

# Abstracts of Research papers volume 17 Number 1 (April 2013)

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# Abstracts of Research papers volume 17 Number 1 (April 2013)

## ENGLISH TITLES

### AGRICULTURAL SCIENCES

#### **A study about some statistical and genetic constants of grain yield and its component of bread wheat (*Triticum durum* L.)**

**Mohammad Nael Khattab**

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#### **Abstract**

Five varieties of bread wheat (*Triticum durum* L.) (Sham11, Sham3, Bohoth11, Bohoth7 and Domah1) and their half diallel crosses were used to study the following quantitative characters ( grain yield per plant, number of spikelet/ spikes (fertile and in fertile, number of grains per spikes, 1000 grain weight, length spikes, length of Awn, tillering and, length stem, weight of grains per spikes), in the farm (video) and its laboratories of the Faculty of Agriculture, Teshreen University, Syria, during the seasons 2008/2011. The study included the estimation of genetic, phenotypic and the environmental variance and correlation between grain yield and its components, broad sense heritability, and the genetic again between grain yield and its components.

The results showed that phenotypic correlation was positive and highly significant between a number of fertile spikelet/ spike and a number of spikelet/ spike (fertile and in fertile), and the length of stem.

The results also showed that genetic correlation was positive and highly significant between grain yield per plant and grains per spike, number of fertile spikelet/ spike and length stem, while the genetic and phenotypic correlation was negative and highly significant between tillering and 1000 grain weight. It can be dependent for improving the yield bread wheat.

**Key words:** *Triticum durum*, correlation coefficient, variance coefficient, and growth traits.

## **Insecticidal effect of local *Bacillus thuringiensis* isolates, collected from some coastal governorates of Yemen**

**Abdullah Nasher M. M., Jamelah M. H. Alhamdany\*\* and Rehab T. R. Alazawi\*\***  
**\*Department of Plant Protection, Faculty of Agriculture, \*\*Department of Biology, Faculty of Science, Sana'a University**

### **Abstract**

Forty eight soil samples were collected from four governorates at coastal areas of Yemen, including Abyan, Taiz, Al-Hudaidah and Hajjah. Sixteen local isolates of *B. thuringiensis* were selected and tested for insecticidal activity against some economic insect pests. The results obtained showed that 52% of the samples contained *Bacillus thuringiensis*. None of the local isolates showed significant mortality on *Sitophilus granaries* fed on grains and treated for 6 days. *Galleria mellonella* larvae fed on honey bee com and treated with different *B. thuringiensis* isolates for 72 hrs haven't been affected significantly, except one isolate from Abyan (46.7%). All isolates from Abyan, Taiz, Al-Hudaidah and Hajjah caused significant mortality to larvae of *Plutella xylostella* after 72 hrs of exposure ranging from 26.7 to 73.3 %, 20 to 73.3%, 53 to 80% and 33 to 47%, for the mentioned areas, respectively. None of any isolates of *B. thuringiensis* collected from Abyan, Al-Hudaidah and Hajjah governorates showed significant mortality on *Phthorimaea operculella* larvae subjected for 48 hrs of exposure, whereas the isolates collected from Taiz showed significant mortality ranging from 27.2 to 61.2%. Continuous survey for new strains or isolates of these bacteria in different areas in Yemen, testing their insecticidal activity, is needed. These local isolates must have Yemeni identity; otherwise, the identification of all local isolates using molecular markers is needed for establishing the identity of these isolates.

**Key words:** Yemen, *B. thuringiensis*, *Sitophilus granaries*, *Galleria mellonella*, *Plutella xylostella*, *Phthorimaea operculella*.

