The Arts and Science of Discovery: Archaeological Research in the Philippines

Armand Salvador Mijares, PhD
Archaeology is....

• Partly the discovery of the treasures of the past, partly the meticulous work of the scientific analyst, and partly the exercise of the creative imagination

» Renfrew and Bahn
• This paper will be presenting four research projects that ASP is involved in.
• All of these projects are either fully or partially funded by University of the Philippines.
• Project: The Excavation of the Old Town of San Juan, Batangas
• Proponent: Dr Grace Barretto-Tesoro
• Funding: OVCRD
• Year: 2009-2011
• Main objectives:
  • Determine the developmental history of the old town of San Juan, Batangas

• Objectives for Structures A and B
  • To determine the nature and extent of the Structure
  • To map all features of the Structure
  • To identify activity areas in the northern part of Structure A
  • To recover datable materials
  • To search for archaeological deposits older than Structure A
  • To identify construction technology
  • To determine reasons for destruction and abandonment
  • To investigate the ‘plaza complex’
Structure A - bahay na bato sa San Juan, Batangas
Structure B - bahay na bato sa San Juan, Batangas
• Results
• 1. Stone houses constructed in the late 1800s
• 2. Identification of different floors i.e. adobe floors, tiled floors, series of dirt and mortar floors
• 3. Identification of rooms i.e. water well, zaguan, kamalig, kitchen, patio, bodega
• 4. Used volcanic tuff blocks, as main construction materials, bounded with lime and mortar
• 5. No deposits older than 1800s
• 6. Found ceramic sherds, square nails, bottle shards, coins, bone toothbrush, roof tile fragments, floor tile fragments, capiz shells
• 7. Stone blocks collected
• 8. Interpreted the area to be a reduccion
• Objectives for the Old Church Complex Site
  • Investigate the church complex and assess the relationships between identified structures.
  • Determine reason/s for abandonment of the main ruins
  • Compare excavation results of the church complex with excavations of the stone houses in the vicinity
• Results
  • 1. Identified the different ruins in the site: church, L-shaped stone floor, lime kiln
  • 2. The construction was not completed due to flooding which lead the town to move to its current location which is 7km inland
  • 3. Building technology similar with how the stone houses were constructed
Image view from northwest pillar - old church of San Juan
• Project: Dewil Valley Palawan Island Bioarchaeology Project
• Proponent: Armand Salvador B Mijares, PhD
  Victor Paz, PhD
  Philip Piper, PhD
Funding: OVCRD
Year: 2009-2011
• The program entails using environmental archaeological approaches to understand the human-environment relationship. Thus the Philippine Bioarchaeological Initiatives (PBI) started using archaeobotany and zooarchaeology as the corner stone approach to address the following research problems.

• What can the macro-botanical remains recovered from Ille tell us about human plant resource procurement patterns and the changing natural environments around Ille site in the past?

• What is the composition and structure of the zooarchaeological communities identified during different phases of human occupation at Ille Cave, and what can this tell us about human subsistence behavior and the local and regional aquatic and terrestrial environments?
Macrobotanical remains which are mostly in charred or mineralized state were painstakingly identified and sorted using a stereomicroscope. Materials that are viable were then subjected to SEM imaging and later compared with the ASP macrobotanical reference collection.
The identification of both wild and domesticated yam (*Dioscorea* cf. *alata*, *Dioscorea hispida* and cf. *Dioscorea prob. cumingii*,) at Ille site during the terminal Pleistocene to Holocene is an important discovery in terms of reconstructing early human diet.

**Cell shape:**
Angular to elongated with minimal intercellular spaces

**Cell size:**
- long: 30.95 – 74.27 um
- short: 27.85 - 53.41 um
- perimeter: 126.9 - 253.07 um
- cell wall thickness: 1.23 - 4.85 um

**Ave.:**
- 55.38 um
- 40.95 um
- 183.39 um
- 2.50 um

Figure 2.12. SEM micrograph from context 2122 <104>
Canarium is major plant specie that needs to be highlighted. This nut is a multifunctional plant that can be consumed as food, source for oil or fuel and can also be used as indicator for vegetation reconstruction. Canarium is an indicator for a forested area.

