

Kurdistan 3<sup>rd</sup> Conference on Biological Sciences

### **III. BIOTECHNOLOGY**

# **Genetic Diversity Analysis Of A Number Of Apple (*Malus Sativa*) Cultivars In Duhok Region Using RAPD Markers**

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## **Abstract**

In this study, variety identification and genetic relationship among eight apple varieties (Star crimson, V2, Yellow Dorset, Yellow Ana, V1, Richard, Frency, Red Dorset) cultivated in Duhok region were investigated. For this a DNA based molecular marker namely RAPD was used. The results using 14 RAPD Operon primers revealed a total of 335 bands, in an average 24 bands for each primer. The results also showed that OPL-01 gave 38 bands and OPO-06 gave 25 bands. The genetic distances among the cultivars were estimated based on the number of bands which ranged between (0.0359 to 0.7285 ). The lowest genetic distance ( 0.0359) was found between cultivar Star crimson and V2 whereas the highest genetic distance (0.7285) was found between cultivars Frency and V2 The dendrogram obtained by using UPGMA cluster analysis based on RAPD data produced two main cluster, the first genetic cluster mostly consisted of 4 sub-group (Star crimson, V2, Richard, V1, Red Dorset), the second cluster consisted of 2 sub-group (Yellow Dorset, Yellow Ana, Frency). This study demonstrated that molecular markers can be useful in assessing genetic diversity, and in sorting apple cultivars into phylogenetic groups prior to their evaluation for apple breeders for improvement varieties in Kurdistan region.

## **Direct And Highly Species-Specific DNA Fingerprints Of Some Iraqi Sheep Breeds**

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### **Abstract**

In this study, a molecular-based technique was employed to fingerprints of a number of Iraqi sheep breeds. For this, blood samples were obtained from four Iraqi indigenous sheep breeds (Awassi, Hamdani, Na'aimi and Karadi) in Duhok and Nineveh provinces. Genomic DNA were extracted, polymerase chain reactions (PCR) were done successfully with specific-species primer. PCR products were subjected to 1.5% agarose gel electrophoresis for fast and easy detection of successful amplification. Then the PCR products were subjected to 6% poly acrylamide gel electrophoresis and stained with silver nitrate. Patterns of different bands were noticed which detect the genotype of each breed. The obtained results can be useful for development of a rational breeding strategy for genetic improvement of sheep in Iraq.

## **Evaluation Of Three Sunflower ( *Helianthus Annuus* L.) Hybrids For Salt Tolerance *In Vitro*.**

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### **Abstract**

This study aimed to induce callus from three sunflower ( *Helianthus annuus* L.) hybrids , namely Anna, Alhaja and kuds and to evaluate their callus for salt stress tolerance . Cotyledons and hypocotyl were taken from seedling of these hybrids and cultured on MS media contained 2,4-D (0.0,0.5,1.0,1.5 and 2.0 ) mg / l and kinetin ( 0.0 ,0.5 ,and 1.0 ) mg / l . The cultures incubated at  $25 \pm 1^{\circ}C$  under light condition (1000 Lux ) for 16 h / day . After 6 weeks observations were taken on the response of cotyledons and hypocotyl to callus induction .The induced callus were cultured on the same MS media that contained appropriate concentrations of 2,4-D and kinetin for callus induction as well as contained various concentration of sodium chloride NaCl ( 0.0 ,0.05, 0.1, 0.15 and 0.2 ) % .After six weeks callus fresh and dry weights, proline and total carbohydrates concentration were measured .

The results showed significant differences among the hybrids , explants , 2,4-D and kinetin concentration and significant interaction between them in their percentage response for callus induction .The results also revealed that fresh and dry weights were significantly reduced with increased NaCl concentration in the medium , hybrids showed significant differences in their response to salt stress .The proline and total carbohydrate concentration increased in callus as NaCl increased in the media .Significant interaction was showed between hybrids and NaCl concentration in these parameters .

