12th Iranian Congress of Biochemistry & 4th International Congress of Biochemistry and Molecular Biology, Mashhad, Iran, September 6-9 2011
Guest Editors: Seyed Mohammad, Reza Parizadeh and Majid Ghayour Mobarhan

12th ICB and 4th ICBMB (Abstracts of the 12th Iranian Congress of Biochemistry and 4th International Congress of Biochemistry and Molecular Biology, Mashhad, Iran, September 6-9, 2011)
Effect of barberry fruit (Berberis vulgaris) on serum glucose and lipids in streptozotocin-diabetic rats
Ziba Rajaei, Mousa-Al-Reza Hajzadeh, Somayeh Shafiee, Azam Alavinejad, Saeed Samarghandian
Department of Physiology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
E-mail addresses: raiaez@sums.ac.ir (Z. Rajaei), hajzadehhm@sums.ac.ir (M.-A.-R. Hajzadeh), shafiees861@sums.ac.ir (S. Shafiee), alavinejad861@sums.ac.ir (A. Alavinejad), samarghandians@sums.ac.ir (S. Samarghandian)

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 100 mg/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

doi:10.1016/j.clinbiochem.2011.08.825

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 lerrifolia Bentham (Lamiaceae), as a native plant species of South Khorasan province, has significant applications in medicine, pharmacology and food industries. In the current study, S. lerrifolia essential oil was tested for its antibacterial activity against cariogenic bacteria and then relation between antimicrobial property and plant fenology was investigated.

Method: Essential oil of plant leaves at three different phonologic stages (vegetative, flowering and seed formation) was extracted by steam distillation method and then its antibacterial activity against Streptococcus mutans (PTCC:1683), Streptococcus sanguis (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 sanguis 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. lerrifolia had significant inhibitory effect on growth of all tested bacteria. In flowering time, the plant showed more antibacterial activity than other phonologic stages and Actinomyces viscosus showed to be the most sensitive bacteria.

Keywords: Antibacterial activity, Agar dilution, Essential oil, Phenologic stages, Salvia lerrifolia, Streptococcus mutans, Streptococcus sanguis, Actinomyces viscosus

doi:10.1016/j.clinbiochem.2011.08.826

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
Fatemeh Forouzanfar, Hamide Rezae Taheri, Amir Akhshami, Behrooz Fathi, Zahra Tayari-Nagaran
Department of Basic Sciences, School of Veterinary Medicine, Ferdowsi University, Mashhad, Iran
E-mail address: dr_f_forouzanfar@yahoo.com (F. Forouzanfar)

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 (Punica granatum 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 MIT 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.
Certificate of Presentation

This is to certify that: Reyhaneh Hoshiyar Sarjani

Title of presentation: Antibacterial effect of S.avia terifolia Benth essential oil obtained in different phenologic stages against cariogenic bacteria

Held a Poster Presentation at the 12th Iranian Congress of Biochemistry & 4th International Congress of Biochemistry & Molecular Biology

Mashhad, Iran

6-9 September 2011

Dr. Majid Gholam Moharbar
Executive Secretary

Scientific Secretary

S. M. R. Parizadeh
Antibacterial effect of *Salvia leriifolia* Benth essential oil obtained in different phenologic stages against cariogenic bacteria

Reyhaneh Hoshyar Sarjami¹, Parvaneh Abrishamchi², Mehrangiz Khagekaramodini³, Javad Asili⁴, Hassan Porsa⁵, Reza Zarif⁶

1- M.Sc. Student, Faculty of Science, Ferdowsi University Of Mashhad
2- Ph.D. in Plant Physiology, Assistant Professor, Department of Biology, Faculty of Science, Ferdowsi University Of Mashhad
3- Ph.D. of Microbiology, Department of Medical Microbiology, Mashhad University of Medical Science
4- Ph.D. in Pharmacognosy, Faculty of Pharmacy, Mashhad University of Medical Science
5- M.Sc. in Agronomy, Contribution from Research Center for Plant Sciences, Ferdowsi University of Mashhad
6- M.Sc. in Microbiology, Mashhad University of Medical Science

**Introduction:** Until microbial actions essential oil 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 current study, *S. leriifolia* essential oil was tested for its antibacterial activity against cariogenic bacteria and then relation between antimicrobial property and plant fenology 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* (ATCC:1683), *Streptococcus sangius* (ATCC:1449) and *Actinomyces viscosus* (ATCC: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 12.5mg/ml against *Streptococcus mutans*, *Streptococcus sangius* and *Actinomyces viscosus*, respectively. The evaluated MICs at flowering
stages were 21, 21 and 25 mg/ml for 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 following time, the plant showed more antibacterial activity than other phenologic stages and *Actinomyces viscosus* showed the most sensitive bacteria.

**Key words**: antibacterial activity, Agar dilution, essential oil, phenologic stages, *Salvia leriifolia*, *Streptococcus mutans*, *Streptococcus sangius*, *Actinomyces viscosus*