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**ENGLISH TITLES**

**ENGINEERING**

**Sensors and Security**

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**Abstract**

Security is a prime concern in our life and everyone wants to be as much secured as possible. Home security is of paramount importance that must have a strong guarding, because there is always a danger of fire or intruder when owner is not in home. Generally, a security system consist of an alarm producing sound, light or process. The devices that inform the control system about what is actually occurring are called sensors. They play very important role in security systems and give the appropriate control signal to the controlling unit, like Motor or Alarm unit. Some engineering students believe that the design of a security protection circuit is complex or difficult, but it's really easy and quite simple even if we want to enhance our security system with different kinds of sensors. To design a security system, it is very important to understand their parameters and applications. The designer must ascertain exactly what parameters need to be monitored and then specify the sensors and data interface. The choice would be dictated by system requirements, cost, and reliability. Once we have identified these parameters and requirements, it is much easier to understand and design any security system, using sensors. The main purpose of this paper is to describe the nature of the sensors and some of their practical applications in security field. We will focus on circuit calculation and will start with a basic type of sensor to determine its application.

**Key words: Sensor, Security, practice, Calculation.**

## ENVIRONMENT

### **Distribution and characteristics of persistent organic pollutant residues in Brown Mussels *Perna Perna* of Hadhramout Coastal Area, Gulf of Aden, Yemen**

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#### Abstract

Environmentally persistent contaminant of polychlorinated biphenyls, organochlorine pesticides and Polycyclic Aromatic Hydrocarbons in brown mussels, *Perna Perna* of Hadhramout coastal area, Yemen, were collected from four sampling sites during (March-April) 2009 and analyzed by (GC-MS).

The  $\sum 46$ PAHs varies from 73.5 to 492 ng g<sup>-1</sup>. Contribution of LMW (2+3 ring) components is much higher (95%) than the HMW (4-6ring) at all locations. This situation probably indicates anthropogenic petroleum spillage; traffic deposited and discharges of wastewater carrying oil as the major sources of PAHs in the region. PAHs containing two or more fused rings are actually ubiquitous organic contaminants in the marine environment. Those PAHs may enter the marine environment of Hadhramout by direct discharge or/and deposition from air in road-runoff/ stormwater drains. The distribution of COMB/ $\sum$ EPA-PAHs, HMW/LMW, and Alkylated/non Alkylated PAHs and confirmed the view of a general Petrogenic origin for PAHs in the samples of Hadhramout coastal area.

**Key words:** Persistent Organic Pollutant; Gulf of Aden; Yemen

**Malaria incidence among Somali refugees in Al-basateen area –Aden  
Governorate- Yemen**

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**Abstract**

A cross-sectional study was performed for malaria infection among Somali refugees in Al-Basateen Area for 7 months, from January to July 2009. A total of 1287 Somalia individuals of high grade fever were screened microscopically and by rapid diagnostic test (RDT). Out of those 1287 refugees, 188 were malaria positive microscopically, with an infection rate of 14.6%. In contrast, 186 were positive by RDT, with an of infection rate of 14.4%.The infection with malaria was detected in different age groups and in both sexes. The highest rate of infection (18.3%) was in children 1-10 years old, and 11-20 age group (18.2%). Malaria incidence was higher in males (17%) than females (12%). The sensitivity of the RDT used in the present study was high (98.9%) and was approximately parallel with (100%) for prepheral blood film (PBF)test. *Plasmodium falciparum* was the predominant malaria parasite in the study area.

**Key words: Malaria, Somalia refugee, RDT, PBF, *P .falciparum*.**

**Coastal ecosystems of Al-Mahrah Governorate, Yemen**

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**Abstract**

Al-Mahrah Governorate is located to the east of the Republic of Yemen. It is bordered with the Sultanate of Oman to the east, Hadhramut Governorate from the west and north, and the Gulf of Aden from the south. The topography of Al-Mahrah Governorate is divided into three parts: the southern coastal plains, the middle mountainous plateau, and the northern desert. The coastal zone of Al-Mahrah Governorate is characterized with diverse enchanted ecosystems. Various ecosystems *e.g.* sandy, muddy, rocky, gravel, in addition to several coastal cliffs and coastal plains exist. In addition, coral reefs and mangrove habitats are observed. Several places in the coastal zone are suitable for turtles breeding and announced by the EPA as protected areas. The coastal strip of Al-Mahrah is characterized with the succession of sandy beaches with rocky cliffs and headlands. During the present study, evidences of erosion has been observed in several places of the coasts due to strong waves. A special attention should be given to the governorate with respect to the coastal zone management.

