

# **GASCIAN**

## **Journal of Science & Applications**

**Volume:3**

**Number:1**

**January-June:2015**



**Gobi Arts & Science College**  
**Gobichettipalayam**

# **GASCIAN**

## **Journal of Science & Applications**

### **PATRON**

**Prof. Dr.R.Sellappan**  
**Principal**

### **CHIEF EDITOR**

**Dr.V.Thiagarasu**  
**Associate Professor of Computer Science**

### **EDITORIAL BOARD**

**Prof.S.Dakshinamoorthi**  
**Associate Professor of Mathematics**

**Dr.V.V. Raju**  
**Associate Professor of Chemistry**

**Dr.B.Srinivasan**  
**Associate Professor of Computer Science**

**Dr.P.Loganathan**  
**Assistant Professor of Botany**

**Dr.D.Venugopal**  
**Assistant Professor of Physics**

**Copy Right © GJSA – 2015 Vol. 3 No. 1**

All rights reserved. No part of material protected by this copyright notice may be reproduced or utilized in any form or by any means, electronic or mechanical including photocopying, recording or by any information storage and retrieval system without prior written permission from the copyright owner. However, permission is not required to copy abstracts of papers on condition that a full reference to the source is given.

## TABLE OF CONTENT

---

Particulars	Page No.
<i>Native Pthread on Android Platform using Android NDK</i> <b>Bala Dhandayuthapani Veerasamy and G. M. Nasira</b>	1
<i>Growth and Characterization of L-Alanine Doped Potassium Nitrate (L-Apn) Single Crystals</i> <b>P.Yasotha, P.Sagunthala and R.Thiagarajan</b>	10
<i>Automated Search Engine for Web Data Access Controls</i> <b>Chaitanya Raveendra and M. Thiyagarajan</b>	15
<i>Synthesis and Characterization of Hydrazine Complexes of 3-Indoleacetic Acid</i> <b>R. Jothimani and P. Kanchana</b>	22
<i>Studies on Seed Germination through In Vitro Shoot Induction of Solanum Violaceum Ortega. – a Valuable Medicinal Plant</i> <b>Sheeba Gnanadeebam D., Viswanathan P. and &amp; Arjunan M.C.,</b>	27
<i>Nonlinear Higher Order Q-Fractional Differential Equations with Nonlocal Boundary Conditions</i> <b>P.Duraisamy and T. Nandha Gopal</b>	30

# **GASCIAN Journal of Science & Applications**

## **OBJECTIVES**

The main objective of GASCIAN Journal of Science & Applications is to promote and encourage the recent discoveries in structural and functional principles of scientific research. It encourages and provides a platform for the publication of research work in different fields of basic and applied sciences including Computer Science.

## **ABOUT THE JOURNAL**

- GASICAN Journal of Science and Applications (GJSA) is the official organ of Gobi Arts & Science College.
- GJSA is a Multidisciplinary, Peer Reviewed, and International Journal.
- GJSA publishes original research articles, review articles in Mathematics, Physics, Chemistry, Botany and Computer Science.
- The Journal will be regularly published biannually in the month of June & December.
- The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence.
- GJSA follows stringent guidelines to select the manuscripts on the basis of its originality, importance, timeliness, accessibility, grace and astonishing conclusions.

## **AUTHOR GUIDELINES**

- Authors should submit electronic version (Microsoft word document) of the manuscript to the editor via e-mail ([gascsajournal@gmail.com](mailto:gascsajournal@gmail.com))
- The article should not be sent as a whole or in part to any other journal at the same time for publication and also must not have published earlier.
- Acceptance or rejection of the manuscript would be decided after the decision of editorial board.
- The submitted manuscripts should have a covering letter and undertaking with signature of the all authors.
- All the papers will be acknowledged and processed further. If the papers are accepted/rejected, the decision will be communicated to the corresponding author but the manuscripts will not be returned.
- GJSA and Editors are not responsible for the statements and opinions expressed by author in their articles and reviews.
- The copyright of the articles and reviews is automatically assigned to the GJSA.
- Length of the paper should not exceed 6 pages.
- Enquiry and other communication should be to the following Email: ([gascsaeditor@gmail.com](mailto:gascsaeditor@gmail.com))
- Template and other information regarding the journal are published in the college website ([www.gobiartscollege.org](http://www.gobiartscollege.org)).

