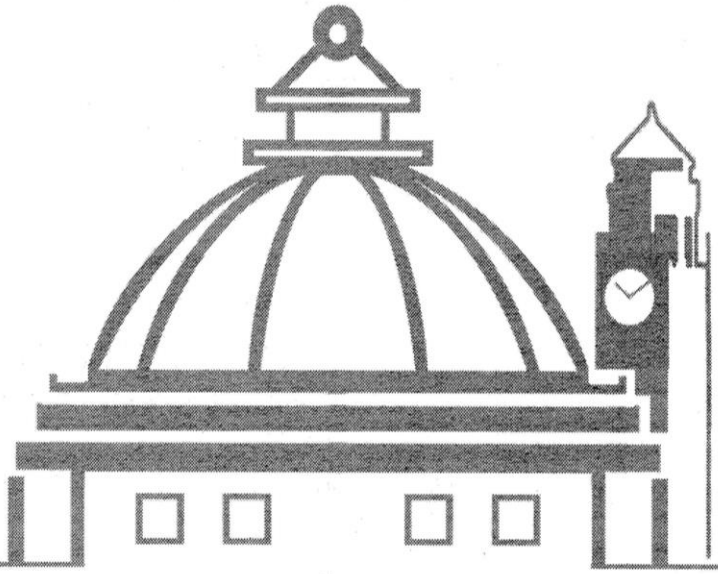


International Publications Awards

Cairo University

Issue VII

October - 2010

Dear colleagues,

We are pleased to introduce the seventh issue of the international publications of Cairo University. It is a further step and distinct contribution, reflecting the scientific ability of staff members, which conforms to international quality standards.

The purpose of issuing these publications is mainly to introduce this work to the academic community, demonstrate the different research abilities of Cairo University researchers, and encourage them to increase the quality and quantity of their research.

We would like to assure you that the administration will spare no effort to support and reinforce these goals.

We congratulate all colleagues who were granted the awards for their international publications of the year 2009 and wish them all the best for their future endeavors.

Lastly, the top 50 eminent authors of Cairo University were tabulated in front of this issue. Their ranking was extracted from both Scopus and Thomson databases according to their number of published articles, number of citations and h-index.

We are also pleased to inform you that this policy will continue to be in effect for the years to come.

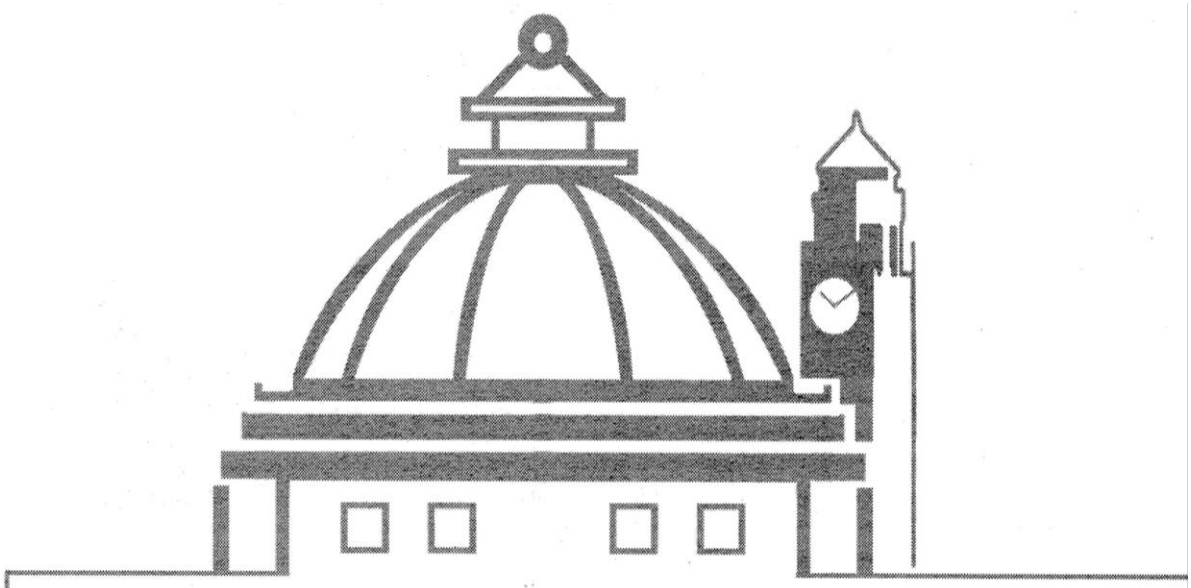
Prof. Hussein M. Khaled

Vice - President for post-graduate studies and research
Cairo university

Prof. Hossam Kamel

President
Cairo university

Table of Contents



Statistical Data

Statistical Data

List of top 10 authors according to the number of publications
(Year 2009)

No	Name	Faculty	No. of Pub.
1	Hany Abdel-Aziz El Shemi	Agriculture	15
2	Tarek Mophamed Abbas	Science	15
3	Ahmed Mohamed Soliman	Engineering	13
4	Abdel-Aty Mustafa Abdel-Aty	Veterinary Medicine	11
5	Abdul Rahman Nabawy Zekri	National Cancer Institute	10
6	Olfat Jamil Ahmed Shaker	Medicine	9
7	Timor Mustafa Ibrahim	Medicine	9
8	Yahya Ahmed Mustafa	Oral and Dental Medicine	9
9	Gamal El Din Esmat	Medicine	9
10	Hisham Jaber Abdel Wahab El Anani	Medicine	8
11	Camellia Mahmoud Osman Ahmed	Veterinary Medicine	8

Statistical Data

List of top 10 authors according to the sum of their impact factor
(Year 2009)

No	Name	Faculty	Sum If
1	Hany Abdel-Aziz El Shemi	Agriculture	37.574
2	Timor Mustafa Ibrahim	Medicine	25.583
3	Mustafa Abdel-Aty Abdel-Aty	Veterinary Medicine	22.927
4	Hisham Jaber Abdel Wahab El Anani	Medicine	22.693
5	Olfat Jamil Ahmed Shaker	Medicine	19.624
6	Abdul Rahman Nabawy Zekri	National Cancer Institute	19.32
7	Mohamed Ali Farag	Pharmacy	18.021
8	Nasser H. Swalam	Science	18.952
8	Osama Kamal Shower	Medicine	16.179
9	Magdy Amin	Pharmacy	13.254
10	Nada Farooq Ahmed Atta	Science	12.656

Statistical Data

List of top 10 authors according to highest single impact factor
(Year 2009)

No	Name	Faculty	Max. If
1	Heba Allah Mohamed Nabil Abdel-Razek	Medicine	10.432
2	Mohamed Sabry Youssef	Science	9.38
3	Magdy Abdel-Aty-Eltaweel	Engineering	8.479
4	Nasser H. Swalam	Science	8.479
5	Nadia Aly Easa	Medicine	8.266
6	Ahmed Mohamed Sobhy Abd El Aziz	Medicine	6.512
7	Essam Mohamed Abdel Muti Darwish	Agriculture	6.493
8	Marwa J. Kamel Bayoumi	National Cancer Institute	6.325
9	Mohamed Ali Farag	Pharmacy	6.11
10	Hany Abdel-Aziz El Shemi	Agriculture	6.11
11	Rehab Mohamed Hassan Amin	Institute of Laser National Enhanced Sciences	6.093

Statistical Data

List of faculties with highest score of impact factor
(Year 2009)

Faculty	Count	%	TOT IF	%	Avg.	Min	Max
Science	242	26.98	326.993	27.98	1.3512	0.1	9.38
Medicine	154	17.17	294.127	25.17	1.9099	0.7	10.4
Engineering	140	15.61	131.234	11.23	0.9374	0.06	8.48
Pharmacy	105	11.71	162.984	13.95	1.5522	0.1	6.11
Agriculture	83	9.25	79.578	6.81	0.9588	0.33	6.49
Veterinary Medicine	50	5.57	61.8	5.29	1.236	0.56	3.21
National Cancer Institute	26	2.90	51.848	4.44	1.9942	0.65	6.11
National Institute of Laser Enhanced Sciences	21	2.34	32.461	2.78	1.5458	0.777	6.09
Medicine Oral and Dental	15	1.67	11.192	0.96	0.7461	1.09	2.727
Arts	15	1.67	0			0	0
Computer	11	1.23	12.102	1.04	1.1002	0.42	2.6
Political Science Economics and	9	1.00	0		0	0	0
Statistical Studies and Research Institute	7	0.78	0			0	0
Archaeology	7	0.78	4.276	0.37	0.6109	2.505	2.505
Nursing	4	0.45	0			0	0
Educational Studies	4	0.45	0		0	0	0
Commerce	4	0.45	0		0	0	0
Total	**897**	**100**	**1168.6**	**100**			

List of number of publications

(2006-2009)

Faculty	2006	2007	2008	2009	Total
Science	142	162	241	242	**787**
Medicine	49	64	124	154	**391**
Engineering	56	79	109	140	**384**
Pharmacy	27	40	77	104	**248**
Agriculture	8	14	35	83	**140**
Veterinary Medicine	11	20	47	53	**131**
National Cancer Institute	9	16	16	27	**68**
National Institute of Laser Enhanced Sciences	13	11	9	21	**54**
Economics and Political Science	13	14	13	8	**48**
Arts	7	7	17	15	**46**
Statistical Studies and Research Institute	8	6	11	7	**32**
Archaeology	1	2	5	16	**24**
Computers and Information	2	3	4	11	**20**
Oral and Dental Medicine			1	15	**16**
Commerce	4	2	1	4	**11**
Nursing			1	4	**5**
African Research and Studies Institute		1	2		**3**
Mass Communication			1		**1**
Dar Al-Oloum	1				**1**
Total	**351**	**441**	**814**	**926**	**2432**

Top 50 authors of Cairo University

(According to no. of publications)

No. of Pub	Author Name	Affiliation
440	Ahmed A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
296	Ahmed M. Soliman	Dept. of Electronics and Communication Engineering
183	Yousry M. Issa	Dept. of Chemistry
167	Hazem Ali Attia	Faculty of Engineering, Electrical Power and Machines Department
163	Olfat El Sibai	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
159	Said S E H Elnashaie	Dept. of Chemical Engineering
141	Ali A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
128	Ahmed Mohamed Galal	Dept. of Chemistry
126	Ahmed A M Moala	Faculty of Agriculture, Dept. of Physics
120	Waheed A. Badawy	Dept. of Chemistry
114	Ahmad S A S Shawali	Dept. of Chemistry
114	Hesham G. Al-Inany	Dept. of Obstetrics and Gynecology
114	Said R. Grace	Faculty of Engineering, Dept. of Engineering Mathematics
112	Mohamed Hilmy Elnagdi	Dept. of Chemistry
111	Badr G. Ateya	Faculty of Science
105	Mohamed Fahim Hassan	Pennsylvania State University
104	Ahmed A E Kassem	Faculty of Pharmacy,
95	Essam Eldin Khalil	Faculty of Engineering
94	Yasser M. Kadah	Faculty of Engineering, Dept. of Biomedical Engineering
91	Ismail A Ismail A Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
89	Mohamed Mahmoud Abdel-Kader	Dept. of Physics
88	Mohammed M A Amer	Faculty of Pharmacy, Dept. of Analytical Chemistry
86	Abdou Osman Abdelhamid	Dept. of Chemistry
82	Mohamed El-Nadi	Dept. of Physics
81	Abd El-Aty, A. M.	Faculty of Veterinary Medicine, Dept. of Pharmacology
81	Mohammed Talaat Abdel Aziz	Dept. of Medical Biochemistry
79	Amir F. Atiya	Faculty of Engineering, Dept. of Computer Engineering
78	Issa M. Issa	Faculty of Science, Dept. of Chemistry
77	Mohamed Mohamed Shoukry	University of Erlangen-Nuremberg, Institute of Inorganic Chemistry
77	Abdou Bakr Mohamed	Faculty of Engineering, Systems Dept.

No. of Pub	Author Name	Affiliation
	Youssef	
77	Ahmed A W Soliman	Dept. of Chemistry
75	Amr Amin Adly	Faculty of Engineering, Electrical Power and Machines Department
74	Mohamed Mamdouh Abdel Aziz	Faculty of Engineering, Electrical Power and Machines Department
74	Ali H. Mortada	Kasr El-Aini School of Medicine, Department of Ophthalmology
72	Rashika R. El Ridi	Faculty of Science, Dept. of Zoology
71	Mohamed S. Karawya	Faculty of Pharmacy, Pharmacognosy Department
69	Mohamed T. Khayyal	Faculty of Pharmacy, Dept. of Pharmacology
69	Ibrahim A. Ammar	Dept. of Chemistry
68	Mohamed A. Zayed	Dept. of Chemistry
68	Magdy W. Sabaa	Dept. of Chemistry
65	Mokhtar O Abbas	Faculty of Engineering, Dept. of Mechanical Design and Production
62	Kamal Mohammed Dawood	Dept. of Chemistry
61	Hussien M Khaled	National Cancer Institute
61	Mohamed Abdel Harith	Natl. Inst. of Laser Enhanced Sci.
61	Taymour Mostafa	Kasr El-Aini School of Medicine, Faculty of Medicine
59	Mohamed Shaarawy	Kasr El-Aini School of Medicine, Dept. of Obstetrics and Gynecology
59	Khaled M. Ismail	Faculty of Engineering, Department of Electronics
58	Fouad A S Soliman	Faculty of Engineering
58	Mohamed Shaarawy	Kasr El-Aini School of Medicine, Dept. of Obstetrics and Gynecology
57	Gehad Genidy Mohamed	Dept. of Chemistry
56	Rany M. Shamloul	Dept. of Andrology
56	Maher Zaki Elsabee	Dept. of Chemistry
56	Ahmad M. Farag	Dept. of Chemistry
54	Rashad S. Barsoum	Cairo Kidney Center

Top 50 authors of Cairo University
(According to total no. of citations)

Tot. Citation	Author Name	Affiliation
1380	Ahmed A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
1087	Ahmed Mohamed Galal	Dept. of Chemistry
1059	Ahmed M. Soliman	Dept. of Electronics and Communication Engineering
979	Amir F. Atiya	Faculty of Engineering, Dept. of Computer Engineering
830	Yousry M. Issa	Dept. of Chemistry
790	Badr G. Ateya	Faculty of Science
758	Hesham G. Al-Inany	Dept. of Obstetrics and Gynecology
675	Ahmed A W Soliman	Dept. of Chemistry
662	Waheed A. Badawy	Dept. of Chemistry
599	Rabab M Gaafar	National Cancer Institute
577	Khaled M. Ismail	Faculty of Engineering, Department of Electronics
543	Said S E H Elnashaie	Dept. of Chemical Engineering
521	Hussien M Khaled	National Cancer Institute
520	Mohamed Shaarawy	Kasr El-Aini School of Medicine, Dept. of Obstetrics and Gynecology
465	Mohamed Saada El-Deab	Faculty of Science, Dept. of Chemistry
456	Rashad S. Barsoum	Cairo Kidney Center
441	Mohamed Hilmy Elnagdi	Dept. of Chemistry
439	Yasser M. Kadah	Faculty of Engineering, Dept. of Biomedical Engineering
433	Olfat El Sibai	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
421	ElBatt, Tamer A.	Faculty of Engineering, Dept. of Engineering Computer Mathematics
420	Gehad Genidy Mohamed	Dept. of Chemistry
403	Ahmad S A S Shawali	Dept. of Chemistry
397	Mohamed Salem Rizk	Dept. of Chemistry
387	Ahmed A M Moala	Faculty of Agriculture, Dept. of Physics
381	Gamal Esmat	Medicine
٣٧٥	Kamal Mohammed Dawood	Dept. of Chemistry
369	Ayman Wahba Erian	Faculty of Science, Dept. of Chemistry
352	Mohamed T. Khayyal	Faculty of Pharmacy, Dept. of Pharmacology
329	Nadia Mokhtar	National Cancer Institute
311	Mohamed Mohamed Shoukry	University of Erlangen-Nuremberg, Institute of Inorganic Chemistry

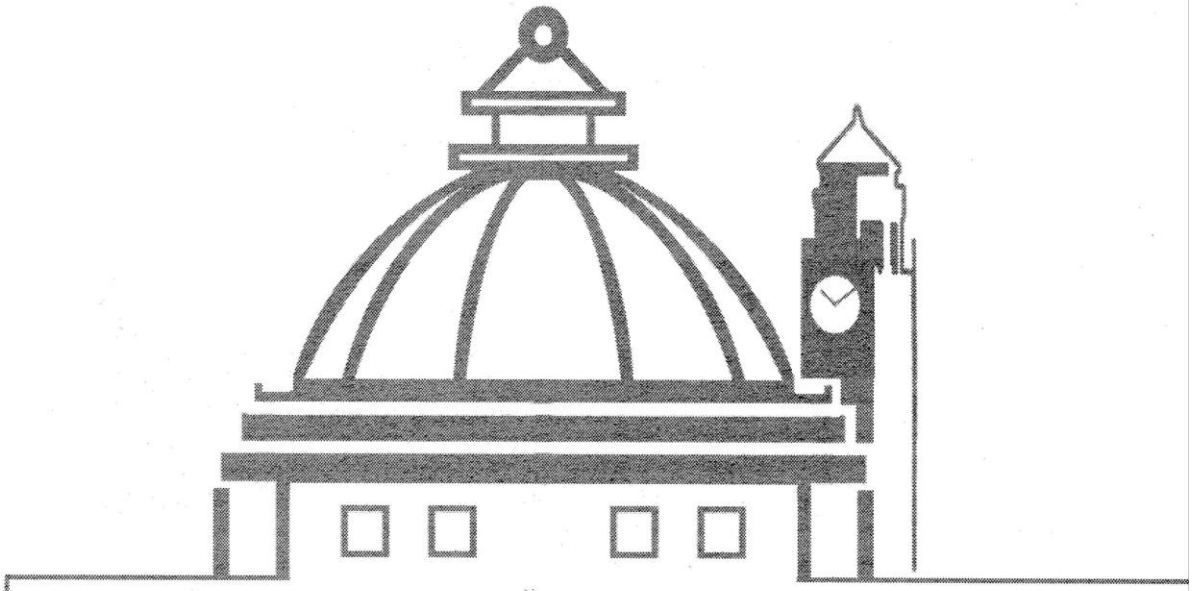
Tot. Citation	Author Name	Affiliation
303	Abd El-Aty, A. M.	Faculty of Veterinary Medicine, Dept. of Pharmacology
294	Said H. Hilal	Faculty of Pharmacy
291	Rany M. Shamloul	Dept. of Andrology
290	A. A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
287	Maher Zaki Elsabee	Dept. of Chemistry
282	Rashika R. El Ridi	Faculty of Science, Dept. of Zoology
282	Said R. Grace	Faculty of Engineering, Dept. of Engineering Mathematics
273	Mohamed Fahim Hassan	Pennsylvania State University
272	Amr Amin Adly	Faculty of Engineering, Electrical Power and Machines Department
265	Hazem Ali Attia	Faculty of Engineering, Electrical Power and Machines Department
257	Zekri, Abdel Rahman	National Cancer Institute
257	Magdy W. Sabaa	Dept. of Chemistry
250	Samy A. Madbouly	Dept. of Chemistry
239	Ali A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
236	Mohamed Abdel Harith	Natl. Inst. of Laser Enhanced Sci.
231	Mohamed Mamdouh Abdel Aziz	Faculty of Engineering, Electrical Power and Machines Department
226	Sherif Mourad Sherif	National Research Council Canada, Institute for Microstructural Sciences
220	A. H M Elwahy	Dept. of Chemistry
218	Mohamed A. Zayed	Dept. of Chemistry
213	Samir I. Shaheen	Faculty of Engineering, Dept. of Computer Engineering
207	Ibrahim A. Ammar	Dept. of Chemistry
203	Mohammed M A Amer	Faculty of Pharmacy, Dept. of Analytical Chemistry
198	Ahmad M. Farag	Dept. of Chemistry
196	Taymour Mostafa	Kasr El-Aini School of Medicine, Faculty of Medicine
191	Mohamed Salem Rizk	Dept. of Chemistry
191	Gamal R. Saad	Dept. of Chemistry
187	El- Tawil, Magdy	Faculty of Engineering, Dept. of Engineering Mathematics
185	M. W. Khalil	Faculty of Science, Dept. of Chemistry
177	Abdou Osman Abdelhamid	Dept. of Chemistry
175	Hala G. El-Shobaky	Faculty of Science, Dept. of Chemistry
173	Ahmed A E Kassem	Faculty of Pharmacy,

Top 50 authors of Cairo University

(According to h-index)

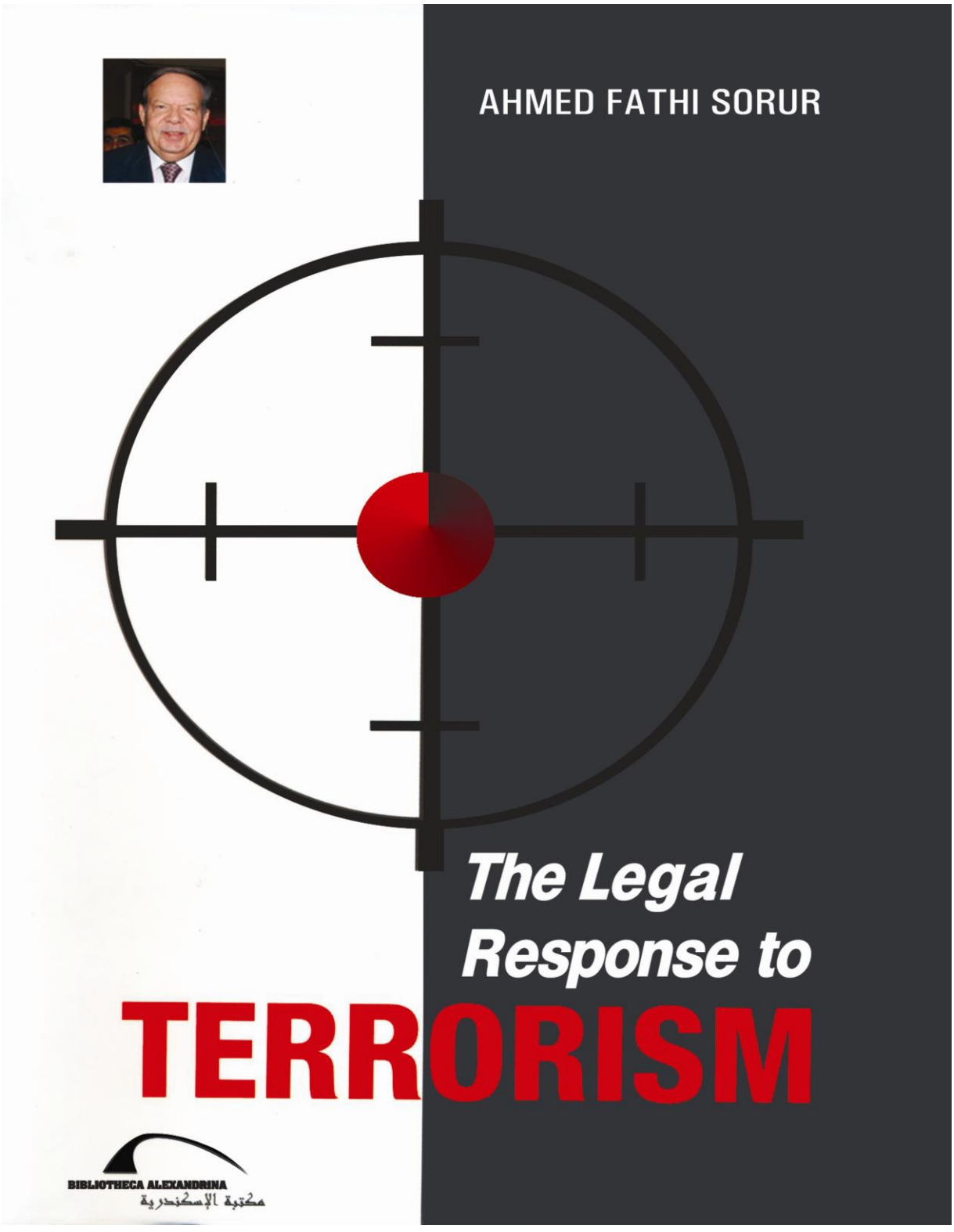
h-index	Author Name	Affiliation
19	Ahmed M. Soliman	Dept. of Electronics and Communication Engineering
17	Ahmed A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
17	Ahmed Mohamed Galal	Dept. of Chemistry
16	Hesham G. Al-Inany	Dept. of Obstetrics and Gynecology
١٦	Kamal Mohammed Dawood	Dept. of Chemistry
16	Mohamed Saada El-Deab	Faculty of Science, Dept. of Chemistry
16	Gehad Genidy Mohamed	Dept. of Chemistry
15	Ahmed A W Soliman	Dept. of Chemistry
15	Mohamed Hilmy Elnagdi	Dept. of Chemistry
14	Khaled M. Ismail	Faculty of Engineering, Department of Electronics
13	Hussien M Khaled	National Cancer Institute
13	Waheed A. Badawy	Dept. of Chemistry
13	Yousry M. Issa	Dept. of Chemistry
13	Badr G. Ateya	Faculty of Science
13	Mohamed Shaarawy	Kasr El-Aini School of Medicine, Dept. of Obstetrics and Gynecology
13	Said S E H Elnashaie	Dept. of Chemical Engineering
13	Fawzy A. Attaby	Dept. of Chemistry
12	Ahmad M. Farag	Dept. of Chemistry
12	Olfat El Sibai	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
12	Ahmad S A S Shawali	Dept. of Chemistry
12	Magdy W. Sabaa	Dept. of Chemistry
12	Amir F. Atiya	Faculty of Engineering, Dept. of Computer Engineering
12	Nadia Ahmed Mohamed	Dept. of Chemistry
12	Samy A. Madbouly	Dept. of Chemistry
11	Mohamed Mohamed Shoukry	University of Erlangen-Nuremberg, Institute of Inorganic Chemistry
11	Abd El-Aty, A. M.	Faculty of Veterinary Medicine, Dept. of Pharmacology
11	Rashika R. El Ridi	Faculty of Science, Dept. of Zoology
11	Hazem Ali Attia	Faculty of Engineering, Electrical Power and Machines Department
10	Barsoum N. Barsoum	Faculty of Science, Dept. of Chemistry
10	Zekri, Abdel Rahman	National Cancer Institute
10	Rashad S. Barsoum	Cairo Kidney Center

h-index	Author Name	Affiliation
10	Ahmed A M Moala	Faculty of Agriculture, Dept. of Physics
10	Youssef F. Rashed	Dept. of Structural Engineering
10	Rany M. Shamloul	Dept. of Andrology
10	Rabab M Gaafar	National Cancer Institute
10	A. H M Elwahy	Dept. of Chemistry
10	Hala G. El-Shobaky	Faculty of Science, Dept. of Chemistry
9	Gamal Esmat	Medicine
9	Gamal R. Saad	Dept. of Chemistry
9	Mohamed Abdel Harith	Natl. Inst. of Laser Enhanced Sci.
9	Ali A. Shafik	Kasr El-Aini School of Medicine, Dept. of Surgery and Experimental Research
9	Yasser M. Kadah	Faculty of Engineering, Dept. of Biomedical Engineering
9	Taymour Mostafa	Kasr El-Aini School of Medicine, Faculty of Medicine
9	Mohamed Mamdouh Abdel Aziz	Faculty of Engineering, Electrical Power and Machines Department
9	Ashraf A. Abbas	Dept. of Chemistry
8	Ahmady A A Yassin	Dept. of Chemistry
8	Fathy Mohamed Abdelrazek	Dept. of Chemistry
8	Nadia Mokhtar	National Cancer Institute
8	Said R. Grace	Faculty of Engineering, Dept. of Engineering Mathematics
8	Soliman A. Mahmoud	German University in Cairo, Dept. of Electrical and Electronic Engineering
8	Mohamed A. Zayed	Dept. of Chemistry
8	El- Tawil, Magdy	Faculty of Engineering, Dept. of Engineering Mathematics
8	Abdou Osman Abdelhamid	Dept. of Chemistry
8	Mohamed T. Khayyal	Faculty of Pharmacy, Dept. of Pharmacology
8	Shaker, Olfat Gameel	Kasr El-Aini School of Medicine, Dept. of Medical Biochemistry
8	Said H. Hilal	Faculty of Pharmacy
7	Maher Zaki Elsabee	Dept. of Chemistry
7	Mohamed Fahim Hassan	Pennsylvania State University
7	Amr Amin Adly	Faculty of Engineering, Electrical Power and Machines Department
7	Hassaneen, Hamdy M E	Dept. of Chemistry
7	Mohamed Salem Rizk	Dept. of Chemistry
7	ElBatt, Tamer A.	Faculty of Engineering, Dept. of Engineering Computer Mathematics
7	Mohamed El-Nadi	Dept. of Physics



Humanity and Social Sciences Sector

Faculty of Low


AHMED FATHI SORUR
The Legal Response to
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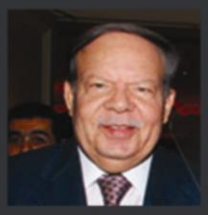
AHMED FATHI SORUR

The Legal Response to TERRORISM



Ahmed Fathi Sorour
Professor of Criminal Law, Cairo University

Dr. Ahmed Fathi Sorour has been President of the Egyptian People's Assembly since 1990

He was the Egyptian Minister of Education from 1986 to 1990. During his tenor as Minister of Education, he drafted the strategy of education modernization approved By the National Conference on Education in 1987; established inter alia advanced Technology institutions, polytechnic institutions, industrial schools, and professional Schools and he also developed the Egyptian Faculties of Engineering in collaboration With the word bank.

Dr. Sorour was the dean of the faculty of low, Cairo university 1983-1985 .He was Vice-President and Member of the Executive Board of UNESCO, 1989-1993; and Permanent Representative of the Arab League to UNESCO, 1972-1978. During his tenor at the UNESCO, he succeeded in introducing Arabic as an official language in the UNESCO and contributed to establishing UNESCO regional offices in Arab.-countries. When he was Minister of Education, he collaborated with the UNESCO in establishing the Bibliotheca Alexandrina.

Dr. Sorour was President of the Inter-Parliamentary Union, 1994-1997, and President of the Arab Parliamentary Union, 1998-2000; and in addition to numerous important national and international posts.

He published almost 30 books; most of them on Penal and Criminal Procedure Law, in addition to more than 100 researches and articles in refereed magazines. Some of his main books are Challenges of a New World, 2010; Constitutional Criminal Law, 2004; Parliamentary Diplomacy and International Cooperation, 1997 (published. in Arabic English and French); Constitutional Legitimacy and Human Rights in Criminal Procedures, 1995; Legality and .Criminal Procedures, 1977; and the Nullity theory in Criminal Procedural Law, PhD Thesis, 1959.

ISBN 978-977-452-087-7

Faculty of Economics and Political Science

International Publications Awards

Cairo University

Moments of Order Statistics of the Generalized Gamma Distribution: A Computational Approach

Wafik Y. Younan[a] and Kamal S. Selim[b]

[a] Department of Economics, The American University in Cairo, Cairo, Egypt
[b] Dept. Computer Applications in Social Sciences, Economics and Political Science, Cairo University

Abstract

This paper gives the derivation of moments of the generalized gamma order statistics. A computational approach is introduced for computing these moments. The main idea basically relies on the expansion of the distribution function of the generalized gamma distribution as an infinite series raised to a positive integer. Moments obtained by Gupta [3] and Breiter and Krishnaiah [1] are easily obtained as special cases. Short tables of moments are given for some values of the parameters of the generalized gamma distribution. Computations are performed on a Pentium 4 processor under Windows 2000 operating system.

Keywords: Generalized gamma distribution; Moments of order statistics.

Published in: Far East Journal of Theoretical Statistics

***ISSN*:** (0972-0863) ***IF*:** (0) ***Code*:** 7903

*I.D. Name: (Kamal S. Selim) E-mail Address: kselim9@yahoo.com

International Publications Awards

Regional Integration, Imperfect Competition and Welfare: the Experience of the Greater Arab Free Trade Area

Nicolas Peridy and Ahmed Ghoneim[a]

[a] Faculty of Economics and Political Science, Cairo University, Egypt

Abstract

The aim of this article is to provide some new insight concerning the welfare impact of the Greater Arab Free Trade Area (GAFTA). It is based on an original theoretical model of regional integration, which not only includes the gains related to the perfect competition framework (exploitation of comparative advantage and more efficient use of factors of production) but also the additional gains due to imperfect competition (terms of trade improvement, reduction in trade costs, existence of scale economies, greater product varieties for consumers) as well as dynamic effects (increase in foreign direct investment, growth effects) and the impact of economic distortions (taxes/subsidies). An application to the GAFTA agreement is subsequently proposed, using inquiries implemented in selected GAFTA countries and selected industries. Results show that direct trade effects are significant. However, the gains due to the removal of NTBs as well as those in imperfect competition are very small. This can be explained mainly by the lack of deep integration across Arab countries as well as by market structures. As a policy implication, GAFTA members should remove the NTBs in the area and deepen their integration process, with more detailed rules of origin, the use of common standards, the removal of distortions like subsidies and dumping measures, as well as the adoption of closer political cooperation and common institutions.

Keywords: Arab integration; Intraregional trade; Great Arab Free Trade Area; Trade policy.

Published in: Économie Appliquée, an international journal of economic analysis

***ISSN*:** (0013-0494) ***IF*:** (0) ***Code*:** 7901

*I.D. Name: (Prof. Ahmed F. Ghoneim) E-mail Address: aghoneim@gmx.de

International Publications Awards

Cairo University

Islamic Terrorism: Real or Mythical Dichotomy? In: Nedzad Basic (ed.), Rethinking global terrorism. Human Rights Conflict Prevention center, International Islamic University, Islamabad, 2009

Amany Massoud

Political Science Department, Faculty of Economics and Political Science, Cairo University

Abstract

This research is dealing with the question linked Islam and terrorism within the framework of globalization, and assessing how far Islam can be considered an offensive religion/civilization or a global alternative.

The aim of this article is to answer the following four questions: 1. How far Islam has proposed, literally, a universal and an accepted global "code of ethics" of tolerance/intolerance or inclusion/ exclusion? 2. Does Islam, historically, call for aggression and contradict with democracy and liberalism? 3. Is there a vital Islamic challenge and threat to western globalization? And 4. Can violence and terrorism be considered as Islamic tools to deal with globalization?

