

PREHISTORIC SUBSISTENCE STRATEGIES ON THE BATANES ISLANDS, NORTHERN PHILIPPINES

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ABSTRACT

Recent excavations on the Batanes Islands, northern Philippines have produced remains from a number of sites collectively spanning a 3000 year period. Seven of the sites produced limited faunal assemblages including both bone and shell allowing questions to be asked about the nature of subsistence over this time-span. Comparison of the archaeological material with ethnographic portrayals of subsistence on Batanes revealed some inconsistencies – particularly regarding the importance of marine products in Ivatan diet. The persistence in the archaeological material of a terrestrial rather than marine focus has interesting implications for maritime pursuits in general in Batanes prehistory.

BACKGROUND

The Batanes Islands lie in the Luzon Strait that separates the islands of Luzon and Taiwan (see Figure 1). There are ten islands in the group, though only the islands of Batan, Sabtang and Itbayat have had permanent populations within the period of European contact (Gonzalez 1966:5). The Luzon Strait, and more specifically the Bashi Channel that separates the Batanes group from the island of Taiwan, is the major convergence area between the South China Sea and Pacific Ocean. Shifting currents, high winds and frequent typhoons mean that sea crossings are particularly perilous (Gonzalez 1966:105). The three major islands themselves have few safe anchorages and the majority of the coastline is rugged and rocky (Gonzalez 1966:5).

In February-March 2002, a team comprised of archaeologists from the National Museum of the Philippines, University of the Philippines and the Australian National University carried out a series of surveys and excavations

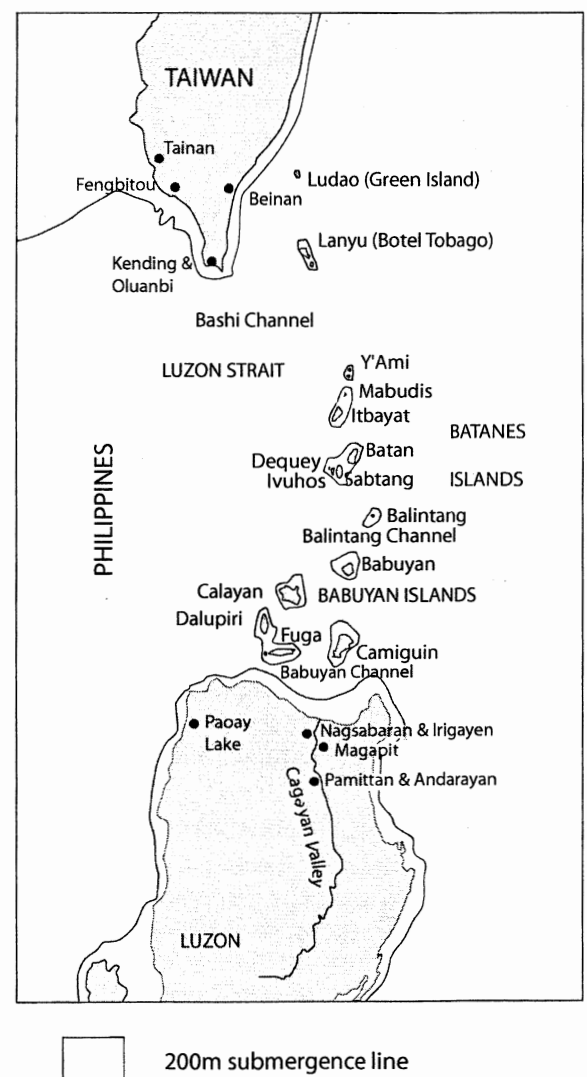


Figure 1: Map of the Luzon Strait, northern Philippines, showing the location of the Batanes Islands.

