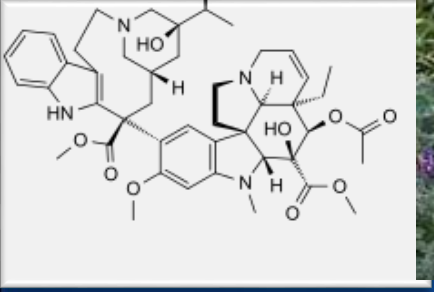


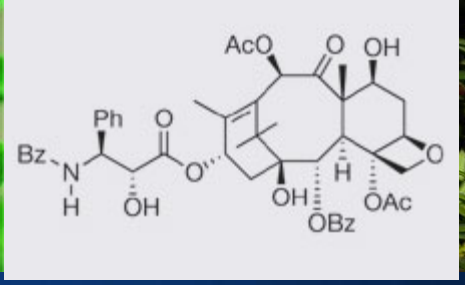
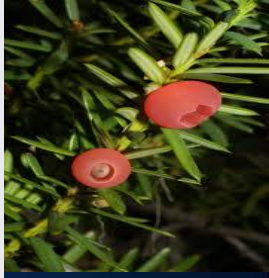

COMSATS' International Thematic Research Group on Natural Products Sciences

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- Importance of research on Natural Products Sciences.
- Previous activities of ITRG on Natural Products Sciences.
- Activities of ITRG during 2016-2017.
- Future plans

Importance of Natural Products in Health and Economy

- Natural products are used by various human civilization since ancient time.
- Discovery of many drugs from traditional medicinal plants.
- For 85% of the world's population, plant materials are a primary source of health care.
- Less than 10% of the world's biodiversity has been evaluated for potential biological activity, many more useful natural lead compounds await discovery.

Importance of Natural Products in Health and Economy

- **An enormous impact on the economy and our societies, and this trend is largely increasing during the last four decades.**

- **The global herbal products/botanicals market is over US$ 100 billion, and expected to grow rapidly due to safe profile and consumer preferences for natural product based medicines.**

- **Research projects focusing on sustainable use of natural products can have strong impact on human wellbeing.**

Importance of Natural Products in Health and Economy

Natural Products have uses in several major areas to human health and economy:

- **Foodstuffs,**
- **Flavoring agents and spices,**
- **Perfumes and cosmetics, and**
- **Pharmaceutical and biological agents**

Sustainable utilization of natural leads to significant commercial perspective to:

- **Global pharmaceutical companies,**
- **biotechnology companies,**
- **Botanical supplement companies,**
- **Food industry**

Foundation of COMSATS' International Thematic Research Group on Natural Products Sciences

COMSATS' International Thematic Group on Natural Products Sciences was launched during the Foundation meeting at the ICCBS on 26th November, 2010 through a Memorandum of Understanding signed by several COMSATS countries

COMSATS' International Thematic Research Group on Natural Products Sciences

- Promotion of research collaboration among the members.
- Joint research projects.
- Exchange of students, technicians and senior professionals.
- Organization of regular events, such as workshops, training courses,
- Sharing of expertise and lab resources.

COMSATS' International Thematic Research Group on Natural Products Sciences

ICCBS is the designated Lead Centre for this thematic research group.

During the foundation meeting, five collaborating institutions were selected as its members

- National Research Centre (Egypt);
- Industrial Research and Consultancy Centre (Sudan);
- Tanzania Industrial Research and Development Organization (Tanzania);
- Royal Scientific Society (Jordan)
- Iranian Research Organization for Science & Technology (Iran).

COMSATS' International Thematic Research Group on Natural Products Sciences

Nineteen participants from eight countries, Bangladesh, Egypt, Iran, Jordan, Nigeria, Pakistan, Sudan, Turkey, attended the meeting.

