

Poster – [A-10-379-1]**Effect of barberry fruit (*Berberis vulgaris*) on serum glucose and lipids in streptozotocin-diabetic rats**

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Objectives: Barberry (*Berberis vulgaris*) is used in traditional medicine for a number of diseases including diabetes mellitus. The aim of the present study was to evaluate the antidiabetic activity of aqueous extract of *Berberis vulgaris* fruit in streptozotocin-induced diabetic rats.

Material and Methods: Male Wistar rats were randomly divided into 4 groups, including 1) control, 2) diabetic, 3,4) diabetics treated with aqueous extract of barberry. The treatment groups received the barberry fruit extract daily in drinking water containing 3.5% and 7.5% from a 100mg/ml of the initial extract, since the day after diabetes confirmation for 6 weeks. The blood glucose and lipids were spectrophotometrically measured in all groups at weeks 0 (before diabetes induction), 3 and 6.

Results: Diabetic rats showed an elevated serum glucose level over those of control rats ($p < 0.0001$) and treatment of diabetic rats for 6 weeks with the aqueous extract of barberry fruit did not change the serum glucose concentration in comparison to diabetic rats. Regarding serum lipids, diabetes induction caused a significant increase in triglyceride concentration compared to control ($p < 0.05$) and treatment with barberry fruit did not change the triglyceride concentration compared to diabetic group. Meanwhile, diabetes induction did not change the total cholesterol and HDL-cholesterol concentrations in diabetic rats compared to controls.

Conclusion: The aqueous extract of *Berberis vulgaris* fruit at amounts of 3.5 and 7.5% of drinking water did not possess the hypoglycemic and hypolipidemic effects in streptozotocin-diabetic rats during 6-week treatment period. Therefore, the usage of barberry fruit in traditional medicine for the lowering of glucose or lipids in diabetic patients may need more investigation.

Keywords: *Berberis vulgaris* fruit, Diabetes mellitus, Hyperglycemia, Hyperlipidemia, Rat

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Poster – [A-10-393-1]**Antibacterial effect of *Salvia leriifolia* Benth essential oil obtained in different phenologic stages against cariogenic bacteria**

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Introduction: Until microbial actions essential oils are one of the most extensively studied aspects of botanical medicine, various aromatic plant species are being investigated for their pharmacological properties. *Salvia leriifolia* Benth (Lamiaceae), as a native plant species of South Khorasan province, has significant applications in medicine, pharmacology and food industries. In the current study, *S. leriifolia* essential oil was tested for its antibacterial activity against cariogenic bacteria and then relation between antimicrobial property and plant phenology was investigated.

Method: Essential oil of plant leaves at three different phenologic stages (vegetative, flowering and seed formation) was extracted by steam distillation method and then its antibacterial activity against *Streptococcus mutans* (PTCC:1683), *Streptococcus sangius* (PTCC:1449) and *Actinomyces viscosus* (PTCC:1202) was evaluated by Agar dilution method. The study was conducted based on Completely Randomized Design (CRD) and data were analyzed with JMP and MSTATC softwares.

Result: Minimum inhibitory concentrations (MICs) of essential oil at vegetative stage were 21, 25 and 12.5 mg/mL against *Streptococcus mutans*, *Streptococcus sangius* and *Actinomyces viscosus*, respectively. The evaluated MICs at flowering stages were 21, 21 and 25 mg/mL for the above mentioned bacteria with the same order. At the stage of seed formation, MIC was 25 mg/mL for all bacteria.

Conclusion: Results showed that the essential oil of *S. leriifolia* had significant inhibitory effect on growth of all tested bacteria. In flowering time, the plant showed more antibacterial activity than other phenologic stages and *Actinomyces viscosus* showed to be the most sensitive bacteria.

Keywords: Antibacterial activity, Agar dilution, Essential oil, Phenologic stages, *Salvia leriifolia*, *Streptococcus mutans*, *Streptococcus sangius*, *Actinomyces viscosus*

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Poster – [A-10-403-1]**Protective effects of pulp aqueous and hydro-alcoholic extracts of *Punica granatum*, on serum/glucose deprivation-induced PC12 cells injury**

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The serum/glucose deprivation (SGD)-induced cell injury in cultured rat pheochromocytoma (PC12) cell line represents a useful in vitro model for studying the induction of cell injury following brain ischemia and other neurodegenerative disorders. Pomegranate (*Punicagranatum L.*) has been known for its antioxidant constituents. To elucidate the neuroprotective effects of pomegranate, we have evaluated pulp aqueous (PHE) and hydro-alcoholic (PAE) extracts, on viability of cultured PC12 cells under serum/glucose deprivation conditions. PC12 cells were grown in DMEM media, supplemented with 10% FCS, and 1% antibiotic, containing 100 IU/ml penicillin and 100 µg/ml streptomycin. After seeding overnight, cells were deprived from serum/glucose for 6 and 12 hrs. In treatment groups, cells were pre-incubated with PHE and PAE (6.25–800 µg/ml) for 2 h before inducing SGD, in which the same treatments were applied. Cell viability was evaluated by MTT assay. Exposure of PC12 cells to SGD condition for 6 and 12 hrs induced a significant decline in cell viability ($p < 0.001$). Treatment of PC12 cells for 6 and 12 h with PHE, PAE (6.25–800 µg/ml) significantly reduced the SGD-induced cytotoxicity in PC12 cells. Herein, we have shown that PHE, PAE increased cell viability following serum/glucose deprivation in PC12 cells. It

emphasizes the potential therapeutic properties of pomegranate pulp in alleviating the pathogenic disturbances associated with cerebral ischemia and other neurodegenerative disorders.

