



SOUTHERN AFRICAN BIOCHEMISTRY AND INFORMATICS FOR NATURAL PRODUCTS PROGRESS REPORT

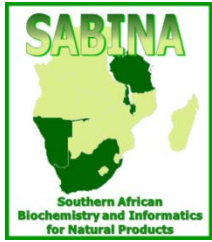


Project participants at the Namibia meeting, Feb, 2011



SABINA Secretariat, Chancellor College, Zomba, Malawi





Introduction



- Grant –USD1,600,000 from Carnegie-IAS RISE for 6 years, for 2008 -13
- **Second grant, USD800000 for 2011-2013**
 - Final planning concluded in February, 2011 in Windhoek
- **ACP-EU funding to POL-SABINA**
 - Carnegie and DST



Introduction -2



- 6 key and broad research areas
 - Molecular biology and functional genomics
 - Natural product chemistry
 - Synthetic chemistry
 - Biochemistry
 - Food Science
 - Bioinformatics



Project purpose and objectives



- Implementation of proactive postgraduate programmes in chemistry/biochemistry and bioinformatics of natural products. The specific objectives are:
 - i. New knowledge and innovations generated through both PhD and MSc studies
 - ii. Strong regional network and sub-networks integrating chemical and biological sciences.
 - iii. Universities and research institutions having better and regionally trained individuals supportive of teaching and learning and or research in their institutions



Expected outputs



- ▣ Innovative networking in chemistry and biochemistry of natural products among SADC universities and research institutes.
- ▣ Cadre of doctoral and MSc young men and women actively involved in studies into the chemistry and biochemistry of natural products.
 - ▣ 20 PhDs and MSc's by the end of 2013
- ▣ Greatly enhanced participation in publication of scientific results in international journals.
- ▣ **Strengthening of research infrastructure**
 - ▣ Equipment provision to UDSM, UNAM and UNIMA, USD90000 each, staggered over the 3 years



Achievements



- **Innovative networking in chemistry and biochemistry of natural products among SADC universities and research institutes**
 - Organized jointly with POLSABINA a HPLC/Phylogenetics/Project management training workshop at UP, Aug,29-Sept,4, 2010 (Carnegie- co-funded the workshops)
 - POLSABINA
 - Scientific writing/Team building in Windhoek, February, 2011
 - Supported training in the use of VRE by project, ICT and Library staff and students
 - Organised national workshops on intellectual property rights at UDSM and UNIMA
 - Established an external peer review reference team (IAC) for SABINA. The IAC comprises 5 distinguished academics and scientists, 40% of whom are female.
 - Prof Barbara Timmermann, USA
 - Prof Yukihiro Hara, Japan
 - Dr Emmanuel Fabiano, Malawi
 - Prof Andrew Marston, South Africa
 - Prof Avrelija Cencic, Slovenia





Achievements -2









- ▣ **Cadre of doctoral and MSc young men and women participating actively in studies into the chemistry and biochemistry of natural products**
 - Sixteen fellowship grants
 - 2 PhD and 4 MSc students awarded scholarships in December, 2008 (3 male + 3 female)
 - 5 PhD and 2 MSc students awarded scholarships in mid September, 2009 (5 male + 2 female)
 - 3 PhD fellowships awarded –May, 2011 (2 male and 1 female)
 - Hosting of fellows at advanced laboratories-CSIR and Wits (CSIR hosted 2 PhD students from WITS and UNIMA and an MSc student from UDSM; UP hosted 2 students, 1 each from UNIMA and UDSM)
 - The Network welcomes the University of Dar es Salaam decision to implement SADC harmonised fee structures for postgraduate students from the region
 - Joint degree programmes between institutions in the network
 - TNA tool developed and await implementing in the last quarter of 2011



