

CODE: CAM: 02 2008

INSTITUTE: Department of Chemistry, Faculty of Science, University of Dschang, Box 67, DSCHANG, Cameroon.

RESEARCH GROUP: **Natural and synthetic bioactive substances with potential applications in medicine and agriculture**

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Staff			Students			
Academic PhD	Academic Other	Tech-nicians	Sandwich PhD	Local PhD	Sandwich MSc/MPhil	Local MSc/MPhil
5	2	2	1	5		4

Awarded degrees	91/02		2003		2004		2005		2006		2007		2008	
S=Sandwich; L=Local	S	L	S	L	S	L	S	L	S	L	S	L	S	L
PhD	8	1	2		1	3			2		1			2
MSc/MPhil/Licentiate	1	36		1		2			3		2		1	

Publications	1991/02	2003	2004	2005	2006	2007	2008
International journals	48	3	5	7	8	8	7
National journals	3						
Conference reports	59	7	4		4	1	1

Arrangement of work-shops/symposia/conf.	2	1					
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Visits by IPICS staff/Swedish scientists	5/6						
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No. of participants trained in IPICS prog.	Sweden or other country in Europe	Regional laboratory
Until December 2008	16	3

IPICS funding (total for the specified period)	Period of funding	Fellowship months (total no.)	Training costs (k-SEK)	Other costs (k-SEK)	Total (k-SEK)
	1991-2008	119	1751	4794	6418

Cooperation initiated	1991
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SUMMARY OF THE RESEARCH GROUP CAM:02

Overall Objectives:

To strengthen the research capacity of the Natural Products Research Group of the University of Dschang through active research co-operation with pertinent Swedish and European institutions. The main domain of co-operation will be in training of young Cameroonian scientists in the fields of natural product chemistry, organic synthesis and pharmacology, with the long-term aim of valorising indigenous knowledge and the abundant renewable plant resources of Cameroon. In order to achieve these objectives, three areas of research training have been selected:

- search for and study of plant-derived anti-parasitic and anti-fungal agents
- advanced organic spectroscopy and hemi-synthetic methodology
- phytochemical and pharmacological study of local spices and condiments and screening of native plants for insect deterrents.

Search for and study of plant-derived anti-parasitic and anti-fungal agents: Human parasitic diseases such as helminthic infections, malaria caused by *Plasmodium falciparum*, trypanosomiasis caused by *Trypanosomia brucei*, and the African Kala-azar infection mediated by *Leishmania donovani*, plague the populations of tropical countries like Cameroon. Although these diseases affect millions of people, multinational pharmaceutical companies in the industrialised countries have only shown little interest in developing anti-parasitic drugs. The obvious reason for this half-heartedness is that the demand for such drugs is from people who can least afford the high cost that their development demands. Remedies for these ailments, therefore, have to be sought first and foremost by scientists in the affected region. Plants selected on the basis of ethnomedical information and chemotaxonomy will be screened for anti-parasitic activity. Attention will be focussed initially on plants used against intestinal worms, fevers, malaria, and schistosomiasis. Concurrently, the anti-fungal potential of some of the plants will be evaluated. All this work will be done using specific bioassay systems. Bioassay-guided isolation of the active principles will be carried out on the active extracts and their structures determined using advanced modern spectroscopic techniques. Some of the characterised active compounds could be used as a basis for standardising active plant extracts for local distribution as cheap and urgent phytomedicines.

Screening of native flora for insect deterrents and study of Cameroonian spices and condiments: The natural plant resources of Cameroon in various zones of “ecological stress” form an important renewable source of natural, selective and biodegradable pesticides. Insecticidal plants will be selected on the basis of folkloric data and information obtained from direct field observation. An inventory of locally used spices and condiments will also be made and their constituents analysed phytochemically and pharmacologically.

Collaboration: To achieve these objectives we have established collaborative linkages for training of our researchers with the Chemical Centre, University of Lund, the Biomedical Centre, Uppsala University, the Chemistry Department, Glasgow University, and the Institute of

Pharmaceutical Biology, University of Munich, in addition to some national laboratories including IPICS project CAM:01.

Keywords: Anthelmintics, anti-fungals, natural products, insect deterrents.

