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Theofilopoulos AN. Immune complexes in autoimmunity. In: Bona CA, Siminovitch KA, Zanetti M, Theofilopoulos AN (Eds.) *The Molecular Pathology of Autoimmune Diseases*. Harwood Academic Publishers, Switzerland 1993, pp 229-244.

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Romanian Archives of Microbiology and Immunology

IN VITRO ANTIMICROBIAL AND ANTIOXIDANT ACTIVITY OF BLACK THYME (*THYMBRA SPICATA* L.) ESSENTIAL OILS

Mehdi Saidi¹, Sobhan Ghafourian², Maryam Zarin-Abaadi¹, Khaavar Movahedi¹, Nourkhoda Sadeghifard^{2*}

¹Department of Horticultural Sciences, College of Agriculture, Ilam University, Ilam, Iran;

²Clinical Microbiology Research Center, Ilam University of Medical Sciences, Ilam, Iran

ABSTRACT

In order to study antimicrobial effects of essential oils of Wild Thyme (*Thymbra spicata* L.) on two Gram positive bacteria (*Streptococcus agalactiae* RJTTC1978 and *Staphylococcus aureus* RJTTC1885) and two Gram negative bacteria (*Escherichia coli* RJTTC2409 and *Klebsiella pneumoniae* RJTTC1097), the research carried out with five concentrations (0.2, 2, 4, 10 and 20 μ l) using disk diffusion and microbroth dilution (to determine MIC and MBC) methods at Ilam University during 2010. Tetracycline and Gentamicin discs were used as control. Chemical composition of the EOs was analyzed by GC-MS. Antioxidant activity of the essential oils (EOs) was measured following DPPH assay. Results showed that Carvacrol (60.36%), γ -Terpinene (15.09%), β -Myrcene (2.15%), *trans*-Caryophyllene (1.78 %) and α -Thujene (1.54%) were the main components of the oils. Evaluation of antimicrobial activity revealed that the oils were active against both Gram positive and Gram negative bacteria. However, the biggest growth inhibitory zone (33.34 ± 0.5 mm) was recorded on *Streptococcus agalactiae* at 20 μ l/ml concentration. The lowest MIC (3.12 μ l/ml) observed for *Klebsiella pneumoniae* and *Streptococcus agalactiae*, while minimum MBC (6.25 μ l/ml) recorded on *Klebsiella pneumoniae*. Radical-scavenging ability of the EOs and BHT ranged from 9.93 ± 2.57 to 77.81 ± 1.3 % and 80.48 ± 0.56 to 10.66 ± 1.11 %, respectively. The inhibiting effect of *Thymbra* oils was stronger than the synthetic BHT, particularly at lower concentrations, as IC₅₀ concentration of EOs for the reduction of DPPH radicals was 1.28 μ l/ml which was lower than IC₅₀ calculated for BHT (1.31 μ l/ml). The total phenolic content, determined according to the Folin-Ciocalteu method, was 1.52 ± 0.15 mg PyE/ml EOs.

Keywords: black thyme, *Thymbra spicata*, antioxidant, essential oils, antimicrobial, total phenolics, disk diffusion, microbroth dilution

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*Corresponding author: Nourkhoda Sadeghifard, E-mail: sadeghifard@gmail.com

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IN VITRO ANTIMICROBIAL ACTIVITY OF PERSIAN SHALLOT (*ALLIUM HIRTIFOLIUM*)

Setareh Soroush^{1,2}, Morovat Taherikalani^{2*}, Parisa Asadollahi², Khairollah Asadollahi⁴,
Mojtaba Taran⁵, Mohammad Emameini¹, Sajjad Alizadeh³

¹Department of Microbiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran;

²Department of Microbiology, School of Medicine, Ilam University of Medical Sciences, Ilam, Iran;

³Student Research Committee, Ilam University of Medical Sciences, Ilam, Iran;

⁴Department of Epidemiology, School of Medicine, Ilam University of Medical Sciences, Ilam, Iran;

⁵Department of Biology, School of Sciences, Razi University, Kermanshah, Iran.

ABSTRACT

Allium hirtifolium is a Persian native plant grown in cool mountain slopes of Iran. It has been used as a spice in Iran for many years. According to the literature review, there are no considerable reports on the antimicrobial properties of this plant. In this study, the antimicrobial activity of Persian shallot hydroalcoholic extract and F1 fraction of the plant (containing amino acid derivatives and/or other cationic compounds) was investigated on some Gram positive cocci and bacilli, Gram negative bacilli, two protozoa, a yeast and a fungus. Excellent activity against *Candida albicans* (MIC = 64 µg/ml, MBC = 128 µg/ml), *Leishmania infantum* (MIC = 0.2 mg/ml on the first day of study) and *Trichomonas vaginalis* (MIC = 5 µg/ml in PSDE form) and a moderate activity against *Bacillus spp* and *Pseudomonas aeruginosa* (MIC = 128 µg/ml) was observed. The results showed that this plant contains some anti-trichomonas and anti-leishmania components.