## Native Pthread on Android Platform using Android NDK

**Bala Dhandayuthapani Veerasamy,**  
Research Scholar, Manonmaniam Sundaranar  
University, Tirunelveli,  
Tamilnadu, India,  
dhanssoft@gmail.com

**G. M. Nasira,**  
Assistant Professor of Computer Science,  
Chikkanna Govt Arts College, Tirupur,  
Tamilnadu, India,  
nasiragm99@yahoo.com

**Abstract:** *The Android NDK libraries authorize us to implement fractions of our Android applications via native code such as C/C++. The Android NDK provides platform specific features and relies on JNI technology to glue the native code to the Android applications. The primary motivation for considering the use of Pthreads on mobile architecture can achieve optimum performances on multi-core mobile architectures. In order for a program to get benefit of Pthreads, it must be capable to be structured into separate, individual tasks that can perform concurrently. This research finding focuses on how android applications can facilitate Pthreads through android NDK that can adventure Pthreads to execute in hybrid mode with Java threads.*

**Key words:** *Android, Applications, Android NDK, Java, JNI, Pthread.*

### 1. INTRODUCTION

Android [14] Inc was originated in Silicon Valley, California in October 2003, with the thought of providing a mobile platform [14] that is more conscious of the user's location and preferences. Google purchased Android Inc in August 2005 as it entirely possessed subsidiary of Google Inc. Google main aim take place to present a fully open platform backed by Google technologies for application developers. In November 2007, the Open Handset Alliance [13], [14] was established as a consortium to develop an open standard for mobile devices. Open Handset Alliance began its expedition by announcing the Android platform.

#### 1.1 What is an Android?

Android [14] is a mobile operating system (OS), is based on a personalized version of Linux. Google required Android to be open and free; therefore, generally the Android code was released under the open source Apache License. The main benefit of implementing Android is that it proposes a unified approach to application development. Developers need only to create for Android applications (Android apps), has to be run on several different devices, as long as the devices are using Android.

Google repeats the standard Java Virtual Machine (JVM) implementation in a lot of compliments. The key figure in Google's implementation of this JVM is Dan Bornstein, who composes the Dalvik Virtual Machine (DVM) - Dalvik is the name of a town in Iceland. DVM [13], [14] obtains the produced Java class files and joins them into one or more Dalvik Executable (.dex) files. The goal of the DVM is to discover every likely way to optimize the JVM for space, performance and battery life. The final executable code in an Android, as an effect of the DVM is stand not on Java byte code but on .dex files as an alternative.

#### 1.2 Android Platform Architecture

Android [13]-[15] is more about using or developing Android apps for mobile devices than an Android OS. Android depends on Linux kernel in order to afford its OS functions. For the user application, Android depends on the JVM technology by employing the DVM. The Android OS is generally divided into five sections [13], [14].

**Linux kernel:** This is the bottom of layer. It is the kernel based on Android. This layer holds all the low level device drivers for the numerous hardware mechanism of an Android device.

**Libraries:** These contain all the code that provides the main features of an Android OS.

**Android runtime:** At the same layer as the libraries, the Android runtime afford a set of core libraries. Android runtime system contains DVM.

**Application framework:** Describes the ability of the Android OS to an application developer, can create use of them in their applications.

**Applications:** At this top layer, we will locate applications that we download and install from the Android play store. Any applications that we write are located at this layer.

## GROWTH AND CHARACTERIZATION OF L-ALANINE DOPED POTASSIUM NITRATE (L-APN) SINGLE CRYSTALS

**P.YASOTHA,**

Assistant Professor in Physics,  
Sri Vasavi College, Erode, Tamil  
Nadu, India.

Email: yashophysics@rediffmail.  
com

**P.SAGUNTHALA,**

Associate Professor in Physics,  
Sri Vasavi College, Erode.  
Tamil Nadu, India.

