



COMSATS' International Thematic Research Group on Natural Products Sciences



Presented by
Farzana Shaheen and M. Iqbal Choudhary
International Center for Chemical and Biological Sciences,
University of Karachi
Karachi-75270, Pakistan

17th MEETING OF COMSATS COORDINATING COUNCIL
Hosted by
Iranian Research Organization for Science & Technology (IROST), Tehran,
19-20 May 2014

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COMSATS' ITRG on Natural Products Sciences

- Natural products are secondary metabolites (e.g. alkaloids, coumarins, flavonoids, lignans, steroids and terpenoids) isolated from plants, animals or micro-organisms.
- The use of natural products, especially plants, as medicines is ancient and universal.
- According to WHO, about 88 per cent of the world's population, rely mainly on traditional medicine for their primary health care.

Why Joint Efforts are required in Natural Product based Drug Discovery

- **Neglected tropical diseases, such as leishmaniasis, malaria, dengue are more prevalent in developing countries. affecting approximately 1 billion people in the world**
- **Developing countries are rich in medical plants which have been used by folk people for the treatment of various diseases.**
- **Effective, safe, and affordable modern medicines are not available to poor population living the developing world.**
- **For example the cost of newer antimalarial drugs is unaffordable sometimes unavailable to local population where malaria is endemic.**

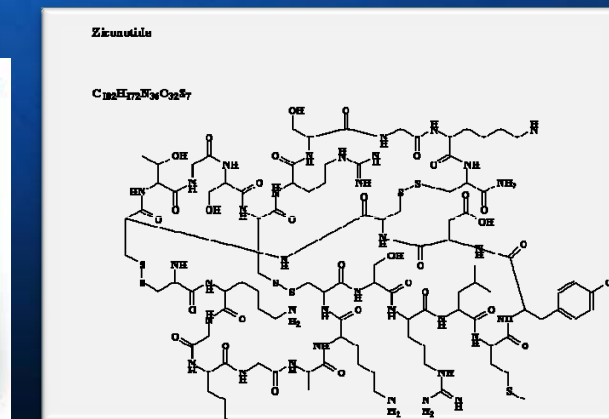
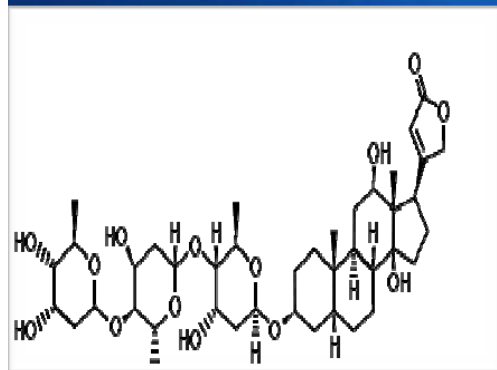
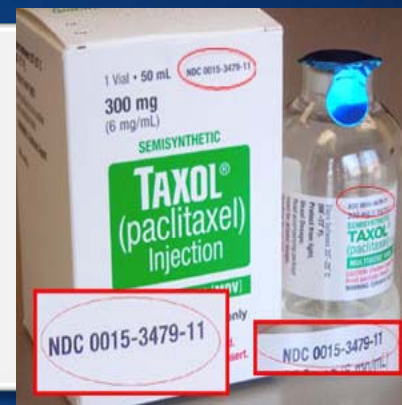
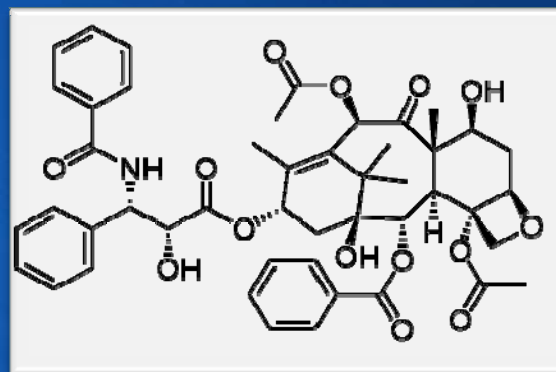
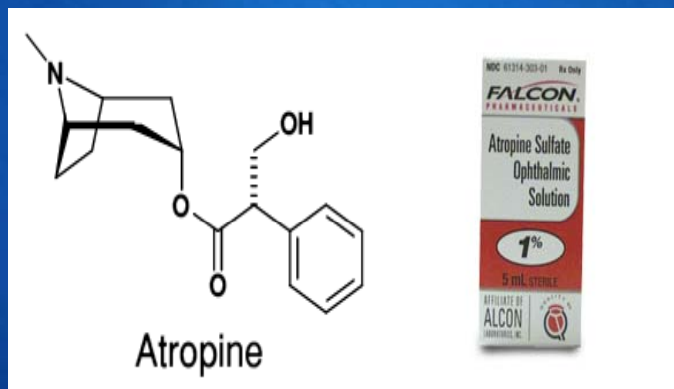
COMSATS' ITRG on Natural Products Sciences

- In modern drug discovery and development processes, natural products play an important role at the early stage of **'lead' discovery**, i.e. discovery of the active natural molecule, which itself or its structural analogues could be an ideal drug.
- Over the last century, a number of top selling drugs have been developed from natural products.



