reliance, sense of personal worth, feeling of belongingness, withdrawing tendencies and nervous symptoms. It was found that female adolescent students are personally well adjusted than male adolescent students of earthquake affected areas of Uri (district Baramulla).

II. Correlation between various dimensions of personal adjustment and academic achievement of male and female adolescent students were found positive and significant.

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Persistence studies of Cyazofamid in potato plant soil and water

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Abstract: Persistence of Cyazofamid was studied in potato plant, in four types of soil viz., black, clay, sandy loam and loamy sand soils and in three types of water viz., acidic (pH 4.0), natural (pH 7.0) and basic (pH 9.0). All the matrixes were treated with Cyazofamid so as to get concentrations of 1 & 2 ppm. These samples of soil and water were kept in laboratory at ambient temperature. Potato plants were collected from the experimental field. The periodic samples in triplicate were drawn at intervals of 0, 3,7,15 & 30 days after treatment and were processed for analysis. The analysis of plant samples on 0 day (after 2 hrs. of application) showed initial deposition of 1.601 & 2.827 ppm of Cyazofamid when sprayed @ 80 g a.i./ha & @ 160 a.i./ha with half life of 1.74 days to 1.89 days respectively. No residue of Cyazofamid could be detected (detection level 0.02 ppm) on 10th day after application in both the treatments. The analysis of soil samples on 0 day showed mean initial deposition of Cyazofamid as 0.816, 0.817, 0.831 and 0.817 ppm when treated with 1 ppm concentration and 2.704, 1.785, 1.753 and 1.706 ppm when treated with 2 ppm in black, clay, sandy loam and loamy sand soils. The half life varied from 4.86-5.04 days in black soil, 3.02-3.21 days in clay soil, 4.15-4.30 days in sandy loam soil and 3.67-3.90 days in loamy sand soil at 1 and 2 ppm respectively. The analysis of water samples on 0 day showed initial deposition of Cyazofamid as 0.872, 0.8769 and 0.850 ppm in acidic, neutral and basic water respectively at 1 ppm and 1.703, 1.712 and 1.759 ppm in acidic, neutral and basic water respectively at 2 ppm. The half life values varied from 5.7 & 6.1 at 1 and 2 ppm level respectively in acidic water; 4.2, 4.5 days at 1 & 2 ppm level respectively in neutral water and 3.8 and 3.9 at 1 & 2 ppm level respectively in basic water.
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Key words: Cyazofamid, persistence, Potato plant, soil, water

Introduction

Cyazofamid a new fungicide is used for the control of disease caused by Oomycetes and Plasmodiophoromycetes fungi. The biochemical mode of action to Cyazofamid is by inhibition of all stages of fungal development. It is commonly used to control early and late blight of tomatoes and potatoes and downy mildew of cucurbit vegetables. No doubt use of pesticides which include insecticides, fungicides and herbicides or any other substance used to control pests improve the crop production by protecting them but residue of these chemicals have negative effects on human health. United State EPA and European commission strictly regulates the level of pesticide residue in various food commodities through maximum residue limit. Therefore, it is very important to determine the persistence of Cyazofamid in plant water and soil which may contribute to residue carry over problem and hence the present studies was carried out to detect level of residue persisted at different time intervals.

Material & Methods

Chemicals and reagents

All the solvent and water used were of HPLC grade. The chemicals used were of analytical grade. The Cyazofamid standard obtained from United Phosphorus Limited Mumbai, India was 99.3 per cent pure. One hundred ppm stock solution of Cyazofamid was prepared in Acetonitrile and serial dilutions of desired concentration were prepared using mobile phase.

Extraction and clean up of samples were done as per AOAC QuEChERS 2007. 01 method by Steven J. Lehotay, (2007).

Persistence in soils

Collection of soil samples

Four types of cultivable field soils were collected from different locations *viz.* (i) Black soil from Regional Research Station, JNKVV, Khandwa, M.P, India (ii) Clay soil from Agriculture Research Station, MPUAT, Kota, Rajasthan, India (iii) Sandy loam soil from Agriculture Research Station, RAU, Durgapura Rajasthan India and (iv) Loamy sand soil from Agriculture Research Station, RAU, Sri Ganganagar, India following standard methodology of soil sampling. The air dried soils were grounded and passed through 1 mm sieve and sub-sampled by the usual method of quartering. The physico-chemical properties of soils (Table 1.) are as under:

Table 1.Physico-chemical properties of soils

Location	Texture	pH	Bulk Density (g/cm^3)	Organic carbon (%)
JNKVV, Khandwa	Black soil	7.81	1.56	0.69
MPUAT, Kota	Clay soil	8.12	1.58	0.68
ARS, RAU, Durgapura	Sandy loam soil	7.20	1.27	0.87
ARS, RAU Sri Ganganagar	Loamy sand soil	6.20	1.62	0.70

Fortification of soil samples

Weighed 50 g of soil samples and transferred to 250 ml beakers separately and fortified at 1 and 2 ppm levels by adding 5 ml of 10 and 20 ppm stock solution of Cyazofamid. In control, 5 ml of water was added. Three replicate flasks for each treatment were taken for analysis on each sampling day along with untreated control. During entire study period, soil moisture was maintained at one third of soil water holding capacity by adding distilled water on regular intervals and stored at room temperature. Samples were then processed for analysis of Cyazofamid residues at intervals of 0 (2h after application), 3, 7, 15 and 30 days after application.

Extraction and Cleanup of soil sample

5.0 g of thoroughly comminuted samples and 10 ml water was taken into Teflon centrifuge tubes. The Teflon centrifuge tubes were covered with black paper to avoid light exposure. 15 ml of 1% Acetic acid in Acetonitrile per 15 g sample was then added in each tube using the solvent dispenser. The tubes were then kept in cold at 4 degree C overnight. 6 g anhydrous MgSO4, and 1.5 g anhydrous sodium acetate per 15 g sample was added to the tubes. The tubes were vigorously shaken by hand for 1 min ensuring that the solvent interacts well with the entire sample and that crystalline agglomerates are broken up sufficiently during shaking. The tubes were then centrifuged at >1500 rcf for 10 min. 6 ml of the Acetonitrile extracts (upper layer) was transferred to the centrifuge tubes containing 50 mg PSA sorbent and 150 mg MgSO4 per mL extract. The tubes were sealed well and shaken for 30 seconds. the tubes were again centrifuged at >1500 rcf for 10 min. The final extract was filtered through Axiva 0.2 µm nylon syringe filter and transferred to HPLC vial for analysis. All the processes were completed in dark.

Validation of Method

Recovery studies were carried out in order to establish the analytical method and to know the efficiency of extraction and clean up steps employed for the present study by fortifying the representative samples with analytical standard of Cyazofamid at 0.02, 0.1 and 0.2ppm level. The results of recovery studies are presented in table 2.

Table 2 Recovery of Cyazofamid from different soil samples

Matrix	Amount fortified (µg/g)	Mean Per cent recovery
Black soil	0.02	92.9
	0.10	91.7
	0.20	91.9
Clay soil	0.02	92.1
	0.10	92.0
	0.20	93.2
Sandy loam soil	0.02	91.7
	0.10	92.8
	0.20	92.8
Loamy sand soil	0.02	92.6
	0.10	92.8
	0.20	93.5

Persistence in water

Preparation of water samples

Sample of water at different pH level *i.e.,* Basic (9.0 pH), Neutral (7.0 pH) and Acidic (4.0 pH), were prepared using buffer capsules of pH 9.0, 7.0 and 4.0 to set up the pH of water. One buffer capsule is required for 100 ml of distilled water to set up respective pH level. In a series of 250 ml conical flask, 200 ml distilled water was added and two capsules were added to each of the conical flask. The conical flasks were then left at room temperature for overnight for homogeneous mixing.

Fortification of water samples

22.5 ml of water samples were transferred to 100 ml beakers separately and fortified at 1 and 2 ppm level by adding 2.5 ml of 10 and 20 ppm stock solution for Cyazofamid prepared from Cyazofamid. In control, 2.5 ml of water was added. Samples were stored at room temperature. Three replicate flasks for each samples were processed for analysis of Cyazofamid residues at intervals of 0 (2h after application), 3, 7, 15 and 30 days after application.

Extraction and Cleanup of water sample

15.0 g of water samples was taken into Teflon centrifuge tubes and processed as per method mentioned in the extraction and cleanup of sample in soil

Validation of Method

Recovery studies were carried out in order to establish the analytical method and to know the efficiency of extraction and clean up steps employed for the present study by fortifying the representative samples with analytical standard of Cyazofamid at 0.02, 0.1 and 0.2ppm level. The results of recovery studies are presented in table 3.

Table 3 Recovery of Cyazofamid from different water samples

Matrix	**Amount fortified (μg/g)**	**Mean Per cent recovery**
Acidic water	0.02	93.4
	0.10	94.5
	0.20	94.5
Neutral water	0.02	95.3
	0.10	95.4
	0.20	95.6
Basic water	0.02	93.8
	0.10	93.7
	0.20	94.9

Persistence in plant

Preparation of plant Sample

Homogenized the sample and took 15 gms of representative plant sample for extraction.