Other participating institutions of the meeting included:

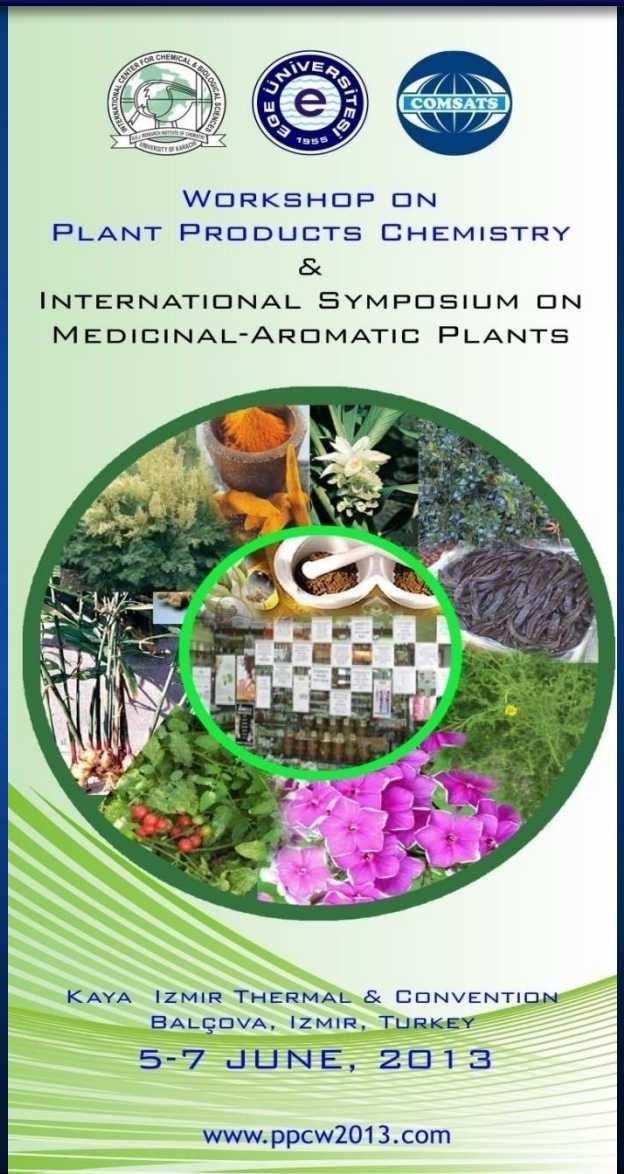
- Department of Science Laboratory Technology of the Federal Polytechnic (Nigeria)
- Institute of Fundamental Studies (Sri Lanka)
- Department of Biochemistry and Molecular Biology, University of Dhaka
- Department of Biology, Ege University (Turkey)
- Lorestan University of Medical Sciences (Iran)

COMSATS' International Thematic Research Group on Natural Products Sciences

Training of Technician under the Program of COMSATS Thematic Group on Natural Products Sciences.

COMSATS' International Thematic Research Group on Natural Products Sciences

- An international workshop entitled, "Plant Products Chemistry" and International Symposium on Medicinal-Aromatic Plants", during 3-7 June 2013, was organized by COMSATS Thematic Group on Natural Products Sciences, Ege University, Izmir, Turkey, and International Center for Chemical and Biological Sciences.



Second Meeting of COMSATS Thematic Group on Natural Products Sciences in Izmir, Turkey June 06, 2013

The second meeting of ITRG was conducted under the leadership of Prof. M. Iqbal Choudhary.

Several new members from different countries were introduced during the meeting with the objective

- **to expand the group over several countries.**
- **to review the group activities.**
- **to strategize the future plans for group activities.**

International Seminar / Workshop
January 20-23, 2014 in IROST Complex, Tehran, Iran

IROST, in collaboration with ICCBS and COMSATS, organized an "International Seminar/Workshop cum Exhibition on Sustainable Utilization of Natural Products for Human Health and Well Being"

Workshop was attended by more than 70 students and researchers from various institutions and industries of Tehran. Four resource persons from Pakistan and Malaysia were invited.

International Seminar / Workshop
January 20-23, 2014 in IROST Complex, Tehran, Iran

This workshop covered different topics such as ethnobotany, natural product chemistry, pharmacology, bioassay techniques used in drug discovery, clinical trials, and commercialization which contribute to a better involvement of natural products in human health and well being.