The first part of the paper answered the first and second questions, clarifying the global dimension of Islam through the concept of the Islamic nation "Ummah", while the second answered the remaining questions.

The research concluded there is no real dichotomy between Islamic nation and globalization, but it is a mythical one which is out of arrogant and dominate policies and strategies in both sides (Islam and the west). While Islam, as a religion has respected the diversity and found its esteems in the following principles: dignity of tire human beings, equality of all human beings, and freedom of thought, conscience and belief guaranteed to all. some Muslims did not apply it properly. The mutual misunderstanding between Islamic nation and Western globalization has created more complications. The west looks at Muslims as they hate freedom and hate the western way of life and want to put women beyond the veil, while Muslims see the universal/western alternative as an arrogant and unaccepted by Muslims.

Keywords: Islam; East west dialogue; Umma; Inclusive civilization; Dichotomy; Terrorism; Globalization; Tolerance; Offensive; violence.

Published in: Rethinking global terrorism. Human Rights Conflict Prevention Center, International Islamic University, Islamabad, (2009).

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Faculty of Arts

International Publications Awards
Cairo University

The Political Prisoner as Antihero: the Prison Poetry of Wole Soyinka and Ahmad Fuad Nigm

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Abstract

In this paper, I undertake a comparative analysis of the prison poetry of the Nigerian writer, Wole Soyinka (b.1934) and the Egyptian poet of the common tongue, ' Ahmad Fu'ad Nigm (b.1924) The tow poets are political activists and public intellectuals whose activism and vocal criticism of post-independence regimes in their respective countries were the main reasons behind their imprisonment. In spite of the marked differences it exhibits in terms of tone, technique and language register, I propose that central to their prison poetry, which is predominantly autobiographical, is the recreation of the central consciousness as an antihero. I argue that, for the political prisoner, the paradoxes inherent in the context of imprisonment favour the emergence of the antiheroic figure. My comparative analysis examines four broad aspects of their poetry with the purpose of tracing how the techniques and strategies each poet employs within each of the broad categories, though differing widely, ultimately produce the figure of the antihero. The figure of the antihero which emerges does not imply surrender or defeat; rather it announces a tactical withdrawal and an ironic self-representation that serve as a powerful comment on an absurd situation.

Keywords: Wole Soyinka and Ahmad Fuad Nigm prison writing comparative literature African literature; Arabic literature antihero Egyptian colloquial poetry.

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Cairo University

International Publications Awards

IPACU

Les Voies de l'anecdotier

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Abstract

Dans cette étude nous essayions d'esquisser un art poétique de l'anecdotier. Nous avons commencé par définir le rôle de l'anecdotier et sa place dans la mise en œuvre, et en forme, du comique spirituel que représente l'anecdote. Raconter une anecdote est le résultat d'une opération qui commence par le goût du fait curieux. A la manière du collectionneur passionné par l'objet rare et curieux, l'anecdotier cultive un sens du fait piquant et du bon mot. Dans un premier temps, le conteur de l'anecdote procède en *taillant* dans le continuum d'une vie ou d'un discours, le trait qu'il relèvera plus tard, par un *art de dire.* Nous aurons remarqué que le maître mot dans l'art de l'anecdotier est celui de simuler : de faire semblant de ne recourir à aucun artifice et d'affecter un naturel, d'autant plus gracieux qu'il est faux. Dans sa mise en récit du fait curieux ou du bon mot, l'anecdotier n'hésitera pas à recourir également à toute sorte de techniques et de stratégies narratives empruntées à l'art du nouvelliste, de l'homme d'esprit, du courtisan voire même du comédien. En outre, il ne serait pas faux de dire que l'anecdotier joue son anecdote. En représentation, devant un auditeur sous le charme et en admiration, le détenteur de la petite curiosité n'oublie jamais son public. C'est en pensant à lui qu'il utilisera un minimum de mots pour créer un maximum d'effets : l'auditeur, son partenaire dans la réussite de l'anecdote, doit pouvoir la mémoriser dès qu'elle sera lancée. A sa façon l'anecdotier est un mémorialiste, une archive vivante qui, grâce une mémoire remarquable, garde les traces des siècles passés.

Keywords: Anecdotier; Art de dire; Artifice; Collectionneur; Comique; Esprit; Forme brève; Humour; Mémoire; Naturel; Public.

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International Publications Awards
Cairo University

Ecrire en Français : Le Cas de la Littérature égyptienne D'expression Française

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Abstract

Pourquoi écrire en français ? Plutôt que de chercher réponse à cette question dans les interviews et les articles des écrivains égyptiens d'expression française, nous interrogerons trois textes littéraires sur les raisons qui président à ce choix, sur les implications culturelles et idéologiques qu'il revêt. Habités par un souci d'ancrage identitaire et développant tout un discours sur ses enjeux, les récits que nous analyserons envisagent l'écriture comme acte permettant de repenser ses liens avec le monde, de se définir par rapport à un environnement, certes francophile, sans pour autant être nécessairement francophone. L'oeuvre serait ainsi cet espace accueillant où s'épanouiraient une identité multiple et une langue polyphonique intégrant harmonieusement les résonances les plus variées.

Keywords: Littérature égyptienne d'expression française; Identité; Polyphonie Francophonie; Langue arabe.

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International Publications Awards

Erzählen Im Kontrast – Kinderwelt Bei Adalbert

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Abstract

Der vorliegende Beitrag versucht, anhand linguostilistischer Betrachtungen die Widerspiegelung der Kinderwelt in ausgewähltr Werken Stifters und Borcherts näher zu beleuchten.

Stifters Erzählungen *Katzensilber* und *Bergkristall* gehören zu den Kindergeschichten, die er kurz nach der Revolution von 1848 als eine Lieblingsgattung des Biedermeier seinen Lesern anbot.

Borcherts zu untersuchenden Kurzgeschichten beschäftigen sich mit der Nachkriegszeit, mit Kriegsfolgen und –trümmern.

Keywords: Linguistik; Angewandte linguistik; Stilistik; Stilanalyse.

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International Publications Awards
Cairo University

The Impact of the use of Information Technology on the Religious Knowledge Prevailing among University Youth: A Social Study

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Abstract

Objective: The study aims at investigating the impact of the use of information technology on the religious knowledge prevailing among the youth. Thus, the information technology is the independent variable and the religious knowledge is the dependent variable.

Methods: The study belongs to the descriptive, interpretive pattern of studies that seeks to investigate the ways in which the religious knowledge of youth has been influenced as a result of the use of the different means of information technology.

Results: The results of the field study showed that there are particular types of information the youth seeks to learn and understand carefully, the most important of which is the religious information. The use of the internet, on the other hand, to obtain the religious information, requires specific skills that must be learned as well knowing the good religious sites that offer honest and accurate content rather than the suspicious sites that offer malformed, misleading content on sensitive religious issues.

Conclusions: The religious knowledge among youth was not limited the holy Qur'an or the traditions of the holy prophet, but came to include as well the circulation of religious fatwas in some sensitive issues in the Egyptian society. In addition to the discussion of some common societal issues from religious perspectives. Thus, religious is no longer seen as the third taboo (religion, policy, sex and politics) as traditionally held in the Egyptian society.

Keywords: Information Technology; Religious Knowledge; Information Society.

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Cairo University

International Publications Awards

IPACU

Development of Intercultural Competence of the Egyptian University Student of Spanish Language

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Abstract

Unlike the traditional premises of Sociocultural Competence, as an integral part of Communication Competence, limited to the simple transmission of knowledge and the introduction of static cultural elements, the concept of Intercultural Competence comes to emphasize the student's necessities when getting in contact with another culture.

The objective of this study is to present some didactic guidelines aimed at reinforcing the Intercultural Competence of the Egyptian student of Spanish as a foreign language. This study is based on the "Holistic Approach", one of the models of Intercultural Competence Learning, which consists in developing affective and emotional aspects in the student in order to reduce ethnocentric tendencies without having to renounce neither his/her personality nor cultural identity, which, indeed, would play a primordial role in the teaching-learning process. In this way, the so called "cultural Shock" could be avoided and the student will be converted into a "cultural performer" whose role would be that of a mediator between the two cultures in contact.

Keywords: Intercultural competence; Egyptian Student of Spanish.

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International Publications Awards
Cairo University

Intratextual Factors in Translating Galdós from Spanish Into Arabic: Addition, Omission and Adaptation

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Abstract

The purpose of this study is to tackle intratextual factors in the translation we made to a Short Story of the great Realistic Spanish author Benito Pérez Galdós (1843 – 1920), namely *Tropiquillos* (1887). In this study we classified all translation strategies or techniques (which are 20), below three general strategies: addition, omission and adaptation.- With "**addition**" we meant any type of morphological and semantic addition that we made from Original Text (OT) to Translated Text (TT). - With **"omission"** we meant any type of morphological and semantic omission that we made from (OT) to (TT). - With **"adaptation"** we meant any type of morphological and semantic modification that we made from (OT) to (TT). In this study, we also referred to pragmatic and contextual factors and causes that made us use these three techniques in the translation.

Keywords: Translation; linguistics; Pragmatics.

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Faculty of Archaeology

International Publications Awards

Cairo University

History of Natural Dyes in North Africa

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Abstract

This work presents an extensive study of natural dyes that used in dyeing of historical textiles. Furthermore, the study focuses on the dyeing process through the ages with an indication of the factors that affect the tones resulting from the dyeing. Also study mentions the importance of using mordents and its role in the process of dyeing and its direct impact in stabilizing the dye on the surface of fiber. The most important sources of natural dyes, whether plant sources or animal sources, which give the color grades, red, yellow, blue and yellow.... Etc, were mentioned. Add to mention the chemical composition of dyes, as well as common names for most types of historical dyes. Study of natural dyes help to date these textiles as well as it helps in the conservation and restoration operations for these historic textiles.

Keywords: Natural; Dyes; Color; Mordents; Indigo; Madder; Safflower; Alum; Linen; Wool.

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Cairo University

International Publications Awards

IPACU

Characterisation of Archaeological Wood
A Case of Study: the Deterioration of a Coffin

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Abstract

An advanced strategy for the improvement of conservation techniques applied to archaeological wood requires a deep insight in its structure. The authors report here a new approach to the structural characterisation of ancient wood. A sample of an ancient Egyptian artefact was studied by means of Scanning Electron Microscopy, analysis of residual low molecular weight compounds, quantitation of the residual amount of lignin and carbohydrates. Its residual lignin was isolated and characterised by 31P-NMR, 1H-NMR and 2D-Homonuclear NMR HOHAHA techniques. These analyses allowed the description of structural details of the ancient wood.

Keywords: Archaeological wood characterization; Lignin structure; ^{31}P-NMR, 2D-NMR, Scanning electron microscopy.

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International Publications Awards

Cairo University

Some Blocks Belonging to the Tias from Kafr el- gebel

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Abstract

Some blocks belonging to the Tias from Kafr el- gebel:During the excavations in the year 1985 near Giza, Ahmad Moussa discovered a group of blocks and other monuments at Kafr el- gebel) Nazlet el- Batran) to the south of Giza Plateau. These monuments were removed and kept in the main magazine of SCA at Giza. The monuments belong to the royal couple Tia and his wife, who bore the same personal name, the princess Tia.It is worth noting that some other monuments belonging to the same couple were discovered. Their tomb was located in 1975, and the excavation results published in 1997. It was suggested that the present blocks are not dismantled blocks from their tomb in Saqqara, but were once part of some kind of funerary chapel, which stood by its own at Giza. The present paper deals with publishing seven blocks out of the whole group.

Keywords:

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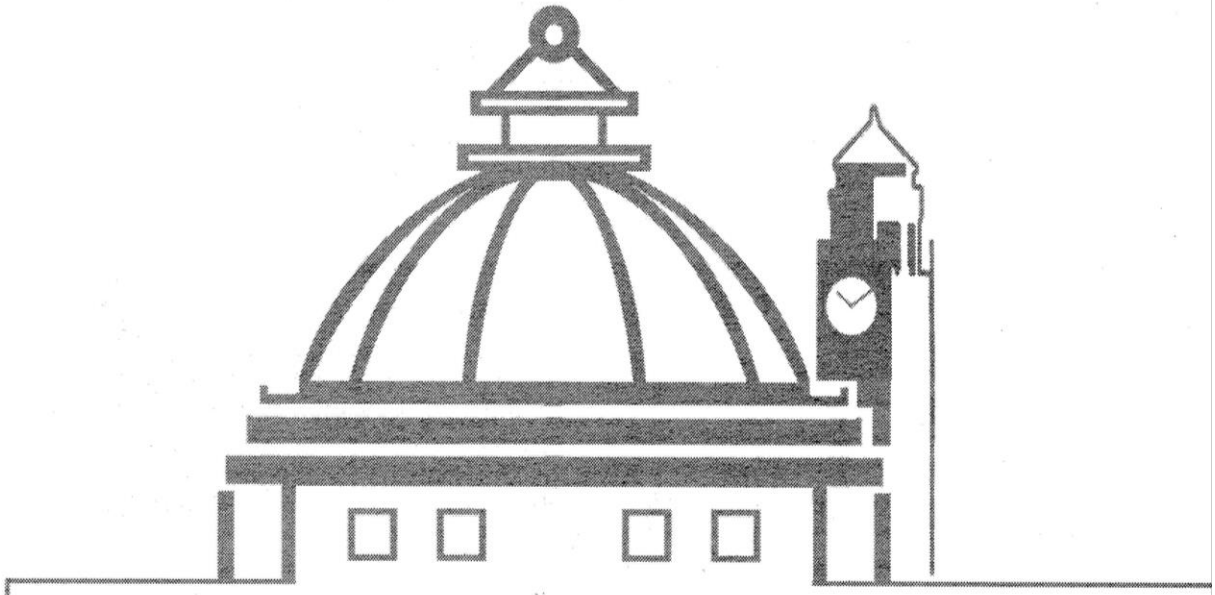

Basic Sciences Sector

Faculty of Science

International Publications Awards

Cairo University

Which can Attenuate Hepatotoxicity Induced By Pesticides Mixture Natural or Synthetic Phenolic Antioxidant

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Abstract

The present study examined the efficiency of green tea polyphenols as an example for natural polyphenols and butylated hydroxytoulene as an example for artificial polyphenols, in counteracting some of biochemical and histological,kl alternations induced by repeated intoxication (28 days) with mixture of well known pesticides, widely investigated separetly. 6 groups of rats were treated as follows G1(control), G2 (p-mix , consists of, 1/60LD50 chloropyrifos =2mg/Kg b.wt, 1/200 LD50 of fenitrothion =2.5 mg/kgm b.wt and 1/100 LD50 of lambada cyhalothrin =0.17 mg/kg b.wt), G3(GT=100mg/animal), G4(p-mix+GT), G5(BHT=10mg/kgb.wt), G6(P-mix+BHT). Blood samples were taken at, 14 and 28 days for further biochemical parameters. Histopathological studies were carried out in liver tissue at the end of the experiment. Significant inhibition in plasma cholinesterase (ChE), damage in liver was observed and confirmed with elevation of plasma alanine aminotransferase (ALT), aspertate aminotransferase (AST) as well as elevation in oxidative stress (OS) marker malodialdehyde (MDA), plasma glucose, total cholesterol, triglycerides and decrease in total glutathione content(GSH). In addition to angiogenic changes in blood vessels of animals treated with P-mix. Natural polyphenols (GT) supplemented to intoxicated rats induced pronounced counteracting effect in MDA, Glucose, cholesterol and triglycerides as well as promising effect in ALT&AST and liver tissue architecture and induce antiangiogenic effect. However, artificial polyphenols (BHT) supplementation has counteracting effect in MDA and GSH but it work synergistically with the p-mix on the other parameters.

Keywords: Fenitrothion; Chlorpyrifos; Lambada cyhalothrin; Mixture; Polyphenols; Green tea; Butylated hydroxytoulene; Oxidative stress; Liver damage markers; Angiogenesis.

Published in: Nature and Science, 7(5): 29-44 (2009).

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Cairo University

International Publications Awards

IPACU

Pollen Types of the Egyptian Species of the Genus Salvia (Lamiaceae)

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Abstract

Pollen morphology of seven species of genus *Salvia* (Lamiaceae) was investigated using light and scanning electron microscope. Pollen was studied to show all possible characteristic features like shape, size, apertures, wall stratification etc. , with special reference to specific characters of each pollen type. Four pollen types were recognized viz. *Salvia aegyptiaca* pollen type, *S.deserti* pollen type, *S.palaestina* pollen type and *S.spinosa* p[ollen type; description of each type, a key to investigated taxa as well as SEM micrographs of pollen types are provided.

Keywords: Pollen morphology; Pollen types; Lamiaceae; Salvia.

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International Publications Awards

Bis (enaminones): Key Intermediates for Novel α, *w* Bis (pyrazolyl phenoxy), Bis (pyranylphenoxy), and Bis (benzo [b] furanylphenoxy) Alkanes

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Abstract

New bis(enaminone) derivatives, 5a,b and 9a,b, were prepared in good yields. Their synthetic utilities as key intermediates for the synthesis of novel bis(pyrazole) 12a,b, bis(pyrane) 17a,b, and bis(benzo[b]furan) 20a–d derivatives were also investigated.

Keywords: Bis(enaminone); Bis(pyrazole); Bis(pyrane); Bis(benzo[b]furan).

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International Publications Awards

The Reaction of Cyanoacetic Acid Hydrazide with 2-Acetylfuran: Synthesis of Coumarin, Pyridine, Thiophene and Thiazole Derivatives with Potential Antimicrobial Activities

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Abstract

The hydrazide-hydrazone derivative **1** was formed through the reaction of cyanoacetic acid hydrazide with 2-acetylfuran. Compound **1** underwent a series of hetrocyclization reactions through its reaction with different chemical reagents to produce arylidene, coumarin, aryl hydrazone, pyridine, thiophene and thiazole derivatives **2–10**. The MIC values for the newly synthesized products were tested against *E. coli, B. cereus, B. subtilis and C. albicans* compared with ampicilline and cycloheximide as reference drugs.

Keywords: Pyridine; Thiophene; Thiazole; Antimicrobial.

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International Publications Awards

Cairo University

Synthesis of Novel Tryptophan Derivatives of Potential Biological Activity

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Abstract

Tryptophan methyl ester **2** reacts with ethyl cyanoacetate to form acetonitrilocarbonyltryptophan methylester **3**. The latter reacts with cyanomethylene reagents, hydrazines, cyanomethylenes and sulfur to form the corresponding α-pyrido-3-indolopropanoate derivatives **6a,b**, pyrazolyltryptophan methyl ester derivatives **8a,b** and thiophenotryptophan methyl ester derivatives **10a,b**, respectively. Also compound **3** reacts with benzaldehyde to give the condensated product **12**. The reactivity of the latter product towards chemical reagents was studied to form pyridine, pyrazole and isoxazole derivatives.

Keywords: Tryptophane; Pyrazole; Pyridine; 1,3-oxazine.
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Cairo University

International Publications Awards

IPACU

The Reaction of Cyclohexan-1,3-dione with Cyanomethylenes: Synthesis of Thiophenes and their Fused Derivatives with Antifungal Activities

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Abstract

Benzothiophenes are one of the most common and consequently them most studied classes of aromatic heterocycles. The occurrence of these heterocycles in a significant number of medicinal agents, active in a variety of disease areas, has led to an enduring interest in the development of new methods for their synthesis 2-Amino-7-oxotetrahydrobenzo[b]thiophenes **3a,b** were prepared according to the Gewald procedure. Their reactivity toward a variety of chemical reagents was studied to give annulated heterocycles with potential bio-responses.

Keywords: Annulated derivatives; Pyridine; Thiazole; Thiophene.
Published in: Phosphorous, Sulfur & Silicon, 184, 2078-2096 (2009).
ISSN: (1042-6507) ***IF*:** (0.692) ***Code*:** 7510

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International Publications Awards

Cairo University

Dimethylformamide Dimethyl Acetal as a Building Block in Heterocyclic Synthesis

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Abstract

This review focuses on the use of dimethylformamide dimethyl acetal in the preparation of heterocyclic compounds via formylation of active methylene groups, methyl groups to give enamines, and formylation of amino groups to give amidines. These compounds are found to be useful intermediates in the formation and modification of heterocyclic compound.

Keywords: ***

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Cairo University

International Publications Awards

IPACU

Supramolecular Liquid Crystals Induced by Hydrogen-Bonding Interactions Between Non-Mesomorphic Compounds. I. 4-(4'-Pyridylazophenyl)-4''-Substituted Benzoates and 4-Substituted Benzoic Acids

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Abstract

Equimolar binary mixtures of the title compounds were prepared to investigate the effect of different polar substituents, either on the pyridine-based derivatives or on the acid component, on the extent and stability of the supramolecular liquid crystal phases induced by intermolecular hydrogen bonding. None of the pyridine based derivative or the acid complement is mesomorphic, but the hydrogen-bonded complexes are. The mixtures prepared were characterized for their mesophase behavior by differential scanning calorimetry, DSC, and polarized light microscopy, PLM. Five azo pyridine-based derivatives (I_{a-e}), with molecular formula X-$C_6H_4COOC_6H_4$-N=N-C_5H_4N, were prepared that differ from each other by the substituent X. The latter varies between CH_3O, CH_3, H, Br, and NO_2. Six 4-substitutedbenzoic acids (Y-C_6H_4COOH, II_{a-f}) were used; the substituent Y varies between CH_3O, CH_3, H, Br, CN, and NO_2. Nematic mesophase is induced in most of the binary mixtures investigated.

Keywords: 4-(4'-pyridylazophenyl)-4"-substituted benzoates; 4-substituted benzoic acids; Binary mixtures; Supramolecular LCs.

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International Publications Awards
Cairo University

Synthesis of Some New Thieno[2,3- b]pyridines, Pyrimidino[4_,5_:4,5]thieno[2,3- b]-pyridines, and 2,3-Dihydro-1,3,4-Thiadiazoles

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[c] Department of Drug Radiation Research, National Center of Radiation Research and Technology, Naser City, Cairo, Egypt

Abstract

Thieno[2,3-b]pyridines were synthesized from 6-benzofuran-2-yl-4-phenyl-2-sulfanylpyridine-3-carbonitrile and each of chloro acetone, ethyl chloroacetate, ω-bromoacetophenone, and chloroacetonitrile. These compounds were conveniently converted into novel pyrido[4_,5_:4,5]thieno[3,2-d]pyrimidines. Also, 2,3-dihydro-1,3,4-thiadiazole was synthesized from hydrazonoyl halides and 2-benzofuran-2-yl-3-(phenylamino)-3-thioxopropanenitrile. The structures of the products havebeen elucidated by elemental analyses, spectral data studies, and alternative syntheses whenever possible. The newly synthesized compounds were tested towards microorganisms.

Keywords: 2,3-Dihydro-1,3,4-thiadiazole; Hydrazonoyl halides; Pyrimidino[4,5:4,5]thieno[2,3-*b*]pyridine; Thieno[2,3-*b*]pyrimidine.

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Cairo University

International Publications Awards

IPACU

Convenient Synthesis of Some New Pyrazolo[1,5-a]pyrimidine, Pyridine, Thieno[2,3-b]pyridine, and Isoxazolo[3,4-d]pyridazine Derivatives Containing Benzofuran Moiety

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Abstract

Pyrazolo[1,5-*a*]pyrimidines, pyrazoles, and thieno[2,3-*b*]pyridine were synthesized from sodium salt of 5-benzofuran-2-yl-3-hydroxypropenone and the appropriate of heterocyclic amines, diazonium chloride, and 1,3-dicarbonoyl compounds. Pyrimidino [4',5':4,5] thieno [2,3-*b*]pyridine, 1,2,3,4-tetrazolo[1",5":6',1']-pyrimidino[4',5': 4,5]thieno[2,3-*b*]pyridine and pyridino[2",3":2',3']thieno[4,5-*d*]1,2,4-triazolo[4,3-e]pyrimidine derivatives were synthesized from 6-benzo[*d*]furan-2-yl-2-thioxohydropyridine-3-carbonitrile and each of formic acid or formamide. Structures of the newly synthesized were established by elemental analysis and spectral data.

Keywords: Pyrazolo[1,5-*a*]pyrimidines; Pyrazoles; Thieno[2,3-*b*]pyridine; Benzofuran.

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International Publications Awards

Cairo University

Study of the Electrochemical Redox Characteristics of some Triazolopyrimidines

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Abstract

An electrochemical study related to the redox characteristics of Ethyl-3-acetyl-6-methyl-1,4-diphenyl-4,3a-dihydro-1,3,4-triazolino[3,4-a] pyrimidine-5-carboxylate ester and its derivatives (1a-f) and (2a-e) in nonaqueous solvents such as 1,2-dichloroethane (DCE), dichloromethane (DCM), acetonitrile (AN ،(dimethylsulphoxide(DMSO) and tetrahydrofurane (THF) using 0.1 mol dm-3 tetrabutylammonium perchlorate (TBAP) as a supporting electrolyte at platinum, glassy carbon and gold electrodes , has been performed using cyclic voltammetry (CV).Controlled potential electrolysis (CPE) is also carried out to elucidate the course of different electrochemical reactions through the separation and identification of the intermediates and final electrolysis products .The redox mechanism is suggested and proved. It was found that all the investigated compounds in all solvents are oxidized in a single irreversible one electron donating process following the well known pattern of the EC-mechanism to give a dimer. On the other hand, these compounds are reduced in a single irreversible one electron step to form the anion radical, which is basic enough to abstract proton from the media forming the radical which undergoes tautomerization and then dimerization processes to give also another biscompound through N-N linkage formation.

Keywords: Cyclic voltammetry; oxidation; reduction; triazolopyrimidine; non-aqueous media; platinum Electrode; glassy carbon electrode; gold electrode.

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Cairo University

International Publications Awards

IPACU

Corrosion Inhibition of Aluminum in Hydrochloric Acid Solution Using Potassium Iodate Inhibitor

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Abstract

The inhibition effect of potassium iodate on the corrosion of aluminum in 2M HCl has been studied by weight loss, polarization and electrochemical impedance pectroscopy (EIS) measurements. It has been found that KIO3 acts as an excellent inhibitor. Inhibition efficiency with 100 ppm inhibitor was very high. Polarization curves reveal that the used inhibitor is a mixed type inhibitor. The surface adsorption of KIO3 leads to a decrease of double layer capacitance as well as an increase of polarization esistance. The adsorption of the inhibitor on the aluminum surface is in agreement with Temkin adsorption isotherm.

Keywords: Aluminum; Corrosion inhibition; KIO3; HCl

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International Publications Awards

Cairo University

Electrochemical Study of Some Substituted Chromene Derivatives in Nonaqueous Media at Pt, Au and Glassy Carbon Electrodes

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Abstract

The redox characteristics of some substituted chromene derivatives has been investigated in different nonaqueous solvents such as, 1,2- dichloroethane (DCE), dichloromethane (DCM) and acetonitrile (AN) using 0.1mol dm-3 tetrabutylammonium perchlorate (TBAP) as a supporting electrolyte at platinum, gold and glassy carbon electrodes, using cyclic voltammetry. Through controlled potential electrolysis (CPE), the product of oxidation and reduction can be separated and identified. The product of oxidation was found to be the corresponding bis-compound. On the other hand, the reduction occurs in a single two electron process to give the dianion, which abstracts protons to saturate the (-C=O) bond. The effect of substituents on the redox mode of an electroactive site has also been studied.

Keywords: Chromene; cyclic voltammetry; oxidation; reduction; non-aqueous solvent; platinum electrode; glassy carbon electrode; gold electrode.

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Cairo University

International Publications Awards

IPACU

Voltammetric Studies on Some Thiadiazoles and Their Derivatives

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Abstract

The redox characteristics of 2-arylaldehydehydrazono-3-phenyl-5-substituted-2,3-dihydro-1,3,4-thiadiazoles (1a-h) have been investigated in nonaqueous solvents such as 1,2-dichloroethane (DCE), dichloromethane (DCM), acetonitrile (AN), Tetrahydrofuran (THF), and dimethylsulfoxide (DMSO) at platinum electrode. Through controlled potential electrolysis, the oxidation and reduction products of the investigated compounds had been separated and indentified. The redox mechanism had been suggested and proved. It had been found that all the investigated compounds were oxidized in two irreversible one-electron processes following the well-known pattern of The EC-mechanism; the first electron loss gives the corresponding cation-radical which is followed by proton removal from the ortho-position in the N-phenyl ring forming the radical. The obtained radical undergoes a second electron uptake from the nitrogen in the N = C group forming the unstable intermediate (di-radical cation) which undergoes ring closure forming the corresponding cation. The formed cation was stabilized in solution through its combination with a perchlorate anion from the medium. On the other hand, these compounds are reduced in a single two-electron process or in a successive two one-electron processes following the well known pattern of the EEC-mechanism according to the nature of the substituent; the first one gives the anion-radical followed by a second electron reduction to givethe dianion which is basic enough to abstract protons from the media to saturate the (C = O) bond.

Keywords: Thiadiazoles; Cyclic voltammetry; Redox characteristics; Non-aqueous solvents; Controlled potential electrolysis.

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International Publications Awards
Cairo University

Electrochemical Behavior of AZ91D Magnesium Alloy in Phosphate Medium: Part II. Induced Passivation

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Abstract

Induced passivation of AZ91D magnesium alloy in phosphate solution was carried out both chemically, using various inorganic oxidants, namely, molybdate, vanadate and iodate, as well as electrochemically by anodizing the alloy under various controlled overpotentials within the range 0.1–3.4 V. In acidic phosphate (pH 4.5), molybdate and vanadate anions exhibit similar behavior, as they show a dissolution effect at lower concentrations and passivation at higher concentrations. On the other hand, iodate anions shows critical behavior with a passivation effect up to 0.1 mM and depassivation for higher concentrations. Generally, over the concentration domain (0.01–1.0 mM) the results reveal small inhibitive effects with maximum values of 19.7% for IO^-_3 and 24–25% for MoO_4^{2-} and VO_3^- manifesting weak propensities for these inorganic species to enhance the corrosion resistance of AZ91D alloy in acidic phosphate medium. The effect of anodic potential on the characteristics of surface films formed on the alloy in alkaline phosphate solution (pH 11.9) indicates that higher forming overpotential induces better passivation due to the formation of rather thicker and more resistive anodic films. The stability of the films is greater in alkaline as compared to acidic phosphate solutions.

Keywords: AZ91D alloy; Phosphate; Passivation; EIS; SEM; Potentiostatic.

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International Publications Awards

Cairo University

IPACU

Role of Some Thiadiazole Derivatives as Inhibitors for the Corrosion of C-steel in 1 M H_2SO_4

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Abstract

Inhibition of C-steel corrosion by some thiadiazole derivatives (I–VI) in 1 M H2SO4 was investigated by weight loss, potentiodynamic polarization, linear polarization resistance (LPR) and electrochemical impedance spectroscopy (EIS) techniques. The presence of these compounds in the solution decreases the double layer capacitance, increases the charge transfer resistance and increase of linear polarization. Polarization studies were carried out at room temperature, and showed that all the compounds studied are mixed type inhibitors with a slight predominance of cathodic character. The effect of temperature on corrosion inhibition has been studied and the thermodynamic activation and adsorption parameters were calculated and discussed. Electrochemical impedance was used to investigate the mechanism of corrosion inhibition. The adsorption of the compounds on C-steel was found to obey Langmuir's adsorption isotherm. The synergistic effect brought about by combination of the inhibitors and KSCN, KI and KBr was examined and explained. The mechanism of inhibition process was discussed in the light of the chemical structure and quantum-chemical calculations of the investigated inhibitors.

Keywords: Thiadiazole derivatives; Corrosion; C-steel; H2SO4; Quantum chemical calculation.

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International Publications Awards

Cairo University

Facile Access to Benzothiazole-containing Pyrrolo[1,2-a] quinolines and Pyrrolo[2,1-a]isoquinolines via Nitrogen Ylides

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Abstract

Quinoline and isoquinoline react with 2-(bromoacetyl)benzothiazole (**1**) in dry benzene to give the corresponding quinolinium and isoquinolinium salts **2** and **10** which undergo base-mediated [3+2] 1,3-dipolar cycloaddition with some acetylene and ethylene derivatives to give the corresponding benzothiazole-containing pyrrolo[1,2-*a*]quinoline and pyrrolo[2,1-*a*]-isoquinoline derivatives.

Keywords: Benzothiazoles; Pyrrolo[1,2-a]quinolines; Pyrrolo[2,1-a] isoquinolines; Nitrogen ylides; 1,3-dipolar cycloaddition.

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International Publications Awards

Heck and Suzuki Cross-Couplings of Aryl and Heteroaryl Bromides in Water Using a New Palladium(II)-complex

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Abstract

A new benzimidazole-based Pd(II)-complex was prepared and its catalytic activity was evaluated in Heck and Suzuki C-C cross-coupling reactions of aryl and heteroaryl bromides with olefins and arylboronic acids, respectively, under thermal heating using water as a reaction solvent. The factors affecting the optimization of such reactions are studied.

Keywords: Palladium; Catalysis; C-C cross-coupling; Water solvent; Aryl halides; Olefins.

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International Publications Awards

Cairo University

A Photoelectron and Double Photoionization Study of the Valence Electronic Structure of 1,4-Bromofluorobenzene

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Abstract

Conventional photoelectron and time-of-flight photoelectron-photoelectron coincidence detection(TOF-PEPECO)spectra have been measured for the outer valence region of the 1,4-bromofluorobenzene molecule. The photoelectron spectra were recorded using HeI□□radiation from a resonance source and the TOF-PEPECO spectra were recorded using HeII□from a pulsed resonance source. The former provides energies of the cationic states and the latter of the dicationic states. The spectra are adequately are adequately interpreted with the aid of accurate Green's function calculations , showing very significant correlation effects. The lowest double ionization energy is found at 23.45 eV associated with the $(^4b_1)$-$^2X^1A_1$ dicationic state.

Keywords: Single photoionzation; Double photoionzation; 1,4 bromofluorobenzene; TOF-PEPECO.