Extraction and Cleanup of sample:

15.0 g of thoroughly comminuted plant samples was taken into Teflon centrifuge tubes and processed as per method mentioned in the extraction and cleanup of sample in soil

Validation of Method

Recovery studies were carried out in order to establish the analytical method and to know the efficiency of extraction and clean up steps employed for the present study by fortifying the potato plant samples with analytical standard of Cyazofamid at 0.02, 0.1 and 0.2ppm level. The results of recovery studies are presented in table 4

Table 4 Recovery of Cyazofamid from potato plant

Matrix	Amount fortified (ppm)	Mean % Recovered
Potato Plant	0.02	91.1
	0.1	91.5
	0.2	92.1

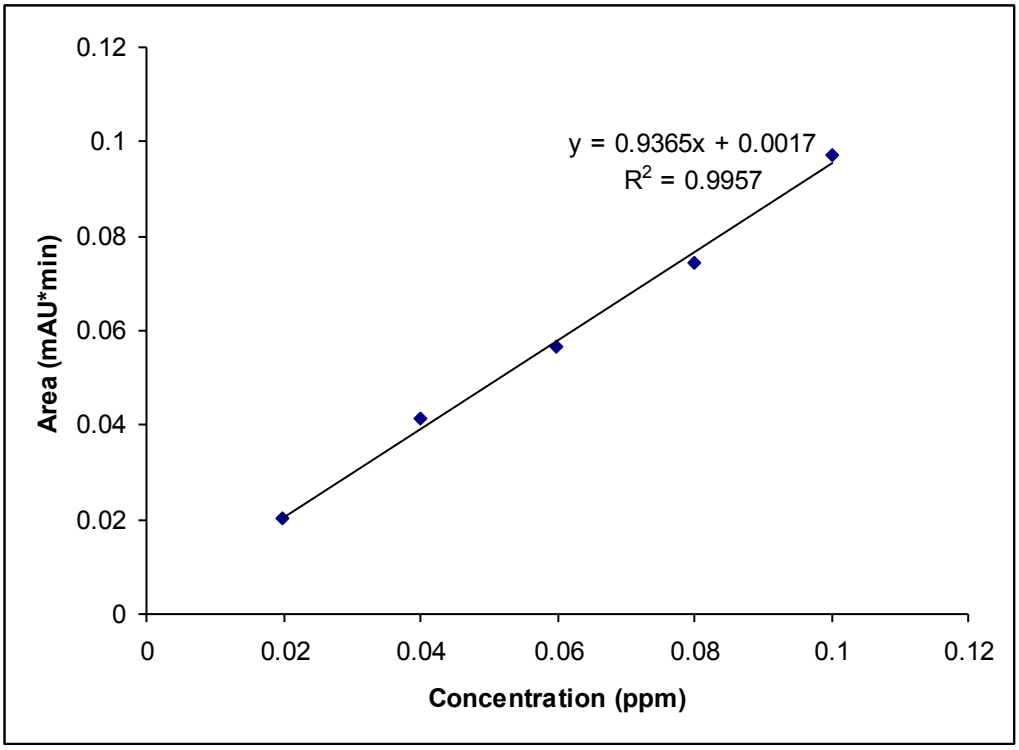
Linearity check study:

Different known concentrations of Cyazofamid standards (0.02, 0.04, 0.06, 0.08 and 0.10 ppm) were prepared in mobile phase and injected 20 µl of std. solution into HPLC system & measured the peak area (Table 5). A standard calibration curve was plotted for concentration of standard vs area measured and curve was found linear within concentration range for Cyazofamid

Table 5 Linear Dynamic Range Data of Cyazofamid Standard

Concentration (ppm)	Area (mAU*min)
0.02	0.0202
0.04	0.0412
0.06	0.0566
0.08	0.0743
0.10	0.0973

Standard Curve:



Tale 6.Persistence of Cyazofamid in soil, water and potato plant

Treatment	days	Residue ppm								Dissipation							
		Soil				Water			Plant	Soil				Water			Plant
		Black	Clay	Sandy Loam	Loamy Sand	Acidic	Neutral	Basic		Black	Clay	Sandy Loam	Loamy Sand	Acidic	Neutral	Basic	
Cyazofamid 1.0 ppm	0	0.817±0.005	0.817±0.005	0.831±0.010	0.817±0.005	0.872±0.008	0.869±0.003	0.850±0.019	1.601	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.668±0.030	0.547±0.022	0.581±0.011	0.586±0.012	0.677±0.005	0.638±0.040	0.588±0.015	0.940	18.2	33.0	30.2	28.3	22.4	26.6	30.9	41.3
	7	0.307±0.011	0.169±0.018	0.262±0.018	0.223±0.011	0.375±0.019	0.274±0.007	0.239±0.024	0.105	62.4	79.3	68.5	72.7	57.0	68.5	71.9	93.5
	15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
	30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
Half Life (Days)		4.86	3.02	4.15	3.67	5.7	4.2	3.8	1.74								
Cazofamid 2.0 ppm	0	1.733±0.021	1.744±0.029	1.753±0.010	1.764±0.042	1.726±0.017	1.712±0.022	1.759±0.038	2.827	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	1.235±0.052	1.078±0.026	1.178±0.016	1.166±0.029	1.318±0.041	1.315±0.112	1.204±0.064	1.276	28.7	38.2	32.8	33.9	23.6	23.2	31.5	54.9
	7	0.690±0.011	0.495±0.026	0.601±0.009	0.592±0.021	0.792±0.027	0.599±0.031	0.565±0.054	0.223	60.2	71.6	65.7	66.4	54.1	65.0	67.9	92.1
	15	0.226±0.013	0.072±0.016	0.161±0.016	0.127±0.017	0.320±0.046	0.183±0.007	0.125±0.019		87.0	95.9	90.8	92.8	81.4	89.3	92.9	
	30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
Half Life (Days)		5.04	3.21	4.30	3.90	6.1	4.5	3.9	1.89	-	-	-	-	-	-	-	-
Untreated control	0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
	3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
	7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
	15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-
	30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-	-	-	-	-	-	-

BDL: Below determination limit=0.02ppm (MRL of Cyazofamid is 0.02ppm as reported by Pest Management Regulatory Agencies2011 Canada)

HPLC analysis

All the determinations were performed using Dionex Ultimate 3000 HPLC with DAD and Acelaim 120.C-18,5um, 120A, 4.6x150mm. HPLC column. The temperature was ambient, mobile phase used was a mixture of Acetonitrile, methanol and HPLC water (pH-4 with acetic acid) in ratio of 52:65:63 (v/v/v). The UV wavelength was 280 nm with run time 15 minute at flow rate 1 ml/min

Results and discussion

Persistence in soil

Data regarding the initial deposition, per cent dissipation and half life value of Cyazofamid in different soil after treatments at the rate of 1 ppm and 2 ppm have been presented in table 6 The analysis of soil samples on 0 day (after 2 hrs of application) showed mean initial deposition of Cyazofamid as 0.816, 0.817, 831 and 0.817 ppm in black, Clay, sandy loam and loamy sand, respectively at 1 ppm and 1.704, 1.785, 1.753 and 1.706 ppm in black, Clay, sandy loam and loamy sand, respectively at 2 ppm. However, Cyazofamid dissipated to below detectable level on 15 day and 30 days at 1 ppm and 2 ppm level respectively in all four types of soil (black, Clay, sandy loam and loamy sand). The half life ($T_{1/2}$) values varied from 4.86-5.04 days in black soil, 3.02- 3.21 days in clay soil, 4.15- 4.30 days in sandy loam soil and 3.67- 3.90 days in loamy sand soil at 1 and 2 ppm levels, respectively. Similar results of cyazofamid degradation in various types of soil (ranging between 3.5-15.1 days) have been mentioned in review report issued by European Commission (2002). Data from table 6 reveals that

half life of cyazofamid was slightly shorter when fortified in lower concentrations (1 ppm) than that of higher concentration (2 ppm) in all the four types of soils. Fomsgaard *et. a*l.(2004) and Weidenhamer and Romeo (2004) also reported slower degradation of chemicals when present in lower concentration as compared to higher.

Persistence in Water

Data regarding the initial deposition, per cent dissipation and half life value of Cyazofamid in different water after treatments at the rate of 1 ppm and 2 ppm have been presented in table 6. The analysis of water samples on 0 day (after 2 hrs of application) showed mean initial deposition of Cyazofamid as 0.872, 0.869 and 0.850 ppm in acidic, neutral and basic water, respectively at 1 ppm and 1.703, 1.712 and 1.759 ppm in acidic, neutral and basic water, respectively at 2 ppm. However, Cyazofamid dissipated to below detectable level on 15 day and 30 days at 1 ppm and 2 ppm level respectively in all three types of water (acidic, neutral and basic water). The half life ($T_{1/2}$) values varied from 5.7 and 6.1 days at 1 and 2ppm level, respectively in acidic water, 4.2 and 4.5 days at 1 and 2 ppm level, respectively in neutral water and 3.8 and 3.9 days at 1 and 2 ppm level, respectively in basic water .These results are in close confirmation to the results reported In pesticide fact sheet of cyazofamid issued by United State EPA (2004), where pesticide degraded in different types of water ranging between 10.8 to 12.9 days at 25 degree centigrade which is slightly higher than our studies probably because of higher temperature in our conditions

Persistence in potato plant

The analysis of plant sample on 0 days (after 2 hrs of application) showed initial deposition of 1.601 and 2.827 ppm for Cyazofamid from UPF 206 @ 80g a.i./ha (200ml/ha) and160 g a.i./ha (400ml/ha) dose treatments respectively. Cyazofamid dissipated to below detectable level at 10 days after application of UPF 206 @ 80 g a.i./ha (200ml/ha) and 160 g a.i./ha (400ml/ha) with the half life of 1.74 days and 1.89 days, respectively(Table 6).Jerome (2009) studied the dissipation of cyazofamid in turfgrss and found half life of 18-19 days.

