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University Sidi Mohamed Ben Abdallah - Faculty of Sciences Dhar El Mahraz, Fez
Physiology-Pharmacology & Environmental Health Laboratory

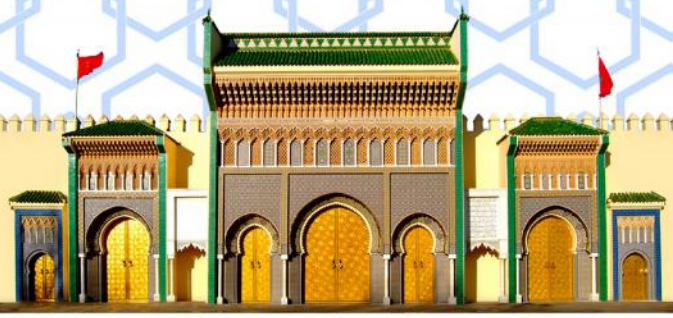
2nd

International Conference
Api-phytotherapy
"Api-Research for sustainable development"

Palais des Congrès Fez, Morocco May 20-22, 2014

المؤتمر الدولي الثاني عن العلاج بالنباتات الطبية ومنتجات النحل

Abstract Book



AGENCE UNIVERSITAIRE DE LA FRANCOPHONIE P.P.S.E AFA FOUNDATION LAHCEN LYOUSSI

Preface

By Gilles RATIA
President of Apimondia & Apiservices

Depuis des siècles, voire des millénaires, nos aïeuls employaient de manière empirique les produits des abeilles pour soigner certains maux. Depuis quelques décennies, la science revisite ces pratiques en apportant la confirmation des bienfaits du miel, du pollen, de la gelée royale, de la propolis et du venin d'abeilles.

La multiplication des sites internet, des symposia et des ateliers sur le vaste sujet de l'apithérapie contribue à une prise de conscience non seulement du grand public mais aussi de certains médecins sur l'importance des produits de la ruche, leurs usages sous contrôle et les associations possibles avec d'autres thérapies comme la phytothérapie ou encore l'aromathérapie.

Le Maroc avec sa riche flore, ses divers microclimats et son attachement culturel et religieux aux abeilles se trouve être un excellent rendez-vous pour les praticiens, venus du monde entier, pour exposer leurs derniers travaux. Vous trouverez dans les pages qui suivent les différents résumés des communications de cette « Deuxième Conférence Api-Phytothérapie », une somme de travail incroyable de la part de scientifiques et thérapeutes, lesquels doivent faire face parfois à des cadres juridiques restrictifs ou encore aux lobbies des grands groupes industriels de la sphère allopathique.

L'apithérapie n'est pas une alternative, elle est une composante importante de la médecine douce, vraie voie du futur !...

Gilles RATIA

For centuries, even millennia, our ancestors employed empirically bee products to cure some ills. In recent decades, science revisits these practices by providing confirmation of the benefits of honey, pollen, royal jelly, propolis and bee venom.The proliferation of websites, symposia and workshops on the broad subject of apitherapy contributes to an awareness not only the general public but also some physicians on the importance of bee products, their use under control and possible associations with other therapies (herbal, aromatherapy).

Morocco, with its rich flora, its various microclimates and its cultural and religious bees attachment happens to be an excellent appointment for practitioners from around the world to showcase their latest work . You will find in the following different abstracts of the "2nd Api- Phytotherapy Conference" pages, an incredible amount of work on the part of scientists and therapists, who face sometimes restrictive legal frameworks and the major industrial groups lobbies of the allopathic sphere. Apitherapy is not an alternative, it is an important component of alternative medicine, a true way of the future! ...

Gilles RATIA

مقدمة

جيل راتيا
رئيس الجمعية الدولية للعلاج بمنتجات النحل *Apimondia*

عمد أجدادنا لقرون خلت، أو لآلاف السنين، إلى استعمال منتجات النحل لعلاج بعض الأمراض. وخلال العقود الأخيرة بدأت العلوم تعيد هذه الاستعمالات من خلال توفير تأكيد لفوائد العسل، **وحبوب اللقاح، وغذاء ملكات النحل، والعكبر وسم النحل.**

لقد أدى انتشار المواقع والندوات وورش العمل حول موضوع العلاج بمنتجات خلية النحل الواسع، إلى الإسهام في تفشي **الوعي،** ليس فقط بين عامة الناس ولكن أيضا في صفوف الأطباء، بأهميتها واستخدامها تحت المراقبة مع امكانية جمعها مع العلاجات الأخرى مثل الأعشاب أو الزيوت الأساسية.

المغرب، مع غنى غطاءه النباتي، وتنوع مناخاته، إضافة إلى ارتباطه الثقافي والديني بنحل العسل، يحدث أن يكون أنسب ملتقى لممارسي هذا العلم من مختلف أنحاء العالم لعرض آخر أعمالهم. سوف تجدون في الصفحات التالية مختلف خلاصات محاضرات هذا "المؤتمر الثاني للعلاج بمنتجات النحل والنباتات الطبية"، وهي مجموعة أعمال رائدة من جانب العلماء والمعالجين، الذين يواجهون، أحيانا، الأطر القانونية المقيدة أو لوبيات المجموعات الصناعية الكبرى في المجال الطبي.

العلاج بمنتجات النحل ليس بديلا، بل هو عنصر هام من عناصر الطب الناعم، السبيل الحقيقي **للمستقبل...**

جيل راتيا

Preface

Dr Theodore Cherbuliez
President of the Commission of apitherapy, Apimondia

Je veux tout d'abord remercier Madame le Professeur Badiaa Lyoussi pour avoir organisé cette Conférence Internationale d'Api-phytothérapie, aussi puissamment représenté. J'ai l'honneur, autant que Président de la Commission d'Apithérapie d'Apimondia de saluer l'Université de Fez, la Faculté des Sciences et l'Association Espace sciences et Vie, pour l'appui et la contribution à cet évènement majeur. Il me faut aussi reconnaître le privilège que nous avons tous d'être reçu dans une des plus belles villes si ce n'est la plus belle ville du Maroc.

Dans un monde de plus en plus enclin à s'adresser à des produits de synthèse pour répondre à des problèmes de santé il est d'importance première de rencontrer un corps médical qui s'adresse à des solutions naturelles.

Des traditions millénaires ont démontré la valeur thérapeutique des "médicaments" créés par des organismes vivant, dont l'exemple premier est représenté par les produits de la ruche et par les plantes médicinales. Ils ne sont pas assujettis à des brevets, dans la mesure où nous respectons leurs attaches à la vie et cela donne un espoir à l'humanité.

Theodore Cherbuliez

First of all, I would like to thank Madam Professor Badiaa Lyoussi for organizing this International Conference on Api- phytotherapy, powerfully represented. I have the honor, as Chairman of the Commission of Apitherapy Apimondia to greet the University of Fez, the Faculty of Sciences and Life Sciences and Space Association for the support and contribution to this major event. I must also recognize the privilege we all have to be received in one of the most beautiful cities if not the most beautiful city in Morocco.

In a world where we use more and more synthetic products to deal with health issues, it is of great importance to meet with a medical community that caters to natural solutions.

Ancient traditions have demonstrated the therapeutic value of "drugs" created by living organisms, whose first example is represented by bee products and medicinal plants. They are not subject to patents, in so far as we respect their ties to life and this gives hope to humanity.

Theodore Cherbuliez

الدكتور تيودور شيربليي
رئيس لجنة العلاج بمنتجات النحل، Apimondia

أريد في البداية أن أشكر الأستاذة بديعة اليوسي على تنظيم هذا المؤتمر الدولي عالي المستوى حول العلاج بمنتجات النحل والنباتات الطبية. ويشرفني للغاية ، كرئيس لجنة Apimondia **الخاصة بالعلاج بمنتجات النحل أن أقدم** التحية لجامعة فاس وكليتها للعلوم، وكذلك لجمعية فضاء العلوم والحياة لدعمهم ومساهمتهم في هذا الحدث الكبير.

لا يفوتني أيضا أن أعبر عن امتناني لأننا جميعا سنحل ضيوفا على واحدة من أجمل المدن المغربية إن لم تكن أجملها.

وإنه، ونحن في عالم يميل على نحو متزايد إلى المنتجات الصناعية لتجاوز مشاكله الصحية، لمن الأهمية بمكان أن يتم العثور على جهات طبية تسعى نحو الاستغناء بالحلول الطبيعية.

وقد أثبتت التقاليد القديمة القيمة العلاجية ل"الأدوية" التي تنتج بواسطة الكائنات الحية، والتي تتمثل، أساسا، في منتجات النحل والنباتات الطبية. وعلى **الرغم من** المكانة التي تتبوأها هذه المنتجات في الحياة بإعطائها الأمل للبشرية، إلا أنها **لا تخضع لنظام براءات الاختراع.**

Dr Albert BECKER
Président de l'Association Francophone d'Apithérapie *(AFA)*

En 2014 coexistent deux apithérapies complémentaires.

→**L'apithérapie traditionnelle** : Multimillénaire en usage dans tous les groupes humains et civilisations sur l'ensemble du globe. Aujourd'hui présente sur tous les continents, elle est pratiquée surtout par les apiculteurs, les chamans, les « médecine-men », les guérisseurs, les thérapeutes de toutes convictions: naturelles, orientales, homéopathie... se référant ou non à des principes philosophiques, religieux, spirituls diverses.

→**L'apithérapie «médicale»** : Pléonasme nécessaire car l'apithérapie moderne est une branche solide de la médecine contemporaine, utilisant les références et les techniques scientifiques les plus modernes de l'«évidence base médecine » dans ses recherches. Cette apithérapie met en place des traitements efficaces, reproductibles, codifiés, contrôlés, concernant des pathologies bien définies.

Cette évolution récente (2008) est initiée par l'AFA. De par ses statuts et la structure de son conseil scientifique en trois collèges : universitaires et paramédicaux, thérapeutes traditionnels puis membres, l'AFA répond à la nécessaire exigence de qualité et amélioration des connaissances médicales dans l'intérêt des patients et des soignants.

CONCEPT GLOBAL DE SANTE

« L'Apithérapie est le traitement préventif ou curatif des maladies humaines et vétérinaires par les produits biologiques issus ou extraits du corps de l'abeille, secrétés par elle ou récoltés et transformés par elle.»

« Il n'est d'art de guérir que dans la liberté »

L'Apithérapie est un concept global de santé préventif mais aussi curatif.
Les produits naturels issus de la ruche sont selon la directive européenne des aliments. Aucune allégation de santé n'est acceptée et les contrevenants poursuivis. Les produits de la ruche ne sont donc pas à considérer comme des médicaments. Il existe au moins une exception dans les productions apicoles « naturelles » : le venin qui est en France remboursé comme médicament dans l'indication de désensibilisation à l'allergie aux piqûres d'abeille. La propolis, qui n'est pas un aliment au sens strict est classée comme tel par la Commission Européenne alors que par sa composition complexe elle participe à de très nombreuses formulations thérapeutiques. Le miel non transformé, stérilisé aux rayons gamma sur tulle, enfin utilisé en pansement, devient un produit de soins des plaies de plus en plus prescrit dans de nombreux pays tant en milieu hospitalier qu'en milieu extra-hospitalier.
Les recherches entreprises, les expérimentations récentes dans certains services hospitaliers en Europe, aux USA, en Asie, témoignent cependant d'effets thérapeutiques intéressants de ces produits apicoles

qui ouvrent de nouvelles voies de recherche en médecine et confèrent à l'apithérapie scientifique un avenir certain parmi les thérapies complémentaires à la médecine allopathique.
En médecine, le terme « alternatif » implique de fait le choix d'une approche différente de la santé et de la maladie que celle qui est proposée en médecine moderne.
Le terme «complémentaire» lorsqu'il se rapporte à l'apithérapie décrit une forme de thérapie qui est utilisée en plus de la médecine allopathique ou traditionnelle. Le patient fait alors appel aux suppléments alimentaires, à la méditation, au magnétisme, à l'astrologie, etc. tout en prenant ses remèdes traditionnels allopathiques, voir les deux.
La distinction entre médecine alternative et médecine complémentaire reste arbitraire à différents égards. La médecine contemporaine allopathique progresse rapidement selon des évaluations successives reproductibles, scientifiques, bases classiques de l' « évidence médecine » anglo-saxonne et européenne. Cette démarche est difficile ou impossible dans les médecines alternatives traditionnelles.
L'apithérapie contemporaine évolue rapidement par les nombreux travaux de recherche de multiples équipes universitaires. Elle devient ainsi une branche thérapeutique reconnue à part entière de la médecine allopathique.

A QUI S'ADRESSE L'APITHERAPIE ?

Avant tout aux patients bien portants, sachant qu'il vaut mieux prévenir que guérir ! C'est l'atout majeur de l'usage journalier des produits apicoles.
L'apithérapie est efficace en prévention des pathologies de système.
Elle est aussi adjuvante dans le traitement des pathologies de système et maladies néoplasiques.
Elle est curative pour les brûlures, plaies, ulcères infectés ou non, pour traiter les pathologies digestives, ORL, dermatologique, ophtalmologique (blépharite, conjonctivite DMLA) mais aussi en endocrinologie, pathologies infectieuses, en cancérologie etc. comme les communications de ce CONGRÈS l'attestent.

C'est le rôle des congrès comme celui-ci organisé à l'initiative du Pr Badiaa LYOUSSI, Professeur de Pharmacologie et de Physiologie de l'Université de FEZ, de confronter entre praticiens, chercheurs, expériences et résultats des travaux en cours. Les présentations des thérapeutiques concourent à l'amélioration des connaissances et des soins dans les pathologies.
C'est l'occasion dans un cadre magnifique pour les nombreux participants en goûtant au sens légendaire de l'hospitalité marocaine, d'approfondir et d'enrichir de leurs compétences l'apithérapie médicale des acquis les plus récents dans l'intérêt des patients, des participants et de l'apithérapie, médecine d'avenir.

Welcome

Dear Conference participants,

It is our great privilege to welcome you, on behalf of the Organizing Committee, to the Second International Conference in Morocco on Api-Phytotherapy : "Api-Research for sustainable development".

This scientific event is particularly timely. It reflects our concerns with api-phytotherapy as well as our scientific and technical needs, induced by the development of an alternative therapy based on bee products and plants.

In a world where the industry increasingly pollutes the environment, where agriculture destroys the"lungs" and the biodiversity of our Earth, where the pharma industry thinks practically only to profit, the bees and their protectors offers all of us a chance of survival and return to a normal, harmonious life.

The themes of the conference, the topics that will be covered by the speakers and authors of this event are related practically to the most important aspects of api-phytotherapy and beekeeping: geo-botanical origin of bee products, characteristics, composition, pharmacological properties, indications, contra-indications, preparations and products. Many important aspects of phytotherapy, especially the ones related to the characteristics and uses of the medicinal bee plants will be discussed too.

The international part of this event can be simply explained if we look to the origin of our speakers, authors and participants coming from at least the following 19 countries: Morocco, France, Egypt, Romania, Yemen, Turkey, Germany, Italy, Portugal, USA, Indonesia, Algeria, Tunisia, Saudi Arabia, Switzerland, Slovenia, Canada, Belgium, Sudan …

Our Conference will set for many years to come the main objectives and goals we should all have: protect and improve the life on Earth, helped by our bees and our extraordinary medicinal plants.

By joining us at Fes, you agree to take part in a challenging program that expects your active participation. The conference provides a forum for discussion amongst scientists, managers and academics from different areas. The program includes plenary lectures, short lectures, as well as series of discussion panels and workshops. The wealth of information exchanged in this international meeting will be of great benefit to all the participants by giving them the opportunity to take part in the most recent developments of Api-phytotherapy and Beekeeping worldwide.

We hope this conference will provide a striking demonstration of a triple collaboration academicians/ industrialists/government officials, and will enhance the development of beehive products and medicinal plants.

Important cultural and social activities have been planned for participants. We are sure you will enjoy the warm Moroccan hospitality and the cultural highlights of Fez, one of the most picturesque Moroccan cities.

I wish all our participants and readers of this book of abstracts to open their hearts and minds to learn more from the extraordinary realm of bees and their medicinal plants…

Pr. Badiaa Lyoussi
Conference Chair

Api phytotherapy, beekeeping and sustainable development

The api-phytotherapy, a toolbox validated by science, is currently recognized as an alternative or a complementary medicine in the areas of curative and preventive health. Its applications are numerous including medicine, surgery, homeopathy, traditional Chinese and Ayurvedic medicine, nutrition...

Practiced for so long, this kind of therapy should be considered as a future alternative and a real chance to develop an inexpensive pharmacopoeia, with no side effects and especially with no trace of chemicals.

The beehive is a real wealth to enhance in terms of nutrition, cosmetics and especially therapeutics. Its products are prescribed for many disorders (digestive, respiratory, cardiovascular, rheumatic, dermatologic, ophthalmic, neurological, gynecological…). It is a kind of complete pharmacy thanks to the therapeutic properties of propolis, pollen, wax, royal jelly, the aromatic honey, venom. The bee honey is rich in carbohydrates, organic acids and lactones, minerals and trace elements, vitamins, enzymes, antibiotic factors, flavonoids... The value of bee products and aromatherapy also justify support for beekeepers and producers of medicinal plants and their derivatives to improve the quality of their production for use in Api-phytotherapy.

Sustainable development seeks to reconcile environmental protection, economic efficiency and equity within and between generations in order to promote medium and long term activities that preserve human life and health of our planet. Principles of action are based on principles of precaution and prevention, equity and solidarity within and outside the States, on the participation of development actors and the people concerned and on the principle transparency at all levels of the decision-making.

Particular attention should be given to local sustainable development. This kind of development may provide a sustainable health and a good quality of life to local communities while preserving the long-term local natural resources and environment.

Morocco provided a multidimensional effort in the context of sustainable development and social action. It has affected health, education, training and rural development, as part of the National Initiative of Human Development (NIHD) under the direct responsibility of His Majesty Mohammed VI. An important part of the state budget is allocated to various social sectors and in particular towards the socially disadvantaged.

About the conference

What is the benefit of the beehive probiotics? What are the harvesting practices? What is the role of propolis in emerging diseases like the flu or cancer? What is the future of beekeeping? Many questions will be addressed in this international conference. This event will bring together a large number of experts, agronomists, researchers and socio-economic and institutional actors involved in the promotion of beekeeping and beehive products.

The conference on beehive products is open to apitherapists, beekeepers, scientists, clinicians and practitioners of alternative medicine, making them discover the world of bees as well.

The main objective is to increase interest in beekeeping and apitherapy. More specifically, it is to identify measures to develop the honey industry, to stimulate research on applications of beehive products in the health field and to provide an overview of the potential of api-phytotherapy.

The speakers will deliver in the plenary sessions keynotes that will improve and refresh the global knowledge base. The conference platform is targeted to health specialists, researchers and ordinary practitioners with a therapeutic interest towards the uses of honey, apitoxin, royal jelly, bees wax, propolis and bee pollen.

During this conference, we will focus on the important relationship between beekeeping, apitherapy, aromatherapy, health, environment and sustainable development. This meeting will promote the exchange of good practice and developing common approaches to research in the field of api-phytotherapy. This will provide a framework able to provide global solutions to common problems.

The meeting will also consider the growing challenges facing the development of beekeeping as well as emerging themes such as the synergy between bee products and aromatherapy for the future of natural medicine.

Another perspective of this conference is to develop an integrated project of promotion of beehive products of the region Fez-Boulemane known for its honey. This project stems from the vision of the strategic plan Green Morocco (Maroc Vert). This will be done with the participation of the beekeeping sector in the region Fez-Boulemane through the competence of the DRA (Regional Directorate of Agriculture), beekeeping associations and researchers in the social sciences and health.

This conference is not only a high-level scientific meeting; it is also a space for debate and reflection where agriculture, health, environment and sustainable development will have full honors.

Conference Objectives

- Networking: to create an international network of expertise and exchange of information on apitherapy
- To build collaborations of sharing and transferring knowledge and technology between developed and developing countries concerned with the api phytotherapy as a future alternative;
- To improve apitherapy techniques and skills;
- To promote the development and use of bee products;
- Empowering hive products and their therapeutic potential;
- To promote research in beekeeping and apitherapy;
- To educate beekeepers on the benefits of apitherapy;
- To encourage local investments in the field of apitherapy;
- Engaging government policy makers towards the importance of the api-phytotherapy;
- To educate the media and the general public on the future treatment of bees;
- To engage decision-makers, socio-economic actors and local communities in the sustainable development;
- To promote local sustainable development based on the specificity of terroirs and the valorisation of their products.

Conference Topics

- Historical Perspective - nutritional and medicinal uses of honey.
- Islamic Perspective - the bee and beehoney in the Qur'an and the Hadith.
- The products of the hive - pollination, source of honey, propolis, beeswax, bee venom.
    - Propolis and its therapeutic potential.
    - Royal jelly: properties and applications.
    - Bee venom: therapeutic potential (cytolytic, antimicrobial and anti-inflammatory activities).
    - Beeswax and cosmetics.
- Health benefits of honey.
    - Use of honey in wound healing and infection control – antibacterial, immunomodulating (anti-inflammatory and immune stimulating) and antioxidant activities.
    - Pharmacological properties of honey – importance of botanical origins.
    - Antimicrobial effect of honey – antibacterial, antifungal and anti viral effects.
    - Use of bee honey in diabetes.
    - Cardio protective effects of bee honey.
- Clinical trials of honey.
- Validation of the therapeutic activity of honey by pharmacological studies.
- Compounds present in honey (flavonoids, anti-oxidants, antimicrobials, enzymes, trace metals, etc).
- Bee honey: authentication, quality control and standards.
- The decline of bee populations: causes and economic consequences.
- Beekeeping as a cottage industry in developing countries.

Workshops

Practical workshops will take place:

- Honey massage, api-cosmetic, preparation of bee products.
- Techniques for ecological / bio-organic beekeeping: Principles, rules and standards.
- Beekeeping in Morocco.
- Production of bee products with the maximum useful substances: honey, pollen, propolis, wax, venom, royal jelly.
- Blind tasting (various honeys and other hive products).
- Bee venom as a therapy for healthcare professionals: rules, principles and "Secrets".

العلاج بمنتجات النحل والأعشاب الطبية، معين منافع مصادق عليه علميا، ويعرف حاليا على أنه طب بديل أو تكميلي في المجالات العلاجية أو الوقائية للصحة. تتعدد استعمالاته بين الطب والجراحة والطب التقليدي الصيني والتغذية...

استعمال منتجات النحل والأعشاب الطبية من أجل العلاج ضارب في القدم، وهو يشكل بديلا مستقبليا وأداة ينبغي استعمالها وتطويرها من أجل تطبيب أقل تكلفة، بدون أعراض جانبية وبالخصوص بدون آثار لمواد كيميائية.

خلية النحل ثروة حقيقية للتثمين على مستوى التغذية والتجميل وخصوصا على مستوى العلاج. هذه المنتجات توصف ضد أمراض منها على سبيل الذكر لا الحصر: أمراض الجهاز الهضمي، والتنفس، والقلب والشرايين، والرئوية، والجلدية، أو تلك المرتبطة بالعيون، أو الدماغ... تعتبر إذن خلية النحل صيدلية كاملة، وذلك راجع إلى المنافع التي يوفرها العكبر، وحبوب اللقاح، والشمع، والغذاء الملكي، والعسل المنكه بالزيوت الأساسية، والعسل الغني بالسكريات، والأحماض العضوية، والمواد المعدنية، والسم، العناصر النزرة، والفيتامينات، والانزيمات، والعوامل المضادة الحيوية والفلافنويدات.

أهمية منتجات النحل والأعشاب الطبية تدفع إلى مساعدة النحالين والعاملين على إنتاج الأعشاب ذات المنافع الطبية ومشتقاتها، وذلك لتحسين جودتهم من أجل استعمالهم في العلاج.

التنمية المستدامة تهدف أساسا إلى إرساء حماية البيئة، والنجاعة الإقتصادية، والإنصاف بين الأجيال أو بين أفراد الجيل نفسه من أجل تحفيز تنمية متوسطة وبعيدة الأمد للأنشطة الإنسانية التي تحفظ له الحياة والحالة الجيدة لكوكبنا. مبادئ العمل تتبنى أساسا على الحيطة والوقاية والإنصاف والتضامن داخل أو خارج الدول، ومشاركة الفاعلين في مجال التنمية وكذا السكان المعنيين، وأيضا **على مبدأ** الشفافية في جميع مستويات صناعة القرار.

وينبغي إيلاء اهتمام خاص للتنمية المحلية المستدامة، التي يجب أن توفر للمجتمعات المحلية صحة مستدامة وحياة كريمة، مع الحفاظ على الموارد الطبيعية والبيئة المحلية على المدى البعيد.

على مستوى التنمية المستدامة والعمل الاجتماعي، فإن المغرب قدم جهودا متعددة الأبعاد، والتي أثرت على كل من الصحة والتعليم والتكوين، والتنمية القروية، وهذا، في إطار المبادرة الوطنية التنمية البشرية (NIHD) تحت الرعاية المباشرة لصاحب الجلالة الملك محمد السادس. تجدر الإشارة إلى أنه تم إيلاء مجهود كبير لهذه المبادرة كما تم تخصيص جزء هام من ميزانية الدولة لمختلف القطاعات الاجتماعية وعلى وجه الخصوص تجاه الطبقات الاجتماعية المعوزة.

المؤتمر

ما هي الفائدة من المعينات الحيوية الموجودة في الخلية؟ ما هي أساليب الجَنْي؟ ما هو دور العكبر في الأمراض الناشئة **مثل الانفلونزا** أو السرطان؟ كيف سيكون مستقبل تربية النحل؟ كل هذه الأسئلة والمزيد، سيتم تناولها بالتحليل العلمي المستفيض في هذا المؤتمر الدولي، والذي سيجمع عددا كبيرا من الخبراء والمهندسين الزراعيين والباحثين والجهات الفاعلة المؤسسية والاجتماعية والاقتصادية المعنية بتعزيز تربية النحل ومنتجاته.

المؤتمر حول منتجات النحل، مفتوح في وجه المعالجين بمنتجات النحل، ومربيه، والعلماء، والأطباء، وممارسي الطب البديل، مما سوف يخولهم اكتشاف عالم النحل.