**Key words:** Coastal ecosystems, Management, Al-Maharah, Yemen.

**Flora of At-Tawila District, AlMahwit Governorate, Republic of Yemen**

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**Abstract**

The present study deals with the floristic analysis of At-Tawila District, Al-Mahwit Governorate, Republic of Yemen. The study area lies between 15° 28' 10" to the north and 43° 32' 43" to the east. This region covers about 58.501 sq km. About 97 species (including species and infra-specific species) belonging to 74 genera and 39 families of the vascular plant have been recorded. Among them two species of Petridophyta belong to Gymnospermae. The dicots are represented by 89 species, while the monocots are

represented by 6 species. The largest families are: Asteraceae, Solanaceae, Lamiaceae, Mimosaceae, Asclepiadaceae, Zygophyllaceae, and Malvaceae. The present results proved that the flora of At-Tawila District is rich and of very a high diversity. The largest genera recorded among of At-Tawila District are: *Pulicaria*, *Euphorbia*, *Commicarpus*, and *Solanum*. It is also noted that the generic index = 1.3

Key words: Flora of [At-Tawila district](#) ,AlMahwit Governorate, species.

## MATHEMATICS

### Diagonally implicit fourth-order Runge-Kutta method for stiff ordinary differential equations

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#### Abstract

Fourth order diagonally implicit Runge-Kutta (DIRK) method for solving stiff ordinary differential equations is derived, which designed to be L-stable method. The stability polynomial of the method is obtained, the stability of the method is investigated, and a set of test stiff problems are used to illustrate the performance of the method. Numerical results show that the new method is more efficient in terms of accuracy, compared to the existing higher order methods.

Key words: stiff ordinary differential equation; diagonally-implicit Runge-Kutta method; A-stable; L-stable.

## MEDICINE

### Prevalence and factors associated with overweight and obesity

**among Hadhramout University lecturers, Yemen**

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(HUCOM)**

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**Abstract**

**A cross-sectional study was conducted to determine the prevalence of overweight, obesity and associated factors among Hadhramout University (HU) lecturers in Al-Mukalla district, Yemen, during the academic year 2011- 2012. A multistage random sampling method was used for the selection of participants. Data were collected by using pre-tested self-administered questionnaires, which was distributed to 380 participants. Also self-reported weight and height, to calculate body mass index, are classified into normal weight - weight gain and obesity, according to the WHO classification for the year (1997). The overall prevalence of overweight and obesity, among HU lecturers, were 24.5% and 22.4% respectively, and was predominant among females than in males. The prevalence of overweight and obesity increased with age, being highest in the 36.46 year-old age group. The study has demonstrated that risk factors associated with overweight and obesity were increasing age and being female, while factors associated with higher risk of having hypertension and diabetes mellitus were overweight and obese. Overweight and obesity is relatively high among Yemeni lecturers in HU, with more prevalent among females than males. Further studies on large scale representing the whole Yemeni population are necessary to determine the extent of the problem.**

**Key words: Overweight, obesity, prevalence, hypertension, diabetes mellitus,  
Yemen.**

**Skin diseases amongst children in Aden**

**Asia Hasan Abdullah Saleh<sup>1</sup>, Amer Omer Bin Al-Zou<sup>2</sup> and  
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**Abstract**

The main objective of the study is to study the patterns of skin diseases among children in Aden. It is a retrospective analysis of patients' data from two private dermatology clinics during the years 2011-2012. There was a total of 805 children with skin diseases, seen at the two private clinics, of which 445 (55.3%) were females and 360 (44.7%) were males. The overall females to males ratio was 1.24:1. The age of patients ranged from 1 month to 13 years and the mean age was  $6.9 \pm 3.6$  years. Children of the age group  $< 6$  years were predominant (44.3%).