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12/1/2011

The role of ultrasound in evaluating patients with biliary obstruction in king Faysal General Hospital, kingdom of Saudi.Arabia,Taif City

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Faculty of applied medical Science

Abstract: Main center of research for this study is role of ultrasound in evaluating patients with biliary obstruction in king Faysal General Hospital, kingdom of Saudi.Arabia ,Taif City. **The main results of this study are:** 1) Ultrasound examination can demonstrate biliary obstructions. 2) Regarding the type of obstruction and main causes of obstruction ultrasound examinations of the gallbladder can detect stone, sludge and other complication diseases, according to my study, ultrasound can detect gallbladder diseases with accuracy of more 96% 3) According to the relationship of biliary tree especially common bile duct and common hepatic duct to the portal vein, hepatic artery and the duodenum, ultrasound can detect obstruction, stricture or any compression due to tumor with accuracy more than 94% with good quality ultrasound machine, good patient's preparations and experience skill sonographer, especially in the distal part of common bile duct due to the duodenum bowel and gases obscuring the duct. magnetic resonance image help us in reporting, follow up & for data reference which helps in the research. 4) According to my study biliary obstruction are more incidences with patient's weight, and increases in females more than males.
[Dr Ibrahim Abdalla Mohamed Elshikh. **The role of ultrasound in evaluating patients with biliary obstruction in king Faysal General Hospital, kingdom of Saudi.Arabia,Taif City.** Academia Arena, 2012;4(1):31-36] http://www.sciencepub.net.7

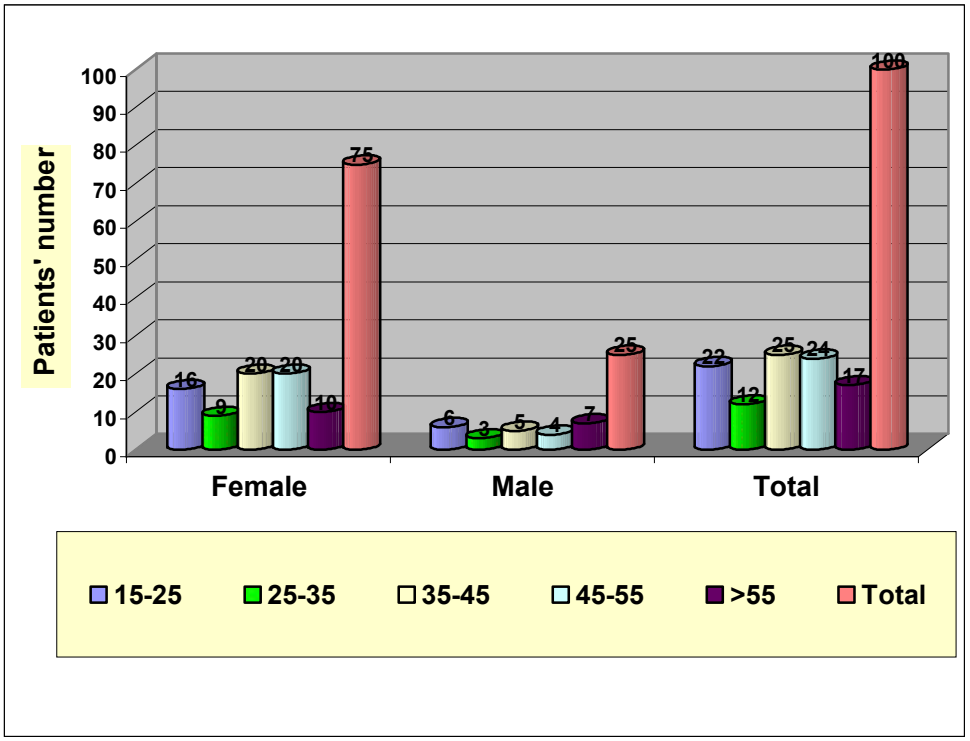
Keywords: ultrasound; patient; biliary; obstruction

Main center of research for this study is role of ultrasound in evaluating patients with biliary obstruction in king Faysal General Hospital, kingdom of Saudi.Arabia ,Taif City. **The main results of this study are:** 1) Ultrasound examination can demonstrate biliary obstructions. 2) Regarding the type of obstruction and main causes of obstruction ultrasound examinations of the gallbladder can detect stone, sludge and other complication diseases, according to my study, ultrasound can detect gallbladder diseases with accuracy of more 96% 3) According to the relationship of biliary tree especially common bile duct and common hepatic duct to the portal vein, hepatic artery and the duodenum, ultrasound can detect obstruction, stricture or any compression due to tumor with accuracy more than 94% with good quality ultrasound machine, good patient's preparations and experience skill sonographer, especially in the distal part of common bile duct due to the duodenum bowel and gases obscuring the duct. magnetic resonance image help us in reporting, follow up & for data reference which helps in the research. 4) According to my study biliary obstruction are more incidences with patient's weight, and increases in females more than males.

IV-1-Data Presentation

Table: 1 Sex with Age

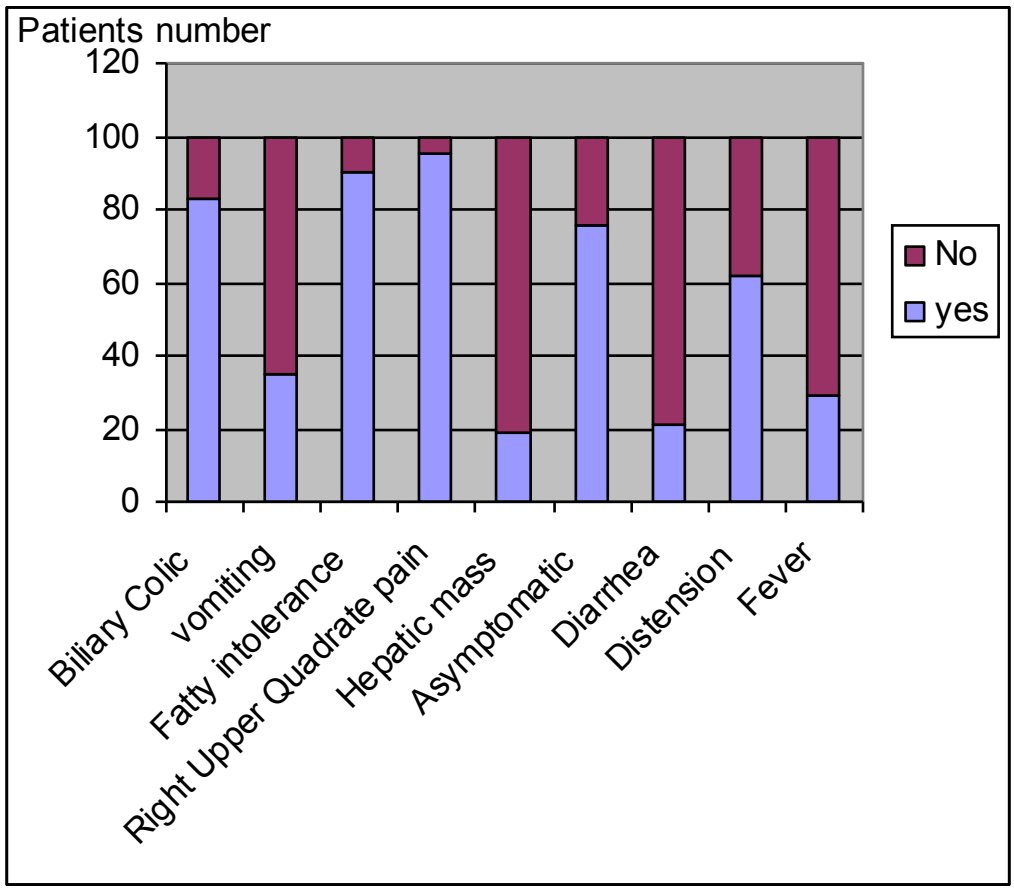
Age	Male	%	Female	%	Total
15-25	6	24	16	21.3	22
25-35	3	12	9	12	12
35-45	5	20	20	26.7	25
45-55	4	16	20	26.7	24
>55	7	28	10	13.3	17
Total	25	100	75	100	100