الهدف الرئيسي هو زيادة الاهتمام بتربية النحل وبالعلاج بمنتجاته. وزيادة في التخصيص، فهو يهدف إلى الخروج بتدابير رشيدة لتطوير قطاع تربية النحل، وتحفيز البحوث بشأن تطبيقاتها في مجال الصحة وتقديم لمحة عامة عن إمكاناتها العلاجية.

الملاحظات الرئيسية التي تجرى في الجلسات العامة تمكن من تحديث قاعدة المعارف العالمية حول العلاج بمنتجات **النحل. المتحدثون** سيتبادلون المعرفة والخبرات مع جميع أولئك الذين لديهم مصلحة خاصة في هذا النوع من الطب البديل. المحور الأساس للمؤتمر يدور حول الاستخدامات العلاجية للمنتجات النحل المختلفة: العسل، سمين النحل، وغذاء الملكات، والشمع، والعكبر، وأخراً حبوب اللقاح.

خلال هذا المؤتمر، سوف نركز على العلاقة الهامة بين تربية النحل، والعلاج بمنتجاته، والعلاج بالزيوت الأساسية، والصحة، والبيئة والتنمية المستدامة. وهذا الاجتماع يعزز تبادل الممارسات الجيدة ووضع نهج مشترك لبحث في مجال طب الأعشاب ومنتجات النحل. الشيء الذي سيوفر إطارا قادراً على تقديم أجوبة شاملة للمشاكل المشتركة.

سوف يركز العمل أيضا على التحديات المتزايدة التي تواجه تطوير تربية النحل وكذلك الموضوعات الناشئة مثل التآزر بين منتجات النحل والزيوت الأساسية لمستقبل الطب الطبيعي.

تطوير مشروع متكامل يقوم على رؤية مخطط المغرب الأخضر الاستراتيجي، والذي يسعى إلى تعزيز منتجات خلية النحل في جهة فاس بولمان المعروفة بعسلها ذي الجودة العالية يتناسب مع آفاق هذا المؤتمر. وهذا يستدعي الإدارة التشاركية لشعبة تربية النحل في **منطقة فاس**-بولمان من قبل كفاءات المديرية الجهوية للزراعة، وجمعيات تربية النحل والباحثين في مجال العلوم والصحة. الهدف هو تطوير منتجات النحل الثمينة على المستويين العلاجي والاقتصادي وكذا على استعادة ثقافة علاجية متميزة تسير قدما بالمنتجات المحلية التي تشكل جوهر الذاكرة العلاجية المغربية المهددة بالانقراض.

هذا المؤتمر ليس فقط لقاء علميا رفيع المستوى، بل يتعداه إلى أن يكون فضاء للنقاش والتأمل حيث تحصل الزراعة، والصحة، والبيئة والتنمية المستدامة على كافة الشرف.

في إطار نسخة 2014 من أنشطتنا في مجال العلاج بمنتجات النحل والأعشاب الطبية، نسعد أن نحيطكم علماً بعقد لقاء علمي **مخصص** لمنتجات النحل. وهذا الحدث في الفترة من 20-22 مايو 2014 **في فاس، المغرب. تقوم اللجنة المنظمة البرنامج التالي:**

وسيتم تخصيص اليوم الأول لقراءة عامة بتنشيط اثنين من الخبراء الدوليين: رئيس "أبيمنديا" Apimondia ورئيس الجمعية الفرنكوفونية للعلاج بمنتجات النحل، تليها ستة محاضرات موضوعية حول العسل، والعكبر، وحبوب اللقاح، وغذاء الملكات، والسم، وهواء الخلية. نتحدث هنا، في إطار هذه المحاضرات، عن إعداد بيان لمسألة تطور المعارف العلمية في هذا مجال. هذه المحاضرات ستعطي لمحة عامة عن منافع منتجات النحل كتخصص علمي جديد.

أما اليوم الثاني فسيخصص لورشات تشاركية، وسيشكل واحد أو اثنان من المنتجات الستة موضوعا لكل ورشة وسيقوم **بالإشراف** عليها خبراء متخصصون. وستجرى هذه الورشات على مرحلتين:

تفكير شامل في أقطاب البحث المستقبلية للتطوير تليها صياغة بعض المشاريع المبتكرة وتحديد الجهات المانحة المحتملة.

في اليوم 3 سيتم تنظيم معرض لمنتجات العسل يتاح للشركاء لعرض منتجاتهم، ولمناقشات وتبادل الآراء حول مواضيع يتم اقتراحها.

موضوع المؤتمر.

- الشبكات: إنشاء شبكة دولية للخبرات وتبادل المعلومات بشأن العلاج بمنتجات النحل.
- بناء تعاونيات تشارك ونقل المعرفة والتكنولوجيا بين البلدان المتقدمة والنامية المهتمة بالعلاج بالنباتات ومنتجات النحل كرؤية مستقبلية.
- تحسين تقنيات العلاج بالنحل وتطوير المهارات.
- تشجيع تطوير واستخدام منتجات النحل؛
- تثمين منتجات النحل وإمكاناتها العلاجية؛
- تشجيع البحوث في تربية النحل والعلاج بمنتجاته
- تثقيف النحالين حول فوائد بعلاج النحل؛

- تشجيع الاستثمار المحلي في مجال العلاج النحل؛
- إشراك صانعي القرارات الحكومية بخصوص أهمية العلاج بمنتجات النحل والنباتات؛
- تحسيس وسائل الإعلام وعامة الناس بمستقبل النحل العلاجي؛
- إشراك صناع القرار والجهات الفاعلة الاجتماعية والاقتصادية والمجتمعات المحلية في سياق التنمية المستدامة؛
- تعزيز التنمية المحلية المستدامة على أساس خصوصية الأرض وقيمة منتجاتها.

محاور المؤتمر

- منظور تاريخي ـ الاستخدامات الغذائية والطبية للعسل.
- **منظور إسلامي - النحل والعسل في القرآن والحديث.**
- منتجات الخلية ـ التلقيح، والعسل، العكبر، شمع النحل، سم النحل.
  - العكبر وقدرته العلاجية.
  - غذاء ملكات النحل: الخصائص والتطبيقات.
  - سم النحل: الإمكانات العلاجية (قدرة تدمير الخلايا، ومضادة الميكروبات ثم مضادة الالتهابات).
  - شمع العسل ومستحضرات التجميل.
- **فوائد** العسل الصحية.
  - استخدام العسل في التئام الجروح والوقاية من العدوى
  - مضاد للبكتيريا، فوائد مناعية (تهييج المناعة ومضادة للالتهابات) ومضادات الأكسدة.
  - الخصائص الدوائية للعسل ـ أهمية المصادر النباتية.
  - التأثيرات المضادة للجراثيم (مضاد للبكتيريا، ومضاد للفطريات ومضاد للفيروسات) لعسل النحل.
  - **عسل النحل والسكري**
  - وقاية العسل من أمراض القلب.
- التجارب السريرية وعسل النحل.
- التحقق من صحة النشاط العلاجي بالعسل الدراسات الدوائية.
- المركبات الموجودة في العسل (الفلافونويد ومضادات الأكسدة، مضادات الميكروبات، والإنزيمات، والمعادن النزرة ...)
- عسل النحل: المصادقة والمراقبة ومعايير الجودة.
- الانخفاض في عدد مستعمرات النحل: الأسباب والعواقب الاقتصادية.
- تربية النحل كصناعة تقليدية في البلدان النامية.

ورشات مقترحة

سيتم عقد ورش للأعمال التطبيقية:

- التدليك بالعسل، وإعداد مستحضرات التجميل من منتجات **النحل.**
- تقنيات متعلقة بتربية إيكولوجية وبيولوجية عضوية للنحل: المبادئ والقواعد والمعايير.
- إنتاج منتجات النحل مع الحد الأقصى من المواد المفيدة: العسل وحبوب اللقاح والعكبر، والشمع، والسم، وغذاء ملكات النحل.
- **تذوق مختلف أنواع العسل ومنتجات النحل الأخرى.**
- **سم** النحل كعلاج للمهنيين الصحيين: قواعد ومبادئ و"أسرار".

Note de présentation

Api phytothérapie, apiculture et développement durable

L'Api-phytothérapie, boite à outils validée par la science, est reconnue actuellement comme médecine alternative ou complémentaire dans les domaines curatifs et préventifs de la santé. Ses applications sont nombreuses notamment en médecine, chirurgie, homéopathie, médecine traditionnelle chinoise et ayurvédique, nutrition…

Pratiquée depuis très longtemps, l'api-phytothérapie est une alternative d'avenir et une véritable chance qu'il nous appartient de saisir et de voir se développer pour une pharmacopée peu couteuse, sans effet secondaire et surtout sans trace de produits chimiques.

La ruche est une vraie richesse à revaloriser sur les plans nutritionnel, cosmétique et surtout thérapeutique. Ses produits sont prescrits aux affections digestives, respiratoires, cardiovasculaires, rhumatismales, dermatologiques, neurologiques parmi tant d'autres. Elle est considérée comme une pharmacie complète de par les vertus thérapeutiques de la propolis, du pollen, de la cire, de la gelée royale, de l'aromiel, du venin et du miel riche en glucides, en acides organiques et lactones, en substances minérales et oligo-éléments, vitamines, enzymes, facteurs antibiotiques, flavonoïdes.

L'intérêt des produits apicoles et de l'aromathérapie justifient aussi le soutien aux apiculteurs et producteurs de plantes médicinales et de leurs dérivés afin d'améliorer la qualité de leur production pour un usage en Api-phytothérapie.

Le développement durable vise à concilier la protection de l'environnement, l'efficience économique et l'équité intra et intergénérationnelle pour favoriser un développement à moyen et long termes des activités humaines qui préserverait la vie et la bonne santé de notre planète. Les principes d'action reposent sur les principes de précaution et de prévention, sur l'équité et la solidarité à l'intérieur et à l'extérieur des États, sur la participation des acteurs de développement et des populations concernées ainsi que sur le principe de transparence à tous les niveaux de la prise de décision.

Une attention particulière doit être donnée au développement durable local qui doit assurer aux communautés locales une santé durable et une bonne qualité de vie tout en sauvegardant sur le long terme les ressources naturelles du terroir et le cadre de vie.

En matière de développement durable et d'action sociale, le Maroc a fourni un effort multidimensionnel qui a touché à la fois la santé, l'éducation, la formation, le développement rural, et ce, dans le cadre de l'Initiative Nationale du Développement Humain (INDH) sous la responsabilité directe de sa Majesté Mohammed VI. Il faut souligner l'effort important qui a été consenti au bénéfice de cette initiative puisque une partie importante du budget de l'état est allouée aux divers secteurs sociaux et en particulier en direction des couches sociales défavorisées.

La conférence

Quel est l'intérêt des pro-biotiques de la ruche ? Quelles sont les méthodes de récolte ? Quel est le rôle de la propolis dans les pathologies émergentes ? Quel sera l'avenir de l'apiculture? Ces questions et beaucoup d'autres seront abordées dans cette conférence internationale qui réunira un nombre important d'experts, d'ingénieurs agronomes, de chercheurs et d'acteurs institutionnels et socioéconomiques impliqués dans la promotion de la filière apicole et des produits de la ruche.

La conférence sur les produits de la ruche est ouverte à api thérapeutes, apiculteurs, scientifiques, cliniciens et praticiens de médecine alternative, leur faisant découvrir ainsi le monde des abeilles.

L'objectif principal est d'accroître l'intérêt pour l'apiculture et l'apithérapie. Plus spécifiquement, il s'agit de dégager les mesures pour développer le secteur apicole, de dynamiser la recherche sur les applications des produits de la ruche dans le domaine de la santé et de dresser un panorama des potentiels de l'api- phytothérapie.

Les Keynotes livrées dans les sessions plénières permettront une actualisation des connaissances sur l'apithérapie. Les intervenants partageront leurs savoir et expériences avec tous les intéressés par cette forme de médecine alternative. La plate-forme de la conférence cible les utilisations thérapeutiques des différents produits de la ruche.

Au cours de cette conférence, nous allons nous pencher sur la relation importante qui existe entre l'apiculture, l'apithérapie, l'aromathérapie, la santé, l'environnement et le développement durable. Cette rencontre favorisera l'échange de bonnes pratiques et le développement d'approches communes pour la recherche dans le domaine de l'api phytothérapie. Ce qui offrira un cadre à même d'apporter des réponses globales aux problèmes communs.

Les travaux porteront également sur les défis croissants auxquels doivent faire face le développement de la filière apicole ainsi que sur des thématiques émergentes comme la synergie entre produits de la ruche et aromathérapie pour l'avenir de la médecine naturelle.

Le développement d'un projet intégré qui se base sur la vision du plan stratégique Maroc Vert et qui cherche à valoriser les produits de la ruche de la zone Fès-Boulemane connue pour son miel de meilleure qualité s'inscrit dans les perspectives de cette conférence. Ceci fera appel à la gestion participative de la filière apicole de la région Fès – Boulemane par des compétences de la DRA (Direction Régionale de l'Agriculture), aux associations apicoles et aux chercheurs du domaine des sciences et santé. Le but est la valorisation des produits de la ruche, précieux sur les plans économique et thérapeutique, et remettre en valeur une culture thérapeutique privilégiée qui remet en avant les produits de terroir constituant l'essence de notre mémoire thérapeutique marocaine en voie de disparition.

Cette conférence n'est pas seulement une rencontre scientifique de haut niveau, c'est aussi un espace de débat et de réflexion où agriculture, santé, environnement et développement durable auront tous les honneurs.

Objectifs de la conférence

- Networking: créer un réseau international d'expertise et d'échange de l'information sur l'apithérapie ;
- Construire des coopérations de partage et de transfert des connaissances et des technologies entre pays développés et en voie de développement concernés par l'api phytothérapie comme thématique d'avenir ;
- Améliorer les techniques d'apithérapie et développer les compétences ;
- Promouvoir l'exploitation et l'utilisation des produits de l'abeille ;
- Valoriser les produits de la ruche et leur potentiel thérapeutique ;
- Promouvoir la recherche en apiculture et apithérapie ;
- Sensibiliser les apiculteurs sur les bienfaits de l'apithérapie ;
- Encourager les investissements locaux dans le domaine de l'apithérapie ;
- Interpeller les décideurs gouvernementaux vis-à-vis de l'importance de l'api-phytothérapie ;
- Sensibiliser les médias et le grand public sur l'avenir des abeilles thérapeutiques ;
- Mobiliser les décideurs, les acteurs socioéconomiques et les communautés locales dans le cadre du développement durable ;
- Promouvoir le développement durable local basé sur la spécificité des terroirs et la valorisation de leurs produits.

Thèmes de la conférence

- Perspective historique – utilisations nutritionnelles et médicinales du miel.
- Perspective islamique – l'abeille et le miel dans le Coran et le Hadith.
- Les produits de la ruche – pollinisation, production de miel, propolis, cire d'abeille, venin d'abeille.
    - Propolis et son potentiel thérapeutique.
    - Gelée royale : propriétés et applications.
    - Venin d'abeille : potentiel thérapeutique (activités cytolytique, antimicrobienne et anti-inflammatoire).
    - Cire d'abeille et cosmétiques.
- Bienfaits du miel pour la santé.
    - L'utilisation du miel dans la cicatrisation des plaies et la prévention des infections – propriétés antibactériennes, immuno-modulatrices (anti-inflammatoire et immunostimulante) et anti-oxydantes.
    - Propriétés pharmacologiques du miel – Importance des origines botaniques.
    - Effets antimicrobiens (antibactérien, antifongique et antiviral) du miel d'abeille.
    - Miel d'abeille et diabètes.
    - Effets cardio-protecteurs du miel d'abeille.
- Essais cliniques et miel d'abeille.
- Validation de l'activité thérapeutique du miel par les études pharmacologiques.

- Les composés présents dans le miel (flavonoïdes, anti-oxydants, antimicrobiens, enzymes, traces de métaux…)
- Le miel d'abeille: Authentification, contrôle de qualité et normes.
- Le déclin de la population d'abeilles : causes et conséquences économiques.
- L'apiculture comme industrie artisanale dans les pays en voie de développement.

Ateliers proposés

Des ateliers pratiques auront lieu :

- Massage au miel, api-cosmétique, préparation de produits d'abeilles,
- Techniques relatives à l'apiculture écologique/ bio-organique : Principes, règles et normes.
- L'apiculture au Maroc.
- Production de produits apicoles avec le maximum de substances utiles : miel, pollen, propolis, cire, venin, gelée royale.
- Dégustation à l'aveugle (miels divers et autres produits de la ruche).
- Venin d'abeille comme thérapie pour les professionnels de santé : Règles, principes et "Secrets".

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29.ANTIOXIDANT AND ANTI-LIPOXYGENASE ACTIVITIES OF EXTRACTS FROM DIFFERENT PARTS OF *LAVATERA CRETICA* L. GROWN IN ALGARVE (PORTUGAL)

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30. CHEMICAL COMPOSITION AND ANTI-PROLIFERATIVE ACTIVITIES OF FOUR MOROCCAN ESSENTIAL OILS

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31.CHEMICAL COMPOSITION AND ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS OF ALGERIAN *MYRTUS COMMUNIS* L.

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32.CHEMICAL COMPOSITION AND ANTIOXYDANT ACTIVITIES OF ESSENTIAL OILS OF ALGERIAN *MYRTUS COMMUNIS* L.

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***33. CITRUS LIMON* AND *CITRUS AURANTIUM* ESSENTIAL OILS FROM MOROCCO: CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES**

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34. A STUDY OF CHEMICAL COMPOSITION AND ANTIBACTERIAL PROPERTIES OF LEAVES ESSENTIAL OIL OF LAURUS NOBILIS FROM MOROCCO

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35. ENQUETE DE CONSOMMATION DU MIEL AU MAROC

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36. PHYTOTHERAPY AND TYPE 2 DIABETES: CONSULTANTS CHU HASSAN II FES, MOROCCO

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37. DONNEES CLINIQUES ET THERAPEUTIQUES DE L'INTOXICATION AIGUE AU MAAJOUN

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38. HERBAL MEDICINE: THE CASE OF DIABETES IN MOROCCO

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39.CHEMICAL ANALYSIS OF MIXTURE OF TRADITIONAL PREPARATION (KOHL) IN THE MOROCCAN POPULATION

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PLENARY LECTURES
&
ORIGINAL COMMUNICATIONS

GOOD BEEKEEPING PRACTICE AND ORGANIC STANDARD FOR BEE PRODUCTS DEDICATED TO APITHERAPY

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The international beekeeping sector is regulated by laws at three different levels:

1. Worldwide, the *Codex Alimentarius*;
2. Regional, e.g. the EU Honey Directive;
3. National, beekeepers' Associations, supermarket chains, honey exporters, importers & packers, consumers associations, Fair Trade system.

At the top level in terms of quality of honey, pollen, royal jelly, propolis, venom and wax we have the "Organic Standards", the only way to offer suitable products to apitherapists and clinics. The European text insists on key chapters: bees, foraging areas, bee feeding, prophylaxis, beehive materials, harvesting and packaging methods. Alas, we still need a worldwide harmonization of these standards.

Apimondia, the International Federation of Beekeepers'Associations, is overstepping its simple congress organization activity by taking the defense of the world's beekeepers, their bees and the consumers of beehive products. Its new policy of working groups will facilitate the dialogue between scientists and beekeepers in order to have concrete projects on a transcontinental scale. One of them is to setup a new standard for bee products dedicated to apitherapy use.

APITHERAPY AND MODERN MEDICINE

Dr Albert Becker
President of Association Francophone d'Apithérapie

Modern apitherapy is a comprehensive concept of health!

Apitherapy is intended for healthy patients: prevention is better than cure. This is the major advantage of the daily food use of bee products quality. Pollen, honey, royal jelly are not composed of isolated active ingredients, but are formed by organic components with a synergistic biological activity. Their preventive role is proven in human medicine: pollens in ophthalmology in the prevention of cataract, honey in wound healing, standardized propolis in prevention and reduction of the time evolution of the influenza.

The main field of application of modern apitherapy therefore lies both in prevention and in the treatment of bacterial, viral, parasitic infection of bronchopulmonary, gastrointestinal, gynecological, dermatological spheres. Rational medical apitherapy is very interesting in the treatment of systemic diseases and as complementary therapy in cancer chemotherapy protocols. It is widely used in cosmetology. In surgery, waxes are used in bone surgery and the honey and propolis in the treatment and healing of wounds and burns to deep 2nd degree. The use of bee products in and out of hospitals is a very important step in reducing the duration of treatment, the outcome of wound healing, reduction of infections, the ease of implementation and quality of care for the caregiver and patient comfort. All this has a very positive impact on the health system economy.

Pharmacological research opens an important place to drift apis mellifera venom wich is not a foodstuff but commodity pharmaceutical. Propolis by their obvious pharmacological quality, their potential application as antiviral and anti- carcinogenic are subject to an important pharmacological research in all medical fields as evidenced by the thousands of scientific articles published in recent years.

ROYAL JELLY AND CANCER

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The antitumoral effect of authentic and active samples of Royal jelly against the most of cellular tumor lineages is generally recognized in vitro and in vivo.
For the hormone dependent cancers (breast, prostate, testicule, ovaries, cervical) our actual knowledge is not enough advanced , particular concerning the interactions with simultaneous chemotherapy generally indisponible for example the inhibitors of aromatase. In one hand Royal jelly inhibit the receptor of estrogenes (ER alpha and ER beta) , which are in strong correlation with certain tumors. This is equivalent to inhibitor effects of these tumors. In the other hand royal jelly is composed of a mixture of hormones estrogenes, testosterones and a number od ecdysteroides. This could establish and normalize the hormonal balance between androgens and estrogenes. For the insect ecdysteroides regulates with high precision the metamorphosis. The aim its to use the same effects and substances to differentiate rigorously the evolution of normal and tumoral human cells particular of stemcells.

BEE VENOM FROM THE BEES TO THE HUMANS, FROM THE NATURE INTO THE TREATMENT OFFICE

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The bee venom is a chemical weapon for the bees, for their protection against the predators. Related with the oriental traditional medicines, bee venom is associated to the Fire element. By chemistry, it contains substances that have locally effect like burning, but regionally and on distance produce benefits. Similarly with the fire, that burns in proximity, but is beneficial along it. For humans, it can be a "weapon" against certain diseases or disorders.

When using the fire, anywhere in the nature, it needs a combustible source, a proper place, not to permit it extending where it could produce damages, to take care at the target for heating, not to burn that or anything around, how strong and how long in time it should be the fire, controlling elements for it.

To use the Fire for treating, it's necessary to be managed properly, so as to reach only the good, but not making the bad. The human being is very complex, nowadays the disorders and diseases are very complex. The adapted absolute treatment, that is supposed to cure, can only be complex, by considering all factors which are involved. The bee venom is a treating instrument that has many faces on which we have to take care. To match all physiologically, pathologically factors and the characteristics of the bee venom for obtaining the optimal result, there are requested associated elements, e.g. good combustible (honey, pollen, royal jelly) and controlling elements (propolis, royal jelly). Usually the entire treatment includes bees products, medicinal plants, diet, psycho-emotional-therapy, massages, energetically therapy, maybe others, depending the patients needs.

The bee venom has many actions when applied on the human being, which could be described chemically, functionally, energetically or by its nature of Fire element. There are many ways to administer it. Examples...

It can be used for many types of patients, in many types of disorders and diseases, e.g. rheumatic sufferance, rheumatoid, neurological, dermatological, cardiovascular.

Considering the multiple aspects of the bee venom, there are some cautions to care about.

A weapon of the bees, the bee venom, may become if handled carefully along with the proper associates, a very effective and sometimes spectacular remedy for humans.

VETERINARY APITHERAPY: CLINICAL APPLICATIONS AND RESEARCH PERSPECTIVES

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Complementary and Alternative Veterinary Medicine is an inclusive term that describes treatments, therapies, and modalities that are not accepted as components of mainstream veterinary education or practice, but that are performed on animals by some practitioners. While these treatments and therapies often form part of veterinary post-graduate education, study and writing, they are generally viewed as alternatives or complementary to more universally accepted treatments. The use of apitherapy in animals is not as common as in humans. Ancient civilisations used bee products for animals too, but modern civilisation and 'education' have seriously lessened our natural instinctive ability and capability. Despite the fact that the modern Western establishment appears to like to relegate apitherapy to the status of 'folklore' or 'old wives' tales', bee products contain a vast spread of pharmacologically-active ingredients and each one has its own unique combination and properties. They are classified in modern herbal medicine according to their spheres of action. Recognised actions include anthelmintic, anticatarrhal, anti-emetic, anti-inflammatory, antioxidant, antibacterial, antifungal, antispasmodic, astringent, diuretic, expectorant, sedative, stimulant and tonic. In our research background, we have used bee products to solve some animal pathologic problems such as mastitis in dairy herds, dermatology in carnivores, bone and skin grafts, burn and wound management….

PROPOLIS : PROPRIETES ET APPLICATIONS EN ODONTOSTOMATOLOGIE

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La nature est parfois généreuse avec l'homme, ainsi au cours des siècles le bénéfice important tiré de l'activité des abeilles a été reconnu dans toutes les civilisations. Au fil des époques, témoignage de leur importance, les abeilles ont été élevées au rang de référence symbolique.
Le miel, la gelée royale sont bien connus du grand public, la propolis en revanche l'est moins, pourtant l'Egypte des pharaons l'utilisait, et les Grecs anciens lui ont donné son nom. Pro : en avant… Polis : cité.
La propolis est une substance résineuse constituée de divers produits végétaux mélangés avec les sécrétions salivaires de l'abeille.
Les exemples de son utilisation médicinale sont très nombreux. Hippocrate, Avicenne, Aristote en parlent favorablement pour soulager et soutenir la guérison des plaies ou ulcères.
Les populations connaissent également la propolis depuis longtemps comme remède « miracle », capable de soigner tout ce qui fait mal, telle une panacée aux vertus réelles non dénuée parfois de superstition.
Une soif de nature s'empare de franges croissantes de population. La propolis connaît à juste raison un regain d'intérêt tout à fait remarquable, d'autant que la science permet aujourd'hui de mieux comprendre son action mais aussi de faire naitre de nouvelles questions et de nouveaux espoirs de succès.
Un défi considérable pour la médecine arrive, les traitements médicamenteux utilisés à grande échelle rencontrent des résistances de plus en plus rebelles. La menace de leurs inefficacités à venir nous fait réfléchir.
Dans ce cadre qui fait l'actualité médicale, la propolis comme cadeau de la nature présente son potentiel chargé d'espoir ; action antiseptique, anti inflammatoire, cicatrisante et variabilité de composition se combinent pour assurer une relève crédible aux traitements actuels.
Les propriétés de la propolis ainsi que leurs applications en odonto stomatologie seront développés dans cette présentation ou il sera question de confronter ses actions médicinales employées empiriquement à la rigueur scientifique médicale basée sur la preuve.