**R.THIAAGARAJAN**

Assistant Professor in Physics,  
Chikkaiah Naicker College, Erode.  
Tamil Nadu, India

**Abstract:** Single crystals of L-Alanine doped Potassium Nitrate were grown by slow evaporation technique at room temperature after repeated recrystallization process. The vibrational frequencies of various functional groups in the grown crystals have been derived from the FTIR analysis in the range of 400 to 4000  $\text{cm}^{-1}$ . The range and percentage of optical transmission are ascertained by recording uv-vis spectrum. Powder X-ray diffraction patterns were recorded and indexed for the structural conformation. It proves the presence of both the parent materials in the grown crystals. The characteristic properties of the grown crystals were analysed with the help of the above mentioned studies.

**Key words:** Slow evaporation, single crystal, uv-vis, FTIR, Powder X-ray diffraction

### INTRODUCTION

Crystals are captivating a primary part in the areas of modern technology involving lasers, sensors, memory chips, infrared detectors, electrical devices and optical components. Within the last few years, the fast development of optoelectronic field imposes new and efficient non linear optical material for S.H.G on optical communication and optical data storage etc.[1]

Non-linear optical materials will be the key elements for the future photonic technologies based on the fact that photons are capable of processing information with the speed of light. Due to this fact the rapid development of optical communication system led to a demand for non linear optical materials of high structural and optical quality [2]. The second order optical effect is concerned in both inorganic and organic materials. In this concern the inorganic materials show the good mechanical and thermal stability with high transparency range, limiting their second order coefficient. The organic with electron rich (donor) and deficient (acceptor) substituent's provide an asymmetric charge distribution, and show large nonlinear optical response [3].

The organic crystals exhibit higher second order non linear coefficient, but poor in thermal and mechanical behaviour and it may be suitable for many device application. To overcome this difficulty, optically active amino acids of crystalline solids are combined with inorganic host favourable for good thermal and mechanical properties.

Crystals (Amino acids family) are under extensive investigations in recent times owing to their favourable properties. Among various amino acids L-Alanine is the simplest molecules contain chiral carbon atom and crystallise, in the non centros symmetric space groups. Therefore they are potential candidates for optical second harmonic generation. In this present work, to enhance the properties, Potassium Nitrate has been doped with L-alanine and semi organic crystals are grown. The growth of single crystals of L-alanine doped potassium nitrate has been carried out by slow evaporation technique [4]. The grown crystals are characterised by studies such as powder XRD, FTIR, optical absorption and micro hardness.

### Experimental Details

The saturated solution of L-alanine was prepared using distilled water as a solvent. Then the saturated solution of potassium nitrate was also prepared and is stirred well using magnetic stirrer. Then both the solutions were taken in the ratio of 1:1. The mixer of solutions was kept in a magnetic stirrer and is allowed to stir for four hours to get a good homogeneity of the mixer. The filtered clear solution of L-alanine doped potassium nitrate with pH value-6 was taken in well cleaned beakers, covered by Aluminium foils sheets with pours in order to favour slow evaporation process. The beaker was kept in a dust free and vibration free environment and is allowed to crystallise. The grown crystals were harvested after the time period of 47 days. The harvested crystals were then recrystallized to get good quality crystals. The crystals obtained are of dimension  $5 \times 4 \times 3 \text{ mm}^3$ . The photograph of the grown crystals were shown in fig. 1.

## AUTOMATED SEARCH ENGINE FOR WEB DATA ACCESS CONTROLS

**ChaitanyaRaveendra,**  
ResearchScholarPhD(Karpagam University),  
Nehru College of Aeronautics and Applied Sciences  
451 – D, Palakkad Main Road,  
Kuniamuthur, Coimbatore,  
TamilNadu, India-641008 Email:  
chaitanya2575@gmail.com

**M. Thiyagarajan,**  
Professor Emeritus and Dean Research  
Nehru College of Aeronautics and Applied Sciences  
451 – D, Palakkad Main Road,  
Kuniamuthur, Coimbatore,  
Tamil Nadu, India-641008  
Email: m\_thiyagarajan@yahoo.com