Dermatitis represented the first group of dermatologic diseases (25.6%) followed by pigmentary disorders (11.8%) and hair disorders (11.6%). Bacterial infection and fungal infection were with (9.7%) and (9.1%) respectively.

The parasitic infestation and viral infection were with the rates (6.5%) and (5.8%) respectively. Among the dermatitis atopic dermatitis were predominant constituted of 15.4%. Dermatitis were distributed equally between females and males, each 12.8%.

Six groups, pigment disorders, hair disorders, Sebaceous glands disorder, benign tumors and genodermatitis were predominant in females, while six others were predominant in males. The difference between values was significant ( $p < 0.05$ ).

We conclude that female children are more affected by skin diseases, and dermatitis is the predominant dermatoses affecting our children.

**Key words:** Skin diseases, children, private clinics, Aden .

## **Pharmacy**

### **Chemical composition, antimicrobial and antioxidant activity of essential oil of Yemeni *Nepeta deflersiana* Schweinf.ex Hedge**

**Shada H. Yassin<sup>a</sup>, Nasser A. Awadh Ali<sup>a\*</sup>, Iman Fadail<sup>a</sup>, Martina Wurster<sup>b</sup>, and Ulrike Lindequist<sup>b</sup>**

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### **Abstract**

The chemical composition, antimicrobial and antioxidant activities of the essential oil, isolated from the leaves of *Nepeta deflersiana* Schweinf.ex Hedge, were investigated. Oil composition showed the presence of three compounds accounting for 91.9% of the total oil content. The main constituents were found to be nepetalactone(89.1%)  $\alpha$ -cubebene (1,9%).The antimicrobial activity of the essential oil was evaluated against five microorganisms, *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, and *Candida albicans*, using disc diffusion. The oil showed strong antimicrobial activity against *Staphylococcus aureus* and *Candida albicans* with inhibition zones of 17 and 23 mm respectively. 2,2-Diphenyl-1-picrylhydrazyl (DPPH) assay was employed to study the potential antioxidant activity of oil. The antioxidant activity of *N. deflersiana* oil showed weak antiradical activity with IC<sub>50</sub> 8.97 $\mu$ l/mL compared to the positive control.

**Key words:** Essential oils, *Nepeta deflersiana*, nepetalactone, GC-MS, anticandidal.

**Formulation of Famotidine Orodispersible tablets**

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**Department of Pharmaceutics- College of Pharmacy -Sana'a University**

**Abstract**

**This investigation was an attempt to prepare famotidine as orodispersible tablets in a more accessible and compliant form. Famotidine Orodispersible tablets (FODTs) were prepared by direct compression method. Excipients such as fillers (mannitol, microcrystalline cellulose (MCC)), disintegrants {starch, sodium starch glycolate (SSG) and gas releasing agents (citric acid, sodium bicarbonate)}, lubricant (Mg stearate), sweetener (aspartame), and flavorant (menthol) were weighed and mixed in geometrical order and compressed into tablets. All the prepared tablets were tested for weight variation, drug content, friability, hardness, wetting time, disintegration in vitro and in oral cavity, and in vitro dissolution. Thus, all the prepared tablets were found to be within the limit of pharmacopoeia and the disintegration time for the formulations ranged between 120 to 20 sec. Amongst all formulations, tablets (F7, F8 & F11) prepared with 7.5,10% SSG or in combination with 10% gas releasing agents exhibited short in vitro disintegration time and in oral cavity of almost 35, 30 and 20 sec and 40, 33 and 18 sec respectively. Complete drug release, within 10 minutes as compared to the conventional tablets, was achieved. Therefore, the prepared FODTs, F7, F8 & F11, could be used as an alternative dosage form to conventional tablets for treating acute gastric and duodenal disorders.**