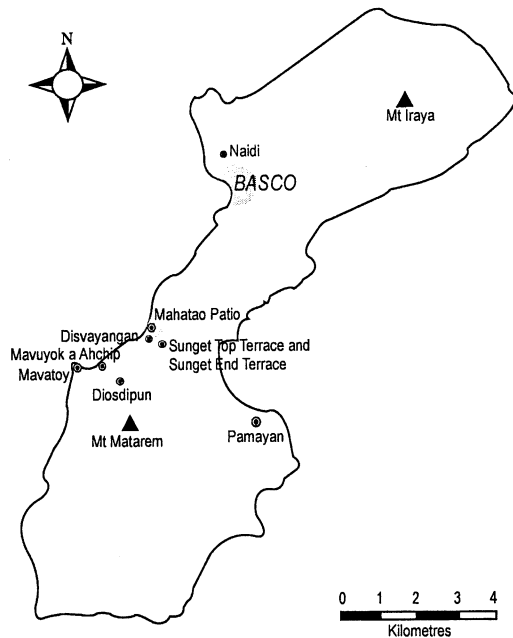


Figure 2: Map of Batan Island showing major settlements and archaeological sites investigated.

on the islands of Batan, Sabtang and Iyuhos within the Batanes Group. Seven sites were excavated, and all were located on the main island of Batan (see Figure 2).

Batan Island itself is 69km² with a hilly topography. Although largely volcanic, there are also limestone areas. The coastlines are often plunging, and many of the beaches are gravel or pebble rather than sand. Although the rugged topography and frequent typhoons make agriculture challenging, the nature of the land means that drainage is excellent, and prolonged flooding is rare.

The subsistence economy in the ethnographic present

The carbohydrate staples in Batanes are locally grown tubers and aroids; yam, sweet potato and taro, with rice being only infrequently grown on the islands. Cattle and goats are grazed extensively, and fishing is of major social and practical importance. Although many different fish species are caught and consumed, the most prized and targeted fish are flying fish (*Cypselurus opisthopus*) and dorado (*Coryphaena* sp.) and special rites and practices surround their capture. Terrestrial snails are consumed on occasion (Rey Santiago pers. comm. 2002) as are marine

shellfish, crustaceans and echinoderms. In general, it can be said that root crops and fish form the basis of the Ivatan subsistence economy, supplemented by other imported and local animal and plant products.

The question of interest for this study is whether archaeological remains reflect a similar economy. A two-pronged approach was employed to investigate this: an archaeobotanical study focusing on phytoliths and plant macro-remains to establish the presence and importance of various plants in the past, and analysis of the faunal remains to establish patterns of animal exploitation in prehistoric Batanes. The results of the faunal analysis are presented here.

SITES EXCAVATED

The seven sites excavated included two cave sites, and five open sites (see Table 1 for dates and Figure 2 for site locations). Chronologically, the sites fell into two major time periods, separated stratigraphically by a tephra layer that can be found across the island. The cultural material at the sites of Sunget Top Terrace and Naidi were both sealed under the most recent tephra layer, while remains at the other sites all post-dated the most recent volcanic event on Batan Island. The five later sites all indicate disturbance to varying degrees with Mavuyok a Ahchip and Diosdipun showing apparently minor degrees of disturbance and the remaining three sites being heavily disturbed. Two further sites, Payaman and Mavato, were excavated in 2003 by the same institutions, however analysis is not complete and material from these sites will not be considered here.

Faunal assemblages and analytical methodology

Animal bones and/or teeth were recovered from all of the sites, with shell assemblages coming from the later sites of Mavuyok a Ahchip, Diosdipun, Mahatao Patio and Sunget End Terrace. Bones were identified to the lowest possible taxonomic level, and were quantified using NISP (number of identified specimens present) and MNI (minimum number of individuals) methods, with weights also being recorded. Identifications were only made to a family (fish) or genus (mammal) level due to a lack of regional comparative material and uncertainties about faunal distributions in Batanes prehistory. All bone analysis was carried out in Australia. Assemblage totals (as calculated through NISP) are presented for mammal remains in Table 2 and 'other' bone in Table 3.

Shell analysis was primarily carried out in the field. Specimens were identified following Abbot and Dance (1982), Springsteen and Leobrero (1986) and Dharma (1988, 1992) and quantified using both MNI and NISP methods. Landsnail type specimens were brought back to Australia