THE USE OF N-CHROMOSOME ROYAL JELLY TO TREAT H. PYLORI ULCERS

Hossein Yeganehrad
Owner of Caspian Apiaries
http://caspianapiaries.com/

Helicobacter pylori is a Gram-negative, microaerophilic bacterium found in the stomach. It was identified in 1982 by Barry Marshall and Robin Warren, who found that it was present in patients with chronic gastritis and gastric ulcers, conditions that were not previously believed to have a microbial cause. It is also linked to the development of duodenal ulcers and stomach cancer. However, over 80 percent of individuals infected with the bacterium are asymptomatic. More than 50% of the world's population harbor H. pylori in their upper gastrointestinal tract. Infection is more prevalent in developing countries, and incidence is decreasing in Western countries.

Caspian Apiaries has pioneered the use of n-chromosome royal jelly in the treatment of those affected by H. pylori. First presented at Apimondia 2011, N-chromosome royal jelly is the name given to the unique royal jelly produced by nurse bees for queen cells that have had drone larvae grafted into them.

We assembled 1173 patients presenting stomach ulcers (40% of patient diagnosis confirmed by endoscopy). (#) The majority of the patients had completed antibiotic therapy with little or no success. Patients were asked to consume royal jelly for 3 weeks, 2 times per day, 20 minutes before breakfast and dinner. Each took a standard dosage of 10 ml of Royal Jelly mixed 1:1 with fruit juice or water.

Results: 90% of clients reported stomach pain disappeared completely. Patient results were confirmed with endoscopy, as well as blood and urine analysis (PCR?), demonstrating complete elimination of H.pylori from patient's system.

TURKISH PROPOLIS: BOTANICAL ORIGIN AND BIOACTIVE PROPERTIES

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Turkey is the only country at a junction of three phytogeographical regions. It occupies just 0.6 % of the world's land surface but is home to 2.6% of the world plant species. Three main climatic types, oceanic, continental and Mediterranean prevail in Turkey. Turkish forests are highly diversified, comprising 648 woody species and subspecies, 168 of which are endemic. Compared to 13.000 plant species in the continent of Europe, Turkey sustains 10.000 plant species.

This review aims to present an update of chemical and bioactive properties, with emphasis on Turkish propolis. The main plant sources of Turkish propolis are *Populus spp., Salix spp., Castanea sativa, Pinus brutia, Eucalyptus sp*. Reports about the biological and pharmacological properties of propolis appeared in the early 1990's in Turkey. Since this period, further research dealing with this matter has been published. The biological activity of propolis is associated mainly with phenolic compounds such as flavonoids and derivatives of hydroxycinnamic acids.

The activity of Turkish propolis and its components against a broad range of bacteria, yeasts and molds has been a subject of intense research, with more than 50 papers published in 20 years. Comparison between several extracts obtained from propolis samples from different botanical and geographical origin and isolated compounds showed that the presence of flavonoids and derivatives of caffeic acid is associated with bactericidal or fungicidal activities. There are several reports about the effect of Turkish propolis on protozoa that cause diseases in humans and animals such as Leichmaniasis. Since several dental and periodontal disorders are associated with bacterial and fungal etiologies, different groups studied the in vitro the effect of Turkish propolis against oral microorganisms. Furthermore, several reports showed the anti-oxidative capacity of Turkish propolis in vitro and in animal experiments. Turkish propolis has the capacity of wound healing and promotion of tissue regeneration in several dermatological problems.

Experimental studies in Turkey showed several different properties, specifically antibacterial, antifungal, antiinflamamtory, anticarcinogenic, immunostimulatory, antioxidant etc. Investigations correlating chemical composition, the basic plant sources in different geographic regions of Turkey, and bioactive properties open the possibility to a classification of a limited number of "chemical types" of Turkish propolis.

Key words: Turkish propolis, bioactive properties, botanical origin

HUMAN INTERFERON-ALFA (HUIFN-AN3) AND PROPOLIS EXTRACTS SHOWS ANTI-INFLUENZA VIRUS ACTIVITY *IN VITRO*

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Introduction Influenza virus infects the respiratory tract in humans and causes a variety of different symptoms which often could become severe.[1] Amantadine and oseltamvir as widely used medicines induce amantadine /oseltamvir resistant Influenza viruses appearence.[2] Propolis is used as a folk medicine and as a dietary supplement for better health .It has different biological activities and among them anti-influenza activity[3,4] . HuIFN-αN3 is a multi-subtype protein showing antiviral, antiproliferative, antitumor, radioprotective ad antitoxic activity. It is used for the treatment of a variety of different viral diseases and cancers. Among viruses there are Influenza A and B being suspectible for HuIFN-αN3 [5, 6]. The purpose of experiments was to elucidate the Anti-influenza activity of the combination of different propolis exracts and HuIFN-αN3 in vitro.

Methods: Cells and viruses: LLC-MK2 cells were cultivated in the Eagle's medium with 10%FCS and Antibiotics. Influenza A and B viruses were obtained from the Virological department of the Institute for Microbiology and Immunology in Ljubljana. **Compounds:** 10% Ethanolic extract of Propolis (Medex D.o.o., Slovenia), 10% Propolis water extract prepared from 30% water-soluble propolis (Medex D.o.o., Slovenia) were used. HuIFN-αN3 was from Institute for Immunology, Zagreb, Croatia. **Cell treatment:** 100µl of medium+2%FCS were added from second to elewenth well. In the first well 200µl of: 10% Ethanolic extract, 10% Ethanolic extract+HuIFN-α N3(1:1,1:2 and 2:1), 10% Water extract of propolis, 10% Water extract of propolis + HuIFN- αN3 (1:1,1:2 and 2:1) and 200µl of HuIFN-αN3 and 200µl of Ribavirine as a control. All samples were serrialy diluted and incubated for 8 hours at 37^{o} C. Influenza A and separately Influenza B viruses were added, and plates were incubated at 37^{o}C for four days, when in the control 100% CPE with small plaques was developed. **Analyses:** Plates were washed with PBS , fixed with 5% Glutaraldehyde, washed with PBS and 100 µl of Crystal-violet was added for 20 minutes. The plates were washed with PBS, air dryed and the OD was measured at 570nm. The effective concentrations for 50% plaque reduction (ID_{50}) was determined from a curve relating the plaque number to the concentrations of the propolis extracts and huIFN-αN3

Results and discussion : Despite the known Anti-influenza activity of different propolis extracts and HuIFN-αN3 in vitro, there are no data about the activity of the combination between them.The experiments were performed to analyse the Anti- influenza activity of 10% Ethanolic extract of propolis and 10% Water extract of propolis in combination with HuIFN-αN3 in different ratios (1:1, 1:2 and 2:1). Ribavirine alone were used as a control.The results in **Table 1** shows, that the best resuls (ID_{50}) were obtained when the combination between 10% Water extract of propolis and HuIFN-α in ratio 1:2 were used. (ID_{50} 12±2 µg/ml for Influenza A and 19±6 µg/ml for Influenza B)

TABLE 1: Antiviral activity of 10% Ethanolic extract of Propolis, 10% Water extract of Propolis and HuIFN-αN3 in the ratio: 1:1, 1:2 and 2:1 expressed as ID_{50} in μg/ml

Sample:	Bioflavonoids as Caffeic acid mg/ml	Influenza A ID_{50} (μg/ml)[1]	Influenza B ID_{50}(μg/ml)[1]
10% Ethanolic extract of Propolis	**19,18**	**82±11**	**62±6**
10% Ethanolic etract of Propolis + HuIFN-αN3 1:1	**9,59**	**35±7**	**31±6**
10% Ethanolic etract of Propolis + HuIFN-αN3 1:2	**6,39**	**22±8**	**15±6**
10% Ethanolic etract of Propolis + HuIFN-αN3 2:1	**12,78**	**42±4**	**31±7**
10% Water extract of Propolis	**14,20**	**31±9**	**29±2**
10% Water extract of Propolis + HuIFN-αN3 1:1	**7,10**	**22±2**	**31±3**
10% Water extract of Propolis + HuIFN-αN3 1:2	**4,73**	**12±2**	**19±7**
10% Water extract of Propolis + HuIFN-αN3 2:1	**9,46**	**25±6**	**30±2**
Ribavirin		**20±2**	**28±4**

[1]ID 50 = is the concetration of the sample needed to inhibit virus-induced CPE on 50%

In case of 10% Ethanolic extract and HuIFN-αN3, the best ratio was 2:1, where 22±7 μg/ml for Influenza A and 15±4 μg/ml for Influenza B. Preliminary data of the intranasal delivery of combination 10% Propolis water extract: HuIFN-αN3 in Saline to volunteers having Flu shows surprisingly high effect on owerall duration, sniff, lachrymation, bark, temperature, and pain.

Key words: Propolis, 10% Ethanolic extract, 10% Water extract, HuIFN-αN3, Influenza A virus, Influenza B virus, antiviral activity, ID_{50}

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SAUDI PROPOLIS AS A SOURCE OF ANTI-CANCER DRUGS: CHEMICAL ANALYSIS AND BIOLOGICAL ACTIVITY

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Propolis is a gluey material collected by honeybees from plants that they use to seal cracks in hives and protect them from infection by bacteria and fungi (1- 4). Propolis was used during the accent times by Egyptians, Romans and Greeks as a medicine for some diseases (5). The properties of propolis as a remedy are due to its bio-active chemical composition (5-8). Therefore, its chemical constituents and biological properties are of interest to researchers to investigate.

In this study we used a multidisciplinary approach to analyze Saudi propolis and to explore its biological activities. Our method spectrum includes GC-MS, high-speed countercurrent chromatography (HSCCC) and metabolite profiling by *off-line* injection to APCI-MS/MS, MTT- assay, flow cytometry, drug affinity responsive target stability (DARTS), immunofluorescence techniques, and other cell based assays.

Our results showed that the biologically active fraction of Saudi propolis inhibits the proliferation of number of cancer cell lines including HepG2 (human liver carcinoma), A549 (human lung carcinoma), and Jurkat (T lymphocyte leukemia) at low microgram level. DARTS, immunofluorescence and other cell based assays suggest cellular tubulin and microtubules as a molecular target of Saudi propolies. Furthermore, cell cycle investigations showed that Saudi propolis induces a G2/M arrest of the cell cycle followed by induction of apoptosis (programmed cell death) in Jurkat cells. Moreover, our GC-MS data indicate that titerpenoids and diterpenoids represent the major components of the biologically active fraction of Saudi propolis (72% and 8% of total extract, respectively).

In addition, HSCCC with pre-fractionation and successive purification steps resulted in the isolation and characterization of various bioactive components from the highly complex propolis fraction. (12*E*)- and (12*Z*)-communic acid, sandaracopimaric acid, (+)-ferruginol, (+)-totarol, 3*ß*-acetoxy-19(29)-taraxasten-20*a*-ol were purified and elucidated by EI-, APCI-MS and 1D/2D-NMR. Cycloartenol and 24-methylene-cycloartenol, as well as five triterpene acetates were isolated in mixtures and elucidated by EI-MS and 1D-NMR. Free fatty acids, and two labdane fatty acid esters, the 15-O-oleoyl-, and 15-O-palmitoyl-isocupressic acid were also identified by APCI-MS/MS.

In summary a total of 19 metabolites could be identified, from the biologically active fraction of Saudi propolis. The chemical metabolite profile of the Saudi Arabian propolis from Al-Baha showed similarities to the results published for propolis from Crete (9), and Greece (10). Depending on the identified diterpene chemical profile, the resin sources for propolis might be *Juniperus procera* or any other plant from the Cupressaceae family (11-14). The confirmation of these findings will require more field studies to trace the plants which are generally visited and this is also depending on the vegetation period.

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HOW DO BEES PROTECT THEMSELVES FROM PATHOGENIC BACTERIA?

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Among the products of the hive, propolis plays a key role in the prevention and control of bacterial invasions. In addition to its bactericidal activity widely documented, propolis also has an inhibitory effect on the expression of virulence genes of some pathogenic bacteria without affecting bacterial growth. This should significantly reduce the emergence of resistant strains. The bacteria are thereby disarmed, and can not trigger their virulence mechanisms in presence of the host organisms. This property is particularly interesting in the perspective of preventive use of propolis in the antibacterial fight

In Psedomonas aeruginosa , multi - flower propolis inhibit the expression of LasI/R and RhlI/R, two main Quorum Sensing (QS) regulatory mechanisms in this opportunistic bacterium.
In addition to this inhibitory effect of QS, some samples of propolis also affect the production of biofilm. In the presence of multi- flowers propolis, the biofilm phenotype is altered as a result of modification in its architecture, and therefore of its molecular composition. This alteration of the biofilm architecture allowed a better penetration of the tobramycin into the biofilm and increases the accessibility of the antibiotic to encapsulated bacteria in the extracellular matrix.
A literature review supported by recent results on propolis samples from Morocco will be presented.

THERAPEUTIC PROPERTIES OF PROPOLIS

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There is an increasing interest of the consumers, pharmaceutical and food industries in products originating from the honeybees, for their promising nutraceutical and medicinal benefits, such as antioxidant effect (for health sustaining and disease prevention), safe and effective food preservation activity (propolis), and as medicinals (prevention of cardiovascular diseases, cancer, etc).

Known by various names (propolis balsam, propolis resin, propolis wax, bee glue or hive dross), and used by the honeybees as a sealant, propolis has been rediscovered as a medicinal agent, reported to be of benefit in the treatment of allergies, bruises, burns, ulcers, sunburn, acne, skin disorders, wounds, tumors, fatigue, sore throat, nasal congestion, respiratory ailments, flu, colds, acne, skin disorders, and shingles. Propolis has a long history of medicinal use, dating back to 350 B.C., the time of Aristotle. Greeks have used propolis for abscesses; Assyrians have used it for healing wounds and tumors; and Egyptians have used it for mummification. Presently, propolis is used as a food supplement, as an ingredient in cosmetics and a medicinal agent. Propolis is reported to have anti-angiogenic, antibacterial, anti-hypercholesterolemic, anti-hypertensive, anti-inflammatory, antimicrobial, anti-oxidant, anti-parasitic, antiseptic, anti-tumor, anti-ulcer, antiviral, fungicidal, local anesthesic, immune-stimulatory, hepato-, cardio- and neuro-protective activity. Propolis is used for canker sores and infections caused by bacteria (including tuberculosis), by viruses (including flu, H1N1"swine" flu, and the common cold), by fungus, and by single-celled protozoans. Propolis is also used for cancer of the nose and throat; for boosting the immune system; and for treating gastrointestinal problems including *Helicobacter pylori* infection in peptic ulcer disease. People sometimes apply propolis directly to the skin for wound cleansing, genital herpes, minor burns and cold sores. It is also used as a mouth rinse for speeding healing following oral surgery. The popularity of propolis can be judged by the rise in the number of publications. Propolis consists of plant resins, balsams, wax, bee pollen and essential oils. The composition of propolis (of different colors) depends on the phyto-geographical location, seasonal collection time, and botanical source. It is reported to contain more than 300 compounds such as flavonoids, polyphenols, phenolic aldehydes, sesquiterpene-quinones, coumarins, amino acids, steroids and inorganic compounds.

Since, many of the human pathologies, such as diabetes, hypertension and other cardiovascular diseases, are associated with inflammation and oxidative stress, as a result of elevated levels of reactive oxygen species (ROS), which cause lipid peroxidation and protein oxidation, propolis (and its extracts) with its anti-oxidant and oxygen radical scavenging activity (mainly due to phenolics and flavonoids) have the potential to be of benefit in the treatment of the above mentioned pathologies.

The beneficial effects of propolis in diabetes have been confirmed by a number of studies in experimental animals. For example, propolis given orally to rats with streptozotocin (STZ)-induced diabetic rats significantly decreased plasma insulin and insulin resistance, reduced glycated hemoglobin, suppressed elevated hepatic enzymes, and increased hepato-renal glutathione peroxidase levels. An ethanolic extract of propolis administered to STZ-induced diabetic rats, reversed body and kidney weight loss, improved serum glucose and lipid profile, and renal function tests, as well as decreased oxidative damage [increased superoxide dismutase, glutathione, catalase and decreased malondialdehyde (MDA)] in the renal and pancreatic tissue. Similar results were obtained by us using Moroccan propolis in STZ-diabetic rats (unpublished data). Intraperitoneal administration of caffeic acid phenethyl ester (CAPE), an active component of propolis, to STZ-diabetic rats reduced oxidative enzymes and ROS scavengers in the heart tissue.. Incubation of HepG2 cells with propolis blocked the induction of the gene expression and enzyme activity of glucose-6-phosphatase caused by high glucose concentration, suggesting its potential as an antidiabetic agent for the treatment of insulin-sensitive diabetes. The anti-inflammatory action of propolis was demonstrated in a septic shock model in rats (induced by lipopolysaccharide), in which CAPE administration decreased the inflammatory cytokines and increased the anti-inflammatory cytokines levels. Artepillin C, another constituent of propolis, given orally showed anti-inflammatory effects in mouse model (carrageenan-induced paw edema and peritonitis); the mechanism of action involved prostaglandin E(2) and nitric oxide inhibition through NF-kappaB modulation. The protective role of propolis against the ROS induced damages in diabetic rats and nephrotoxicity models gives hope that they may have similar protective action in humans. Preliminary data in diabetic subjects, which demonstrated beneficial effects of propolis to control and prevent diabetes (unpublished results), and the experimental diabetes study in rodents suggest that propolis (or compounds isolated from propolis) may be useful in human diabetes.

A review on the main health claims and therapeutic properties of propolis will be presented.

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PROPOLIS AQUEOUS EXTRACT HAS PROTECTIVE AND ANTI-APOPTOTIC EFFECTS IN RADIATION-INDUCED MUCOSITIS IN RATS.

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Purpose: Radiation enteritis is a common adverse effect in patients undergoing radiotherapy. The present study was intended to investigate the anti-apoptotic effect of aqueous propolis extract (AEP) on mucositis induced after total body irradiation. **Materials and methods:** Intestinal mucositis was induced in rats by exposure to whole body gamma-irradiation from a Cs^{137} source at radiation dose levels of 4, 6, and 8 Gray. AEP was given orally in doses of 450, 650 and 850 mg/kg for 3 days prior to irradiation and for 2 days after. Rats were sacrificed one day later and segments of small intestine were examined histologically while intestinal homogenates and serum samples were used to assess relevant parameters for apoptosis (calcium, cytochrome c, B-cell lymphoma-2 and complex 1), inflammation (diamine oxidase, lactate dehydrogenase, tumor necrosis factor and myeloperoxidase) and oxidative stress (glutathione and thiobarbituric acid reactive substance).
Results: The extent of intestinal injury was dependent on the radiation dose level and histological evidence of apoptosis was shown at an exposure of 8 Gray. Apoptotic changes were associated with an increase in cytosolic calcium, depletion of mitochondrial cytochrome c, B-cell lymphoma-2 and complex 1. Serum diamine oxidase and lactate dehydrogenase as well as intestinal tumor necrosis factor and myeloperoxidase were also increased. Intestinal reduced glutathione and thiobarbituric acid reactive substance were deranged**.** AEP was shown to protect to a large extent against the histological changes induced by radiation and counteract dose-dependently the derangement in all the parameters previously measured. **Conclusion:** The findings provide supportive evidence for the beneficial anti-apoptotic, anti-inflammatory, and anti-oxidant effects of AEP against intestinal radiation damage.

HONEY IN TYPE 2 DIABETES MELLITUS

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Background: In spite of recent advances in the management of Diabetes Mellitus (DM) the mortality from macro-vascular complications is still high. Honey is a natural substance produced by honey bees. It has many benefits for nutrition and health. **Aim of study:** The aim of the present trial was to test the effects of long-term honey intake, as a sole treatment, in patient volunteers with type 2 DM. This trial started on 2001 and is still ongoing. **Patients:** Twenty adult patients with type 2 DM volunteered to stop their medications and use honey as an alternative and sole treatment for their diabetes and its associated metabolic disorders. Their mean age was 46.5 years and they were of both sexes (M: F= 3:2). The mean duration of their diabetes was 5.1 years. At baseline: the mean HbA1C value was of 9.7%. The mean BMI was 32.5. Twelve (60%) patients had systemic hypertension and twelve (60%) had dyslipidemia. Ten (50%) patients had symptoms of peripheral neuritis, and one patient had retinopathy with retinal hemorrhage. Four patients had coronary heart disease (CHD); and implantation of stents for coronary arteries was done for two of them. **Methods:** All patients stopped their medicines and consumed honey in an empirical dose of 2 g/kg/day assuming body weight 75 kg. In addition to oral honey, 15 patients also volunteered to receive honey through the intravenous route during the initial period of the intervention. We used mainly two types of honey in this study; Clover honey from Egypt and Ziziphus honey from Yemen and Pakistan. **Results:** The duration of intervention ranged from 0.42 to 10.6 years, with a median of 1.04 year. Ten (50%) patients continued the trial for more than one year, 5 patients (25%) completed one year intervention and 5 (25%) discontinued the intervention before one year. Three patients have been still continuing the intervention till now. The only cause of discontinuation of the intervention was persistent hyperglycemia. In all patients long-term honey therapy resulted in persistent hyperglycemia, persistent dyslipidemia, body weight reduction and improvement of macro-vascular complications (hypertension and coronary heart disease). None of the patient volunteers developed diabetic ketoacidosis (DKA), cerebral strokes or serious infections characteristic of DM. However one patient, who continued the intervention for almost 11 years developed peripheral neuritis and diabetic foot, and non-proliferative retinopathy after 8 years. The renal functions remained normal throughout the period of intervention. However three patients showed micro-albuminuria after 2.6, 7.25 and 10.6 years intervention. Discontinuation of honey therapy resulted in deterioration of the cardiovascular status in two patients 3 years after discontinuation of honey, after periods of intervention of 6 and 7 years. Also, two patients, who did not receive anti-diabetic medicines after discontinuation of honey, developed diabetic ketoacidosis 1 and 4 months after discontinuation of honey, after periods of interventions of 0.5 and 2.6 years, respectively. **Conclusion:** Long term honey therapy as a sole treatment in type 2 diabetes mellitus resulted in weight reduction and improvement of macro-vascular complications despite persistent hyperglycemia and dyslipidemia. However, micro-vascular complications in the form of neuropathy and retinopathy have been developed in one patient who continued the intervention for almost 11 years. Well-designed randomized controlled studies in large cohorts of patients are thus recommended to answer the questions: Would honey concomitantly with anti-diabetic medications have the potential to prevent, cure or reduce both macro- and micro-vascular complications of DM? Or would continuation of honey therapy as a sole treatment have the potential to reduce or cure the micro-vascular complications which have developed in some patient volunteers?

MEDICINAL USES OF HONEY: FUTURE APPLICATION

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Honey has long been used to treat infections. Many countries including USA gave approval for using honey for management of wounds and burns. We have been providing sound scientific data explaining how honey works as a wound healer. Honey increases nitric oxide, decreases prostaglandins, and eradicates microbial infection, and it contains many elements that involve in wound healing such as trace elements and antioxidants. More studies are exploring other aspects of honey activity such as its effect on blood sugar, body weight, lipid profile, C- reactive protein, pro-inflammatory prostaglandins, and homocysteine. Others and we have provided evidence supporting the use of honey in patients with diabetes, hypertension, dyslipidemia, obesity, and cardiovascular diseases. Growing data now expanding honey activity against tumors. Clinical and preclinical studies on potential influence of honey on wound healing, infections, diabetes mellitus and cardiovascular risk factors are discussed in this presentation

GLYCAEMIC INDEX AND HONEY

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Sugars are the most important component of honey, the physical attributes of honey are largely determined by the kinds and concentrations of the carbohydrates present. In most honeys, the monosaccharide fructose predominates but exceptions occur such as in rapeseed (canola) honey that contains greater amounts of glucose than fructose. There are at least twelve disaccharides in honey in addition to fructose and glucose. These are sucrose, maltose, isomaltose, nigerose, turanose, maltulose, leucrose, kojibiose, neotrehalase, gentiobiose, laminaribiose and isomaltulose. The Glycemic Index (GI) is a physiologically based method used to classify carbohydrate foods according to their blood glucose-raising potential. The Glycemic Index measures the area under the glycemic response curve during a 2-hour period after consumption of a 50g carbohydrate serve from a test food, with values being expressed relative to the effect of either white bread or glucose. Most research relating to the Glycemic Index and health indicates the clinical usefulness in the treatment of diabetes and hyperlipidaemia. Several studies in lean healthy people, obese individuals, and people with diabetes show consistently higher day long insulin levels with diets based on high Glycemic index foods in comparison with low Glycemic index diets of similar nutrient composition. In people with diabetes, the consumption of high Glycemic index foods results in a far more exaggerated glycemic and insulin response, which may lead to worsening insulin resistance and eventually the need for drug or insulin therapy. Furthermore, higher day long insulin levels promote carbohydrate oxidation at the expense of fatty acid oxidation, thereby encouraging synthesis of very low density lipoprotein cholesterol (VLDL) in the liver and fat storage in adipose tissue. A combination of high Glycemic Index carbohydrate and high fat (of any type) in a meal therefore may be synergistic in promoting weight gain.

In our study, while comparing certain biochemical parameters before and after honey intake, we also determined the glycemic index of 11 honey varieties in 20 healthy students with a mean (±standard error) age of 20.8±1.8 years. All volunteers participating in the study underwent anthropometric measurements and dietary questionnaires were obtained. They were served 50 g carbohydrate portions of different varieties of honey or the reference food (glucose), on separate occasions.