Graph: 1 Sex with Age

Table: 2 Clinical Features

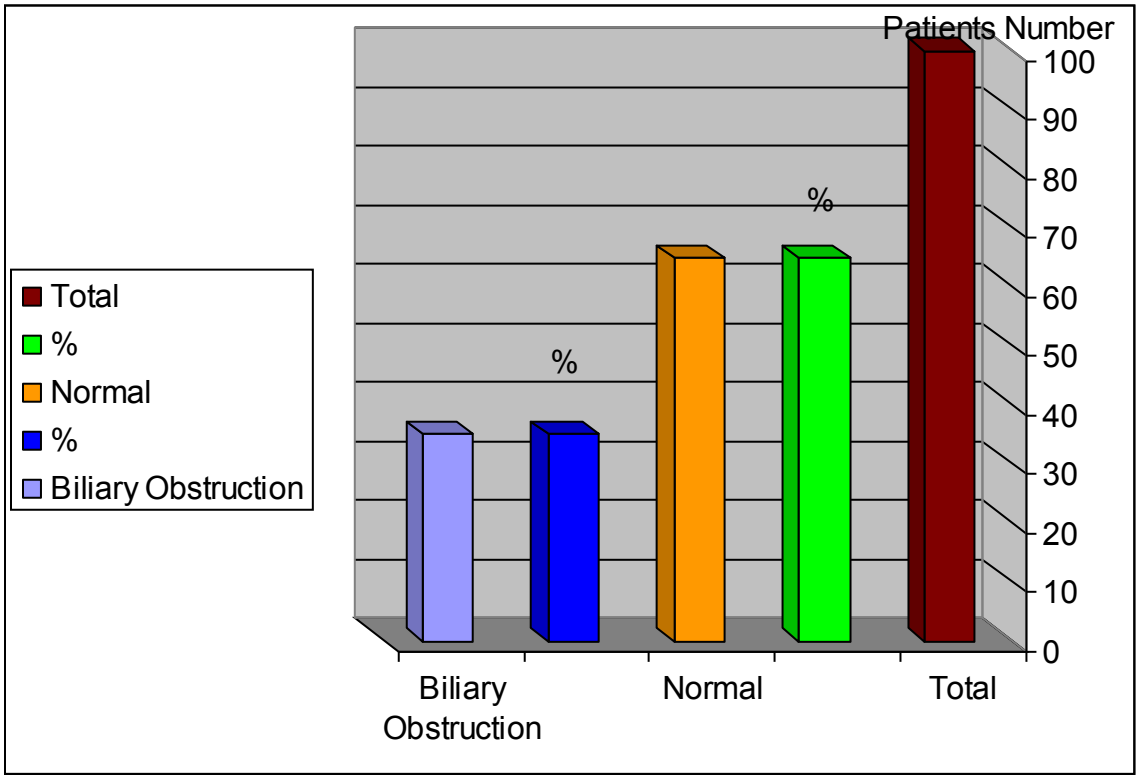
Clinical feature	yes	No
Biliary Colic	83	17
vomiting	35	65
Fatty intolerance	90	10
Right Upper Quadrate pain	95	5
Hepatic mass	19	81
Asymptomatic	76	24
Diarrhea	21	79
Distension	62	38
Fever	29	71



Graph: 2 Clinical Features

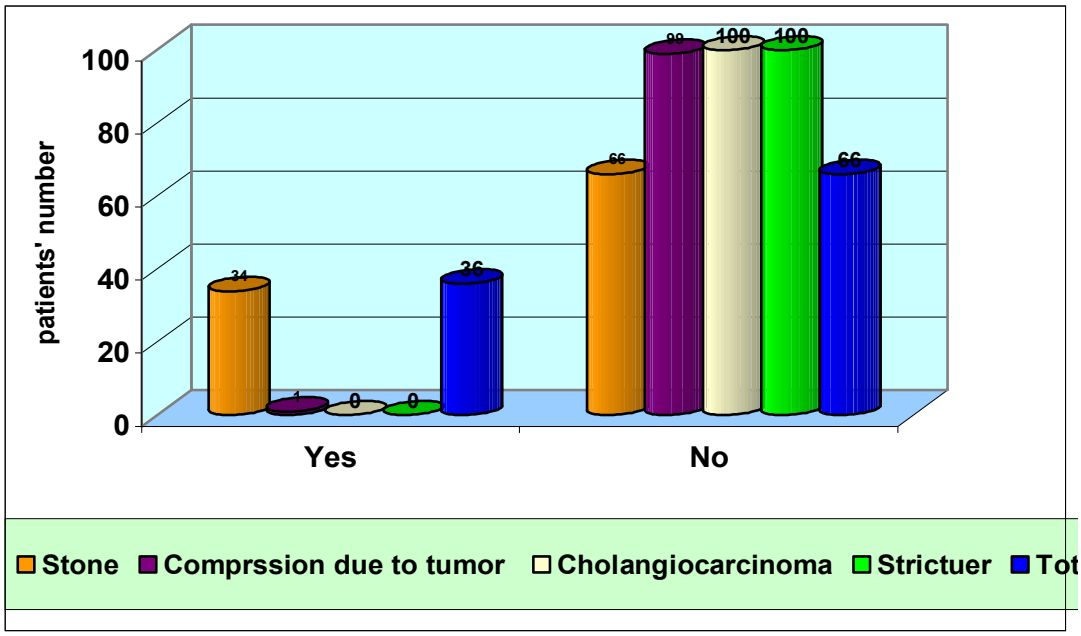
Table: 4 Ultrasound Findings (Results)

Biliary Obstruction	%	Normal	%	Total
35	35	65	65	100



Graph: 4 Ultrasound Findings

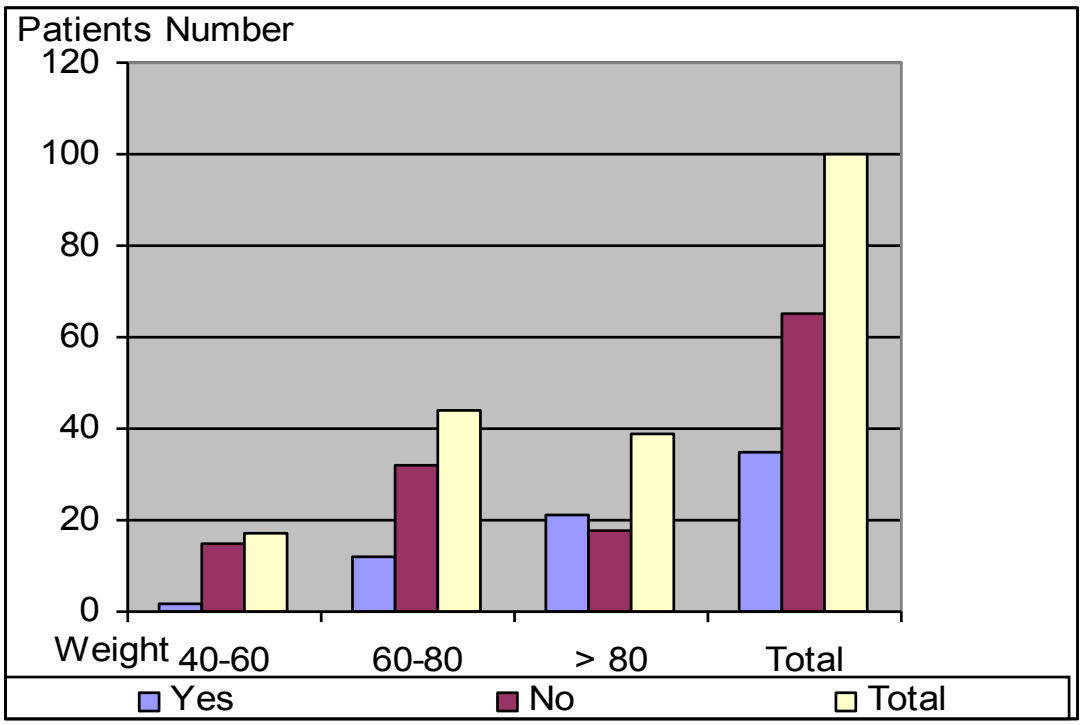
Causes	Yes	%	No	%	Total
Stone	34	34%	66	66%	100
Comprssion due to tumor	1	1%	99	99%	100
Cholangiocarcinoma	0	0%	100	100%	100
Stricture	0	0%	100	100%	100
Total	36	36%	66	66%	100



Graph: 5 Causes of Obstruction

Table :(6) Biliary Obstruction with weight

Weight	Yes	%	No	%	Total
40-60	2	5.7	15	23.1	17
60-80	12	34.3	32	49.2	44
> 80	21	60	18	27.7	39
Total	35	100	65	100	100



Graph: (6) Biliary Obstruction with weight

Result and CONCLUSION:

In this study the diagnostic accuracy of ultrasound`in the gallbladder was more than 96% and in the common bile duct more than94% we can said the accuracy of ultrasound in biliary system obstruction is more than 95% where it assitance in providing guidance for the procedure

Finally out of all the prementioned facts ultrasound is playing an essential tools in detection of biliary system obstruction with proper investigation

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12/2/2011

Productivity and sustainability of sugarcane (*Saccharum officinarum*) genotypes under various planting seasons and fertility levels in South-East Rajasthan.

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ABSTRACT: A field experiment was conducted during cropping seasons of 2008-09 to 2010-11 at Kota to evaluate different sugarcane genotype (COPK-05191, COPK-05192 & CO-05011 under three levels of NPK (150:45:30, 200:60:40 & 250:75:50) in three season (spring and summer). Genotype COPK-05191 recorded highest cane yield and commercial cane sugar (CCS) across the season. Individual cane weight increased significantly upto 200:60:40 NPK/ha. Genotype COPK-05191 gave better yield and net profit, hence could be adopted in the region for optimizing sugar productivity and regulating crushing schedule at factory level. Fertility level of 200:60:40 NPK/ha was optimum for growth and cane yield during spring as well as summer planting.
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Key words : Sugarcane, genotype season, commercial cane sugar, NPK level, net return.