---

**Abstract:** *Services can be implemented in the context of reusability. Thus information can be transferred among the services to enhance the co-operation for data collection. Relevant and accurate data must be retrieved from across the web and can be implemented by setting controls on the data handled by the user. Here we have implemented a sample scenario to illustrate deterministic finite automaton of the data flow among the services to retrieve the data from the web based on the information for which he has been authorized.*

**Keywords:** *Service computing, web services, Deterministic Finite Automata, car bank loan*

---

### 1. INTRODUCTION

Service computing refers to a flexible computing architecture that packages functionality as a suite of interoperable routines that can be used within multiple, separate systems from several business domains. Service computing requires loose coupling of services with operating systems, and other technologies that underlie applications. Functions are separated into distinct self-describing and autonomous units, or services, which developers make accessible via pre-defined interfaces over a network in order to allow users to combine and reuse them in the production of applications. These services communicate with each other by passing data in a well-defined, shared format, or by coordinating an activity between two or more services. Service Computing includes the concepts of Service Oriented Architecture, Mashups, Software as a Service, and Cloud Computing. Authorization techniques in the web services has been implemented and web service architecture has been studied by Geetha and Rohith [2].

Finite state machines and their transitions has been explained by Hopcraft, Motwani and Ullmann[4]. Finite state generators are simple computing machines that output a sequence of symbols. An FSA recognizes (or accepts) a string of symbols (or word) if starting in an initial state it can read in the symbols one after the other while making transitions from one state to another such that the transition reading in the last symbol takes the machine into a final state. Hopcroft, Motwani and Ullmann defines an NFA as a finite set of states, a finite set of input symbols, on start state and a set of accepting states as its output. It has a transition function  $\delta$  which takes a state and an input symbol as argument but returns a set of zero, one, or more state. According to basic definition of finite state automata, it is one of the most significant developments has been the discovery of the model checking technique, that automatically allows to verify on-going behaviors of reactive systems.

Web Service Architecture Working Group defining a Web service as "a software system identified by a URI, whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition using XML based messages conveyed by Internet protocols". A Web service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description using SOAP messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.

Documents are coming in a pile and we need to collect the documents to traverse one by one. There arise a need to store the documents for automaton. Francois explained the push down automata for xml processing. Basic definition of PDA is, Pushdown automata is a finite automata with auxiliary storage devices called stacks. (A stack is merely a pile. And symbols are normally placed on stacks rather than various colored discs.) The rules involving stacks and their contents are: a) Symbols must always be placed upon the top of the stack. b) Only the top symbol of a stack can be read. c) No symbol other than the top one can be removed.

According to William Stallings [9], The most efficient way to handle the intruders and the malicious software is the implementation of the trusted system technology. Trusted system deals with the protection of data or resources based on the basis of the permission of the user. This when implemented in

## SYNTHESIS AND CHARACTERIZATION OF HYDRAZINE COMPLEXES OF 3-INDOLEACETIC ACID

**R. Jothimani**

Assistant professor,  
Department of chemistry,  
Gobi Arts and Science College,  
Gobichettipalayam, Tamilnadu,  
India.

**P. Kanchana**

Assistant professor,  
Department of chemistry  
PSGR Krishnammal College for women,  
Coimbatore, Tamilnadu,  
India.

**Abstract:** Transition metal complexes of 3-indole acetic acid and hydrazine were synthesized and characterized by IR spectra, elemental analysis, powder XRD studies. The synthesized complexes were screened against bacteria and fungi and the result were presented.

### INTRODUCTION

Coordination chemistry highly specialized area of inorganic chemistry into one of the most attractive and productive fields of chemistry today. The interaction of transition metal ions with biological molecules provides one of the most fascinating areas of coordination chemistry. The transition metals and their ions have much higher tendency to form coordination compounds. Coordination compound the metal species acts as electron acceptor (Lewis acid) and neutral molecules with lone pair of electrons (or) anion as electron donor (Lewis base). A metal atom (or) ion when bonded directly to a fixed no. of anions (or) molecules constitutes a coordination entity<sup>1,2</sup>. During the past half century co-ordination chemistry grew from a highly specialized area of inorganic chemistry into one of the most attractive and productive field of chemistry. Being the most attractive research area, this field plays an essential role in modern industrial processes, novel kind of drugs and biology<sup>3,4</sup>.