SABINA Fellows- first intake







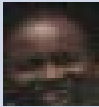


Fellow	University	Study Area	Supervisors/ Collaborators
Justin Omolo (TZ) 	WITS, PhD	Phytochemistry and synthesis of bioactive natural products isolated from Tanzania medicinal plants	Prof Charles De Koning Dr. Vinesh Maharaj
Nicholas Mphangwe (MW) 	UP, PhD	Genetic studies and use of molecular markers in tea breeding and selection	Prof Zeno Apostolides Dr. H. Nyirenda
Tinotenda Shoko(ZW) 	UNIMA, MSc	Flavour chemistry of some indigenous fruits and vegetable used in Malawi	Prof JDK Saka Mr Maurice Monjerezi Prof Z. Apostolides
Ms Sicilia Ilonga 	UNAM, MSc	Screening of Anticancer and antioxidants compounds from selected indigenous plants	Dr Martha Kandawa-Schulz Dr S. Lyantagaye
Ken Ngwira (MW) 	UDSM, MSc	Phytochemistry of antimalarial plants used in Malawi	Dr. Quintino Mgani Dr. Vinesh Maharaj
M. Pelly Malebe(SA) 	UP, MSc	Development of genetic markers for tea	Prof Zeno Apostolides



SABINA Fellows-2 intake



	University	Study Area	Supervisors/Collaborators
Adushan Pillay (RSA) 	Wits, PhD	Synthesis of benzoquinones as potential anticancer agents	Prof Charles De Koning
Ms. Petrina Kapewangolo (NM) 	UP, PhD	Biochemistry of Natural Products	Prof Debra Meyer Dr Martha Kandawa-Schulz
Godwil Madamombe (TRFCA-Zw) 	UP, PhD	Mechanical harvesting on physiology of tea (<i>Camellia sinensis</i>) in terms of yield and quality	Dr Nicolette Taylor Prof Zeno Apostolides Dr. H. Nyirenda
Kumbukani Nyirenda (MW) 	UNIMA, PhD	Phytochemistry and biological activities of 4 local plants used in treating priority diseases in Malawi	Prof John Saka Dr Vinesh Maharaj Dr E Fabiano
Benjamin Kumwenda (MW) 	UP, PhD	Comparative genomics study of complete sequenced <i>Thermus sp</i> strains	Dr Oleg Reva Prof F. Joubert
Ms Moola Nyambe(NM) 	UNAM, MSc	Chemical analysis of Namibian teeth cleaning(chewing) sticks	Dr M. Kandawa Schultz Dr S. Lyantagaye
Ms Liberata Mwita(TZ), 	UDSM, MSc	Discovery of potential drugs from mushroom of the genus <i>Coprinus</i>	Dr Oleg Reva Dr S. Lyantagaye