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International Publications Awards

Cairo University

Enhanced Electro-oxidation of Formic Acid at Manganese Oxide Single Crystalline Nanorod-modified Pt Electrodes

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Abstract

The electro-catalytic activity of Pt towards the oxidation of formic acid is significantly enhanced upon the electro-deposition of manganese oxide nanorods (in single crystalline phase, γ-MnOOH). The modified Pt electrodes are shown to support the direct oxidation of formic acid to CO_2 (i.e., dehydrogenation pathway), while suppressing the dehydration pathway (producing the poisoning intermediate CO). This behavior is clearly indicated by comparing the intensity of the corresponding two oxidation peaks (I^{d}_{p} and I^{ind}_{p}) observed, respectively, at 0.2 and 0.55 V vs. SCE, where I^{d}_{p} is the peak current of direct formic acid oxidation and I^{ind}_{p} is the current due to the dehydration (i.e., indirect) pathway of formic acid oxidation. I^{d}_{p} increases with surface coverage θ of MnOOH reaching the highest activity at θ of ca. 30%. MnOOH is believed to play a crucial role as a catalytic mediator which facilitates the charge transfer during the direct oxidation of formic acid into CO_2.

Keywords: Nanorods; Single crystals; Modified surfaces; Electro-catalysis.

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International Publications Awards

Cairo University

Electrochemical Applications of Modified Electrodes in Wasterwater Treatment and Energy Conversion Systems

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Abstract

This chapter sheds some light on the use of modified electrodes in some vital processes related to environmental and energy conversion systems. It highlights the use of modified electrodes (planar and porous) in the remediation of industrial waste water contaminated with nitrate ions or lead ions using modified Au electrodes and porous electrochemical reactor operating in a flow regime, respectively. Additionally, this porous flow-through electrode system has also been used for the production of hydrogen gas from flowing alkaline electrolytes. Our results concerning this issue will be briefly outlined.

The second part of this chapter describes our recent researches on the development of tailor-designed nanoparticles-based electrocatalysts with controllable size and crystallographic orientation, for reactions of relevance to, among others, the polymer electrolyte membrance fuel cell, e.g., oxygen reduction and evolution reactions as well as formic acid oxidation. This includes the fabrication and characterization of chemically/electrochemically-prepared metallic nanoparticles (e.g., Au) and metal oxide nanostructures (e.g., manganese oxide) onto various substrates and their applications as electrocatalysts.

Keywords: Nanostructures; Preferential orientation; ORR; OER; Formic acid oxidation; PEM fuel cells; Wastewater; Pollution; Heavy metals; HER; Metal oxides.

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International Publications Awards
Cairo University
IPACU

Equilibrium and Kinetic Studies of the Reactions between Aqua[1-(2-aminoethyl)piperazine]palladium(II) and Biologically Relevant Nucleophiles

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Abstract:

The kinetics and mechanism of the complex-formation reactions of $[Pd(AEP)(^{H}2^{O})]^{2+}$, where AEP stands for 1-(2-aminoethyl) piperazine, with biologically relevant ligands were studied as a function of selected nucleophiles and pH. The reactivity of the ligands follows the sequence L-methionine > guanosine-5`-monophosphate > glycine > inosine >> glutathione. The substitution reactions with glutathione showed two reaction steps in which the first step involves coordination through nitrogen and depends on the nucleophile concentration, whereas the second step involves intramolecular isomerization from N- to S-bonded glutathione and does not depend on the nucleophile concentration. The stoichiometry and stability constants of the formed complexes are also reported, and the concentration distribution of the various complex species was evaluated as a function of pH. The results are discussed in terms of the mechanism of antitumor activity of related platinum complexes.

Keywords: Palladium; Kinetics; Reaction mechanisms; N ligands; Equilibrium; Biomolecules Glutathione; Antitumor agents.

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International Publications Awards

Cairo University

Equilibrium Studies on Complex-Formation Reactions of Pd[(2-(2-aminoethyl)pyridine)(H2O)2]2+ with Ligands of Biological Significance and Displacement Reactions of DNA Constituents

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Abstract

The [Pd(AEP)Cl2] complex was synthesized and characterized, where AEP = 2-(2-aminoethyl)pyridine. The stoichiometry and stability constants of the complexes formed between various biologically relevant ligands (amino acids, peptides, DNA constituents and dicarboxylic acids) and $[Pd(AEP)(H_2O)_2]^{2+}$ were investigated at 25 °C and 0.1 M ionic strength. The equilibrium constants for the substitution of representative coordinated ligands such as inosine, glycine or methionine by cysteine were calculated and the concentration distribution diagrams of the various species evaluated. The kinetics of base hydrolysis of free and coordinated amino acid esters was investigated. The effects of the medium dielectric constant and temperature on the kinetics of base hydrolysis of the glycine methyl ester in the presence of the $[Pd(AEP)(H_2O)_2]^{2+}$ complex were studied and the activation parameters $\Delta H^{\neq}$ and $\Delta S^{\neq}$ for the hydrolysis process were determined.

Keywords: Bioinorganic chemistry; Kinetics; Hydrolysis; N,O ligands; N ligands; S ligands; Structure-activity relationships; Palladium complexes.

Published in: Eur. Journal Inorg. Chem. 3912– 3920 (2009).

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International Publications Awards

Interaction of Dimethyltin(IV) and Trimethyltin(IV) with Dehydroacetic Acid

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Abstract

The interaction of trimethyltin(IV) and dimethyltin(IV) with dehydroacetic acid was investigated at 25 °C and 0.1M ionic strength in 20% dioxane–water mixture. The stepwise formation constants of the complexes formed in solution were calculated using the non-linear least-square program MINIQUAD-75. The concentration distribution of the various complex species was evaluated as a function of pH.

Keywords: Trimethyltin(iv); Dimethyltin(iv); Dehydroacetic acid; Complex formation.

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International Publications Awards

Cairo University

Organo Solve Pulping of Cotton Linters

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Abstract

Compared to prehydrolysis-soda pulping, prehydrolysis-soda-ethanol-pulping of cotton linters stabilizes the long-chain cellulose macromolecules against alkaline degradation. The presence of ethanol also results in a more open and accessible fine structure, higher chemical reactivity (in xanthation), and better viscose filterability. Prehydrolysis-soda-ethanol-anthraquinone pulping results in still further stabilization of the cellulose in cotton, a more open and accessible fine structure, higher chemical reactivity and a better viscose filterability. In this respect, the hydrochloric acid (HCl) is superior to the sulphuric acid (H_2SO_4). The prehydrolysis-soda-ethanol-anthraquinone pulping method gives cotton linters with better chemical reactivity than that of commercial softwood pulp.

Keywords: Anthraquinone (AQ); Cotton linters; Chemical reactivity (xanthation); Ethanol; Fine structure; Filterability; Prehydrolysis-soda pulping; Prehydrolysis-soda-ethanol-pulping; Prehydrolysis-soda-ethanol- anthraquinone pulping.

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International Publications Awards

Convenient Synthesis of Novel Bis (Hydrazone) and Bis (Indole) Derivatives

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Abstract

The synthetic potency of (Z,Z)-3,3'-(ethane-1,2-diyldiimino)dibut-2-enoate (**1**) as a versatile precursors for the synthesis of novel bis(hydrazone) and bis(indole) derivatives via its reaction with some electrophiles and nitrogen nuclephiles was investigated.

Keywords: Bis(hydrazone); Bis(indole); Pyrazolo[5,1-*c*][1,2,4]triazine; Electrophiles; Nitrogen nuclephiles.

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International Publications Awards

Cairo University

Synthesis of Some Novel Bis(Pyrazole), Bis(Pyridine) and Bis (Pyrazolo[5,1-C]-1,2,4-Triazine Derivatives

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Department of Chemistry, Faculty of Science, Cairo University, Giza, Egypt

Abstract

Treatment of N,N'-(ethane-1,2-diyl)bis(cyanoacetamide) (**1**) with hydrazonoyl chlorides **2a,b** afforded bis(aminopyrazoles) 5a,b. Heating of compound **1** with arylmethylenepropanedinitrile **9a-c** afforded bis(pyridine) derivatives **13a-c**. Also, compound **1** coupled smoothly with the arene diazonium salt generated from 3-chloroaniline or 5-amino-4-methyl-3-phenylpyrazole (**16**) to afford the corresponding hydrazones **15** or bis(pyrazolo[5,1-c]-1,2,4-triazine-3-carboxamide) **19**. Refluxing of compound **1** with N,N-dimethylformamide dimethyl acetal (DMF-DMA) in xylene afforded bis(2-cyano-3-(dimethylamino) acrylamide) (**20**) which reacted with hydrazine hydrate to afford the novel bis(cyanoopyrazole) **23**.

Keywords: Bis(cyanoacetamide); Hydrazonoyl chlorides; Bis(aminopyrazole); Bis (pyrazolo [5,1-*c*][1,2,4-triazine); *N*,*N*-Dimethylformamide-dimethylacetal.

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International Publications Awards

Cairo University

Simultaneous Removal of Chromium, Copper, Cadmium and Lead Ions from Aqueous Solution by Adsorption onto Kaolin

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Abstract

The objective of this study was to evaluate the use white kaolin for its ability to remove chromium (III), copper (II) , cadmium (II) and lead (II) from their mixed aqueous solution. The effects of contact time, pH, initial metal concentration and amount of adsorbent on the adsorption process at room temperature 25 ± 2 °C were studied. Batch adsorption studies were carried out by mixing a known amount of kaolin with 50 ml of mixed ions solutions until equilibrium was attained, then the removal was calculated. Batch experiment results showed that an equilibrium time of 30 min. was required for the adsorption of Cr (III), Cu (II), Cd (II) and Pb(II) on kaolin. The maximum metal removal was found to be pH dependent, the optimum pH was found to be 6.5. With an increase in the concentrations of these metals, their adsorption decreased. Increasing kaolin loading weight increased the removal percentages of Cr (III), Cu (II), Cd (II) and Pb(II). Isothermal studies showed that the experimental data are best fitted to the Temkin isotherm model. The applicability of the obtained results was also investigated using a real wastewater sample.

Keywords: Adsorption; Chromium; Copper; Cadmium; Lead; White kaolin; Temkin isotherm.

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International Publications Awards

Cairo University

Atom-Efficient, Solvent-Free, Green Synthesis of Chalcones by Grinding

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Abstract

An improved Claisen–Schmidt condensation reaction of methyl ketones and aromatic aldehydes can be achieved by grinding at room temperature in the absence of solvents. This process is simple, efficient, economical, and environmentally benign compared to classical reactions.

Keywords: Chalcones; Claisen–Schmidt condensation; Green chemistry; Grinding; Solvent-free synthesis.

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International Publications Awards

Functional Overexpression and Purification of a Codon Optimized Synthetic Glucarpidase (Carboxypeptidase G2) in Escherichia Coli

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Abstract

Glucarpidase (former name: carboxypeptidase G2, or CPG2) is a bacterial enzyme that is widely used in detoxification of the cytotoxic drug, methotrexate, and in Antibody Directed Enzyme Prodrug Therapy for cancer treatment. The glucarpidase gene of Pseudomonas sp. strain RS-16 was previously cloned in E coli, but expresses at a level that is approximately 100-fold lower than in the native strain. In this study, a synthetic gene coding for glucarpidase was codon-optimised and synthesized for maximum expression in E. coli using the vector pET28a. Our work indicated that the enzyme was expressed to ~60% of the total host protein and that purification of the recombinant His-tagged protein could be achieved in a single step by Ni^{2+}charged column chromatography. The synthetic recombinant glucarpidase expressed within this system was biologically active and zinc dependant. Our study showed that Mg^{2+} as well as Mn^{2+} ions inhibit the activity of the recombinant enzyme.

Keywords: Synthetic carboxypeptidase G2; CPG2 overexpression; ADEPT; Protein purification; Synthetic Glucarpidase.

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International Publications Awards

Cairo University

Light and Electron Microscopic Studies in the Development of the Ovaries of Culex Pipiens Quinquefasciatus (Say) (Diptera: Culcidae)

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Abstract

Christopher's stages of ovarian development are redefind in Culex Pipens quinquefasciatus to provide a more uswful description of mosquito physiology. During this ovarian development, seven growing stages of the oocyte are observed in the adult stage, the gradusl increase in the oocyte size during these phases is attributed to yolk deposition. During vitellogensis, the oocyte and nurse cell nucleus are similar in size (stagel I). then, the oocyte enlarges and occpies on third of the egg follicle, whil the nurse. Christopher's stages of ovarian development are redefind in Culex Pipens quinquefasciatus to provide a more uswful description of mosquito physiology. During this ovarian development, seven growing stages of the oocyte are observed in the adult stage, the gradusl increase in the oocyte size during these phases is attributed to yolk deposition. During vitellogensis, the oocyte and nurse cell nucleus are similar in size (stagel I). then, the oocyte enlarges and occpies on third of the egg follicle, whil the nurse.

Keywords: Cx. P. quinquefasciatus; Ovaries; Light and electron microsscopic studies.

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Cairo University

International Publications Awards

IPACU

Hydrogeophysical Assessment of Wadi El-Sheikh Aquifer, Saint Katherine, South Sinai, Egypt

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Abstract

Over the last few years, Saint Katherine, South Sinai has seen large scale development in connection with building new cities, land reclamation, and tourism. The Wadi El-Sheikh aquifer constitutes one of the major freshwater recourses in the Saint Katherine area. In that regard, ten Schlumberger vertical electrical soundings (maximum AB/2 = 682 m) associated with a number of measured and/or calculated geoelectric and petrophysical parameters of the aquifer were conducted to delineate and assess the aquifer. Furthermore, subsurface stratigraphic data and measured hydrological parameters of shallow boreholes in the study area were integrated with the geoelectrical results. The integration of the sounding results, borehole data, geoelectric, and petrophysical parameters effectively delineated the alluvial fresh water aquifer with true resistivities ranging between 206 and 255 Ohm.m and thickness ranging between 32 and 66 m. The northern part is characterized by a gradual decrease in porosity (30.2 % at BH-7), electric anisotropy coefficient (1.03 at VES 8, 9, and 10), and total dissolved solid (TDS) concentrations (319 ppm in spring season and 348 ppm in summer season at BH-7). On the other hand, the northern part is characterized by a gradual increase in grain size, tortuosity (1.349 at BH-7), permeability (65 meter/day at BH-7), and transmissivity (2340 meter^2/day at BH-7) reflecting high aquifer potential. Moreover, the downward gravitational movement of groundwater is greater in the northern direction as well. In that regard, deep wide-spaced development water wells (30 ~ 35m depth) are recommended to be drilled in the northern area.

Keywords: Hydrogeophysics; Geoelectric parameters; Hydrological parameters; Petrophysical parameters; Wadi El-Sheikh; Saint Katherine; South Sinai.

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International Publications Awards

Cairo University

Fourier Expansions with Modular Form Coefficients

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Abstract

In this paper, we study the Fourier expansion where the coefficients are given as the evaluation of a sequence of modular forms at a fixed point in the upper half-plane. We show that for prime levels l for which the modular curve $X_0(l)$ is hyperelliptic (with hyperelliptic involution of the Atkin–Lehner type) then one can choose a sequence of weight k (any even integer) forms so that the resulting Fourier expansion is itself a meromorphic modular form of weight 2-k. These sequences have many interesting properties, for instance, the sequence of their first nonzero next-to-leading coefficient is equal to the terms in the Fourier expansion of a certain weight 2-k form. The results in the paper generalizes earlier work by Asai, Kaneko, and Ninomiya (for level one), and Ahlgren (for the cases where $X_0(l)$ has genus zero).

Keywords: Meromorphic modular forms; Fourier expansions; Hyperelliptic modular curves; Atkin–Lehner involution; Coefficient duality.

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International Publications Awards

Cairo University

On the Zeros of the Second and Third Jackson q-Bessel Functions and their Associated q-Hankel Transforms

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Abstract

We investigate the zeros of *q*-Bessel functions of the second and third types as well as those of the associated finite *q*-Hankel transforms. We derive asymptotic relations of the zeros of the *q*-Bessel functions by comparison with zeros of the theta function. The asymptotics of *q*-Bessel functions are also given. Zeros of finite *q*-Hankel transforms of *q*-summable functions are shown to be real and simple except for a finite number of possible non real zeros. Sufficient conditions are given to guarantee that all zeros are real. We give some applications concerning zeros of combinations of *q*-Bessel functions.

Keywords: q-Bessel functions; q-Hankel transforms.

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International Publications Awards

Cairo University

On Reality and Asymptotics of Zeros of q-Hankel Transforms

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Abstract

We give sufficient conditions which guarantee that the finite q-Hankel transforms have only real zeros which satisfy some asymptotic relations. The study is carried out using two different techniques. The first is by a use of Rouche's theorem and the other is by applying a theorem of Hurwitz and Biehler. In every study further restrictions are imposed on q in (0,1). We compare the results via some interesting applications involving second and third q-Bessel functions as well as q-trigonometric functions.

Keywords: q-Hankel transforms; Rouche's Theorem; q-Bessel functions; q-trigonometric functions.

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Cairo University

International Publications Awards

IPACU

A Simple Construction of Representable Relation Algebras with Non Representable Completions

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Abstract

We give a simple new construction of representable relation algebras with non-representable completions. Using variations on our construction, we show that the elementary closure of the class of completely representable relation algebras is not fiitely axiomatizable.

Keywords: Algebraic logic; Relation algebras; Completions.

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International Publications Awards

Cairo University

Neat Reducts and Amalgamation in Retrospect, a Survey of Results and some Methods Part 1

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Abstract

Introduced by Leon Henkin back in the fifties, the notion of neat reducts is an old venerable notion in algebraic logic. But it is often the case that an unexpected viewpoint yields new insights.Indeed, the repercussions of the (seemingly very innocent) fact that the class of neat reducts is not closed under forming subalgebras turn out to be enormous.In this paper we review and, in the process, discuss, some of these repercussions in connection with the algebraic notion of amalgamation. Some new unpublished results (answering long-standing open problemsin the field) concerning neat reducts and amalgamation are given. (Theorems 11, 13, 19 and 31-38 are such).

Several counterexamples which convey the gist of techniques used in this area are presented two of which are new (Theorem 19, Theorem 38).It is known that the algebraic notion of amalgamation in a class of algebras corresponds to the metalogical notion of interpolation in the corresponding logic.

Answers to open question in the recent paper \cite{AUU} concerning both amalgamation and interpolation are summarized in tabular form at the end of this paper.

This paper appears in two parts. The present first part contains results on neat reducts. The second part contains results relating the notion of neat embeddings to various amalgamation properties.

Mathematics Subject Classification: 03G15, 03C10.

Keywords: Algebraic logic; Amalgamation; Cylindric algebras; Neat reducts.

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International Publications Awards

On Neat Embeddings of Cylindric Algebras

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Abstract

We show thay certain properties of dimension complemented cylindric algebras, concerning neat embeddings do not generalize much further. Let \alpha\geq \omega. There are non rep cylindr algebras of which \alpha each of which is a generating subreduct of the same \beta dimensional cylindric algebra. We show that there exists a representable algebra A of dimension \alpha such that A is a generating subreduct of B and B' both in CA_{\alpha+\omega} however B and B' are not isomorphic. This answers questions raised by Henkin Monk and Tareski

Keywords: Cylindric algebras; Neat embeddings.

Published in: Mathematical Logic Quarterly 5 (1):1-3 (2009).

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International Publications Awards

Cairo University

A Note on Substitutions in Representable Cylindric Algebras

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Abstract

We show that it is impossible to define a substitution operator for arbitrary representable cylindric algebras that agrees in its basic properties with the notion of substitutions introduced for dimension complemented algebras.

Keywords: Cylindric algebras; Polyadic algbras; Substitutions.

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International Publications Awards

Cairo University

Epimorphisms in Cylindric Algebras and Definability in Finite Variable Logic

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Abstract

The main result gives a sufficient condition for a class K of finite dimensional cylindric algebras to have the property than not every epimorphism is surjective.

In particular not all epimorphisms are surjective in CA_n and the class of representable CA_n for finite n>1. This solves problem 10 of "Cylindric set algebras" by Henkin et all. By a result of Nemeti this shows that the Beth-definability property fails for fiite variable fragments of first order logic as long as the number n of variables is graeter than 1 and we alow models of size > n+1, but holds if we allow models of size n+2. We also ues our results in the paper to show that several problems in the literature concerning injectice algebras and definability of polyadic operations in CA_n are best possible.

Keywords: Algebraic logic; Epimorphisms; Cylindric algebras.

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International Publications Awards

Cairo University

On Naet Embeddings of Agebraisations of First Order Logic

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Abstract

Let alpha$ be an infinite ordinal. There are non-isomorphic representable algebras of dimensio \alpha each of which is a generating subreduct of the same \beta dimensional algebra. Dually there exists a representable algebra A having dimension \alpha, such that A is a generating subreduct of B and B', howecver B and B' are not isomorphic. The above was proved before for cylindric algebras. We show that Pnter's substitution algebras and Halmos' quasipolyadic algebras behave like CA's, while halmos' polyadic algebras do not .

Keywords: Algebraic logic; Cylindric algebras; Substitution algebras; Neat reducts.

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Cairo University

International Publications Awards

IPACU

The Amalgamation Property and A Problem of Henkin Monk and Tarski

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Abstract

Usng the fact that the class of representable cylindric algebras of infinite Dimension fails to have the amalgamation property, we solve a roblem in the monograph "Cylindric algebras, Part 1" by Henkin, Monk and tarski. Our results apply to other algebras, namely Pinter's substitution algebras and Halmos' quasipolyadic algebras.

Keywords: Algebraic logic; Cylindric algebras; Substitution algebras; Super amalgmation.

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International Publications Awards

Cairo University

Neat Reducts and Amalgamation in Retrospect, a Survey of Results and some Methods Part 2

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Abstract

Introduced by Leon Henkin back in the fifties, the notion of neat reducts is an old venerable notion in algebraic logic. But is it often the case that an unexpected viewpoint yields new insight. Indeed the repercussions of the(seemingly very innocent) fact that the class of neat reducts is not closed under forming subalgebras turn out to be enormous. In this paper, we review, and in the process discuss some of these repurcussions in the connection to the algebraic notion of amalgamation. Some new unpublished results (answering long standing open problems in the field) concerning neat reducts and amalgamation are given. (Theorems 11, 13, 19, and 31-38 are such). Several counterexamples which convey the gist of techniques used in this area two of which are new (Theorems18, Theorem 38). It is known that the algebraic notion of amalgamation in a class of algebras correspond to the metalogical notion of omitting types in the corresponding logic.

Answers to open problems in the field are summarized at tabular form at the end of the paper.

This paper appears in two parts. The first part contains results on neat reducts.

The second present part contains results relatimg the notion of neat embeddings to amalgamation.

Keywords: Algebraic logic; amalgamation; cylindric algebras; neat reducts.

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International Publications Awards

Cairo University

On Complete Representations of Algebras of Logic

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Abstract

Introduced by Leon Henkin back in the fifties, the notion of neat reducts is an old venerable notion in algebraic logic.

But it is often the case that an unexpected viewpoint yields new insights.

Indeed, the repercussions of the (seemingly very innocent) fact that the class of neat reducts is not closed under forming subalgebras turn out to be enormous.

In this paper we review and, in the process, discuss, some of these repercussions in connection with the algebraic notion of amalgamation.

Some new we show that there exists an atomic polyadic equlaity algebra of dimension n that is elemtary equivalent to a completely representable polyadic algebra, but its diagonal free reduct is not completey representable

Keywords: Algebraic logic; Polyadic algebrasm complete representations.

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International Publications Awards

Cairo University

Classes of Algebras that Are not Closed Under Completions

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Abstract

We show that for several classes studied in algebraic logic, the class of representable algebras of finite dimension >2 is not closed under completions. We prove similar results for many varieties that approximate the class of representable algebras.

Our results apply to diagonal free algebras polyadic equality algebras and all subreducts in between.

Keywords: Algebraic logic; Cylindric algebras; Polyadic algebras; Completions.

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Cairo University

International Publications Awards

IPACU

On a Theorem of Vaught for First Order Logic with Finitely Many Variables

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Abstract

We prove that the exstence of atomic models for countable atomc theories does not hold for L_n fist order logic restricted to the first n varables for finite n>2. Our proof is algebraic via polyadic algbras. We note that L_n has been studied in recent times as a multi modal logic with applications in computer science

Keywords: Algebraic logic; Vuaght's theorem; Polyadic algebras.

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International Publications Awards

Cairo University

Amalgamation of Reducts of Polyadic Algebras, Both a Positive Result and a Negative Result

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Abstract

Let G\subseteq \omega^{\omega} be a semigroup. G polyadic algebras with equality are reducts of polyadic algebras with equality obtained by restricting the similarity type and axiomatization of polyadic algbras to substitutions in G, and possibly weakening axioms covering diagonal elemnts.

Such algebras where introduced in the context of finitizing first order logic with equlaity.

We show that when G is a specific semigroup then the class of G algebras fails to have the amalgamation propety.

On the other hand, when G is a strongly rich semigroup then a natural superclass of G algebra obtained by discarding one of the equations holding in G has the super amalgmation property

Keywords: Algebraic logic; G polyadic algebras; Amalgamation.

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International Publications Awards

A Note on Cylindric Algebras

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Abstract

If two atomic cylindric set algebras of finite dimnsion > 1 are isomorphic, then base minimality does not imply that they are lower base isomorphic. This contrasts the case of boolean algebras.

Keywords: Algebraic logic; Cylindric algebras; Base isomorphism.

Published in: International Mathematical Forum (1) 6: 267-275 (2009)

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International Publications Awards

Cairo University

Omitting Types Algebraically Via Cylindric Algebras

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Abstract

We generalie the Omitting types Theorem for first order logic to logics with infinitary predicates. Also we give a necessary and sufficient condition for when non principal types are omitted. Our characterization applies to first order logic. Our treatment is agebrac using cylindric algebras.

Keywords: Algebraic logic; Cylindric algebras; Omitting types.

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International Publications Awards

Cairo University

IPACU

On the Amalgamation Property of Various Algebraic Logics

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Abstract

We show that a natural class of representable algebras of logic has the super amalgamation property. Applications of this result are given. In particular questions originally raised by Tarski Henkin Monk and Pigozzi are answered. Several technques for falire of amalgmation are appropriately modeified, proving new results. Answers to open problems are summarized in tabular form at the end of he paper.

Keywords: Algebraic logic; Neat reducts; Superamalgamation.

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International Publications Awards

Cairo University

A Jacobi Spectral Galerkin Method for the Integrated Forms of Fourth-Order Elliptic Differential Equations

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Abstract

This article analyzes the solution of the integrated forms of fourth-order elliptic differential equations on a rectilinear domain using a spectral Galerkin method. The spatial approximation is based on Jacobi polynomials $P_n^{(\alpha,\beta)}(x)$ with $\alpha,\beta\in(-1,\infty)$ and n the polynomial degree. For $\alpha = \beta$, one recovers the ultraspherical polynomials (symmetric Jacobi polynomials) and for $\alpha=\beta=\mp\frac{1}{2}$, $\alpha=\beta=0$, the Chebyshev of the first and second kinds and Legendre polynomials respectively; and for the nonsymmetric Jacobi polynomials, the two important special cases $\alpha=-\beta=\pm\frac{1}{2}$ (Chebyshev polynomials of the third and fourth kinds) are also recovered. The two dimensional version of the approximations is obtained by tensor products of the one dimensional bases. The various matrix systems resulting from these discretizations are carefully investigated, especially their condition number. An algebraic preconditioning yields a condition number of *O(N)*, *N* being the polynomial degree of approximation, which is an improvement with respect to the well-known condition number $O(N^8)$ of spectral methods for biharmonic elliptic operators. The numerical complexity of the solver is proportional to N^{d+1} for a *d*-dimensional problem. This operational count is the best one can achieve with a spectral method. The numerical results illustrate the theory and constitute a convincing argument for the feasibility of the method.

Keywords: Biharmonic operator; Direct solver; Fourth-order differential equations; Jacobi polynomials; Spectral method.

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Cairo University

International Publications Awards

IPACU

Implementation of the Parameter-expansion Method for the Coupled Van Der Pol Oscillators

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Abstract

In this paper, the parameter-expansion method is applied to four mutually coupled biological systems described by coupled Van der Pol oscillators. The coupling parameter is non-identical between oscillators. The result with reveals that approximation obtained by this approach is valid uniformly even for very large parameters. One iteration is sufficient to obtain a highly accurate solution, which is valid for the whole solution domain.

Keywords: Parameter-expansion method; Coupled Van der Pol oscillators.

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International Publications Awards

Application of He's Parameter-expansion Method for the Nonlinear Differential Equations

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[b] Department of Mathematics, Faculty of Science, Benha University, Benha, Egypt

Abstract

In this paper, the parameter-expansion method is implemented to a non-linear differential equations and a coupled system of non-linear partial differential equations. One iteration is sufficient to obtain a highly accurate solution, which is valid for the whole solution domain.

Comparison of the obtained solution with the exact one shows that the method is very effective and convenient. The accuracy of this method is verified for the focusing Manakov systems by ensuring that the conserved quantities remain almost constant.

Keywords: Parameter-expansion method; Focusing Manakov systems; Conserved quantities.

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ISSN: **(**1565-1339) ***IF*****:** (8.479) ***Code*****:** 7502

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Cairo University

International Publications Awards

IPACU

An Efficient Dynamical Systems Method for Solving Singularly Perturbed Integral Equations with Noise

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[b] Benha University, Faculty of Science, Mathematics Department, Benha, Egypt
[c] Qatar University, Faculty of Science, Department of Mathematics, Doha, Qatar

Abstract

In this paper we apply the dynamical systems method (DSM) proposed by A. G. Ramm, and the variational regularization method (VRM), to obtain numerical solution to some singularly perturbed ill-posed problems contaminated by noise. The results obtained by these methods are compared to the exact solution for the model problems. It is found that the dynamical systems method is preferable because it is easier to apply, highly stable, robust, and it always converges to the solution even for large size models.

Keywords: Dynamical systems method (DSM); Variational regularization method (VRM); Ill-posed problems.

Published in: Computers and Mathematics with Applications 58: 1418-1424 (2009).

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International Publications Awards

Exact Solutions of Some Coupled Nonlinear Partial Differential Equations Using the Homotopy Perturbation Method

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Abstract

The purpose of this study is to introduce a modification of the homotopy perturbation method using Laplace transform and Padé approximation to obtain closed form solutions of nonlinear coupled systems of partial differential equations. Two test examples are given; the coupled nonlinear system of Burger equations and the coupled nonlinear system in one dimensional thermoelasticity. The results obtained ensure that this modification is capable of solving a large number of nonlinear differential equations that have wide application in physics and engineering.

Keywords: Homotopy perturbation method; Padé approximation; Laplace transform; Coupled nonlinear Burger equations and 1-D thermo-elasticity.

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International Publications Awards
Cairo University

Concurrent pi-Vector Fields and Energy beta-change

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Abstract

The present paper deals with an intrinsic investigation of the notion of a concurrent π-vector field on the pullback bundle of a Finsler manifold (M,L). The effect of the existence of a concurrent π-vector field on some important special Finsler spaces is studied. An intrinsic investigation of a particular β-change, namely the energy β-change (eL2(x, y) = L2(x, y)+B2(x, y) with B := g(ζ, η); ζ being a concurrent π-vector field), is established. The relation between the two Barthel connections Γ and eΓ, corresponding to this change, is found. This relation, together with the fact that the Cartan and the Barthel connections have the same horizontal and vertical projectors, enable us to study the energy β-change of the fundamental linear connections in Finsler geometry: the Cartan connection, the Berwald connection, the Chern connection, and the Hashiguchi connection. Moreover, the change of their curvature tensors is concluded. It should be pointed out that the present work is formulated in a prospective modern coordinate-free form.

Keywords: Special Finsler space; Pullback bundle; Energy β-change; Concurrent π-vector field; Canonical spray; Barthel connection; Cartan connection; Berwald connection; Chern connection; Hashiguchi connection.

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International Publications Awards

Cairo University

Dynamical Localization for Unitary Anderson Models

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Abstract

This paper establishes dynamical localization properties of certain families of unitary random operators on the *d*-dimensional lattice in various regimes. These operators are generalizations of one-dimensional physical models of quantum transport and draw their name from the analogy with the discrete Anderson model of solid state physics. They consist in a product of a deterministic unitary operator and a random unitary operator. The deterministic operator has a band structure, is absolutely continuous and plays the role of the discrete Laplacian. The random operator is diagonal with elements given by i.i.d. random phases distributed according to some absolutely continuous measure and plays the role of the random potential. In dimension one, these operators belong to the family of CMV-matrices in the theory of orthogonal polynomials on the unit circle. We implement the method of Aizenman- Molchanov to prove exponential decay of the fractional moments of the Green function for the unitary Anderson model in the following three regimes: In any dimension, throughout the spectrum at large disorder and near the band edges at arbitrary disorder and, in dimension one, throughout the spectrum at arbitrary disorder. We also prove that exponential decay of fractional moments of the Green function implies dynamical localization, which in turn implies spectral localization. These results complete the analogy with the self-adjoint case where dynamical localization is known to be true in the same three regimes.

Keywords: Anderson model; Localization; Unitary operators; Fractional moment method.

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Cairo University

International Publications Awards

IPACU

Elastic and Total Reaction Cross Sections of Oxygen Isotopes in Glauber Theory

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Abstract

We systematically calculate the total reaction cross sections of oxygen isotopes, $^{15–24}$O, on a ^{12}C target at high energies using the Glauber theory. The oxygen isotopes are described with Slater determinants generated from a phenomenological mean-field potential. The agreement between theoretical and experimental results is generally good, but a sharp increase of the reaction cross sections from ^{21}O to ^{23}O remains unresolved. To examine the sensitivity of the diffraction pattern of elastic scattering to the nuclear surface, we study the differential elastic-scattering cross sections of proton-^{20,21,23}O at the incident energy of 300 MeV by calculating the full Glauber amplitude.

Keywords: Oxygen isotopes; Glauber theory; Nucleon distributions and halo features; Elastic proton scattering; Interaction and reaction cross section.