Natural Product based Drug Discovery

- Atropine obtained from *Atropa belladonna*,
- *Strychnine* a CNS stimulant,
- Ziconotide identified from a cone snail, *Conus magus*, (non- NSAID analgesic drug)
- Taxol® obtained from the bark of the Pacific yew tree



Why Joint Efforts are required in Natural Product based Drug Discovery

- Collaborative research on traditional plants and validation of potentially useful natural products for diseases should be carried out in order to achieve self reliance .
- There is strong need of training of manpower in the key aspects of natural product research and its applications to make drug discovery programs stronger in developing countries.

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

Under the leadership of Director ICCBS, Prof. M. Iqbal Choudhary, *H.I., S.I., T.I.*, 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 Objectives

- To promote research collaboration among the members.
- To plan joint research projects.
- To train students, technicians and senior professionals.
- To organize regular events, such as workshops, training courses.
- To share expertise and lab resources.

COMSATS' ITRG ON Natural Products Sciences

Members Present at the Foundation Meeting



Members of COMSATS' ITRG 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).**

Members of COMSATS' ITRG on Natural Products Sciences

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

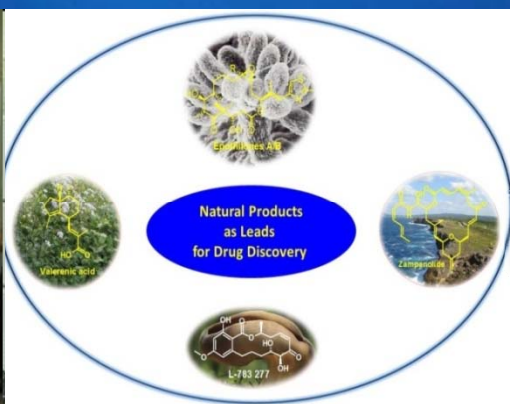
Other participating institutions of the meeting included:

- 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' ITRG on Natural Products Sciences

COMSATS
Member
Countries

Main Activities
Capacity Building and Joint Research Project



COMSATS' ITRG on Natural Products Sciences

Training of technician and Researchers

Dr. Cenk Durmućkahya,
(Assistant Professor, Celal Bayar
University) visited ICCBS, during
13-30 January 2014, as an
academic visitor under COMSATS
Thematic Group program.

He received training in natural
product research



COMSATS' ITRG on Natural Products Sciences

Workshops and Conferences

- 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, University of Karachi, Pakistan.

- <http://www.ppcw2013.com>



COMSATS' International Thematic Research Group on Natural Products Sciences

Topics

- Phytotherapy
- Pharmacognosy and Phytochemistry
- Medicinal-Aromatic Plants (MAP) and Food Industries
- Environment & MAP Systems, Sustainable Use
- Horticulture of Medicinal Plants Production and manufacturing systems
- Basic Research
- Good Practices of Traditional Healing
- Marketing Systems - Opportunities and Challenges

COMSATS' International Thematic Research Group on Natural Products Sciences

Organisers

Prof. Dr. Fazilet Vardar Sukan
(Dept. of Bioengineering, Ege University, Izmir, Turkey)

Prof. Dr. Munir Ozturk
(Rtd. Prof. of Botany, Ege University, Izmir, Turkey)

Prof. Dr. M. Iqbal Choudhary (H. I., S. I., T. I.)
(Director ICCBS, University of Karachi, Pakistan)

Prof. Dr. Erdal Bedir
(Dept. of Bioengineering, Ege University, Izmir, Turkey)



Second Meeting of COMSATS ' ITRG 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



**Second Meeting of COMSATS ' ITRG on Natural Products
Sciences in Izmir, Turkey, June 06, 2013
Objectives**

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

Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Agenda

**Strategy for Instrument Sharing
Program for member institution**

**Strategy for Bioassay Screening
Program for member institution**

**Screening of Plant Extracts in
Antimicrobial and antiparasitic
Assays in order to discover new
lead compounds against infections**

**Program for Training Visits
(Scientists and Technicians)**



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Makhloufi Ahmed
University of Bechar,
Algeria

Dr. Nazli Boke Sarikohya
Ege University, Faculty of Science,
Chemistry Department, Bornovo, Izmir,
Turkey

Dr. Nurgul Sultanova
Al-Farabi Kazakh National University
Chemistry and Chemical Technology
Faculty, Al-Farabi 71, Almaty
Kazakhstan