Keywords: *Punica granatum*, Serum/glucose deprivation, PC12 cells, Neurodegenerative disorders

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Poster – [A-10-405-1]

Antinociceptive effect of *Solanum Melongena* extract on phasic pain model in male mice

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Introduction: Patients who are suffering from pain usually seeking for medicinal recommendations about their nutritional regime. One of the most contraindicated vegetative regarding pain modulation is *Solanum Melongena*. In this study we conducted to evaluate the antinociceptive effect of *Solanum Melongena* hydro-alcoholic extract on acute and chronic pain models in male mice.

Materials and Methods: This study was conducted on 70 male mice divided into 14 groups. Formalin test was used for chronic and tail flick test for acute pain assessments. In each category 3 test groups were administered 3 different doses of extract (10, 100 and 1000 mg/kg), 3 positive control groups received 3 different doses of morphine sulfate (1, 2 and 4 mg/kg). Distilled water was injected to animals in the remaining negative control group in each category.

Results: In tail flick test the analgesia index in test groups was dose dependently greater than the negative control group and the differences were significant at 45 to 60 min after the drug administration ($p < 0.05$). The analgesia index was the same as 4 mg/kg morphine sulfate ($p > 0.05$).

Conclusion: According to our findings solanum extract in a dose dependent manner led to relieve acute pain in mice.

Keywords: *Solanum Melongena*, Tail flick test, Acute pain, Mice

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Poster – [A-10-413-1]

The study of antibacterial effects of water and alcoholic extracts of *Eryngium billardieri* leaves, roots and seeds on *Staphylococcus aureus*

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Eryngium billardieri from the umbelliferae family is a plant with medicinal and antimicrobial properties. This plant is an Iran endemic plant and grows in central zone of Saveh. In this research plant was collected from a zone of Saveh and the different parts of the plant: root, leaf, seed with methanol extracts and water extracts were examined against *Staphylococcus aureus*. The result indicates that: antimicrobial compounds from plant may inhibit microbial growth of *S. aureus* whereas seed extracts was found to be higher than that of leaf and root extracts.

Keywords: Antibacterial effects, *S. aureus*, Water and alcoholic extracts

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Poster – [A-10-434-1]

Improvement of hyperinsulinemia in type 2 diabetic rats by *Trigonell Foenum* compare to *Fumaria Officinalis*

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Introduction: Hyperinsulinemia is a central pathophysiological feature of type 2 diabetes mellitus and has been shown to play a key role in the disease evolution. Feeding of a high fructose diet to rats results in hyperglycemia, hypertriglyceridemia and hyperinsulinemia. In Iran, use of herbal drugs is very common. Among them, *Trigonell foenum* and *Fumaria officinalis* are used frequently. The present study was carried out to evaluate the effect of aqueous extracts of *Trigonell Foenum* and *Fumaria Officinalis* in type 2 diabetes induced by rich fructose diet in rats.

Methods: Diabetes was induced in male Wistar rats by feeding 21% fructose in water for 8 weeks. Treatment with 10% of aqueous extracts of *Trigonell Foenum* and *Fumaria Officinalis* was applied in separate groups of diabetic rats for another 8 weeks. On day 0, after diabetes induction and the last day of the experiment, blood samples were collected from the heart of 12-h fasted and anesthetized animals. Also after 6 h urine was collected in metabolic cage.

Results: Values for blood glucose, plasma insulin, urine glucose and urine volume were increased significantly after 8 week of high fructose feeding; the aqueous extracts of *Trigonell Foenum* diet diminish the insulin, weight and blood glucose in comparison with the high fructose-fed control group ($p < 0.05$). Results from the *Trigonell Foenum* group did not show any significant difference with those of diabetic group. Comparison between the two herbal extract showed significantly better effect of *Trigonell Foenum*.

Conclusion: The obtained results suggest that *Trigonell Foenum* extract has hypoglycemia effect in part by improve insulin resistance.

Keywords: Insulin resistance, Fructose, Rat, Diabetes, *Trigonell Foenum*, *Fumaria Officinalis*

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Poster – [A-10-465-1]

Antibacterial activity of the essential oils of aerial parts and roots of two *Salvia* species from Iran

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Introduction: *Salvia* is one of the species of the oil rich subfamily Nepetoidea (family Lamiaceae) which has been found to possess significant biological activities. Purpose: Gram (+/-) bacteria, causes