**Key words: Orodispersible tablets, disintegration time, wetting time, famotidine, Sodium starch glycolate.**

**Isolation of Dihydroquercetin and its Glycoside Dihydroquercetin-rhamnoside from *Catha edulis* Forsk.**

**Ali Gamal Alkaf<sup>1</sup>, Nasser A. Awadh<sup>2</sup> and Nasr Abdo Ghaleb<sup>3</sup>**  
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**Pharmacognosy Department<sup>2</sup>, Faculty of Pharmacy, Sana'a University;**  
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**Abstract**

Fractionation of the stem extract, from *Catha edulis* has resulted in the isolation of two known aglycones dihydroquercetin: (a) taxifolin, and (b) dihydromyricetin, ampelopsin.. Fractionation of leaf extract resulted in the isolation of 4 flavonoid glycosides dihydroquercetin: rhamnoside astilbin; dihydromyricetin 3-O-rhamnoside; myricetin-3-O-L-rhamnoside, myricitrin, and quercetin-3-L-galactoside. Dihydroquercetin taxifolin (in the stem), and dihydroquercetin –rhamnoside astilbin (in the leaves) have been reported for the first time in Khat plant. All isolated compounds were identified by means of chromatographic and spectral methods (UV-VIS, IR, <sup>1</sup>H-NMR).

**Key words:** *Catha edulis*, flavonoids, dihydroquercetin, dihydroquercetin – rhamnoside.

***Lavandula pubescens* Decne- A Potential Source of Carvacrol-Rich essential oil in Yemen**

**Nasser A. Awadh \*<sup>1</sup>, Martina Wurster<sup>2</sup>, Ali Gamal Alkaf<sup>3</sup>, Iman Fadail<sup>1</sup>, Iman Sharaf<sup>4</sup> and Ulrike Lindequist<sup>2</sup>**

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**Abstract**

Chemical composition of the essential oil of *Lavandula pubescens* Decne, leaves (Lamiaceae) collected from Arrojom locality- Mahweet province, Yemen, was studied by GC-MS. Thirteen constituents were identified in oil distilled from the leaves of which carvacrol (70.0%), caryophyllene oxide (5.5%),  $\beta$ -copaene (3.7%),  $\beta$ -bisabolene (2.5%), thymol methyl ether (2.0%), borneol (1.9%), piperitone oxide (1.5%) and an unidentified compound (4.4%) were the major constituents.

**Key words:** *Lavandula pubescens*, carvacrol, GC-MS, essential oil.

**PHYSICS**

**Calculation of Gamma Ray dose build-up factor for concrete  
using Berger's formula**

**Khalid Omar Al-Baiti\* and Ahmed Sahel Wahdain\***

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Hadhramout University of Science and Technology  
, Republic of Yemen**

**Abstract**

The gamma ray dose buildup factor for point isotropic source for four types of concrete (ordinary concrete, magnetite concrete, ferrophosphorous concrete, and barytes concrete) up to 20 (*mfp*) has been calculated, using computer programs according to Berger's formula. The programs have been designed to work with any value of gamma ray energy by adapting Lagrange interpolation method.

**Key words: Gamma ray - point isotropic source - dose buildup factor - Berger's formula - Lagrange interpolation method - Concrete.**

**MATHEMATICS**

**SHORT COMMUNICATIONS**

**On some inequalities of complex polynomials**

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**Abstract**

**In this paper, certain generalization of well-known Bernstien-type inequalities for complex polynomials is obtained.**

**Key words: Polynomials, inequalities in the complex domain, zeros of a polynomial.**

**On pre – I–open sets and pre –I– continuous functions**

**Khaled M. Al- Hamadi and Abdulla S. Bin Shahna**

**Department of Mathematics, University of Aden, Aden, Yemen.**

**Abstract**

**Jankovic and Hamlett [8] introduced the notion of I – open sets in topological spaces. AbdEl-Monsef et al. [2] further investigated I – open sets and I – continuity. Dontchev [3] introduced the notion of pre – I – open sets and obtained a decomposition of I – continuity. In this paper, we obtain further properties of pre – I – open sets and pre – I – continuous functions introduced in [3].**

**Key words: Pre – I - open, pre – I – continuous function, pre – I – compact space.**

**ARABIC TITLES**

**AGRICULTURE SCIENCES**

**Response of grain yield and its components in durum wheat (*Triticum turgidum L. var. durum*) to different levels of irrigation water, nitrogen, and nitrogen application timing**

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<sup>2</sup>Dep. Field crops, Faculty of Agriculture, Aleppo University, Syria.