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International Publications Awards

Cairo University

Effect of Host Medium on the Fluorescence Emission Intensity of Rhodamine B in Liquid and Solid Phase

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Abstract

In this work, we study the effect of concentration, host medium, PH and Phase states on the fluorescence emission from the laser dye Rhodamine B pumped by UV laser as exited source. The polymethylmethacrylate PMMA is used as a host medium in case of solid phase samples while, ethanol and Tetrahydrofuran (THF) are used in case of a liquid one. Laser Induced Fluorescence (LIF) technique was used to study the fluorescence properties of both cases of liquid and thin film solid-state samples. In addition, the Dual Thermal Lens (DTL) technique was used to study the quantum yield of these samples. The concentrations of Rhodamine B in ethanol as solvent between 2×10^{-2} M and 5×10^{-6} M were studied. The maximum fluorescence emission is observed at concentration of Rhodamine B C=3×10^{-4} M. Comparison studies were investigated for different host medium such as ethanol, THF, PMMA in liquid phase state and PMMA in solid phase state. The measurements revealed that, the behavior of both phases state was analogous. Rhodamine B/PMMA thin film sample by ratio of 4:1 and thickness 0.12 mm was found to have the best photostability sample with a quantum yield about ≈0.82.

Keywords: Laser induced fluorescence (LIF) technique; Rhodamine B; UV laser; Tetrahydrofuran (THF); Polymethylmethacrylate (PMMA); Dual thermal lens (DTL). PH. Quantum yield.

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Cairo University

International Publications Awards

IPACU

Effect of Substrate Temperature on the Alvanomagnetic, Photoelectrical and Optical Properties of Pb08sn0.2te Thin Films

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Abstract

The effect of substrate temperature on the electrical, photoconductivity, galvanomagnetic and optical properties of $Pb_{0.8}Sn_{0.2}Te$ films was studied. The electrical resistivity decreases one order of magnitude as Ts increases and nearly unchanged with the temperature from 77-300 K. The carrier's concentration decreases by 2-3 orders of magnitude as Ts increases. It was observed that the carriers are p-type due to a slight excess Te in the films and nearly unchanged with temperature. The Hall mobility was observed to increase by 1- 2 orders of magnitudes as Ts increases. The average optical transmittance was found to be 30 % for films deposited at room temperature and increases close to 90-100 % as Ts increases to 673 K. The optical band gap was calculated and was found to be quite higher than those for single crystal which decreases as Ts increases to be close to the band gap of the single crystal as films annealed at 673 K. The IR photoconductivity measurements shows that high photosensitivity at low temperature was observed while it was smaller at room temperature. The determined band gap from the photoconductivity measurements is similar to the obtained from the optical method while both of them are higher than the calculated from the semi-empirical formula of $Pb_{0.8}Sn_{0.2}Te$ crystals. This difference was decreased as the substrate temperature increased and mainly depends upon the carrier's concentration. This was explained by the Burstein-Moss effect of low effective mass and/or high carriers concentration semiconductors.

Keywords: Lead Tin Telluride; Thin Films; Structure; Electrical; Optical Properties; Photoconductivity; Energy Gap and Substrate Temperature.

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International Publications Awards

Cairo University

Effect of Substrate Type and Optimization of the Preparation Condition for PbSnTe Films used as IR Photoconductors

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Abstract

$Pb_{0.85}Sn_{0.15}Te$ was prepared from its constituent pure elements by melting in helium atmosphere under vacuum of 10^{-3} Torr. Thin films were deposited from this ingot materials by electron beam evaporation technique on glass and mono-crystalline substrates of KBr, CaF_2, mica sheets and BaF_2 at substrate temperature 573 K. The films were annealed at 723 K for one hour. The composition of the films are close to the ingot material composition while excess Te was observed the crystallographic orientation [200] was observed to be preferred during the growth process of the film. Hall mobility of the films was observed to be lower than of the mobility of the single crystal. p-type carrier concentration of ~10^{18} cm^{-3} at 300 K. Cooling heating cycles process was applied to the films from 100-300 K. The dark and photoconductivity were measured in the same temperature range. It was found the films change due to cooling-heating process. This was discussed briefly and the difference of the thermal expansion coefficient and thermal conductivity between the films and the substrates was pointed out. A model of films-substrates matching was suggested and relations were deduced. It results that the thermally expansion coefficient of the films and the substrates should be close to each other for epitaxial growth. Different substrates with different thermal expansion coefficient, structure, surface properties and unit cell dimension was used in order to verify our suggested model. It was found that the Hall mobility dark conductivity and photoconductivity increase sharply and approach the values of the PbSnTe single crystal for films deposited on single crystalline substrates. The measurements of Hall mobility shows that the carriers are scattered by acoustic phonons. The band gap photoconductivity of the films was measured at different compositions and temperatures under monochromatic IR radiation and the band gap were determined. The results agree well with the theoretical data.

Keywords: PbSnTe; Thin Films; Structure; Photoconductivity; Band.

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Cairo University

International Publications Awards

IPACU

Ameliorative Effect of Mepacure Against Rimactazid-Induced Hepatotoxicity in Rats

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Abstract

Tuberculosis is a dangerous disease and its death toll is increasing year by year. Rimactazid (rifampicin + isoniazid) is one of the effective drugs in the treatment of tuberculosis. However, the use of this drug is associated with toxic reactions in tissues, particularly in the liver. Mepacure (DDB+silymarin) is known to be an effective agent for liver protection and liver regeneration. The aim of this study was to investigate the protective action of mepacure against hepatotoxicity induced by rimactazid drug with respect to the changes in the levels of serum total protein, albumin, total globulins, bilirubin, glucose, triglycerides, total cholesterol, as well as the activities of aspartate transaminase (AST), alanine transaminase (ALT) and alkaline phosphatase (ALP). Treatment of rats with rimactazid alone, daily for six weeks, induced hepatotoxicity as evidenced by serum biochemical measurements: total protein, albumin, bilirubin, glucose contents were significantly elevated, and the levels of triglycerides and AST activity were significantly decreased. Co-administration of mepacure was found to significantly ameliorate the rimactazid drug-induced alterations in the levels of total protein, albumin, bilirubin, glucose and triglycerides. However, the concurrent administration of mepacure and rimactazid enhanced the toxic effect induced by rimactazid alone on the level of serum total cholesterol and the activities of AST and ALP. From the results obtained, it can be concluded that mepacure is beneficial against hepatotoxic actions of drug used in chemotherapy of tuberculosis in animal models, at least from the view point of parameters examined in this study.

Keywords: Tuberculosis; Rimactazid; Mepacure; Total protein; Albumin; Total globulins; AST.

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Faculty of Agriculture

International Publications Awards

Cairo University

Gas Chromatography-Mass Spectroscopy Analysis and Evaluate Cumin Seeds and Their Essential Oil as Growth Promoters of New Zealand White Rabbits

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Abstract

Present study was aimed to investigate the chemical composition of cumin seeds essential oil by using Gas Chromatography-Mass Spectroscopy (GC-MS), also evaluate the effect of cumin seeds at two levels (0.25 and 0.50%) and its essential oil at four levels (25, 50, 100 and 200 mg kg^{-1} b.wt.) on growing New Zealand White (NZW) rabbits performance. Furthermore, a change in blood constituents was measured as indicators of metabolic enzymes. GC-MS data indicated that 28 constituents were identified, representing (91.37%) of the total amount of essential oil. Significant effects of cumin seeds and its essential oil on growing performance, digestibility and some metabolic enzymes functions were observed at some levels either from cumin seed or its essential oil.

Keywords: Cumin; Rabbt; Promoters; Feed efficiency; Carcass; Blood constituent.

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International Publications Awards

Diversity and Evolution of the Cydia Pomonella Granulovirus

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Abstract

Eight new field isolates of *Cydia pomonella* granulovirus (CpGV) originating in Iran and Georgia and one English CpGV isolate were analysed for restriction fragment length polymorphisms (RFLPs) and by partial genome amplification and sequencing. According to the observed RFLPs, most of the predominant genotypes of these isolates could be assigned to those present in previously found isolates originating from Mexico (CpGV-M), England (CpGV-E) and Russia (CpGV-R). We suggest that these isolates should be designated genome A, B and C types, respectively. A fourth genome type was identified in three isolates and is designated D type. The isolates with A, B and D type genomes contained four open reading frames (ORFs) (ORF63– ORF66) not present in C type genomes. The lack of these ORFs in other granuloviruses suggests that the C type genome is evolutionarily ancestral to the other genome types. The B and D type genomes contained an additional insertion of a non-protein coding region of 0.7 kb, which was at different genome locations. Analysis of the partial gene sequences of late expression factor 8 (lef-8), lef-9 and polyhedrin/granulin (polh/gran) genes revealed single nucleotide polymorphisms (SNPs) that corresponded to the RFLP types. Phylogenetic analyses based on these SNPs corroborated the proposed ancestry of the C type genome. C type viruses were also less virulent to neonate codling moth larvae than the other virus types. In conclusion, the known diversity of CpGV isolates can be described by four major genome types, which appear to exist in different isolates as genotype mixtures.

Keywords: ***Cydia pomonella*;** Diversity; Granulovirus; CpGV; RFLP, lef-8, lef-9; Polh/gran.

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International Publications Awards

Cairo University

Evaluation of some Pollutant Levels in Conventionally and Organically Farmed Potato Tubers and their Risks to Human Health

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Abstract

A total of 144 kg of potato tuber samples, representing two different types of Arming production |e g. conventional (C) and organic (0were collected from different locations in Giza govemoralc (Egypt), and subjected to pesticide residue and heavy metal analyses. Residues of some organochlonne pesticides (OCI). such as HCB and hepuchlor as well as some orga no phosphor us pesticides (OPPs). such as merh-amidophos. thiometon. profenofos.phorate and pinmiphos-inethyl were found in a number of samples at concentration levels exceeding their MRU. The majority of the analy2ed samples contained detectable concentrations of Zn, Cu. Mn, Fe. Cd, Pb. Cr. Ni arid Co. Specifically. Pb and Fe were round in a number of samples at concent rations exceeding their MLs. Contamination among the two types of potatoes varied front a season to another and contamination of C potatoes was nearly 2 times that of O potatoes either by pesticides or heavy metals. Estimation of dietary intake of pesticides and heavy metals by potatoes revealed that only phoratc residues cither in conventional or organic potatoes may pose risks to human health. None of the studied heavy metals showed to cause dietary intake risks to human health. The study shed light to the problem of multi toxicants in potatoes.

Keywords: Pesticides and heavy metal; Conventionally and organically produced potatoes; Risk; Assessment.

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International Publications Awards

Cairo University

IPACU

Monitoring of Pesticides and Heavy Metals in Cucumber Fruits Produced from Different Farming Systems

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Abstract

A total of 216 kg of cucumber samples, representing three different types of farming production |e.g.. conventional (C). green house (C) and organic (0)1. Were collected from different locations in Giza governor-ate (Egypt), and subjected to pesticide residue and heavy metal analyses. Residues of some organochlorine pesticides (OCPs), such as hexachlorobenzcnc (HCB), hcptachlor. aldrin, endrin. dieldrin and o.p'-DDT. as well as organophosphorus pesticides (OPPs). such as chlorpyrifos-methyl. thiometon and phorate were found in a number of samples at concentrations exceeding their MRU. Lindane was detected in 33.3%. 50.0% and 25.0% of samples from C. C and O cucumber, respectively, without violation. The insecticide mcthamidophos showed high frequency in the analyzed samples of C. G and 0 cucumbers accounting to 66.7%, 41.7% and 50.0%. Respectively, without violation. The majority of the analyzed samples contained detectable concentrations of Zn. Cu. Mn. Fe. Cd. Pb. Cr. Ni and Co. Only. Pb and Cd were found in a number of samples at concentrations exceeding their MLs. Contamination among the three types of cucumber either by pesticides or heavy metals varied from a season to another. Generally, the greenhouse cucumber contained the highest value of total pesticide residues (1.016 mg kg 1). Followed by organic (0.442 mg kg"1) and then conventional (0.415 mg kg ') cucumbers. Heavy metal contaminations in the three cucumber types accounted to 4.968, 5.350 and 6.248 mg kg ', respectively. The study shed light to the problem of multi toxicants in a food commodity such as cucumber; a common element in the daily human diet.

Keywords: Pesticide residues; Heavy Metals; Cucumber fanning systems.

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International Publications Awards

Cairo University

Nitrogenous Nutrition of Paspalum Turfgrass Grown in Sandy Soil Using Chemical and Biofertilizers

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Abstract

This study was conducted in a private turfgrass nursery in El- kssassin, Ismailia Governorate, during the two successive seasons of 2005/2006 and 2006/2007, with the aim of investigating the response of seashore paspalum (*Paspalum vaginatum*, Swartz cv. Salam) to two N sources: ammonium nitrate (33.5% N) at the rates of 3, 4 or 5 g N/m^2/month, only or cerealin (a commercial product containing *Bacillus polymyxa* and *Azotobacter chroococcum* bacteria) with or without ammonium nitrate at the same rates. Unfertilized plants were used as the control.All treatments increased plant height, turf density, fresh and dry weights of clippings/m^2 and underground parts/m^2, as well as the leaf contents of pigments (total chlorophylls and carotenoids), total carbohydrates, N, P and K, compared with the control. In general, raising the rate of chemical N fertilization caused steady increases in the values of most parameters. These increases were more pronounced when chemical N fertilization was combined with the use of cerealin. Cerealin + N at 5 g/m^2/month gave the highest values for most of the vegetative growth parameters as well as the different chemical constituents, whereas inoculation with cerealin alone was the least effective treatment. In most cases, combining cerealin with chemical N fertilization reduced the need for chemical N fertilization by approximately 20-25%. It can be concluded that inoculation of *Paspalum vaginatum*, Swartz cv. Salam plugs with cerealin, followed by chemical N fertilization of the turf at the rate of 4 g N/m^2/month was sufficient to maintain high quality for the above-ground turf, and relatively good characteristics for the underground parts and chemical composition.

Keywords: ***Paspalum vaginatum*;** Biofertilization; Fertilization.

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International Publications Awards

Cairo University

IPACU

Effect of Gibberellic Acid and Chemical Fertilization on Growth and Chemical Composition of Cryptostegia Grandiflora, R.Br. Plants

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Abstract

This study was conducted in the Experimental Nursery of the Ornamental Horticulture Department, Faculty of Agriculture, Cairo University, during the two successive seasons of 2006/2007 and 2007/2008. The aim of the study was to investigate the response of *Cryptostegia grandiflora*, R. Br. plants to gibberellic acid spray treatments and NPK fertilization (using conventional and slow-release NPK fertilizers). The plants were fertilized monthly with a conventional NPK fertilizer (18 N – 6 P_2O_5 – 6 K_2O) at rates of 5 and 7 g/plant, or were supplied every 4 months with a commercial slow release fertilizer (Regal Nursery, 24 N -8 P_2O_5 -8 K_2O) at rates of 15 and 21 g/plant. In addition, unfertilized plants were used as the control. Plants receiving each of the NPK fertilization levels were sprayed monthly with gibberellic acid at concentrations of 50 or 100 ppm. Control plants were sprayed with tap water. Results showed that GA_3 and/or chemical fertilization treatments increased the values recorded for most of the different vegetative growth parameters (vine length, number of internodes of main vine, average internode length, stem diameter, number of branches/plant, leaf area, fresh and dry weights of leaves, stems and roots/plant), as well as the N and K percentages in leaves, compared to the untreated plants. In most cases, increasing GA_3 concentration resulted in steady increases in these parameters. Total chlorophylls, total carbohydrates and P concentrations were decreased by GA_3 treatments and increased by chemical fertilization treatments. Raising the application rate of each type of chemical fertilizer resulted in steady increases in the values of most of the studied growth parameters. In most cases, at the same fertilization rate, the slow-release fertilizer Regal Nursery gave higher values for most of the vegetative growth and chemical characteristics, compared to the conventional NPK fertilizer. In most cases, combining GA_3 at 50 ppm with the highest rate of Regal Nursery (21 g/plant/4 months) gave values that were insignificantly different than the highest values recorded for most of the vegetative characteristics, which were obtained in plants sprayed with GA_3 at 100 ppm and supplied with the highest rate of Regal Nursery. From the obtained results, it can be recommended that, for the best vegetative growth of *Cryptostegia grandiflora* plants, the plants should be sprayed with GA_3 at 50 ppm and supplied with 21 g/plant/ 4 month of the slow- release fertilizer Regal Nursery (24 N -8 P_2O_5 -8 K_2O).

Keywords: ***Cryptostegia grandiflora*;** GA_3; NPK fertilization; Slow release fertilizer; Regal Nursery.

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International Publications Awards

Cairo University

Response of Paspalum Turfgrass Grown in Sandy Soil to Trinexapac-ethyl and Irrigation Water Salinity

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Abstract

This study was conducted at a private turf nursery in El-Kassassin, Ismailia Governorate, Egypt, during the two successive seasons of 2006/2007 and 2007/2008, with the aim of investigating the response of paspalum (*Paspalum vaginatum*, Swartz), grown in sandy soil, to trinexapac-ethyl (TE) and irrigation water salinity. The turfgrass was irrigated with water containing NaCl and $CaCl_2$ (1:1, w/w) at concentrations of 5000, 7000 and 9000 ppm. Control plants were irrigated using water from Ismailia canal (310 ppm). Plants receiving each of the irrigation water salinity treatments were sprayed monthly with TE at concentration of 200 and 400 ppm. Control plants were sprayed with tap water. Results showed that spraying turfgrass with TE increased most of the vegetative growth characteristics (coverage percentage, lawn density, fresh and dry weights of underground parts) as well as concentrations of total chlorophylls, carotenoids, total carbohydrates and K in clippings, whereas raising the salt concentration in irrigation water resulted in steady reductions in the values of these parameters, compared to the control. On the other hand, spraying the turfgrass with TE decreased the concentrations of proline, Na, Cl and Ca in clippings, whereas raising the irrigation water salinity resulted in steady increases in the values of these parameters, compared to the control. Both TE and irrigation water salinity treatments decreased sward height before mowing as well as fresh and dry weights of clippings, compared to the control. In both seasons, paspalum turfgrass irrigated with saline water up to 7000 ppm and sprayed with TE at 400 ppm gave coverage percentage, turf density, fresh and dry weights of underground parts as well as concentrations of total chlorophylls and carotenoids which were insignificantly different than those recorded with control plants. It can be concluded that for improving the tolerance of *Paspalum vaginatum* grown in sandy soil to irrigation water salinity up to 7000 ppm, with no significant reduction in most of vegetative characteristics and quality, the turf should be sprayed monthly with TE at 400 ppm.

Keywords: ***Paspalum vaginatum*;** Trinexapac-ethyl; TE; Salinity.

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International Publications Awards

Response of Senna Occidentalis, Link Plants to Fertilization as well as Citric Acid and Their Role in Remediating Soil Polluted with Cu and Pb

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Abstract

This study was carried out in polyethylene bags at the Experimental Nursery of the Ornamental Horticulture Department, Faculty of Agriculture, Cairo University, Giza, Egypt during the two successive seasons of 2007/2008 and 2008/2009, with the aim of investigating the response of *Senna occidentalis* plants, grown in sandy clay loam soil polluted with Cu and Pb, to citric acid (0, 10 and 20 m M), El-Wadi compost as organic fertilizer (1 compost: 9 soil, v/v) and monthly chemical NPK fertilization (0, 5, 6 and 7 g/plant of 18-6-6, N-P_2O_5-K_2O) and their role in remediating the soil. The results showed that the vegetative characteristics (plant height, stem diameter, number of branches/plant and fresh and dry weights of leaves, stems and roots/plant and dry weight of shoots) as well as concentrations of total chlorophylls in leaves, total carbohydrates, N, P, K, Cu and Pb in shoots, Cu and Pb uptake were favourably affected by the different fertilization treatments either chemical fertilization separately or combined with El-Wadi compost. Increasing NPK rate with or without the compost increased most values. The combined treatments of chemical NPK fertilization and El-Wadi compost gave higher values for most characters, as compared to those obtained with plants received the same chemical fertilization alone. On the other hand, the extractable Cu and Pb in the soil decreased by fertilization. Treating soil with citric acid decreased the values of different vegetative growth characteristics as well as concentrations of total chlorophylls in leaves, total carbohydrates in shoots and extractable Cu and Pb in the soil. On the other hand, it increased the concentrations of N, P, K, Cu and Pb in shoots as well as Cu and Pb uptake. It can be concluded that, For the the best vegetative growth of *Senna occidentalis* plants grown in soils polluted with Cu and Pb, the soil should receive El-Wadi compost (1 compost : 9 soil) and the plants should be fertilized with 7 g NPK (18-6-6)/plant monthly with no addition of citric acid. For improving the remediation of soil, the soil should be treated with citric acid at 20 m M before planting and the plants should be fertilized with the previous fertilization treatment.

Keywords: ***Senna occidentalis*;** Fertilization; Polluted soils; Heavy metals; Cu; Pb; Hyperaccumulator.

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International Publications Awards

Cairo University

Bio - Organic Fertilization and its Impact on Apricot Young Trees in Newly Reclaimed Soil

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Abstract

This study was carried out on young Canino apricot trees (*Prunus armeniaca* L.) during 2006/2007 and 2007/2008 seasons in National Research Centre station – at Nubaria region. Response of vegetative growth, leaf mineral and chlorophyll contents to organic fertilization (Compost) either or in combination with tested biofertilizers (Yeast. *Candida tropicalis* and/or *Azospirillum lipoferum*) were compared with mineral fertilization. Compost was added in three levels i.e, 50,100 and 150 % based on actual N recommended by Egyptian Ministry of Agricultural (75 and 150 g for 1st and 2nd season, respectively). Results indicated that mineral fertilization significantly improved values of all tested parameters compared with all treatments in the first season. While in the second one, high levels of the organic fertilizer (100 or 150 % Compost) in combination with both biofertilizers reflected best results with regard to vegetative growth parameters. This revealed promoting effects of both biofertizers. The effect of yeast was attributed to being a natural source of cytokinins, protein, nucleic acid and vitamin B. whereas the effect of azospirllium was attributed to its nitrogen fixation, auxins biosynthesis and reducing soil pH and thus releasing fixed nutrients. This was also reflected on achieving the highest macro and micro nutrients and chlorophyll in the leaves of these treatments.

Keywords: Young apricot trees; Canino; Organic fertilization; Biofertilization Vegetative growth; Macro and micro nutrients; Chlorophyll.

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International Publications Awards

Effect of Summer Pruning and GA3 Spraying on Inducing Flowering and Fruiting of Zebda Mango Trees

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Abstract

This study was carried out to evaluate the effect of summer pruning and GA_3 spraying after fruit setting in the on year on inducing flowering and yield in the off year season of mango cv Zebda. Trees were subjected to the following pruning treatments, light, moderate and severe pruning. Pruning treatments were done after fruit setting during the last week of May in 2005 and 2006 seasons.

Trees were sprayed immediately after pruning with GA_3 at 0, 25, 50 or 100 ppm.

The highest number of new flushes per shoot was achieved with severe pruning and spraying GA_3 at 100 ppm. Moderate pruning with GA_3 at 100 ppm was the most effective treatment for increasing length of new flushes. Moderate pruning with application of GA_3 at 100 ppm recorded the highest number of leaves per flush. Severe pruning and application of GA_3 at 50 ppm gave the maximum number of panicles per shoot.

The longest panicle resulted from moderate pruning and GA_3 at 100 ppm. Severe pruning treatment with GA_3 at 100 or 50 or 25 ppm was the most effective for increasing number of fruits per tree. The highest fruit weight was recorded with moderate pruning without spraying GA_3. Moderate pruning and GA_3 at 50 ppm proved to be the most effective treatment for improving yield of Zebda mango trees in the off- year season.

Keywords: Mango (*Mangifera indica*, L.); Pruning; GA_3; Yield.

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International Publications Awards

Cairo University

Vegetative Growth Cycles of Some Mango Cultivars in Relation to Flowering and Fruiting

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Abstract

This experiment was carried out during the years 2006, 2007 and 2008 on four mango cultivars namely Ewais, Sediek, Zebda and Keitt. The experiment was designed to evaluate the three vegetative growth cycles of spring, summer and autumn of these cultivars in relation to flowering and fruiting. Results indicated that, the trees in "off" year produced higher percentage of vegetative growth cycles than those in "on" year and the main growth cycle was emerged in the summer this was noticed with all tested cultivars. Vegetative growth cycles emerged in "off" year was higher in shoot length, number of leaves and leaf area than those emerged in "on" year. Summer growth cycle recorded the highest significant shoot length, number of leaves and leaf area compared to spring and autumn growth cycles. Generally, the three growth cycles differed in shoot length, number of leaves and leaf area according to bearing habit and cultivars. Summer growth cycle gave the highest flowering percentage followed by spring cycle then autumn cycle which recorded the lowest values. Percentage of perfect flowers and panicle length was significantly higher in "on" year than "off" year. The highest percentage of perfect flowers and panicle length was detected in summer growth cycle followed by spring and autumn cycles. Pollen germination percentage was significantly higher in "on" year than "off" year. Summer growth cycle recorded the highest pollen germination followed by spring and autumn growth cycles. Keitt and Zebda cultivars recorded higher pollen germination than Sediek cultivar. On the other hand, the lowest pollen germination was achieved with Ewais cultivar. Panicles emerged in "on" year has significant higher number of fruits at harvest than those emerged in "off" year. Number of fruits per panicle at harvest varied significantly between the three growth cycles where, the highest value was recorded with summer followed by spring and autumn cycles. The trees in "off" year produced higher fruit weight than in "on" year. The maximum fruit weight was presented on summer growth cycle followed by spring growth cycle, while the minimum fruit weight was found on the autumn growth cycle. There were no significant differences in fruit TSS and acidity among the three vegetative growth cycles.

Keywords: Mango; Vegetative growth cycles; Flowering; Fruiting.

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International Publications Awards

Comparative Study on Normal and Nubbin Fruits of Some Mango Cultivars

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Abstract

This study was carried out during 2007 and 2008 seasons on 20 years old trees of Ewais, Hindi Bisinnara, Hindi Khassa and Bullocks Heart mango cultivars. The study aimed to compare between normal and nubbin fruits of the studied cultivars. Results indicated that the highest percentage of nubbin fruits was recorded with Bullocks Heart cultivar followed by Ewais and Hindi khassa cultivars. Meanwhile the lowest percentage was achieved with Hindi Bisinnara cultivar. Number of normal fruits was higher than the nubbin fruits for all tested cultivars. Ewais trees produced the maximum number of nubbin fruits comparing to the other tested cultivars. Trees of the four tested cultivars produced higher significant yield of normal fruits than nubbin fruit. Bullocks Heart and Ewais trees produced higher yield of normal and nubbin fruits than the other tested cultivars. Fruit length, width and thickness were significantly of grater values for normal fruits than for nubbin fruits. Normal fruits recorded higher fruit and pulp weight than the nubbin fruits. Meanwhile, the pulp stone ratio was higher in nubbin fruits than the normal fruits.

The normal fruits contained higher acidity than the nubbin one. The nubbin fruits were higher in their TSS, total sugars and TSS/ acid ratio than the normal fruits. Nubbin fruits recorded higher weight loss and decayed earlier than the normal fruits when kept at room temperature for two weeks. Analysis of endogenous hormones revealed that, the normal fruits contained higher concentrations of gibberellins and cytokinins and lower concentrations of auxins and abscissic acid comparing to the nubbin fruits. These findings explain the reasons of making mango nubbin fruits have a slower growth rate than the seeded one and small in size, and most of these fruits dropped and fail to reach full size.

Keywords: Mango; *Mangifera indica*; Nubbin fruit; Gibberellins; Cytokinins; Auxins; Abscissic acid; Yield; Fruit weight; TSS.

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International Publications Awards

Cairo University

Effect of Pruning Severity and Spraying Some Chemical Substances on Growth and Fruiting of Guava Trees

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Abstract

An experiment was carried out on 25 years old guava trees hybrid I grown at the nursery of the faculty of Agriculture, Cairo University, Giza, Egypt during the two successive seasons, 2005 and 2006. Trees were subjected to the following pruning treatments, pinching, moderate or severe pruning and sprayed on 15th February after pruning with potassium nitrate (1, 2 and 4%) or ethephon (200, 400 and 600 ppm) or dormex (0.5, 1 and 1.5%) compared with the control(sprayed with water only), to study their effect on inducing growth and yield of guava trees. Results showed a significant increase in average index number of bud burst and shoot length with severe pruning plus spraying potassium nitrate at 4% concentration compared to the other treatments. Moderate pruning plus spraying ethephon at 600 ppm produced the highest number of new shoots in both seasons. Dormex at 1.5% with moderate pruning gave the highest average index number of flower bud burst in the first season. Meanwhile, ethephon at 600 ppm with severe pruning produced the highest average index number of flower bud burst in the second season. A pronounced and significant increase in initial fruit set was found with moderate pruning and application of potassium nitrate at 4%. Also, pruning treatments with spraying chemicals substances improved tree yield.

Keywords: Guava; Pruning; Potassium nitrate; Ethephon; Dormex; Growth; Fruit set; yield.

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International Publications Awards

Effect of Irrigation Levels on Fruit Quality of The Picual Olive (Olea Europaea L.) Cultivar

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Abstract

This study was carried out in two successive seasons (2004/ 2005 and 2005/ 2006) on the Picual olive (*Olea europaea* L.) cultivar grown in El-Maghara region in mid North Sinai Governorate. It was aimed to evaluate the effect of different levels of irrigation on fruit quality of this cultivar. Trees were about 10 years old grown in sandy soil, planted at a spacing of 5m x 5m and the drip irrigation system was used. Three levels of irrigation were used, i.e 100% or 75% or 50% of the actual calculated needs of water requirements. Results indicated that fruit weight, volume, length, diameter and flesh thickness and moisture were increased under the 100% irrigation level. Meanwhile the fruit oil content and water use efficiency were increased under the irrigation level of 50% actual water needs. Acid value and saponification number were decreased by decreasing irrigation levels. The effect of irrigation level of 75% actual need gave intermediate values between 100% and 50% irrigation levels for studied parameters. It could be concluded that growing olive trees under water deficiency (50-75% of actual water requirements) may be employed to increase olive fruit oil content and water use efficiency and decrease acid value of olive oil.

Keywords: Olive; *Olea europaea* L.; Irrigation levels; Fruit quality.

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International Publications Awards

Cairo University

Fruit, Seed and Seedling Characteristics of Eight Newly-Developed Interspecific Hybrids of Citrus

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Abstract

This study was carried out during the years 2005, 2006 and 2007 at a private farm in Wardan village and greenhouses and laboratories of Faculty of Agriculture, Cairo university, Giza, Egypt. The objectives were to develop and evaluate characteristics of fruits, seeds and seedlings as well as leaf endogenous hormones of eight newly-developed citrus interspecific hybrids. Five Egyptian cultivars of citrus viz. Sour orange (SO), Volkamer lemon (VL), Lime (LI), Balady mandarin (BM) and Valencia orange (VO) were used as parents; the 1st two, i.e SO and VL were used as seed parents to be crossed with the pollen parents, so eight interspecific citrus hybrids were developed. Selfing was also done for the two seed parents. Germination tests of the seeds indicated that two hybrids (VLLI and VLBM) failed to develop embryos (embryo abortion) and six hybrids developed embryos and seedlings, namely SOVL, SOVO, SOLI, SOBM, VLVO and VLSO. Sour orange cultivar was better than Volkamer lemon as a seed parent in giving hybrids with better fruit, seed and embryo traits and could therefore be consider a good seed parent in hybridization programs of citrus breeding. However, hybrids made on Volkamer lemon showed higher means of most studied seedling characteristics, higher contents of endogenous cytokinins and lower contents of ABA than those made on Sour orange. More specifically, the hybrid VLSO combined the greatest number of desirable traits of seedlings, the highest content of leaf cytokinins and gibberellins and the lowest content of ABA; the hybrid VLVO ranked second in this regard and its seed contained a large number of nucellar embryos. Moreover, the hybrid SOLI was the earliest in fruit maturity and the highest in seed germination%, polyembryonic seeds% and embryos/seed; the hybrid SOBM ranked second in this regard. These hybrids were more vigorous than others and than VL and SO selfed parents and could therefore be considered of good potential as genetically improved rootstocks.

Keywords: Interspecific hybrids; Citrus; Fruit set; Fruit maturity; Polyembryony; Seedling; Endogenous hormones.

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International Publications Awards

Response of Citrus Rootstocks and Transplants to Biofertilizers

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Abstract

This study was carried out during 2007 and 2008 seasons on 20 years old trees of Ewais, Hindi Bisinnara, Hindi Khassa and Bullocks Heart mango cultivars. The study aimed to compare between normal and nubbin fruits of the studied cultivars. Results indicated that the highest percentage of nubbin fruits was recorded with Bullocks Heart cultivar followed by Ewais and Hindi khassa cultivars. Meanwhile the lowest percentage was achieved with Hindi Bisinnara cultivar. Number of normal fruits was higher than the nubbin fruits for all tested cultivars. Ewais trees produced the maximum number of nubbin fruits comparing to the other tested cultivars. Trees of the four tested cultivars produced higher significant yield of normal fruits than nubbin fruit. Bullocks Heart and Ewais trees produced higher yield of normal and nubbin fruits than the other tested cultivars. Fruit length, width and thickness were significantly of grater values for normal fruits than for nubbin fruits. Normal fruits recorded higher fruit and pulp weight than the nubbin fruits. Meanwhile, the pulp stone ratio was higher in nubbin fruits than the normal fruits.

The normal fruits contained higher acidity than the nubbin one. The nubbin fruits were higher in their TSS, total sugars and TSS/ acid ratio than the normal fruits. Nubbin fruits recorded higher weight loss and decayed earlier than the normal fruits when kept at room temperature for two weeks. Analysis of endogenous hormones revealed that, the normal fruits contained higher concentrations of gibberellins and cytokinins and lower concentrations of auxins and abscissic acid comparing to the nubbin fruits. These findings explain the reasons of making mango nubbin fruits have a slower growth rate than the seeded one and small in size, and most of these fruits dropped and fail to reach full size.

Keywords: Mango; ***Mangifera indica*;** Nubbin fruit; Gibberellins; Cytokinins; Auxins; Abscissic acid; Yield; Fruit weight; TSS.