INTRODUCTION

Sugar is the second largest agro-processing industry accounts for 2.2 per cent of country's total cropped area. Three biggest sugar producers in world are Brazil, India and European (EU), each producing between 18 and 23 million tons per year. However, these producers differs greatly in their level of self sufficiency in terms of sugar consumption and alternatively diverting their resources for ethonal production. Ethanol produced from

Sugarcane being used as bio-fuel which is environment-friendly and blended with gasoline. In Brazil 20-24 per cent of ethanol is blended with gasoline while in USA it is 10 per cent in India, 5 per cent blending was made mandatory to reduce the imports of crude petroleum and hence it need to produce 500 million litre of ethanol per annum.

In subtropical India sugarcane (*Saccharum officinarum*) under various planting seasons and fertility levels is planted in autumn, spring and summer season. Productivity of different genotype is greatly influenced by genetic make up and agro techniques. Role of nitrogen in increasing tillers and growth is well recognized. Heavy application of nitrogen decreases the juice quality. Optimum nutrient management for sugarcane plant crop plays key role as it establishes vigorous stubble, which affects the ratoon yield (Shukla, 2007). In India, ideally sub tropical sugarcane could be grown in Feb.-March season but for improved yield & quality identification of optimum time of sowing which fits well to the local climatic and weather variable is very important. Tillering period in sugarcane is the most important growth phase which governs the cane yield in subtropical India. Normally sugarcane germination under subtropical conditions is 30-35% as compared to 80-85% in tropical part of the country. When sugarcane planting is delayed from February to April/May, it gets lesser time for tillering and reduces productivity (Pandey and Shukla, 2001). Thus, time of planting is a key component for obtaining high sugarcane productivity. Climatic and agronomic practices required for cultivation of sugarcane in subtropical condition is not well known and have selection of suitable subtropical sugarcane genotype, which is liable to change as per genotypes and environment under different planting seasons and nutrient levels needs to be identified in subtropical India.

MATERIALS & METHODS

A field experiment was conducted during 2008-09 to 2010-11 at Agricultural Research Station, Ummedganj, Kota (Raj.) ($25^{o}13$ latitude N & $75^{o}25$ longitude E Altitude of 258 m above MSL) using three sugarcane genotypes viz COPK- 05191, COPK-05192 & CO-0501 and three NPK levels 150:45:30, 200:60:40 & 250:75:50 kg/ha, to identify suitable genotypes under various planting seasons. Clay loam soil of experiment with pH 8.0, organic carbon 0.55%

and available nitrogen (355 kg/ha), available P_2O_5 (23.6 kg/ha), available K_2O (287 kg/ha). Nine treatment combination were tested in a 3 times replicated randomized block design. Separate trials were conducted for spring and summer seasons. Planting of spring (Fubruary planted) and summer season (April planted) was done at 75 cm row spacing. The sowing were taken up as per the technical programme. Farm yard manure at 10 ton/ha was incorporated uniformly over the field before last plouging. NPK were applied as per the treatments. Rest of nitrogen was topdressed on 30 & 60 DAP except basal dose of nitrogen as per treatment.

Five canes were randomly selected for each plot for estimation of growth attributes, yield and quality parameters. Juice purity and commercial cane sugar (CCS) were calculated. Sucros content in juice was determined (chen & chou) 1993 . Milable Cane stalk were counted in December for spring and summer crops. Cane growth attributes were measured before harvesting at the time of juice analysis. Variances were subjected to Bartlett's test for homogeneity of variance. As variances were found to be homogenous pooled data for 3 consecutive years for spring and summer were presented.

Sustainability yield index (SYI) was calculated for different treatments taking yield as dependent variable. Mean yield of each treatment (Yt) and standard deviation (S) over years were calculated using the yield data from 2008 to 2011 (spring and summer) for arriving at SYI using the equation $h_1 = (Yt-S)/Ymax$- where h_1 is sustainability index of h treatment over a period of n years and Ymax is the maximum yield.

The experimental location experiences sub tropical climate with dry summer extending from march to August. A perusal of 50 year weather data of the site reveals that the area received a mean annual rainfall of 772.6 mm distributed in 43.6 rainy days. The mean annual maximum and minimum temp ranged from 22.3 to 43.96 ^oC and 5.44 to 27.4 ^oC, respectively. The mean relative humidity ranged from 38.96 to 80.26 per cent. The mean pan evaporation per day ranged for 1.6 to 16.9 mm (Table 1).

Table 1 : Mean monthly maximum and minimum temp, RH, evaporation and total rain fall.

S. No.	Month	Temp ^oC						RH %			Rainfall (mm)			Evaporation		
		Maximum			Minimum											
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1	Jan.	22.10	21.8	22.2	5.03	5.4	5.9	76.1	73.7	68.0	-	6.6	2.6	1.5	1.37	1.7
2	Feb.	25.1	23.6	25.8	5.23	5.6	10.7	71.6	69.2	68.9	-	3.4	1.4	2.8	2.4	3.2
3	March	33.7	32.3	33.5	13.1	10.9	10.7	59.8	59.3	55.1	4.2	-	-	5.5	5.2	4.7
4	April	38.1	35.2	36.9	17.7	14.2	14.85	41.5	42.5	32.9	32.2	-	-	6.2	4.9	6.5
5	May	40.3	43.6	41.4	18.2	17.5	17.85	43.2	43.6	44.5	-	3.0	-	12.6	10.2	12.5
6	June	42.5	44.8	44.6	27.2	28.2	8.8	48.8	50.5	50.3	70.0	6.4	23.2	18.5	14.6	17.6
7	July	36.6	28.6	35.6	28.3	26.5	27.4	64.7	66.9	66.8	160.3	111.7	156.8	4.9	2.8	3.2
8	Aug.	33.8	29.3	32.7	24.3	23.8	25.1	79.8	80.0	81.0	115.4	70.2	256.2	3.8	3.3	2.8
9	Sept.	32.3	32.8	33.5	26.6	27.2	25.62	72.7	74.5	74.4	53.0	3.2	104.5	4.2	3.8	4.9
10	Oct.	34.5	33.4	35.2	28.3	20.5	20.62	64.3	64.8	48.1	4.8	-	-	3.9	3.3	5.3
11	Nov.	29.0	26.8	28.0	14.8	14.2	15.95	76.2	75.3	74.9	4.5	8.8	37.5	1.1	1.4	2.1
12	Dec.	22.0	27.3	23.8	7.2	7.5	7.85	64.7	64.7	65.1	-	2.7	2.5	1.3	1.0	1.2

Results and discussion

Growth yield and quality of plant crop:

Spring planting:

Mean data of 3 cropping season indicated that genotype CO-05011 showed higher germination (41%) than COPK-05192 and COPK-05191 i.e. 40.2 % and 33.8 per cent respectively (Table No. 2). Maximum number of tillers and milable were found with COPK-05191 owing to its higher tillering capacity. Over all mean individual cane weight (892.33 gm.) of COPK 05191 and COPK-05192 (811 gm) were at par. It showed that although COPK-05192 produced thicker cane than COPK-05191, contribution of cane length in cane weight compensated the effect of diameter so COPK-05192 was at par with COPK-05191. Higher cane yield was harvested with genotypes COPK-05191. Owing to higher number of millable canes and optimum cane weight. Genotype (COPK-05191) showed the highest brix (21.36%) and pol (18.35 %) reading at 10 month stage in spring cane (Table 2). It was observed that maximum benefit from higher sugar genotype COPK-05191 could be harvested in December under spring planting situation.

Germination of spring plant crop remained unaffected due to fertility levels. Number of tillers 8 millable canes increased significantly up to 200:60:40 NPK kg/ha. Moreover, higher dose of NPK also reduced the tiller mortality indicating the besides production of millable canes higher nutrition level helped in maintaining retention of tillers. The role of nitrogen in chlorophyll formation and carbohydrate metabolism and positive interaction of

nitrogen and phosphorus and nitrogen with potassium is well known. It was main reason in improving millable canes, growth and vigour of sugarcane plant. Higher cane weight was obtained up to 200:60:40 NPK kg/ha, as it had positive effect on growth and development processes (Pandey and Shukla 2001). Thus cane yield and CCS were also higher at this fertility level. CCS was the function of cane yield and quality. The higher cane yield contributed greater share in improving CCS than cane quality parameters.

Table 2 : Influence of genotype and fertility levels applied in spring & summer crop on growth yield and commercial cane sugar (CCS) of sugarcane crop (Pooled data of 3 cropping season).