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Shynar Zhumogolyieca
Alfarabi Kazakh National University
Chemistry and Chemical Technology
Faculty Alfarabi 71, Almaty
Kazakhstan

Dr. Moses Zaruwa
Adamana State University
P.M. B 25, Molzi, Adamawa State
Nigeria

Dr. Amir Reza Jassibi
Medicinal and Natural Products
Chemistry Research Center,
Sheraz University of Medical Sciences,
shiraz
Iran



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Cenk Durmuskahya,
Celal Bayar University Biology
Department, Manisa
Turkey

Dr. Waleed S. Koko
Medicinal and Aromatic Plants
Research Institute, National Center for
Research, Khartoum, Sudan

Dr. Jamal Mesogi
Department of Pharmacognosy and
Medicinal Plant, Faculty of Pharmacy
University of Tripoli
Libya
Dr. Boulonouar Ali
University of Buchar
Algeria



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Benlarbi Lorbi
University of Bechar
Department of Science and Technology
Algeria

Dr. Basile-Jimmy Djimtomvaye
Ege University
Department of Chemistry
Turkey

Prof. Dr. Mahmoud I. Mostafa Nassar,
Pharmaceutical Industries Division,
National Research Centre (NRC),
Egypt
Prof. Dr. Latifa K. Darusman
Biopharmaca Research Center, Bogan
Agricultural University
Indonesia



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Mehmood Reza Moen
Associate Professor of Pharmacognosy,
School of Pharmacy Sheraz University
of Medical Sciences
Shiraz, Iran

Prof. Dr. Suheylyla Kırmızıgül, Ege
University, Faculty of Science
Turkey.



Second Meeting of COMSATS ' ITRG on Natural Products Sciences in Izmir, Turkey, June 06, 2013

Dr. Asma Bettaiev
National Agronomic Institute of Tunisia
Tunisia

Dr. Moufiola Oveslati
University of Science Mathematics and
Physics of Tunis
Tunisia



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

- IROST, ICCBS and COMSATS, jointly organized an “International Seminar/Workshop cum Exhibition on Sustainable Utilization of Natural Products for Human Health and Well Being”
- attended by several 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

Topics

Ethnobotany, natural product chemistry, pharmacology, bioassay techniques used in drug discovery, latest approaches of drug discovery based on natural products for the human health and well being.



International Seminar / Workshop

January 20-23, 2014 in IROST Complex, Tehran, Iran

MoU was signed in a signature ceremony, between IROST and International Center for Chemical and Biological Sciences (International Center for Chemical and Biological Sciences), University of Karachi, Karachi, Pakistan”.



Activities of COMSATS' ITRG on Natural Products Sciences

JOINT RESEARCH PROJECT

JOINT RESEARCH PROJECT

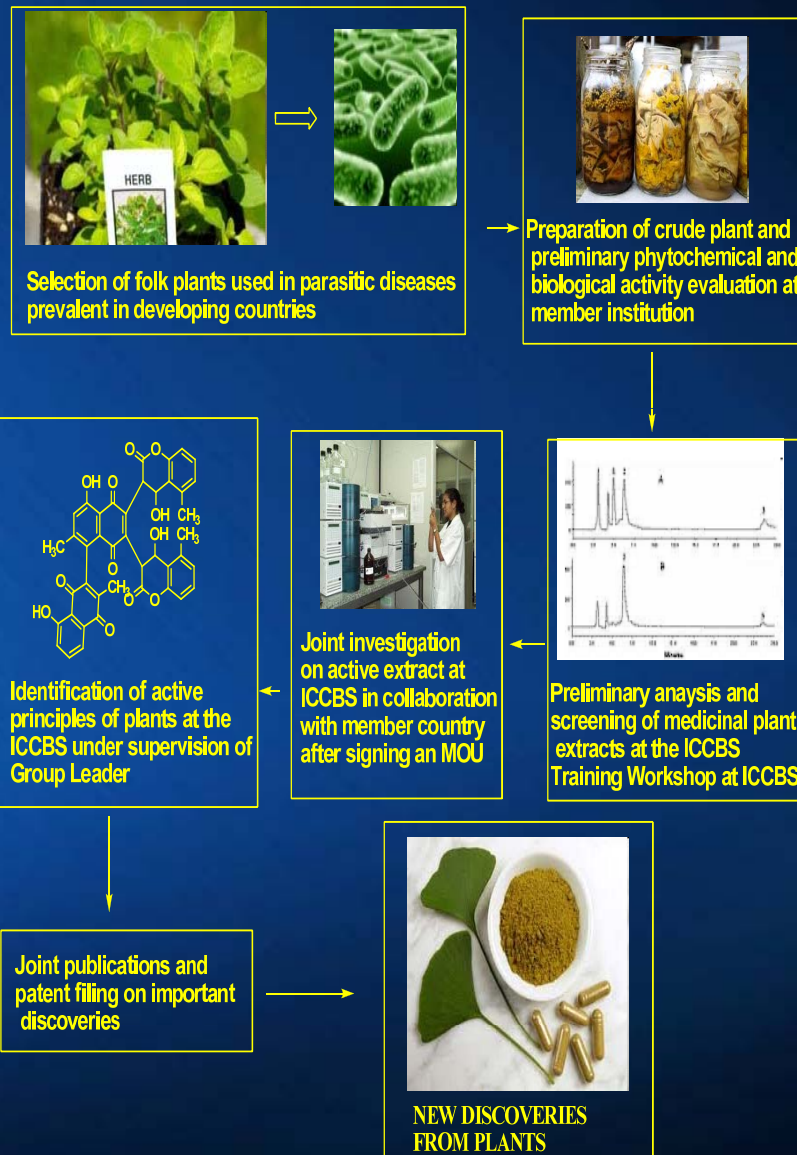
Drug Discovery from Nature for Neglected Diseases