## **BIOLOGY**

### **Study of the toxicity risks of Mancozeb and Carbendazim fungicides used in Yemen on some living tissues of rabbits as a bioindicator**

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### Abstract

Mancozeb and Carbendazim are two fungicides used in Yemen. No histological study has been conducted to assess their toxicity on animal tissues in our country. Both fungicides differ in their toxicity level. Carbendazim is severely restricted, while the other is not. That's why this study was conducted. Hundred local rabbits were used and LD<sub>50</sub> of Mancozeb and Carbendazim were estimated. It is 8800 mg/ kg. bw (body weight) for Mancozeb and 10200 mg/ kg. bw for Carbendazim. At sublethal doses hair started to fall down and blood came out from mouth. Histological sections of liver and kidney were performed and then studied. Severe lesions were observed in both organs treated by both fungicides.

**Key words:** Mancozeb, Carbendazim, Liver, Kidney, Tissues.

### **Investigation of antioxidant and antibacterial effects of *Dodonaea viscosa*, *Fragaria x ananassa duch* and *Vernonia amygdalina* leaves**

**Aziza Taj Al- Deen<sup>\*1</sup>, Ghanya Al-Naqeb<sup>2</sup> and Qais Al-Maqtari<sup>1,2</sup>**

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<sup>2</sup>Department of Food Sciences and Technology, Faculty of Agriculture, University of Sana'a, Yemen

### Abstract

This study is carried out to investigate the antioxidant and antimicrobial effects of 3 selected plants collected from the area around Sana'a University, including *Dodonaea viscosa*, *Fragaria x ananassa Duch* and *Vernonia amygdalina*. The leaves of the three plants were dried, ground and extracted with methanol. The obtained extracts were tested for their antioxidant activity, using scavenging activity of DPPH radical method, and for their antimicrobial activity using agar diffusion method. Results showed that the three samples produced antioxidant activity towards DPPH radical and the scavenging activity was approximately nearly from the pure antioxidant standard, ascorbic acid. The IC<sub>50</sub> values of *Dodonaea viscosa*, *Fragaria x ananassa duch* and *Vernonia amygdalina* leaf extracts were 150±1.5, 180±3.0 and 135±2.6µg/ml respectively, whereas, for L- ascorbic acid, it was 120±2.0µg. All extracts inhibited the growth of *Micrococcus litius*, *Bacillus subtilis* and *Salmonella choleraesuis*, except for the *Escherichia coli*. The *Dodonea viscosa* showed more potent inhibitory effect against *Micrococcus litius* and moderately against the *Bacillus subtilis* and *Salmonella choleraesuis*, whereas The *Vernonia amygdalina* moderately inhibited the *Micrococcus litius*, *Bacillus subtilis* and *Salmonella choleraesuis* when compared to the standard antibiotic Enrofloxacin. The *Fragaria x ananassa duch* inhibited moderately the *Bacillus subtilis* and *Salmonella choleraesui*. Further investigations are recommended in order to establish new pharmacological possibilities for their applications.

**Key words:** Antioxidant; antibacterial; *Dodonaea viscosa*, *Fragaria x ananassa* duch  
*Vernonia amygdalina* ; radical scavenging

## CHEMISTRY

### Production of ultra-low sulphur gasoline and assessment of the efficiency of ferrocene antiknock additive

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#### Abstract

The present research was focused on the production of stock gasoline with ultra-low sulphur content up to 10 ppm (Euro-5 Standard) by blending of different gasoline streams produced in the “Lukoil Neftochim” Bourgas - Bulgaria refinery units as well as on the study on the efficiency of ferrocene antiknock additives.

Some recipes for the production of stock gasoline A92, A95 and A98 commercial grade, on the basis of component streams, produced in LNHB refinery units and satisfying all specifications of the European regulation were elaborated. Thus, the gasoline blending provides a great potential benefit to the refinery in view of minimizing operating costs and product quality improvement.

It has been proved that the efficiency of the additive is a function of the total content of alkanes and, particularly, of that of paraffin in the blended gasoline. The higher is its content the higher the additive efficiency is.