Six varieties of monofloral honey (pine, chestnut, thyme, astragalus, lime, citrus fruits) and five varieties of honey from different geographical origin (Şemdinli, Bingöl, Muş, Kayseri, Yüksekova) were used in the study after their pollen, moisture, sugar (glucose, fructose, sucrose, turanose, maltose, trehalose, isomaltose, erloz, melezitose, maltotriose) and organic acids (oxalic, tartaric, citric, malic, succinic, ascorbic and acetic acids) were analyzed. Blood was collected after an overnight (12 h) fast and 15, 30, 45, 60, 90, 120 minutes after intake and the GI was calculated by expressing each subject's incremental area under the blood glucose curve after honey as a percentage of his or her mean blood glucose curve after glucose.

The glycemic index values for honeys from Bingöl, Şemdinli, Kayseri, Yüksekova and Muş were found to be 57.4, 47.8, 64.2, 52.6, and 75.5 respectively, while the glycemic index values for honeys of citrus, tragacanth, chestnut, thyme, linden and pine were found to be 44.9, 69.1, 55.5, 55.3 and 58.8 respectively. Accordingly, honeys from Yüksekova and Şemdinli as well as thyme and citrus honeys have low GI, while honeys from Kayseri and Bingöl as well as astragalus, chestnut, linden and pine honeys have intermediate GI, and the honey from Muş has high GI.

THE INFLUENCE OF ROYAL JELLY (RJ) ON HUMAN INTERFERON- ALFA' S (HUIFN-AN3) INHIBITION OF HUMAN COLON CANCER CELLS (CACO-2) PROLIFERATION *IN VITRO*

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Purpose. As a part of Royal jelly's biological activity, investigations of its possible antitumor activity were performed, and its possible interactions with Human Interferon-α (HuIFN-αN3), being used for the treatment of different cancers, despite its molecular mechanism behind its cytoreductive action is still unknown. The purpose of this study was to investigate the influence of royal jelly on HuIFN-α induced inhibition of Human colon cancer cells (CaCo-2) proliferation, and theirs effect on intracellular Glutathione (GSH) and Lipid peroxidation (MDA assay).

Methods. The antiproliferative (AP) activity of royal jelly (0,1g/10ml PBS), HuIFN-α, (1.000I.U./ml), 10-HDA (100 μM/ml), and different combinations between them in ratio 1:1, 1:2 and 2:1 on CaCo-2 cells were determined. Their's influence on Glutathion level was measured by Sigma-Aldrich glutathione assay kit. The lipid peroxidation was measured by MDA (Malondialdehyde) assay.

Results. The obtained data demonstrated, that Royal jelly alone, has low AP activity: 2.0 (0,005 g/ml); HuIFN-α has AP activity of 2.5 (208,33 I.U./ml). In the combination between Royal jelly and HuIFN-α (2:1), the AP activity was 3.5. In that combination the level of GSH was 24,9 ±2,4 nmol/mg of proteins (70,2±3,2 nmol/mg in Control) and the level of MDA was 72,3±3,1 nmol/mg (23,6±9,1 nmol/mg in Control).

Conclusions. It seems that the 10-Hidroxy-2-decenoic acid, as the main component of the Royal jelly is responsbile for the influence of royall jelly on Interferon' s Alpha (HuIFN-α) inhibition of Human colon cancer cells (CaCo-2) proliferation *in vitro*.

Key words: 10-HDA, Antiproliferative activity, CaCo-2 cells, Glutathione (GSH), Human Interferon – Alpha (HuIFN-α), Lipid peroxidation (MDA), Royal Jelly.

IDENTIFICATION OF UNEXPECTED CHEMICAL RESIDUES AND CONTAMINANTS IN FOOD SAMPLES USING HIGH RESOLUTION TRIPLE TOF SYSTEM

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Food manufacturers have a clear commitment to deliver high quality products that satisfy consumer's expectations to ensure that the foods they produce are safe. However, surveys frequently reveal that there is a certain degree of concern expressed by consumers about the potentially harmful effects of food contaminants and residues such as pesticides, veterinary drugs, mycotoxins and other food residues on human health. In this case, the industries selling fresh foods to consumers, and those that are involved in the manufacture of processed foods, are affected. The risk of residues in a raw material will be dependent on the degree of control and knowledge of the field / crop and hive treatment. The number of contaminants and residues increases every year, representing more and more threats on honeybees and on humans.

Liquid Chromatography coupled to tandem Mass Spectrometry (LC-MS/MS) has become an indispensable tool for the analysis of contaminants and residues in food of animal and plant origins, as well as in drinking water. Analytical methods have significantly reduced the time needed for sample preparation and clean-up [1-2]. Mass analyzers based on triple quadrupole technology operated in Multiple Reaction Monitoring (MRM) mode deliver highly selective and sensitive quantitative results and are therefore well established for multi-target screening and quantitation of food contaminants. However, at low concentrations, sometimes, MRM ratios are not so consistent or not even possible for confirmation. Using MS/MS spectra library database, the hybrid Quadrupole-Linear Ion Trap or QTRAP^{TM} systems allow to do confirmation at low concentrations. Spectra at different collision energies could also be used in order to have better identification matches. While these technologies may cover expected and frequently detected food contaminants, less common ones (some with high toxicity) may go unnoticed. Generic screening methods fill this gap and may ultimately replace current targeted measurements.

In recent years, there has been an increasing demand for retrospective and non-targeted data analysis. Liquid chromatography coupled with high resolution time-of-flight mass analyzers (LC-HR-MS) seems to open new attractive possibilities for contaminants and residues analysis. High resolution and accurate mass instruments are capable of performing targeted and non-targeted screening in a single LC-MS/MS run. This, in principle, allows detection of an unlimited number of compounds, provided that the selectivity and sensitivity are sufficient.

A generic QuEChERS procedure [1] was used to extract residues and contaminants from fruit, vegetable and honey samples. Extracts were subsequently analyzed by LC-MS/MS using an AB SCIEX TripleTOF® system operated in high resolution accurate mass MS and MS/MS mode. Full scan MS and MS/MS data was explored to identify known-unknowns using non-targeted data processing tools. A major challenge in full scan MS-based screening methods is data processing. Given the high number of analytes, it is no longer feasible to manually evaluate the data through extracted ion chromatograms. Instead, tools are needed for reliable automated (library-based) data handling and reporting. Sample-control-comparison was used to find unexpected contaminants. Identification was based on MS and MS/MS information, formula finding, ChemSpider searching, and automatic MS/MS fragments interpretation. This challenging data processing workflow was automated to allow easy result review and reporting [3].

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OVERVIEW ON THE LAST TEN YEARS OF BEE POLLEN RESEARCH

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The past ten years have been very fruitful for research in bee pollen. Some countries have specific regulations and thankfully the amount of analytical results that already exist on the various floral sources from many countries are able to allow us to have in short term an overview of the almost total world production.
Still chasing that marketed products have the finest possible quality, first of all, the collection of the product need to follow the best practice and APIFRESH Project gave an important contribution with the publication of the "Best Practice Guide for Bee Pollen collection and preservation" [1].
Many other sources of information as new approaches in discernment of bee pollen loads using computer vision [2] and full evaluation on the samples using FT-IR [3] are included in this research as important tools to be used as current analysis.
In the third volume of COLOSS BEEBOOK [4] (Standard methods for *Apis mellifera* product research) we are now in condition to include all the standard methods for studying bee pollen.
From the research published, depending on the floral source, for instance, bee pollen will be in a near future included in pharmaceutical formulations. For that simplified registration as traditional use, needs to be supported with a monograph, for example, at the European Pharmacopea. Further reliable studies with this goal can provide a short-term development of a document that guarantees to the consumer a quality product and a risk assessment consistent with the legislation.
The determination of toxic contaminants such as heavy metals and pesticides, among others should be included in the final documents. Another imperative aspect is the contamination of genetically modified plants whose impact is still unpredictable, and this still needs research because there are few results available concerning this issue.
This opens an significant contribution to the profitability of bee products and also allows the consumer the confidence that is crucial to guarantee good products on the market.
As a conclusion we are now able to say that monofloral bee pollen is nearly completely studied in many producer countries where they add important financial sources for the development of this product.

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EFFECT OF INTAKE OF PATENTED FRESH MONOFLORAL POLLEN MIX ON MUSCLE MASS AND METABOLISM IN UNDERNOURISHED OLDER RATS.

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Introduction: Undernutrition in elderly people speeds up sarcopenia, with an impact finally on mortality. Nevertheless, a resistance to renutrition has been described in older patients. So, new nutritional strategies to be able to improve efficacy of renutrition seem to be required. Fresh monofloral pollens have a very interesting nutritional diversity and density. They contain several nutritional substances (probiotics, antioxidants, AA) which jointly come from one food, have beneficial effects on muscle protein metabolism. The aim of the study was to evaluate the efficacy of renutrition phase from a fresh monofloral pollens supplement on the muscle protein mass and metabolism in undernourished older rats.

Methods: Male Wistar rats of 22 months old (n=10/gr) have been undernourished by a reduction of diary intake at 50% of their needs during 12 weeks. Then, the rats have been re-nourished with a standard diet supplemented with 2.5, 5 or 10% of patented fresh monofloral pollens mix. Older rats without the denutrition phase have been used as a control group. Body composition, inflammatory parameters and muscle protein synthesis (ASR) have been analyzed. The latter has been measured by 13C valine enrichment analysis. The activation state of the regulation ways of protein traduction has been evaluated. ANOVA was used for statistic analyze following by Fischer's test.

Results: Body mass was significantly decreased during the denutrition phase (-32%; $p<0.0001$) and increased after the renutrition phase without a difference between the different groups. A significant increase of muscle mass was noted in rat groups supplemented with pollen mix compared to the control group ($p>0.05$). While the denutrition phase led to a significant reduction of the muscle protein synthesis measured in Plantaris muscle, only standard and 10% pollen mix supplement diets resulted in an increase of this muscle synthesis compared to the undernourished rat group ($p>0.03$). The renutrition phase led to partial (standard and 2.5 pollen mix diets) or complete (5 and 10% pollen mix diets) of the activation level of protein traduction regulation ways.

Conclusion: A standard diet of renutrition supplemented with our patented fresh monofloral pollen mix improves the recovery of muscle mass in undernourished older rats. Overall, these results underline the efficacy of our patented product and its interest in undernourished elderly people.

THERAPEUTIC BENEFITS OF ROYAL JELLY: CLINICAL STUDIES

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Royal jelly (la gelee royale), a milky viscous protein-rich secretion from the hypopharynx and mandibular glands of worker honey bees (*Apis mellifera*), is fed exclusively to female larvae destined to become the queen. Because of the instability, freshly collected royal jelly must be refrigerated or frozen immediately or lyophilized to a powder. It contains water (65%), proteins (15%), sugars (15%), lipids (5%), vitamins [A (carotenes), B1 (thiamin), B2 (riboflavin), B3 (nicotinic acid), B5 (panothenic acid), C (ascorbic acid), D, H (biotin), K and R (rutine)], essential amino acids, sterols, acetylcholine, trace metals, enzymes, 10-hydroxy-trans-2-decenoic acid (2%, antibacterial), and neopterin. Some important proteins include royalactin (the queen maker), royalasin (antibacterial), jelleines (antimicrobial), and major-royal-jelly-proteins (immunosuppressive).

In traditional medicine, royal jelly is reported to be a health-food, and useful in asthma, hay fever, arthritis, liver disease, pancreatitis, insomnia, fatigue, premenstrual syndrome, stomach ulcers, kidney disease, bone fractures, menopausal symptoms, skin disorders, and hypercholesterolemia. It is said to reduce the risk of cardiovascular disease, delay the effects of aging, boost the immune system, and balance the hormones. Topical application is said to act as a skin tonic, moisturizer and hair growth stimulant.

Pharmacological studies show that royal jelly has immune-modulating, anti-allergic, anti-atherosclerotic, anti-fatigue, anti-hypertensive, anti-inflammatory, anti-microbial, anti-oxidant, anti-tumor, anti-ulcer, hypolipidemic, and vasodilatory activities. In addition, royal jelly is neuro-, gastro-, hepato-, and photo-protective, is a wound-healing promoter, has insulin-like effect, prevents sarcopenia, as well as affects cell growth, differentiation, and survival.

Since, the queens (fed exclusively on royal jelly) are much bigger (4-fold) and live longer (30-fold) than worker bees and produce thousands of eggs, it has led to the assumption that ingestion of this product will produce the same effect in humans, that is, increase in body weight, improved fertility, and enhanced longevity.

A number of clinical studies conducted in patients and human volunteers validate some of the purported beneficial effects of royal jelly on human health.

(I) Diabetes-Hyperglycemia-Glucose tolerance

a) In 50 female T_2DM patients, 25 were administered orally 1000 mg/day royal jelly and 25 were given placebo for 8 weeks. The mean fasting glucose decreased significantly (from 163.1 $\pm$ 42.5 mg/dL to 149.7 $\pm$ 42.7 mg/dL), HbA_{1C} decreased (from 8.7 $\pm$ 2.2 to 7.05 $\pm$ 1.45%. p=0.001), while serum insulin increased (from 70.3 $\pm$ 29.2 pmol/L to 86.5 $\pm$ 27.5 pmol/L, p=0.01). Oxidation indices also declined (increase in erythrocyte superoxide dismutase and glutathione oxidase activities and decrease in malondialdehyde levels). These results suggest that royal jelly supplementation may be beneficial in controlling diabetes outcomes (Pourmoradian S, et al., Chinese J Integr Med 2014 (1-6) (in press).

(b) In 20 healthy young volunteers, oral glucose tolerance test after ingestion of 20 g of royal jelly indicated improved glucose tolerance, suggesting insulin-like activity (Münstedt K et al., J Med Food 2009; 12:1170).

See also IV-b; VI-a

(II) Hyperlipidemia

a) Administration of royal jelly (10 g/day for 14 days) increased high density lipoprotein (HDL)-cholesterol in elderly patients (Münstedt K et al., J Alternat Complement Med 2009;15:329)

b) Meta-analysis of the controlled human trials of royal jelly to reduce hyperlipidemia showed a significant reduction in total serum lipids and cholesterol levels and normalization of (HDL)-cholesterol and low density lipoprotein (LDL)-cholesterol as determined from decrease in β/α lipoproteins; at a dose of approximately 50 to 100 mg per day, total serum cholesterol levels decreased by about 14%, and total serum lipids by about 10% (Vittek J. Experientia 1995;51:927)

c) Addition of royal jelly to the treatment regimen in elderly arteriosclerotic patients decreased cholesterol and total lipids (Madar J et al., Zeitschrift Alternsforsch1965; 18:103)

See also IV-b

(III) Rheumatoid arthritis

a) In a study in 80 patients with rheumatoid arthritis (40 treated, 40 control), administration of royal jelly for 3 months resulted in significant reductions in Clinical Disease Activity Index ($p=0.012$), swollen joint count ($p=0.024$), tender joint count ($p=0.027$), and morning stiffness ($p=0.004$). These results suggest that royal jelly may be suitable for adjunct therapy of rheumatoid arthritis (Mobedi Z, et al., J Isfahan Med School 2013:252:1428).

(IV) Menopausal syndrome/Premenstrual syndrome

a) In a placebo controlled randomized trial in women who suffered from severe menopausal symptoms, administration of melbrosia (a mixture of royal jelly, fermented flower pollen and pollen) significantly decreased menopausal symptoms (compared to placebo). Melbrosia may be an alternative for women who do not want to take hormone replacement therapy (Szanto E et al., Wien Med Wochenschr 1994; 144:130).

b) In an open, multicenter, uncontrolled, prospective observation study, 55 postmenopausal women were treated with *Melbrosia* for 3 months. There was a significant reduction in menopausal symptoms. In addition, there was reduction in serum cholesterol and LDL-cholesterol, and an increase in HDL-cholesterol and triglycerides (Georgiev DB et al., 2004, available at: http://www.medscape.com/viewarticle/493599_4)

c) In 60 menopausal women, administration of Lady 4 (combination of primrose oil, damiana, ginseng and royal jelly), there was significant improvement in 87% of the treated individuals in symptoms as measured by Menopause Rating Scale II (Yakoot M et al., Forsch Komplemen Med 2006;2011;18:264),

d) In a randomized, double-blind, placebo-controlled, crossover trial, the overall symptom score decreased significantly in 32 women treated with Femal, a mixture of pollen extract, pollen and royal jelly; sleep quality improved and weight gain was suppressed (Winter K and Hedman C. Curr Therapeut Res 2002;63:344).

(V) Cognitive impairment

a) Sixty-six patients with mild cognitive impairment were treated with a commercial dietary supplement (Memo^{R}) consisting of 750 mg of lyophilized royal jelly, 120 mg *Ginkgo biloba* extract and 150 mg *Panax ginseng* extract for 4 weeks. The Mini-Mental State Examination score improved significantly ($p<0.0001$) in treated individuals (Yakoot M et al., Clin Intevent Aging 2013;8:975).

(VI) Erythropoiesis

a) In a randomized, placebo controlled, double-blind trial, in thirty healthy volunteers, who ingested 3 g of royal jelly daily for 6 months, there was significant increase in red blood cell count, hematocrit, insulinogenic index and testosterone, and a decrease in fasting plasma glucose; mental health score also improved (Morita H et al., Nutr J 2012:11:1 Article No 77).

(VII) Benign prostatic hyperplasia

a) Daily intake of royal jelly (37.8 g) for 6 months decreased PSA in 40% of patients with benign prostatic hyperplasia [Dimitrovski A et al., 2010: Eur Urol 2010 (Supplements);9:598].

(VIII) Periodontitis

a) There was significant improvement in 16 patients with chronic periodontitis, who were treated with the conventional treatment along with an ethanolic mixture of propolis and royal jelly (Badea V et al., Farmacia 2013;61:685).

(IX) Wound-Ulcer

a) Daily topical application of 5% sterile royal jelly for 3 months to foot ulcers (n = 30) in diabetic patients was not superior to placebo in terms of healing, although, there was no adverse effect (Siavash M et al., Int J Wound 2013 (in press). It is possible that the concentration of royal jelly was insufficient. However, the same group of investigators reported healing of 7 of 8 diabetic foot ulcers by topical application of 5% royal jelly for 41 days (Siavash M et al., J Res Med Sci 2011;16:904).

b) Topical application of royal jelly and honey for 2 weeks completely healed the wound following removal of endometriosis of cesarean section scar in 7 patients (Ahmed ATA and Mohamed JA. Geburtshilfe Frauenheilkunde 2011;71:5).

c) Application of PEDYPHAR ointment (containing royal jelly and panthenol) daily for up to 6 months completely healed diabetic foot ulcer in 90% patients (n=60) (Abdelatif M et al., J Wound care 2008;17:108).

(X) Asthenozoospermia-Infertility

a) Pericoital intravaginal application of a mixture of honey and royal jelly significantly improved the chances of pregnancy (Abdelhafiz AT and Muhammd JA. Int J Gynecol Obstr 2008;2:146).

(XI) Skin disorders/Photo-damage

a) Application of a cream containing propolis (1%) and royal jelly (0.5%) in 13 patients with sensitive skin of different etiology for 2-4 weeks was effective in decreasing the symptoms (Knor T et al., Farmaceut Glasnik 1999 55:229)

b) Topical application of a cream containing 10-hydroxy-2-decenoic acid (a component of royal jelly) for 21 days to the skin of volunteers with UV-induced xerosis, decreased inflammation and improved hydration index by 60% [Duplan H et al., J Invest Dermatol 2012;132 (Suppl.1):S61.

(XI) In addition, treatment of lymphocytes from patients with Grave's disease with royal jelly (4 mg/mL) resulted in increase in interferon-gamma, and decrease in the levels of Th1- and Th2-marker cytokines, suggesting that royal jelly may be effective as an immunomodulatory agent in Grave's disease (Erem C et al., Endocrine 2006;30:175).

Clinical studies showing healing properties validate the truth of the Holy Quran, which states that secretions of the honey bee have medical benefits.

In may be noted that none of the patients in human studies (listed above) experienced any adverse effect from ingesting royal jelly, however, several cases of adverse effects of royal jelly have been reported, such as anaphylaxis, asthma, and hypersensitivity in atopic individuals. It may be pointed out that some of the adverse effects may be due to non-jelly components present in the commercially available preparations, which contain freeze-dried royal jelly, honey, pollen, beeswax, safflower oil, glyceryl esters of fatty acids and vitamin E.

When using royal jelly, one should consider the following: geographical and seasonal variation, flower source, composition, stability, purity, and lack of data on optimal dosing.

EFFECT OF ROYAL JELLY ON NEPHTOTOXICITY

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Royal jelly (RJ), a white-yellowish, cream like material secreted from the hypopharyngeal and mandibular glands of worker-caste (nurse) honeybees, is a widely consumed health benefits. RJ consists of proteins, carbohydrates, fats, free amino acids, vitamins and minerals, and significant amounts of bioactive substances such as unsaturated fatty acids of 10-hydroxy-2-decenoic (10H2DA), 3,10- dihydroxydecanoic, and sebacic acids Pharmacologically, RJ displays vasodilative, hypotensive, antitumor, antihypercholesterolemic, anti-inflammatory, and antioxidative activities. The major fatty acid component of RJ, 10H2DA, has antitumor, collagen synthetic, and MMP-inhibitory activities.
In our study, we investigated the effects of royal jelly on cisplatin-induced nephrotoxicity and oxidative stress in rats.Adult male Wistar albino rats were randomly divided into eight groups: the control, cisplatin, royal jelly, and royal jelly plus cisplatin groups. Biochemical and histopathological methods were utilized for evaluation of the nephrotoxicity. Blood was collected and analyzed for blood urea nitrogen (BUN), alanine aminotransferase, aspartate aminotransferase, triglyceride, total cholesterol, uric acid, total bilirubin, and total protein levels. The kidney samples were stored for the measurement of malondialdehyde (MDA), glutathione peroxidase (GSHPx), superoxide dismutase (SOD), and catalase (CAT) activities and processed for histopathological examinations. Administration of cisplatin to rats induced a marked renal failure, characterized with a significant increase in serum BUN and uric acid concentrations, and they had higher kidney MDA and lower GSH-Px, SOD, and CAT activities. In the groups that were administered RJ in association with CP, improvement was observed in some oxidative stress parameters and certain other biochemical parameters, pre-treatment with RJ being more effective. The CP-induced changes in histopathologic findings of kidneys were partially reversed by treatment with royal jelly. The results provide further insight into the mechanisms of CP-induced nephrotoxicity and confirm the antioxidant potential of royal jelly.

THE VENOM THERAPY PROTOCOLS

Théodore Cherbuliez
Vice president of the American Apitherapy Society
Executive Committee of Apimondia, USA

TRAITEMENT AU VENIN D'ABEILLES

Plusieurs aspects seront présentés :

- les indications médicales avec leurs protocoles ;
- une revue des réactions adverses au venin et de la suite à leur donner, ainsi que les protocoles employés ;
- donnés statistiques des différentes réactions
- les techniques d'administration du venin ;
- le fait que le venin soit produit exclusivement par des organismes vivant et n'est utilisé que venant directement d'une abeille;
- Le rôle important que le patient peut prendre dans son traitement

VENIN D'ABEILLE OU APITOXINE

Il y a dans la littérature médicale mondiale une vaste confusion entre le venin d'abeille et les dérivés du venin, appelés généralement Apitoxine. Les deux ont des compositions et des indications ainsi que des principes de pensée différents. La notion de produit vivant, accueilli par un organisme lui aussi vivant est primordiale dans l'approche en Apithérapie.

TRAITEMENT DES OSTEOMIELYTES MULTI-RESITANTES EN APITHERAPIE

Pr Roch Domerego
Vice-président de l'Apithérapie d'Apimondia
France

Une application en milieu hospitalier approuvée par les instances nationales (Ministère de la Santé et l'éthique scientifique) a été effectuée pendant 4 années, de 2002 à 2005 à l'hôpital universitaire Frank Pais de la Havane. Cette étude, supervisée par les Pr. Théodore Cherbuliez et Roch Domerego a montré l'efficacité du traitement par des proparomiels (huile essentielle, extrait de propolis et miel) avec plus de 84% de réussite.

Ces protocoles mis en place ont permis d'éviter 240 amputations.

Les traitements proposés en apithérapie ont été comparés à des protocoles associant les proparomiels aux antibiotiques. Aucune différence significative de résultats a été notée ce qui a permis de conclure qu'il y avait une totale compatibilité entre les protocoles d'apithérapie et ceux de médecine allopathique.

Cela a permis aussi de montrer que seul le protocole d'apithérapie était tout aussi efficace avec un coût inférieur et en monnaie nationale. L'exploitation des résultats a démontré des traitements plus rapides, une absence de résistance et de récidive.

GELÉE ROYALE ET PROPOLIS
INDICATIONS SUR LA MODULATION ÉPIGÉNÉTIQUE
DE LA RÉGULATION GÉNIQUE

Professeur Dr. habil. Eberhard Bengsch

Rapide présentation des mécanismes de régulation épigénique

- Influence des effets épigénomiques dans la formation des maladies humaines: exemple de la carcinogénèse
- Rôle de l'épigénomique dans le développement des castes de la ruche– Effets moléculaires de la Gelée Royale
  → Régulation épigénomique : principes
- Les Flavonoides comme régulateurs épigenomiques de l'activité génétique–la Propolis source de flavonoides

Résumé et vision d'avenir:

- Effets des connaissances de l'épigénomique de l'abeille sur la recherche apithérapeutique
- Les mécanismes de régulation épigenomique se font par la methylation de ADN et la modification des histones liés à l'ADN . De petites molécules effectrices agissent sur des mécanismes épigénétiques et peuvent les diriger
  (inhibiteurs de l'ADN -Methyltransferase, de l'Histone-acetylase)
- Le développement des castes dans la ruche est fortement épigénétiquement influencé par la nature
- Quelques inhibiteurs de l'histone-acetlyase- sont présents dans la Gelee Royale et la Propolis et agissent sur le developpement royal
- Nos connaissances concernant le début des maladies et les influences épigénétique qui les déclenchent sont balbutiantes
- Les résultats de la recherche apithérapeutique concernant les implications épigénétiques sur les cellules humaines et l'organisme vont progresser. Des travaux méthodiques en médecine et dans la recherche en génétique moléculaire font aujourd'hui des progrès très rapides
- La combinaison entre biochimie classique, apidologie, méthodogie systématique en biologie permettront d'obtenir des résultats fondateurs en apitherapie dans l'explication des effets thérapeutiques des produits de la ruche

« API-HORMONE » ET AIR DE LA RUCHE

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Revue bibliographique des substances volatiles véhiculées par l'air de la ruche et leurs fonctions dans la colonie d'abeille.