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International Publications Awards
Cairo University

Rooting Light Weight Offshoots of Zaghloul Date Palm Using Hydroponic Technique

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Abstract

Two experiments were carried out to evaluate the rooting possibility of different weights of Zagloul date palm offshoots as affected by plant growth regulators injection. The first was dealt with studying the effect of different offshoots weights (<2 kg, 2 to <5 kg, 5 to <8 kg, 8 to <12 kg and 12 to 15 kg) on offshoots performance under nursery condition. The second was carried out at the greenhouse to investigate the effect of IBA, NAA and IAA injection at 0, 50, 100 and 150 ppm on Zagloul date palm offshoots weighing <2 kg, 2 to <5 kg and 5 to <8 kg cultured in hydroponics system. Nursery results cleared that offshoots weighing 12 to 15 kg gave the highest percentages of survival, rooting and good parameters of growth. On the other hand, offshoots weighing less than 2 kg appeared 100% mortality after 12 months from planting. In hydroponics culture, offshoots survival percentage, number of leaves per offshoot, leaf length, rooting percentage and number of roots per offshoot were significantly increased by either offshoots weight 5 to <8 kg or IBA treatment. Also, offshoots injected by 150 ppm IBA gave the highest growth and rooting parameters. The highest percentages of survival and rooting and good performance of growth and rooting parameters were obtained with offshoots weighing 5 to <8 kg injected by 150 ppm IBA. Finally, this study is opening field to expansion advantaging from terminal products through detachment offshoots from date palm i.e., aerial offshoots, secondary offshoots and small offshoots in date palm propagation.

Keywords: Date palm; Light weight offshoots; Growth regulators; Hydroponics; Rooting.

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International Publications Awards

Characteristics of Four Barhee Dates Strains as Affected By Pollen Source and Pollination Time

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Abstract

This study was carried out during two successive seasons (2005 & 2006) at the Experimental Research Station, Fac. Agric. Giza, Egypt. Pollen grains used in this trial were collected from three regions (Fayoum, Kerdasa and Maraziek) to pollinate four strains of Barhee seedling palms at three times (2, 4 and 6 days of spathe cracking). Results indicated that all studied fruit characters were significantly differed between Barhee strains. Fayoum pollen source gave the highest fruit retained and bunch weight with low fruit quality (fruit and flesh weights, fruit dimensions and fruit contents of TSS, total soluble and reducing sugars) comparing with other pollen sources. While, Kerdasa pollen source gave the highest fruit quality in both seasons with decreasing in fruit retained and bunch weight comparing with other pollen sources. In addition delaying pollination time from 2 to 6 days after spathe cracking reduced fruit retained percentage and bunch weight, whereas, it enhanced fruit quality in both seasons. The interaction between pollen grain source and pollination time significantly affected fruit characters under study in the two seasons.

Keywords: Date palm; Pollen source; Pollination time; Barhee; Strains.

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International Publications Awards

Cairo University

Effect of NAA, GA3 and Cytophex Spraying on Samany and Zaghloul Date Palm Yield, Fruit Retained and Characteristics

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Abstract

This investigation was conducted during two successive seasons (2005 and 2006) at the Experimental Research Station, Fac. Agric. Giza, Egypt. Samany and Zaghloul fruiting date palms were conducted in this study. The study is aimed to improve fruit quality through spraying NAA at 0, 50, 100, 150 ppm, GA_3 at 0, 50, 100, 150 ppm and Cytophex (CPPU, 2-Chloro-4-pridyl phenyl urea) at 0, 25, 50, 75 ppm on strands after carples fall (4 weeks after pollination). Results indicated that spraying 150 ppm of GA_3 produced the lowest retained fruits and bunch weight of Samany and Zaghloul cultivars. Also, spraying 75 ppm of cytophex increased significantly fruit and flesh weight of Samany and Zaghloul fruits. Fruit length, fruit diameter and fruit size of Samany and Zaghloul date palm had increased by spraying cytophex at 75 ppm. Fruit chemical properties appeared that fruit moisture content was reduced by spraying GA_3 at 150 ppm or cytophex at 75 ppm in both cultivars during the two seasons. In addition, spraying 75 ppm of cytophex increased Samany and Zaghloul fruits content of TSS, Total soluble sugars and reducing sugars in the two seasons. From these results, spraying 75 ppm of cytophex is the best treatment to increase Samany and Zaghloul fruits quality under Giza conditions.

Keywords: Cultivar; Cytophex; Date palm; Fruits; GA_3; Quality; Samany; Spraying; Zaghloul.

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International Publications Awards

Comparison Study on Barhee Cultivar and Two Strains of Barhee Palm Seedling Trees

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Abstract

This study was carried out during two successive seasons 2007 and 2008 at the Experimental Research Station, Fac. Agric. Giza, Egypt. Two strains of Barhee seedling palms were used in this trial compare with Barhee cultivar. Results indicated that morphological characters of date palm Barhee cultivar and the studied strains were similar statistically concerning trunk girth, length of frond base zone and spines number and length. Whereas, strain 2 recorded the highest values of spine zone length of frond and leaflet length. On the other hand, Barhee cultivar and strain 2 produced similar statistically results of frond and leaflet length. On the other hand, the highest leaflet zone of frond was obtained with Barhee cultivar leaves. In addition, there is no significant differences were obtained in strands numbers per inflorescence between Barhee cultivar and the other two palm strains under study. Strain two produced the longest strand followed by Barhee cultivar and strain one. Concerning fruit retained percentage and bunch weight, strain 2 produced the highest values in this regard while Barhee cultivar produced the lowest values in this concern. Also, strain 2 produced the highest weight of fruits, flesh, seed and the percentage of seed/fruit weight; whereas, Barhee cultivar produced the lowest values in this regard. Moreover, fruit length (L), diameter (D), L/D ratio, size and fruit firmness did not differ significantly within Barhee cultivar and the studied strains. Regarding to fruit chemical properties, there is no significant differences were detected between Barhee cultivar and the strains under study concerning fruit moisture, acidity, chlorophyll A and B and carotene. Also, there is no significant differences were found between different sources of Barhee in their fruit contents of TSS in the two seasons. On the other hand, strain two produced the highest total and non-reducing sugars of fruit content comparing with Barhee cultivar and strain one. Whereas, strain one produced the highest fruit content of reducing sugars comparing with fruits of Barhee cultivar and strain two. Sensory evaluation revealed that two strains of seedling Barhee palm that compared during this study with Barhee cultivar were similar in all studied attributes with scoring excellent except fruit chewiness for strain two that achieved very god score.

Keywords: Barhee; Chemical properties; Date palm; Evaluation; Fruit; Physical properties; Sensory; Strains.

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Faculty of Veterinary Medicine

International Publications Awards

Cairo University

Chemical and Biological Investigation of Arauca heterophylla Salisb Resin

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Abstract

Three labdane diterpenes, namely labda-8(17),14-diene, 13-epicupressic acid, and 13-Oacetyl-13-epicupressic acid, were isolated from the resin collected from stem exudates of Araucaria heterophylla Salisb. (Araucariaceae). The isolated compounds were identified using different spectroscopic methods (1H NMR, 13C NMR, HMQC, HMBC and COSY).The resin extract showed antiulcerogenic activity against ethanol-induced stomach ulcers in Sprauge Dawely rats using ranitidine as standard. In addition,the resin and theisolated compounds showed variable cytotoxic activities against breast (MCF7) and colon (HCT116) cancer cell lines.

Keywords: Araucaria heterophylla; Labdane Diterpenes; Antiulcerogenic and Cytotoxic Activities.

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International Publications Awards

The Role of Ornamental Goldfish Carassius Auratus in Transfer of Some Viruses and Ectoparasites to Cultured Fish in Egypt: Comparative Ultrapathological Studies

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Abstract

Goldfish, common carp and Nile tilapia were sampled to investigate lesions induced by viral diseases and ectoparasites. Goldfish exhibited neoplasms, *Dermocystidium* sp., *Ichthyophthirius multifiliis* (Ich), *Trichodina reticulata*, *Lernaea cyprinacea* and systemic infections. Neoplastic and systemic infections in goldfish were associated with viral infection. *Oreochromis niloticus* and *Cyprinus carpio* were mainly infested with several species of *Trichodina* and monogeneans.The presence of *Dermocystidium* sp. in carp, and viral particles in the liver and spleen of *O. niloticus* and *C. carpio*, was uncommon. Microscopically, intracytoplasmic inclusion bodies in the hepatic cells and lymphocytic infiltration in other internal organs of the three fish species were seen. Ultrastructural study showed enveloped viral particles in some cells in all fish species. The recorded parasitic infections were associated with degenerative, necrotic, inflammatory and proliferative changes in the skin and underlying muscles. Imported ornamental goldfish may be a source of infection to carp and native tilapia. Histopathology and transmission electron microscopy demonstrated the etiology and pathogenesis of infection and the preliminary diagnosis of viral infection, which is not common in Egypt. It is recommended that goldfish be excluded from edible-fish aquaculture ponds. Strict regulations regarding the transfer and quarantine of imported fish should be implemented.

Keywords: Carassius auratus; Cyprinus carpio; Dermocystidium sp.; Electron microscopy; histopathology; Ichthyophthirius multifiliis; Ich, Lernaea cyprinacea; Oreochromis niloticus; Trichodina reticulate; Viruses.

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International Publications Awards

Cairo University

Pharmacokinetics of Levofloxacin in Male Camels (Camelus Dromedarius)

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Abstract

The target of the present study was to investigate the plasma disposition kinetics of levofloxacin in Camels (n = 8) following a single intravenous (i.v.) bolus or intramuscular (i.m.) injection at a dose rate of 4 mg/kg bwt, using a two-phase crossover design with 15 days as an interval period. Plasma samples were collected at appropriate times during a 48-h administration interval, and were analyzed using a microbiological assay method. The plasma levofloxacin disposition was best fitted to a two-compartment open model after i.v. dosing. The half-lives of distribution and elimination were 0.26 ± 0.21 and 2.92 ± 0.61 h, respectively. The volume of distribution at steady-state was 1.01 ± 0.36 L/kg, the total body clearance (Cl_{tot}) was 0.28 ± 0.08 L/h/kg, and the areas under the concentration–time curves (AUCs) were 14.51 ± 2.64 µg.h/mL. Following i.m. administration, the mean $t_{1/2el}$ and AUC values were 3.47 ± 0.86 h and 13.63 ± 3.11 µg.h/mL. The bioavailability was high (93.95% ± 8.38%), with a peak plasma mean concentration (C_{max}) of 1.90 ± 0.73 µg/mL attained at 1.51 ± 0.61 h (T_{max}). The in vitro protein binding percentage was 23.51%. Based on the calculated C_{max}/MIC and AUC_{24}/MIC, a dosage of 5 mg/kg b.wt. is recommended to treat infections caused by bacteria with MIC ≤ 0.1 μg/ml.

Keywords: Levofloxacin; camels; Pharmacokinetic disposition; MIC; Bioavailability.

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International Publications Awards

Pharmacokinetics, Urinary Excretion and Milk Penetration of Levofloxacin in Lactating Goats

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Abstract

The pharmacokinetic properties of levofloxacin, were investigated in six lactating goats after single intravenous (IV) and intramuscular (IM) administration at a dose of 4 mg/kg body weight (b.w.). Levofloxacin concentration was analyzed by microbiological assay using *Escherichia coli* ATCC 10536 as test microorganism in plasma, milk and urine samples. Plasma levofloxacin disposition after IV and IM dosing was best fitted to a bicompartmental and a monocompartmental open models with first-order elimination, respectively. Following IV administration, the distribution half-life ($t_{1/2\alpha}$) was 0.31 ± 0.11 h and the elimination half-life ($t_{1/2\beta}$) was 2.95 ± 0.27 h. The volume of distribution at steady state (V_{dss}) was 0.73 ± 0.22 L/kg and the total body clearance (Cl_{tot}) was 0.18 ± 0.04 L/h/kg. Following IM administration, the mean T_{max}, C_{max}, $T_{1/2el}$ and AUC values for plasma data were 1.78 ± 0.32 h, 3.16 ± 0.46 µg/mL, 3.64 ± 0.42 h and 21.31 ± 1.24 µg•h/mL, respectively. The IM bioavailability was 84.91 ± 7.52% and the protein binding of levofloxacin in plasma and milk were 22% and 37%, respectively. Levofloxacin penetration from the blood into the milk was extensive and rapid, and the drug was detected for 36 h after IV after IM injections. Levofloxacin urine concentration was 10 to 18 times higher than concurrent plasma concentration and also, could be detected in urine till 36 h post-injections by both routes. Consequently, systemic administration of levofloxacin could be efficacious against susceptible mammary and urinary pathogens in goats.

Keywords: Levofloxacin; Goats; Pharmacokinetics; Urine; Milk.

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Institute of Statistical Studies and Research

International Publications Awards
Cairo University

A Comparative Study for Estimating Parameters in Panel Data Model

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Abstract

This paper examines the panel data models when the regression coefficients are fixed, random, and mixed, and proposed the different estimators for this model. We used the Mote Carlo simulation for making comparisons between the behavior of several estimation methods, such as Random Coefficient Regression (RCR), Classical Pooling (CP), and Mean Group (MG) estimators, in the three cases for regression coefficients. The Monte Carlo simulation results suggest that the RCR estimators perform well in small samples if the coefficients are random. While CP estimators perform well in the case of fixed model only. But the MG estimators perform well if the coefficients are random or fixed.

Keywords: Panel Data Model; Random Coefficient Regression Model; Mixed RCR Model; Monte Carlo Simulation; Pooling Cross Section and Time Series Data; Mean Group Estimators; Classical Pooling Estimators.

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International Publications Awards

Building Logical Statements for Decision Making based on Symbolic Value Partition Technique and Generalized Distribution Table

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Abstract

Knowledge acquisition continues to be a challenging and time consuming task in building decision support systems. Rule induction is a data mining process for acquiring knowledge in terms of decision rules from a number of specific 'examples' to explain the inherent causal relationship between conditional factors and a given decision. This paper introduces a rule induction algorithm which uses (i) The symbolic value partition technique, which divides each attribute domain of a data table into a family of disjoint subsets, and construct a new data table with less attributes and smaller attribute domains; (ii) using the Generalized Distribution Table (GDT) as a hypothesis search space and combining the GDT with the rough set methodology to generate decision rules from the new data table. The proposed algorithm could effectively reduce the size of attribute domains. Furthermore, it help computing smaller rule sets with better coverage and Better classification accurate rates compared with that of the attribute reduction approach.

Keywords: Knowledge discovery; Rule Induction; Rough sets; Attribute reduction; Symbolic value partition.

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International Publications Awards

Fault Diagnosis of Power Transformer Based on Fuzzy Logic, Rough Set theory and Inclusion Degree Theory

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Abstract

Power transformers are one of the most expensive components of electrical power plants and the failures of such transformers can result in serious power system issues, so fault diagnosis for power transformer is very important to insure the whole power system run normally. Due to information transmission mistakes as well as arisen errors while processing data in surveying and monitoring state information of transformer, uncertain and incomplete information may be produced. Moreover, real time is another important characteristic so as to meet high speed diagnosis requirements. Based on these points, this paper presents an intelligent fault diagnosis method of power transformer based on fuzzy logic Rough set theory and inclusion degree theory. By using a fuzzy logic technique, the continuous attribute values are transformed into the fuzzy values by automatically deriving membership functions from a set of data with similarity clustering, then rough sets is applied to implement attributes reduction and a simplified decision table is got, finally, inclusion degree theory is used for inducing logical rules from quantitative data. The practical results show that the method is an effective method for fault diagnosis of transformer and has yielded promising results.

Keywords: Transformer; Fuzzy logic; Inclusion degree theory; Rule induction; Fault diagnosis; Rough Set theory.
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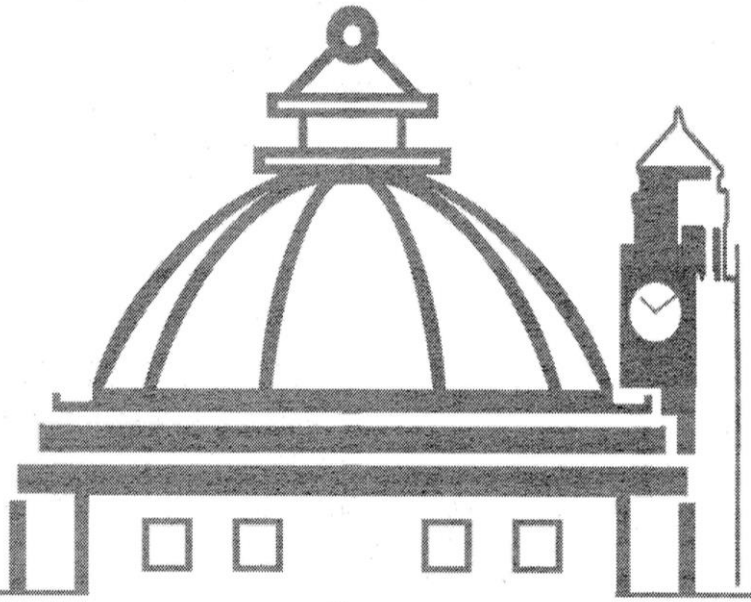

Medical Sciences Sector

Faculty of Medicine

International Publications Awards

Cairo University

Clinical Parameters that Predict Successful Outcome in Men with Premature Ejaculation and Inflammatory Prostatitis

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Abstract

Introduction. Premature ejaculation (PE) is the most common sexual problem, and chronic prostatitis is an important cause of PE. **Aim.** The aim of this study was to determine which clinical parameters predict successful outcomes following treatment of men with PE and chronic prostatitis (category II and IIIa). **Main Outcome Measure.** Change in intravaginal ejaculatory latency time (IELT) and its relation to different clinical parameters. **Methods.** This study included 210 heterosexual men with PE and inflammatory prostatitis. PE was found to be acquired in 155 men (A-PE) and lifelong in 55 (LL-PE). All participants were asked to complete the National Institutes of Health-Chronic Prostatitis Symptom Index (NIH-CPSI). Sequential microbiologic specimens were obtained. Antibiotics were given to 184 men for 4 weeks, guided by sensitivity tests. Twenty-six men refused or did not comply with the antimicrobial therapy and were used as the untreated group. Clinical reevaluation was conducted after 28 days. **Results.** Two of the 26 men (7.7%) from the untreated group experienced an increase in their ejaculatory latency compared with 109 of the184 men (59.0%) who received antimicrobial therapy (P = 0.0001). After treatment, 90 of 155 men (58.0%) with A-PE reported ILET > 2 minutes compared with 21 of 55 men (38.2%) with LL-PE (P = 0.012). Based on a receiver operating characteristic curve, antimicrobial therapy is most effective if there are _19 pus cells per high-power field (HPF) in the expressed prostatic secretion (EPS) analysis, with a sensitivity of 85.6% and a specificity of 70.7% (area under the curve 0.783, 95% CI 0.716–0.850). Other clinical parameters were not useful in predicting outcomes.**Conclusions.** Antimicrobial therapy is useful in the treatment of PE associated with inflammatory prostatitis. The treatment is most effective in men with A-PE and when there are _19 pus cells per HPF in an EPS analysis.

Keywords: Premature Ejaculation; Inflammatory Prostatitis; Antimicrobial Therapy; Treatment of Premature Ejaculation.

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International Publications Awards

Freezing and Crushing Technique: a New Concept for the Extraction of Testicular Spermatozoa from Men with Non-Obstructive Azoospermia

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Abstract

Ninety samples were harvested from 20 men with nonobstructive azoospermia and divided into two fractions, the first fraction was minced, and the second fraction was exposed to the freezing and crushing (FC) technique. The sperm recovery rate was found to be 21/30 (70%) in the FC fractions compared with 8/30 (26.6%) in the mincing fractions.

Keywords: NOA, Thawing of cryopreserved TESE.

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International Publications Awards

Cairo University

Long-term Outcome of Lesional Posterior Cortical Epilepsy Surgery in Adults

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Abstract

Objective: The aim of this study was to evaluate the short- and long-term seizure outcome and to find predictors of outcome after epilepsy surgery in lesional posterior cortical epilepsies (PCEs).

Methods: The operative outcome in 80 consecutive adult patients with lesional PCEs who underwent resective surgery for intractable partial epilepsy between 1991 and 2006 was retrospectively studied.

Results: The probability of remaining in Engel Class I was 66.3% (95% CI 60 to 72) at 6 months, 52.5% (95% CI 47 to 57) at 2 years, 52.9% (CI 45 to 59) at 5 years and 47.1% (CI 42 to 52) at 10 years. Factors predicting poor outcome were the presence of a somatosensory aura, extraregional spikes, incomplete resection, interictal epileptiform discharge (IED) in EEG 6 months and 2 years postsurgery, history of generalised tonic-clonic seizure (GT-CS) and the presence of focal cortical dysplasia in the resected specimen. Factors predicting good outcome were childhood onset of epilepsy, short epilepsy duration, ipsilateral spikes, visual aura, presence of well-circumscribed lesion in preoperative MRI and a pathologically defined tumour. In the multivariate analysis, predictors were different in the long and short term as follows: incomplete resection as proven by postoperative MRI (hazard ratio (HR) 2.059 (CI 1.19 to 3.67)) predicts seizure relapse in short-term follow-up. The presence of IED in the EEG performed 6 months after surgery (HR 2.3 (CI 1.128 to 4.734)) predicts seizure relapse in the long-term fellow-up. However, the absence of a history of GT-CS independently predicts seizure remission in short- and long-term follow-up.

Conclusions: Surgery in PCEs proved to be effective in short- and long-term follow-up. Lesional posterior cortical epilepsy may be a progressive process in a substantial number of cases.

Keywords:

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Cairo University

International Publications Awards

IPACU

Accreditation of Medical Laboratories in Egypt

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Abstract

Today, there are more products and services available than ever before. This means the need for consumer protection has never been greater. Consumers can be protected by certification, inspection and testing under certified quality systems. Medical laboratory services are essential to patients care and therefore have to be available to meet the needs of all patients and the clinical personnel responsible for the care of those patients. Such services include arrangements for requisitions, patient preparation, patient identification, collection of samples, transportation, storage, processing and examination of clinical samples, together with subsequent validation, interpretation, reporting and advice, in addition to the considerations of safety and ethics in medical laboratory work. Whenever allowed by national regulations, it is desirable that medical laboratory services include the examination of patients in consultation cases, and that those services actively participate in the prevention of disease in addition to diagnosis and patient management. Each laboratory ought also to provide suitable education and scientific opportunities for professional staff working with it Accreditation in compliance with international standards delivers confidence in certificates and reports by implementing widely accepted criteria set by the European (CEN) or International (ISO) Standardization bodies. The standards address issues such as impartiality, competence and reliability, leading to confidence in the comparability of certificates and reports across national borders. Egyptian Accreditation Council (EGAC) is the sole body in Egypt to accredit all conformity assessment structure including medical laboratories by the Presidential Decree. Egyptian Accreditation Council is internationally recognized by the International Accreditation Forum (IAF), and International Laboratory Accreditation Cooperation (ILAC), those two international organizations are to ensure the competence of the Accreditation bodies.

Keywords: Accreditation; Regulation; Clinical Laboratories; Egypt.

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International Publications Awards

Cairo University

Intra-articular Adjuvant Analgesics following knee arthroscopy: Comparison between Dexmedetomidine and Fentanyl

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Abstract

This study was designed to compare the analgesic effect produced by intra-articular administration of either dexmedetomidine or fentanyl in combination with bupivacaine following arthroscopic knee surgery. Ninety ASA physical status 1-11 patients, scheduled for knee arthroscopic procedures were randomly assigned into three groups. The control group B received 30ml 0.25%bupicacaine only' group B/D received 30ml 2.25%bupivacaine and dexmedetomidine 1ug/kg. and group B/F received 30ml 0.25% bupivacaine and fentanyl 1ug/kg at the end of arthroscopy. Postoperatively pain visual analogue scale at test and during movement the time to first postoperative analgesic request, and the total postoperative analgesic use during the first 24hrs were recorded. The time to first postoperative analgesic request was longer in the B/D group and B/F group versus equivalent for the B/D and B/F group. No early side effects were noted. It was concluded that both dexmedetomidine and fentanyl provide comparable analgesia after arthroscopic knee surgery when administered intraarticularly in combination with bupivacaine.

Keywords: Knee arthroscopy; Intraarticular Analgesia; Postoperative pain; Dexmedetomidine; Fentanyl.

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Cairo University

International Publications Awards

IPACU

Photo Quiz, A Pregnant Woman with Severe Diarrhea

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Abstract

A 29 years old pregnant female patient from Upper Egypt was admitted to the hospital complaining of a history of one year duration of diarrhea, vomiting, loss of weight, pallor and lower limb edema. Examination revealed seven months pregnancy, muscle wasting and dehydration. Ultrasonography showed mild free intraperitoneal fluid, pericardial effusion and hyperperistaltic movements of the intestinal loops. There was a history of consumption of raw *Oreochromis nilotica.* The case was diagnosed as malnutrition as a result of infection with *Capillaria philippinensis. Oreochromis niloticus* is thought to be the intermediate host of this nematode parasite and the fish eating birds are considered the main hosts.Autoinfection is an integral part of the life cycle of the parasite in man. Diagnosis was based on the clinical symptoms as well as finding the characteristic peanut-shaped eggs in the feces of the patient. Treatment with albendazole, multivitamins and high protein diet gave dramatic improvement

Keywords: Capillaria philippinensis; Intestinal capillariasis; Malabsorption; Malnutrition; Peanut-shaped eggs.

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International Publications Awards

Cairo University

Effects of Losartan, HO-1 Inducers or HO-1 Inhibitors on Erectile Signaling in Diabetic Ratsjsm

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Abstract

Introduction. Activation of the renin-angiotensin system which is common in diabetes mellitus might affect heme oxygenase (HO-1) gene expression. **Aim.** Assessment of the effects of administration of angiotensin II (Ang II) receptor antagonist (losartan) with HO-1 inducer or inhibitor on erectile signaling in diabetic rats. **Materials and Methods.** Seventy male rats were divided equally into seven groups; healthy controls, streptozotocininduced diabetic rats, rats on citrate buffer, diabetic rats on losartan, diabetic rats on HO-1 inducer (cobalt protoporphyrin [CoPP]), diabetic rats on losartan and CoPP, and diabetic rats on losartan and HO-1 inhibitor (stannus mesoporphyrin [SnMP]). **Main Outcome Measure.** HO enzyme activity, HO-1 gene expression, cyclic guanosine monophosphate (cGMP) assay, intracavernosal pressure (ICP), and cavernous tissue sinusoids surface area. **Results.** HO-1 gene expression, HO enzymatic activity, and cGMP were significantly decreased in the cavernous tissue of diabetic rats. These parameters were significantly elevated with the use of CoPP that restored the normal control levels of HO enzyme activity. Administration of losartan exhibited a significant enhancing effect on these parameters compared with the diabetic group, but not restored to the control levels, whereas administration of CoPP combined with losartan led to the restoration of their normal levels. ICP demonstrated significant decline in diabetic rats. The use of CoPP and/or losartan led to its significant improvement compared with diabetic rats. Administration of either losartan and/or CoPP led to a significant increase in the cavernous sinusoids surface area of diabetic rats. Administration of losartan with SnMP significantly decreased the enhancing effect of losartan on the studied parameters. **Conclusion.** The decline in erectile function in diabetes mellitus could be attributed to the downregulation of HO-1 gene expression. HO-1 induction added to Ang II receptor antagonist could improve erectile function.

Keywords: Gene therapy; Heme oxygenase; Erectile dysfunction; Carbon monoxide cavernous tissue.

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International Publications Awards

Cairo University

An Immunohistochemical Study of Laminin in Basal Cell Carcinoma

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Abstract

Background: Laminins are components of the extracellular matrix that mediate cell adhesion, growth, migration, proliferation and differentiation. Basement membrane (BM) laminins, in particular, may play a role in enhancing carcinoma cell motility. **Aim:** To evaluate the distribution pattern of laminin in basal cell carcinoma (BCC), as regards the basement membrane, cellular cytoplasm, peritumoral lacunae and surface epithelium and to correlate laminin distribution with different variants of BCC. **Patients and Methods:** Skin biopsy specimens were obtained from 21 BCC patients for routine histopathological and immunohistochemical study. Laminin was evaluated qualitatively and semiquantitatively using monoclonal mouse antihuman antibody (Dako-Laminin, 4C7. Code No: MO638, which reacts with the terminal globular domain of the α5 chain) **Results:** The majority of BCC cases showed patchy cytoplasmic distribution of laminin. The BM expression of laminin, in most cases, was well defined, fine and linear with irregular areas of thickening. Staining intensity was moderate in differentiated and mixed variants, weak in superficial spreading and absent in morpheic types. **Conclusion:** Cytoplasmic and basement membrane laminin is important in the pathogenesis and invasion of BCC. Most laminin was in basement membrane zone (BMZ), and the more differentiated the tumor, the more cytoplasmic and BM staining it expressed.

Keywords: Immunohistochemistry; laminin; Basal cell carcinoma.

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International Publications Awards

Cairo University

Effect of HO-1 cDNA-Liposome Complex Transfer on Erectile Signaling of Aged Rats

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Abstract

This work aimed to assess the efficacy of haeme oxygenase-1 (HO-1) cDNA-liposome complex transfer as a mediator of erectile signalling in aged rats. One hundred and fifty aged white albino rats were equally divided into five groups: controls, rats receiving lipofectamine, rats receiving intracorporeal HO-1 cDNA-lipsome complex, rats receiving HO-1 cDNA-liposome complex plus nitric oxide synthase (NOS) inhibitor, and rats receiving HO-1 cDNA-liposome complex plus HO inhibitor. Six rats were killed from each group after 12, 24 and 48 h, and after1 and 2 weeks. In dissected cavernous tissues, the following were assessed: HO-1 gene expression, Western blot for HO-1, HO enzyme activity, cGMP and histopathology. The results showed that HO-1 cDNA-liposome complex transfer led to a significant increase in cavernous tissue HO-1 protein, HO-1 gene expression, HO enzyme activity and cGMP up to 1 week. NOS inhibition exhibited no effect on HO-1 gene enhancement of cavernous tissue HO enzyme activity or cGMP, whereas inhibition of HO significantly decreased these parameters. Histopathology of cavernous tissue demonstrated a significant dilatation of helicine arteries in HO-1 cDNA-liposome complex treated group after 48 h compared with the controls. It is concluded that HO-1 cDNA-liposome complex transfer augments cavernous tissue cGMP with subsequent sinusoidal relaxation.

Keywords: Gene therapy; Heme oxygenase; Erectile dysfunction; Carbon monoxide; Cavernous tissue.

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International Publications Awards

Cairo University

Electron Microscopy Study of Peripheral Nerves in the Uvulae of Snorers and Obstructive Sleep Apnoea Patients

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Abstract

Hypothesis: The pathophysiology of snoring and obstructive sleep apnoea is still unclear. Two theories are proposed. The first is the obstructive theory, which postulates palatopharyngeal muscle hypertrophy leading to airway narrowing; there is no neural role. The second is the neurogenic theory, which postulates neural degeneration due to vibratory stretch trauma, leading to muscle atrophy and collapse. As identification of nerve fibres in the uvula and palate is difficult and time-consuming, all previous studies aiming to differentiate between these two theories have been based on indirect observation of the muscles, rather than direct study of the nerves. **Methods**: We conducted a prospective study to directly observe and study nerve fibres in uvular specimens from 10 cases of obstructive sleep apnoea, compared with specimens from 10 cases of simple snoring, using transmission electron microscopy. Five autopsy cases served as controls. **Results**: Obstructive sleep apnoea was associated with definite degenerative changes in myelinated and unmyelinated nerve endings. These degenerative changes were present to a lesser degree and in a smaller proportion of cases of simple snoring. **Conclusion:** The events postulated by the neurogenic theory of obstructive sleep apnoea appear to play an important role in the pathophysiology of snoring and obstructive sleep apnoea.

Keywords: Sleep apnoea syndromes; Snoring; Snoring; Palate; Electeon microscopy.

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International Publications Awards

Cairo University

Triple Negative, Basal Cell Type and EGFR Positive Invasive Breast Carcinoma in Kuwaiti and British Patients

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Abstract

Geographical and ethnic variations in the incidence of various types of breast carcinoma are known to exist. We were therefore interested in finding out whether or not there are differences in the incidence of triple negative breast carcinoma and EGFR positive tumours between patients from a Middle Eastern Country as compared with a Western Country, as this might have implications concerning health planning strategies. Eighty eight patients with invasive breast carcinoma were studied, 38 patients from The University of Kuwait Hospital, and 50 consecutive patients from Charing Cross Hospital, London (CX). In spite of the relatively small number of cases, the results clearly show that the incidence of triple negative tumours is similar in the two studied populations, 13% in the Kuwaiti and 16% in CX patients. The morphological and biological characteristics of these tumours in the two populations also appear similar with most of the tumours being high grade ductal or metaplastic tumours, with the majority being cytokeratin 5/6 positive (80% and 71% respectively). Many were also EGFR positive, although the percentage of EGFR positive tumours from Kuwaiti patients (80%) was higher than that from CX patients (43%). Our study also confirms the low incidence of low grade tumours in Kuwaiti when compared with their incidence in Western societies. This could be the result of genetic or life style differences although the presence of the National breast screening programme in the UK, may have contributed in the detection of a higher percentage of low grade and less advanced tumours. The other major difference noted between the two populations concerned the younger age of Kuwaiti patients. This suggests a possible real genetic difference that may be an indication for starting breast screening in Kuwait at an age earlier than the age of 50 which is currently the starting age of screening in the UK.

Keywords: Breast Pathology; Triple Negative; Basal Cell type; EGFR.

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Cairo University

International Publications Awards

IPACU

Clinicovirologic Analysis of Hepatitis C Infection in Transfusion-dependent b-thalassemia Major Children

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Abstract

Regular blood transfusion puts b-thalassemia major patients at a higher risk of developing hepatic iron overload and hepatitis C virus (HCV) infection. The association between several transfusion-related factors and an increased risk of developing HCV viremia has been reported. The effect of HCV infection on liver damage in transfusion-dependent thalassemia patients has been poorly described. A sample of 100 Egyptian transfusion-dependent b-thalassemia major children were studied. Individual patients underwent full history taking, clinical examination and a panel of laboratory tests including HCV ribonucleic acid polymerase chain reaction (HCV-PCR) in blood samples. Liver biopsy was performed for 24 patients. HCV-PCR was positive in 64% of patients. A statistically significant correlation was found between HCVPCR positivity (HCV viremia) and shorter inter-transfusion interval. There was a significant positive correlation between mean serum ferritin level and mean levels of alanine aminotransferase and aspartase aminotransferase. Histopathologic features of both chronic hepatitis and siderosis were present in 91.7% of biopsy specimens, and fibrosis was present in 41.67%. A higher risk of HCV viremia is noted with a shorter inter-transfusion interval. The reduced role of HCV infection in chronic liver injury in this group of patients may be surpassed by the associated effects of iron overload because of the chronic transfusion. However, the latter finding should be verified in larger studies.