It was found that the maximum increase in RON, by using ferrocene antiknock additive, can be up to five points and the maximum increase in MON – up to 2.9 points for the studied sample.

**Key words:** ultra-low sulphur, gasoline, ferrocene antiknock additives, Euro-5.

## **Oxidation of ceftriaxone sodium (CFS) by Cr(VI) in acidic medium: kinetics and surfactant effect**

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### **Abstract**

The oxidative degradation of ceftriaxone (CFS) by Cr(VI) in sulfuric acid medium has been kinetically investigated. The reaction was found to be first order with respect to Cr(VI) and hydrogen ions and apparent -1 order with respect to CFS. The observed rate constant was found to decrease by increasing NaCl concentration and to be independent of the concentration of TX-100 non-ionic surfactant. A stoichiometry for the reaction has been estimated which agreed well with the experimental findings.

**Key words:** Ceftriaxone sodium, Cr(VI), Oxidative degradation, Kinetics.

## **ENGINEERING**

### **Hybrid image fusion algorithm and its spatial and spectral effects**

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### **Abstract**

This paper demonstrates analyses, processing and evaluation of simplex, semi-complex and complex fusion methods, and proposes of a fusion method. In this new method, we have combined a specialized hue-saturation intensity (HSI) transformation with a discrete wavelet transform (DWT) analysis. The aim is to improve the quality of multispectral (MS) and panchromatic (Pan1) of original images obtained from remote sensing platforms: (Ikons and Lansat-7). The first intensity (spatial  $I_1$ ) component of the MS images is obtained by HSI transformation. The second (I) is resulted by using the average of red, green and blue main colors of the same source (Ms). Four steps have been used to get a new Pan3. Firstly, Pan2 image is formed by multiplying the ratio of standard deviation (of Pan1 and I) with the difference between original pan<sub>1</sub> and its mean ( $\mu_{p1}$ ), then the result is added to the mean of intensity ( $\mu_I$ ). Secondly, by convolving high pass, Laplacian filter with the difference of the previous two intensities ( $\Delta I$ ). Thirdly, in order to decrease noise, convolved result ( $C_1$ ) is fused with  $I_1$  via median filter. Finally, both the fused result and intensity (I1) images are then subjected separately to DWT and then

compound by bands to obtain Pan3. Thus, the final fused image is obtained after inverse DWT (IDWT) that is followed by re-synthesizing of the three components: H, S (remained above) and IDWT of Pan3. Experiments have been conducted with the MS and Pan-images. Then, the proposed method is compared with the classical methods: Mean, Maxmin, HSI, principle of components analysis (PCA) and the wavelet transform (of fusion methods). The results of the experiments of noisy-free, noisy and de-noisy images have shown that the spectrum information is kept well, while the details information of original image is improved.

Key words: Image fusion; HSI transformation; PCA transformation; DWT transformation

## MATHEMATICS

### Multi-graphs-*PW* and multi-symmetric digraphs- *PW*

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#### Abstract

In this is paper, we give some definitions and results of multi-Graphs-*PW* and multi-symmetric Digraphs-*PW* and the relationship between them.

**Key words:** multi-Graphs-*PW*, multi-symmetric Digraphs-*PW*, multi-set .

### Generating Functions for the Multiple Hypergeometric Function of Higher Order

Ahmed Ali Atash

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#### Abstract

In this paper, we apply the two results given in [5] to derive our main results in order to obtain two generating functions for the multiple hypergeometric function of higher order, by using integral operators. Some (a known) generating functions of the general triple hypergeometric series  $F^{(3)}[x, y, z]$  and Lauricella's function  $F_C^{(n)}$  have been derived as special cases of our main results.