Initiated by
**COMSATS THEMATIC GROUP
ON NATURAL PRODUCTS SCIENCES**

GROUP LEADER

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

Group members from Turkey, Sudan, Egypt, Nigeria, SriLanka, Malaysia, Indonesia and Pakistan have participated in joint research proposal entitled, "Drug Discovery from Nature for Neglected Diseases".



Members actively participating in the group.

Dr. Mahmoud I. Mostafa Nassar
National Research Centre, Dokki,
Cairo, Egypt.
Email: mnassar_eg@yahoo.com

Dr. Waleed S. Koko
Medicinal and Aromatic Plants
Reserach Institute, National Center
for Research, Khartoum
Sudan
Email: wasyko-2002@yahoo.com

Prof. Dr. Azhari Mohamed Elbadawi
Director General, Industrial
Research and Consultancy Centre
COMSATS Recognised Centre of
Excellence
P O Box 268, Khartoum, Sudan
Email: azharielbadawi@hotmail.com

Prof. Abdullahi Mann
Department of Science
Laboratory Technology,
The Federal Polytechnic, Bida,
PMB 55, Bida, Niger State,
Email: abdumann@yahoo.com

Dr. Cenk Durmuskahya,
Celal Bayar University Biology
Department, Manisa
Turkey,
Email: cdkahya@gmail.com

Members actively participating in the group.

Prof. Munir Ozturk

Department of Biology,
Faculty of Science,
Ege University,
Bornova, 35100-Izmir,
Tel: +90-535- 309 8104
Email: munirozturk@gmail.com

Dr. Farzana Shaheen

International Center for
Chemical and Biological
Sciences
University of Karachi, Karachi,
Pakistan

Prof. Dr. M. Iqbal Choudhary H.I., S.I., T.I.

Director,
International Center for Chemical and
Biological Sciences
University of Karachi, Karachi,
Pakistan

Dr. Atia-tul-Wahab

International Center for Chemical and
Biological Sciences
University of Karachi, Karachi,
Pakistan

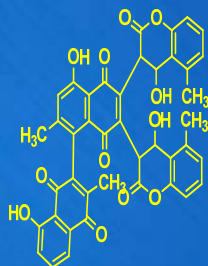
JOINT RESEARCH PROJECT



Selection of folk plants used in parasitic diseases prevalent in developing countries



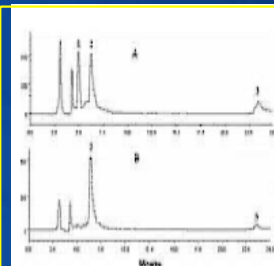
- Preparation of crude plant and preliminary phytochemical and biological activity evaluation at member institution



Identification of active principles of plants at the ICCBS under supervision of Group Leader



**Joint investigation
on active extract at
ICCBS in collaboration
with member country
after signing an MOU**



Preliminary analysis and screening of medicinal plant extracts at the ICCBS Training Workshop at ICCBS

Joint publications and patent filing on important discoveries



NEW DISCOVERIES

JOINT RESEARCH PROJECT

Drug Discovery from Nature for Neglected Diseases

Collaborative Work of Members from Sudan With ICCBS

Dr. Waleed Koko research group from Medicinal and Aromatic Plants Research Institute (MAPR), Sudan, has prepared 32 medicinal plant extracts and submitted to the ICCBS for Biological screenings which is under process.

JOINT RESEARCH PROJECT

Bioassay-guided isolation work on Plants endemic to Turkey.