<sup>3</sup>Scientific Agricultural Research, Damascus, Syria.

**Abstract**

This research was conducted at the Agricultural Research Center of Qunaeitra, during two growing seasons (2008-2009 and 2009-2010), in order to know the effect of water, nitrogen and nitrogen application timing, on grain yield components of durum wheat. The experimental design was (RCBD), with three levels of irrigation water (100 - 70 - 40)%, three nitrogen levels (225 - 150 - 75) kg N ha<sup>-1</sup>, and six models for timing of N application. Traits were affected by the three inputs and their interactions, The Interaction (100% × 225 × 2) showed significantly higher response for biological yield (15890) kg ha<sup>-1</sup>, Grain yield (8076) kg ha<sup>-1</sup>, spikes per square meter (485) spike m<sup>-2</sup>, grains per spike (37.5) grain spike<sup>-1</sup>, and 53% harvest index. and reached the highest value of Spike threshing index (89.2%) at (100 × 225 × 5). The lowest significant biological yield value reached (5863 and 5985) kg ha<sup>-1</sup> and grain yield (2379 and 2282) kg ha<sup>-1</sup> by interaction (40% × 75 × 5 and 6), less significant values for the number of spikes (266, 255, 257) spike m<sup>-2</sup> resulted in interaction of less nitrogen level (75) with the application timing model (5) and with all the water levels (100, 70, 40)%, respectively. The impact of severe water stress were at the highest level of nitrogen (225) and, for the same model, fertilization (5) decreased significantly from 397 to 374 spike m<sup>-2</sup>. Amounted grains per spike less significant value (19.8) grain spike<sup>-1</sup> at the interaction (40% × 75 × 6). 1000 Kernels weight Ranged between (49.8) g as the highest significant

value, according to the interaction (100%×225×6) and (33.5)g as the lower significant value by interaction (40%×225×2).

**Key words:** Durum wheat, timing, levels, nitrogen, water.

**Rearing of the predator Green Lacewing *Chrysoperla carnea* (Stephen) (Neuroptera: Chrysopidae) on *Sitotroga cerealella* (Olivier) eggs under laboratory conditions**

**Saleh Omer El-Baity<sup>1</sup> and Mohammed Ali Habashan<sup>2</sup>**

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<sup>2</sup>Agriculture Research and Extension Authority East coast -Mukalla-Hadhramout

**Abstract**

This experiment was conducted to determine the impact of the type of food and temperature on the development of the predator Green Lacewing *Chrysoperla carnea* (Steph.) for the purpose of obtaining better conditions for breeding when fed on two types of egg of the Angoumis grain moth *Sitotroga cerealella* (fresh and cooled eggs) under laboratory conditions; at a temperature of  $1 \pm 25$  ° c , relative humidity of  $52 \pm 6\%$  and under 24 h alternating cycles of light(16h) and darkness(8h). This study was conducted in the laboratory of the plant Protection Department, Office of Agriculture and Irrigation in Wadi Hadhramout during the year 2012. Our results showed that the incubation period of the eggs of periods were 3.2 and 3.8 days when feeding on the fresh eggs of *Sitotroga cerealella* and cooled eggs respectively; significant difference at 5% level, The larval period was different with different types of eggs. Duration of larval development period was 8.0 days reared on fresh eggs of *S. cerealella* and 9.6 days on cooled eggs *S. cerealella*. The pupal period was 11.2 days on fresh eggs *S. cerealella* and 9.4 days on cooled eggs of *S. cerealella* completed its life cycle in 22.4 days the complete from the eggs to adult period on feeding on fresh eggs *S. cerealella* and 22.8 days on cooled eggs. Our data also showed that the rearing *C.carnea* on fresh eggs of *Sitotroga cerealella*, at a temperature of 22 °c and 25 °c, different depending on temperature. The duration was 3.8 and 3.0 days when feeding on 22 °c and, 25 °c. The larva completes its

larval stage in 9.6 days at 22 °c and 8.8 days at 25 °c. There is no significant difference on the pupal stage and the overall life cycle from the egg to adult predator.