Keywords: Thalassemia; Transfusion; Hepatitis C; Aminotransferase; Siderosis; Fibrosis.

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International Publications Awards

Cairo University

MEFV Mutations in Egyptian Patients Suffering from Familial Mediterranean Fever: Analysis of 12 Gene Mutations

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Abstract

The objective of the study is to screen 12 MEFV gene mutations in Egyptian patients with familial Mediterranean fever (FMF) and to study the initial hypothesis that the phenotypic expression of the disease may be attributable to the existence of a particular mutation. We enrolled 136 Egyptian patients (74 males, and 62 females) with a clinical diagnosis of FMF. DNA was amplified by PCR and subjected to reverse hybridization for the detection of 12 MEFV gene mutations. The phenotypic expression of the disease was compared in two subgroups according to the presence of homozygote E148Q and M694V gene mutations. The most frequent gene mutations in the studied group were V726A, M694V, M680I, E148Q and M694I in 41.2, 32.4, 29.4, 25 and 20.6%, respectively. At least one of these main five founder mutations was present in 132 patients (97.1%). Thirty-two patients (23.5%) were homozygote for one of the main five founder mutations.

The most common homozygote gene mutations were E148Q and M694V, each in 12 patients (8.8%). Significant increase in abdominal pain and arthritis was found in patients with homozygote M694V mutation compared to those with E148Q mutation. All patients with amyloidosis had M694V gene mutation. The increased frequency of V726A gene mutation and the rarity of amyloidosis in this study suggest that Egyptian patients may have a milder form of FMF compared to other populations. The five main founder mutations account for the vast majority of cases of FMF. M694V gene mutation may be associated with increased frequency of abdominal pain, arthritis and the presence of amyloidosis.

Keywords: Familial Mediterranean fever –MEFV; Amyloidosis; Egyptian population.

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Cairo University

International Publications Awards

IPACU

Can Magnetic Resonance Imaging Differentiate Undifferentiated Arthritis Based on Knee Imaging?

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Abstract

Objective. To compare findings as observed on enhanced magnetic resonance imaging (MRI) of the knee joints, in oligoarticular-undifferentiated arthritis (UA) in those with established rheumatoid arthritis (RA) and spondyloarthropathy (SpA).*Methods*. A total of 55 patients with knee arthritis were consecutively recruited for the study, including 25 with undifferentiated oligoarthritis of the knee joint(s), 15 fulfilling the American College of Rheumatology criteria for RA and 15 with SpA. In all patients in the UA and in the RA group, rheumatoid factor and anti-CCP2 antibody (ELISA) were tested. All patients underwent enhanced MRI of the more symptomatic knee. All groups were compared in terms of demographics, laboratory Investigations, and MRI findings. *Results*. Synovial thickness differed significantly in the RA group compared to UA and SpA groups ($p < 0.001$). The RA group showed a higher rate of bony and cartilaginous erosions and bone marrow edema compared to UA and SpA groups ($p < 0.001$). Enthesitis was found in all patients in the SpA group (100%) and differed from RA and UA groups ($p < 0.001$).

Conclusion. Patients with RA showed more destructive changes in terms of synovial thickening, bone marrow edema, cartilaginous and bone erosions compared to UA and SpA groups. Enthesitis is a common feature on MRI in SpA, while absent in the RA and UA groups. This latter finding may have important clinical implications for classification purposes, and can help to determine the evolving pattern of patients with UA of the knee joint.

Keywords: Knee Joint Enhanced Magnetic Resonance Imaging; Undifferentiated Arthritis Of The Knee Joint; Rheumatoidarthritis; Seronegative Arthropathy Inflammatory Synovitis.

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International Publications Awards
Cairo University

A Cadaver Model that Investigates Irreducible Metacarpophalangeal Joint Dislocation

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Abstract

Purpose: Controversy exists over the pathologic anatomy of irreducible dorsal metacarpophalangeal (MCP) dislocation. The aim of this work is to develop a cadaveric model of MCP joint dislocation that closely simulates the clinical situation and to study the structures around the MCP joint and their contribution to irreducibility of the dislocation. **Methods**: Nine fresh-frozen cadaveric specimens were amputated at the radiocarpal joint and stabilized in a specially formulated fixture. The dislocation was created by an impact load delivered by a servohydraulic testing machine, at a displacement rate of 1000 mm/s and with a maximum displacement of 60 mm. An irreducible dislocation was successfully created in 6 index fingers. An attempt at closed reduction was followed by a dissection of the dislocated joint. **Results**: In the 6 examined specimens, the flexor tendons were ulnar to the joint in all cases, the radial digital nerve was superficial (5 cases) or radial (5 cases) to the metacarpal head, and the lumbrical was usually radial (5 of 6 cases) to the joint. Division of the superficial transverse metacarpal ligaments, natatory ligaments, flexor tendons, or lumbricals does not aid reduction of the dislocation. Division of the volar plate was necessary for reduction of the dislocation in all 6 cases, whereas division of the deep transverse metacarpal ligaments does not allow reduction of the dislocation. **Conclusions**: We present a model for creating an irreducible MCP joint dislocation using an impact load that simulates the clinical situation. The volar plate is the primary structure preventing reduction of the dislocation. Division of the deep transverse metacarpal ligament is not effective in reducing the dislocation. The flexor tendons, lumbricals, superficial transverse metacarpal ligament and natatory ligaments do not contribute to irreducibility. The anatomy of the structures surrounding the MCP joint is variable, and careful dissection to prevent iatrogenic injuries is mandatory.

Keywords: Dislocation; Joint; Deep transverse metacarpal ligament; Volar plate.

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International Publications Awards

Disease Progression from Chronic Hepatitis C to Cirrhosis and Hepatocellular Carcinoma is Associated with Repression of Interferon Regulatory Factor-1

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Abstract

Background/aim: Infection with hepatitis C virus (HCV) frequently results in a persistent infection, suggesting that it has evolved efficient mechanism(s) for blocking the host cell's innate antiviral response. The immune response to virus infection results in activation or direct induction of the interferon regulatory factors (IRFs), which are a family of proteins involved in the regulation of interferon (IFN) and IFN inducible genes. IRF-3 and IRF-7 have been shown to play an essential role in virus-dependent signaling, whereas IRF-1 is critical for proper IFN-dependent gene expression. This study has been performed to show the expression profile of IRF-1, IRF-3, and IRF-7 in Egyptian patients with HCV-related liver diseases and hepatocellular carcinoma (HCC).

Materials and methods: This study included 90 patients, who were positive for HCV infection by reverse transcription PCR, divided into three groups: group I (Gr I) included 30 patients with chronic hepatitis C, group II (Gr II) included 30 patients with liver cirrhosis in addition to group III (Gr III) of 30 patients with HCC. Reverse transcription PCR analysis was performed to determine the expression profile of IRF-1, IRF-3, and IRF-7 genes extracted from the peripheral blood mononuclear cells of those patients.

Results: IRF-1expression was significantly higher ($P < 0.001$) in patients of Gr I (86.6%) compared with those in Gr II (46.7%) and Gr III (36.7%), whereas IRF-3 expression was significantly higher ($P < 0.005$) among patients of Gr II (73.3%) in comparison with that in Gr I (50%) and Gr III (36.7%). In contrast, although expression of IRF-7 was higher in Gr II than in the other groups, there was no statistically significant difference ($P > 0.05$).

Conclusion: Alterations in IRFs expression might be considered as markers associated with a higher risk of cirrhosis in patients with chronic HCV infection. Expression of IRF-1 and IRF-3 were more prevalent in patients with chronic HCV and cirrhosis, respectively, in comparison with HCC patients. Thus, IRF-1 could be nominated as one of the tumor suppressor factors and could aid in the early detection of HCC.

Keywords: hepatitis C virus; Hepatocellular carcinoma; Interferon regulatory facto.

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International Publications Awards

Cairo University

Recurrence of Hepatitis C Virus (Genotype 4) Infection After Living-Donor Liver Transplant in Egyptian Patients

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Abstract

Objectives: The recurrence of hepatitis C virus infection after liver transplant is common and may endanger both graft and patient survival. We investigated the frequency and outcome of and risk factors for the recurrence of that virus after living donor liver transplant in hepatitis C virus positive recipients.

Materials and Methods: Seventy-four adult hepatitis C virus positive subjects were monitored for 36 months after living-donor liver transplant and demographic and laboratory data for the recipients and donors were evaluated. Recurrent hepatitis C virus infection was diagnosed on the basis of viral replication revealed by polymerase chain reaction after transplant, elevated levels of transaminases, and the results of liver biopsy**.**

Results: Hepatitis C virus recurrence was identified in 31.1% of the patients studied. Histopathologic recurrence was mild, and 91% of the subjects had a fibrosis score of ≤ F2. No recipient exhibited cirrhosis or clinical decompensation during followup. Recurrent hepatitis C virus infection was associated with pretransplant and posttransplant viral load and antibody positive to hepatitis B core antigen. No other risk factors (sex, donor or recipient age, pretransplant Child-Pugh or Model for End-Stage Liver Disease scores, immunosuppressive drug therapy, and treatment with pulse steroids) were significantly correlated with the frequency of hepatitis C virus recurrence, the grade of the histologic activity index, or the stage of fibrosis.

Conclusions: In living-donor liver transplant recipients, patient and graft survival rates associated with hepatitis C virus (genotype 4) related cirrhosis were comparable to those in deceased-donor liver transplant recipients reported in the literature. Recurrent infection with hepatitic C virus after livingdonor liver transplant was mild. After transplant, a higher viral load and the presence of antibody to hepatitis B core antigen could be risk factors for hepatitis C virus recurrence. Long-term follow-up in a large number of patients is required.

Keywords: Hepatitis C recurrence; Liver transplant; Outcome post LDLT.

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Cairo University

International Publications Awards

IPACU

A Randomized Controlled Trial to Assess the Safety and Efficacy of Silymarin on Symptoms, Signs and Biomarkers of Acute Hepatitis

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Abstract

Purpose: Milk thistle or its purified extract, silymarin (Silybummarianum), is widely used in treating acute or chronic hepatitis. Although silymarin is hepatoprotective in animal experiments and some human hepatotoxic exposures, its efficacy in ameliorating the symptoms of acute clinical hepatitis remains inconclusive. In this study, our purpose was to determine whether silymarin improves symptoms, signs and laboratory test results in patients with acute clinical hepatitis, regardless of etiology.

Methods: This is a randomized, placebo-controlled trial in which participants, treating physicians and data management staff were blinded to treatment group. The study was conducted at two fever hospitals in Tanta and Banha, Egypt where patients with symptoms compatible with acute clinical hepatitis and serum alanine aminotransferase (ALT) levels 42.5 times the upper limit of normal were enrolled. The intervention consisted of three times daily ingestion of either a standard recommended dose of 140mg of silymarin (Legalons, MADAUS GmbH, Cologne, Germany), or a vitamin placebo for four weeks with an additional four-week follow-up. The primary outcomes were symptoms and signs of acute hepatitis and results of liver function tests on days 2, 4 and 7 and weeks2, 4, and 8. Side-effects and adverse events were ascertained by self-report.

Results: From July 2003 through October 2005, 105 eligible patients were enrolled after providing informed consent. No adverse events were noted and both silymarin and placebo were well tolerated. Patients randomized to the silymarin group had quicker resolution of symptoms related to biliary retention: dark urine (p ¼ 0.013) , jaundice (p ¼ 0.02) and sclera icterus (p ¼ 0.043). There was a reduction in indirect bilirubin among those assigned to silymarin (p ¼ 0.012), but other variables including direct bilirubin, ALT and aspartate aminotransferase (AST) were not significantly reduced.

Conclusions: Patients receiving silymarin had earlier improvement in subjective and clinical markers of biliary excretion. Despite a modest sample size and multiple etiologies for acute clinical hepatitis, our results suggest that standard recommended doses of silymarin are safe and may be potentially effective in improving symptoms of acute clinical hepatitis despite lack of a detectable effect on biomarkers of the underlying hepatocellular inflammatory process.

Keywords: Hepatitis; Milkthistle; Silybum marianum; Silymarin; Randomizedcontrolledtrial; Egypt.

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International Publications Awards

Cairo University

Improvement of Steatosis After Interferon Therapy in HCV Genotype 4 is Related to Weight Loss

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Abstract

Introduction: Hepatic steatosis is common in patients with chronic hepatitis C virus (HCV) infection, and its occurrence may be related to both host and viral factors. Relationship between improvement in steatosis and response to anti-viral treatment remains unclear. This study assessed the factors associated with steatosis in patients infected with genotype 4 HCV, and to correlate degree of changes in steatosis with host factors and response to treatment.

Methods: Records of 175 patients with chronic genotype 4 HCV infection, who had received interferon and ribavirin combination therapy, were reviewed retrospectively to extract data on body mass index (BMI), presence of diabetes mellitus, and liver histology findings. Paired BMI data and liver biopsies (pre- and 24-weeks post-treatment) were available in 86 patients. Baseline steatosis and its changes (before and after treatment) were the dependent variables in a univariate and multivariate analyses.

Results: Steatosis was found in 88/175 (50.3%) of baseline biopsies. Its presence was related to baseline BMI ($r=0.33$, $P<0.01$), but not with viral load, or grade of liver inflammation or fibrosis. On follow up, improvement in steatosis was significantly associated with degree of weight loss but not with response to anti-viral treatment.

Conclusion: Steatosis is common in genotype 4 HCV infection, and its presence appears to be related to high BMI, but not to viral load or degree of liver injury.

Keywords: Combination interferon therapy; HCV genotype 4; Obesity; Steatosis; Sustained viral response.

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International Publications Awards

Response to Pegylated Interferon Alfa-2a and Ribavirin in Chronic Hepatitis C Genotype 4

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Abstract

The safety and efficacy of pegylated interferon (PEG-IFN) alfa-2a and ribavirin were studied among patients treated for genotype 4 chronic hepatitis C. Ninety-five patients with chronic hepatitis C genotype 4 were treated with PEGIFN alfa-2a (180 mg/week) plus ribavirin (_11 mg/

kg/day) for 48 weeks. The primary end point was sustained virological response, defined as non-detectable levels of HCV RNA at the end of follow up (week 72). The proportion with sustained virological response was 58/95¼61.1% (95% CI¼50.5–70.9%). Side effects were generally mild, well managed by dose reductions (in 62% of patients); in only two patients were side effects sufficiently severe to require treatment interruption. Ninety percent of patients adhered to treatment up to week 12, and their sustained virological response rate was higher compared to non-adherent (65% vs. 22%, respectively, P¼0.012). None of the patients who failed to achieve 1 log reduction of viral load by week 8 (n¼15), or 2 log reduction by week 12 (n¼17), had a sustained virological response.

In conclusion, sustained virological response in genotype 4 Egyptian patients treated with PEG-IFN alfa-2a and ribavirin was estimated around 60%, intermediate between sustained virological response observed in genotype 1 and genotype 2–3 patients in Western countries. The early virological response (week 4 or week 8) should be investigated as a criterion to decide whether the patient may benefit from a shorter duration of therapy.

Keywords: Chronic hepatitis C; genotype 4; Pegylated interferon; Sustained virological response; Treatment response predictors.

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International Publications Awards

Cairo University

Evaluation of a Novel Pegylated Interferon Alpha-2a (Reiferon Retard®) in Egyptian Patients with Chronic Hepatitis C – genotype4

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Abstract

Introduction: Egypt has the highest HCV prevalence in the world, mostly genotype 4.

Aim: Assessment of the efficacy, safety and compliance of a novel 20-kDa linear PEG interferon α-2a (Reiferon Retard®) derived from Hansenula polymorph a expression system combined with ribavirin for the treatment of chronic HCV Egyptian patients.

Patients and methods: One hundred chronic HCV patients divided according to the degree of fibrosis on liver biopsy into group A, including F1and F2 patients and group B including F3 and F4. Patients received a fixed weekly dose of 160 µg of the PEG interferon in combination with ribavirin in standard with adjusted dosage and were followed up by PCR after 3, 6, 12 and 18 months. End of treatment response (ETR), sustained virological response (SVR), possible side effects, discontinuation of the drug and concomitant use of cytokines were reported.

Results: At 48 weeks the overall ETR rate was 64% with 73% and 40% for group A and B respectively, and SVR at 72 weeks revealed an overall response rate of 56% viral clearance with 69% and 22% for group A and B respectively. There were notably minimal hematological complications.

Conclusion: The efficacy and high safety profile in absence of significant hematological reactions substantiates the hypothesis that the chemistry of different interferon's and their pegylation pattern may reflect on the clinical outcome.

Keywords: Chronic hepatitis C; Haematological advarsa effects ; Pegylated imterferons alpha – aa.

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International Publications Awards

Antischistosomal Therapy: Current Status and Recent Developments

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Abstract

Despite the existence of the highly effective antischistosome drug PZQ, schistosomiasis is spreading into new areas, and although it is the cornerstone of current control programs, PZQ chemotherapy does have limitations. In particular, mass treatment does not prevent reinfection. Furthermore, there is increasing concern about the development of parasite resistance to PZQ. Consequently, vaccine strategies represent an essential component for the future control of schistosomiasis as an adjunct to chemotherapy.

Keywords:

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International Publications Awards

Cairo University

Prevalence of Hepatic Abnormalities in A Cohort of Egyptian Children with Type 1 Diabetes Mellitus

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Abstract

Background and aim: Children with type 1 diabetes mellitus (T1DM) are frequently investigated for hepatic abnormalities. This study was carried out to report on the prevalence of hepatic abnormalities in diabetic children and adolescents and to highlight the possible etiology and appropriate management.

Methods: The study included 692 children (333 were males) with T1DM attending the Diabetes Unit at Cairo University Pediatric Hospital. Their mean age was 9.65 ± 4.18 yr. All children were subjected to clinical examination for hepatomegaly, determination of alanine aminotransferase (ALT) and antibodies to hepatitis C virus (anti-HCV), and abdominal ultrasonography. All children with clinical, laboratory or ultrasound abnormality were counseled about proper glycemic control and followed up. If abnormalities persisted, more detailed investigations were carried out. HCV RNA was done for anti-HCV positive children.

Results: Sixty (8.7%) were found to have one or more abnormalities: clinical hepatomegaly in 13 (1.9%), elevated ALT in 27 (3.9%), anti-HCV in 25 (3.6%) and abnormal hepatic ultrasound in 31 (4.5%). Forty percent of anti-HCV positive children were HCV-RNA positive. Glycogenic hepatopathy was diagnosed in three cases by liver biopsy. Abnormalities were reversible in 37/60 after proper glycemic control.

Conclusion: Although diabetic children are at risk of acquisition of HCV, poor glycemic control is the key factor that predisposes to hepatomegaly, elevated ALT and abnormal ultrasound findings. A 4 to 8-wk therapeutic trial of proper glycemic control is recommended prior to more invasive diagnostic procedures.

Keywords: Children; Egypt; Glycogenic hepatopathy; HCV – T1DM.

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International Publications Awards

Cairo University

Quality of Life of Egyptian Donors After Living-Related Liver Transplantation

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Abstract

Background and study aim: Quality of life after liver donation must remain a primary outcome measure when we consider the utility of living donor liver transplants. In making clinical decisions on the use of transplantation for chronic liver diseases, consideration should be given to the key factors likely to affect subsequent health related quality of life. It would be beneficial for donors, if factors predicting good quality of life are identified. The aim of this study was to assess the health related quality of life changes experienced by donors following living related liver transplantation using the Short Form 36 (SF-36) questionnaire.

Patients and methods: Between August 2001 and December 2006, 125 adults received liver grafts from living donors at Dar Al-Fouad Hospital, Cairo, Egypt. The SF-36v2 questionnaire was applied to 30 donors after at least 6 months following donation and maximally 4 years after donation (mean ± SD:3.28 ± 1.56 years). Furthermore, 30 healthy volunteers were taken as a control group.

Results: None of the donors required re-surgery and no deaths were reported. Only 4 (13.3%) donors experienced minor complications, which did not affect their quality of life and had no long term effects.

No significant difference was found between donors and control group when means of the Physical and Mental Component Summary were compared. The physical functioning domain was the only domain of health which showed a statistically significant difference between both groups.

Keywords: SF-36v2 Living related liver transplantation Quality of life.

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International Publications Awards

How to Write a Thesis

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Abstract

This article is by no means intended to cover the whole aspect of thesis writing; it covers its main outline, together with many of the pitfalls the candidate is liable to come across. It does not consider, either, how to design a research.

Keywords:

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International Publications Awards

Unexpectedly High Proportion of Ancestral Manu Genotype *Mycobacterium tuberculosis* Strains Cultured from Tuberculosis Patients in Egypt

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Abstract

Tuberculosis is one of the important public health problems in Egypt. However, limited information on the Mycobacterium tuberculosis genotypes circulating in Egypt is available. A total of 151 M. tuberculosis strains were characterized by spoligotyping. The results revealed that 74.8% of M. tuberculosis isolates grouped into 13 different clusters, while 25.2% had unique spoligotype patterns. Comparison with an international spoligotyping database (the SITVIT2 database) showed that types SIT53 (T1 variant) and SIT54 (Manu2 variant) were the most common types between cluster groups. In addition, new shared types SIT2977, SIT2978, and SIT2979 were observed. The results identified for the first time an unusually high proportion of ancestral Manu strains of M. tuberculosis from patients in Egypt. The percentage of the Manu clade in this study (27.15%) was significantly higher than its overall representation of 0.4% in the SITVIT2 database. We show that in Egypt tuberculosis is caused by a predominant M. tuberculosis genotype belonging to the ancestral Manu lineage which could be a missing link in the split between ancestral and modern tubercle bacilli during the evolution of M. tuberculosis.

Keywords:

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Faculty of Pharmacy

International Publications Awards

Cairo University

Preventive Effect of the Flavonoid, Quercetin, on Hepatic Cancer in Rats Via Oxidant/Antioxidant Activity: Molecular and Histological Evidences

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Abstract

The incidence of hepatocellular carcinoma is increasing in many countries. The estimated number of new cases annually is over 500,000, and the yearly incidence comprises between 2.5 and 7% of patients with liver cirrhosis. The incidence varies between different geographic areas, being higher in developing areas; males are predominantly affected, with a 2:3 male/female ratio. **Methods:**Experiments were designed to examine the effect of *N*-Nitrosodiethylamine (NDEA) as cancer-inducer compound and to confirm the preventive effect of the flavonoid quercetin on hepatocellular carcinoma in rats. Briefly, thirty six male albino rats of Wistar strain were divided into 3 groups: the 1st group was administered NDEA alone (NDEA-treated), the 2nd group was treated simultaneously with NDEA and quercetin (NDEA+Q) and the 3rd group was used as control (CON). Randomly amplified polymorphic DNA polymerase chain reaction (RAPD-PCR) as well as *p53*-specifi PCR assays were employed to determine genomic difference between treated, and control animals. Histological confirmation as well as oxidant/ antioxidant status of the liver tissue was done. **Results:** RAPD analysis of liver samples generated 8 monomorphic bands and 22 polymorphic bands in a total of 30-banded RAPD patterns. Cluster analysis and statistical analyses of RAPD data resulted in grouping control and NDEA+Q samples in the same group with 80% similarity cut-off value. NDEA-treated samples were clustered in a separate group. Specific PCR assay for polymorphism of P^{53} gene revealed a uniform pattern of allele separation in both control and NDEA+Q samples. Quercetin anticancer effect was exhibited in significant decrease of oxidative stress and significant decrease of antioxidant activity. Histopathological studies showed normal liver histology of the NDEA+Q samples. Meanwhile, several cancer-induced features were clearly observable in NDEA-treated samples. **Conclusion:**This paper demonstrated that preventive effect of quercetin on hepatocarcinoma in rats by RAPD-PCR, tracing the effect on *p53* gene and by histopathological evidence. Hereby, it was proved that quercetin exerted its preventive effect via decreased oxidative stress and decreased antioxidant activity.

Keywords: Hepatocellular carcinoma; *N*-Nitrosodiethylamine; Quercetin chemotherapy; Triplet therapy; Doublet therapy; Outcomes; Response rates; Overall survival.

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International Publications Awards

Molecular Dissection of the Clonal M1T1 Group A Streptococci Using Proteomics, Genomics, and Bioinformatics Tools

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Abstract

A particular strain of the group A streptococci (GAS), known as the M1T1 clone, has exhibited unusual epidemiology and virulence, and has been largely associated with the pandemic of invasive GAS infections worldwide.

M1T1 was among few GAS strains that have outnumbered other serotypes since the mid-1980s, and their increase in GAS populations coincided with the resurgence of invasive and severe forms of streptococcal diseases, especially the streptococcal toxic shock syndrome (STSS) and necrotizing fasciitis (NF).

The resurgence of the severe diseases was thus suspected to be a result of an unusual pathogenic potential inherent to the few reemerging strains.

This book discusses unique features that may have endowed the global M1T1 clone with its unusual properties, and the genomic and evolutionary basis for its emergence and persistence. Among M1T1's unique features are its ability to switch to a hypervirulent phenotype with a survival advantage in deep tissues; the acquisition and exchange of mosaic prophages that encode novel exotoxins; and the production of the potent DNase Sda1, which frees the bacteria from the leukocyte extracellular traps.

Keywords: *Streptococcus pyogenes*; Virulence factors; Immunogenetics; Pathogenomics; Bioinformatics; Proteomics; Genomics; Microarray analysis; Prophage; Streptodornase; Superantigens; Toxins; Horizontal gene transfer.

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International Publications Awards

Cairo University

Synthesis of Novel Pyridazinyl Benzimidazole, Benzothiazole and Benzoxazole of Expected Anti-Inflammatory Activity

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Abstract

In this study, a novel series of 6-oxopyridazinyl benzazoles and 3, 6-dioxopyridazinyl benzazoles were prepared from the starting compounds, 2-hydrazinobenzimidazole, 2-hydrazinobenzothiazole and 2-hydrazinobenzoxazole by reaction with butyric acid derivatives and cyclic anhydrides respectively.

The structures ofthe new compounds were confirmed by elemental analysis as well as 'H NMR, IR and MS data. Some ofthe newly prepared compounds were subjected to evaluation for their anti-inflammatory activity using carrageenan induced paw edema at dose 100 mg kg-' using indomethacin as a reference standard and were found to be bioactive.

Keywords: 6-oxopyridazinyl benzazoles; 3, 6-dioxopyridazinyl benzazoles; Anti-inflammatory activity.

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International Publications Awards

Development and Validation of HPLC, TLC and Derivative Spectrophotometric Methods for the Analysis of Ezetimibe in the Presence of Alkaline Induced Degradation Products.

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Abstract

Reversed phase-high performance liquid chromatography (RP-HPLC), thin layer chromatography (TLC) densitometry and first derivative spectrophotometry (^{1}D) techniques are developed and validated as a stability-indicating assay of ezetimibe in the presence of alkaline induced degradation products. RPHPLC method involves an isocratic elution on a Phenomenex Luna 5_ C18 column using acetonitrile: water: glacial acetic acid (50:50:0.1 v/v/v) as a mobile phase at a flow rate of 1.5 mL/min. and a UV detector at 235 nm. TLC densitometric method is based on the difference in R*f*-values between the intact drug and its degradation products on aluminum-packed silica gel 60 F254 TLC plates as stationary phase with isopropanol: ammonia 33% (9:1 v/v) as a developing mobile phase. On the fluorescent plates, the spots were located by fluorescence quenching and the densitometric analysis was carried out at 250 nm. Derivative spectrophotometry, the zero-crossing method, ezetimibe was determined using first derivative at 261 nm in the presence of its degradation products. Calibration graphs of the three suggested methods are linear in the concentration ranges 1-10 mcg/mL, 0.1-1 mg/mL and 1-16 mcg/mL with a mean percentage accuracy of 99.05 _ 0.54%, 99.46 _ 0.63% and 99.24 _ 0.82% of bulk powder, respectively. The three proposed methods were successfully applied for the determination of ezetimibe in raw material and pharmaceutical dosage form; the results were statistically analyzed and compared with those obtained by the reported method. Validation parameters were determined for linearity, accuracy and precision; selectivity and robustness were assessed by applying the standard addition technique.

Keywords: HPLC; TLC; Derivative spectrophotometry; Ezetimibe; Alkaline degradation products.

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International Publications Awards

Cairo University

LC Determination of Lidocaine and Prilocaine Containing Potential Risky Impurities and Application to Pharmaceuticals

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Abstract

A liquid chromatographic method for the determination of lidocaine (LID), prilocaine (PRL) and their impurities 2,6-dimethylaniline (DMA) and o-toluidine (TOL) has been developed.

The analysis was performed on a reversed phase C18 Hypersil BDS column at ambienttemperature.

A mobile phase consisting of Briton-Robinson buffer, pH 7 — methanol — acetonitrile(40: 45: 15 v/v/v) was used at a flow rate of 1.2 mL min^{-1}. Detection was achieved at 225 nm using benzophenone as internal standard over the concentration range 1.25 – 80 µg mL^{-1} for all analytes. The relative standard deviations RSD (n = 7) for the assay were less than 0.95%. Limit of detection values were found to be 0.346, 0.423, 0.112 and 0.241 µg mL^{-1} for LID, PRL, DMA and TOL, respectively.

The intraday and the inter-days RSD % indicated the precision of the procedure. The method proved to be suitable for the quality control of LID and PRL in pharmaceuticals.

Keywords: Column liquid chromatography; Pharmaceutical study; Lidocaine; Prilocaine and impurities.

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International Publications Awards

Thin-Layer and Column Chromatographic Methods for the Simultaneous Determination of Ambroxol Hydrochloride and Doxycycline Hyclate in Binary Mixture

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Abstract

Two selective and reproducible methods have been established for simultaneous analysis of ambroxol hydrochloride (Amb) and doxycycline hyclate (Dox).

The first method is densitometric TLC on silica gel with ethyl acetate–ethanol–glacial acetic acid–water 9:4:0.5:1 (v/v) as mobile phase. The linear range was 1–10 μg per zone (equivalent to 100–1000 μg mL^{-1}) for both drugs.

The second method is high-pressure liquid chromatography (HPLC) on a C18 column with methanol–0.5 M phosphate buffer, pH 6.5 60:40 (v/v) as mobile phase and ultraviolet detection at 254 and 270 nm for Amb and Dox, respectively. This method was linear over the concentration ranges 37.5–750 and 50–750 μg mL^{-1} for Amb and Dox, respectively.

The methods enabled specific and accurate analysis of these drugs in laboratory-prepared mixtures and in Ambrodoxy capsules.

The results obtained agreed statistically with those obtained by use of the official B.P. methods.

Keywords: Ambroxol hydrochloride; Doxycycline hyclate; TLC–densitometry; HPLC impurities.

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International Publications Awards

Cairo University

Synthesis and Antitumor Activity of Some 5H-Pyrrolizine, Pyrimido [5,4-a] Pyrrolizine Pyrimido [4,5-b] Pyrrolizine derivatives

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Abstract

Seven new series of condensed pyrrolizine derivatives of anticipated antitumor activity have been synthesized. Comprises ethyl-1-cyano-3-phenylcarbamoyl-6,7-dihydro-5*H*pyrrolizin- 2-yl-carbamate, 2,4-dioxo-1*H*-pyrimido[4,5-*b*]pyrrolizine-9-carbonitrile, 1- cyano-2-(3-substituted ureido)-3N-phenyl-6,7-dihydro-pyrrolizine-3-carboxamide, 3- (alkyl / phenyl)-4-imino-2-oxo-9N-phenyl-2,3,4,5,6,7-hexahydro-1*H*-pyrimido [5,4- *a*]pyrrolizine-9-carboxamide , 4-amino-3-(alkyl / phenyl)-2-oxo-2,3,4,5,6,7-hexahydro- 1*H*-pyrimido[5,4-*a*]pyrrolizine-9-carboxamide, of 2-amino-3N-phenyl-6,7-dihydro- 5*H*-pyrrolizine-1,3-dicarboxamide and 4-oxo-9N-phenyl-4, 5,6,7-tetrahydro-3*H*pyrimido[5,4-*a*]pyrrolizin-9-carboxamide derivatives. Eleven were screened for their *in vitro* antitumor activity and ten compounds proved to possess moderate to weak activities.

Keywords: Pyrrolizine; Pyrimido[4,5-*b*]pyrrolizine; Pyrimido[5,4-*a*]-pyrrolizine; Anticancer; Probit analysis.

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International Publications Awards

Stability Studies of the Effect of Crosslinking on Hydrochlorothiazide Release

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Abstract

The aim of this study was to determine the changes in the *in vitro* drug release from cross-linked hard gelatin capsules containing a water-insoluble drug. An immediate release hydrochlorothiazide (HCTZ) capsule formulations containing drug, lactose, starch 1500 were prepared and exposed to accelerated stability study (40°C/ ambient RH (relative humidity), 40°C/60% RH, 40°C/75% RH, and 40°C/90% RH) in closed dark bottles for 4 weeks. Notable decrease in drug dissolution was observed after 4 weeks in all humidity conditions as compared with freshly prepared capsules. In an attempt to overcome capsule cross-linking, glycine alone, citric acid alone and both glycine and citric acid were added to the prepared formulations.

In all humidity conditions, addition of glycine alone or citric acid alone did not affect the decrease in dissolution profile. On the other hand, addition of both glycine and citric acid together was found to prevent capsule cross-linking completely. Fourier transfer infrared (FTIR) spectroscopy and differential scanning calorimetry (DSC) were performed on blank capsules (with no glycine or citric acid) and after storage for 4 weeks to identify the physicochemical changes in drug and other capsule components hence its effect on dissolution.

Keywords: Hard gelatin capsule; Cross-linking; Hydrochlorothiazide; Relative humidity; Starch.

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International Publications Awards

Buccal Mucoadhesive Tablets of Flurbiprofen: Characterization and Optimization

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Abstract

The aim of this work was to develop and optimize sustained-release mucoadhesive tablets of flurbiprofen. Mucoadhesive polymers used were chitosan as primary polymer and hydroxypropylmethyl celluose, hydroxypropyl cellulose, or sodium carboxymethyl cellulose as secondary polymer.