**Key words:** Generating functions, multiple hypergeometric function, triple hypergeometric series ,integral operator.

## **MEDICINE**

### **Clinical pattern of complex febrile seizures in children: Al-Wahda Teaching Hospital, Jan-June 2009**

**Abdullaif Mohamed Ali Al-Qubati and Talal Kassem Mehjan  
Pediatric Department, Al-Wahda T. Hospital-Aden**

#### **Abstract**

This prospective-observational study was performed on children with complex febrile seizures admitted to the Pediatric Wards of Al-Wahda T. Hospital, during the period Jan-June 2009, aiming to illustrate the clinical pattern of this important disorder.

Thirty nine children with complex febrile seizures were included, representing 41.5% of patients presented with febrile seizures during the period of study.

Males outnumbered females with a male: female ratio of 1.6:1.

The onset was more frequent (59%) under 12 months of age, and the mean was 14. 64 months.

Generalized multiple seizures were the predominant presenting features (53.8%) and focal seizures was documented in 33.3% of patients.

Family history of febrile seizures was found in 51.3% and parental consanguinity in 35.9%.

Anemia was common (74.4%) and viral upper respiratory infection was the commonest triggering febrile illness.

It can be concluded from this study that, complex febrile seizure is a recognized disorder in children, occurred more frequently in early age and among those with positive family history. Establishment of a guideline for uniformed assessment, classification and management, along with parental education have been recommended to enhance the disease favorable outcome.

**Key words:** age at onset, generalized multiple seizures, family history and upper respiratory tract infection.

### **Histopathological changes of lamotrigine on heart, lungs and kidneys of the albino rats fetuses**

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\*\* Department of Forensic Medicine & Toxicology, Faculty of Medicine, Aden University, Yemen

\*\*\* Department of Embryology, Faculty of Medicine, Aden University, Yemen

## Abstract

The aim of this study is to elucidate the possible histopathological effects of lamotrigine (one of the new antiepileptic drugs) on heart, lung and kidney of fetuses of albino rats after intrauterine exposure to that drug .This study was conducted over a period of 6 months extending from August 1, 2011 to January 1, 2012. Thirty adult non pregnant female albino rats and 15 male rats of the same strain, weighed 150-200 grams, were purchased from the Animal House of Faculty of Medicine, Assiut University.

Thirty pregnant rats were used in this study and they were classified in three groups: a) Control Group: consisted of 10 pregnant females with normal saline administration. b) Group one: consisted of 10 pregnant females with therapeutic dose of lamotrigen oral administration of 5.4 mg /Kg body weight (Study Group I), and (c) Group two: consisted of 10 pregnant females with high dose of lamotrigen oral administration of 32 mg /Kg body weight (Study Group II).The oral administration was done daily, from day one of pregnancy, for nineteen days of gestation.

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**Key words:** Epilepsy, Lamotrigine, Fetus, Heart, Lung, Kidneys, Histopathology

## **Consumers satisfaction with the National Center of Public Health Laboratories services. 2010.in Aden Governorate**

**Sausan Bakhubira \*, Ahmed S. Al Garba \*\*, Jamil A. Raheem\*\*\* and Seena A. Yusouf \*\*\***

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### **Abstract**

The quality of health services reflected by patient's perception in terms of satisfaction to the services they are providing. The opinions of consumers of the National Center of Public Health Laboratories, in Aden, about the services provided by the center may indicate the quality of the services.

The objective of the present study is to find out the satisfaction of consumers with the services of Aden National Center of Public Health Laboratories, with regard to demographic characteristic, and to estimate the most important problems or defects in the services so as to take corrective actions.