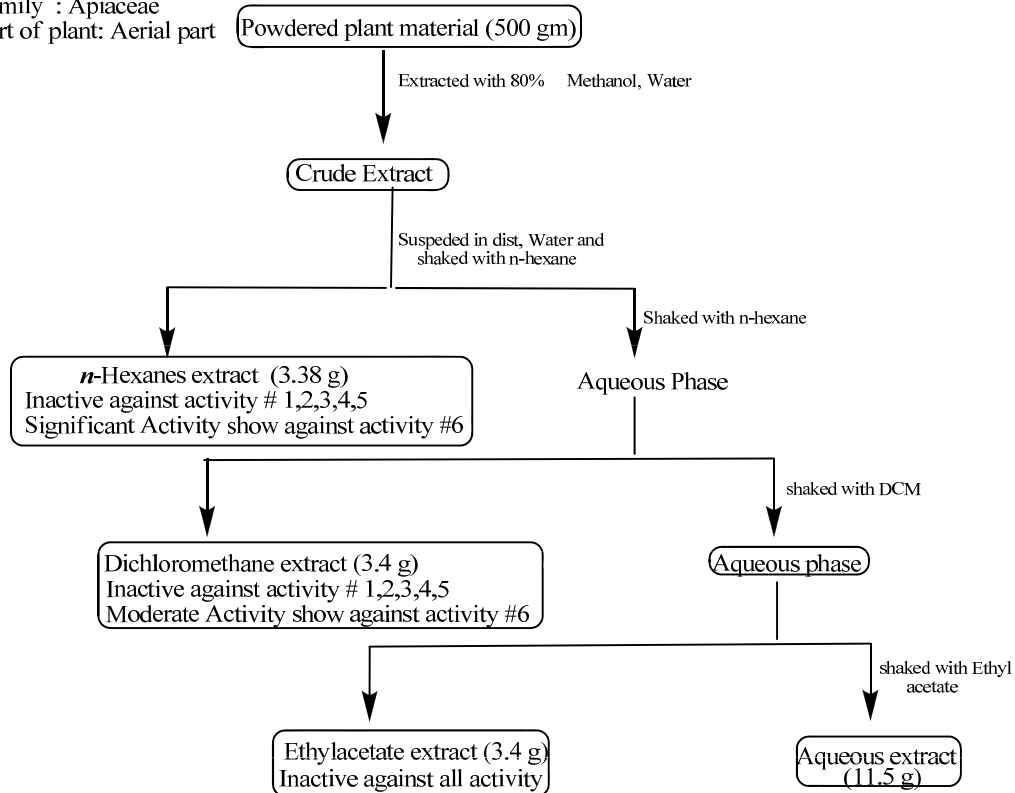
- *Centaurea lydia* (Asteraceae family),
- *Centaurea calolepis* (Asteraceae family),
- *Cirsium sipyleum* (Asteraceae family),
- *Achillea millefolium* subsp. *sipylea* (Asteraceae family),
- *Sideritis sipylea* (Lamiaceae family)
- *Eryngium thorifolium* (Apiaceae family).