JOINT RESEARCH PROJECT
Drug Discovery from Nature for Neglected Diseases

Initiated by
COMSATS THEMATIC GROUP
ON NATURAL PRODUCTS SCIENCES

GROUP LEADER
Prof. Dr. M. Iqbal Choudhary *H. I., S. I., T. I.*
Director, ICCBS

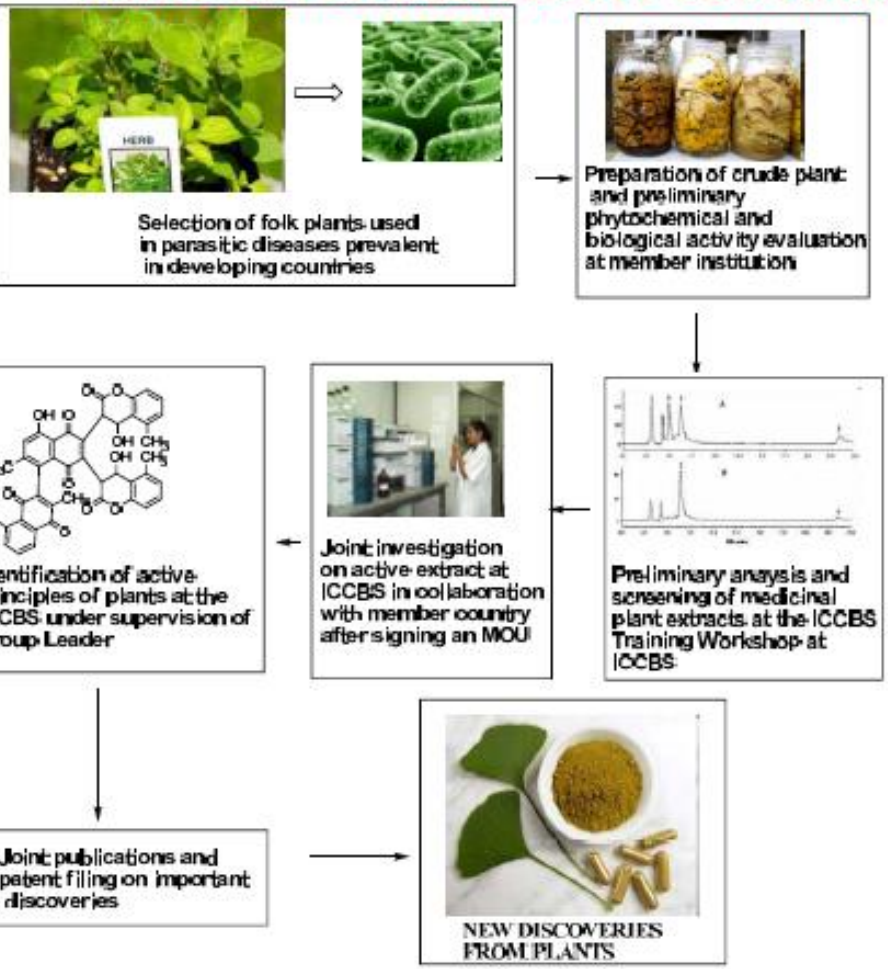
During the conferences and seminars, COMSATS Thematic Group members from Sudan, Egypt, Nigeria, SriLanka, Malaysia, Indonesia and Pakistan committed to participate in joint research proposal entitled, "Drug Discovery from Nature for Neglected Diseases".

OBJECTIVES:

- To explore the wealth of medicinal plants of developing countries for the discovery new bioactive compounds against parasitic diseases .
- To develop a strategy to become self-sufficient in their health needs.
- To develop research collaboration in COMSATS member countries in the field of natural products sciences by addressing common health problems.
- To train highly qualified human resources in the field of natural products-based drug discovery to combat tropical diseases in this region.