This is a cross sectional descriptive survey conducted in the National Center of Public Health Laboratories- Aden Governorate, Yemen. during the period from April – June 2010. Random samples of 430 consumers were taken from different departments of the center and a planned questionnaire was filled by them. Data were processed in the Statistical Package of Social Sciences (SPSS), Version15. A cross tabulation relation (Chi square test) with significance level 0.05 was used. The results of our study subjects showed that 53% are women and 47% are male (80.9% are Yemeni nationality and 19.1% are not Yemeni). The mean age of our study consumers are 41.3 years  $\pm$  14 years. The educational level of the consumers showed that 52.8% were of high education (secondary and university), and the rest (47.2%) of low level of education and illiterates. 177, out of 430 respondents (41.1%), showed high satisfaction with the services provided by the center, and 184 respondents (42.8%) with good satisfaction. Only 69 participants (16.1%) were with acceptable or low level of satisfaction. We concluded that while a satisfaction survey is a screening tool that identifies topics of dissatisfaction, to find out the specific problems of consumers and to undertake targeted corrective actions, we found that the satisfaction of consumers with Aden National Center of Public Health Laboratories services is high were of which 83.9 % of them was between high and moderate.

**Key words:** Consumers satisfaction, laboratory services, satisfaction survey.

## ARABIC TITLES

### AGRICULTURE SCIENCES

#### Evaluation of plant extracts against *Rhizactania solani* causing tomato wilt *in vitro*

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#### Abstract

The vital plant has achieved a great importance in modern agriculture to stop the danger of the extensive use of chemical pesticides in pests fighting which cause dangerous result that can affect human beings and his environment.

A number of experiments have been done in the Department of Biology, Faculty of Education-Sabir, University of Aden, aiming at assessing the effect of twelve species of plant water extract as antifungi: Garlic *Allium sativum*, Neem *Azadirachta indica*, cactus *Aloe vera*, Datura *Datura stramonium*, Eucalyptus *Eucalyptus camaldulensis*, Lantana camara *Lantana camara*, Colocyth *Citrullus colocythis*, Thevetia *Thevetia peruviana*, Nerium *Nerium oleander*, Basil *Ocimum basilicum*, Castor *Ricinus communis*, calotrope *Calatropis procera*, with concentration of 10% w/v by poisoned food technique against *R. salani* which causing wilting of tomatoes . All these Ethanol extract 70% ethanol have given effectiveness against fungus with different degrees. Four of these extracts showed strong effectiveness of inhibition of fungal. The *A. sativum* is the most effective one, because it, completely prevents the growth of mycelial. The rate of inhibition reached 9mm, then *D. stramanium* *A.indica* and *C. colocythis* with the rates 85.0, 73.7 and 68.2 mm successively. The least effective extract was *L. camara* because it's effectiveness was too weak that the inhibition rate did not pass 27.8mm after 7days of incubation.

The effectiveness of the plant water extract was tasted in another experiment for the same plants, except this *L. camara*, and with the same concentration on the growth of *R. solani*. The results have shown that three of the extracts gave strong effectiveness in the fungi inhibition. *A. sativum* was the most effective with inhibition rate of 81.0 mm, then *D. stramnaiun* and *A.indica* with the rates of 76.2 and 72.0 respectively. The least effectiveness was for *T. peruviana* because the effect was too weak that the rate of inhibition did not pass 9.9 mm after 7days of incubation.

**Key words:** plant extracts, fungus, *Rhizctoniasolani*

## **Comparing the efficacy of some plant extracts and fungicides in inhibition *Aspergillus flavus* and *Penicillium digitatum* in laboratory**

**Basel Ibrahim <sup>(1)</sup> Zakaria Al –Naser <sup>(2)</sup> and D. Ezz Al-dden<sup>(3)</sup>**

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<sup>2</sup>**Plant Protection, Faculty of Agriculture Damascus University, Syria.**

<sup>3</sup>**Plant Protection, Faculty of Agriculture Damascus University, Syria.**