# **Characterization Of The Purified Klebocin Produced From The Local Isolate *Klebsiella Pneumonia* (K64)**

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## **Abstract**

The purified Klebocin produced from the local isolate *Klebsiella pneumonia* (K64) was characterized according to its molecular weight, pH, temperature and iron effect on the microbial activity against indicator strains that included: *Escherichia coli*, *Klebsiella pneumonia*, *Staphylococcus aureus*, *Candida albicans* and *Aspergillus niger*. Gel-filtration chromatography was done to determine the molecular weight of the Klebocin. Gradient pH values of Phosphate buffer (4-9) was prepared for pH characterization. Temperature characterization was done by incubating Klebocin solution in different temperature degrees ranged from 20-60C° in water bath. Gradient concentration of Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> was prepared (0-10)mM for Iron influence on the microbial activity of the purified Klebocin. Klebocin molecular weight was 100 kDa, it remained active and stable in different pH values and temperature degrees, low concentration of Iron increased the activity of the purified Klebocin against indicator strains.

# **Polymorphism In Booroola (Fecb) Gene Associated With Litter Size In Hamdani Sheep**

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## **Abstract**

**This study was carried out to investigate possible polymorphisms in FecB gene. Blood samples were collected from 64 ewes of Hamdani sheep. Genomic DNA was extracted using Magic buffer method. The quantity and quality of extracted DNA was examined with spectrophotometry and gel electrophoresis. The polymerase chain reaction (PCR) was used for amplification of a fragment with 140 bp at this locus. For genotyping of individuals at Booroola locus, the resulted amplified fragments were digested using *AvaII* restriction enzyme. *AvaII* restriction enzyme was used to detect possible mutation (G|GACC). All samples showed wild allele and Fec<sup>++</sup> genotype. Considering the phenotypic records in this breed, the result revealed that the genetic factor responsible for litter size is not related to report of Booroola major gene and research should continue to search for other major genes in this breed.**

# Quantitative Image Analysis of Bcl-2 Protein In Glioma Tumor Using Adobe Photoshop Program

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## Abstract

**Background:** In immunohistochemistry staining, antibodies are used to detect and localize antigens in cellular compartments in sections taken from paraffin blocks. Computerized image processing techniques are widely available to analyze immunohistochemically stained tissues; however, the image analysis programs are generally highly specific and expensive. This study aimed to show the feasibility of quantitative image analysis (QIA) by using computer program currently in widespread use.

**Methods:** An available computer programs, Adobe Photoshop CS4 Extended, was used to separate areas in the same tissue sections stained with Bcl-2 antibody and labelled with peroxidase in human Glioma tissue. QIA was made on the relevant images using this program.

**Results:** There is no significant difference in the frequency of Bcl-2 expression among the groups according to the tumor grade; it was detected in 21 of 29 cases (72.41%), digital count of positive reaction, area and percentage of area covered by the positive reaction were not statistically different and not correlated to the tumor grade (P value = 0.350, 0.754 and 0.723) ( $r=-0.225$ ,  $-0.144$  and  $-0.169$ ) respectively. While, with the Bcl-2 score there are highly statistical difference and possess higher positive correlation with them (P=  $\leq 0.001$ ,  $\leq 0.001$  and  $\leq 0.001$ ) ( $r= 0.923$ ,  $0.807$  and  $0.797$ ) respectively.

**Conclusion:** QIA is a safe and reliable method of analyzing tissue samples stained using immunohistochemical methods.

# **Application of Specific PCR assays for detection of Methicillin-Resistant *Staphylococcus aureus* (MRSA)**

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## **Abstract:**

In this study, forty isolates previously identified as *Staphylococcus aureus* were selected and recultured on mannitol salt agar as a selective media for this bacterium. These isolates were subjected to antibiotic susceptibility test for screening methicillin resistance using oxacillin disc (1µg). The results showed that twenty two isolates of *S. aureus* were resistant to oxacillin whereas other eighteen isolates were sensitive to oxacillin. Molecular typing techniques were also employed for further confirmation detection of *S. aureus*. Specific PCR assay was used for detection of thermonuclease (*nuc*) as *S. aureus* specific primer. The results revealed that all isolates produced an amplicon of 280bp confirming at a molecular level that they were *S. aureus*. These isolates were also subjected to PCR assays (*mecA*) for detection of methicillin resistant gene. The results showed that only 15 out of 22 *S. aureus* isolates that showed oxacillin resistancy produced an amplified fragment of 310bp, the other seven isolates didn't amplify any bands indicating the lack of *mecA* gene. Molecular typing especially PCR based assays are increasingly employed as the most powerful technique for the investigation and control of classical and emerging nosocomial pathogens.