S.No.	Treatment	Germination (%)	Tillers (000/ha)	NMC (000/ha)	Cane weight (gm)	Cane yield (t/ha)	Pol % Juice	CCS ton/ha.	Nutrient uptake (kg/ha)		
									N	P	K
Spring planted crop											
Genotypes											
1	COPK-05191	33.8	134.81	99.40	892.33	81.20	18.35	9.82	263.8	17.9	210.5
2	COPK-05192	40.2	130.87	93.98	871.0	74.20	17.58	9.55	230.7	16.2	175.3
3	CO-05011	41.0	125.36	90.31	839.33	71.46	17.25	9.58	244.5	15.2	190.8
4	SEm	1.4	0.23	0.45	11.46	0.21	0.34	0.08	4.2	0.78	3.6
5	CD (P=0.05)	4.2	0.69	1.33	33.42	0.63	1.08	0.25	12.6	2.35	10.8
Fertility level NPK kg/ha											
1	150:45:30	37.5	128.17	91.95	849.66	75.23	17.53	9.47	230.4	12.5	153.1
2	200:60:40	41.3	131.60	95.65	885.00	75.90	18.06	10.08	255.8	18.2	213.3
3	250:75:50	36.2	131.27	96.08	868.0	75.73	17.58	9.40	253.2	18.6	210.2
4	SEm	1.4	0.23	0.45	11.46	0.21	0.34	0.08	4.2	0.78	3.6
5	CD (P=0.05)	NS	0.69	1.33	33.46	0.64	NS	0.25	12.6	2.35	10.8
Summer season											
Genotypes											
1	COPK-05191	29.4	121.54	85.05	934.75	65.43	18.53	8.45	240.4	15.3	175.8
2	COPK-05192	35.6	114.79	80.43	897.70	65.00	17.12	8.21	234.8	15.4	163.9
3	CO-05011	29.0	100.49	77.75	855.68	57.7	16.66	8.06	239.5	17.3	174.5
4	SEm	0.67	0.81	1.52	6.43	0.85	0.23	0.13	1.5	0.63	2.1
5	CD (P=0.05)	2.03	2.42	4.55	19.20	2.55	0.70	0.39	4.6	1.9	6.3
Fertility level NPK kg/ha											
1	150:45:30	33.9	106.88	79.12	855.55	61.23	17.34	7.87	230.9	14.9	158.5
2	200:60:40	32.9	113.41	83.31	905.53	63.90	17.72	8.60	244.8	17.8	165.9
3	250:75:50	27.2	116.88	80.81	897.04	63.00	17.45	8.25	239.0	15.3	189.8
4	SEm	0.67	0.81	1.52	6.43	0.85	0.22	0.13	1.5	0.63	2.1
5	CD (P=0.05)	NS	2.42	4.55	19.20	2.55	NS	0.39	4.6	1.93	6.3

Summer planting :

Summer (April) planted crop exhibited lower germination (31.33%) than spring-planted one (38.33) COPK-05192 maintained its superiority for higher germination during both the seasons. Summer cane produced lesser number of tillers over the period due to less time available for tillering. These results are in close conformity with the results obtained by Pandey and Shukla (2003). COPK-05191 produced the highest number of millable canes. Cane yields of COPK-05191 and COPK-05192 were at par during summer planting, indicating better competitive ability of former genotypes when planted in summer season compared to spring season. It may be due to favourable weather condition for the better germination and initial growth of subtropical spring season sugarcane. Sowing under spring season crop growth performance was better than the summer sowing. The total amount of dry matter production in spring season sugarcane is responsible in total amount of radiation intercepted. High plant establishment (drycott et al. 1974). Provided better leaf growth per unit area throughout the growing season. Highest CCS was obtained with COPK-05191. It was owing to higher cane yield and quality of COPK-05191. Planting of various high sugar genotypes in summer (April) exhibited variation in sucrose accumulation pattern over spring cane so through selection of genotypes the high sugar of good quality could be harvested even in the summer season under north Indian conditions.

Various Fertility levels could not influence germination of sugarcane significantly (Table 2 production of tillers millable canes and cane length increased significantly. Higher cane weight and cane yield were obtained up to 200:60:40 NP and K/ha. Higher cane yield was obtained because of production of millable canes and cane weight

and it led to finally higher CCS at similar fertility level. Nutrient application beyond 200:60:40 NP and K/ha could not show significantly impact on cane yield and CCS in summer planted cane.

Correlation coefficient among various major growth and yield contributing indicated highly positive relationship between these character (r = 0.75) and millable cane to cane yield (r = 0.73), indicating higher contribution of milable cane and cane length in cane yield. Millable cane contribution was higher to that of cane weight, which showed importance of earlier formed tiller in increasing cane productivity in north Indians conditions. Cane yield & CCS in spring planting were positively correlated (r = 0.808). It was due to increase in cane quality parameters in all the genotype.

Sustainability yield Index :

Sustainability yield index (XYI) was highest (0.570) in genotype COPK-05191 followed by COPK-05192 (0.535) & CO-05011 (0.453) in the different planting system (spring & summer). This was followed by recommended dose of fertilizer (200:60:40 NPK kg/ha). SYI was maximum (0.536) in 200:60:40 NPK kg/ha and lowest (0.501) in 150:45:30 NPK kg/ha. Sohlenius (1990) observed a reduction in Protozoa biomass following the decreasing or increasing the application of in organic fertilizer.

Nutrient uptake and economics :

Nutrient uptake by spring and summer crops determined (Table 2) at harvest stage showed that COPK-05191 removed the maximum NPK from soil during both the cropping seasons. Spring-planted crop analyzed higher mean values (246.4 kg N, 16.43 kg P_2O_5 and 192.2 kg K_2O/ha) of nutrient removal compared to counterpart summer planted cane (238.2, 16.0, and 171.4 kg NPK/ha) due to higher tonnage harvested. Increasing levels of NPK showed increase in nutrient removal through spring and summer cane. However, greater differences were observed in plant cane than in ratoon cane. Nutrient removal through planting spring and summer canes depicted positive balance with N and P in soil and negative balance with K. Spring cane (plant crop) showed higher nutrient uptake than its summer the trend was reversed in summer-planted cane. Singh and Yadav (1992) also reported similar results.

The increase in uptake of phosphorus might be due to the complexing properties of organic material which prevented the precipitation and fixation of nutrient and kept them in soluble form. These results are in accordance with those of Swarup (1993). Plant crop recorded significantly higher potassium uptake than the summer crop. Significant difference were noticed among treatments. The up take of K was season dependent, being low in cool winter month (Vijaya Shankar Babu, 2007).

Table 3 : Effect of genotype and fertility levels on sustainability yield index, economic and B:C ratio under different planting system (pooled for spring and summer, three cropping seasons).

S. No.	Treatment	Yield ton/ha (Spring & summer pooled)	Sustainability yield Index (SYI)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Genotypes						
1	COPK-05191	73.31 (29.92)	0.570	146620	95500	2.86
2	COPK-05192	69.60 (28.40)	0.535	139200	88080	2.72
3	CO-05011	64.58 (26.54)	0.453	129160	78040	2.52
4	SEm	0.55	-	-	-	-
5	CD	1.65	-	-	-	-
Fertility levels						
6	150:45:30	68.23 (27.85)	0.501	136460	85340	2.66
7	200:60:40	69.90 (28.53)	0-536	139800	88680	2.73
8	250:75:50	69.36 (28.29)	0.521	138720	87600	2.71
9	SEm	0.55	-	-	-	-
10	CD	1.65	-	-	-	-

Figures in the parenthesis are SD of mean.
Cost of production of spring and summer plant cane 51120 Rs/ha..

Higher benefit :

Higher benefit cost ratio was observed with COPK-05191 under both the plant and summer. In spring plant cane, benefit : cost ratio increased up to 200:60:40 kg N, P and kg/ha. The maximum benefit: cost ratio was found in COPK-05191 (2.86).

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物理基本概念分析与电磁场和重力场的统一

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Abstract: 这篇文章分析了时间、空间、场、质量、电荷、光速、能量---的本质，在此基础上提出电磁场和重力场之间的关系。由于所提供的是物理理论中最基础部分，文中所提供的原理和公式无法从更基本的原理中推导出来，所以有很多是逻辑推理加猜测，它的正确性只有把统一场论理论作为一个工具去解决实际问题时候，才能够体现出来。
[张祥前. 物理基本概念分析于电磁场和重力场的统一. Academia Arena, 2012;4(1):42-49] (ISSN 1553-992X). http://www.sciencepub.net. 9

Keywords: 时间、空间、场、质量、电荷、光速、能量

1， 宇宙是由什么构成的？

宇宙是由物质点和它周围空间构成的，不存在第三种与之并存的东西，一切物理现象都是物质点在它周围空间相对于我们观测者运动所形成的。

像我们眼前的一棵树、一条河是“物”，树的生长、河水的流动是“事”。宇宙中，物质点和空间是“物”，其余的像时间、位移、质量、电荷、场、能量、速度----都是“事”，是“物”相对于我们观测者运动所表现出的一种性质。

2， 物理概念是怎么来的？

除物质点和空间外，其余一切物理概念，像质量、电荷、光速、力、动量、能量、-----都是物质点在空间中运动相对于我们观测者所表现出的一种性质。

在物理概念中，像声音、光、力、---这些物理概念是物质点在空间中运动触及到我们观测者，我们观测者对这些感觉加以分析、概括而形成的。

时间和场有点特殊，时间是我们观测者自己在空间中运动引起的，场是空间本身运动所引起的。

3，宇宙中物质点为什么要运动？

物理学中的运动状态和几何中的垂直状态是等价的，任何一个处于垂直状态中的质点其位置相对于我们观测者一定要运动，并且不断变化的运动方向和走过的轨迹又可以重新构成一个垂直状态。这个可以叫垂直原理。

不断变化的运动方向一定是曲线运动，圆周运动最多可以作两条相互垂直的切线，而空间是三维的，所以运动一定会在圆形的垂直方向上延伸，合理的看法是质点在空间中以柱状螺旋式运动。