### **Abstract**

The investigation was carried out to evaluate the efficacy of petroleum ether extracts of *Capparis spinosa* and *Melia azedaracht* L. for suppressing the growth of the fungi, *Penicillium digitatum* and *Aspergillus flavus* on artificial media, in compared with standard fungicides, benomyl and mancozeb, under laboratory condition. The results indicated the superiority of fungicides in suppressing the growth of both fungi, where the fungicide benomyl gave the lowest ED<sub>50</sub> for both fungi *Penicillium digitatum* and *Aspergillus flavus* which were 10.72 and 16.98 ppm., respectively. *Capparis spinosa* extract caused full suppression for *Penicillium digitatum* and *Aspergillus flavus* at dose, 250 ppm, while *Melia azedaracht* L. extract caused full suppression for *Penicillium digitatum* and *Aspergillus flavus* at 180 and 200 ppm, respectively. It is clear that the higher concentration has caused higher suppression, a suppression which varies according to plant species and treated fungus.

**Key words:** Plant extract, Fungicides, *Penicillium digitatum*, *Aspergillus flavus*

## **Evaluation of seven local isolates of entomopathogenic nematodes belonging to the genus heterorhabditis and one belonging to the genus steinernema for storing at high temperatures (40-50°C)**

**Abdulla Bin-Zghew Al-Amri\* and Intsar Mahfood Obad\*\***

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**\*\*Plant protection section - Nasser College of Agricultural Sciences / University of Aden .**

### **Abstract**

The evaluation tests of seven local isolates of entomopathogenic nematodes (EPNs) belonging to the genus heterorhabditis and one belonging to the genus steinernema isolated from the soil of Hadramout coast directorates , showed high ability of storing at high temperatures. All isolates of the genus heterorhabditis tolerate temperature 40°C in the form of suspended concentration 100 Infective Juvenile stage (IJs) / ml in closed vials capacity 45 ml, for 11 hours and 45 °C for 105 minutes and 50 °C for 75 minutes,with vitality rates ranged between 19.2 - 27.2%, 8.8 - 32.8% and 27.6 -

76.0 %, respectively. The isolate (H) of the genus *Steinernema* tolerates 40 °C for 8 hours and 45 °C for 90 minutes and 50 °C for 75 minutes, with vitality rates reached 38.4, 53.2 and 12.8% respectively. The storage in open vials extended the storage period of all isolates at 40 °C by about 1600% without mention lose , and at 45 °C by about 140% and at 50 °C by up to 50% without mention lose in the vitality of heterorhabditis isolates and with percentage vitality of 58.4 and 66.0%, respectively, for the steinernema isolation , compared to keeping in closed vials . all isolates were take the same direction in terms of the ability of tolerance to high temperatures 40 , 45 and 50 °C , despite some of them were statistically equal to each other but that according to calculation differences between them they can be arranged descending order as follows: F, G, E, A, D, B, C, and finally H.

**Key words :** Local isolates , heterorhabditis , steinernema , high temperatures , closed vials, open vials,.

## **Effect of Yemeni Sidr Honey ( *Ziziphus Spina Christi* )and some antibiotics on *Escherichia coli***

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### **Abstract**

This research aims to study the effect of Yemeni Sidr Honey and some antibiotics on *Escherichia coli*. By the use of Kirby Bauer`s method, the results showed that *E.coli*-isolated from raw milk and drinking water - was inhibited by this Honey, and diameters of clear inhibition zones were 32mm , 19 mm 28mm and 18mm at Honey concentration of 100 % and 20 %, respectively. By the use of filtration discs, the results showed that *E.coli* – isolated from raw milk and drinking water – was inhibited by this Honey, and diameters of clear inhibition zones were 27mm , 17 mm 26mm and 16 mm at Honey concentration 100 % and 20 %, respectively. When industrial antibiotics discs were used, the results showed that Augmentin had higher inhibited effect (26mm), while Chloramphenicol had lower inhibited effect (16mm). However, Tetracyclin had no inhibited effect on *E.coli*.