Keywords: *Allium hirtifolium*, Persian shallot, antimicrobial activity

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*Corresponding author: Dr. Morovat Taherikalani (PhD), Assistant Professor in Medical Microbiology, Ilam University of Medical Science, School of Medicine, Department of Microbiology, Banganjab, Ilam, I.R. of Iran. Zip code: 69391-77143; Tel: +98-841-223-5747; Fax: +98-841-222-7136; E-mail: taherikalani@gmail.com

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ANTIBIOTIC RESISTANCE PROFILES OF *ACINETOBACTER* SP. STRAINS ISOLATED FROM INTENSIVE-CARE UNIT PATIENTS

Elvira Borcan¹, Camelia Ghiță¹, Mariana Carmen Chifiriuc^{2*}, Veronica Lazăr²

¹Bacteriology Laboratory, Fundeni Clinical Institute, Sos. Fundeni 258, Bucharest, Romania; ²University of Bucharest, Faculty of Biology, Microbiology Immunology Department, Aleea Portocalelor, 1-5, Bucharest, Romania

ABSTRACT

Multidrug resistance and the increasing number of severe infections caused by *Acinetobacter* sp. strains are a major issue for intensive care units (ICUs), where patients with severe diseases and often destabilized physiological condition are admitted. The **aim** of this study was to investigate the antibiotic resistance profiles of 200 *Acinetobacter* spp. isolated from tracheal aspirates in patients admitted to ICU, Fundeni Clinical Institute (FCI). **Methods:** the samples were collected from intubated patients between January 2006-December 2007. The microbial strains were identified with the help of the *BD Phoenix* system. The investigation of the antibiotic resistance patterns was performed by agar disk diffusion method according to CLSI recommendations, and the production of metallo-beta-lactamases (MBL) was confirmed by MBL E-test. **Results:** the majority of the studied strains (80%) were multidrug resistant with a high percentage of panresistance (32%). Metallo-beta-lactamases production among the strains with resistance to imipenem was high (over 83%), these strains being also resistant to the majority of the other tested antibiotics with the exception of colistin. **Conclusions:** Our results confirmed that the multidrug resistance is the major threat of *Acinetobacter* sp. infections, especially when they occur in high risk patients.

Keywords: *Acinetobacter* sp., intubated patients, multidrug resistance, metallo-beta-lactamases

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*Corresponding author: Mariana-Carmen Chifiriuc, e-mail: carmen_balotescu@yahoo.com.

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CHARACTERIZATION OF *KLEBSIELLA PNEUMONIAE* STRAINS PRODUCING EXTENDED SPECTRUM β -LACTAMASES AND AMPC TYPE β -LACTAMASES ISOLATED FROM HOSPITALIZED PATIENTS IN KERMAN, IRAN

Shahla Mansouri¹, Davood Kalantar², Parisa Asadollahi³, Morovat Taherikalani³, Mohammad Emaneini^{2*}

¹Department of Microbiology, School of Medicine, Kerman University of Medical Sciences. Kerman, Iran;

²Department of Microbiology, School of Medicine, Tehran University of Medical Sciences. Tehran, Iran;

³Department of Microbiology, School of Medicine, Ilam University of Medical Sciences. Ilam, Iran

ABSTRACT

Klebsiella pneumoniae is a major cause of nosocomial infections. Emergence of antibacterial resistance and production of β -lactamases are responsible for the frequently observed empirical therapy failures. The aim of this study was to determine the presence and the prevalence of extended spectrum β -lactamases (ESBLs) and AmpC β -lactamases in clinical isolates of *K. pneumoniae* in Kerman, Iran. Resistance to different antibiotics was determined using standard disk diffusion method. The β -lactamases phenotypes were determined by combined disk method. Polymerase chain reaction (PCR) was used to determine *bla*_{CTX-M} and *bla*_{CMY} genes in the ESBLs and AmpC positive isolates. Out of the 75 *K. pneumoniae* isolates, 31 (41.3%) produced ESBLs, 11 (14.6%) produced AmpC β -lactamases and 1 (1.3%) was resistant to imipenem, probably by the production of a metallo β lactamase in the phenotypic assay. Simultaneous production of ESBLs and AmpC β -lactamases as well as the concomitant presence of *bla*_{CTX-M} and *bla*_{CMY} genes was detected in one isolate. Prevalence of *bla*_{CTX-M} and *bla*_{CMY} among isolates were 20% and 2.6%, respectively. β -lactam therapy can fail when β -lactamase- hyper-producing organisms appear in an infection. The occurrence of isolates co-expressing many types of β -lactamases can cause serious problems, regarding the treatment of infections caused by these pathogens.