Les abeilles communiquent entre elles en utilisant la "dance" comme l'avait découvert Von Frisch au début du siècle dernier, mais elles utilisent aussi des substances hormonales. La phéromone royale, émise par la reine est la plus connue, elle maintient la cohésion sociale dans la ruche. Le couvain émet aussi des substances hormonales qui expriment et anticipent les besoins en soins et nourriture.

Ces hormones pourraient justifier tout ou partie des effets thérapeutiques observés sur l'homme par plusieurs établissements en Europe. Le but sera ensuite de confirmer scientifiquement ces effets supposés par une étude clinique en double aveugle contre placebo et de déterminer l'origine de ces effets.

A NEW METHOD OF COMMERCIAL BEE VENOM PRODUCTION

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Apitoxin, or honeybee venom, is a bitter colorless liquid. The active portion of apitoxin is a complex mixture of proteins, which causes local inflammation and acts as an anticoagulant. The venom is produced in the abdomen of worker bees from a mixture of acidic and basic secretions. A honeybee can inject 0.1 mg of venom via its stinger.

Bee venom has many commercial, medicinal and therapeutic applications. Among the growing list of uses, Bee Venom Therapy (BVT) has been used to treat arthritis, rheumatism, skin diseases, Lyme disease and chronic fatigue syndrome.

Historically, collecting bee venom was a laborious and technical procedure, requiring skillful of handling of each individual bee. Recently, developments in electro-stimulation of worker bees have lead to a revolution in bee venom collection, allowing for large-scale commercial bee venom collection operations.
Caspian Apiaries continues to build on these advances with new techniques applied the electro-stimulation process developed by Mihaly Simics (Simics, 1999). The key to these new developments is the use Caspian Solution™, a proprietary mixture of pheromones and bee pollen. In combination with electro-stimulation techniques, Caspian Apiaries is able to maximize the yield of bee venom in three ways: First, the techniques allow Caspian Apiaries to collect bee venom from up to 500 hives a day. Second, the use of Caspian Solution™ has been shown to increase the per colony yield of venom. Finally, the use of Caspian Solution™ in these techniques has also been shown to shorten the recovery period needed before a colony's venom can be harvested again.

By stimulating bees to release Nasamov pheromone, Caspian Solution™ mitigates the effects of the alarm pheromone released as a byproduct of the electro-stimulation. The pacifying effect of Caspian Solution™ makes the environment around the collecting device safer, as well as allows for the rapid re-deployment of electro-stimulation equipment to other colonies.

This presentation will include a description of the techniques, including donor hive selection, proper parameters for the electro-stimulation, a working time-frame for efficient and scalable collection and the hygienic, collection, transportation, desiccation and storage of bee venom.

UTILISATION DU VENIN D'ABEILLE DANS LA CICATRISATION DES PLAIES NECROSEES ET DEVASCULARISEES

Pr Roch Domerego
Vice-président de l'Apithérapie d'Apimondia
France

Historiquement, le venin a eu de nombreux usages. Dès 400 ans avant notre ère, mais il n'y a que peu de temps que le venin est utilisé dans la cicatrisation des plaies devascularisées et, en particulier des escarres chroniques.

Cette étude de cas met en exergue l'utilisation de l'effet vaso-constructeur du venin créant une inflammation locale bénéfique et permettant une revascularisation des tissus. Les processus biologiques indispensables à la cicatrisation sont rétablis. Ils permettent une stimulation afin de retrouver les 3 phases classiques de la cicatrisation : la détersion, le bourgeonnement et l'épithélialisation.

Une explication des protocoles permettra de connaître l'ensemble de la technique clinique utilisée.

THE INFECTIOUS RISK AND AROMATHERAPY

Dr **Jean Pierre Willem**
Président de l'Association de Solidarité Intern*ationale « Médecins Aux Pieds Nus » (MAPN)*
Directeur de la Faculté Libre de Médecines Naturelles et d'Ethnomédecine (FLMNE)
Président de l'Association Biologique internationale (ABI), France

Infectious and contagious diseases cause the death of 14 million people across the planet every year.
Flu, dengue, tuberculosis, hepatitis, yellow fever, smallpox, hemorrhagic fever, malaria, cholera, HIV… This infectious risk has always threatened the humanbe as epidemics or pandemics. SARS, Ebola, meningitis lightning, bird flu, chikungunya and now swine flu and the new coronarovirus are all alerts of current or future infectious threat. There is no treatment or vaccine for most of these "new" virus.
There are essential oils and suitable therapies able to restore the immunological balance and neutralize all these intruders.

Essential oils (EO)

In nature, nothing is as dense or subtle as the essential oils from aromatic plants. These vegetable essences have an extraordinary molecular and concentration complexity. They give rise to original and innovative biochemical and therapeutic interest.
They effectively compete with synthetic drugs and even exceed in more than one area. The best known are the EO of Chinese cinnamon, lemon, eucalyptus, laurel, clove, melaleuca,
mountain savory, tea tree; and there is no side effects.
A chemical synthesis product is dead, inert, devoid of energy and disruptive life balance. Conversely, all natural products are alive, endowed with a revitalizing energy that can restore the physiological balance by stimulating the vital processes.
Scientific aromatherapy represents the future of medicine. Patients and users are amazingly surprised about the effects observed.
EO can be prescribed under different ways: nasal, rectal, vaginal, oral, cutaneous… However, the doses used and the toxicity of certain EO require a good knowledge of their properties. They are not dangerous since there is a reasonable and rational use. Numerous scientific studies and daily use prove that these small "biochemical bombs" do miracles.

IN VITRO EVALUATIONS OF CYTOTOXICITY AND ANTI-INFLAMMATORY EFFECTS OF *PEGANUM HARMALA* SEED EXTRACTS IN THP-1-DERIVED MACROPHAGES

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Peganum harmala (*P. harmala*) seeds have been widely used in traditional Greco-Arab herbal medicine to treat various inflammatory diseases and recently is studied in research laboratories. However, *Peganum harmala* (*P. harmala*) anti inflammatory mechanism is not fully understood. The aim of this *in vitro* study was to evaluate the cytotoxicity and anti-inflammatory properties of *P. harmala* seeds extract through modulation of both, anti-inflammatory (IL-10) and pro-inflammatory (TNF- and IL-1, IL-6) cytokines release as well as their mRNA expression in human THP-1-derived macrophages. Cytotoxicity was examined by MTT and LDH release assays. Results obtained indicate that the water extract was non-cytotoxic up to 250 g/ml. Hence, assessing the anti-inflammatory properties of *P. harmala* was carried with extract concentrations up to 250 g/ml. Inflammation in THP-1 cells was induced by 1 g/ml lipopolyssacharide/ml (LPS). *P. harmala* extracts remarkably increased IL-10 release and mRNA expression at a concentration of 64 g/ml. In addition, *P. harmala* inhibited the expression and release of IL-1, IL-6 and TNF- in dose-dependent manner. These results indicate that *P. harmala* seeds probably exert anti-inflammatory properties throughout increasing the release and expression of IL-10 mRNA as well as by suppressing IL-1, IL-6 and TNF- mRNA expression in THP-1 cells.

EVALUATION OF OSTEOINDUCTION AND OSTEOCONDUCTION IN ORTHOTOPIC AUTOCLAVED BONE ALLOGRAFT COVERED WITH PROPOLIS IN DOGS

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The orthopedic surgeon is often faced with the loss of bone substance in diaphyseal region of long bones. Our study is based on a biological approach to the filling of segmental bone loss by implanting an autoclaved orthotopic allograft of one centimeter length covered and uncovered with propolis in the femoral diaphysis. The experiment involved eight adult dogs, from local breed and different sex; split into two groups .An autoclaved allergenic graft without propolis was implanted in graft covered with a thin layer of propolis. The aim of our study is to determine the osteoinductive and ostéoconductive allograft covered with propolis, to follow clinically and radiologically the incorporation of the autoclaved graft. The results showed that the use of a graft covered with propolis accelerated the osteoinductive and osteoconductive process, this is reflected by an early passage of the callus.

Key words:

Propolis, autoclaved allograft, osteoinduction, osteoconduction, Radiography**.**

THE ROLE OF HONEY BASED OINTMENT IN THE FIXATION OF SKIN GRAFT COMPARED TO SILVER SULFADIAZINE IN DOGS: A PRELIMINARY STUDY

Mohamed Hamdi, Abdellatif Boudra, Fatiha Abdellah and Laïd Boukraâ
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Honey has been used in the past for the treatment of wounds and skin ulcers. Currently we are rediscovering its healing properties. Its proper application in infected wounds and burns and split-thickness skin graft gives favorable evolution. Our study is based on a comparison of two treatments, one conventional and another alternative, to monitor full-thickness mesh skin auto-grafts in dogs. The aim of our study was to evaluate the role of honey in the fixation of the graft, as well as the evaluation of antibacterial and anti -inflammatory effect of honey gel, while comparing its effect to that of silver sulfadiazine 1% on the development of the graft with time, to determine the effective formulation to maintain the graft. To do so, six dogs of local race from different sexes were dispatched into two groups of three dogs. Wound and skin graft from the first group were treated by silver sulfadiazine 1%, whilst those of the second group were treated by a honey gel. The results showed that honey gel could prepare a well-vascularised recipient and uncontaminated wound bed. The adhesive properties of honey allow a close and lasting contact between the graft and the wound bed. Honey gel created ideal conditions for a steady growth in skin grafts with a rate of success of skin grafts treated with honey gel higher than that of grafts treated with silver sulfadiazine 1%. Thus, honey and honey gel could be a good alternative for wound and graft management.

Key words: honey gel, silver sulfadiazine, full-thickness mesh free skin auto-graft, wound bed.

VOLATILE PROFILING, CHEMICAL CHARACTERIZATION, MINERAL COMPOSITION, MICROBIOLOGICAL QUALITY AND BIOLOGICAL ACTIVITIES OF HONEY-BASED "ÁGUA-MEL"

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Água-mel" is a honey-based product produced in Portugal for ancient times. Several attributes have been reported to "água-mel" particularly in the alleviation of simple symptoms of upper respiratory tract. Samples of "água-mel" from diverse beekeepers from different regions of Portugal were studied in what concerns chemical characterisation, volatile compounds, phenol and brown pigment antimicrobial, antioxidant and antiviral properties. Also, the evaluation of some physicochemical and organoleptic properties over "água-mel" production was also done.

The chemical and microbiological data indicates a safe consumption of "agua-mel. The antimicrobial activity found for "água-mel" samples confirm the virtues reported by popular findings. In addition, this work also reveals the antiviral properties of "água-mel" evidenced by a decrease on the infectivity of the Qβ bacteriophage.

A great variability on the levels of phenol and brown pigment was found among samples which were responsible for the variability detected also on the antioxidant activities, independent on the method used. A strong correlation was found between phenol and antioxidant activity independent on the assay performed, nevertheless more evident between melanoidin content and antioxidant activity. All samples possessed the capacity for inhibiting lipoxygenase, nevertheless with different strengths.

The volatile fraction isolated from each individual of Água-mel sample was a complex mixture in which 91 components were identified, representing 84-97% of the total volatiles. Cluster analysis showed two poorly correlated clusters (Scorr<0.3). Cluster I which included only one sample from 2008 was characterized by the dominance of trans-β-ocimene (19%), γ-terpinene (15%) and 2-furfural (9%). Cluster II that included the remaining 7 samples showed two moderately correlated subclusters (Scorr<0.5). The six more correlated samples from sub-cluster IIa were dominated by 2-furfural (18-41%) and benzene acetaldehyde (12-39%). n-Nonadecane (14%), n-heneicosane and 2-furfural (both 13%) were the main components of the one sample from sub-cluster IIb.

Concerning the mineral composition, K (1270-4105 mg/kg) was the main mineral present in samples immediately followed by Mg (44.50-188.90 mg/kg).

During manufacturing, Colour, melanoidins, HMF and acidity increased over time. The levels of phenols increased over time as well as the antioxidant activity.

Such results reveal the importance of standardize the production of "água-mel" in order to obtain a product with greater acceptance.

Acknowledgements :

The authors wish to thank the Ministério da Agricultura, Mar, Ambiente e Ordenamento do Território (Portugal) through the Programa Apícola Nacional 2011–2013, Medida 6A, for its financial support of this research.

Keywords: "Água-mel", phenols, melanoidins, biological properties

HEALTH MONITORING AND CONTROL OF HONEY SOLD IN THE CITY OF FEZ (MOROCCO)

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Honey maintains it's aseptic through its bacteriostatic and antifungal powers. Nevertheless, when beekeeping operations such as harvesting, extraction and display for sale, it may be contaminated and thus constitute a danger to human health.

Under the supervision and control of diseases in food transportation, a study, which aimed at assessing the hygienic quality of traditional and industrial honey, was made at the Regional Diagnosic Laboratory and Epidemiological Environmental Health. It involved 50 samples aseptically at various out lets in the city of Fez, by environmental health technicians. The samples were transported to the laboratory in a cooler maintained at a temperature of 4°C.They was analyzed according to Moroccan norms.

The physico-chemical analysis involved measuring the hydrogen potential and electrical conductivity. Microbiological analysis included the enumeration of aerobic mesophilic flora Total, of Total Coliforms, Faecal Coliforms, *Staphylococcus aureus*, sulphite-reducing anaerobes, yeasts and molds as well as research *Salmonella*.

The results obtained showed that all the samples tested had an acidic pH (min 3.45 and max 3.98) and conductivity between146-176µs / cm. The absence of contamination was found in all industrial samples. However, 24% of traditional samples were contaminated. Total Aerobic Mesophilic Flora was observed in16% of cases with a concentration ranging from $4.2x10^2$ to $4x10^4$CFU/ml, the Total Coliforms in 12% of cases with a density of $4.8x10^3$to$9x10^3$ CFU/ml, yeast and mold were observed in16% of cases with a number from $5.3x10^3$ to $1.1x10^4$CFU/ml. The lack of *Salmonella*, *Staphylococcus aureus* and Sulphite reducing anaerobes was noted.

These results require the need to strengthen the implementation of hygiene rules during production, transport and storage of honey in order to avoid any contamination that may cause a health risk especially for children, old people, pregnant women and the immuno-compromised topics.

Key words: Honey, hygienic quality, monitoring, health risk, Fez, Morocco

PRELIMINARY CHARACTERIZATION OF BALSAMINE OMEGA PRODUCT

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In this work, we propose to determine the physicochemical characteristics of the natural extract from plants, honey and derivates of the hive "the Balsamine Omega product" and exploring its biological properties such as antioxidant activity, antimicrobial activity and anticancer properties.

To characterize the Balsamine Omega product, a determination of total polyphenols, flavonoids, flavonol and condensed tannin, were made. The main reason for choosing these compounds is that they have a growing importance, thanks to their beneficial effects on health. We have also determine, the anti-radical activity (DPPH) and the reducing power to evaluate the antioxidant capacity of our product. Important values are obtained either for polyphenol compounds and antioxidant activity.

Balsamine Omega product is considered as an anticancer drug, to confirm this hypothesis, we conducted cell cytotoxicity test on cancer cell line such as the B95-8 and the ATCC : Hep 2 cells in culture. Our results showed a cytotoxic effect of the Balsamine product on the two cancer cell lines as a function of the concentrations used and we obtain a low IC_{50} which explain the effective anticancer effects at a low concentration of the Balsamine Omega product taking into account the concentration of the product (300 mg / ml).

We also evaluate the antibacterial and the antifungal activities, the results show that the Balsamine product is endowed with antibacterial activity against the tested strain.

In conclusion of this work, results on Balsamine Omega product promote utilization of this product as anticancer product.

Keywords: Balsamine Omega, Anticancer, Antioxidant, Polyphenol.

PHYTOCHEMICAL INVESTIGATION OF ANTIMICROBIAL AND ANTIOXIDANT ACTIVITY LEAVES EXTRACTS OF *CORCHORUS OLITORIUS*

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The leaves of *Corchorus olitorius* is a genus of about 40-100 species of flowering plants in the family Malvaceae, native to tropical and subtropical regions throughout the world. The Sudanese varieties are one of the best in the market, which prompted investigation of leaves extracts.

The 96% ethanol, ethyl acetate, methanol extract exhibited significant antimicrobial activity and highlighted the biological monitoring of activity in order to isolate the active metabolites from the methanol extract of the leaves. For antioxidant activity, highest result was ethyl acetate extract .

The presence of sterols and triterpenes, carotenoids, coumarins, alkaloids, saponins, tannins and carbohydrates was confirmed by phytochemical screening of the diethyl ether, methanolic and aqueous extracts of the leaves. Isolation of the antibacterial secondary metabolites was achieved by fractionation of the active methanol extract by sing, liquid solid column chromatographic technique and biological monitoring of activity of column fractions eluted with chloroform and methanol. The composition of fractions was monitored by analytical and preparative TLC.

Keywords: Phytochemical screening, extract , *Corchorus olitorius* leaves , antimicrobial activity, antioxidant activity, minerals content.

CHEMICAL COMPOSITION AND ANTIOXYDANT ACTIVITIES OF ESSENTIAL OILS OF ALGERIAN *MYRTUS COMMUNIS* L.

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This study was designed to examine the chemical composition and antioxidant activities of the essential oils of Algerian *Myrtus communis* L. harvested in 14 distinct localities extending from the region of Bissa in Chlef to the region of Tenes on the seaboard (Northwest of Algeria). The essential oil yield ranged from 0.28% to 0.77% (w/w), respectively. The essential oil composition of myrtle leaf and fruit was characterized by high proportions of α-pinene, the main compound of monoterpene hydrocarbon class, ranging from 23.09 to 48.78% for leaf and 21.1 to 43.94% for fruit. Essential oil was rich in oxygenated monoterpenes, largely due to 1,8-cineole with 10.31 to 24.22% for leaf and 5.32 to 36.34% for fruit. Limonene was present also in an important amount depending of the organ and locality; from 11.01 to 29.72% for leaf and 7.5 to 35.43% for fruit. However the amounts of linalool ranged from 1.81 to 32.41% for leaf and 0.72 to 7.48% for fruit. Antioxidant activities of the different essential oils myrtle leaves were evaluated by using DPPH radical scavenging, ABTS, reducing power and metal chelating activity assays. The results showed variability with the locality. Indeed for DPPH; the values of IC_{50} ranged from 2.28 and 12.66 mg/ml for the localities of Teraghnia and Oued Goussine respectively. The essential oils showing the best power of chelating of iron was noted for the locality of Tigharghar with a value of 1.41 mg/ml against the highest value of 12.45 mg/ml for *M. communis* harvested in the locality of Teraghnia. Otherwise essential oils obtained from *M. ommunis* of the localities Oued khdhar -canton rouaichia- and Oued Goussine showed the best reducing power of iron. The best activity for ABTS was noted for *M. communis* from Ouled Sidi Ali in Boucheral.

Keys words: *Myrtus communis* L.- essential oil- chemical composition- antioxidant activities.

BEEKEEPING IN SLOVENIA

Andrej Sever
Member of the Supervisory Board of beekeeping (Slovenia)

Beekeepers in Bela krajina (Slovenia) have been trying to use the idea of »Teaching beekeeping and work with bees« as a therapy for individuals with mental disabilities to build up their close bond with the nature and environment. The basis to start working with this population was our experience of beekeeping teaching in primary schools.

The project Beekeeping and work with bees started in 2012 and has been performed in the cooperation with personnel in the Care and working centre (VDC) in Črnomelj. At the beginning we set up an apiary with four hives and supplied the basic equipment for beekeeping. Beekeeping in the VDC has become a weekly therapy. Six people with moderate disabilities in their mental and physical development have been included. The therapy encourages their motoric skills and positive thinking, improves their self-esteem and independence and helps them to integrate into normal social and business lives.

Since the project started, the participants have improved their manual skills, they have started to look for and read the issues on bees and working with them in books, newspapers and on the websites. They have also learned about healing and nectar-bearing plants. The result has been a successful connection with other activities in the VDC, such as arts, crafts and gardening. Their knowledge about bees and beekeeping has been repeatedly used and associated in the art field, with printing and embroidering on a variety of products. The participants have also been motivated for other work in the VDC, have become partly self-supplied with food and more confident in communication and in their neighbourhood.

The full results of the project will be shown and reported in details after a few years.

APITOURISM AND APITHERAPY IN SLOVENIA

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Slovenia, a country of renowned beekeepers, prestige and rich beekeeping tradition and cradle of apitherapy! ApiRoutes and Slovenian Beekeeping Organisation, together we are developing an unique product that we named ApiTourism. It offers discovery and experience of a country, endowing new meaning to the notions of travel and tourism, as well as the impressions and effects a holiday may have. It is a project that is supported on national level. Slovenian beekeepers give Insight into that, which makes the world a better place, encourages one to become more scrupulous, responsible as well as able to contribute more. *ApiTourism is giving a new meaning to the classical beekeeping*. Typical Slovenian bee houses, painted bee hives front panels, ginger bread cookies, great men's as dr. Filip Terc along with the beauties of the country are all unique to Slovenia. These are all advantages that gave us an opportunity to develop ApiTourism. The aim of ApiTourism is to explore and experience a country through nature, bees and personal experience. Traverse as many as fifteen routes, and learn about some unique beekeeping practices which yield superior honey, as well as still and sparkling meads. Become familiar with the beneficent healing effects of apitherapy in typical Slovenian bee house together with honey massage and a whole range of medicinal preparations and products from the hive. Discover the world of quality honey, the tastes, textures and aromas of which are *natural, authentic and relaxing.* Observe the history of beekeeping spread out through centuries, internationally recognized beekeepers, professors at Royal Academy in Vienna and advanced beekeeping methods. Weather you come for holiday, travelling or professional excursions, friendly and open-handed beekeepers will take you insight of mystic bee world…Slovenian beekeepers took even one step further. In 2013 we are starting with ApiTourism and Apitherapy bee house guarantee certification that is positioning Slovenia next to the great leaders in tourism sector. ApiTourism can be applied in any country that has beekeepers that are beekeeping with a hart. Find out how you can apply excellent Slovenian beekeeping practice and what are the advantages of apitherapy in typical Slovenian bee house at the presentation. The presentation on beneficent healing effects of apitherapy in typical Slovenian bee house will held mr. Vogrinčič, which specialzitation is biodynamic beekeeping. The bible on dr. Filip Therch will be presented by dr. Pivec, author of the book.

<u>The benefits you will observe from the presentation:</u>

- ✓ Slovenia, the cradle of apitherapy, presentation of the Bible »dr. Filip Terch« by dr. Pivec
- ✓ Apitherapy in typical Slovenian bee house presented by Mr. Vogrinčič
- ✓ The importance of exchanging Api experiences
- ✓ Slovenia, Unique Apicultural Experience
- ✓ Extensive Slovenian Beekeeping Heritage
- ✓ Honey and High Quality Bee Products
- ✓ Authentic Practices and Superb Service
- ✓ Honey experience – a gift to your body and soul

Are you looking for a new api-experience? Do you want to find the key to the success of Slovenia's beekeepers? This is your opportunity to learn about what keeps our busy bees buzzing.

Welcome to Slovenia, the cradle of apitherapy, a land of excellent apiculture and a rich beekeeping tradition!

TECHNOLOGIES ET PRATIQUES POUR LES PETITS PRODUCTEURS AGRICOLES (TECA) *GROUPE D'ECHANGE SUR L'APICULTURE*

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Promouvoir l'échange de connaissances et d'information sur l'apiculture

Les instituts de recherche, les agriculteurs et les projets génèrent des technologies pour améliorer les pratiques de l'apiculture, le traitement des produits apicoles, et leur marketing. Mais cette information reste souvent dispersée et n'arrive pas au grand public qui pourrait bénéficier de ces technologies améliorées et meilleures pratiques. Spécialement les apiculteurs en zones rurales, qui pourraient facilement augmenter leurs récolte et revenues de l'apiculture en appliquant des techniques améliorées.

Pour faire face à ce problème et augmenter les bénéfices de la recherche et des années d'amélioration des pratiques, l'Organisation des Nations Unies pour l'agriculture et l'alimentation (FAO) a décidé de mettre en place un Groupe d'Echange sur l'apiculture sur sa plateforme en ligne TECA (teca.fao.org) où l'information et les connaissances peuvent être partagées, et les apiculteurs et intervenants du monde entier peuvent se rencontrer pour discuter des sujets relatifs à l'apiculture.

Le Groupe d'Echange sur l'apiculture est une plateforme impulsée par la demande et modérée par FAO. La FAO y mène avec ses partenaires à des intervalles régulières des discussions modérées sur des thèmes d'actualité dans le monde apicole avec le but d'informer ses membres dans un langage facile et pratique avec de l'information basée sur la recherche.

La présentation expliquera les caractéristiques et le fonctionnement de la plateforme et illustrera comment contribuer au contenu de TECA à travers un partenariat.