Phytochemical work and Biollogicsal Screening of Eryngium thorifolium

Species : *Eryngium thorifolium*

Family : Apiaceae

Part of plant: Aerial part

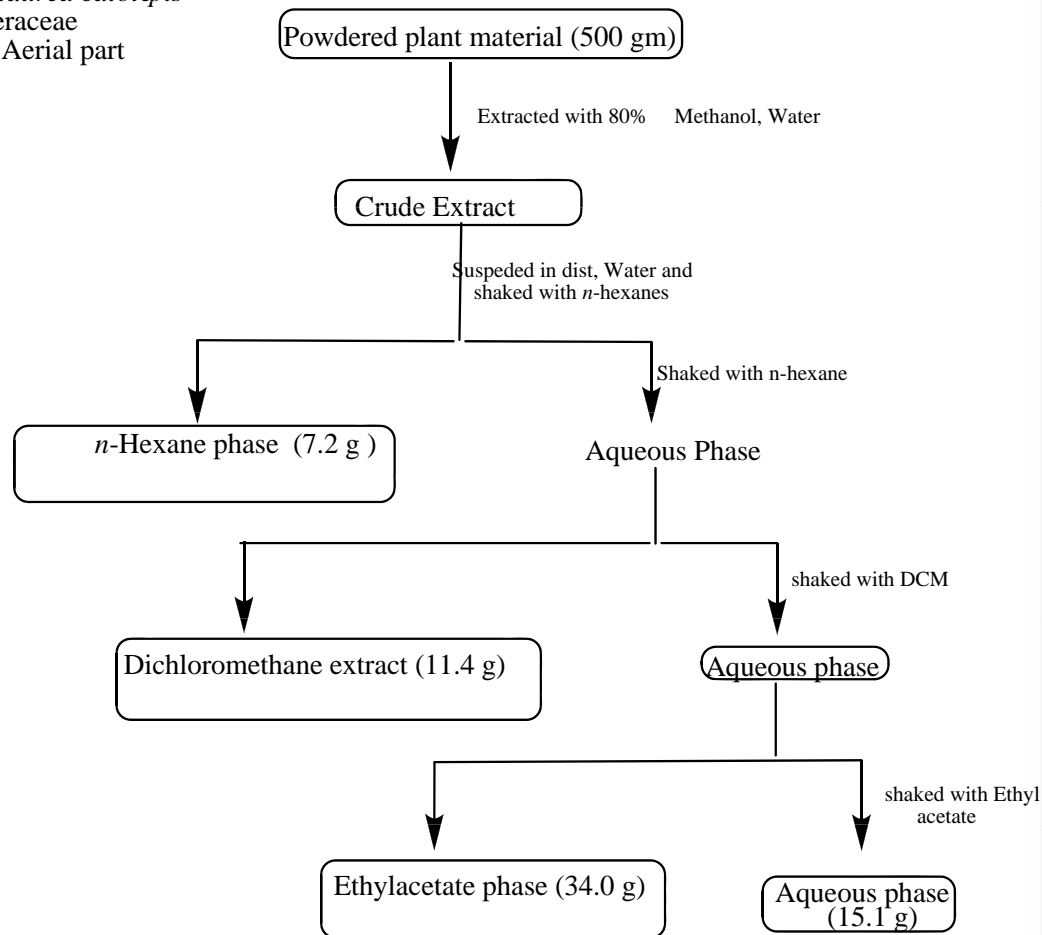


Activity Performed

1. Brine Shrimp (*Artemia salina*) Lethality Bioassay
2. In Vitro Antibacterial Bioassay
3. In Vitro Antifungal Bioassay
4. Insecticidal Activity by Contact Toxicity Method
5. Invitro Phytoxic Bioassay
6. Antilashmenial Activity Bioassay

Phytochemical work and Biollogicsal Screening of Centaurea calolepis

Species : *Centaurea calolepis*
Family : Asteraceae
Part of plant: Aerial part



Activity Performed

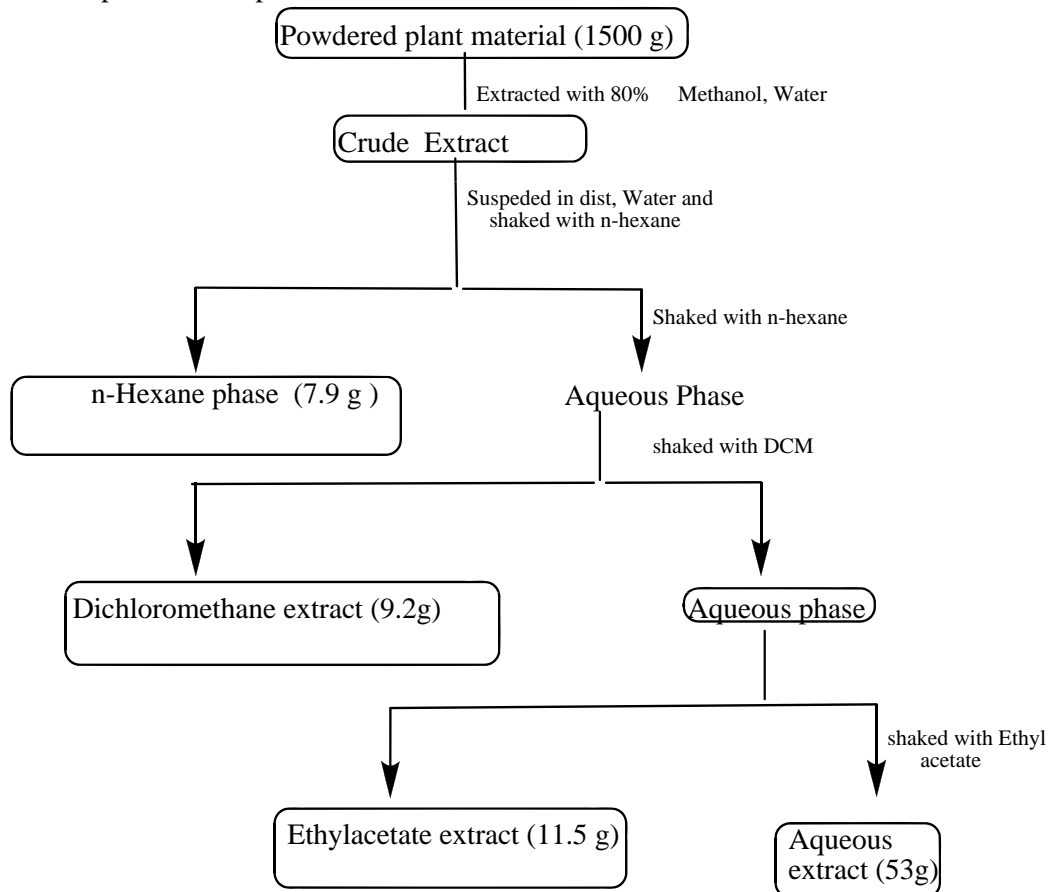
1. Brine Shrimp (*Artemia salina*) Lethality Bioassay
2. In Vitro Antibacterial Bioassay
3. In Vitro Antifungal Bioassay
4. Insecticidal Activity by Contact Toxicity Method
5. Invitro Phytotoxic Bioassay
6. Antilashmenial Activity Bioassay