**Key words:** Eggs of *Sitotroga cerealella*, *Chrysoperla carnea*, larvae, Pupae.

**The effect of pollen sources on the sex ratio of pawpaw  
(*Carica papaya* L.) cv. Honey Dew**

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**Abstract**

This investigation was carried out in the experimental farm of Nassir's Faculty of Agricultural Sciences, during 2001&2002, to study the effect of pollen sources on the sex ratio of pawpaw cv. Honey Dew. The present results revealed that the seeds of cross-pollination with hermaphrodite flowers of Andromonoecious trees cv. Honey Dew and cross-pollination with male and hermaphrodite flowers of Andromonoecious trees cv. Coastal Local Hadramout Red pulp gave fruiting plants (female + Andromonoecious plants) by 100% in both seasons.

**Key words:** Cross-pollination, Sex ratio, Andromonoecious trees, Fruiting plants,  
Pawpaw.

## **ENVIRONMENT**

### **Studying the effect of afforestation on plant biodiversity in a burnt forest /Al-meedan region, Lattakia, (Syria)**

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### **Abstract**

This research aimed at studying plant biodiversity in a burnt and afforested region AL MEEDAN from Lattakia's forests. This is done in order to know the effect of afforestation on plant biodiversity. We have compared the biodiversity in three types of forest lands: burnt and naturally regenerated, burnt and afforested, natural, and unburnt lands (control).

The research showed that a big change has occurred in plant biodiversity into the burnt and naturally regenerated lands, these changes were immense in the herbs layer because of the fire, and the richness in this layer has increased in species that have the ability to compete under the new ecological conditions. As for the effect of afforestation, it has proved to be negative and clear in relation to the herbs layer, and was in lesser degree in the shrubs layer. This is because the preparations for afforestation often destroy a particular group of plants and living beings whose life is disturbed due to disturbance in the places where they live.

Afforestation is necessary in locations that are environmentally threatened (erosion), and the natural regeneration in burnt lands is considered preferable if it is done without interfering, in case of the presence of danger on biodiversity, or for the purpose of protection.

**Key words: Afforestation - plant biodiversity - fire - regeneration.**

**Study of the phenotypes diversity of (*Papaverrhoes L./ Papaveraceae*) in the Syrian coast**

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**Abstract**

**This research has been carried out to study the phenotypes diversity of *PapaverrhoesL.* in the Syrian coast. The samples of this research were collected from different sites of the Syrian coast (Latakia&Tartous).**

**The research showed that there are many Phenotypes that belong to this species (Genotype), and two phenotypes species of *PapaverrhoesL.* had been studied according to the morphological and anatomical parameters, as well as paleonological study. May be, The causes of this diversity are either genetic or environmental. The development has led to the emergence of flowers with a less number of parts had replaced the flowers with a more number of parts.**

**This study contributes to some extent in giving information on the issue of evolution in Angiospermes that require continual research.**

**Key words: *PapaverrhoesL.*, phenotypes diversity, Genotype.**

**PHYSICS**

**Growth of CdS single crystals and studies of its structure and electrical properties**

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**Abstract**

High quality of CdS single crystal is grown from the melting of their highly pure element in evacuated closed tub at  $10^{-5}$  torr. The prepared crystals have been characterized, using X-ray diffraction XRD. The lattice parameters have been determined, their values are  $a = 4.147\text{\AA}$  and  $c = 6.735\text{\AA}$ , and compared with the available data in literature. The X-ray diffraction showed that the powder has hexagonal structure and the preferred orientation along (002) plane. The average grain size was  $0.039\mu\text{m}$ . The electrical measurements were carried out on a bulk. It was found that the crystal (dc) conductivity increases with the increasing of temperature and the Ac conductivity increased with the increasing of frequencies.

**Key words:** Cds singal crystal, X-rays diffraction, lattice parameters, (dc) conductivity, Ac conductivity, average grain size.