4， 平行原理，

物理学中（或者是几何学中）的平行状态对应数学中的正比性质。两个物理量，如果可以用线段来表示，相互平行的话，一定成正比关系。

5，物理学中运动状态的描述不能够脱离观测者。

相对论认为时间、位移、力、质量---很多物理概念是相对的，对于不同的观测者可能有不同的数值。这“相对”两个字延伸一下，就是相对于观测者而言，如果没有观测者，或者不指明那一个观测者，时间、位移、力、质量---许多物理概念失去了意义。由于时间、位移、力、质量---这些物理概念来自于物质点相对于

我们观测者在空间中的运动，所以讲，脱离观测者（我们人）描述运动是没有意义的。

咋一看，以上看法好像是一种唯心主义，不过，唯心主义认为一旦没有观测者，没有人，一切都没有了，这个也是不对的。正确的看法应该是这样的：宇宙中所有的运动都是相对于我们人而言的，一旦没有了人，宇宙给我们的景象就像照相机照相过程中的一个定格镜头，而不是不存在。

物理学中的运动状态从几何的角度看就是垂直状态，是同一个现象我们观测者从不同的角度看出现不同的结果。

有人认为，在没有人类之前的宇宙照样在运动，所以运动的存在于人是没有关系的。其实“没有人类之前”这句话是一个病句，没有了人类，哪来的没有人类之前，没有我们人哪来的前后，上下左右，东西南北？

注意，物理学中描述的运动，空间、物质点、观测者三个东西一个都不能少，否则，运动就失去了意义。描述时间的变化有点特殊，观测者和物质点变成了一个东西。

人类对运动的认识有一个发展的过程，牛顿力学认为描述一个物体的运动，必须要找一个认为是静止的参照性物体，作为参照物，运动的描述强调了在某一段时间里物体在空间中走过的路程。

牛顿力学认为时间和空间的长度的测量于观测者的运动没有关系。

相对论继承了牛顿力学基本看法，但是相对论强调了不同的观测者，测量的某些物理量的数值可能是不同的。

相对论认为时间和空间长度的测量于观测者的运动速度有关系。低速时候，关系不明显，接近光速时候，特别明显。

统一场论认为描述运动必须要相对于一个确定的观测者，没有观测者、或者不指明那一个观测者描述运动是没有意义的。选择一个参照物描述运动有时候是不可靠的。

统一场论认为时间是观测者自己在空间中运动形成的，物体在空间中运动的位移于观测者的观测有关，不同的观测者可能有不同的结果。

6，空间为什么是三维的？

我们知道，空间中任意一点最多可以作三条相互垂直的有向线段，称为三维空间。

一维空间决定了质点以直线运动，二维空间决定了质点以圆或者曲线运动，三维空间决定了质点以柱状螺旋式运动。或者说质点直线运动产生了一维空间，质点曲线运动产生二维空间，质点柱状螺旋式运动产生了三维空间，这两钟看法是我们人对同一个现象从不同角度出发而出现的。

7，螺旋规律。

宇宙中所有的物体包括空间本身都是以螺旋式在运动。

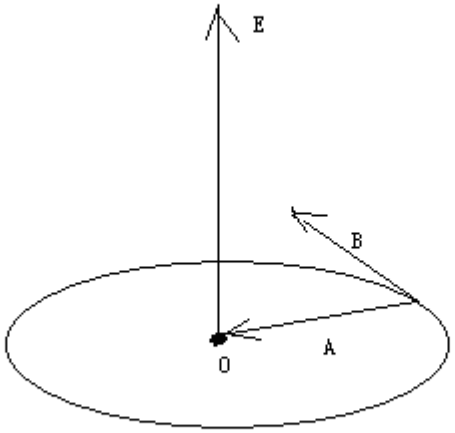
8，场的本质。

宇宙中任何一个物质点周围空间都以螺旋式在绕这个物质点运动，在空间这个螺旋式旋转运动中，旋转的中心是一个点，在我们观测者看来，可以叫重力场，旋转的中心是一条直线，我们可以叫电场，旋转的中心是一个圆（或者曲线）我们可以叫磁场。

磁场**B**和重力场**A**的叉乘的矢量积是电场**E**，满足右手螺旋关系。

$$\mathbf{A}\times\mathbf{B} = s\ \mathbf{E}$$

式中 s 是常数。



上图是一个相对于我们观测者静止的物质点 0 周围产生了重力场 A、电场 E、磁场 B。电场、磁场、重力场三者相互垂直。

电场是基本的，磁场和重力场是电场相对于我们观测者在不同的角度观测出现不同的结果。

注意，场是质点周围空间相对于我们观测者运动变化形成的，空间、物质点、观测者三个东西一个都不能少，否则，场就失去了意义。

9，时间的物理定义。

前面指出，一切物理概念都是物质点在空间中相对于我们运动所形成的，很多物理概念首先来自于物质点在空间中运动给我们人的一种感觉。

时间也可以认为某某东西在空间中运动给我们人的一种感觉。什么东西在空间中运动给了我们时间的感觉？

我们把一个人用宇宙飞船送到几百亿亿光年远的一个空间区域里，把这个人丢下来后，飞船立即飞回来。这个空间区域里别的星球离得都非常非常的遥远，可以设想，这个人仍然有时间的感觉？是什么物质点运动使这个人有了时间的感觉？这个情况下，仅有这个人的身体而已。正确合理的看法是：

时间是我们观测者对自己在空间中运动的一种感受。

任何观测者周围空间相对于观测者都以柱状螺旋式离开运动，柱状螺旋式运动可以看成旋转运动和直线运动的叠加，时间就是这种空间的直线运动那部分给我们人的一种感受，与观测者自己在空间中直线移动的路程成正比。

有人认为，在没有人类之前的宇宙照样有时间，所以时间是人的感觉的观点是错误的，其实“没有人类之前”这句话是一个病句，没有了人类，哪来的没有人类之前，没有我们人，哪来的前后，上下左右，东西南北？

10，如何描述空间的运动？

一条直线，我们可以看则是由无数个点构成，一个平面我们也可以看则是由无数个点构成，同样道理，我们可以把三维空间看则是由许多个点构成，称之为几何点。描述这些几何点的运动，就可以描述出空间的运动。

11，光速的定义。

宇宙中任何一个物质点，包括任何一个观测者，周围空间都以柱状螺旋式向外辐射运动，光是静止于空间中被空间这种柱状螺旋式运动带着向外跑的。

这个柱状螺旋式运动是直线运动和围绕这条直线旋转运动这两种运动的叠加。

空间这种柱状螺旋式运动中直线运动那部分是观测者产生时间感觉的原因，因而：直线运动的空间 = 时间。

为了在数学上使“直线运动的空间 = 时间”成立，我们需要在时间前面乘上不随时间、运动空间变化的一个常数---光速，

直线运动的空间 = 光速乘以时间

光速反映了时空同一性，光速和时间一样，是我们为了描述空间的运动而人为抽象出的一个概念。

12，三维螺旋时空方程

一个物质点 O，相对于我们观测者静止，我们以 O 点为原点，建立一个三维直角坐标系 xyz ，O 点周围空间中任意一个几何点 P 的坐标值(x,y,z)随时间 t 变化，并且 P 点走过的轨迹是柱状螺旋式。

$x = R\cos\omega t$

$y = R\sin\omega t$

$z = C\ t$

式中 R 是 O 点到 P 点的距离，ω 是 P 点绕 O 点旋转运动的角速度，C 是常数。

设想 O 点周围有许多个像 P 点那样的几何点，我们现在来考虑这些几何点的位移量累加起来的结果是多少。

设在 ds 面积上有 dn 条几何点的位移矢量 x 或者 y,z 穿过去，在 O 点周围我们取一个包围 O 点的封闭面积 S，有多少条几何点的矢量 x,y 穿进面积 S，就会有多少几何点 x,y 穿出面积 S，一进一出，相互抵消，原因是几何点矢量 x,y 是旋转量，结果

$\int Sx\ \ dn/ds = 0$

上式表示包围 O 点的包围面 S 上有 O 条几何点矢量 $x = R\cos\omega t$ 穿过。

$\int Sy\ dn/ds = 0$

上式表示包围 O 点的包围面 S 上有 O 条几何点矢量 $y = R\sin\omega t$ 穿过。

$\int Sz\ \ dn/ds = N$

上式表示包围 O 点的包围面 S 上有 N 条几何点矢量 $z= C\ t$ 穿过。

13，空间的运动具有波动性。

我们知道，波动和柱状螺旋式运动有很大的区别，波动是振动形式在媒质中的传播，而不像螺旋式运动是质点在空间中移动。但是对于空间这个特殊的东西，两种运动却可以兼容。

我们知道，一个几何点运动不会有波动效应，但是，一群几何点情况就不一样了。由于空间中一个几何点和另外一个几何点绝对没有区别，因而可以断定，空间的柱状螺旋式运动里面包含了波动形式。

这样，式 x = Rcosωt 和 y = Rsinωt 可以写成波动形式,由于类似于柱状螺旋式运动，很显然，波动方向和振动方向垂直，是横波。这样，x、y 不光是时间 t 的函数，也是 z 的函数，随着 z 的变化而变化。

x = Rcosω（t - z/C）

y = Rsinω（t - z/C）

由于 z = C t 是空间柱状螺旋式运动中的直线部分，而时间是由空间柱状螺旋式运动中的直线部分形成，因而可以认为

z = 直线运动的空间 = 光速乘以时间 = C t

可以认定上面的波动速度 C 就是光速。场的本质就是我们人对空间的这种波动过程的描述而抽象出的一个概念。重力场是这个空间波动的根源，电磁场是波动的传播，传播的速度就是光速。

14，光速为什么会不变?