COMSATS' International Thematic Research Group on Natural Products Sciences

JOINT INVESTIGATIONS ON MEDICINAL PLANTS IN SEARCH OF NEW REMEDIES FOR DEVELOPING COUNTRIES



JOINT RESEARCH PROJECT
Drug Discovery from Nature for Neglected Diseases

LIST OF PLANTS SELECTED FOR JOINT PROJECT

Research teams from member countries (Turkey, Sudan, Egypt, Nigeria) complied information on medicinal plants which are traditionally used in parasitic and infectious diseases prevalent in their countries. The research team from Nigeria compiled a list of over 100 medicinal plants for this project.

Prof. Abdullahi Mann
Department of Science
Laboratory Technology,
The Federal Polytechnic, Bida,
PMB 55, Bida, Niger State,
Nigeria

JOINT RESEARCH PROJECT
Drug Discovery from Nature for Neglected Diseases

LIST OF PLANTS SELECTED FOR JOINT PROJECT

Research teams from Sudan, complied information on medicinal plants which are traditionally used in parasitic and infectious diseases and they sent us the final list of 22 medicinal plants.

Dr. Waleed S. Koko
Head, Dept. Microbiology and Parasitology
Medicinal and Aromatic Plants Research Institute,
National Centre for Research P. O. Box 2404
Khartoum Sudan.

Joint Research project

LIST OF PLANTS SELECTED FOR JOINT PROJECT

The research team from Egypt (Dr. Mahmoud I. Mostafa Nassar National Research Centre) . Dr. Nassar finalized a list of 37 medicinal plants used in parasitic diseases in Egypt.

Prof. Dr. Azhari Mohamed Elbadaw collected information about the medicinal plants from Sudan which were planned to be investigated during this joint project.

Dr. Fatma Zerrin (Turkey) compiled a list of 37 herbal plants to be investigated.

Joint Research project

In 2014 we finalized the list of plants for the joint project, all participating institutions showed great interest, and committed to execute the joint proposed project as per plan but due to lack of funds available for initial phase of project, no significant progress could be made.

It is now proposed that joint projects between ICCBS and interested member institution should be carried out as ICCBS and Kazakhstan Universities has initiated.

During May 2016 to April 2017, visitors from Turkey, Iran, and Nigeria , Kazakhstan, received training in medicinal plant research at the ICCBS, Pakistan. Several scientists visited the ICCBS for medicinal plant research under different scholarship programs.

Osahon Kennedy OGBEIDE
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Kissinger O. ORUMWENSODIA
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Faculty of Life Sciences
University of Benin, Nigeria
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Scholars visited the ICCBS for different research projects 2016.

Ekpeno Josiah
Organic Synthesis
University of Ibadan, Nigeria

Ms. Fatma Ayaz
Gazi University
Faculty of Pharmacy,
Department of Pharmacognosy
06330 Etiler-Ankara, Turkey

Ms. Mahdiealsadat Hosseyni Moghadam
Shahid Beheshti,
University of Medical Sciences
Tehran, Iran

Schloars visited the ICCBS for medicinal plant research during 2016.

Ms. Aseemova Meirkhan
71Kazakh State National University
A-Farabi Avenue
Almaty 480078
Kazakhstan

Ibanga Okon Isaac
Organic Synthesis
Akwa Ibom State University, Nigeria

Akinsola Adegboye, Akande
Department of Chemistry
University of Ibadan, Oyo Nigeria

COMSATS SPONSORED PARTICIPANTS OF THE 14TH EURASIA CONFERENCE, DECEMBER 15 - 18, 2016

Prof. Dr. Cheng-Yong Su
Professor,
Lehn Institute of Functional Materials (LIFM)
School of Chemistry & Chemical Engineering
Sun Yat-Sen University,
Guangzhou 510275,
China

Coordination assembly of Metal Organic Cages (MOC s) materials incorporating functional sites or groups

COMSATS SPONSORED PARTICIPANTS OF THE 14TH EURASIA CONFERENCE, DECEMBER 15 - 18, 2016

Prof. Dr. Lalith Jayasinghe
Senior Research Professor,
Project Leader; Natural Products,
Institute of Fundamental Studies,
Hantana Road,Kandy,
Sri Lanka
Mob: 94-71-8668994
Email: ulbj2003@yahoo.com