Figure 2.30. Charred Canarium (prob. C. odontophyllum) fragments from context 769
• Zooarchaeology has been a developed specialization in archaeology, although in the Philippines it has stagnated for quite some time.

• The establishment of the zooarchaeological laboratory at ASP had been an important development.

• Archaeological research, which entails excavation, will always encounter animal remains. Identification of these animal remains is therefore essential in reconstructing site function and human-animal interaction.

• Identifying the animal remains up to its specie level could enhance the quality of our archaeological interpretation.
<table>
<thead>
<tr>
<th>Order</th>
<th>Family</th>
<th>Genus/Species</th>
<th>Local names</th>
<th>English name</th>
<th>TP</th>
<th>EH</th>
<th>MH</th>
<th>LH</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insectivora</td>
<td>Soricimorpha</td>
<td>Crocidura cf. batakonum</td>
<td>Bising</td>
<td>Shrew</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Pteropodidae</td>
<td>Pteropus sp.</td>
<td></td>
<td>Flying fox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Rhinolophidae</td>
<td>Rhinolophus cf. creaghi</td>
<td>Kabat/kabag</td>
<td>Creagh's horseshoe bat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Hipposideridae</td>
<td>Hipposideros diadema</td>
<td>Kabat/kabag</td>
<td>Diadem roundleaf bat</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hipposideros cf. ater</td>
<td>Kabat/kabag</td>
<td>Dusky roundleaf bat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td>Primates</td>
<td>Vespertilionida</td>
<td>Myoits cf. macrotarsus</td>
<td></td>
<td>Phil. large-footed myoits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Cercopithecidae</td>
<td>Macaca fascicularis</td>
<td>Unggoy</td>
<td>Long-tailed macaque</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Manidae</td>
<td>Manis culionensis</td>
<td>Balintong</td>
<td>Palawan pangolin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td>Rodentia</td>
<td>Sciuridae</td>
<td>Hylopetes nigripes</td>
<td>Pula Tuka</td>
<td>Arrow-tailed flying squirrel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Endemic</td>
</tr>
<tr>
<td></td>
<td>Sundasciurus sp.</td>
<td></td>
<td>Bising</td>
<td>Tree squirrels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Endemic</td>
</tr>
<tr>
<td>Muridae</td>
<td>Maxomys panglima</td>
<td></td>
<td>Daga</td>
<td>Palawan spiny rat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Rattus cf. Eomonicus</td>
<td></td>
<td>Daga</td>
<td>Malaysian field rat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Sundamys muelleri</td>
<td></td>
<td>Daga</td>
<td>Great Sunda rat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td>Carnivora</td>
<td>Hystricidae</td>
<td>Hystrix pumila</td>
<td>Durian</td>
<td>Palawan porcupine</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Endemic</td>
</tr>
<tr>
<td></td>
<td>Canidae</td>
<td>Cuon/Canis sp.</td>
<td>Aso</td>
<td>Wild dog?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td></td>
<td>Mustelidae</td>
<td>Amblonyx (Aonyx) cinereus</td>
<td>Diaggin</td>
<td>Oriental small-clawed otter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td></td>
<td>Mephitidae</td>
<td>Mydus marchel</td>
<td>Pantot</td>
<td>Palawan stink badger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Endemic</td>
</tr>
<tr>
<td></td>
<td>Herpestidae</td>
<td>Herpestes brachyurus</td>
<td></td>
<td>Short-tailed mongoose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td></td>
<td>Viverridae</td>
<td>Arctictis binturong</td>
<td>Binturong</td>
<td>Binturong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extant</td>
</tr>
<tr>
<td>Felidae</td>
<td>Paradoxurus hermaphroditus</td>
<td></td>
<td>Musang</td>
<td>Common palm civet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td></td>
<td>Panthera tigris</td>
<td></td>
<td>Tiger</td>
<td>Tiger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td>Artiodactyla</td>
<td>Cervidae</td>
<td>Axis calamianensis</td>
<td>Usa</td>
<td>Calamian hog deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cervus sp(p)</td>
<td>Usa</td>
<td>Deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extinct</td>
</tr>
<tr>
<td></td>
<td>Sus ahoenobarbus</td>
<td></td>
<td>Baboy</td>
<td>Palawan bearded pig</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Endemic</td>
</tr>
</tbody>
</table>