Tablets were evaluated in terms of weight variation, thickness, hardness, friability, swelling, surface pH, *in vitro* mucoadhesive force, and *in vitro* release. The compatibility between flurbiprofen and the tablet excipients was confirmed by fourier transfer infrared studies. Both the primary and secondary polymers were found to have synergistic effects on tablet swelling, bioadhesion, and *in vitro* drug release.

Formulations containing sodium carboxymethyl cellulose (F1) showed a maximum swelling index of 4.144 after 8 h, maximum mucoadhesive force (0.27 N), and convenient *in vitro* release over 8 h. D-optimal design was employed to evaluate the effect of the ratio of the primary polymer ($X1$) and the type of secondary polymer ($X2$) on the swelling index after 8 h ($Y1$), drug release after 8 h ($Y2$) and time taken for 30% drug release ($Y3$).

Keywords: Flurbiprofen; Buccal delivery; Mucoadhesive tablets; Chitosan; D-optimal design.

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Cairo University

International Publications Awards

IPACU

Seasonal Variation in the Essential Oil Composition of Origanummajorana L. Cultivated in Egypt

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Abstract

The hydro distilled essential oil content of Origanummajorana L. (Lamiaceae) ranged from 2.5-3% with the maximal value (3%) in spring.

Analysis of the oil by GC/MS resulted in the identification of 15, 15, 11, and 14 components in the oils prepared in spring, summer, autumn, and winter, respectively.

The composition of the essential oils differed quantitatively and qualitatively according to the time of collection.

Thymol (38.4%) and cis-Sabinene hydrate (25.3%) were the major components in spring plants. Terpinen-4-ol (37.4%, 20.5%, 16.3%) was a major component in the summer, autumn and winter oils, respectively. cis-Sabinene hydrate (54.4%) was major in winter plants while terpinolene (43.1%) was the main component in autumn plants.

Other components detected in lower amounts in all oil samples were sabinene and p-cymene (up to 7.4% and 13.9% in autumn), and α-terpinene (up to 13.3% in summer).

Keywords: *Origanummajorana;* Essential oil; Seasonal variation.

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International Publications Awards

Cairo University

Enhancement of Amlodipine Cardioprotection by Quercetin in Ischaemia/Reperfusion Injury in Rats

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Abstract

Objectives To investigate the possible modification of the cardioprotective effect of amlodipine when co-administered with quercetin in myocardial ischaemia/reperfusioninduced functional, metabolic and cellular alterations in rats.

Methods Oral doses of amlodipine (15 mg/kg) and quercetin (5 mg/kg), alone or in combination, were administered once daily for 1 week. Rats were then subjected tomyocardial ischaemia/reperfusion (35min/10min). Heart rates and ventricular arrhythmias were recorded during ischaemia/reperfusion progress. At the end of reperfusion, activities of plasma creatine kinase (CK) and cardiac myeloperoxidase were determined. In addition, cardiac contents of lactate, ATP, thiobarbituric acid reactive substances (TBARS), reduced glutathione (GSH) and total nitrate/nitrite (NOx) were estimated. Finally, histological examination was performed to visualize the protective cellular effects of different pretreatments. Key findings Combined therapy provided significant improvement in the amlodipine effect toward preserving cardiac electrophysiologic functions, ATP and GSH contents as well as reducing the elevated plasma CK, cardiac TBARS and NOx contents.

Conclusion Quercetin could add benefits to the cardioprotective effect of amlodipine against injury induced in the heart by ischaemia/reperfusion

Keywords: Amlodipine; Arrhythmias; Ischaemia; Quercetin; Reperfusion.

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National Cancer Institute

International Publications Awards

Cairo University

Altered expression of Proliferation-Inducing and Proliferation-Inhibiting Genes Might Contribute to Acquired Doxorubicin Resistance in Breast Cancer Cells

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Abstract

This study was designed to investigate the molecular changes that may develop during exposure of breast cancer cells to anticancer agents and that may lead to acquired resistance. We used two breast cancer cell lines, a parental (MCF7/WT) and a doxorubicin-resistant (MCF7/DOX) one. Cell survival, cell cycle distribution and RT-PCR expression level of genes involved in DNA damage response, MDR1, GST and TOPOIIalpha were measured. MCF7/DOX cells were five-fold more resistant to doxorubicin (DOX) than the MCF7/WT cells. DOX treatment causes arrest of MCF7/DOX cells in G1 and G2 phases of cell cycle whereas MCF7/WT cells were arrested in S-phase.

The molecular changes in both cell lines due to DOX treatment could be classified into: (1) the basal level of p53, p21, BRCA1, GST and TOPOIIalpha mRNA was higher in MCF7/DOX than MCF7/WT. During DOX treatment, the expression level of these genes decreased in both cell lines but the rate of down-regulation was faster in MCF7/WT than MCF7/DOX cells. (2) The expression level of MDR1 was the same in both cell lines but 48 and 72 h of drug treatment, MDR1 disappeared in MCF7/WT but still expressed in MCF7/DOX. (3) There was no change in the expression level of BAX, FAS and BRCA2 in both cell lines.

Conclusively, after validation in clinical samples, overexpression of genes like BRCA1, p53, p21, GST, MDR1 and TOPOIIalpha could be used as a prognostic biomarker for detection of acquired resistance in breast cancer and as therapeutic targets for the improvement of breast cancer treatment strategies.

Keywords: Breast cancer; Doxorubicin; DNA damage response (DDR); TOPOIIa; MDR1; GST.

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Cairo University

International Publications Awards

IPACU

SEN Virus Infection in Egyptian Patients on Maintenance Hemodialysis: Prevalence and Clinical Importance

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Abstract

Background and purpose: SEN virus (SENV) is assumed to be responsible for post-transfusion non-A to –E hepatitis. Phylogenetic analysis of SENV has shown 9 different strains. Two strains, SENV-H and SENV-D, were described as possible candidates for post-transfusion hepatitis. This study examined the prevalence of SENV infection and its clinical importance for patients undergoing hemodialysis.

Methods: Serum samples were obtained from 63 long-term hemodialysis patients, and examined for SENV-H and SENV-D viremia by polymerase chain reaction. Serum samples were also obtained from 20 patients with chronic kidney diseases (CKD) who were not undergoing hemodialysis and from 20 apparently healthy blood donors to act as controls. For SENV screening, a primer pair was used for the conserved ORF1 region among all SENV genotypes from A to I.

Results: SENV infection more frequent among hemodialysis patients (33/63; 52.4%) and those with CKD (10/20; 50.0%) than among the control participants (2/20; 10.0%) [p = 0.003]. Twenty three of 33 hemodialysis patients had SENV-H or -D, 61% of whom were positive for SENV-H only, 4% were positive for SENV-D only, and 36% were positive for both SENV-H and SENV-D. SENV infection was not associated with age, sex, amount or duration of hemodialysis, or liver function test results. Elevated alanine aminotransferase was significantly associated with HCV viremia, but not with SENV infection.

Conclusions: Egyptian hemodialysis patients and those with CKD are at higher risk for SENV transmission. SENV-H is more prevalent than SENV-D.

was significantly

Keywords: Polymerase chain reaction; Prevalence; Renal dialysis; Torque teno virus.

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International Publications Awards

Cairo University

Catechol-O-Methyltransferase Expression and 2-Methoxyestradiol Affect Microtubule Dynamics and Modify Steroid Receptor Signaling in Leiomyoma Cells

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Abstract

Context: Development of optimal medicinal treatments of uterine leiomyomas represents a significant challenge. 2-Methoxyestradiol (2ME) is an endogenous estrogen metabolite formed by sequential action of CYP450s and catechol-Omethyltransferase (COMT). Our previous study demonstrated that 2MB is a potent antiproliferative, proapoptotic, antiangiogenic, and collagen synthesis inhibitor in human leiomyomas cells (huLM). **Objectives**: Our objectives were to investigate whether COMT expression, by the virtue of 2ME formation, affects the growth of huLM, and to explore the cellular and molecular mechanisms whereby COMT expression or treatment with 2MB affect these cells. **Results**: Our data demonstrated that E2-induced proliferation was less pronounced in cells over-expressing COMT or treated with 2MB (500 nM). This effect on cell proliferation was associated with microtubules stabilization and diminution of estrogen receptor a (ERa) and progesterone receptor (PR) transcriptional activities, due to shifts in their subcellular localization and sequestration in the cytoplasm. In addition, COMT over expression or treatment with 2ME reduced the expression of hypoxia-inducible factor -1a (HIF-1 a) and the basal level as well as TNF-a-induced aromatase (CYP19) expression.

Conclusions: COMT over expression or treatment with 2ME stabilize microtubules, ameliorates E2-induced proliferation, inhibits ERa and PR signaling, and reduces HIF-1 a and CYP19 expression in human uterine leiomyoma cells. Thus, microtubules are a candidate target for treatment of uterine leiomyomas. In addition, the naturally occurring microtubuletargeting agent 2ME represents a potential new therapeutic for uterine leiomyomas.

Keywords: Catechol- O- methyltransferase; 2- Methoxy estradiol; Leiomyoma cells.

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International Publications Awards

Physiological Studies on Growth of Two Different Strains of Lentinus Edodes

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Abstract

Lentinus edodes a Chinese edible and medicinal mushroom (newly introduced to Egypt from China) was grown using the submerged culture.

The biomass of the two tested strains were extracted with ethanol to obtain the tested crude extract for its biological activity for further studies.

Studies on the physiological factors affecting the biomass production as well as the extract of the two strains were carried out.

The maximum production of the biomass and extract of the two strains was obtained at 25°C, pH 7, fructose as carbon source and under static incubation. Strain Lentinus edodes LC202 produced maximum yield of biomass and extract by using yeast extract as nitrogen source at concentration of 5 g/l, fructose concentration at 10g/L and 13 days incubation period. While Lentinus edodes LC2141 gave the maximum biomass and extract yield by using sodium nitrate as nitrogen source at 2 g/L concentration, fructose concentration at 15g/L and 15 days incubation period. Different heavy metals at different concentrations were also tested.

Keywords: *Lentinus edodes*; Ethanol extract; Submerged culture; Optimum growth conditions.

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International Publications Awards

Cairo University

Trastuzumab Versus Lapatinib: the Cardiac Side of the Story

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Abstract

HER2 gene plays a pivotal role in the pathogenesis of 20% of breast cancer patients.

At the same time, it is one of the main cardiac survival pathways when subjected to bio-mechanical stress including exposure to anthracyclines. With the emergence of the anti-HER2 targeting agents, concerns raised regarding the potential cardiac toxicities of these drugs. In the early clinical trials with trastuzumab, it was evident that it has a significant cardiac toxicity.

The incidence of symptomatic heart failure ranged from 4% to 7% with trastuzumab alone, and 27% when administered concurrently with doxorubicin. On the other hand, available data suggest that lapatinib is much less cardiotoxic.

The incidence of symptomatic heart failure has been constantly reported to be less than 0.5%. In this review, we discuss the possible theories behind the differences in the cardiac profile of both agents. We emphasize on the role of cardiac bioenergetics and the effects of trastuzumab and lapatinib on ATP production through the different effects they exert on the cardiac mitochondria.

Keywords: HER2 Lapatinib Trastuzumab Cardiac toxicity.

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International Publications Awards

Third Generation Triplet Cytotoxic Chemotherapy in Advanced Non-Small Cell Lung Cancer: A Systematic Overview

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Abstract

Background*:* Previous meta-analysis on three drugs combination for treatment of advanced non-small cell lung cancer (NSCLC) did not demonstrate an improvement in survival, however many of the trials included in this meta-analysis used older and less effective cytotoxic drugs. We conducted this analysis to compare the relative efficacy of third generation triplet therapy with that of standard double therapy in the treatment of advanced NSCLC.

Methods*:* A Medline searchwas performed using the search terms "lung cancer" and "randomized trials".

Trials not utilizing a third generation cytotoxic chemotherapeutic agent (paclitaxel, docetaxel, vinorelbine, gemcitabine) were excluded. Pooled odds ratios (OR) for the objective response and toxicity rates were calculated using the Mantel-Haenszel estimate. Pooledmedian ratios formedian survivalwere calculated using the weighted sum of the log-ratio of median ratios of individual study.

Results: We analyzed six randomized comparative trials involving 1932 patients. Patients receiving triplet therapy had a significantly higher response rate (OR: 1.33; 95% CI, 1.50–2.23; $P < 0.001$). Incidence of grade III/IV hematological toxicitywas higher with triplet therapy. Non-hematological toxicities, with the exception of neuropathy, were similar. Median survival of triplet therapy was not significantly different from doublet (MR: 1.10; 95% CI: 0.91–1.35; $P = 0.059$).

Conclusions: Triplet therapy with third generation cytotoxic drugs is associated with higher tumor response rate at the expense of increased toxicity. Although triplet therapy had a better overall survival ,compared to doublet therapy, this did not reach statistical significance.

Keywords: Advanced non-small cell lung cancer Cytotoxic chemotherapy Triplet therapy Doublet therapy Outcomes Response rates Overall survival.

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International Publications Awards

Cairo University

The First Children's Cancer Hospital, Egypt International Scientific Conference

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Abstract

A wide gathering of scientists, clinicians, pharmacists and nurses specialized in pediatric oncology practice met to celebrate the second anniversary of children's hospital cancer hospital, Egypt (CCHE).The celebration was in the form of high–brow teaching lectures and reports presented by international experts in the fields of pediatric CNS tumors, solid tumors (neuroblastoma , nephroblastoma , soft tissue and bone tumors), lymphoma , leukemia and pediatric oncology nursing .

The conference extends its activities to hospital management, clinical pharmacy and telemedicine. Furthermore, CCHE experts presented the efforts performed to establish a state of- the- art pediatric oncology hospital equipped with all needed facilities to raise the standard of care to the highest levels.

Keywords: CNS tumors; Leukemia; Pediatric oncology; Lymphoma; Radiation; Nursing; Oncology; Solid tumors.

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Cairo University

International Publications Awards

IPACU

Role of PET/CT in Malignant Pediatric Lymphoma

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Abstract

Introduction Malignant pediatric lymphoma accounts for ١٠–١٥% of all pediatric cancers, (representing 2–3% of all malignancies), with a peak incidence between 5–9 years. Chemotherapy is usually the first and most common mode of treatment. The choice of treatment and prediction of prognosis depend on the histological type of tumor, initial staging, evaluating treatment response, and detection of early recurrence. Conventional imaging modalities have many limitations. PET/CT is more accurate, however so far the literature lacks the results of a large group of patients.

Aim of study To report the role of PET/CT in the abovementioned objectives at the newly established Children's Cancer Hospital in Cairo, Egypt, which is one of the busiest dedicated pediatric oncology centers of such purposes in the world. All findings were proven by histopathology، clinically, and by clinical follow-up. Patient population A total of 152 patients (35 girls and 117 boys) with histologically proven malignant lymphoma (117 HD, 35 NHL) were included in this study. They were divided into four groups. Group I: 41 patients for initial staging.Group II: 51 patients for evaluating early treatment response after two to three cycles of chemotherapy. Group III: 42 patients for evaluating treatment response 4–8 weeks after the end of their treatment. Group IV: 18 patients evaluated for long-term follow-up. Results of PET/CT were compared with the other conventional imaging modalities (CIM).

Results The sensitivity, specificity, accuracy, and positive and negative predictive values of PET/CT and CIM were as follows: In Group I: PET/CT modified staging and treatment in 11 out of 41 cases (26.8%), upstaged 5 (١٢,٢%)patients and down-staged six (14.6%) patients. Group II: 100%, 97.7%, 98%, 85.7%, 100%, respectively، for PET/CT and 83%, 66.6%, 68.6%, 25%, 96.7% for CIM respectively Group III: At the end of chemotherapy 100%, 90.9%, 92.8%, 75%, 100%, respectively, for PET/CT and 55.5%, 57.5%, 57.1%, 26.3%, 82.6% for CIM, respectively.
Group IV: For long-term follow-up, all the parameters scored 100% for PET/CT, 100%, 38.4%, 72.2%, 50%, 100% for CIM, respectively.

Conclusion PET/CT in pediatric lymphoma is more accurate than CIM. We recommend that it should be the first modality for all purposes in initial staging, evaluating treatment response and follow-up.

Keywords: Malignant lymphoma; Pediatric lymphoma; Initial staging; Evaluating treatment response; Follow-up malignant lymphoma; F18-FDG PET/CT

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International Publications Awards

Cairo University

Nipple Sparing Mastectomy with Nipple Areola Intraoperative Radiotherapy: One Thousand and One cases of a five years Experience at the European institute of oncology of Milan (EIO)

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Abstract

In order to reduce mutilation, nipple-areola complex (NAC) conservation can be proposed for the treatment of breast cancer when mastectomy is indicated. To reduce the risk of retro areolar recurrence, a novel radiosurgical treatment combining subcutaneous mastectomy with intraoperative radiotherapy (ELIOT) is proposed. One thousand and one nipple sparing mastectomies (NSM) were performed from March 2002 to November 2007 at the European institute of oncology (EIO), for invasive carcinoma in 82% of the patients and in situ carcinoma in 18%. Clinical complications, aesthetic results, oncological and psychological results were recorded. A comparison was performed between the 800 patients who received ELIOT and the 201 who underwent delayed one-shot radiotherapy on the days following the operation. The median follow up time was 20 months (range 1–69) for a follow up performed in 83% of the patients. The NAC necrosed totally in 35 cases (3.5%) and partially in 55 (5.5%) and was removed in 50 (5%). Twenty infections (2%) were observed and 43 (4.3%) prostheses removed. The median rate of the patients for global cosmetic result on a scale ranging from 0 (worst) to 10 (excellent) was 8. Evaluation by the surgeon in charge of the follow-up gave a similar result. Only 15% of the patients reported a partial sensitivity of the NAC. Of the fourteen (1.4%) local recurrences, ten occurred close to the tumour site, all far from the NAC corresponding to the field of radiation. No recurrences were observed in the NAC. In a group of patients characterized by a very close free margin under the areola, no local recurrence was observed. Overall, 36 cases of metastases and 4 deaths were observed. No significant outcome difference was observed between the 800 patients receiving intraoperative radiotherapy (ELIOT) and the 201 patients receiving delayed irradiation.

Keywords: Mastectomy; Nipple sparing; Breast cancer; Intraoperative radiotherapy.

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Faculty of Oral and Dental Medicine

International Publications Awards
Cairo University

The Effect of Different Irrigating Solutions on Bond Strength of Two Root Canal–Filling Systems

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Abstract

The bond strength of ActiV GP root canal filling system and gutta-percha/AH plus sealer (Dentsply, Detrey, GmbH, Germany) when used after final rinse with different irrigation protocols was evaluated in this study. Forty roots were randomly divided into four groups (n =10) according to the final irrigation regimen: group 1, 5mL 17% EDTA; group 2, 5 mL 17% EDTA followed by 5mL 2% chlorhexidine gluconate (CHX); group 3, 5 mLQ1 MTAD; and group 4, 5 mL MTAD followed by 5 mL2% CHX. Each group was further subdivided into two subgroups (n = 5): in subgroup a, the root canals were filled using warm gutta-percha and AH plus sealer,and in subgroup b, the root canals were filled using the ActiV GP obturation system. Two-millimeter thick horizontal sections from the coronal and midthirds of each root were sliced for the push-out bond strength measurement. EDTA/CHX/ActiV GP (2.46 _ 1.02 MPa) yielded significantly the highest mean bond strength value. The significantly lowest bond strength was recorded for EDTA/ActiV GP (1.12 _ 0.72 MPa). It was concluded that the bond strength of ActiV GP was improved by using 2% CHX in the final irrigation after 17% EDTA, whereas CHX did not enhance the effect of MTAD on the bond strength of the material. The bond strength of gutta-percha/AH plus was adversely affected by MTAD and MTAD/CHX.

Keywords: ActiV GP; AH plus; Bond strength; Chlorhexidine; EDTA; MTAD.

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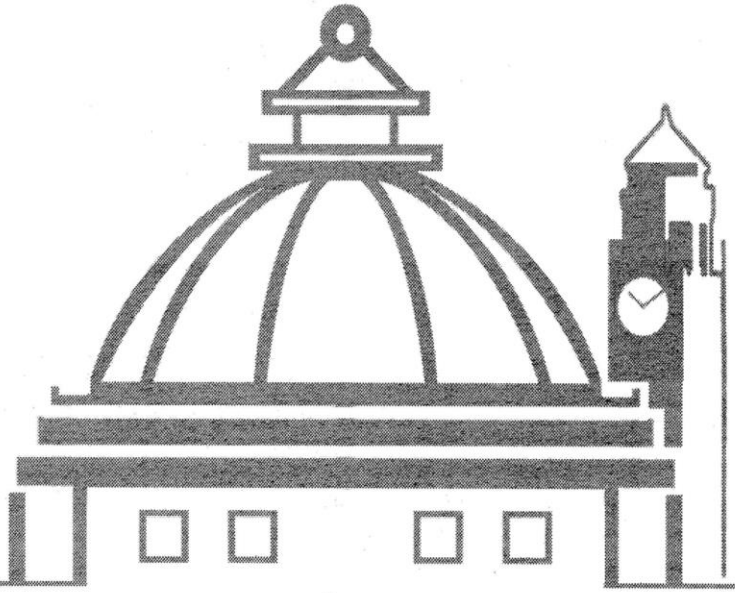

Engineering Sector

Faculty Of Engineering

International Publications Awards

Experimental Investigation of Screech Tone Characteristics of Jet Interaction with a Flat Plate

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Abstract

The screech tone characteristics of an underexapnded jet in the vicinity of a flat plate where the jet is emitted from a circular sonic nozzle and interacts with a flat plate placed parallel to the jet axis have been investigated experimentally. The flow is visualized using the schlieren technique, and the unsteady pressure on the flat plate as well as the sound pressure level (SPL) in the far field are measured for different jet-plate separation distances. It is found that screech tone vanishes when the flat plate comes close to the jet axis. However, there is an azimuthal directivity in its propagation, which depends on jet-plate separation distance. In addition, the highly oscillating baseline jet flow is suppressed by the jet-plate interaction, and screech tone completely disappears when the jet-plate separation distance becomes less than 0.61 of the jet diameter.

Keywords: Under-Expanded Jet; Jet-Plate Interaction; Screech Tone; Aeroacoustic Noise.

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Cairo University

International Publications Awards

IPACU

Design, Fabrication, and Realization of a Supersonic Wind Tunnel for Educational Purposes

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Abstract

The supersonic wind tunnel is an indispensable facility for basic education in any course that covers compressible flows and one of the main pillars of any aerodynamic laboratory. The introduction of a supersonic wind tunnel at the aerodynamics laboratory of the Aerospace Engineering Department at Cairo University had often been postponed and was hindered by a lack of funds for the purchase of foreign equipment and expertise. Thoughts therefore turned to building such facility instead of buying it, substituting high-tech and complex foreign equipment for locally produced equipment, and 'thinking out of the box' to make the most use of available resources, even when this led to some unconventional applications. An extensive scheme for the design, fabrication, and realization of a multi-Mach number (M = 1.5, 2, and 2.5) supersonic wind tunnel for laboratory experiments is proposed in this paper. The proposed scheme is simple, detailed and multi-level; it starts by utilizing one-dimensional isentropic fl ow theory for the conceptual design phase and makes full use of computational fl uid dynamics at the detailed design phase. This ensured that we had a working design before we embarked on the manufacture of any components, which would have been costly to modify had there been any design error. A parametric study has been carried out for a number of design parameters, using numerical simulations. After the design and fabrication, a number of successful standard textbook experiments, for Mach number 2, were carried out as validation for the proposed scheme. The results showed good agreement with the theoretical predictions

Keywords: Compressible flow; Wind tunnel testing; Supersonic flow; Computational fluid dynamics; Isentropic flow; Method of characteristics; Shock waves.

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International Publications Awards
Cairo University

Aerothermoacoustic Response of Shape Memory Alloy Hybrid Composite Panels

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Abstract

Supersonic nonlinear vibrations of a traditional composite panel impregnated with prestrained shape memory alloy fibers and subjected to combined aerodynamic, thermal, and random acoustic loads are investigated. A nonlinear finite element model is developed using the first-order shear-deformable plate theory, von Kármán straindisplacement relations, and the principle of virtual work. The aerodynamic pressure is modeled using the quasisteady first-order piston theory. Thermal load is assumed to be steady-state constant temperature distribution, and the acoustic excitation is considered to be a white-Gaussian random pressure with zero mean and uniform magnitude over the panel surface. Nonlinear temperature-dependence of material properties is considered in the formulation. The dynamic nonlinear equations of motion are transformed to modal coordinates to reduce the computational efforts. The Newton–Raphson iteration method is employed to obtain the dynamic response at each time step of the Newmark numerical integration scheme. Finally, the nonlinear response of a shape memory alloy hybrid composite panel is presented, illustrating the effect of shape memory alloy fiber embeddings, aerodynamic pressure, sound pressure level, and temperature rise on the panel response.

Keywords: Panel flutter; Shape memory alloy; Aeroelasticity; Acoustic; Random; Composite.

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International Publications Awards

Cairo University

Limit-Cycle Oscillation of Shape Memory Alloy Hybrid Composite Plates at Elevated Temperatures

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Abstract

A traditional composite plate impregnated with pre-strained shape memory alloy fibers and subject to combined thermal and aerodynamic loads is investigated to demonstrate the effectiveness of using the SMA fiber embeddings in improving the static and dynamic response of composite plates. The problems investigated can be categorized into: thermal buckling subject to aerodynamic loading, linear flutter boundary at elevated temperatures, nonlinear flutter limit-cycle, and chaotic oscillations at elevated temperatures. A nonlinear finite element model based on the von Karman strain displacement relations and first-order shear deformable plate theory is derived. Aerodynamic pressure is modeled using the quasi-steady first-order piston theory. The governing equations are obtained using the principle of virtual work based on thermal strain being a cumulative physical quantity. Newton- Raphson iteration is employed to obtain the static aero-thermal large deflection at each temperature step and the dynamic response at each time step of the Newmark numerical integration scheme. A frequency domain solution is presented for predicting the flutter boundary at elevated temperatures, while the time domainmethod along with modal transformation is applied to numerically investigate periodic, non-periodic, and chaotic limit-cycle oscillations. The results show that the critical buckling temperature of the plate is greatly increased, and hence the thermal post-buckling deflection is suppressed by using SMA fiber embeddings. The SMA fiber embeddings caused an increase in the critical dynamic pressure at elevated temperatures, and enlargement of the static flat and dynamically stable region of the panel.

Keywords: Panel flutter; Shape memory alloy; Aeroelasticity; Chaos; Composite.

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International Publications Awards

Cairo University

Correlation Between the Chemical Structure of Biodiesel and its Physical Properties

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Abstract

Biodiesel is a renewable, biodegradable, environmentally benign, energy efficient, substitution fuel which can fulfill energy security needs without sacrificing engine's operational performance. Thus it provides a feasible solution to the twin crises of fossil fuel depletion and environmental degradation. The properties of the various individual fatty esters that comprise biodiesel determine the overall properties of the biodiesel fuel. In turn, the properties of the various fatty esters are determined by the structural features of the fatty acid and the alcohol moieties that comprise a fatty ester. Better understanding of the structure-physical property relationships in fatty acid esters is of particular importance when choosing vegetable oils that will give the desired biodiesel quality. By having accurate knowledge of the influence of the molecular structure on the properties determined, the composition of the oils and the alcohol used can both be selected to give the optimal performance. In this paper the relationship between the chemical structure and physical properties of vegetable oil esters is reviewed and engineering fatty acid profiles to optimize biodiesel fuel characteristics is highlighted.

Keywords: Biodiesel; Cetane number; Oxidative stability; Vegetable oil; Viscosity.

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Cairo University

International Publications Awards

IPACU

Maximum Utilization of used Oils for Cleaner Environment

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Abstract

The disposal of both used mineral and vegetable oils is one of the main environmental problems. Actually, uncontrolled disposal seriously damages the sewage system, blocks pipes and causes unbalance to the aquatic ecosystem. In this study, spent mineral oil was used in the production of grease while spent vegetable oil was transformed into soap, which was incorporated in the production of grease. The specifications of the manufactured grease were compared with those of commercial grease. The processing parameters were investigated to achieve the highest quality of grease together with a maximum yield and better specifications.

Keywords: Used lube oil; Used vegetable oil; Grease; Soap; oil pollution.

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International Publications Awards
Cairo University

Effects of Surface Treatment of Ground Rice Husk on the Polyurethane Based on Castor Oil

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Abstract

Polyurethane (PU) elastomer based on castor oil and polymeric diphenylmethane diisocyanate (PMDI) was synthesised with NCO/OH ratio = 2 as a polymeric matrix. Polyurethane was composited with rice husk with average particle size less than 200 μm. Ground rice husk was pretreated by steam and sodium hydroxide solution in order to study and evaluate the effect of different surface treatment methods on the properties of the polyurethane composites. Scanning Electron Microscopy (SEM) was used to investigate dispersion and fracture surfaces of the composites. Mechanical test (hardness), Thermogravimetric Analysis (TGA), and Differential Scanning Calorimetry (DSC), were employed to characterise the developed composite materials in details. Composite polyurethanes based on treated and untreated rice husk showed different physical, chemical and mechanical properties. SEM micrographs of PU-treated rice husk (steam) displayed rice husk tightly embedded in the PU matrix with uniform distribution. The steam treatment increased the interfacial adhesion within the material, which showed a high thermal stability. PU-treated rice husk (sodium hydroxide 10 wt.%) showed poor mechanical properties. Untreated rice husk showed moderate mechanical properties as compared to the preceding cases.

Keywords: Polyurethane; Castor oil; Composites.
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International Publications Awards

Prediction and Verification of the Conditions Governing the Synthesis of Tailored Zeolite a for Heavy Metals Removal

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Abstract

Numerous experimental trials, exhaustive analytical and testing procedures are usually undertaken, to reach the appropriate conditions for synthesis of "Zeolite A". However, it is possible to come-up with a semi quantitative approach, through modeling and optimization techniques, to define the approximate range of initial conditions governing the preparation of a tailored zeolite with specific characteristics including silica to alumina ratio, particle size, and cation exchange capacity to be used for the removal of heavy metals.

This paper is an attempt to adopt an engineering approach essentially comprising the formulation of a mathematical model relating the characteristics of zeolite A to the synthesis conditions based on numerous experimental published results, optimization to define the synthesis conditions required to produce specific zeolite A , verification of this proposed approach with experimental results for preparation of tailored zeolite A conducted at our laboratories and the assessment of its efficiency for separation of chromium (III). The composition of the synthesized zeolite A has been as anticipated and the removal of chromium (III) has been in agreement with the developed model. These results indicate that is possible to adopt this approach in a generic manner to select the optimum synthesis conditions for the preparation of zeolites having specific performance characteristics.

Keywords: Zeolite A; Synthesis; Prediction; Optimization; Chromium.

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International Publications Awards
Cairo University

Power System Reliable Stabilization with Actuator Failure

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Abstract

This article presents a new approach to design reliable controllers acting on the excitation and governor of a synchronous alternator. The usage of a power system stabilizer is inevitable for the enhancement of dynamic stability of power grids. The suggested reliable power system stabilizer ensures stability either when both controllers are sound or when one of them fails. A redundant feedback con-troller is designed using particle swarm optimization to achieve a desired degree of stability whether or not the main controller is responding. The design of the redundant controller is based on minimizing an eigenvalue-based objective function using particle swarm optimization. A single-machine infinite-bus system is considered to demonstrate the functionality of the proposed fault-tolerant controller. Results of the eigenvalue analysis reported in the present article show the effectiveness of the proposed power system stabilizer under different loading conditions. The approach is extended to consider reliable stabilization for multi-machine systems where the designed controller could successfully stabilize the system with sound operation as well as under control channel failure.

Keywords: Power system stabilizer; Dynamic stability; Reliable control; Particle swarm optimization.

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International Publications Awards

Power System Stabilizer Design for Minimal Overshoot and Control Constraint Using Swarm Optimization

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Abstract

Power systems are subjected to severe repetitive oscillations that might cause generator shaft fatigue and, consequently, breakdown. In this article, we con-sider the problem of designing a power system stabilizer that alleviates generator shaft fatigue through the minimization of the maximum overshoot. Moreover, through our design, the levels of control signal, as well as controller parameters, have to be maintained within certain bounds imposed by physical and practical considerations.

In this respect, a technique based on the particle swarm approach is proposed to identify the parameters of a fixed structure lead compensator through the solution of a min-max problem while satisfying systems constraints. To enhance the overall performance of the system under wide loading conditions, a set of operating points is considered within our approach. The proposed power system stabilizer is applied to a single-machine infinite-bus system at different loading conditions, and the results showed the effectiveness of the developed approach.

Keywords: Particle swarm optimization; Power system stabilizer; Small signal stability.

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International Publications Awards
Cairo University

A Neuro-fuzzy Adaptive Power System Stabilizer Using Genetic Algorithms

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Abstract

This article presents the design technique of an adaptive power system stabilizer using adaptive neuro-fuzzy inference systems trained via data obtained from genetic algorithms. The parameters of a standard power system stabilizer are tuned using adaptive neuro-fuzzy inference systems to achieve a certain damping ratio and settling time at all load points within a wide region of operation. The overall transfer function of the system is derived in terms of the power system stabilizer parameters. A genetic algorithm is used to minimize a multi-objective optimization function that forces the damping ratio and settling time of the system to desired values. The optimization process is separately conducted at selected operating points to yield power system stabilizer parameters that change with load variations.

Results of genetic algorithm optimization are used to form a training dataset of an adaptive neuro-fuzzy inference systems agent, which could give the power system stabilizer parameters at any load within the specified region of operation. Results of power system stabilizer testing show that the desired performance indices could be fulfilled from light load to over load under both lagging and leading power factor conditions. System performance shows a remarkable improvement of dynamic stability by obtaining a well-damped time response.

Keywords: power system stabilizers; adaptive control; neuro-fuzzy systems; genetic algorithms.

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International Publications Awards

Robust Control of Switched Reluctance Motor Drives using Kharitonov Theorem and Swarm Intelligence

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Abstract

The paper presents a design technique for proportional integral (PI) robust current and speed controllers of switched reluctance motor (SRM) drives. The variations of stator inductance, equivalent resistance, moment of inertia and coefficient of friction are considered leading to uncertain plant representation of the drive. Robustness of the controllers is achieved through Kharitonov theorem considering parameter uncertainties over wide ranges of operation. To attain best performance, the design is cast as an optimisation problem solved by particle swarm optimisation (PSO) to ensure maximum possible degree of stability. Extensive comparisons with the classical methods are carried out showing noteworthy advantages of the proposed routine.