Fungi Associated with Medicinal Plants as a Promising Source of Bioactive Compounds

COMSATS SPONSORED PARTICIPANTS OF THE 14TH EURASIA CONFERENCE, DECEMBER 15 - 18, 2016

ANTI-INFLAMMATORY EFFECTS IN ROS OF EXTRACTS FROM *VERBASCUM MARSCHALLIANUM*

M. M. Nykmukanova, [1] B.K. Yeskaliyeva, [1]G.Sh. Burasheva, [2] M. I. Choudhary

[1]Al-Farabi Kazakh National University, Almaty, Kazakhstan
[2] H.E.J. Research Institute of Chemistry, University of Karachi, Karachi-75270, Pakistan

ANTI-INFLAMMATORY EFFECTS OF EXTRACTS FROM *VERBASCUM MARSCHALLIANUM*

M. M. Nykmukanova

- Antiinflammatory activity and phytochemical analysis of various extracts of *Verbascum mar schallianum*.

- The anti-inflammatory activity of various extracts from V. *marschallianum* was determined with Oxidative Burst Assay.

ANTIINFLAMMATORY EFFECTS IN ROS OF EXTRACTS FROM *VERBASCUM MARSCHALLIANUM*

M. M. Nykmukanova

According to her study, extracts of V. *marschallianum* contained glycosides, flavonoids, saponins and phenolic compounds which may be responsible for the substantial anti-inflammatory activity.

The ethanolic (IC_{50} = 25.3±1.6), ethyl acetate (IC_{50} =16.7±5.1) and dichlormethane (IC_{50} = 20.3±2.9) extracts showed moderately anti-inflammatory activity.

Hexane and *n*-butanol extracts were inactive. Standard used for the assay is Ibuprofen IC_{50} = 11.2 ± 1.9).

ANTIINFLAMMATORY EFFECTS IN ROS OF EXTRACTS FROM *VERBASCUM MARSCHALLIANUM*

M. M. Nykmukanova

The major compound - luteolin was obtained by a recycling preparative HPLC system (LC-908W), using a ODS M-80 column with water:methanol 90:10 isocratic elution. Luteolin was obtained with a purity degree of >97%

.

Structural identity was confirmed by comparison of analytical data (1D and 2D NMR, IR, UV and mass-spectrometry).

ANTIINFLAMMATORY EFFECTS IN ROS OF EXTRACTS FROM *VERBASCUM MARSCHALLIANUM*

M. M. Nykmukanova

The luteolin was screened to study the anti-inflammatory activity and it showed good anti-inflammatory activity (IC_{50} = 8.2± 1.6) compared to the standard inhibitor Ibuprofen.

The study established the value of plants used in traditional medicine, which could be of considerable interest to the development of new drugs.

BIOASSAY-GUIDED ISOLATION OFANTIDIABETIC COMPOUND FROM *CLIMACOPTERA*

G. A. Seitimova[1*], B. K. Yeskaliyeva[1], G. Sh. Burasheva[1], M. I. Choudhary[2]

[1]Al-Farabi Kazakh National University, Faculty of Chemistry and Chemical Technology, Almaty, Kazakhstan
[2]H.E.J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan

BIOASSAY-GUIDED ISOLATION OFANTIDIABETIC COMPOUND FROM *CLIMACOPTERA*

G. A. Seitimova[1*], B. K. Yeskaliyeva[1], G. Sh. Burasheva[1], M. I. Choudhary[2]

Plants from genus *Climacoptera* have been previously reported to possess a wide variety of pharmacological activities including antifungal, antibacterial, antioxidant, and immunomodulatory.

In her study, it was evaluated the anti-diabetic potential of extracts from *Climacoptera obtusifolia* via protein tyrosine phosphatase 1B (PTP1B) and advanced glycation end products (AGE) formation inhibitory-assays.