BEEKEEPING IN THE REGION FEZ BOULEMANE

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The Region of Fes-Boulemane contains a significant potential for the development of beekeeping , which is characterized by an old local skills and diverse native bee flora that grows in the forest extending over 260.000 ha and range-lands exceeding 1.000.000 ha of area.
The rich flora of the region is composed by lot off species such us : caper (*Capparis spinosa*), hare's ear (*Bupleurum spinosum*), jujube (*Ziziphus lotus*), thyme (*Thymus zygis*), oregano (*Origanum vulgare*), rosemary (*Rosmarrinus officinalis*), holm oak (*Quercus ilex*) and carob (*Seratonia siliqua*). The last six species-honeys are well known and produced in other areas of Morocco, while honey's hare's ear (locally called "Zandaz") and honey's caper ("Kabbar"), little known, they can be considered two products land with high potential for development.
At the regional level, honey production has increased from 16 tonnes/year in 2008 to 62 tons/year in 2013, so 1.2 % of the national production, while the objective of beekeeping spinneret in the Green Morocco Plan is to achieve a regional production of 280 t/year in 2020. A Current honey production is provided by 6.100 hives wich 4.600 modern hives and 1.500 traditional hives. The level of unit production of modern hives can reach 14Kg/hive, while traditional hive hardly reaches 5Kg/hive .
Beekeeping in the region of Fez-Boulemane exudes 7.5 million Dirhams as a value with unit prices that vary depending on the type of honey 120 DH/kg for honey's all flowers to 350Dh/Kg for honey's hare's ear and honey's thyme.
Currently , beekeeping is growing at the Regional level by the emergence of several cooperatives that aggregate in provincial Representation, in the order to become a regional structure under the auspices of the Moroccan Interprofessional Federation of Beekeeping (FIMAP). Thus, beekeeping cooperatives active in the region are among 66 whose 31coopératives into the Province of Boulemane, 29 coop. into the Province of Sefrou and 5 coop. into the Province of Moulay Yacoub .
To develop beekeeping by the Regional Directorate of Agriculture Fez-Boulemane (DRA) from upstream (production of honey) to downstream (commercialisation) in Regional Agricultural Plan, has undertaken a range of interventions like :

- Starting a development project of beekeeping spinneret from 2010 in pillar2 in Sefrou Province with a budget of 4 296 000 DH ;
- Improved capacity of professional organizations in terms of beekeeping equipment and packaging to improve production in quality and in quantity ;
- Support for cooperatives quality analysis of honeys produced in the Region;
- Upgrading of beekeepers by training sessions, tours and travels;
- Launch of the labeling processfor "Middle Atlas honey" to improve marketing conditions;
- Encouragement for marketing by participation in national, regional and international (Franch, Germany, Switzerland) agricultural events.

SITUATION DE LA FILIERE APICOLE DANS LES PAYS DU MAGHREB

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Présentation du secteur apicole

Dans les pays du Maghreb, le secteur apicole joue un rôle socio-économique important, grâce à la diversité des ressources d'affourragement des abeilles, l'étendu de leur surface et la présence de races d'abeilles locales adaptées au climat. Les abeilles contribuent également à la sauvegarde de l'environnement et la biodiversité. Mais, le potentiel de production de miel reste largement sous exploité dans ces pays. L'apiculture est considérée l'une des activités agricoles qui participe à l'amélioration des revenus de l'agriculteur et contribue à la sécurité alimentaire dans la région.
En plus des divers produits de la ruche (cire, miel, pollen, gelée royale, venin des abeilles et propolis), l'élevage des abeilles profite à la pollinisation des arbres, des plantes naturelles et cultivées et par conséquent, à l'augmentation des rendements et à la participation à l'amélioration de l'alimentation humaine.

Population et races d'abeilles

Au Maroc trois races d'abeilles sont exploitées par les apiculteurs : Apis mellifica intermissa, Apis mellifica major et Apis mellifica sahariensis. En Tunisie : Apis mellifera intermissa l'abeille « chèvre » ou « Maasi » et l'abeille « Ghanmi » abeille ordinaire, relativement douce.
Durant les dernières décennies, plusieurs opérations d'introduction de races étrangères ont été réalisées. En 1976, 1.500 colonies d'abeilles de race Apis mellifera carnica ont été importées de la Roumanie . En Algérie deux races d'abeille sont élevées : Apis Mellifica Intermissa et Apis Mellifica Sahariensis . En mauritanie : La race d'abeille élevée et répandue semble la race Apis mellifica Adansonii, de la sous famille des Apinae

Principales plantes mellifères et périodes de production

Les potentialités apicoles sont très importantes au Maroc ; Algérie et Tunisie grâce aux ressources mellifères très diversifiées. En Mauritanie les ressources mellifères constituent l'un des facteurs limitant du développement de l'apiculture, en raison de leur grande destruction causée par la désertification qui frappe le pays depuis la fin des années 1960.

2-Différents systèmes de l'apiculture et leur état actuel

La filière apicole dans les pays du Maghreb se caractérise par la dominance du secteur traditionnel par rapport au secteur moderne avec une tendance ces dernières décennies vers le secteur moderne. Ces deux secteurs ont une faible productivité.

Types de miel produits par région

Tenant compte de la diversité mellifères plusieurs type de miel sont produits dont les miels préférés sont ceux de montagne.

Production de miel

La production totale de miel est très variable. Elle est estimé à 6kg/ruche traditionnel et 20 à 25kg/ruche moderne.

Organisations professionnelles de la filière

La filière apicole n'a pas connue un développement important au niveau de l'organisation professionnelle. Durant les 50 dernières années, seul le modèle des coopératives, notamment pour la commercialisation du miel, a connu un certain succès. Pendant cette dernière décennie l'apiculture a connu plusieurs contraintes dont les principales sont la chute de rendement par ruche, et les problèmes de commercialisation du miel qui sont dus principalement à l'importation du miel (le prix du kg du miel local est relativement élevé par rapport au miel importé). Ces problèmes ont incité les apiculteurs à s'organiser pour assurer un développement intégré de la filière et sauvegarder leur intérêt. Actuellement, la filière est organisée en associations, unions, fédération interprofessionnelle et union Maghrébine de l'apiculture.

Importance socio-économique de l'apiculture

Le secteur apicole joue un rôle socio-économique non négligeable. En plus, dans les activités de l'apiculture, d'autres emplois indirects sont nombreux et importants.

L'apiculture joue également un rôle essentiel dans la pollinisation des plantes naturelles et cultivées, et améliore la quantité et la qualité des productions végétales, notamment l'arboriculture fruitière, le maraîchage, et les cultures industrielles...

<u>Principales contraintes de la filière apicole</u>

En matière de production et productivité

- Les contraintes liées au milieu naturel, notamment les changements climatiques et les sécheresses successives des dernières décennies ont perturbé le calendrier des floraisons et des miellées ;
- La limitation d'accès, voire interdit à des espaces forestiers de plus en plus gérés par des sociétés privées ou à des vergers d'agrumes privé, empêche les apiculteurs de l'exploitation de ressources mellifères.
- La déforestation et le remplacement par les services des eaux et forets des Eucalyptus productifs du miel par des Eucalyptus qui produisent plus du bois que du miel.
- La pratique très faible voire inexistante de sélection des ruches et de l'élevage des reines par les apiculteurs.
- Manque de programme de sélection et d'amélioration génétique chez les abeilles
- Insuffisance de programme de recherche et de purification des races d'abeilles locales
- Le non maîtrise par les apiculteurs de la lutte contre les maladies, notamment la varroase
- Insuffisance de l'encadrement du secteur : très peu de cadres ou techniciens spécialisés en apiculture.
- Insuffisance des programmes de formation des apiculteurs, techniciens et cadres.
- Faible niveau de technicité des apiculteurs en matière de conduite technique d'un élevage apicole moderne malgré quelques efforts déployés par l'Etat en matière de formation et d'organisation de sessions et de journées d'information.

- Manque des programmes de transfert de technologie en matière de diversification de produits et en apithérapie.
- Manque d'institutions de formation en apiculture moderne et fermeture des centres de Lalla Mimouna et Elkoudia qui était spécialisés dans les formations en apiculture

***En matière de conditionnement, de valorisation et de commercialisation des produits de la ruche* :**

Dans ce domaine, le seul produit commercialisé et source principale de revenu des apiculteurs est le miel.
Souvent les circuits de commercialisation et les conditions de conditionnement du miel ne répondent pas aux normes de qualité.
Des efforts sont à déployer pour la valorisation et la diversification des produis de la ruche. Notamment par la labellisation et la certification des produits du terroir

Perspectives de développement de la filière apicole

Proposition d'une stratégie

La stratégie proposée pour le développement de la filière apicole au Maroc est basée sur les axes suivants la suivante :

- Diversification des produits
- Assurer l'autosuffisance en miel
- Renforcement de capacités techniques et managériales

Actions à mettre en œuvre

Programme de mise à niveau professionnel

Mise en place d'un système de coordination et de suivi avec les départements du ministère de l'agriculture

Programme de renforcement de capacités techniques

Programme de recherche

Programme de sauvegarde et de développement de la race d'abeilles saharienne

Création d'un centre nationale de l'apiculture

Mise à niveau de la législation en vigueur sur la qualité du miel

Promotion des produits de la ruche, notamment le miel

Labellisation des principaux miels de terroir et identification de leur vertu thérapeutique

Mise en place des systèmes d'incitations à l'investissement plus encourageantes

POSTERS

APITHERAPY ASSOCIATON AND THE REGULATION WORKSHOPS OF MINISTRY OF HEALTH IN TURKEY

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After being worked for nearly four years, "Legislation for the Traditional and Complementary Medicinal Practices" has been almost completed and announced to the public through the press in Turkey recently. A part of this legislation is on Apitherapy practices and therefor Apitherapy Association has been actively involved in the regulation workshops of the Ministry of Health in Turkey.
There is no statutory professional regulation of any traditional and complementary medicine practitioners in the country yet. This Regulation is now being prepared based on the previous laws and law decrees on medical issues. The purpose of such a legislation would be to regulate the procedures and principles on the determination, operation and monitoring of the related health institutions and also the education and authorization of people who would practice the complementary and traditional medical methods .
The Apitherapy Association has been very keen that there should be professional standards, registration and accountability in all aspects of such practices in the country.

Key words: apitherapy, regulation, legislation

PHENOLIC, MELANOIDINS CONTENTS AND ANTI-OXIDANT ACTIVITY OF 12 *BUPLEURUM SPINOSUM* MONFLORAL HONEYS

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The genus Bupleurum is Known by the presence of several bioactive molecules like Saponins, flavonoids, coumarins, fatty acids, Steroids, polysaccharides and polyacetylens.

In this study, 12 *Bupleurum spinosum* monofloral honey samples from different regions and from different beekeepers in Morocco were analyzed. Total phenolic content, melanoidins, color and antioxidant activity (DPPH, reducing antioxidant power and total antioxidant capacity) were assessed.

The results show that honey's color ranged from the light amber to the dark amber, only three of them (S2, S4 and S5) had a dark amber color. Those three samples had also the most important amount of melanoidins.

Total phenolic content ranged from 435,4144 to 921,5231 mg GAE/kg. Two samples from Ait bouilloul (S4 and S5), one from Ait bazza (S2) and one from Ait ali (S6) had the highest amounts. Their values were respectively: 921,523, 858,741, 842,451 and 881,840 mg GAE/kg of honey. All those samples were harvested in 2013. The lowest values (522,500 and 435,414 mg GAE/kg of honey) were recorded for the sample from Ait ali and the Ait bourais (S7 and S8), and both were harvested in 2011.

The total antioxidant activity ranged from 105,706 to 153,178 mg.Asc.Ac.equiv./g of honey. The samples S2 and S3 from Ait Bazza showed the highest activity, while S1 from the same region and S5 from Ait Bouilloul recorded the lowest antioxidant activities.

The most important free radical scavenging activity of DPPH was seen in S12 from Bouiblane and S6 from Ait ali. Whereas S7 also from ait Ali was the lowest sample for this activity.

As for reducing activity of our samples from Boulemane and Ait bourais had the most important ones. The lowest activity was recorded for S7 from Ait Ali.

Key-words: honeys, *Bupleurum spinosum*, phenolic, antioxidant, reducing activity.

MELISSOPALYNOLOGICAL ORIGIN DETERMINATION AND VOLATILE COMPOSITION ANALYSIS OF CORSICAN "CHESTNUT GROVE" HONEYS

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Corsica Island is characterized by the richness of polliniferous and melliferous resources which provide honey productions throughout the year. The diversity of Corsican honeys is recognized by "Protected Designation of Origin" denomination: "Miel de Corse-Mele di Corsica", divided into six categories. Data analysis of melissopalynological and sensorial characteristics has been used to characterize the geographical and botanical origins of Corsican Honeys [1]. The honeys dominated by *Castanea sativa* are therefore defined as one of the major types: "miels de la châtaigneraie". In Corsica, as in many other European countries, chestnut is one of the best sources of nectar and pollen for honeybees [2], at the beginning of summer. However, chestnut is widespread in the whole island as mixed grove around villages or dense forests from 600 to 900m.

The aim of this work was to establish the first typology of volatiles from Corsican chestnut honeys. The relationship between volatile fractions of honey and those of *Castanea sativa* nectar was also determined.

In the current study, 50 Corsican Chestnut honeys from 2003 to 2009, representative by their geographical distribution were selected according to their melissopalynological profile. Thus, two distinct types of pollen spectra dominated by *Castanea sativa* were reported corresponding to "monofloral" honeys or more complex honeys. Furthermore, analysis of pollen spectrum has allowed certifying their geographical origin by highlignting the typical species associations which distinguishes them from other European chestnut honeys [1, 3, 4].

The volatile compositions of honey samples and *Castanea sativa* nectar were studied using HS-SPME, GC and GC-MS. The volatile fraction of honey was characterized by 39 components amounting to 68.1-89.4% of the total composition. The main compounds were 2-aminoacetophenone, benzaldehyde, acetophenone, furan-3-carboxaldehyde, octanoic acid and nonanoic acid. Finally, the nectar from *Castanea sativa* flowers harvested on eight Corsican locations showed acetophenone, nonanal, methyl salicylate and linalool as main components.

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MELISSOPALYNOLOGICAL AND VOLATILE ANALYSIS OF HONEYS FROM CORSICAN *ERICA ARBOREA* MAQUIS

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Honey is prepared by the honeybees from raw materials as nectars and/or honeydew; nectar is an aqueous sugar-containing and flavourful secretion, directly produce by plants. The workers bees have important effects as chemical changes and concentrations of the raw material. In general, aroma and flavour of honey are formed by volatile materials, which depend principally upon the nectar(s) whence it originates [1,2].

The Corsican honeys are certified by the National "A.O.C" and the European "A.O.P" denominations: "Miel de Corse-Mele di Corsica" divided into six ranges. In the current study, 14 honey samples of "Maquis de Printemps" range were selected according to their melissopalynological and sensorial characteristics [3]. These honeys have been prepared by bees from nectars issued of shrub vegetation dominated by *Erica arborea*.

For each sample, quantitative and qualitative melissopalynological data are established in order to produce the microscopic picture of the *Erica arborea* predominance variability and the importance of secondary nectariferous species representation. Moreover, the volatile compositions of *Erica arborea* flowers and honey samples were carried out using HS-SPME, GC and GC-MS. The aim of this work was to establish the relationships between volatile fractions of nectar from *Erica arborea* flowers and those of corresponding honey.

In the volatile fraction of *Erica arborea* flowers, 20 components were identified amounting to 85.5% of the total composition. The major components were oct-1-en-3-ol, *(E)*-β-ocimène and benzaldehyde. The volatile fraction of honeys was characterized by 18 components with octanal, benzaldehyde, phenylacetaldehyde, *para*-anisaldehyde, 4-propylanisol and *para*-menth-1-en-9-ol as main compounds. However, honey compositions showed qualitative and quantitative differences on their chromatographic profiles.

Finally, aromatic complexity of "Maquis de Printemps" honeys is linked to volatile compositions, sensorial properties and palynological associations. Furthermore, the variability of these characteristics appears to be dependant of the altitudinal repartition of *Erica arborea* and other melliferous sources.

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CHARACTERIZATION OF CORSICAN "SPRING CLEMENTINE" AND "SPRING PREDOMINANT ASPHODEL" HONEYS BY MELISSOPALYNOLOGICAL AND VOLATILE ANALYSIS

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Corsican honey is recognized by "Protected Designation of Origin" and "Appellation d'Origine Controlée" denomination, and both marked: "Miel de Corse-Mele di Corsica". The geographical and botanical origins of these honeys has been characterized by their melissopalynological and sensorial properties and distinguished into six categories: "spring maquis", "spring", "summer maquis", "chestnut grove", "honeydew" and "automne maquis"[1]. In Corsica, from april to june, the richness of spring polliniferous and melliferous resources provide the "spring" honeys. These products showed two predominated origins: "spring clementine honey" from cultivated area of oriental plain and "spring asphodel honey" from coastal areas [1,2]. The aim of this work was to establish the first typology of volatile fractions of these honeys using HS-SPME, GC and GC-MS.

13 Corsican "spring honeys" were selected according to their geographical distribution. Pollen spectrum and total pollen density had been established [1,3,4] and two distinct types of pollen spectra were demonstrated: six samples could be considered as "spring clementine" honey and seven were "spring asphodel" honey. The common melissopalynological characteristic is the "under-representation" of clementine and asphodel pollen, but they could be distinguished by typical associations of cultivated or non cultivated areas. In addition, low values of color and electrical conductivity and low aromatic intensity with floral and fruit aroma characteristics of the two ranges were quite similar.

The volatile compositions of "spring clementine" and "spring asphodel" honeys were characterized by 42 and 33 components, respectively. The chromatographic profiles showed that these honeys could be distinguished by their volatile fraction: the main compounds of "spring clementine" honey were three lilacaldehyde isomers whereas phenylacetaldehyde, benzaldehyde and toluene were identified as the main components of "spring asphodel" honey. In accordance with our previous results [3,4], it appeared that the analysis of volatile components could be considered as an interesting supplementary method for the characterisation of botanical origin of Corsican honeys.

Keywords: Corsican "spring" honey, HS-SPME, volatile fraction

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ASSESSMENT OF PHENOLIC CONSTITUENTS AND ANTIBACTERIAL CAPACITY OF SAHARA HONEY PRODUCED BY *APIS MELLIFERA*

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Sahara honey samples from Algeria were screened for total phenolic contents by Folin Ciocalteau method and colour characteristics.Two different assays were performed to evaluate the antibacterial capacity of the honey samples: agar-well diffusion and Growth inhibition %.Total phenolic content varied from 0.620 to 1.044 mg/100 g honey as gallic acid equivalent.The colour of the Sahara honeys, analysed in this study was very variable and ranged from pale yellow to dark brown.In the antibacterial tests using two bacteria, *Staphylococcus aureus* and *Pseudomonas aeruginosa*were moderately sensitive to honey samples. There was no correlation between antibacterial activity and total phenolic contents

Keywords: Honey;Sahara; Antibacterial; Colour; Phenolic

MELANOIDINS, PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF 14 MOROCCAN HONEYS

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Honey is as a good source of natural antioxidants, which are effective in reducing the risk of occurrence of several diseases. This study was undertaken to address the limited knowledge regarding the physicochemical characterization, polyphenolic content and antioxidant activities of honeys produced in some Moroccan regions.

Phenolic content varied from 180.82 in rosemary honey to 890.58 mg GAE/kg in sage honey from Selimane, whereas the flavonoid content ranged from 2.19 in rosemary honey from Oujda to 126.85mg QE/kg in Official spurge honey.

The antioxidant capacity of honey was evaluated by Trolox equivalent antioxidant capacity (TEAC), Oxygen radical absorbance capacity (ORAC), nitric oxide (NO) radical-scavenging assay, and chelating power. Results clearly showed significant differences in the antioxidant activities measured through several methods. Sage honey from Ben Selimane had the best capacity for scavenging free radicals, in contrast to the monofloral lavender and rosemary honeys from Oujda, and thyme honeys from Boulemane as well as the multifloral honey purchased from Zaraphyt which possessed weak capacity for scavenging free radicals.

A positive correlation between honey color, phenol, flavonoids and melanoidins amounts was found.

Key-words: Honey, Melanoidins, antioxidant, Phenolic, free radicals.

MOROCCAN HONEY: PHYSICOCHEMICAL CHARACTERIZATION, MINERAL CONTENT AND CHANGES IN QUALITY PARAMETERS DURING HEAT TREATMENT

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Beekeepers generally heat honeys at mild temperatures chiefly to prevent post-bottling crystallization. Honey aging during storage along with that procedure affects greatly the honey quality, which is evidenced through the simultaneous reduction in the diastase activity, an increase in the hydroxymethylfurfural (HMF) content and formation of non-enzymatic browning pigments. Diastase activity, proline and HMF content are a honey quality parameters used to determine if honey has been extensively heated during processing.

The main objective of this study was to determine the physicochemical composition on some Moroccan honeys and to assess changes in the HMF, proline, melanoidins' content, diastase activity and colour of honey during heat treatment (121ºC for 30 min).

The chemical characterization of honeys before heating showed a great variability of the ash percentage (0.14-0.93%); electrical conductivity (119-1690 mS/cm); free acidity (1.65-31.38 meq/kg); lactone acidity (5.37-10.03 meq/kg); glucose (278.36-369.33 g/kg); fructose (321.78-454.48 g/kg); proline (421.33-1669.70 mg/kg); diastase activity (3.65-16.17 Schade units/g); and HMF (0.75-126.45 mg/kg).

The HMF and melanoidins' content increase during heat-treatment while the proline content decreases. The diastase activity was not found.

Key words: honey, heat treatement, diastase, hydroxymethylfurfural.

PHYSICOCHEMICAL CHARACTERISATION AND ANTIOXIDANT ACTIVITY OF SEVEN TUNISIAN HONEYS

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In this study, physicochemical parameters (moisture, electrical conductivity, ash content, melanoidins, phenolic content, colour, hydroxymethyl furfural, acidity, pH, proline, diastase) and antioxidant activity (TEAC, total antioxidant activity, reducing power) were determined in 7 honeys from Tunisia. Four belonging to monofloral honeys such as jujube (*Zizyphus lotus*), orange (*Citrus Spp*.), thyme (*Thymus vulgaris),* Eucalyptus *(Eucalyptus globulus)* and three multifloral designed H1, H2 and H3.

The Physicochemical analysis showed significant differences among honeys. The total phenolic contents varied considerably and ranges from 482.8 for orange honey to 1141.6 mg AGE/kg. Multifloral honey H2 with the highest amount on phenolic compounds shows one of the best reducing antioxidant power and the best capacity of free radical ABTS scavenging while jujube honey showed the lowest free radical scavenging activity.

The total antioxidant activity show that the multifloral was the best antioxidant followed by thymus honey. Multifloral H3 showed the highest amount of melanoidins while orange honey have the low amount.

Key-words: honey, monofloral, phenolic, antioxidant, reducing power.

POLYPHENOL CONTENT, ANTIOXIDANT, FREE RADICAL SCAVENGING AND METAL CHELATING ACTIVITY OF SIX MOROCCAN PROPOLIS SAMPLES

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Propolis is a natural product produced by bees, resulting from the addition of mandible secretions to resins collected from different plant parts. It has a very broad chemical diversity because its composition varies with the site of collection, plant materials and producing species of bee and it is known for a long time for its health benefits and biological activities.
Hydro-alcoholic extracts (alcohol 70%), obtained from of six samples of propolis from Morocco (S1, S2, S3, S4, S5 and S6) were investigated regarding their phenolic content and their antioxidant activity using (DPPH, total antioxidant activity, nitric oxide scavenging activity, reducing power and metal chelating activity).
The extracts revealed a great diversity in polyphenol content and the highest total phenolic contents were exhibited in the samples S1, S4 and S5 while the sample S2 exhibited a very poor phenol content.
Among extracts studied, potent total antioxidant activity and DPPH• scavenging ability were shown by sample S5 followed by the sample S4 and S1, whereas sample S2 had the lowest activity.
The highest reducing power was determined for the sample S5 while the best nitric oxide scavenging activity is showed in the sample S1.

Key-words: phenolic content, antioxidant, propolis

DETERMINATION OF THE TOTAL PHENOLIC, FLAVONOID AND ANTIOXIDANT ACTIVITY OF PROPOLIS FROM MOROCCO

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Propolis (bee glue) is the generic name for the resinous substance collected by honeybees (Apis mellifera, L.) from various plant sources, has been used for thousands of years in traditional medicines in many regions of the world.
The intricate composition of propolis is very complex and varies depending on plant sources from different geographic regions and one the bee species. Being this chemical composition, propolis is able to exert various biological activities such as antibacterial, antihepatoxic, antioxidative, anti inflammatory, anticancer, antifungal. It has also been used in cosmetic.

The term 'propolis' was used in Ancient Greece meaning: pro (for, in front of, e.g., at the entrance to) and polis (city or community); a substance that is for or in defence of the city or hive. Propolis is a resinous material collected by bees from bud and exudates of the plants, which is transformed in the presence of bee enzymes. This product has a chemical complex composition and has gained popularity as alternative medicine. It has also been used in cosmetic. Being the chemical composition complex, propolis is able to exert numerous pharmacological activities such as antioxidant, antibacterial, anticancer, antifungal, anti-inflammatory, immunomodulatory and antiviral activities.

The objective of the present research has to evaluate the content of total phenols and flavonoid as well as the antioxidant activity of propolis samples collected in different main area of Morocco.
Ethanol extracts of propolis (EEP) were prepared by maceration and evaluated for their antioxidant activities by 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical-scavenging and the total phenolic content of samples was determined by the folin-ciocalteau procedure.
Our results indicate that Morocco propolis constitutes an excellent source of effective natural antioxidants and were also correlated with the total polyphenol and flavonoid contents.

CHEMICAL COMPOSITION, LIPID PEROXIDATION INHIBITION, ANTI-INFLAMATORY AND ANTIDIABETICACITIVITIES OF MOROCCAN PROPOLIS

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Propolis is widely used as a folk medicine and as a constituent of health foods in many parts of the world. It presents many beneficial biological activities such as antioxidant, antiinflammatory, antitumor, hepatoprotective, local anesthetic, immunostimulatory, antimutagenic, etc.

The main purpose of this study was to evaluate the chemical composition and biological activities (prevention of lipid peroxidation, anti-inflammatory and anti-diabetic activities) of eleven hydro-alcoholic extracts of Moroccan propolis.

The relative abundance of the main chemical constituents of propolis revealed a great chemical diversity between samples. Some were flavonoids and flavonoid/phenolic esters rich, while others were rich in diterpenes. In other cases, sugars were the most important constituent present in the propolis samples.

This chemical variability was responsible for the diversity of results in the antioxidant and anti-inflammatory activities and the ability to inhibit α-amylase and α-glucosidase.

