Palaeohabitat context of ancient Austronesian population dispersals: the 1500-1000 B.C. time interval in the Mariana Islands, western Pacific

Mike T. Carson
Assistant Professor
Archaeology Office
Micronesian Area Research Center (MARC)
University of Guam (UOG)
First settlement in Mariana Islands around 3,500 years ago

First time people crossed large open-ocean distance more than 2000 kilometres

Related to Austronesian ancestors in this larger Asia-Pacific region

Very important, first time crossing this kind of distance as well as first time crossing the Asia-Pacific frontier
Earliest settlement in Mariana Islands 3,500 years ago linked to early Austronesian cultural heritage of sea-faring tradition and early formation of Austronesian identity.
What was the environment like when Austronesian ancestors first settled in the Mariana Islands? What did these people experience in their ancient world? What kind of lifestyle was possible or preferable?

Landscapes (and seascapes) seen today are not the same as those experienced by ancient Austronesian settlers 3,500 years ago.

For example, broad sandy beaches and coastal plains around Guam are more recent formations.
Ancient living surfaces are now buried rather deep beneath today’s beaches, often more than 2 metres.
Over the last 3,500 years, coastal habitats have transformed substantially.

Along with this change in coastline, other change can be noted in the nearshore marine ecosystem, native forest composition, and overall habitat.

The ancient habitat - or palaeohabitat - of first Austronesian settlers was quite different than can be seen today.
Digital terrain model of Guam, Present-day conditions

Conditions 3,500 years ago, Noting very different coastlines
3,500 years ago, set of small islets in shallow water

Detail of Orote Peninsula, southwest Guam, present-day Naval Harbour
Ancient lagoon at Orote,
Now buried several metres deep
3,500 years ago,
Narrow beach fringe in Tumon
and large valley basin in Hagatna.
Findings in Hagatna

Present-day conditions, paved urban area

3,500-year-old conditions, under-water within large embayment
Example of test trench in Hagatna

Test trench 03, west profile

Column of 2-liter samples:
- a. 130-140 cm (peat, upper portion)
- b. 140-150 cm (peat, middle portion)
- c. 155-160 cm (peat, lower portion)
- d. 160-165 cm (marine muck)

- Asphalt and crushed coral fill; smooth, very abrupt lower boundary; no cultural material
- Yellowish brown (10 YR 5/4) to dark brown (10 YR 3/3) silty clay; moist, friable consistence; smooth, very abrupt lower boundary; crushed coral fill, modern rubbish
- Black (10 YR 2/1) peat; wet, slightly sticky consistence; smooth, very abrupt lower boundary; preserved natural botanical remains, no cultural material
- Light gray (5 YR 7/2) to olive gray (5 YR 5/2) marine muck; wet, slightly sticky consistence; smooth, very abrupt lower boundary; natural marine shells, no cultural material
- *Porites* sp. coral limestone, indurated; lower boundary not reached; no cultural material
4,800 years ago: coral reef growing in shallow lagoon

3,500 years ago: mangrove forest growing in shallow ocean water

Until 1900s: fresh-water wetland with sedges

Modern: land-fill for urban land use
3,500 years ago, narrow beach fringe around base of limestone cliff and plateau
Ritidian today is protected as the Guam National Wildlife Refuge, U.S. Fish and Wildlife Service.

Excavations verified earliest settlement 3,500 years old in much different coastal zone than can be seen today.
Excavations showed series of occupations, interrupted by high-energy storm deposits

Earliest occupation was a small-scale and short-term fishing camp within an inter-tidal setting at the edge of a lagoon, around 1500-1000 B.C., at end of highstand maximum and before period of sea-level drawdown

Later occupations were increasing size and intensity, as the sea level lowered and the coastal plain became broader
Ancient Austronesian settlers made and used finely decorated pottery, similar to findings in the Philippines of the same age, 3,500 years ago.
Variety of stone sources utilised for diverse tool-kit
Local shells used for making beads, bracelets, fishing gear, and other items
Variety of pendants and other personal adornments, revealing artistic value and appreciation by individual people.
Conclusions about first Austronesian settlers and their ancient environment 3,500 years ago in the Mariana Islands …

Sites preserved deep beneath today’s broad beaches

Ancient contexts were narrow beach fringes, marginal sand spits and berms, edges of swamps, shallow inter-tidal zones, and other such settings

Artifacts reflect Austronesian Neolithic material culture, shared with ancient Austronesian world around 3,500 years ago

Supporting physical environment began to transform around 3,000 years ago, so original lifestyle could not be sustained

Very different by 2,000 years ago
Continuing research …

Using terrain model for targeting zones of earliest sites

Ongoing data collection for full time-range, for example in succession of 500-year intervals, for addressing long-term evolution and transformation of the physical environment and human response

Collaborating with other scientists for more holistic understanding of palaeohabitat

Also more cross-regional comparison, for example with Philippines, Taiwan, and Indonesia

Acquiring new data to address issues of mentality and motivation of Austronesian ancestors 3,500 years ago, specifically how they related to their ancient environment
With many thanks …

Academia Sinica for invitation and support

Micronesian Area Research Center, especially Director Dr. John A. Peterson

Guam Preservation Trust

U.S. Fish and Wildlife Service

U.S. Naval Facilities and Engineering Command

Nanbo Insurance Corporation

Baba Corporation

Goodwin Corporation