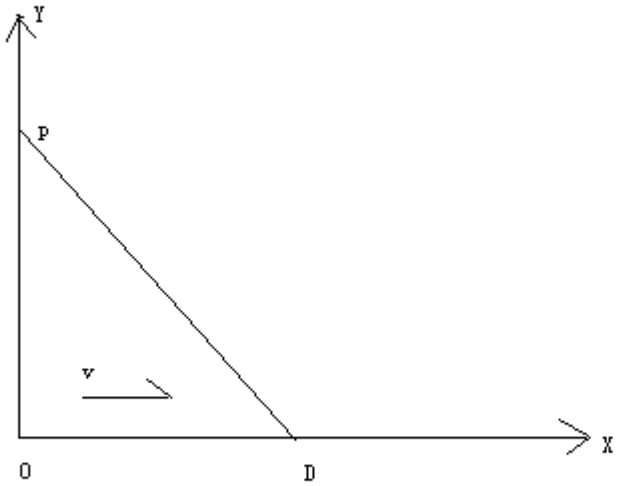
光速不变严格的讲包括：

A：发光的光源相对于我们观测者静止，所发出的向外辐射的光，不论强度大小，速度都是每秒 30 万公里。

B：两个相互匀速直线运动的观测者测量同一个光源发出的光的速度都是每秒 30 万公里。

对于 A 情况。空间相对于我们观测者时时刻刻都以光速辐射式向外运动，光是静止于空间中被空间运动带着向外跑的，所以光的速度是空间运动速度决定的，于发光物体无关。

对于 B 情况。设想有两个观测者甲和乙在时刻 k，处于空间同一点 0，我们以 0 点为原点，建立一个平面二维直角坐标 XOY,如下图,



设想在 k 时刻，观测者甲和乙看到一个几何点 P 从 0 点出发，沿 Y 轴运动，随后，观测者乙以速度 v 相对于甲沿 X 轴运动，而甲一直静止于 0 点。这样，观测者甲根据前面时间的物理定义认为在时间 t 内几何点 P 以光速 C 走了 OP 这么远的路程，而乙认为 P 点在时间 T 内走了 √(OD²+OP²)，

根据前面时间的物理定义，观测者获得的时间于周围空间中以直线、光速运动的几何点走过的路程成正比，这样：

OP/t = √(OD²+OP²)/T=光速 C

由于 OD=vT,经过运算，可知：t = T√(1-v²/C²)

这个结果和相对论一样的，运动的观测者发现时间延长了。

由于时间是观测者相对于周围空间以光速运动形成的，两个观测者如果认为那一个在运动，他在空间中走过的路程将相应的变化，而时间相应的也在变化，结果是光速速度不变。

观测者周围空间直线运动 = 光速 C 乘以时间

观测者周围空间直线运动一有变化，时间随之相应的变化，结果是光速 C 始终不变。

可以作一个推论：两个相互做任何复杂运动的观测者测量同一束光的速度都是每秒 30 万公里。

15，质量的定义

在某一个观测者看来，一个物质点 O 具有质量 m 是指周围有 N 条螺旋时空方程中提到的以光速向外辐射运动的几何点矢量 z= C t，在 O 点周围一块小面积 ds 上有 dn 条以光速运动几何点的位移矢量 z = C t 穿过去。

令 A = dn/ds

km =∫A ds = N

以上 k 是比例常数，∫包围 O 点封闭曲面积分。

16，电荷的定义

在某一个观测者看来，一个质点 Q 具有电荷 q，是指 Q 点周围一个小面积 ds 上穿过了 dn 条前面三维螺旋时空方程中的几何点的光速矢量 z /t = C，令 E = dn/ds

kQ =∫E ds = N

以上 k 是比例常数，∫是包围 Q 点封闭曲面积分。

相对于我们观测者，正电荷周围空间以逆时针时针旋转，负电荷周围空间以顺时针旋转。

17，重力场产生于运动的空间。

相对于我们观测者，物体周围空间以逆时针旋转产生了重力场。一个离质点 O 距离为 r 的几何点 P 以速度 v 绕 O 点旋转运动，O 点产生的重力场 A，等于几何点 P 的加速度。

A = v²/r

质点 O 在周围产生的重力场 A 我们从另一角度也可以认为是指 ds 面积上穿过了 dn 条以光速运动的几何点的位移矢量。

A = dn/ds

18，电场的定义

一个质点 Q 在周围产生的电场 E 是指 ds 面积上穿过了 dn 条以光速运动的几何点的光速矢量。

E = dn/ds

19，动量的定义

根据前面的三维螺旋时空方程，任何一个物质点 O 点，相对于我们观测者静止时候，周围有许多几何点辐射式运动，产生了 N 条 z = C t 几何点的位移矢量，O 点的质量 m 取决于 N 的大小，将 z = C t 对时间 t 求导，结果是光速 C，当 O 点相对于我们观测者静止时候，个数 N 按理不会随时间 t 变化，可以认为 O 点周围有 N 条几何点位移矢量 z = C t，就会有 N 条光速 C，结合牛顿的动量思想，我们可以认为：

任何一个质量为 m 的质点相对于我们静止时候都不是真正静止的,以一个光速 C 在穿越空间运动，因而有一个特殊的静止动量 P = m 静 C

当这个质点相对于我们以速度 v 匀速直线运动时候，光速 C 在 v 的方向上不变，在 v 的垂直方向上发生变化，变成了 C- v,相应的动量变成

P = m 动（C- v）

P 、C、v 都是矢量，并且 C- v 和 v 相互垂直。

20，力的定义

前面的基本原理指出，一切物理现象都是物质点在空间中运动所形成的，按照这种思想，电磁力和万有引力都是物质点在空间中相对于我们观测者运动形成的，都是惯性力，都是动量 P = m（C- v）随时间 t 的变化率。

F = dP/dt = Cdm/dt - vdm/dt - mdv/dt

Cdm/dt - vdm/dt 是质量随时间变化的力，简称加质量力，也是电磁力，是我们观测者从不同的角度观察而出现不同的结果。其中 Cdm/dt 是电场力，vdm/dt 是磁场力，mdv/dt 牛顿第二定理中的惯性力，也是万有引力。

电磁力和万有引力相互垂直。低速情况下，电场力、磁场力、万有引力相互垂直。

加质量力造成的运动也可以称为加质量运动。加质量运动是一种不连续的运动，光在照射到玻璃上被反射回来速度的变化是不需要时间的，是不连续的，光是一种加质量运动。

加质量运动就是一个物体质量随时间变化需要时间，当质量变化到零时候，可以从某一个速度突然的达到光速，随着这个物体一同运动的观测者发现自己从某一个地方突然的消失，在另一个地方突然的出现，这个运动过程不需要时间。质量的变化有一种不连续特性。量子力学中电磁波辐射的能量不连续的原因是：光子在变成光子之前需要一个固定的使质量变成零的能量。

21，能量的定义

一个质点质量为 m，相对论认为有一个静止能量 $E = m C^2$，意思是指这个质点周围 N 条几何点的光速的平方，N 的大小取决质量 m

注意，能量是质点和空间之间相对于我们观测者运动变化形成的，空间、物质点、观测者三个东西一个都不能少，否则，能量就失去了意义。

22，随时间变化的重力场产生电场

一个质点的质量 m 随时间 t 变化产生了电场 E，

E = k dm/dt

上式积分形式为

E = k∫ds dA /dt

上式中 k 是常数，A 是重力场场强，表示在小面积 ds 上穿过了 dn 条以光速运动的几何点位移矢量。

23，随速度变化的电场力产生磁场力和重力场力。

惯性力 F = dP/dt = Cdm/dt - vdm/dt - mdv/dt 中，一个物体当速度 v 为零时候磁场力 vdm/dt 和重力 mdv/dt 不存在，仅有电场力 Cdm/dt，电场力随速度变化的那两部分我们可以叫做磁场力和重力场力。

24，光子模型

相对于我们观测者加速运动的电荷会在周围空间产生加速变化的电磁场，加速变化的电磁场使某些电子周围的力场和电磁特性消失后，再将这些电子带着以光速辐射式向外运动，这个就是电磁波，又称光。

光子模型一种是由单个电子相对于我们观察者以螺旋式远离我们运动，并且旋转的中心是条直线，在这个直线方向速度是光速。

第二种是两个电子绕一条直线旋转，同时又沿着这条直线平行方向以光速运动，结果是以螺旋式远离我们观察者运动，并且这两个电子在中心这条直线的垂直方向是对称的。

25，基本物理概念和导出物理概念。

物理概念有的是基本的，某些物理概念是这些基本概念导出的。比如时间和位移是基本的，速度是由时间和位移所导出的。还有比位移和时间更基本的物理概念，下面是表示这些物理概念从高级、基本的到低级的示意图。

物质点、空间→时间、位移、场→速度、光速→质量、电荷→动量→力→能量、功→温度、光、声音、颜色、----

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