The samples in which predominated flavonoid showed the best anti-inflammatory activity, while the best ability to inhibit α-glucoxidase is showed for the samples rich in sugars.

The higher inhibition of α-amylase was found in the samples where the predominant compounds are diterpenes followed by the sample rich in flavonoids / esters phenolics.

The sample predominantly constituted by flavonoids presented the best antioxidant activity, measured by the capacity of preventing liposomes oxidation, followed by the sample in wichfalavoinds/phenolic esters predominated.

Key-words: chemical composition, propolis, flavonoids, lipid peroxidation.

PROTECTIVE EFFECT OF PROPOLIS AGAINST RENAL DYSFUNCTION INDUCED BY POTASSIUM DICHROMATE IN MALE WISTAR RATS

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Propolis is a natural resinous mixture produced by honey bees from substances collected from parts of plants, buds, and exudates. The composition of this sticky resin and its physico-chemical properties, biological activities and therapeutic uses depend on the vegetation where the hives are placed, the climate and the variety of the queen (1). Studies have shown that Propolis has biological properties that have been applied to medicinal products, in particular, products for topical antimicrobial, antifungal and immunostimulant treatment (2). The aim of this study is to evaluate the possible protective effect of Propolis against the renal dysfunction caused by potassium dichromate (K2Cr2O7). Wistar male rats received potassium dichromate (single dose), a second group received Propolis by gavage 5 days before and during dichromate exposure, a third group received only Propolis and the control group received potable water. The creatinine clearance, excretion of sodium, potassium and chloride were measured. The results revealed that the function of the proximal tubule has been altered, which results a decrease in the glomerular filtration rate 24 hours after exposure to dichromate. In the group pretreated with Propolis the TFG and the excretion of urinary electrolytes showed only slight alteration with a beginning of recovery on the 8th day after exposure to dichromate, suggesting that the damage caused by this metal were prevented by Propolis. In conclusion, the dichromate was claimed to cause adverse effects manifested in the acute renal dysfunction in rats, and the administration of Propolis to these animals attenuated the adverse effects of this metal.

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DIETARY HONEY PROTECT AGAINST LEAD –INDUCED HEPATONEPHROTOXICITY IN RABBITS

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Natural honey is well known for its therapeutic value and has been used in traditional medicine of different cultures throughout the world.

The aim of this study was to evaluate the protective effect of carob honey against lead -induced hepato-nephrotoxicity in rabbits. Eighty male Rabbits were allocated into different groups and over a 4-week period, they orally received honey and were treated either with lead alone (2g/kg b.w) or after a pretreatment period with honey. Clinical, clinico-pathological and histopathological evaluations were done and lead-treated groups were compared with rabbits receiving no treatment and with rabbits given honey. The results indicated that oral administration of lead induced severe hepatic and kidney injury. The combined treatment with lead plus honey resulted in a significant improvement in all evaluated parameters. This improvement was prominent in the group receiving lead after combined pretreatment with honey. Animals receiving honey were comparable to the control untreated group. It could be concluded that honey protect rabbits against the severe lead-induced hepatic and renal toxic effects. Our results suggest that the protective activity of honey may have been related to their antioxidant properties.

ANTIOXIDANT ACTIVITY, PHYSICO-CHEMICAL PARAMETERS, MINERAL CONTENT AND DIURETIC ACTIVITY OF MOROCCO MONOFLORAL CAROB HONEY

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Carob plant is one of the most imprtant tree in Morocco It is found in the regions of Fez, Marrakech, Agadir, Essaouira, Taza, El Hoceima, Bni Mellal, Khenifra, Taounate. This tree considered as one of the most powerful fruit and forest trees, since all its parts are useful and have values in many areas. So it presents a great socioeconomic importance and many favorable rural development potential and the mountain economy.
Currently, Morocco is the second largest producer of carob globally after Spain, and its production reached 25% from the whole world production in 2005.
In the present study, the physico-chemical specifications of carob honey marketed in Morocco was determined, Its total phenols content, its flavonoids, the antioxidant activity of this honey monofloral and its diuretic activity were also studied in normal models of Wistar rats to evaluate the diuretic potential of an acute and sub-chronic oral administration and of the carob honey .
The results showed that the carob honey cause an increase in the volume of excreted urine in parallel to a clear and significant increase in natriuresis and kaliuresis. This increase was greater than that observed in rats treated with furosemide. This significant correlation suggests a direct tubular effect of active principles present in the carob honey.
In addition, the study shows a significant decrease in urinary urea with a small change in proteinuria while blood analysis showed no change in plasma electrolytes and urea, which confirms the effectiveness of administration carob honey as diuretic.

Keywords : **C**arob honey, **d**iuretic activity; **n**atriuresis; **k**aliuresis; **f**urosemide; **A**ntioxidant activity; **p**henols; **f**lavonoids

DIURETIC ACTIVITY OF HONEY OF CAPER *CAPPARIS SPINOSA* FROM MOROCCO AND PROPOLIS IN NORMAL WISTAR RATS

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In recent years there has been a renewed interest in the study of honey and propolis composition and biological properties. Honey is nectar collected from many plants and processed by honey bees (Apis mellifera), it is one of the oldest known medicines. Propolis (bee glue) is a resinous hive product collected by honey bees from various plant sources, it is a popular folk medicine possessing a broad spectrum of biological activities (1). In Morocco, honey and Propolis are widely used in traditional medicine, unfortunately, there are not enough investigations regarding its biological activities, and the diuretic effect of *Capparis spinosa* honey and Propolis were never studied. However several authors have previously shown the high content of honey in minerals, (2,3) which may contributes to promote dieresis. We hypothesized that the combination of this two hive products may produce synergistic effects. The aim of the present study was to evaluate possible positive interaction between Honey of *Capparis spinosa* from Morocco and Propolis on renal function, mainly on the transport of water, the transfer of certain electrolytes (Na +, K +, Cl-) and glomerular filtration. Honey of *Capparis Spinosa* , Propolis of Polular, Honey and Propolis and a reference drug, furosemide, were orally administered to 4 groups of Wistar rats for 21 days. Control animals received distilled water. After administration of honey, urine output was significantly increased from the first day of treatment until its stabilization; the total volume of urine excreted was similar to that of furosemide. Our Honey showed similar diuretic activity as the thiazide ones. On the other side the administration of Propolis with the same protocol had a contradictory effect compared with honey. However, the combination of these two hive products has been able to maintain diuresis in the normal range. Like these results, chang the excretion of urinary electrolytes (Na^+, K^+, Cl^-). Despite the changes in the urinary excretion of electrolytes, plasma concentrations were not affected by any of the three treatments.

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NEPHROPROTECTIVE EFFECT OF *BUPLEURUM SPINOSUM* HONEY AGAINST POTASSIUM DICHROMATE INDUCED NEPHROTOXICITY IN WISTAR RATS

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The main objective of our study was to assess the effect of daily administration of *Bupleurum spinosum* honey on nephrotoxicity induced by single sub-cutaneous injection of potassium dichromate ($K_2Cr_2O_7$) in female Wistar rats.

For the evaluation of nephrotoxic effects, we have used classic parameters for the assessment of kidney function like creatinine clearance, the representative parameter of glomerular filtration rate, the free water clearance which measures the efficiency of collector tubule and the sodium extracted fraction estimating electrolytes absorption in proximal tubule.

Our results demonstrated that the group pretreated by honey showed a significant ($p<0,05$) resistance to the induced nephrotoxicity, compared with no treated nephrotoxic group. At the end of the experiment this group showed also a slight tendency for the recuperation of renal function

EFFET DE LA GELEE ROYALE MAROCAINE SUR CERTAINS PARAMETRES SANGUINS CHEZ LES LAPINS : GLYCEMIE, BILAN LIPIDIQUE ET IONIQUE

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La GR constitue la meilleure «mixture» nutritive thérapeutique que la nature n'ait jamais élaborée dans l'évolution du système vivant. C'est un produit de l'abeille en provenance des glandes post-cérébrales (hypopharyngiennes) mandibulaires et labiales des jeunes ouvrières. Elle est produite par digestion partielle essentiellement à partir du pollen et du nectar. De nombreuses études sur les activités biologiques ainsi que la composition chimique de la GR ont été menées, compte tenu des propriétés biologiques et les effets exceptionnels qui lui sont attribués à savoir l'antioxydant, hypoglycémiant, hypocholestérolémiant, hepatoprotecteur , hypotenseur , antitumoral, antibiotique, anti-inflammatoire, immunomodulateur , antiallergique, et antivieillissement. L'objectif de cette étude est l'exploration de l'effet de la gelée royale marocaine administrée par voie intraveineuse sur certains paramètres sanguins chez les lapins : Glycémie, bilans lipidique et ionique. ainsi que son effet par voie orale sur la glycémie et le poids corporel des lapins.

Nos résultats indiquent que La gelée royale administrée par voie intraveineuse a un effet important sur la diminution de la glycémie, de la concentration plasmatique, des triglycérides et du cholestérol. Aucun effet sur la concentration des ions Na+ et K+ n'a été constaté. Le traitement journalier par la GR induit une augmentation du poids corporel et une diminution importante de la glycémie chez les lapins : Effet dose réponse.

IDENTIFICATION AND DIURETIC EFFECT OF *ZIZIPHUS LOTUS* HONEY

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In recent years, humans have a tendency to treat based natural product, it is an alternative or complementary medicine forming a pharmacopoeia without adverse side effects and evidence of the chemical in the human body. Honey has long been recognized in the Qur'an and Sunnah, it is a very sweet natural product produced by bees using nectar from flowers, easily and directly assimilated by the body.

Several therapeutic properties were attributed for jujube honey. The objective of this study is to determine the floral origin of honey and to evaluate the acute and sub-chronic oral administration of honey on renal parameters.

In the study of pollen honey (melissopalynology) we reveal the presence of more than 45% of pollen jujube after identification with the pollen of Ziziphus lotus reference (Ben Nasri Ayachi M and all 1995).

Treatment with a single dose of honey solution leads to a decrease in urine output that is significant after 24 hours.

After sub-chronic treatment (12 days) with honey, there is a decrease in urine output unlike furosemide treated group. Mean change in natriuresis (Na +), and a significant increase in urinary potassium (K +) for the group treated with honey, with a significant increase in glomerular filtration. Natriuresis Na + and K + urinary potassium and highly significant for treatment with furosemide.

For plasma electrolytes for both treatments during 12 days did not result in a change in plasma concentrations of Na + and K +

It is concluded that oral administration of the solution of honey Ziziphus lotus leads to a clear and significant decrease in diuresis therefore antidiuretic activity with an increase in urinary electrolytes and no effect on plasma electrolytes.

ANTIOXIDANT ACTIVITY OF POLLEN FROM SIX MELLIFEROUS PLANTS IN THE REGION FEZ-BOULEMANE

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Melliferous plants are plants that are visited by bees: *Apis mellifera* to collect the raw material necessary for their life in the hive.
Melliferous plants are either nectariferous plants: they give bees their need for nectar or poliniferous for those who provide pollen and the third type is those who give both at the same time.
Pollen of flowers are the main source of protein for bees pollinating, they are also the source of polyphenols found in the honey and royal jelly.

For this reason we have chosen to evaluate the richness of polyphenols and especially of flavonoids of hydro ethanolic pollen extract (25 :25 V/V) for six melliferous plants : *Anetum graveolens, Capparis spinosa, Opuntia-ficus-indica, Malva Sylvestris, Papaver rhoas, Calendula officinalis* of the region of Fez- Boulemane and we evaluated the antioxidant activity by the method of Free radical scavenging activity (DPPH) .
The results showed that the most active extract of pollen in the DPPH test are: *Anetum graveolens*, *Malva sylvestris*, *Papaver rhoas*, and beyond that of BHT (0,006±0001) (mg/ml); the *Anetum graveolens* extract has the highest phenolic content and flavonoids .while the lowest is the *Malva Sylvestris* for phenols and *Opuntia-ficus-indica* for flavonoids .

Keywords: Melliferous plants; Pollen; polyphenols; flavonoids; hydro ethanolic extract; the antioxidant activity

CHEMICAL COMPOSITION ANTI-OXIDANT AND METAL CHELATING ACTIVITY OF SOME PORTUGUESE ESSENTIAL OILS

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The essential oil used in this study was isolated by hydrodistillation using a Clevenger-type apparatus according to the European Pharmacopoeia. The chemical composition was investigated by using gas chromatography-retention indices and gas chromatography mass spectrography.
The main compounds *Thymus carnosus* oil were camphene (23.1%), borneol (14.4%) and α-pinene (10.7%). Whereas the main compounds *Thymus lotocephalus* were α-pinene (13%) 1,8-cineole (24.3%) and Linalool (18.5%).
The *Thymus mastichina and Thymus albicans* oils were dominated by 1,8-cineole (52.8% and 69.2% respectively) while the *Thymus caespititus* oil was dominated by thymol (33.6%) followed by *p*-cymene (12.2%) and carvacrol (10.9%). *Thymbra capitata* was dominated by carvacrol (70.3%) and γ-terpinene (11.2%).
The present work was also conducted to evaluate antioxydant activity of essential oils using a TEAC and metal chelating activity. The results showed that *T. caespititus* oil exhibited higher antioxidant activity followed by *Thymbra capitata* oil (IC_{50} value: 0.0026 mg/mL and 0.0036 mg/mL, respectively), meanwile *Thymus albicans* exhibited lower antioxidant activity ($IC_{50}^{=}$ 3.65 mg/ml).
T. lothocephalus showed the best metal chelating activity (IC_{50}= 0.058 mg/mL) followed by *T. carnosus* (IC_{50}= 0.058 mg/mL), while *Thymbra capitata* and *T. caespititus* showed no activity.

Key-words: essential oil, *Thymus*, metal chelating, antioxydant activity, chemical composition.

TOTAL PHENOLS, ANTI-ACETYLCHOLINESTERASE AND FREE RADICAL SCAVENGING ACTIVITIES OF SOME MOROCCAN MEDICINAL PLANTS

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The history of medicinal and aromatic plants is associated with the development of civilizations. China (birthplace of herbal medicine), India, the Middle East, especially the Arabo-Muslim world, Egypt, Greece, and Rome represent civilizations in which aromatic and medicinal plants had an important role. In the present study, the capacity of ethanolic extracts of fifteen medicinal plants from Morocco for scavenging free radicals and inhibiting acetylcholinesterase activities, were evaluated.

Among the extracts studied, *Taraxacum officinale* extracts had significantly the higher amounts of phenols than the remaining samples, immediately followed by the extract of *Hypericum perforatum L.* and *Rumex patientia* extracts while *Cynarias colymus* had the lowest concentrations of phenols.

The extracts of *Hypericum perforatum L., Taraxacum officinale* and *Rumex patientia* presented the highest capacity for scavenging ABTS free radicals (IC50= 0.026mg/mL; IC50=0.027 mg/mL and IC50=0.041 mg/mL respectively). The lowest activity is found in the extracts of *Cynarias colymus* (IC50=2.07 mg/mL) and *Phoenix dactylifera L.*(IC50=0.982 mg/mL).

Crataegus extract (IC50=0.0171 mg/mL) and *Ceratonia siliqua* extract (IC50=0.0174 mg/mL) extracts was the most active showing the best ability for inhibiting acetylcholinesterase whereas that of *Phoenix dactylifera L.* (IC50= 2.313mg/mL) was the worst.

Key-words: medicinal plants, extracts, acetylcholinesterase, ABTS free radicals.

VASORELAXANT EFFECT OF ESSENTIAL OIL ISOLATED FROM *NIGELLA SATIVA* (L.) SEEDS IN RAT AORTA: PROPOSED MECHANISM

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The effect of the essential oil extracted from *Nigella sativa* (L.) seeds (Nigella oil) was investigated for its vasorelaxant activity on isolated rat aorta. Nigella oil at concentrations of 10 – 100µg/mL elicited a dose-dependent relaxation of the aorta, which was pre-contracted with noradrenaline (NA, 10^{-6} M) or KCl (100mM). In the presence of Nigella oil (75 µg/mL, the dose response curves to increasing concentrations of NA (10^{-9} M to 10^{-4}M) or KCl (10mM -100mM) were displaced downwards, indicating inhibition of the vasoconstrictive effect. This relaxation effect was independent of the presence of endothelium. In addition, the vasodilatory activity of the Nigella oil was not affected by pre-treatment of the rings with N^G-nitro-L-Arginine (an inhibitor of endothelial nitric oxide synthase; 0.1 mM), suggesting that the vasorelaxant effect is not mediated by nitric oxide. Furthermore, pretreatment of the rings with Nigella oil (75 µg/mL suppressed the tension increment produced by increasing external calcium concentration (0.25mM to 1.5mM).

Tin conclusion, the essential oil extracted from *Nigella sativa* seeds produces smooth muscle relaxation, which is independent of endothelium and is not mediated by nitric oxide. The results also suggest that the vasorelaxing effect of the oil results from the blockade of both voltage-senstive and receptor-operated calcium channels, and this may have therapeutic significance, in that Nigella oil may be useful as an antihypertensive agent in humans.

Key words: Essential Oil, *Nigella sativa*, endothelium, calcium channel, vasodilator, rat.

ANTISPASMODIC EFFECT OF AQUEOUS EXTRACT OF *BERBERIS HISPANICA* ON RODENT ISOLATED JEJUNUM

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The medicinal plant *Berberis Hispanica* is widely encountered in Rif, middle Atlas and high Atlas of Morocco where it is used to treat digestive problems. The effects of the aqueous extract of the bark part of this plant (AEBH) on rodent jejunum were studied. AEBH reversibly relaxed the spontaneous tonus of the rabbit jejunum in a concentration-dependent manner. The inhibitory effects of the extract were not affected by pretreatment with the inhibitors of adrenergic receptors α and β yohimbine, prazozin and propranolol. AEBH also reversed the tonic contraction of rat jejunum induced by 75 mM KCl and 10^{-6} M Carbachol. This result suggests that antispasmodic action of the extract is probably mediated through calcium channel blockade. These results were consistent with the popular use of the plant to treat gastrointestinal disorders.

Keywords: Aqueous extract, *Berberis Hispanica*, jejunum, antispasmodic.

RELAXANT EFFECT OF *ORIGANUM MAJORANA* AQUEOUS EXTRACT ON RODENT INTESTINAL SMOOTH MUSCLES

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In Morocco the medicinal plant *Origanum majorana* (Lamiaceae) is usually used in traditionally medicine to treat digestive problems. The effects of aqueous extract of the aerial part of this plant (AEOM) on rodent jejunum were studied. AEOM reversibly relaxed the spontaneous tonus of the rabbit jejunum in a concentration-dependent manner. The inhibitory effects of the extract were not affected by pretreatment with the inhibitors of α and β adrenergic receptors (yohimbine, prazozin and propranolol). AEOM also reversed the tonic contraction of rat jejunum induced by 25 mM KCl or 10^{-6} M Carbachol. The pretreatment of the latter isolated intestine with this essential oil produced a dose-dependent shift of the Ca^{2+} and CCh dose-response curve to the right, with suppression of the maximal effect, similar to the one of antagonist no-competitive of muscarinic receptors and voltage calcium channel respectively. Our results show that AEOM exerts relaxant effects on intestinal smooth muscle, consistent with the popular use of the plant to treat gastrointestinal disorders.

Keywords: *Origanum majorana*, aqueous extract, jejunum, antispasmodic

SCIENTIFIC VALORISATION OF A MOROCCAN MEDICINAL PLANT: TOXICOLOGICAL AND PHARMACOLOGICAL EFFECTS OF LYOPHILIZED EXTRACT OF *BERBERIS VULGARIS L.*

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The use of medicinal plants is very old. Since antiquity, man sought to find the source of his well-being in his natural environment. Although there are few reliable estimates of prevalence, the use of medicinal plants (MP) continues to expand rapidly and has grown into a multibillion dollar industry across the world. The influence of religious, sociocultural and socioeconomic issues, traditional practices and belief in the use of MP is evident, particularly in Chinese and African societies. Among consumers, there is a widespread belief that remedies of natural origin are safe. Most MP can be obtained without a prescription from various outlets. But, as with all medicines, MP have been shown to have adverse effects which are related to a variety of causes: adulteration, mistaken use of the wrong species or misidentification, incorrect dosing, errors in use, contamination and toxic constituents. MP chemical constituents responsible for pharmacological activity are large and complex and the majority of them are unknown. There are no government standards for the quality of MP in most countries and the main problem is that little is known about them scientifically. MP are not tested with the scientific rigor required of conventional drugs. The absence of a regulatory framework presents the major problem in pharmacovigilance for MP.

The present study was undertaken for the valorisation of *Berberis vulgaris L.* (BV), a medicinal and aromatic plant largely used in Moroccan pharmacopoeia, by scientifically validated techniques, to evaluate the toxicity of the plant, the cellular effects, the hypotensive activity and mechanisms implied in this pharmacological effect. *Berberis vulgaris L.* (BV) belongs to the family of (Berberidaceae), it is used in vernacular pharmacopoeia as infusion, decoction, extract and tincture for functional derangement of the liver, regulating the digestive powers, removing constipation, dyspepsia, diarrhoea, and for intermittent inflammatory fevers. After single oral administration of the lyophilized extract of the stem bark of BV (0, 1, 4, 6g/kg BW) to adult IOPS mice, we followed the clinical symptoms and the ponderal evolution of the various batches during 14 days. The LD_{50} of oral acute dose was 4.02 g/kg BW. Furthermore, various tissues, targets of toxicity: brain, liver, kidneys and colon were removed for anatopathologic visualization. No noticeable changes in general behaviour and weight were observed after the oral administration. The LD_{50} (≥3.5g/kg BW) of BV classifies it among non-toxic plants. Moreover, no marked adverse changes were observed in the different target tissues examined. As regards to pharmacological studies, we investigated the hypotensive effect of BV in normotensive anesthetised rabbits (n=6). The intravenous (iv) administration of the lyophilized extract (at 5, 10, 15, 20, and 25 mg/kg BW) caused a significant and dose-dependant decrease in systolic blood pressure from de dose of 5 mg/Kg BW, and insignificant fall in the hematocrit. In order to identify the mechanisms of this hypotensive effect, we measured the urinary flow and the rate of sodium (Na^+) and potassium (K^+) excretion; the effect was insignificant ($P > 0.1$). Additional studies are required to clarify the mechanisms of antihypertensive action of BV.

Key Words: Medicinal plants, Valorisation, *Berberis vulgaris*, lyophilized extract, Acute toxicity, Hypotensive effect, Anatomopathological examination, IOPS mice, Rabbits.

ANTIBACTERIAL, ANTI-ACETYLCHOLINESTERASE, ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF LEAF, FLOWER AND SEED AQUEOUS EXTRACTS OF *LAWSONIA INERMIS* FROM TUNISIA

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Lawsonia inermis Linn. (henna) has been used from ancient times for staining hands and as hair dye. Nevertheless such plant has been also used in folk medicine to treat rheumatoid arthritis, headache, ulcers, diarrhoea, leprosy, fever, leucorrhoea, diabetes, cardiac disease, and as hepatoprotective, among other diseases. In addition, and more recently, antioxidant activities have also been reported for this plant. In the present work the capacity for scavenging free radicals and for preventing lipid peroxidation of leaf, flower and seed aqueous extracts were evaluated. The amounts of total phenols depended greatly on the part of the plant used. Seeds had the highest concentration of phenols (56.81 mg GAE/g) in contrast to that of flower extract (18.74 mg/g). A positive correlation between total antioxidant activity and phenol content was observed ($r=0.984$, $p<0.01$). Seed extract showed higher capacity for scavenging ABTS ($IC50=0.0185\pm0.001$ mg/ml), DPPH ($IC50=0.024\pm0.002$ mg/ml) and superoxide anion radicals ($IC50=0.274\pm0.134$ mg/ml), whereas leaf extracts evidenced higher capacity for scavenging hydroxyl ($IC50=0.442\pm0.149$ mg/ml) and nitric oxide ($IC50=0.810\pm0.050$ mg/ml) free radicals. The capacity for preventing lipid peroxidation was also higher in leaf extracts. In contrast, the capacity for chelating iron ions was observed for seed extracts ($IC50=0.680\pm0.00$ mg/ml). Leaf and seed extracts inhibited better hyaluronidase than flower ones and also have the capacity to inhibit acetylcholinesterase. Whereas extracts from seeds showed a slight activity but only at the highest volume, namely the inhibitory zones for *S. aureus* ATCC 6538, MRSA 12 and *P. aeruginosa* were 12.00 ± 0.00 mm, 9.00 ± 0.0 mm and 10.50 ± 0.70 mm.

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Keywords: radical scavenging ability, lipid peroxidation prevention, henna.

ANTI-INFLAMMATORY AND ANTI-OXIDANT ACTIVITIES OF MOROCCAN ESSENTIAL OILS AND THEIR MAJOR COMPONENTS

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Essential oils are constituted by dozens of compounds and the biological activities can be attributed to the major components and/or to minor ones. The use of essential oils in the pharmaceutical, agricultural and nutritional fields are due to their antimicrobial, antiviral, nematicidal, antifungal, insecticidal, antioxidant and anti-inflammatory activities.

In the present work, four traded essential oils: *Eucalyptus globulus*; *Thym*us *vulgaris*; *Cupressus sempervirens*, and *Foeniculum vulgare*, provided by a Moroccan company and their major components were investigated for their antioxidant and anti-inflammatory activities. The antioxidant capacity of the studied commercial essential oils was determined by evaluating the ability for scavenging free radicals (ABTS, hydroxyl, peroxyl and NO), lipid peroxidation (liposomes) and chelating ability.

T. vulgaris EO showed the best capacity for scavenging ABTS (IC50= 0.010±0.000 mg/ml), hydroxyl (IC50= 0.40±0.00 mg/ml) and peroxyl radicals (IC50= 1787.97±244.55 TE*µmol mg-1). Nonetheless it was not as effective for scavenging nitric oxide radicals or even for chelating iron metal. This activity seems to be predominantly due to the thymol and carvacrol. Borneol and p-cymene had only a very weak activity which is in accordance to previous studies that showed that these compounds have slight or no antioxidant activity.