### HYDRAZINE

Hydrazine (also called diazane) is an chemical compound with the formula  $N_2H_4$ , was for many years considered as a special chemical available only in the aqueous solution, having an ammoniacal odour. Hydrazine, also called dinitrogen tetra hydride, is a diacidic base, slightly weaker than ammonia, is a colourless liquid (mp  $2.0^\circ C$ ; bp  $113.5^\circ C$ ), and dissolves in polar solvents such as water, alcohols, ammonia and amines. Hydrazine can arise via coupling a pair of ammonia molecules by removal of one hydrogen per molecule. Each  $H_2N$  subunit in hydrazine is pyramidal in shape. The rotational barrier is twice that of ethane. These structural properties resemble those of gaseous hydrogen peroxide, which adopts a "skewed" anticlinal conformation, and also experiences a strong rotational barrier.

### 3. 3-INDOLE ACETIC ACID

IAA(indole acetic acid) is the most common naturally occurring plant hormone of the auxin class<sup>5</sup>. Chemically IAA is a carboxylic acid in which the carboxyl group is attached through a methylene group to the C-3 position of an indole ring molecular formula is  $C_{10}H_9NO_2$ . In appearance, IAA is a colourless solid. It is an endogeneous heterocyclic auxin plant hormone derived from indole. It is soluble in ethanol but not in  $H_2O$ . IAA is an essential compound produced primarily in buds and developing plant leaves which induce transcription of genes involved in cell elongation and cell division in response to light and gravity. In tissue culture, IAA and other auxins are used because of their prominent effects on root formation. In addition IAA has also been shown to induce cell generation activity in plant when challenged with wounds. It is a plant metabolite which regulates the growth and differentiation of plant tissue. Studies have been performed to determine the effects IAA and similar chemicals on the development of the cerebral cortex during early embryogenesis<sup>6</sup>. One study performed in rats determined that such compounds decreased the locomotor activities of the embryos/fetuses.

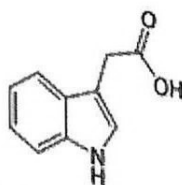


Fig. 1. 3-INDOLE ACETIC ACID

## Studies on Seed Germination, through *In Vitro* Shoot Induction of *Solanum violaceum* Ortega. – a valuable medicinal plant

**SHEEBA GNANADEEBAM D.,**  
Gobi Arts & Science College (Autonomous)  
Gobichettipalayam, Tamil Nadu,  
India

**VISWANATHAN P & ARJUNAN M.C.,**  
Government Arts College (Autonomous),  
Coimbatore, Tamil Nadu,  
India

**Abstract:** A study was done to investigate the effects of some physical and chemical factors on growth and development of *Solanum violaceum* in vivo and in vitro. The effects of light, temperature on seed germination of seedling growth requirements, and effect of germination medium and cytokinins on shoot induction and multiplication in vitro were investigated. In an in vitro experiment, seedlings germinated in Murashige and Skoog medium had superior shoot induction. To collectd from 10 days old in vitro seedlings and inoculated in MS medium containing different concentration of auxins and cytokinins used for plantlet formation. The plantlets obtained were successfully hardened.

**Key words:** *Solanum violaceum*, germination, in vitro micropropagation, conservation.

### INTRODUCTION

In plants kingdom, there are thousands of plants known and unknown medicinal drugs of man. Plants are the traditional source for many chemicals used as pharmaceuticals, bio-chemicals, fragrances, food colours and flavours (Leung, 1980). The use of medicinal herbs can even cure deadly diseases that have long been treated with synthetic drugs (Punitham, 2001). Out of 2,50,000 identified higher plants in the world. India has estimated 8,000 species of known medicinal plants (Subbash Mali and Ved, 1999). In India medicinal herbs which formed of our traditional system of medicines, Siddha, Ayurvedha and Unani. India is a leading exporter of the medicinal plants in the world trade. (Pradhan 2001).