Identified animal remains from Dewil Valley

© Copyright of University of the Philippines Diliman. All rights reserved. 2013
Palaeozoology of Palawan Island, Philippines

Philip J. Piper a,d,*, Janine Ochoa b, Emil C. Robles a, Helen Lewis c, Victor Paz a,d

aArchaeological Studies Program, Palma Hall, University of the Philippines, Diliman, Quezon City 1101, Philippines
bDepartment of Anthropology, Palma Hall, University of the Philippines, Diliman, Quezon City 1101, Philippines
cSchool of Archaeology, Newman Building, University College Dublin, Belfield, Dublin 4, Ireland
dResearch Associate, National Museum of the Philippines, P Burgos Avenue, Manila, Philippines
The first evidence for the past presence of the tiger *Panthera tigris* (L.) on the island of Palawan, Philippines: Extinction in an island population

Philip J. Piper\(^a\), Janine Ochoa\(^a\), Helen Lewis\(^b\), Victor Paz\(^a\), Wilfredo P. Ronquillo\(^c\)

\(^a\) Archaeological Studies Program, Palma Hall, University of the Philippines, Diliman, 1101 Quezon City, Philippines
\(^b\) School of Archaeology, University College Dublin, Dublin 4, Ireland
\(^c\) National Museum of the Philippines, P. Burgos Street, Manila 1000, Philippines
• Project: Going Deep in Time: The Archaeology of Callao Cave
• Proponent: Armand Salvador Mijares, PhD
• Date: 2007 (2009, 2011)
• Funding: UP System PhD Lateral Entry Grant
• Australia Research Council Grant
Digital Elevation Model of the Philippines showing location of study area and archaeological sites plotted (red triangles). Location of Callao Cave is shown as a yellow circle. Created using GRASS.
2003  Excavation of Callao Cave

© Copyright of University of the Philippines Diliman. All rights reserved. 2013
Burnt Cervid bones

Chert Flake tools

Possible Moraceae phytolith

Poaceae phytolith

Parenchymatous tissues (wild roots?)

Burnt sediment (hearth)
Excavation of the 67k layer
The Callao MT3
Dating the Callao MT3 using U Series at the Research School for Earth Science Australian National University
Laser ablation MC-ICPMS

<table>
<thead>
<tr>
<th>Line</th>
<th>L1</th>
<th>C</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 1</td>
<td>$^{232}\text{T}_\text{h}$</td>
<td>$^{234}\text{U}$</td>
<td>$^{235}\text{U}$</td>
<td>$^{238}\text{U}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line 2</td>
<td></td>
<td>$^{230}\text{Th}$</td>
<td>$^{234}\text{U}$</td>
<td>$^{235}\text{U}$</td>
<td>$^{238}\text{U}$</td>
<td></td>
</tr>
</tbody>
</table>
Laser ablation U-series analysis

- Four laser ablation scans were then recorded on the cross-section

**Track 1** - 71.3±12.3
**Track 2** - 70.0±15.0
**Track 3** - 67.5±19.1
**Track 4** - 62.2±17.8

66.7±1 ka, as a minimum age estimate for the MT3.
New evidence for a 67,000-year-old human presence at Callao Cave, Luzon, Philippines

Armand Salvador Mijares a,*, Florent Détroit b, Philip Piper a, Rainer Grün c, Peter Bellwood d, Maxime Aubert c, Guillaume Champion b, Nida Cuevas e, Alexandra De Leon e, Eusebio Dizon e

a Archaeological Studies Program, Palma Hall, University of the Philippines, Diliman, Quezon City 1101, Philippines
b CP 140 Département de Préhistoire du Muséum national d’histoire naturelle, 57, rue Cuvier, 75005 Paris, France
c Research School of Earth Sciences, Bldg 61 Mills Road The Australian National University, Canberra ACT 0200, Australia
d School of Archaeology and Anthropology, AD Hope Building, The Australian National University, Canberra ACT 0200, Australia
e Archaeology Division, National Museum of the Philippines, P Burgos Ave., Manila, Philippines
2009 Callao Cave Excavation
The east wall of the ante chamber (2011)

© Copyright of University of the Philippines Diliman. All rights reserved. 2013
Wenner Gren Foundation International Collaborative Research:
The Callao Project
Florent Detroit and Armand Mijares

© Copyright of University of the Philippines Diliman. All rights reserved. 2013
Implications of the Discovery of the Callao Man to current scientific debate

• The breaking of the imaginary 50k time barrier of human existence in Southeast Asia is an important first step in understanding and reconstructing human diaspora. There is still a need to fill in the gaps in terms of human fossil recovery and associated cultural materials.