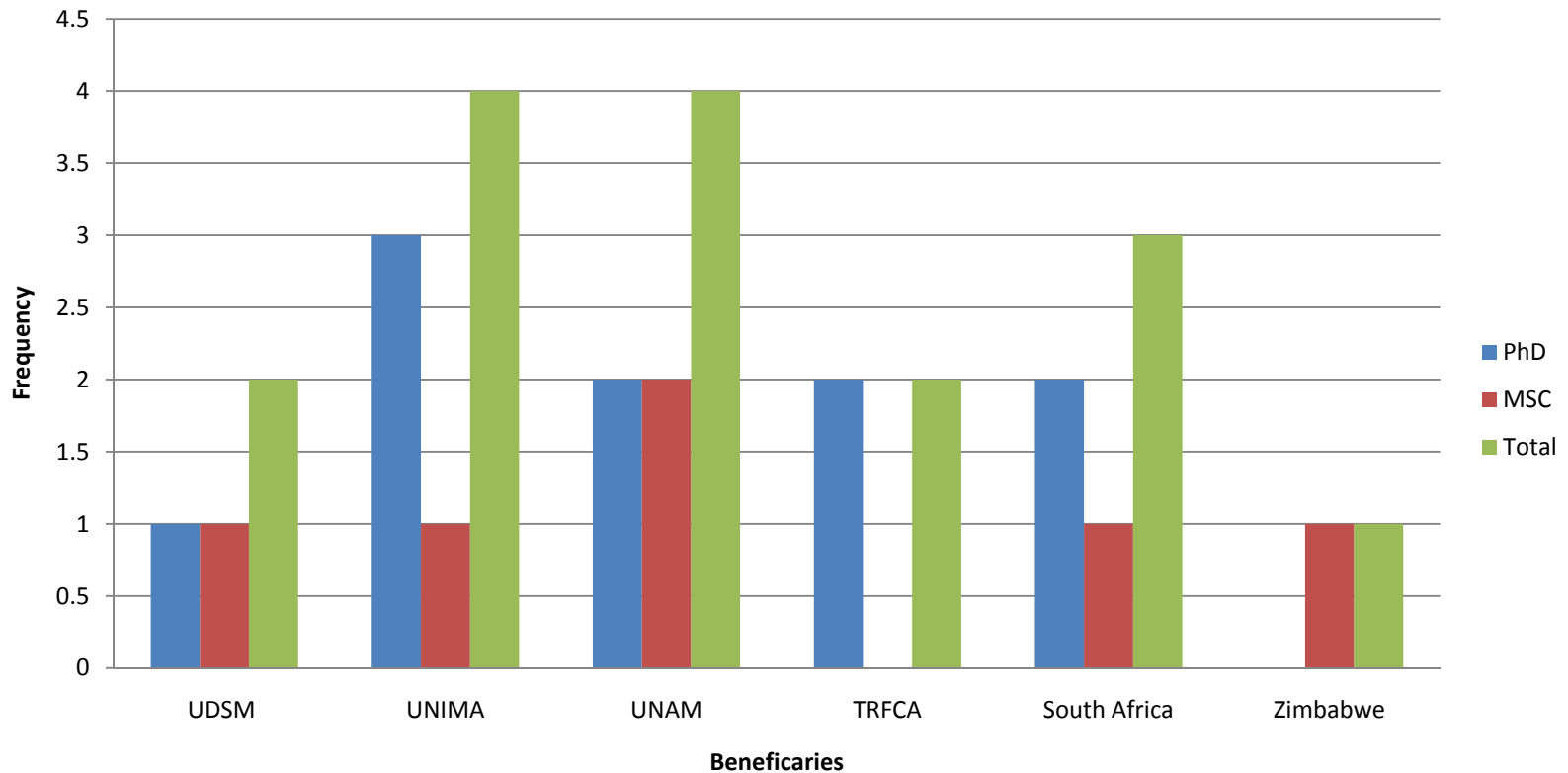
SABINA Fellows- 3 intake



Fellow	University	Study Area	Supervisors/Collaborators
M. Pelly Malebe (SA)	UP, PhD	Development and evaluation of a panel of molecular markers for drought tolerance in tea <i>Camellia sinensis</i> (L.) O. Kuntze	Prof Zeno Apostolides +++ supervisors
Jimmy Sumani (MW)	Wits, PhD	Synthesis of bifunctional organic-organometallic complexes as anticancer agents	Prof Charles De Koning +++ supervisors
Ms Sicilia Ilonga(NM)	UNAM, PhD		Dr Martha Kandawa-Schulz Dr Vinesh Maharaj
To be selected	MSc		
	MSc		

