

UP Mindanao's Biotech Research and Capabilities

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Biotech Defined

The application of scientific and engineering principles by biological agents to provide knowledge, goods, and services.

Fields of biotech....

- * Ecological/Environmental
- * Industrial/ Bioprocessing
- * Pharmaceuticals
- * Farming/Food Production
- * Medical
- * Bioinformatics

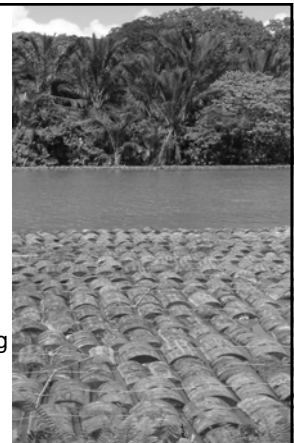
Environmental/Ecological

- Conservation of Biodiversity
 - PCR-based detection of possible new species (Microsatellite analysis: Eagle, Deer, Bat, Frogs, Birds)
 - Genetic biodiversity of indigenous Plants by RAPD (e.g. Sago, *Nepenthes sp.*, bananas)
 - Wildlife Conservation (DNA-sexing of the Philippine Eagle)
- Bioremediation
 - Hg-Resistant Bacteria in Mine Tailings



Bioprocesses/ Industrial

- * Direct L-Lactic Acid Fermentation of **Sago Starch**
- * HFCS Production from **Sago Starch**
- * Sago Starch Bioprocessing using Raw Starch Digesting Amylases



Pharmaceutical

- * Angiotensin-I-Converting Enzyme (ACE) Inhibitors from Fermented Foods

Biotechnologies for Farming and Food Production

- * Micropropagation/Tissue Culture of Sago
- * Identification and Biological Control of Selected Pests in Major Crops (Corn, Durian, Coconut, Sago, etc)
- * Screenhouse Trials of Bt 11 Maize Against Asiatic Corn Borer
- * Probiotics for Broiler Feeds
- * Plant Growth-Promoting Rhizospheric Nitrogen-Fixers of the Sago Palm



Bioinformatics

- Clarito, BS., S.T.Bastian and V.E. Dumaje. "A Software for Computation and Visualization of synonymous and Nonsynonymous Substitution in Mitochondrial Gene." *Third place SMARRDEC Sectoral Review, Davao City July 2005.*

Medical

- Stem Cell Research
- Tissue Engineering
- Gene Therapy
- Diagnostics
- Food Safety/Toxicogenomics

Capabilities

- * Human Resource
 - Dr. Antonio R. Obsioma (Animal Science)
 - Dr. Eufemio T. Rasco (Plant Breeding)
 - Dr. Reynaldo G. Abad (Plant Pathology)
 - Dr. Emma Ruth V. Bayogan (Horti, Post-Harvest)
 - Dr. Anna U. Novero (Botany, Tissue Culture)
 - Dr. Virginia P. Obsioma (Food Science)
 - Dr. Severo T. Bastian (Molecular Phylogeny)
 - Dr. Ruth U. Gamboa (Marine Biology)
 - Dr. Norberto Navarette Jr. (Applied Mathematics)
 - Dr. Dulce M. Flores (Food Science and Chemistry)



Capabilities

- * Human Resource
 - Prof. Lynn Esther E. Rallos (MS Microbiology)
 - Prof. Cleto S. Nañola (MS Marine Biology)
 - Prof. Joey Ronnel U. Carcallas (MS Genetics)
 - Dr. Elmar Z. Udarbe, DVM (MS Biomedical Sci)
 - Prof. Fritzie B. Ates (MS Biology, Wildlife)
 - Prof. Cheryl M. Talde (MS Biology, Freshwater)
 - Prof. Vicente B. Calag (MS Computer Science)
 - Prof. Imma C. A. Licayan (MS Food Science)
 - Prof. Noreen Grace V. Fundador (MS Biochem)
 - Ms. Angela B. de los Santos (MS Chemistry)

Lab Capabilities

- Standby electricity generator
Glass distiller
- * Mol Bio and Tissue Culture
 - PCR
 - Electrophoresis
 - Laminar Flow Hood
 - Autoclave
 - Ultralo-temp freezer/cryogenic freezer
 - Photo documentation (UV-Vis)
 - Laminar flow hoods

- Chemistry and Biochem
 - Enzyme and Protein Works
 - Column chrom/gel sieves
 - Hi-speed Refrigerated Centrifuge
 - UV-VIS Spectro
 - SDS-PAGE
 - Proximate Analysis

- Microbiology/Biology
 - Phase-Contrast Microscopy
 - Autoclave
 - Microtome
 - Orbital shaker
 - Incubators & refs
 - Compound microscopes

Papers presented (Biotech researches)

- CARCALLAS, R.J. *Determination of Genetic Diversity in Musa sp. Using RAPD analysis*. 18th SMARRDEC/ RD&E Symposium, Biotech Sector Aug. 15-16, 2005 Davao City.
- FLORES, DM. *Documenting the Indigenous Plant Starch Sources in Mindanao: Genetic variation of the sago palm by RAPD analysis*. (*ibid.*)
- FLORES, DM, K. SHIBATA, J.TAGUBASE, G. KOBAYASHI, and K. SONOMOTO. *Screening, Isolation and Identification of potent lactic acid bacteria for direct lactic acid fermentation*. Paper presented at the Annual Seminar on JSPS Large Scale Cooperative Biotechnology Research, December 2-4, 2004 at Inna Grand Bali Beach, Bali Indonesia

• SHIBATA, K., G. KOBAYASHI, D.M.FLORES, AND K. SONOMOTO. *Direct L-lactic acid fermentation with sago starch by a newly-isolated lactic acid bacterium*. Paper presented at the Annual Seminar on JSPS Large Scale Cooperative Biotechnology Research, December 2-4, 2004 at Inna Grand Bali Beach, Bali Indonesia.

• OBSIOMA, VP. *Salmonella colonization in broilers treated with prebiotics and competitive exclusion cultures*. Best Paper in Phil. Society of Animal Science Convention. Oct 20-22, 2004 Shangrila Makati Hotel.

• CARCALLAS, R.J. *Effective number of microsatellite primers and optimal sample size for genetic diversity analysis of coconut (Cocos nucifera L.)*. In 35th Annual Scientific Conference of the CSSP, 8-12 March 2004. Davao City.

Best papers at the 2006 Annual convention of the Wildlife Conservation Society of the Philippines. Students Category. **April 4-6 Puerto Princesa, Palawan.**

1st place. RJ A. Malcampo. *Phylogenetic position of five microbat species in Mindanao inferred from complete cytochrome b gene sequences.*

2nd place. Abegail P. Lozada. *Sex determination and genetic diversity of the Philippine Eagle (Pithecophaga jefferyi Ogilvie-Grant) using PCR-based techniques.*

RESEARCH RESOURCES

- * *And of course the whole of Mindanao as our laboratory & workplace, and the remaining virgin lands and forests as source of biodiversity and exotic species.*

Thanks and Have a Green Day!