This *Solanum violaceum* belongs to the family Solanaceae. The whole plant is used for carminative and expectorant, beneficial asthma, dry cough, colic dysuria, chronic fever, flatulence, relieve pain arising from difficult parturition and also used for aphrodisiac, astringent. Plant seeds are collected for *In vitro* germination. Different type of callus from basic material for regeneration. Successful plantlets transferred to soil after proper hardening.

### MATERIALS AND METHODS

Explants from the plants were collected in the field itself, without removing the plant from the habitat. The seeds were used. The seeds of *Solanum violaceum* were collected from the natural populations of Pachaamalai Hills, Tiruchirapalli District, Tamil Nadu. Matured seeds were collected from the field grown plants. The seeds were surface sterilized with 0.1% HgCl<sub>2</sub> for 3 minute followed by sterile water rinsing for three or four times. The seeds were inoculated in each conical flask. The tubes were kept below the lamps and for total darkness, they were kept in a chamber. The percentage of germination was noted after 47 days.

Shoots of the subcultures were induced in the dark in a MS/2 solid medium in which was added NAA or IBA at 1 - 5 mg. Measurements were made every 15 days to evaluate the parameters of rooting. The young plants were transplanted in cups containing vermiculite. A total of 10 to 15 plants were used for each treatment. The rate of survival was given after 30 days.

### RESULTS

#### Seed Viability test and Seed germination (in vitro/in vivo conditions)

The main objective of the present study is to develop for mass production of medicinal plant. The seeds were tested for their viability both *in vivo* and *in vitro*. For *in vivo* the five earthen pots were filled with garden soil with healthy seeds were each earthen pots. For *in vitro* healthy and uniform size 20 seeds were inoculated in each conical flasks containing MS basal medium. The seed germinated was counted on 10<sup>th</sup> day inoculation and noted. The number of seeds germinated in each flask is given in (Plate 1 and Table 1).

# Nonlinear Higher Order $q$ -fractional Differential Equations with Nonlocal Boundary Conditions

P.Duraisamy<sup>†</sup> and T. Nandha Gopal<sup>††, 1</sup>

<sup>†</sup>Department of Mathematics, Gobi Arts and Science College, Gobichettipalayam, Tamilnadu, INDIA

<sup>††</sup>Department of Mathematics, Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Tamilnadu, Coimbatore, INDIA

**Abstract:** We study the existence of solution for a higher order nonlinear  $q$ -fractional differential equations with nonlocal boundary conditions in a Banach Space. The existence result is based on the contraction mapping principle. An illustrative example is also presented.

**Keywords:**  $q$ -fractional differential equations, nonlocal boundary conditions, Banach fixed point theorem.

## 1 Introduction

Fractional differential equations arise in many engineering and scientific disciplines such as physics, chemistry, biology, economics, control theory, signal and image processing, etc.[10,15,19,20].

Boundary value problems of fractional-order differential equations have been extensively investigated during the last few years, and a variety of results on the topic have been established. A great deal of the work on fractional boundary value problems involves local/nonlocal boundary conditions; for example, see[3,4,7,9,11].

Fractional  $q$ -difference( $q$ -fractional) equations are regarded as the fractional analogue of  $q$ -difference equations. Motivated by recent interest in the study of fractional-order differential equations, the topic of  $q$ -fractional equations has attracted the attention of many researchers. The details of some recent development of the subject can be found in[2,5,6,12,13,16,17], whereas the background material on  $q$ -fractional calculus can be found in a recent text[8].

In this paper, we consider the following nonlinear higher order  $q$ -fractional differential equations with nonlocal boundary conditions:

$${}^c D_q^\beta x(t) = f(t, x(t)), \text{ for } t \in J = [0, 1] \quad (1)$$

$$x(0) = 0, x'(0) = 0, x''(0) = 0, \dots, x^{(n-2)}(0) = 0, x(1) = \alpha x(\eta),$$

<sup>1</sup>Corresponding Author: T. Nandha Gopal, E-mail: nandhu792002@yahoo.co.in