Training, research visits:

Year	Participant (months)	Research host	Research field
80/81	Johnson F. Ayafor (8)	G Samuelsson, BMC, UU	Medicinal plants
91/92	Barthelemy Nyasse (5)	U Ragnarsson, BMC, UU	Peptide synthesis
92/93	Barthelemy Nyasse (3)	U Ragnarsson, BMC, UU	Peptide synthesis
93/94	Barthelemy Nyasse (12)	U Ragnarsson, BMC, UU	Peptide synthesis
93/94	Etienne Dongo (6)	L Bohlin, BMC, UU	Pharmacological screening
94/95	Barthelemy Nyasse (3)	U Ragnarsson, BMC, UU	Peptide synthesis
94/95	Pierre Tane (5)	O Sterner, LTH, Lund Univ	Natural Products Chem
94/95	Margu�rite Tchuendem (6)	J Connolly, Glasgow Univ	Natural Products Chem
95/96	Pierre Tane (9)	O Sterner, LTH, Lund Univ	Natural Products Chem
95/96	Apollinaire Tsopmo (4)	O Sterner, LTH, Lund Univ	Natural Products Chem
95/96	Johnson F Ayafor (1)	O Sterner, LTH, Lund Univ	Natural Products Chem
95/96	Margu�rite Tchuendem (2)	B Abegaz (NABSA), Univ of Gaborone, Botswana	Natural Products/ Structure elucidation
1997	Apollinaire Tsopmo (6)	O Sterner, LTH, Lund Univ	Natural Products Chem
1997	Albert Kamanyi (3)	H Wagner, Munich Univ	Pharmacology
1997	Johnson F Ayafor (1)	O Sterner, LTH, Lund Univ	Natural Products Chem
1998	Apollinaire Tsopmo (6)	O Sterner, LTH, Lund Univ	Natural Products Chem
1998	David Ngnokam (3)	J Connolly , Glasgow Univ	Natural products Chem
1999	James A Mbah (5)	O Sterner, LTH, Lund Univ	Natural Products Chem
1999	Mathieu Tene (2)	J Connolly, Glasgow Univ	Natural Products Chem
1999	Johnson F Ayafor (1)	O Sterner, LTH, Lund Univ	Natural Products Chem
2000	Eric Tanifum (3)	J Connolly, Glasgow Univ	Natural Products Chem
2000	Apollinaire Tsompo (2)	O Sterner, LTH, Lund Univ	Natural Products Chem
2001	Apollinaire Tsompo (1)	O Sterner, LTH, Lund Univ	Natural Products Chem
2001	Alimbert Tchinda (3)	J Connolly, Glasgow Univ	Natural Products Chem
2001	Hippolyte Kamden (3)	B Abegaz (NABSA), Univ of Gaborone, Botswana	Natural Products/ Structure elucidation
2002	Godfred Ayimele (3)	J Connolly , Glasgow Univ	Natural Products Chem
2003	Mathieu Tene (3)	J Connolly , Glasgow Univ	Natural Products Chem
2003	Dieudonne Ngamga (3)	B Abegaz (NABSA), Univ of Gaborone, Botswana	Natural Products/ Structure elucidation
2004	Hippolyte Kamden (4)	J Connolly, Glasgow Univ	Natural Products Chem
2005	Dieudonne Ngamga (4)	B Abegaz (NABSA), Univ of Gaborone, Botswana	Natural Products/ Structure elucidation
2006	James Mpetega (5)	J Connolly, Glasgow Univ	Natural Products Chem

Other visits to Sweden:

Johnson F Ayafor	1991, 1993, 1995, 1999
Pierre Tane	2004, 2005

Visits by IPICS staff:

R-M Båålöw	1989
R Liminga	1990, 1995
M Åkerblom	1999, 2001

Visits by European scientists involved in the cooperation:

L Bohlin	1993	Plant collection
F Sandberg	1993	Plant collection
U Ragnarsson	1995	Thesis examination
O Sterner	1997	Thesis examination
P Baeckström	1998	Lecturer at workshop
J Connolly	1999	Thesis examination
A Djikeng	2008	

Long-term visits by European students/researchers:

Maria Swartling (2m)	2000	Visiting student Sida MFS grant
Sara Hult (2m)	2000	Visiting student Sida MFS grant

Funding: (k-SEK)

Years	Training/exchange	Other project costs (equipment)	Total
1980/90	46	-	46
1991/92	70	-	70
1992/93	44	202	246
1993/94	270	122	392
1994/95	222	283	505
95/96 (18 months)	292	280	572
1997	169	271	440
1998	232	168	400
1999	135	329	464
2000	52	215	267
2001	80	314	267
2002	17	451	468
2003	64	453	517
2004	58	507	565
2005	-	515	515
2006	-	155	155
2007	-	389	389
2008	-	140	140
Total	1751	4794	6418

Financial support from other sources:

- 1) International Foundation for Science (IFS)
Johnson F Ayafor, grant F/0443-4; Pierre Tane, grant F/xxx-; Apollinaire Tsopmo, grant F/2764-1; Marguérîte Tchuendem, F/2764-1
- 2) National Institute of Health (NIH, USA): Johnson F Ayafor, grant ICBG/5-1; 5-2; Pierre Tane, ICBG/5-3