Phytochemical work and Biological Screening of *Circium sipyleum*

Species : *Circium sipyleum*

Family : Asteraceae

Part of plant: Aerial part



Activity Performed

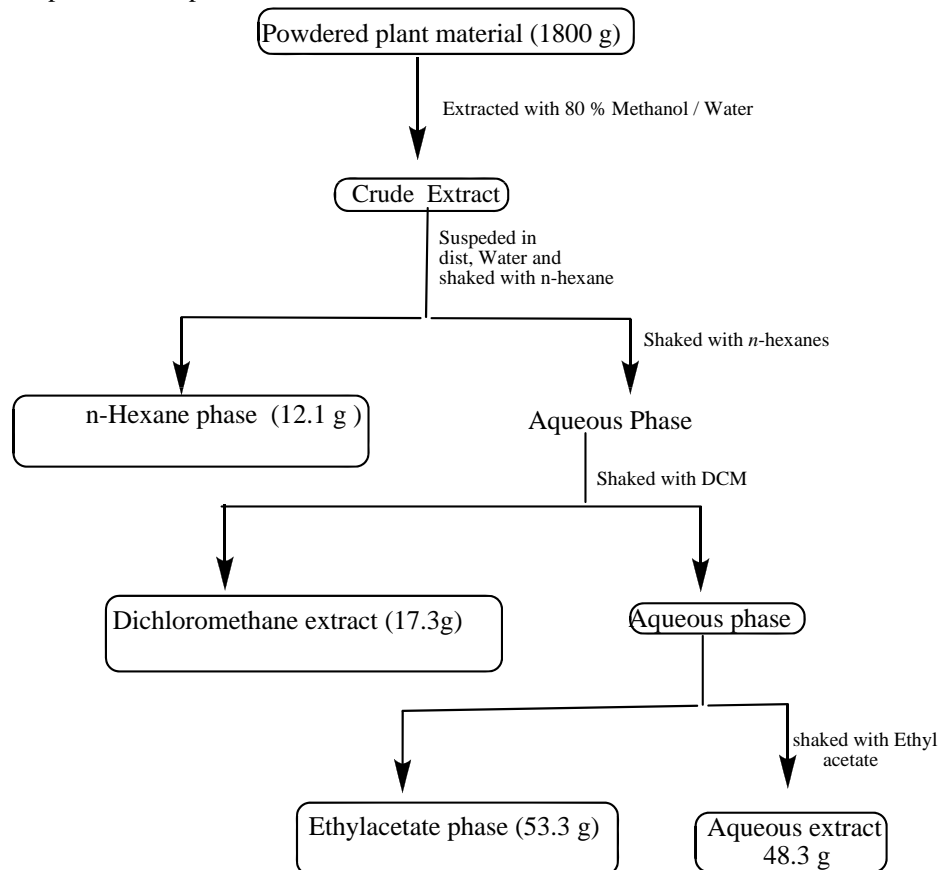
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3. In Vitro Antifungal Bioassay
4. Insecticidal Activity by Contact Toxicity Method
5. Invitro Phytoxic Bioassay
6. Antilashmenial Activity Bioassay