• The Callao remains could contribute more to the on going debate and to the general theory of Human Evolution.
I believe that early humans already have the basic knowledge of building a simple sea worthy vessel and crossed the open sea gap. This could be as simple as a raft.
• Project: Palaeoenvironmental and Biodiversity Study of Mindoro Island: An Archaeological Science Initiative
• Proponents:
  Armand Salvador Mijares-ASP
  Victor Paz-ASP
  Alfred Pawlik-ASP
  Thomas Ingicco-ASP
  Carlo Arcilla- NIGS
  Benjamin Vallejo-EnvSci
  Corazon De Ungria-NSRI
  Sabino G Padilla Jr-UP Manila (Rebecca Crozier-ASP)
• Funding OVPAA-EIDR
• Year 2012-2016
The general aim of our inter-disciplinary research is to seriously contribute to answering regional questions on the peopling of the Philippine Islands and the Sundaland region.

Specifically, we aim to draw from the current expertise we have in UP to address a hypothesis about the timing and direction of human introduction to the Philippine archipelago.

The island of Mindoro is strategically located land formation between Borneo/Palawan (Sundaland) and the main Philippine Archipelago that have great potential to contribute to our understanding of

1. Early human colonization of the Philippines;
2. Human adaptive behaviour in different island environments through time;
3. The history of the flora and fauna of the islands;
4. Landscape and ecosystem changes through time related to global climate and sea level variations.
In addressing this Agenda, we are tapping on different current resources

• The Archaeological Studies Program maintains a number of especially equipped research laboratories for Lithic analysis, Zooarchaeology and Archaeogenetics, Geoarchaeology, Archaeobotany and Palaeoanthropology (Human Osteology). 

• The National Institute of Geological Sciences (NIGS) of the College of Science currently has the laboratories necessary for identifying and sourcing the stone implements (XRF/XRD) recovered from the archaeological survey and excavation.

• With NSRI DNA Analysis Laboratory, attempts will be made to extract aDNA from the human remains recovered from the site and compare/relate this to the extant groups in Mindoro.
Archaeological Survey: Finding Sites in Mindoro
Luyang Baga Cave complex, Abra de Ilog

• First identified in 1994 by AnthroWatch and reported by Mijares in the 1996 National Museum Paper

• Contains metal age pottery, adzes, jade adzes, obsidian flakes, animal remains
Sitio Binabagan, an Iraya community
Preformed adzes

Metal Age pot (lead)
Lanas, Kurtingalan, Sta Cruz

Possible area to conduct coring for palaeobotany/palynology
Aguas, Rizal
Tumanog rockshelter

Potsherds and shellmidden observed
Narciso, Magsaysay

Famnoan Formation (Late Pliocene)
Cueva Uno- shell midden and pottery
Kawayan Cave composed of 2 chambers and rockshelters on both ends
Shell midden of mostly marine origin
The SE rockshelter with Treasure hunter’s pit

Dr. Porr cleaning the wall
Two layers of shell midden were observed
Salamagi Cave
Bubog 2: Stratigraphy in trench 2 showing shell midden deposits and rock fall
**Large marine shells (open lagoon)** (5kya)

**Smaller gastropods shells (Mangrove)** (10kya)
North of the Southern Arc – The Mindoro Archaeological Research Program: A summary of the 2010 and 2011 fieldwork activities

Martin Porr¹, Armand Salvador B. Mijares², Alfred F. Pawlik², Philip J. Piper⁵ and Sabino Padilla Jr⁺
Newly discovered sites (2012-2013) in Bulalacao, Oriental Mindoro
• UP Archaeological research has dramatically changed in recent times.
• We are now in the forefront of understanding not only our past, but also engaged in regional and global debates and discoveries.
• Three important components in this change are
• 1. Well trained Archaeological personnel
• 2. Development of different laboratories and analytical facilities
• 3. Access to research grants
THANK YOU.....