C. sempervirens EO was the most effective in scavenging NO free radicals (IC50= 6.47±6.70 mg/ml), and *F. vulgare* EO showed the most effective chelating power (IC50= 0.03±0.00 mg/ml).

F. vulgare (IC50= 0.47±0.01mg/ml) along with *T. Vulgaris* (IC50= 0.46±0.01 mg/ml) EOs showed the highest prevention of the liposome peroxidation, in contrast to that of *C. aurantium* in which the IC50 was not possible to determine.

F. vulgare EO (IC50= 0.04±0.01 mg/ml) had the highest activity in contrast to the lowest observed with *T. vulgaris* EO (IC50= 0.19±0.00mg/ml). The activity observed in *F. vulgare* EO may be attributed to its major compound, E-anethole(IC50= 0.02±0.01mg/ml).

Key words: anti-inflammatory, Anti-oxidant, lipid peroxidation, free radicals.

ANTIOXIDANT AND ANTI-LIPOXYGENASE ACTIVITIES OF EXTRACTS FROM DIFFERENT PARTS OF *LAVATERA CRETICA* L. GROWN IN ALGARVE (PORTUGAL)

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Lavatera cretica L. (syn. *Malva multiflora* (Cav.) Soldano, Banfi & Galasso; syn. *Malope multiflora* Cav.; syn. *Malva pseudolavatera* Webb & Berthel.) (cornish mallow) belongs to Malvaceae family and it has been used in folk medicine as anti-inflammatory among other applications. The capacity of different parts of *L. cretica* plant for preventing lipid peroxidation, scavenging free radicals and inhibiting lipoxygenase activity was evaluated and correlated with the total phenol and flavonoid content.

Leaf extracts had the highest concentrations of total polyphenols and flavonoids (254.62±6.50 mg GAE/g; d.w.) and the highest capacity for scavenging ABTS free radicals (IC50=2.88±0.54) and hydroxyl radicals (IC50=0.81±0.05 µg/mL) and the best capacity for inhibiting lipoxygenase (IC50=0.013±0.0034 µg/mL). Bract plus sepal extract possessed the best capacity for preventing lipid peroxidation (IC50=0.19±0.03 µg/mL) and scavenging superoxide anion radicals (IC50=1.13±0.48 µg/mL.

Inflammation and neurodegenerative diseases in which high production of free radicals are involved, L. cretica with those properties may have an important role in the prevention and/or treatment of those diseases.

Key-words: Anti-inflammatory, *antioxidant*, extracts *Lavatera cretica.*

CHEMICAL COMPOSITION AND ANTI-PROLIFERATIVE ACTIVITIES OF FOUR MOROCCAN ESSENTIAL OILS

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Essential oils (EOs) are complex mixtures of natural compounds extracted from aromatic plants which possess several biological properties: antimicrobial, anti-inflammatory, anti-cancer, antioxidant and much more activities.

In the present work, the chemical composition and the anti-proliferative activity of commercial EOs from Morocco (*Thymus vulgaris*, *Cupressus sempervirens*, *Foeniculum vulagare*, *Cupressus sempervirens*) was checked and compared with their main constituents.

Essential oils was analyzed by Gas chromatography and Gas chromatography–coupled with mass spectrometry and the cytotoxic activity was studied on THP-1 leukemia cell line by treating these cells with increasing doses of the EOs or their main components.

T. vulgaris EO main components were p-cymene (24,6 %), borneol (15.5%), carvacrol (15.4%) and thymol (11.8%), this EO showed the best anti-proliferative activity after 24 h of cell treatment, in contrast to *F. vulgare* EO mainly composed by E-Anethole 69.4% that showed low anti-proliferative activity, even at higher concentrations. After 96 h of cell exposition, the trend was similar. The activity of this essential oil may be attributed to carvacrol and thymol, while p-Cymene was the least effective.

C. sempervirens EO mainly rich in α-Pinene (47.3%), limonene (31.4%) and δ-3-Carene (17.6%), also had anti-proliferative activity on THP-1 cells similar to that of limonene, in contrast to that of α-pinene, which only possessed weak activity.

E. globulus EO contains p-cymene (37.8%), 1,8-cineole (29.3%) and limonene (26.1%) as main components and showed a weak antiproliferative activity. Such result may be due to the weak activity of p-cymene and 1,8-cineole.

The anti-proliferative activities of both EOs, as well as those of the standards, were dose-dependent.

Key-words: Essential oils, anti-proliferative activity, Chemical composition.

CHEMICAL COMPOSITION AND ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS OF ALGERIAN *MYRTUS COMMUNIS* L

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Myrtus communis L. is an endemic aromatic plant used in traditional medicine in Algeria known for its therapeutic virtues in large part due to its essential oils whose biological activities are largely sought to be utilized in various domains namely medical, agricultural and agri-food, cosmetic ... etc. Among these, it is necessary to raise the antifungal activity whose interest is certain in medicine or agriculture. This modest work contributes to to highlight the antifungal activity of our essential oil extracted from Algerian *Myrtus communis* on some plant pathogenic fungi isolated from infected vegetable and cereal crops: *Ascochyta rabiei*, *Fusarium oxysporum*, *Aspergillus ochraceus* and *Alternaria solani*. The extraction of essential oils is carried out according to the protocol of hydrodistillation. The yield was 0.04% for myrtle leaves. The analyse of chemical composition done by GC and GC/MS showed 63 compounts identified with the dominance of α-pinene (23,5%), 1,8-cineole (19,1%), limonene (17%) and linalool (19,7%). The antifungal activity of essential oil determined by the method of direct contact was highly significant ($p < 0.05$ %) and goes on increasing with the increase of the concentration (from 0.1 to 0.5 %) on all strains fungal studied. At the maximal dose of 0.5%, *Alternaria solani* has shown the most sensitive mycelium growth with an average of 6.7 mm against 25.3, 23.3 and 12.7 mm noted for *Ascochyta rabiei*, *Aspergillus ochraceus* and *Fusarium oxysporum* respectively. Results corresponding to inhibition rates of 91.75%, 84.81%, 68.74 % and 63.64% for *Alternaria solani*, *Fusarium oxysporum*, *Aspergillus ochraceus* and *Ascochyta rabiei* respectivly.

Keywords: *Myrtus communis* L.-essential oil - chemical composition - antifungal activity.

CHEMICAL COMPOSITION AND ANTIOXYDANT ACTIVITIES OF ESSENTIAL OILS OF ALGERIAN *MYRTUS COMMUNIS* L.

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This study was designed to examine the chemical composition and antioxidant activities of the essential oils of Algerian *Myrtus communis* L. harvested from 14 distant localities extending from the region of Bissa in Chlef to the region of Tenes on the seaboard (Northwest of Algeria). The essential oil production representing a yield ranging fom 0.28% to 0.77% (w/w), respectively. The essential oil composition of myrtle leaf and fruit was characterized by high proportions of α-pinene, the main compound of monoterpene hydrocarbon class, ranging from 23.09 to 48.78% for leaf and 21.1 to 43.935% for fruit. Essential oil was rich in oxygenated monoterpenes, largely due to 1,8-cineole with 10.31 to 24.22% for leaf and 5.32 to 36.34% for fruit. Limonene was present also in amportant amount depending of the organ and locality; from 11.01 to 29.72% for leaf and 7.5 to 35.43% for fruit. However the amounts of linalool were ranging from 1.81 to 32.41% for leaf and 0.72 to 7.48% for fruit. Antioxidant activities of the different essential oils myrtle leaves were evaluated by using DPPH radical scavenging, ABTS, reducing power and metal chelating activity assays. The results showed variability with the locality. Indeed for DPPH; the values of IC50 ranged from 2.28 et 12.66mg/ml for the localities of Teraghnia and Oued Goussine respectively. The essential oils showing the best power of chelating of iron was noted for the locality of Tigharghar with a value of 1.41mg/ml against the highest value of 12,45mg/ml for *Myrtus communis* harvested from the locality of Teraghnia. Otherwise essential oils obtained from *Myrtus ommunis* of the localities Oued khdhar -canton rouaichia- and Oued Goussine showed the best reducing power of iron. The best activity for ABTS was noted for *Myrtus communis* of Ouled Sidi Ali in Boucheral.

Keys words: *Myrtus communis* L.- essential oil- chemical composition- antoxidant activities.

CITRUS LIMON AND *CITRUS AURANTIUM* ESSENTIAL OILS FROM MOROCCO: CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES

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Essential oils, major by-products of citrus juice processing; are important flavoring ingredients in food and beverage products. Being complex mixtures of chemical compounds they can be classified into two main groups: terpenes and phenylpropanoids. Natural pigments (mainly carotenoids and chlorophylls) are also present in the citrus essential oils.

The present investigation reports the chemical composition, the antioxidant (TEAC: Trolox Equivalent Antioxidant Capacity, Hydroxyl radical scavenging activity, Nitric oxide scavenging capacity, ORAC: Oxygen radical absorbance capacity, Chelating metal ions, Inhibition of lipid peroxidation of lecithin liposomes), Anti-inflammatory activity and Anti-proliferative activities of *Citrus aurantium* and *Citrus limon* and compared with their main constituents.

Citrus aurantium EO showed the best scavenging free radicals capacity measured by TEAC (IC50=22.54±0.23 mg/mL), hydroxyl (IC50=22.54±0.23 mg/mL), and ORAC (161.93±2.07 TE (μmol mg-1) mean, while *Citrus limo*n EO was the most effective in scavenging NO free radicals (IC50=19.61±1.04 mg/mL), preventing liposomes peroxidation (IC50=0.54±0.02 mg/mL), and chelating metal (IC50= 0.03± 0.00 mg/mL) ions.

Limonene dominated *C. limon* EO, and limonene standard showed similar activities, which allows to conclude that the activity of the whole EO may be attributed to this monoterpene.

In *C. aurantium* EO, linalool and linalyl acetate along with other EO components contributed to the best activity of the entire EO.

Concerning the anti-inflamatory activity, the *citrus limon* EO showed the best activity (IC50=0.30±0.01 mg/mL), the same result as limonene (IC50=0.29±0.01 mg/mL).

The cytotoxic activity of *C. aurantium* and *C. limon*, EOs and their main constituents was studied on THP-1 leukemia cell line by treating these cells with increasing doses of the EOs or their main components.

C. aurantium EO had higher capacity to reduce the growth of THP-1 cells than their main components, linalool and linalyl acetate. Limonene also showed relative high anti-proliferative activity better than the *C. limon* EO.

A STUDY OF CHEMICAL COMPOSITION AND ANTIBACTERIAL PROPERTIES OF LEAVES ESSENTIAL OIL OF LAURUS NOBILIS FROM MOROCCO

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Medicinal plants have been used for centuries as remedies for human diseases because they contain chemical components of therapeutic value (Nostro et al., 2000). According to the World Health Organization (WHO) in 2008, more than 80% of the world's population relies on traditional medicine for their primary healthcare needs (Pierangeli et al., 2009). Laurel (Laurus nobilis) is an evergreen tree cultivated in many warm regions of the world, particularly in the Mediterranean countries.

The extraction of essential oils of leaves of Laurus nobilis is obtained by hydrodistillation and analyzed by gas chromatography coupled with mass spectrometry (GC/MS) and gas chromatography with flame ionization detection (GC-FID) for determining their chemical composition and identification of their chemotypes. Their antibacterial activity was studied in vitro on tree bacterial strains: Staphylococcus aureus, Staphylococcus intermedius and Klebsiella pneumonia. The essential oil yields of the studies were 1.86%. The major component was 1,8-cineole (52.43%), other predominant components were á-terpinyl acetate (8.96%), sabinene (6.13%), Limonene (5.25%), á- pinene (3.72%), linalool (3.14%), terpinene-4-ol (2.56%), á-terpinene (2.12%), â-pinene (1.98%), á- terpineol (1.56%), bornyl acetate (1.89%), á-phellandrene (1.28%), myrcene (1.13%), camphene (1.05%), p-cymene (0.94%), ó-terpinene (0.98%) and eugenol (0.56%). The chemical compositions revealed that this leaves had compositions similar to those of other Laurus nobilis essential oils analyzed in other countries. The bacterial strains tested were found to be sensitive to essential oils studied and showed a very effective bactericidal activity with minimum inhibitory concentrations (MIC) ranging from 0.01 to 1 mg/ ml.

Key Words: Laurus nobilis, Essential Oil, (GC/MS), Antibacterial Activity.

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ENQUETE DE CONSOMMATION DU MIEL AU MAROC

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L'apiculture au Maroc est une des filières à fort potentiel mais qui est à ce jour en plein développement. La production moyenne en miel varie entre 3500 et 4000 tonnes/an. La réglementation et la normalisation du miel sont aussi loin d'être à la hauteur de programme « Plan Maroc vert » dont il fait partie.

La réalisation de l'enquête de consommation du miel au Maroc a pour but d'inciter les apiculteurs à orienter leur stratégie vers la production de miel de qualité, de permettre à l'industrie apicole de mieux comprendre la situation actuelle ainsi que les problématiques en terme de commercialisation, et aussi pour connaitre les utilisations thérapeutiques du miel par la population marocaine afin d'orienter les chercheurs d'investiguer leurs bienfaits.

Cette enquête de consommation du miel au Maroc a réalisé par le laboratoire de Physiologie-Pharmacologie et Santé environnementale au cours de l'année 2014. Afin de garantir les résultats optimums et non biaisés, le questionnaire à été rempli par des catégories sélectionnées au hasard. Un total de 530 personnes à répondu à cette étude. L'enquête permettra le recueil de données utiles et pertinentes. Une discussion des résultats par catégorie sociodémographique, sur les modes de consommation de miel, le type de miel, la fréquence de consommation par région.

PHYTOTHERAPY AND TYPE 2 DIABETES: CONSULTANTS CHU HASSAN II FES, MOROCCO

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Introduction: Diabetes is a major public health problem in Morocco. Over the past decades attention has focused the use of medicinal plants in the treatment and control of this disease. **The objective** of this study was to determine the rate of diabetic paients who use herbal medicine to treat their diabetes , and the relationship between it and sociodemographic parameters and those related to the disease , determine main herbs used to identify how and why of their use and side effects. **Methodology:** This is a cross-sectional study on a selection of 158 type 2 diabetic consultant or hospitalized in the University Hospital Hassan II Fez Endocrinology service on a two-month period subjects. Patients were interviewed using a questionnaire to identify the medicinal plants used, the methods and the reasons for their use. **Results:** The mean age was 57 years ± 10.5ans and 66.7 % women. Among the patients who participated, 36 % said they have used herbal medicine to control blood sugar. Their use was significantly higher among women (71.9%), and among older about 45 years old. The majority of complications were noticed among consumers, but no association was demonstrated. 40 species of plants have been identified, mainly T. foeniculum -graecum L, S. officinalis L, Artemisia vulgaris L. The common disorders of the digestive system accounted for the high incidence of oral administration and the method of preparation as decoction, herbal tea, crushing and maceration. The occurrence of side effects or toxicity was reported by 15.8 % of consumers; including 33.3% cases were gastric problems. Patients advocated several reasons to justify their use, but mainly a previous positive experience claimed by other diabetics. Most users are unaware of plant's toxicity as well as of their appropriate use (part to be used, mode to prepare them and quantity. **Conclusion:** The use of herbal medicine is common in the armamentarium of type 2 diabetes in Morocco. This use, however, must be based on the results still few scientific studies. Their conditions of use should be specified and users should be warned of possible side effects.

Key-words: Type 2 diabetes – treatment – medicinal plants – Morocco.

DONNEES CLINIQUES ET THERAPEUTIQUES DE L'INTOXICATION AIGUE AU MAAJOUN

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Introduction : Le Maâjoun est une pâte électuaire préparée traditionnellement à base de cannabis, auquel sont ajoutées des plantes atropiniques à propriétés hallucinogènes telles que : les graines de Datura (Chdeq Jmel), les baies de Belladone (Bellaydour), les graines de Jusquiame (Sikrane) et parfois des médicaments psychotropes surtout les benzodiazépines. Au Maroc, le Maâjoun est consommé dans un but toxicomanogène ou aphrodisiaque. L'intoxication est généralement le résultat d'un surdosage. Nous rapportons un cas d'intoxication sévère par le Maâjoun ayant évolué favorablement après un traitement symptomatique.

Observation : Mr .A.K. âgé de 21ans, sans antécédents pathologiques notables admis aux urgences pour un état d'agitation avec trouble de conscience inexpliqué. L'histoire de la symptomatologie remonte à la veille de son admission ou le patient a présenté ; suite à l'ingestion dans une fête d'un produit suspect ayant l'aspect d'un chocolat; des vomissements, des céphalées, fièvre élevée avec raideur des articulations. L'examen clinique trouve un patient inconscient GCS à 10, conjonctive rouge avec larmoiement spontané, hyperthermie à 41°C avec à l'examen respiratoire une fréquence à 40 cycle/min. le reste de l'examen somatique était sans particularité.
Un bilan biologique, une ponction lombaire et une TDM cérébrale ont été faits revenus sans particularité. La recherche toxicologique sur les urines a montré initialement par la présence de métabolite de cannabis (tétra-hydrocannabinol THC) et de benzodiazépines puis ces deux molécules ont été quantifiées objectivant ainsi une forte concentration en tétra-hydrocannabinol (205ng/l) et en benzodiazépines (3100.80 mg/l). L'analyse complémentaire par la chromatographie liquide à haute performance à barrette diode (HPLC/DAD), sur le sérum et les urines, a confirmé la présence de métabolite de cannabis, du diazépam et du clorazépate di-potassique. Le patient a favorablement évolué après une semaine d'hospitalisation en milieu de réanimation.

Conclusion : L'intoxication par le Maâjoun est généralement bénigne, cependant, en cas de surdosage important l'intoxication peut engager le pronostic vital des toxicomanes.

HERBAL MEDICINE: THE CASE OF DIABETES IN MOROCCO

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The use of herbal medicines is widespread in Africa, including Morocco. This practice is transmitted orally and ritually. The objectives of this study were to determine the rate of diabetic patients who use herbal medicine in the region "Fez-Boulmane", to identify the medicinal plants used, and to find the reasons for the use. This is a prospective study, spread over one year from May 2010 to May 2011, involving 199 diabetic patients (type 2).

The collection of information was done through a questionnaire, having information related to the patient, illness, and the plants used. The data was analyzed by SPSS software version 17. This study concerned 199 patients, 63.3% were female, the edge age of the patients was ranging from 20 to 90 years with an average age of 56 + / -10 years. the level of education was 52 % divided into a primary education (19 %), secondary school enrollment (22%) and only 11 % of our patients had a higher level of education. 72 % of patients have a standard socio-economic level, however (63.3%) were without social security. The majority of diabetics were unbalanced (74%) with a median HbA1c of 8.7%, the macro and micro vascular complications diseases were present in 72.9% of cases.

Among diabetics under study, 86 patients responded (43.2%) use medicinal plants to treat diabetes, associated or not to the treatment prescribed by the doctor. The reasons behind this can be summarized in: first, the low cost for 3 % of patients, second access to the treatment for 6,4 % of them, and third the belief in the efficacy of medicinal plants for 90.6% of cases. The most commonly plants used were fenugreek, sage and olive; the side effects associated with the use of plants were reported in 14.5% of patients, especially digestive problems. Other side effects were noted such as palpitations, dizziness and aches. More than half of our patients (52.2%) were disappointed with the results they had when they use plants in order to control their glycemic balance. We compared two groups of patients, those who use the plants for the treatment of diabetes and those who do not, we found that: The use of herbal medicine was more pronounced in women, Patients with higher socio-economic and educational level use less plants, but this difference was not significant ($p = 0.3$, $p = 0.19$) and we do not find the existence of a significant association between the presence of degenerative complications and the use of plants ($p = 0.5$).We can conclude from this study that the should be based on scientific evidence which is unfortunately rare. Conditions of use should be better defined and patients should be informed of potential side effects.

CHEMICAL ANALYSIS OF MIXTURE OF TRADITIONAL PREPARATION (KOHL) IN THE MOROCCAN POPULATION

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Kohl is a popular eye care product and its use has been reported since ancient times. Kohl has been defined as an eye preparation in ultra fine form of specially processed "Kohl Stone" (galena) incorporated with some other therapeutically active ingredients. It has been claimed to keep the eyes cool and clean, improve vision and strengthen the eyes. It has also been used for the prevention and treatment of eye diseases such as blepharitis, cataract, conjunctivitis

The use of traditional mixture and remedies such as kohl is very common in Morocco, especially among women, children and babies. Kohl is an eye cosmetic; it is usually mixed with other substances then applied on women's eye brows and used in skin treatment for children. Many people adds various herbs or other substances to the kohl such as *Aframomum melegueta*, *Jusmin*, *Syzygium aromaticum* (clove). Most commercially produced Khol contain high levels of lead.

Our study reveals that lead concentration in both non mixed and mixed samples are significantly higher, however in the mixture, the lead level is low due to many ingredients added in the preparation. Nevertheless, lead concentration in both type of khol is very high and consequently constitutes a risk for public health, particularly for children.

Prolonged application of khol may cause excessive lead storage in the body, affecting the brain and bone marrow, causing convulsions and anemia.

Despite recommendations against the use of 'Khol', it is routinely used in children. It is necessary that the health care providers should educate the parents regarding the use of Khol

Other studies are necessary to establish the correlation between lead in Khol and in blood, urine samples of women and children using this product.

Keywords: kohl, eye cosmetic, trace element, lead

MELGARBE – A PRO-ACTIVE BEEKEEPING ASSOCIATION

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MELGARBE-Associação de Apicultores do Sotavento Algarvio; Edifício da Direção Regional de Agricultura e Pescas do Algarve; Rua Clementino Baeta; 8005-924 FARO

There are presently 10475 registered beekeepers in Portugal, representing a population of approximately 35 thousand apiaries and 607 thousand hives. The beekeeping activity is scattered across the national territory and the Algarve is one of the regions where there is a smaller number of beekeepers but where larger beekeepers average, 125 hives per beekeeper. (2)

Melgarbe is a private rights company, non-political and has the main objective of developing and supporting beekeeping by improving the knowledge and know how of its members through its own extension services, or through resorting to national or international collaboration. Presently the Association has 200 members from Algarve region, which own a total of 43069 bee colonies, most of them are "Lusitana" and "Reversível" hive models. Approximately 49% of beekeepers from Melgarbe are professionals (over 150 colonies per beekeeper). The Melgarbe beekeepers have on average 215 hives, wich is considerably higher than the national average. It's located in Algarve, the most southern region in mainland Portugal with a land area of 4 996.8 Km^2. It´s delimited in the North with the Alentejo Region, in the West with the Guadiana River, in the South and East with the Atlantic Ocean. This region is a very diverse landscape and it's divided into 3 main areas south to north. The coastal area is known as the "litoral" and where most of the touristic activity is situated, the "barrocal", in the middle,is the agricultural land. The densely wooded hills separating the Algarve from the Alentejo are known as the "Serra". The terms "Barlavento" and "Sotavento" describing different areas of the Algarve - these are simply western Algarve and eastern Algarve.Honey is the main direct product of the national beekeeping with its internal use mainly intended for human consumption. The industrial use of this product, especially directed to the food industry and to a lesser extent the pharmaceutical industry takes in Portugal residual values. (1)

National production of honey, from 2008, has been presenting an increasing trend, taking the regional production accompanied this development. From 2010, there was an increase in the export of honey to European Union and "third" countries, with the exception of 2012, in which there has been an inversion in this situation solely at European level. Such a situation may have resulted from atypical year in climate terms: abnormally low temperatures in spring, drought and the fires that occurred in the summer of 2012, negatively affecting production at the national level and especially at the level of the Algarve region Relative to average prices in intra-trade relations, it appears that the exports are higher reflecting the appreciation of the national monofloral honey which is dominant in this transaction. (1)

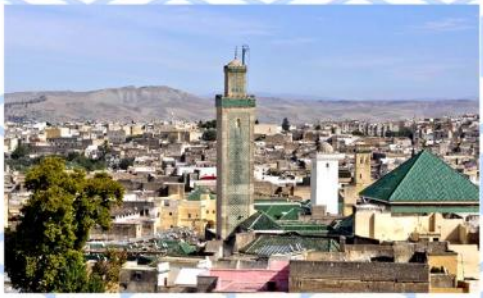
In general, the difficulties experienced in the Algarve are the same as the national level, apiaries with effective low productivity, lack of skilled labor, deficiencies at the level of health management a poor technical management, poor concentration supply, bulk sales as the most frequent form of transaction, lack of strategic planning and insufficient market knowledge, etc.

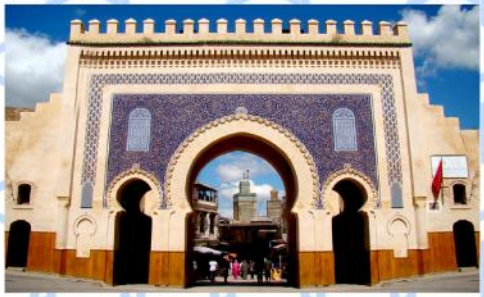
With regard to technical management stands out a scarce resource artificial feeding, insufficient replacement queens, lack of control of swarming, and improper installation of the apiaries.

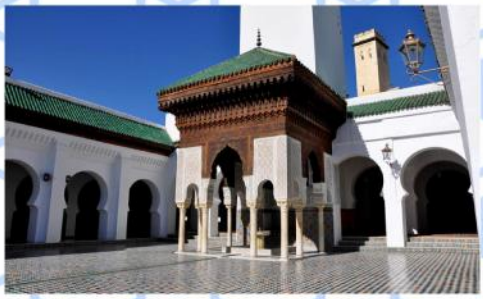
However this situation tends to change once in recent years many young people from different economic areas, with different know-how and openness to innovation, have been investing in beekeeping, which will contribute to an increased professionalization of the sector. It aims to increase and diversifying the production of other products such as pollen, bee bread, royal jelly, propolis and bee venom. The latter with great application in apitherapy is undoubtedly an area with great potential

for development in the Melgarve is interested to invest. On the other hand it is necessary to concentrate the processing and supply of bee products, as well as improve the management and apiculture health.

References:
[1] Programa Apícola Nacional 2014-2016, Gabinete de Planeamento e Políticas (2013)
[2] Direção Geral de Alimentação e Veterinária







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