**Key words:** Sidr honey, *Escherichia coli*, inhibition, industrial antibiotics.

# **BOTANY**

## **The effect of aqueous extracts of the roots of Mesquite and Calotropis on the germination and growth of seeds of Cowpea (*Vigna sinensis*)**

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### **Abstract**

Many plants have the ability to secrete inhibitory substances that inhibit the growth of other plants. An experiment was conducted to study the effect of aqueous extracts of the roots of Mesquite ( *Prosopis juliflora* ) and Calotropis ( *Calotropis procera* ) on the germination and growth of seeds of cowpea. Different concentrations (12.5, 25, 50, 100%) of both extracts were used in both extracts in this experiment. The results showed the ability of these extracts to inhibit germination and growth of cowpea. The inhibition increased by the increase of extracts concentration; the high concentration (100%) gave the higher inhibition, compared to the control. A gradual decrease in the percentage of germination and growth of radicle and root, was observed by the increase of the concentration, and the highest decrease was recorded at a high concentration (100%) in the studied characters.

**Key words:** Cowpea , Mesquite extracts , Calotropis extracts, inhibition.

## **Natural medicinal plants in Aden Flora**

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### **Abstract**

The Yemeni man used plants in various aspects of life such as, accommodation , protection , farming , beautification and also in the treatment of different diseases. Realizing the interest of man in these plants in the field of treatment, it has been decided that this scientific paper must focus on the documentation of popular heritage regarding herbal treatment by making field visits through which data were gathered, documented and analyzed, The plants were collected from different localities of Aden, identified and classified scientifically .

Seventy-one species of medicinal plants, belonging to 59 genera of 36 families, were collected and identified. All these plants are used internally and externally as medical treatment to cure different diseases.

**Key words:** treatment uses, herbs , diseases, plant sort.

## **Plant leaves used in the treatment of some diseases affecting people in Alwadie District- Abyan – Yemen**

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### **Abstract**

The theuraptic prosperity in Yemen come due to vegetative diversity, as well as the Yemeni plant ecosystem possess some species often used directly for treatment. As the plant species differ, they also differ in its parts used for the treatment of deseases affecting human beings. In the study, area people has ability to conclude plant leaves uses in the treatment of many diseases. In this study we found that 36 plant species belong to 25 family used for internal and external treatment as required.

**Key words:** Theuraptic uses, sickness, medicinal plant leaves, Alwadie District.

## **Ethno-medical uses of wild flora of Thi-Sufal district, Ibb Governorate Yemen**

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### **Abstract**

This study was conducted during the period Nov. 2009 – July 2010 at Thi-Sufal district located at N 13,514,72 – 13,58 , 90 , 44 and E 44, 8, 55, 11 – 44,03 ,07 , 30 . The topography of the study area consists of high and medium mountains altitudes. The regular rainfall helps to grow diverse plant vegetation. The local people are triply connected with their land and plants they are traditionally using in daily activities. The study results show that 85 species belong to 71 genera are traditionally used as an oral or external treatment for different diseases.

**Key words:** Ethno-medical uses , plants diversity , high mountains , topography.

# **GEOLOGY**

## **Getting rid of dangerous carbonate rocks on the slopes of Mukalla hill using geochemical method**

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### **Abstract**

The falling rocks on the slopes cause catastrophes to the people who live there. A geologic - geomorphological study on the carbonate rocks exposed to fall on the slopes of Mukalla Hill in Hadhramout Governorate (Republic of Yemen) has been conducted, and geochemical method for getting rid of them completely and safely has been worked out. Based on the traditional way of producing lime from the limestone, the mentioned method has been accomplished by burning the rocks at high temperature directly at their positions on the slopes. By using this method, about a half of its mass converts into carbon dioxide gas which leaves the rock to the atmosphere, and the other half to porous brittle calcium oxide mass; which, by sprinkling water on some of its separate parts, is partially converted into incompact dough of calcium hydroxide, and into splinters of calcium oxide, so that it can be removed. At the end of the process, the whole rock will be got rid of.

**Key words:** Carbonate rocks , Rock Falling , Slopes , Mukalla , Geochemisry.