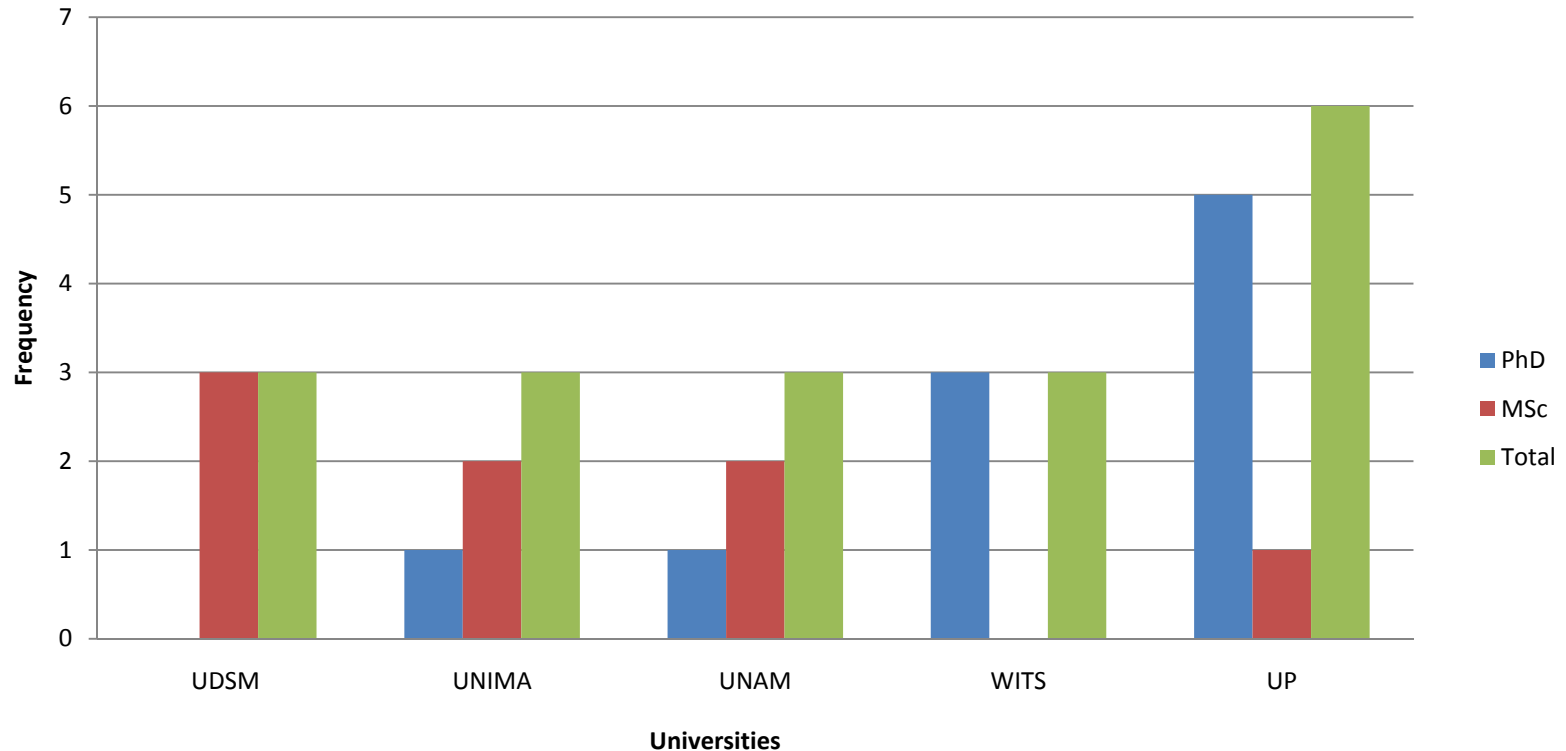
Benefit sharing

Figure 1: Distribution of scholarships amongst beneficiaries



Benefit sharing-2

Figure 2: Hosting of students at the five SABINA universities





Scientific publishing



- **Published papers**

- i. Mwita, L, Lyantagaye, S and Mshandete, A (2010) The effect of the interaction of varying chicken manure supplement levels with three different solid sisal wastes substrates on sporocarp cap lengths and diameters, stipe lengths and diameters and dry weights of *Coprinus cinereus* (Schaeff) S. Gray s.lat. *African Journal of Biotechnology*, **10 (7)**: 1172-1180.
- ii. Omolo, J J, Johnson, M M, van Vuuren, S F and de Koning, C B (2011) The Synthesis of Xanthones, Xanthenediones and Spirobenzofurans: Their Antibacterial and Antifungal Activity. *Bioorganic & Medicinal Chemistry Letters*. DOI: 10.1016/j.bmcl.2011.09.088. In press.



Scientific dissemination



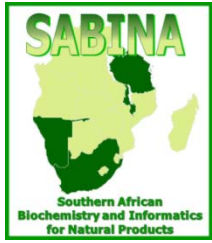
1. J. Omolo and C.B de Koning. *The Synthesis of Bioactive Xanthenes and Related Products Inspired by Natural Products Isolated from Tanzanian Medicinal Plants*. The Second International Tanzania Chemical Society Conference, Dar es Salaam, 5-7 October, 2011.
2. A Pillay and C B de Koning. *The Synthesis of Potential anticancer Naphthoquinones*, ASSAF Young Scientists Symposium, Pretoria, 26-28 September 2011.
3. B. Kumwenda. *Comparative genomics study of completely sequenced Thermus sp. Strains to enhance and facilitate their application in biotechnology for thermostable enzyme biosynthesis*, International Society for Computational Biologists Conference, Cape Town International Convention Centre, 9-11 March 2011
4. J Omolo, V Maharaj, D Naidoo and C B de Koning. *The Isolation of Bioactive anti-HIV Natural Products from Tanzanian Medicinal Plants*, 40th National Convention of the South African Chemical Institute, The University of the Witwatersrand, 16-21 January 2011.