Keywords: Robust control; Switched reluctance motors; SRM; Kharitonov theorem; Swarm optimisation.

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International Publications Awards

Adaptive Deadbeat Controllers for Brushless Dc Drives Using Pso and Anfis Techniques

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Abstract

The paper presents a tuning methodology for the parameters of adaptive current and speed controllers in a permanentmagnet brushless DC (BLDC) motor drive system. The parameters of both inner-loop and outer-loop PI controllers, which vary with the operating conditions of the system, are adapted in order to maintain deadbeat response for current and speed. Evenly distributed operating points are selected within preset regions of system loading. A particle swarm optimization (PSO) algorithm is employed in order to obtain the controller parameters assuring deadbeat response at each selected load. The resulting data from PSO are used to train adaptive neuro-fuzzy inference systems (ANFIS) that could deduce the controller parameters at any other loading condition within the same region of operation. The ANFIS agents are tested at numerous operating conditions indicating deadbeat response at all cases. The response of the developed controllers is compared to that of classical controllers whose parameters are tuned using the well-known Ziegler-Nichols method. Results signify the superiority of the proposed technique over the classical method.

Keywords: Brushless DC motors; Adaptive control; Deadbeat response; Particle swarm optimization; Neuro-fuzzy systems.

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International Publications Awards

Robust Control of a Flexible-arm Robot using Kharitonov Theorem and Swarm Intelligence

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Abstract

In this paper, Kharitanov stability theorem is utilized to design control law for flexible manipulators. Hence, not only the stability of the controller is guaranteed but also a wide range of uncertainty in the system can be introduced. To evaluate the performance of the proposed control strategy and to demonstrate its applicability and effectiveness, it is employed to produce a robust feedback control of a realistic industrial benchmark problem for a flexible manipulator. The gearbox stiffness is considered nonlinear and the system has uncertainty in the model, end load uncertainty, and disturbances at the motor and the tool. Results of the response of the system with the control schemes are presented. The robustness performance of the controller is evaluated in terms of reference tool position tracking in the presence of mentioned disturbances and uncertainties.

Keywords: Brushless DC motors; Adaptive control; Deadbeat response; Particle swarm optimization; Neuro-fuzzy systems.

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International Publications Awards
Cairo University

Linear-matrix-inequality-Based Sliding Mode Control for Brushless d.c. Motor Drives

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Abstract

This paper deals with the robust sliding mode control of a brushless d.c. motor drive. A state-space model of the system is developed. The sliding mode controller is separated into linear and non-linear components. The novelty of the approach is in the rationale and method used to synthesize the linear control component which involves a linear matrix inequality (LMI) optimization. System uncertainty due to changes in load inertia is represented as norm bounded. A robust design approach is developed, yielding a robust controller against system uncertainties. A reaching condition to bring the system states to a sliding surface is developed, and the control burden lies heavily on the linear part to alleviate the chattering problem of conventional sliding mode control. The effect of the non-linear component on system performance is analysed. Testing the proposed controller verifies its effectiveness compared with the conventional one.

Keywords: Electric drives; Sliding mode control; Robust control; Linear matrix inequality.

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International Publications Awards

A Modified CMOS Differential Operational Trans-Resistance Amplifier (OTRA)

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Abstract

A modified CMOS realization of the differential operational trans-resistance amplifier (OTRA) is presented. A fair comparison with Mostafa and Soliman OTRA [Mostafa H, Soliman A. A modified CMOS realization of the operational trans-resistance amplifier. Frequenz 2006;60:70–6] shows that the modified differential OTRA provides better performance in most parameters. The OTRA is suitable for analog VLSI applications since it does not suffer from constant gain bandwidth product. Hence, it can exhibit wide bandwidth at high gain values. Moreover, an OTRA-based variable gain amplifier (VGA) is also introduced.

Keywords: CMOS operational trans-resistance amplifier; Analog VLSI applications; Variable gain amplifier; Wireless communications.

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Applications of

International Publications Awards

Cairo University

Applications of Voltage and Current Unity Gain Cells in Nodal Admittance Matrix Expansion

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Abstract

The Nodal Admittance Matrix (NAM) expansion method based on using nullor elements and pathological mirror elements is used to provide a systematic synthesis method of controlled sources. Two new NAM expansions for the Voltage Controlled Voltage Source (VCVS) are introduced in this paper. Four realizations of the noninverting VCVS using two resistors and three unity gain cells are given three of them are new. Four new realizations of the inverting VCVS using two resistors and three unity gain cells are given. A new NAM for the Current Controlled Current Source (CCCS) is introduced. Eight new realizations for the CCCS using two resistors and three unity gain cells are given. The realization of Voltage Controlled Current Source (VCCS) using one resistor and two unity gain cells is discussed. The realization of Current Controlled Voltage Source (CCVS) using one resistor and two unity gain cells is discussed. Applications of unity gain cells in Current Conveyor (CCII), Inverting Current Conveyor (ICCII) and Current Feedback Operational Amplifier are given. New realizations of the Tow Thomas (TT) filter using unity gain cells are given.

Keywords: Nodal Admittance Matrix; Controlled sources; Unity gain cells.

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International Publications Awards

Novel CMOS Realization of Balanced Output Third Generation Inverting Current Conveyor with Applications

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Abstract

A new current conveyor block, named balanced output third generation inverting current conveyor (ICCIII+-), is introduced in this paper. A novel CMOS realization for this block is proposed. To show the strength of this block, many applications are given such as integrators, filters and an oscillator. The proposed ICCIII+- and the presented applications are tested with SPICE simulations using CMOS 0.35 µm technology to verify the theoretical results.

Keywords: Current conveyor; Integrators; Filters; Oscillators.

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International Publications Awards
Cairo University

On the Trade-offs of Cooperative Data Compression in Wireless Sensor Networks with Spatial Correlations

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Abstract

In this paper we study the problem of efficient data dissemination over one- and two-dimensional multi-hop wireless sensor grids with spatially correlated sample measurements. In particular, we investigate the trade-offs of exploiting correlations via cooperatively compressing the sensor data as it hops around the network. We focus on two performance metrics, namely transport traffic and scheduling latency. More specifically, we investigate using basic information theory the feasibility of sublinear scaling laws , with the number of nodes, under a variety of cooperation strategies ranging from naive non-cooperative forwarding to sophisticated hierarchical cooperation. First, we show that a simple cooperation scheme, namely forward/reverse cooperation, achieves a logarithmic growth rate for the transport traffic and a linear growth rate for the schedule length with the number of nodes. Thus, we shift our focus to multi-phase cooperation to show that: i) $O(\sqrt{N})$ schedule length is achievable using two-phase cooperation which is a combination of noncooperative and forward/reverse cooperation schemes and ii) Logarithmic schedule length and transport traffic are both achievable using hierarchical cooperation, yet at the expense of more complexity in coordinating nodes' cooperation. This also opens room for optimizing these). performance measures for a given network size. Finally, we analyze the impact of fixed bit rate and derive upper bounds on the scheduling latency.

Keywords: Wireless sensor networks; Spatial correlations; Data compression; Entropy; scheduling latency; Scaling laws.

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Cairo University

International Publications Awards

IPACU

Efficient Time/Frequency Permutation of MIMO-OFDM Systems through Independent and Correlated Nakagami Fading Channels

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Abstract

Space-Time Frequency (STF) codes for MIMO-OFDM over block-fading channel can achieve rate *Mt* and full-diversity *Mt Mr Mb L* which is the product of the number of transmit antennas *Mt*, receive antennas *Mr*, fading blocks *Mb* and channel taps *L*. In this article, time permutation is proposed to provide independent block-fading over Jake's Doppler power spectrum channel. Moreover, we show the performance variations of STF code as channel delay spread changes. Therefore, we introduce a frequency/time permutation technique in order to remove the frequency correlation among sub-carriers, which subsequently increases the coding gain and achieves maximum diversity. Finally, the symbol error rate (SER) performance of the proposed time/frequency permuted STF codes over independent and correlated MIMO antenna branches under Nakagami fading channel is simulated. We show that the proposed systems provide better performance and more robust to large values of antennas correlation coefficients in comparison with the un-interleaved one.

Keywords: MIMO; OFDM; Space-Time Frequency Coding; Nakagami Fading Channel; Time/Frequency Interleaving.

Published in: Int. J. Communications, Network and System Sciences

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International Publications Awards

Cairo University

On the Oscillation of Second Order Half--linear Dynamic Equations

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Abstract

We obtain some oscillation criteria for solutions to the second-order half-linear dynamic equation

$$(a(x^{\Delta})^{\alpha})^{\Delta}(t)+q(t)x^{\alpha}(t))=0$$

When $\int^{\infty} a^{-1/\alpha}(s)\Delta s=\infty$ or $\int^{\infty} a^{-1/\alpha}(s)\Delta s<\infty$

These criteria unify and extend known criteria for corresponding half-linear differential and difference equations.

Some of our results are new even in the continuous and the discrete cases.

Keywords: Dynamic equations; Half linear; Oscillation; Second order.

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Cairo University

International Publications Awards

IPACU

Oscillations of Fourth Order Functional Differential Equations

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Abstract

We establish some sufficient condition for the oscillation of all solutions of the fourth-order functional differential equation.

$$\frac{d}{dt}\left(a(t)\left(\frac{d^3}{dt^3}x(t)\right)^{\alpha}\right)+q(t)f(x[g(t)])=0$$

and

$$\frac{d}{dt}\left(a(t)\left(\frac{d^3}{dt^3}x(t)\right)^{\alpha}\right)=q(t)f(x[g(t)])+p(t)h(x[\sigma(t)])$$

when $\int^{\infty}a^{-1/\alpha}(s)\,ds<\infty$. The case when $\int^{\infty}a^{-1/\alpha}(s)\,ds=\infty$ is also included.

Keywords: Oscillation; Fourth order; Functional differential equations.

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International Publications Awards

Cairo University

Oscillation theorems for second order nonlinear dynamic equations

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Abstract Some new criteria for the oscillation of nonlinear dynamic equations of the form

$$\left(a(t)(x^{\Delta}(t))^{\alpha}\right)^{\Delta} + f(t, x^{\sigma}(t)) = 0$$

on a time scale $\mathbb{T}$ are established.

Keywords: Oscillation; Nonoscillation; Super linear; Almost linear.

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International Publications Awards

Oscillation Criteria for third order nonlinear difference equations

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Abstract

We shall establish some new criteria for the oscillation of the third order nonlinear difference equations of the form

$$\Delta^2 (a(n)(\Delta(x(n))^\alpha) + q(n)f(x[g(n)]) = 0$$

and

$$\Delta^2 (a(n)(\Delta x(n))^\alpha) = q(n)f(x[g(n)]) + p(n)h(x[\sigma(n)])$$

when $\sum^{\infty} a^{-1/\alpha}(n) < \infty$.

Keywords: Oscillation; Nonoscillation; Comparison; First and second order.

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International Publications Awards
Cairo University

Exact Distribution of the Mann–Kendall Trend Test Statistic for Persistent Data

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Abstract

The distribution-free Mann–Kendall test is widely used for the assessment of significance of trends in many hydrologic and climatic time series. Previous studies have suggested both exact and approximate formulas for the calculation of the variance of the test statistic when the data are serially correlated. This paper outlines a procedure for the calculation of the exact distribution of the Mann–Kendall trend test statistic for persistent data with an arbitrary correlation structure. The particular cases of the AR(1) (first order autoregressive) model and the Fractional Gaussian Noise (FGN) model are presented for sample sizes between 3 and 9. While it has been previously shown that the Normal distribution gives a reasonable approximation to the exact distribution for large values of sample size n, a more accurate approximation based on the Beta distribution is proposed for moderate values of n. The application of the test to small samples is illustrated by testing the significance of recent trends starting in 1990 in 58 world river flow time series. The results confirm the effect of scaling in small samples and the benefits of using the Beta distribution as an approximation.

Keywords: Mann–Kendall; Trend test; Exact distribution; Scaling; Distribution-free; Climatic variability.

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Cairo University

International Publications Awards

IPACU

Enhancing the Effectiveness of Prewhitening in Trend Analysis of Hydrologic Data

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Abstract

Prewhitening of hydrologic as well as other types of natural time series has been suggested in the literature to eliminate the adverse effect of autocorrelation on the results of trend tests. It has been suggested in a recent study that prewhitening is not recommended when a true trend exists in the data. When prewhitening is applied, there has also been a debate on whether or not to remove an apparent trend before estimating the autocorrelation parameter ρ to ensure effective prewhitening. This is because while failing to remove an apparent trend before estimating ρ results in loss of power due to overestimation of ρ when a true trend exists in the data, it is also true that removing an apparent trend before estimating ρ results in loss of significance due to underestimation of q when no trend exists in the data. In this study, the applicability of prewhitening in the possible presence of a true trend is first established. It is then shown that simultaneous estimation of the trend slope and the autocorrelation coefficient, followed by correction of bias in the correlation coefficient largely eliminates the under/over-estimation of ρ within the limits of sampling variations, thus greatly enhancing the effectiveness of prewhitening. It is also shown that careful inference about the correlation model is critical for effective prewhitening. A comparison between the results obtained with and without bias correction is presented for a case study of trends in river flow series from different parts of the world. The results emphasize the importance of bias correction in small samples, as well as the importance of careful choice of a serial correlation model for the data, especially in the case of long time series.

Keywords: Trend test; Climatic change; Mann–Kendall test; Autocorrelation parameter bias; Prewhitening; River flow time series.

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International Publications Awards
Cairo University

On the Implementation of Prabhu's Exact Solution of the Stochastic Reservoir Equation

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Abstract

After 50 years of Prabhu's paper on the exact solution of the stochastic reservoir equation for the important class of gamma inflow distributions with an integral shape parameter, a detailed implementation of the exact solution is still lacking, despite its potential usefulness from both theoretical and practical points of view. This paper explores some properties of Prabhu's exact solution and investigates the numerical difficulties associated with its implementation. The solution is also extended to derive the distributions of deficit, spillage, yield, and actual release from the reservoir. Explicit analytical solutions for three relatively simple cases are given in detail as examples and comparisons with approximate numerical solutions are made, which reveal some shortcomings of approximate methods. The implementation of the solution in the general case reveals some numerical problems associated with large values of the shape parameter of the inflow distribution and large ratios of reservoir size to draft, mainly due to accumulation of round-off errors. A Matlab program has been developed to calculate emptying and filling probabilities over a wide range of reservoir parameters using extended precision. Comparison of Prabhu's solution with the numerical solution of the reservoir integral equation highlights possible problems with the numerical solution, which may produce inaccurate or even invalid results for large reservoirs, large drift, and large skewness of the inflow distribution. A comparison between gamma and lognormal distributions as models of skew revealed that as the reservoir size, drift, and skewness increase, the probability of emptying of the reservoir becomes smaller for the case of gamma inflow than in the case of lognormal flow having the same skewness coefficient.

Keywords: Stochastic reservoir; Prabhu; Equilibrium storage; Exact solution; Gamma inflow; Reservoir storage.

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International Publications Awards

Effect of Persistence on the Significance of Kendall's Tau as a Measure of Correlation Between Natural Time Series

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Abstract

Although persistence in natural data is generally admitted, its effect on the significance of various statistical tests has not been extensively studied and is sometimes overlooked or simply ignored in practice. In particular, modified tests that are robust in the presence of persistence are still lacking. In many situations, need may arise to test the significance of correlation between two observed natural time series. Although the estimation of the classical product-moment correlation coefficient is a straightforward task, classical significance testing depends on two major assumptions. The first assumption is that the data are Gaussian, which is violated by many natural time series. In this case, a distribution-free measure of correlation, such as Kendall's tau should be used. The second, and often overlooked assumption, is that the observations in each time series are not autocorrelated, which is also violated by most natural time series. Similar to the case of trend testing (e.g. Mann-Kendall trend test), which has received some attention recently, the existence of persistence increases the chance of falsely detecting significant correlation when the two series are actually uncorrelated. In this paper, the effect of both short- and long-term persistence (STP and LTP) on the distribution of Kendall's tau as a distribution-free measure of correlation between two time series is investigated, and an exact expression for its variance under persistence is derived. The implications of these results for the analysis of natural data are illustrated through the study of spurious correlation between a 133-year Nile flow time series from A.D. 1871 to A.D. 2003 and independent segments of a reconstruction of the North Hemisphere temperature time series from A.D. 1000 to A.D. 1980, both of which exhibit LTP. It is shown that spurious significant correlation between completely unrelated segments of the two time series is on average three times as common as in random series of the same length at the 10% significance level, which is consistent with the theoretical results. It is also shown that accounting for LTP by using the correct variance of the test statistic effectively reduces the probability of false identification to near its expected nominal value of 10%. Similar results were obtained at other significance levels.

Keywords: Kendall's Tau; Persistence; Cross-correlation; Significance test.

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International Publications Awards

Cairo University

On the Ijk Forms of the Truncated Lu Decomposition

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Abstract

Matrix LU decomposition has six ijk forms. Different forms have different computational complexity and storage requirements particularly on vector and parallel computers. Other factors governing the choice of a particular form are considered. For treating Fredholm integral equations of the first kind, the truncated LU decomposition of the resulting system matrix is recommended. Required modifications to selected known ijk forms are presented.

Keywords: LU Decomposition; Truncated LU Decomposition; ijk Forms; Fredholm Integral Equation of First kind.

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Faculty of Computer

International Publications Awards
Cairo University

KP-Miner: A Keyphrase Extraction System for English and Arabic Documents

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Abstract

Automatic key phrase extraction has many important applications including but not limited to summarization, cataloging/indexing, feature extraction for clustering and classification, and data mining. This paper presents the KP-Miner system, and demonstrates through experimentation and comparison with widely used systems that it is effective and efficient in extracting keyphrases from both English and Arabic documents of varied length. Unlike other existing keyphrase extraction systems, the KP-Miner system does not need to be trained on a particular document set in order to achieve its task. It also has the advantage of being configurable as the rules and heuristics adopted by the system are related to the general nature of documents and keyphrases. This implies that the users of this system can use their understanding of the document(s) being input into the system, to fine tune it to their particular needs.

Keywords: Keyphrase extraction; Heuristic rules; Automatic indexing.

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Cairo University

International Publications Awards

IPACU

Scheduling Jobs on Computational Grids using a Fuzzy Particle Swarm Optimization Algorithm

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Abstract

Grid computing is a computational framework used to meet growing computational demands. This paper introduces a novel approach based on Particle Swarm Optimization (PSO) for scheduling jobs on computational grids. The representations of the position and velocity of the particles in conventional PSO is extended from the real vectors to fuzzy matrices. The proposed approach is to dynamically generate an optimal schedule so as to complete the tasks within a minimum period of time as well as utilizing the resources in an efficient way. We evaluate the performance of the proposed PSO algorithm with a Genetic Algorithm (GA) and Simulated Annealing (SA) approach. Empirical results illustrate that an important advantage of the PSO algorithm is its speed of convergence and the ability to obtain faster and feasible schedules.

Keywords: Swarm intelligence; Grid computing; Particle swarm optimization.

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International Publications Awards

Rough Sets and Near Sets in Medical Imaging: A Review

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Abstract

This paper presents a review of the current literature on rough-set- and near-set-based approaches to solving various problems in medical imaging such as medical image segmentation, object extraction, and image classification. Rough set frameworks hybridized with other computational intelligence technologies that include neural networks, particle swarmoptimization, support vectormachines, and fuzzy sets are also presented. In addition, a brief introduction to near sets and near images with an application to MRI images is given. Near sets offer a generalization of traditional rough set theory and a promising approach to solving the medical image correspondence problem as well as an approach to classifying perceptual objects by means of features in solving medical imaging problems. Other generalizations of rough sets such as neighborhood systems, shadowed sets, and tolerance spaces are also briefly considered in solving a variety of medical imaging problems. Challenges to be addressed and future directions of research are identified and an extensive bibliography is also included.

Keywords: Computational intelligence; Hybrid rough image processing; Image classification; Image segmentation; Medical imaging; Near sets; Rough sets.

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International Publications Awards

Spiking Neural Network and Wavelets for Hiding Iris Data in Digital Images

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Abstract

This paper introduces an efficient approach toprotect the ownership by hiding the iris data into a digital image for authentication purposes. The idea is to secretly embed an iris code data into the content of the image, which identifies the owner. Algorithms based on Biologically inspired Spiking Neural Networks, called Pulse Coupled Neural Network (PCNN) are first applied to increase the contrast of the human iris image and adjust the intensity with the median filter. It is followed by the PCNN segmentation algorithm to determine the boundaries of the human iris image by locating the pupillary boundary and limbus boundary of the human iris for further processing. A texture segmentation algorithm for isolating the iris from the human eye in a more accurate and efficient manner is presented. A quad tree wavelet transform is first constructed to extract the texture feature. Then, the Fuzzy c-Means (FCM) algorithm is applied to the quad tree in the coarse-to-fine manner by locating the pupillary boundary (inner) and outer (limbus) boundary for further processing. Then, iris codes (watermark) are extracted that characterizes the underlying texture of the human iris by using wavelet theory. Then, embedding and extractingwatermarking methods based on Discrete Wavelet Transform (DWT) to insert and extract the generated iris code are presented. The final process deals with the authentication process. In the authentication process, Hamming distance metric that measure the variation between the recorded iris code and the corresponding extracted one from the watermarked image (Stego image) to test weather theStego image has been modified or not is presented. Simulation results show the effectiveness and efficiency of the proposed approach.

Keywords: DWT; Watermarking; PCNN.

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International Publications Awards

Cairo University

Intelligence Techniques for Prostate Ultrasound Image Analysis

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Abstract

In this paper we present an intelligent scheme, employing a combination of fuzzy logic, pulse coupled neural networks (PCNNs), wavelets and rough sets, for analysing prostrate ultrasound images in order diagnose prostate cancer. Image noise is a principal factor which hampers the visual quality of ultrasound images and can therefore lead to misdiagnosis. To address this issue we first utilise an algorithm based on type-II fuzzy sets to enhance the contrast of the image. This is followed by performing PCNN-based segmentation in order to identify the region of interest and to detect the boundary of the prostate pattern. Then, a wavelet features are extracted and normalised, followed by application of a rough set analysis to discover the dependency between the attributes, and to generate a set of reducts consisting of a minimal number of attributes. Finally, a rough set classifier is designed for discrimination of different regions of interest to determine whether they represent cancer or not. To evaluate the performance of our approach, we present tests on different prostate ultrasound images. The experimental results obtained, show that the overall classification accuracy offered by the employed rough set approach is high compared with other intelligent techniques including decision trees, discriminant analysis, rough neural networks, fuzzy ARTMAP, and neural networks.

Keywords: PCNN; Prostate ultrasound image analysis.

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International Publications Awards

A Decision Support System Prototype for Technical Analysis of Financial Markets Based on the Moving Average

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Abstract

The Moving Average (MA) crossover technique is one of the popular technical analysis tools used by investors in financial markets. The technique depends on identifying the lengths of short and long time periods, type of MA model and type of price data on which the analysis is to be based. Unfortunately, most users base their selection of these parameters on recommendations which could be not suitable for a particular market or security. Also, technical analysis software do not provide a tool through which a search for the best (optimal) rule that generates the highest return could be reached. Technical analysts recommend that users fine tune these parameters according what they see suitable for their strategy. Accordingly a decision support system was developed based on the MA crossover technique that is capable of providing descriptive statistics for the time series data of market indices and securities, evaluating the statistical significance of returns generated by any MA rule, searching for the optimal MA rule that generates the highest significant returns and scan among a group of securities for the latest signals and highest returns. The system has the added of advantage of searching for the optimal MA rule among a large universe of MA rules. The DSS system was used to investigate the predictive capabilities of the MA crossover with respect to the Egyptian Exchange Stock market. The lengths of 1-20, 1-25 and 1-30 along with the closing price emerged as the most profitable for the rules. The exponential MA model dominated as the most profitable model for many securities, while the simple MA model was effective for a few securities. The results obtained provide strong evidence that the MA crossover technique can predict the Egyptian stock market index and its securities and reject the null hypothesis that the returns earned by the technique are equal to the unconditional buy-and-hold strategy. Therefore, there could be great opportunities from applying this technique to the Egyptian market for yield enhancement and portfolio diversification.

Keywords: Moving average crossover; Optimal moving average rules; Securities; Decision support systems; Egyptian exchange stock market; CASE 30 Index.

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National Institute of Laser

International Publications Awards
Cairo University

Titanium Plasma Spectroscopy Studies Under Double Pulse Laser Excitation

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Abstract

Laser_induced breakdown spectroscopy (LIBS) was applied for parametric studies of titanium (Ti) plasma using single and double pulsed laser excitation scheme. Here a pulsed Nd:YAG laser was employed for generation of laser produced plasma from solid Ti target at ambient pressure. Several ionized titanium lines were recorded in the 312–334 nm UV region. The temporal evolution of plasma parameters such as excitation temperature and electron number density was evaluated. The effect of incident laser irradiance, position of the laser beam focal point with respect to the surface of illumination, single and double laser pulse effect on plasma parameters were also investigated. This study contributes to a better understand ing of the LIBS plasma dynamics of the double laser pulse effect on the temporal evolution of various Ti emission lines, the detection sensitivity and the optimal dynamics of plasma for ionized states of Ti. The results demonstrate a faster decay of the continuum and spectral lines and a shorter plasma life time for the double pulse excitation scheme as compared with single laser pulse excitation. For double pulse excitation technique, the emissions of Ti lines intensities are enhanced by a factor of five which could help in the improvement of analytical performance of LIBS technique. In addition, this study proved that to avoid inhomogeneous effects in the laser produced plasma under high laser intensities, short delay times between the incident laser pulse and ICCD gate are required.

Keywords: LIBS. Nd:YAG; Tiitanium; Spectroscopy.

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International Publications Awards

Computational Notes on the Analysis of C59-Zn, C59-Cd and C59-Hg Fullerenes

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Abstract

Heavy metals doped fullerenes systems are known as unstable structures. Accordingly semiempirical molecular orbital calculations were used to evaluate structural features and vibrational spectra of C60 as well as C59-Zn,C 59-Cd,and C59-Hg respectively. The effect of doping is discussed in terms of the change in the C–C bond lengths,net atomic charge distribution,total dipole moment and final heat of formation as well as other thermo-chemical parameters. The obtained results indicate that both molecular dimensions and C–C bonds are increased as a result of doping. The doping affects also atomic charge distribution and increases the value of the total dipole moment. Another result of doping is the presence of new bands in vibrational spectra of doped fullerenes which attributed to M-C vibrations; where M is the Zn,Cd and Hg respectively.

Keywords: C60; Hetero-Fullerens; C 59-Zn; C 59-Cd; C 59-Hg and PM3.

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International Publications Awards
Cairo University

Development of a Silver Ion Source Using Nanosecond Pulses of a Nd:YAG laser at Different Wavelengths

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Abstract

A silver ion source was designed by focusing the fundamental and harmonics of Q-switched Nd:YAG laser pulses onto a silver target and simultaneously applying an electric potential in an argon environment. The silver ions were detected at a distance of 2 cm from the target surface using a Faraday cup ion probe after letting them pass through a retarding mesh grid (copper electrode). We aim to produce and characterize the silver ions generated by the laser radiation of different wavelengths and pulse energy, ambient gas pressure and the electrode spacing under applied electric field. In addition to this, the effect of laser radiation on plasma under vacuum and at different argon gas pressures was investigated. The velocity distribution function of the plasma emitted from the silver target was investigated under argon discharge. These measurements demonstrated clearly that the velocity distribution function and current signals depend on laser power, laser wavelength and argon pressure. We observed a ten fold increase in the plume current with increase in the applied voltage and ion velocity in the presence of a laser field. The surface morphology of the laser irradiated samples was investigated using reflection optical microscopy.

Keywords: Physics of gases; Plasma and electric discharges; Nd:YAG laser; Silver; Ion source; Electric discharges.

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Cairo University

International Publications Awards

IPACU

Photo-physical Properties and Quantum Yield of Some Laser Dyes in New Polymer Host

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Abstract

The field of laser dyes-active solid polymer materials is a promising field and quite competitive with liquid dye lasers. This paper investigates some photo-physical parameters of pyromethene (PM-567, PM-597) and Rhodamine B dyes incorporated into glycidyl methacrylate (GMA) promising polymeric host matrix. These parameters are: absorption and emission cross-sections, fluorescence lifetime and quantum yield, in addition to FT-Raman spectra as an indication for binding the dye molecules with the backbones of GMA polymeric chain.

Keywords: Laser dyes; Solid state dye laser; Photophysical properties.

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International Publications Awards

Cairo University

Morphological Changes of the Root Surface and Fracture Resistance After Treatment of Root Fracture by CO2 Laser and Glass Ionomer or Mineral Trioxide Aggregates

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Abstract

This in vitro study evaluated the morphological changes of the root surface and fracture resistance after Treatment of root cracks by CO2 laser and glass Ionomer or mineral trioxide aggregates (MTA). Fifty freshly extracted human maxillary central incisor teeth with similar dimension were selected. Crowns were sectioned at the cemento-enamel junction, and the lengths of the roots were adjusted to 13 mm. A longitudinal groove with a dimension of 1 ×5mm^2 and a depth of 1.5mm was prepared by a high speed fissure bur on the labial surface of the root. The roots were divided into 5 groups: the 10 root grooves in group 1 were remained unfilled and were used as a control group. The 10 root grooves in group 2 were filled with glass Ionomer, 10 root grooves in group 3 were filled with MTA, the 10 root grooves in group 4 were filled with glass Ionomer and irradiated by CO2 laser and the 10 root grooves in group 5 were filled with MTA and irradiated with CO2 laser. Scanning electron microscope was performed for two samples in each group. Tests for fracture strength were performed using a universal testing machine and a round tip of a diameter of 4 mm. The force was applied vertically with a constant speed of 1 mm min 1. For each root, the force at the time of fracture was recorded in Newtons. Results were evaluated statistically with ANOVA and Turke^y's Honestly Significant Difference (HSD) tests. SEM micrographs revealed that the melted masses and the plate-like crystals formed a tight Chemical bond between the cementum and glass Ionomer and melted masses and globular like structure between cementum and MTA. The mean fracture resistance was the maximum fracture resistance in group 5 (810.8 N). Glass Ionomer and MTA with the help of CO2 laser can be an alternative to the treatment of tooth crack or fracture. CO laser increase the resistance of the teeth to fracture.

Keywords: MTA; Glass Ionomer; CO2.

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International Publications Awards

Tooth Whitening and Temperature Rise with Two Bleaching Activation Methods

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Abstract

To measure the tooth whitening and the surface and Intrapulpal temperature increase in vitro on freshly extracted upper human central incisors after chemical, Zoom AP light and diode laser activated bleaching. Thirty caries-free upper human incisors were selected. Teeth were divided into three equal groups according to the methods of activation of the bleaching agent (n=10). A whitening gel containing hydrogen peroxide was applied to the buccal surface of all teeth. Group I was bleached using chemically activated hydrogen peroxide gel, for three applications of 15 min each. Group II was bleached with high intensity advanced power Zoom activation light (Zoom AP), for three applications of 15 min each. Group III was bleached with diode laser activation technique, where the teeth were irradiated with 2 watt diode laser for three applications of 30 sec each. Degree of whitening was assessed using an image analysis system, while temperature rise was recorded using a thermocouple on the external tooth surface and Intrapulpal .The degree of whitening increased significantly in all groups. However, the percentage of whitening was not statistically significantly different between the three groups. In addition, group II showed statistically significant higher mean rise in both surface and pulp temperatures than group I and group III. Chemical bleaching produces the same whitening effect as Zoom AP light and laser, with no surface or pulpal temperature rise. Laser application is faster and produces less surface and pulp temperature increase than Zoom AP light. Diode laser used to activate bleaching gels is not considered dangerous to the vitality of dental pulp using power settings of 2W.

Keywords: Tooth whitening; Temperature rise; Thermal changes; Zoom; Diode laser.

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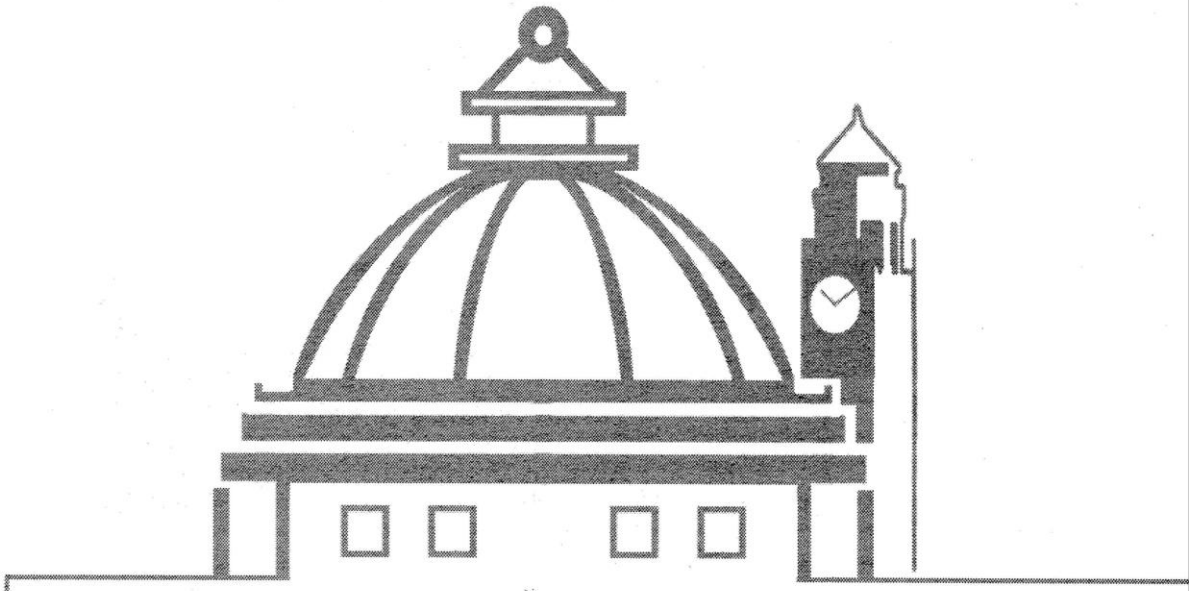

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