BIOASSAY-GUIDED ISOLATION OFANTIDIABETIC COMPOUND FROM *CLIMACOPTERA*

G. A. Seitimova[1*], B. K. Yeskaliyeva[1], G. Sh. Burasheva[1], M. I. Choudhary[2]

Air-dried and finely powdered aerial parts of the plant ***Climacoptera obtusifolia***, which belongs to the halophytes were collected from saline soils at South Kazakhstan region, were exhaustively extracted with ethanol (80%).

The ethanolic *extract* was *successively* partitioned *using solvents* of gradient polarities: *n-hexane*, *ethylacetate*, *n-butanol.*

BIOASSAY-GUIDED ISOLATION OFANTIDIABETIC COMPOUND FROM *CLIMACOPTERA*

G. A. Seitimova[1*], B.K.Yeskaliyeva[1], G.Sh.Burasheva[1], M. I. Choudhary[2]

All tested extracts showed significant potent inhibitory activity on PTP1B; but the butanol fraction of *Climacoptera obtusifolia* is the most potent fraction with an IC_{50} value of 1.53 µg/mL.

At the same time, all extracts were subjected to *in vitro* screening against glycation of bovine serum albumin (BSA).

A bioassay-guided fractionation technique was used for identifying the principal active component. Four fractions from *n*-BuOH extract exhibited relatively higher activity against BSA antiglycation (antidiabetic) model (IC_{50} = 0.27–0.73 mg/mL), obtained at different polarities.

BIOASSAY-GUIDED ISOLATION OF ANTIDIABETIC COMPOUND FROM *CLIMACOPTERA*

G. A. Seitimova[1*], B. K.Y eskaliyeva[1], G. S h. Burasheva[1], M. I. Choudhary[2]

- **To isolate pure compounds from these active fractions, Sephadex LH-20 column chromatography and HPLC were used.**

- **Thus, three tamarixetin glycosides were isolated. Structures of isolated polyphenols were elucidated by modern spectral techniques.**

- **By using antiglycation (antidiabetic) activity -guided fractionation, bioactive compound was isolated from the *n*-BuOH extract of aerial parts of *Climacoptera obtusifolia* and subsequently identified tamarixetin glycoside.**

Name of Scholar: Kissinger Obagogei Orumwensodia Nigeria

Duration of Ph.D. Study: December 2016-May 23 2017.

Worked on three medicinal plants of Nigeria. *Alstonia boonei* (stem bark), *Spondias mombin* (Stem Bark), *Nauclea latifolia*.

Worked on in-vivo antiplasmodial studies:

Optimization of process of antimalarial assay,

results activity order EA>HE>EM>M

Name of Scholar: Osahon Kennedy, OGBEIDE
Nigeria
Duration of Ph.D. Study: November 24, 2016-May 23 2017.

Bioassay-guided isolation work on three medicinal plants of Nigeria. *Caesalpinia pulcherrima for antimalarial consituents of this plant*

He learnt techniques used in Medicinal plant research, HPLC purification and structure elucidation of Eight (8) different natural products

Name of Scholar: Osahon Kennedy, OGBEIDE
Nigeria
Duration of Ph.D. Study: November 24, 2016-May 23 2017.

Bioassay-guided isolation work on three medicinal plants of Nigeria. *Caesalpinia pulcherrima for antimalarial consituents of this plant*

Learnt Medicinal plant research, HPLC purification and structure elucidation of Eight (8) compounds

Name of Scholar: Kelly ORIAKHI
Country Name: Nigeria
Duration of Ph.D. Study: 2016- 2017

Activity Guided Isolation and Characterization of hepatoprotective Compound(s) from some Nigerian Medicinal Plants.

Methanol extract of *Tetracarpidium conophorum* had hepatoprotective effect in rats' induced liver damage.

This research was directed to isolate the active principles from seed, stem bark and root bark *T. conophorum* plants.

Future Plan

- Project proposal (PC-1) will be submitted to the Government of Pakistan for funding for Thematic Group
- Next Thematic Group meeting in Pakistan 2018.
- COMSATS will be requested to help in the mobility to scientists between partner institutions.

Thank you for your atention