Phytochemical work and Biological Screening of *Achillea millefolium*

Species : *Achillea millefolium*

Family : Asteraceae

Part of plant: Aerial part



Activity Performed

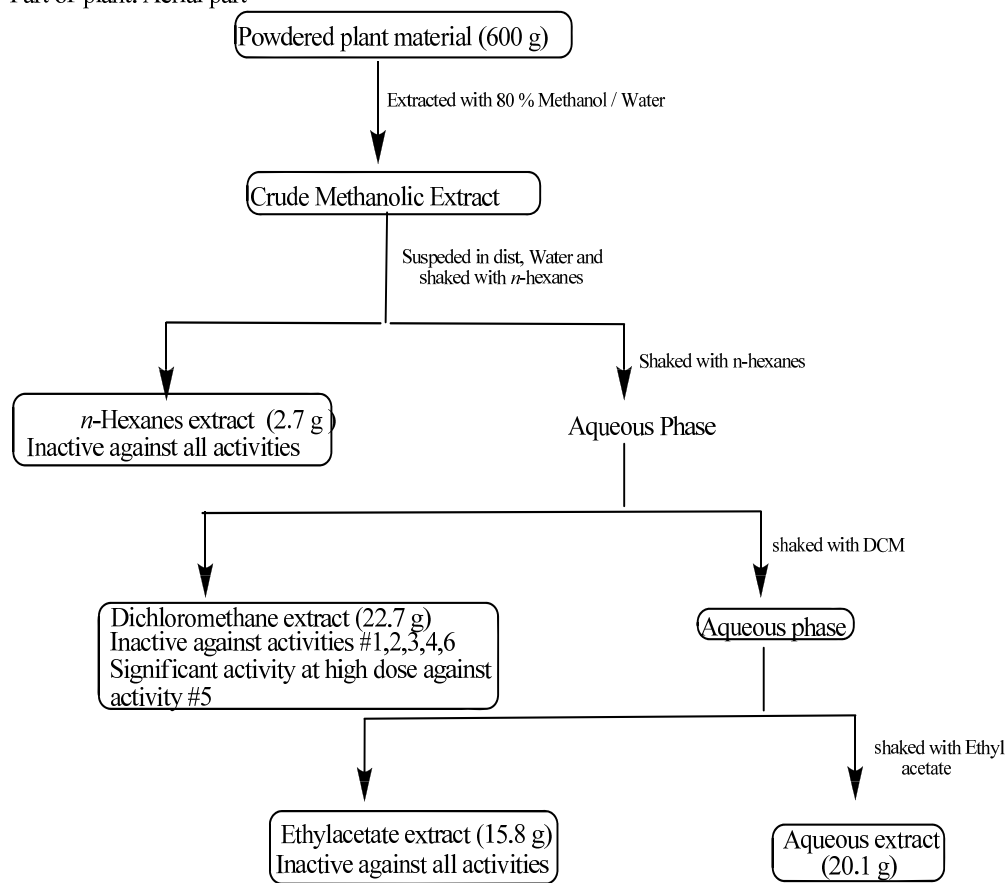
1. Brine Shrimp (*Artemia salina*) Lethality Bioassay
2. In Vitro Antibacterial Bioassay
3. In Vitro Antifungal Bioassay
4. Insecticidal Activity by Contact Toxicity Method
5. Invitro Phytotoxic Bioassay
6. Antilashmenial Activity Bioassay

Phytochemical work and Biollogicsal Screening of *Sideritis spyleum*

Species : *Sideritis spyleum*

Family : Lamiaceae

Part of plant: Aerial part



Activity Performed

1. Brine Shrimp (*Artemia salina*) Lethality Bioassay
2. In Vitro Antibacterial Bioassay
3. In Vitro Antifungal Bioassay
4. Insecticidal Activity by Contact Toxicity Method
5. Invitro Phytotoxic Bioassay
6. Antilashmenial Activity Bioassay

JOINT RESEARCH PROJECT

One of the most active Group member Prof. Dr. Munir (Turkey) submitted Plants submitted five plant extracts for 20 bioassays screenings

S. No.	Plant
1.	<i>Plantago major</i>
2.	<i>Garcenia atroviridis</i>
3.	<i>Rhizophora mucronata</i>
4.	<i>Xylocarpus granatum</i>
5.	<i>Leptospermum flavescens</i>

JOINT RESEARCH PROJECT

Collaborative Work of Members from Turkey



JOINT RESEARCH PROJECT

Plants selected for future bioassay-guided isolation studies

Leptospermum flavescens Sm. And *Rhizophora mucronata*

On the basis of significant Immunomodulatory activity, antileishmanial and anticancer activities

JOINT RESEARCH PROJECT

Bioassay-guided isolation work on biologically crude extracts of selected plants.

- *Centaurea lydia* (Asteraceae family),
- *Centaurea calolepis* (Asteraceae family),
- *Cirsium siphyleum* (Asteraceae family),
- *Achillea millefolium* subsp. *siphylea* (Asteraceae family),
- *Sideritis siphylea* (Lamiaceae family)
- *Eryngium thorifolium* (Apiaceae family).

Workshop on Natural Products Chemistry & International Symposium on Medicinal-Aromatic Plants

Venu: Near East University, Dates: 29-30 September 2014

The proposed workshop and symposium will be jointly organized by Near East University in the Turkish Republic of Northern Cyprus, ICCBS, Pakistan, and COMSATS Thematic Group on Natural Products Sciences.

Organizers

Assoc. Prof. Dr. Salih Gücel (TRNC)

Prof. Dr. M. Iqbal Choudhary (Director General ICCBS-Karachi University, Pakistan)

Prof. Dr. Münir Öztürk (Advisor)

Scientific Secreteriat

Dr. Farzana Shaheen

Dr. Atia-tul-Wahab

Fatma Kaya Yıldırım

Congress Secreteriat

Environmental Research Center

Submission of PC-1 for Funding

ICCBS / COMSATS are jointly working to submit PC-1 to Government of Pakistan for financial assistance to joint research project.

Thank you very much for your attention

ITRG Email

Comsats.thematic.group@gmail.com