Completion of studies



1. Malebe, Pelly, University of Pretoria, *Development of Molecular Marker Assisted Selection for Drought Tolerance in Tea Camellia sinensis (L.) O. Kuntze*. MSc Thesis, graduated.
2. Justin Omolo, The University of Witwatersrand, *Bioassay-Guided Isolation and Synthetic Studies on Natural Products Obtained from Tanzanian Medicinal Plants*, PhD thesis, submitted.
3. Shoko, Tinotenda, University of Malawi, *A Study of Volatile flavour constituents of some edible fruits and leaves of cassava and cocoyams growing in Malawi*, MSc –Applied Chemistry Thesis, submitted.

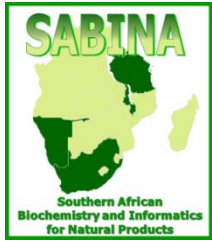


Scientific networking



- POLSABINA facilitated exchange visits of students and staff at partner institutions
 - Kennedy Ngwira at CSIR
 - Kumbukani Nyirenda at CSIR
 - John Saka to CSIR/ACGT
 - Oleg to UDMSM

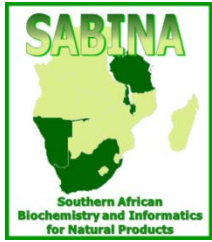




MSc Programme –NP Science



- Engage AFNNET to provide support
 - Prof. John Stephen Tabuti will join the MSc development process
- WIO-RISE is being approached.
- UDSM is participating in the AFNNET programme



Project Management



- ▣ Administrative support to nodes provided
 - Communication-email
 - Building or consolidating trust amongst partners

- ▣ Key challenges
 - ▣ Equitable distribution of fellows across the nodes- capacity building
 - UDSM, no PhD student registered at that Institution
 - UNAM, 1 PhD student registered at that Institution
 - UNIMA, 1 PhD student registered at that Institution
 - UP, 5 PhD students registered at that Institution
 - WITS, 3 PhD students registered at that Institution
 - ▣ Remaining MSc fellows- delays in finalizing the MSc programme



SABINA Network partners



▣ MALAWI

- ▣ Chancellor College, University of Malawi (Email: sabinasec@chanco.unima.mw)
 - ▣ Prof John DK Saka, Academic Director, Chemistry Department
 - ▣ Mr Frank Ngonda, Project Manager, Secretariat
 - ▣ Mr Chikondi Jenala, Project Accountant, College Finance Office

▣ Tea Research Foundation of Central Africa (TRFCA)

- Dr Hastings Nyirenda

▣ NAMIBIA

- ▣ Dr Martha Kandawa -Schultz, Department of Chemistry and Biochemistry, University of Namibia



SABINA Network partners -2



■ SOUTH AFRICA

- Dr John Becker, African Centre for Gene Technologies
- Prof Jane Morris, African Centre for Gene Technologies
- Dr Vinesh Maharaj, Centre for Scientific and Industrial Research
- Prof Zeno Apostolides, Department of Biochemistry, University of Pretoria
- Prof Charles de Koning , School of Chemistry, The University of Witwatersrand
- Dr Oleg Reva, Bioinformatics and Computational Biology Unit, University of Pretoria
- Prof Debra Meyer, Department of Biochemistry, University of Pretoria
- Ms Ella Nyakunu, Project Manager, POL-SABINA, ACGT

■ TANZANIA

- Dr Quintino Mgani, Department of Chemistry, University of Dar es Salaam
- Dr Sylvester Lyantagaye, Department of Molecular Biology and Biotechnology, University of Dar es Salaam



Building a cadre of next generation of active and relevant academics and researchers



SABINA Secretariat, Chancellor College, Zomba, Malawi





Asante!

Obrigado!

Merci!

Zikomo!

Thank you!

Yewo!

Tatenda!

Siyabonga!

Gracias!