Keywords: ESBLs, AmpC- β -lactamases, imipenem resistance, *Klebsiella pneumoniae*

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*Corresponding author: Mohammad Emaneini; E-mail: emaneini@tums.ac.ir; Tel/Fax: 098- 021- 8895- 5810; Department of Microbiology, School of Medicine, Tehran University of Medical Sciences; 100 Poursina St., Keshavarz Blvd., Tehran, Iran

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BLOODSTREAM INFECTIONS IN IMMUNOCOMPROMISED HOSTS

Raluca Papagheorghe*

Central Laboratory Department of Microbiology Clinical Hospital Colțea, Bucharest, Romania

ABSTRACT

Immunocompromised hosts are at high risk for bloodstream infections (BSIs); the outcome is unpredictable (even with adequate therapy), frequently severe (mortality 27%).

A 26 months survey in a haematology/oncology hospital was set-up; it comprised 158 patients and detected 171 positive blood cultures. The origin of the infections was primitive in 27.22% and secondary in 72.78% of the cases; the most frequent cause was the presence of a vascular catheter (23.41%). The second most important cause were the respiratory infections (19.62%), followed by the urinary tract infections (UTIs) (11.39%). Gram negative bacilli represented 59.4%, the enterobacteriaceae were predominant (35.59%), followed by *Pseudomonas aeruginosa* (10.73%) and species like *Serratia marcescens* and *Acinetobacter baumannii*. Although isolated at low level, they worry by an increasing frequency. Among Gram positive cocci (43.51%) coagulase negative staphylococci (CoNS) were the most frequent (25.42%), followed by *Staphylococcus aureus* (18.08%); *Enterococcus faecalis* (5.65%) was isolated from polymicrobial (associated) infections.

The strains of *E. coli*, *K. pneumoniae* and *P. aeruginosa* were constantly susceptible to carbapenems, demonstrating otherwise various susceptibility patterns, generally elevated to the antibiotics we tested. The production of extended spectrum betalactamase (ESBL) was 22.58%. The methicillin resistance was 54.4% in *S. aureus* strains; the susceptibility was variable among 7 other antibiotics tested. One *Staphylococcus* strain had reduced susceptibility to vancomycin.

A multidisciplinary survey is necessary for the control of the multidrug resistant organisms (MDRO).

Keywords: Bloodstream infections, immunocompromised hosts, multidrug resistant strains

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*Corresponding author: Raluca Papagheorghe MD, r.papagheorghe@yahoo.com

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IMMUNOLOGICAL MANIFESTATIONS IN TYPE I DIABETIC CHILDREN

**Andreea Liana Răchișan¹, Bianca Andreea David², Simona Căinap¹,
Nicolae Miu¹, Mariana Andreica¹, Gabriel Samașca^{3*}**

¹Department of Pediatrics II; ²Student at Faculty of Medicine;

³Department of Immunology, University of Medicine and Pharmacy "Iuliu Hațieganu" Cluj-Napoca, Romania

ABSTRACT

In the past decade a number of studies suggested that type 1 diabetes mellitus is an oxidative stress influenced disease. Paraoxonase 1 enzyme plays a crucial role in antiatherogenic-antioxidant circle. The aim of our study was to examine the possible differences in paraoxonase 1 enzymatic activities in diabetic children associated other autoimmune diseases versus a control group. Another objective of the study was to determine if there is any difference according to the gender in paraoxonase 1 activities (arylesterase and paraoxonase activities). Paraoxonase 1 activities were determined in 51 diabetic children and 36 healthy controls. In diabetic children we determined also the C-peptide level. The paraoxonase 1 arylesterase activity was lower in diabetic females compared with diabetic males. The level of C-peptide is in an inverse correlation with the years of the disease. The paraoxonase activities have a correlation with the level of insulin antibodies in type I diabetic children. Our data suggest that paraoxonase enzymatic pattern may be different in these two activities. PON1 arylesterase activity may exhibit a tendency to low levels in women in comparison to men. The C-peptide level is a valuable tool in assessing the restant β cell function.

Keywords: diabetes, paraoxonase 1, C-peptide, β cell

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*Corresponding author: Dr. Samașca Gabriel, "Iuliu-Hațieganu" University of Medicine and Pharmacy, Pediatric Clinic II, Str. Crișan 3-5, CP 400177, Cluj-Napoca, Romania; email: Gabriel.Samasca@umfcluj.ro.

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IMPACT OF THE MOLECULAR DIAGNOSIS ON THE MANAGEMENT OF PATIENTS WITH ASEPTIC MENINGITIS

Anda Băicuș^{1,2*} and Ruxandra Cardaș²

¹*Cantacuzino NIRDMI, Bucharest, Romania*

²*Carol Davila University of Medicine and Pharmacy, Bucharest, Romania*

ABSTRACT

Between 2007-2008, epidemic episodes of aseptic meningitis occurred in Romania. Most important strains isolated were Echoviruses. A commercial kit for rapid molecular detection of aetiological agents of aseptic meningitis was tested. The introduction of the molecular tests in clinical use is important by the efficient decision-making concerning the treatment.

Keywords: aseptic meningitis, Echoviruses, molecular detection

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*Corresponding author: Anda Băicuș, email: abaicus@cantacuzino.ro