Table 1: Excavated sites and associated dates

SITE NAME	SITE TYPE	DATE bp	CONTEXT
Sunget Top Terrace	Open site	2910±190 [ANU 11817] 2630±30 [ANU 11693] 2000±140 [ANU 11707]	Residue in pottery (AMS) Layer 5 charcoal concentration squares A/D, layer 5, 20-30cm within layer
Basco-Songsong Road	Open site	2620±30 [ANU 11695] 2240±140 [ANU 11708] 1590±210 [ANU 11694] modern [ANU 11709]	North sample with pottery A2, 0-10cm within layer South sample in road section A1, 0-10cm within layer
Diosdipun	Cave site	590±110 [ANU 11696] >modern [ANU 11736]	Test pit 2, 175cm below surface Extension south end, 120cm
Mavuyok a Ahchip	Cave site	modern [ANU 11711] 550±70 [ANU 11712] 750±80 [ANU 11697] 900± 60 [ANU 11713]	Square C, layer 2, 5-10cm within layer Square C, layer 3, 0-5cm within layer Square B, layer 3, 25-30cm within layer Square C, layer 3, 30-35cm within layer
Disvayangan Gully	Open site	No date – redeposited material	
Mahatao Patio	Open site	No date – site heavily disturbed	
Sunget End Terrace	Open site	No date – site heavily disturbed	

Table 2: Excavated mammal bone assemblages from Batan Island (NISP)

SITES	Pig	Dog	Rat	Deer?	Sheep/ Goat	Unid. mammal
Sunget Top Terrace	3		4			15
Mavuyok a Ahchip	1				2	9
Diosdipun	1		2	1		11
Disvayangan	4					1
Mahatao Patio	7	3				29
Sunget End Terrace	2	3	1			7

Table 3: Excavated fish, bird, decapod and reptile assemblages from Batan Island (NISP)

	Fish				Bird	Decapod		Reptile	
	Diodontidae	Scaridae	Labridae	Unid.		Coenobita sp.	Other	Turtle	Other
Sunget Top Terrace	14	1	4						
Mavuyok a Ahchip	1			35	1		1		6
Diosdipun				3		3			
Disvayangan									
Mahatao Patio				3				5	
Sunget End Terrace				5	3				

for identification, whereas marine shell was dumped onsite after identification and quantification. Attention was paid to condition of both bone and shell specimens including any indications of taphonomic alteration, as well as size and maturity.

RESULTS OF FAUNAL ANALYSIS

The early sites: Naidi and Sunget Top Terrace

The creation of the Basco-Songsong Road had exposed a site labelled as Naidi. A 3x1 m excavation proceeded back from the road-cut, and produced sherds of red-slipped pottery from beneath the uppermost tephra layer along with associated charcoal. With regards to fauna, only one tooth was recovered from the Basco-Songsong Road excavations. It was a molar shattered into four fragments, but due to the nature of the breakage, it could not be discerned with any certainty whether the tooth was pig or human. Given this, the Naidi site will be discussed no further.

Sunget Top Terrace is a small habitation site located close to a ridge-top behind the village of Mahatao. As well as containing numerous fragments of red-slipped pottery and notched stone net-sinkers, Sunget Top Terrace produced a faunal assemblage including both bones and teeth but no shell. This lack of shell is thought to be the result of chemical dissolution within the acidic clay matrix – a process which has visibly affected bones and teeth from the site. Three pig teeth along with four rat bones comprised the identifiable mammal assemblage. Given the very fragmented nature of the bone assemblage the other mammal bone remains, mostly longbone fragments, could not be identified. Labrid and diodontid fish were represented by teeth alone, and one scarid premaxilla was present.

Due to the nature of preservation at Sunget Top Terrace, the faunal assemblage cannot be seen as giving an accurate representation of faunal exploitation at the site. Rather, it can be seen as indicating the use of various types of fauna by site residents. The presence of labrid, diodontid and scarid fishes indicate that fishing was a part of the subsistence regime from the earliest known period of Batanes settlement. Furthermore, the presence of scarid and diodontid would indicate that fishing was done by means of netting or spearing, as opposed to angling (see Butler 1994), with netting considered probable due to the presence of a number of stone net sinkers. The domestic pig is also present from the earliest known phases of occupation. As it has not been possible to identify the rat bones down to species, it is unclear whether the rats represented in the Sunget sample are native or introduced.

Mavuyok a Ahchip

The post-eruptive site of Mavuyok a Ahchip (c.900 BP to sub-modern) lies at the inland mouth of a small tube-like sea

cave that runs right through the wall of an extinct volcanic crater. The adjacent coastline is coral reef on volcanic bedrock, with small pockets of sea grass and sand cover. Due to the small size of the cave platform, it was only possible to open 2.5 m² for excavation. Large sherds of earthenware cooking pots dominated throughout the deposits from surface to base. A small faunal assemblage was also recovered including bone, shell and calcified crustacean remains.

A small amount of mammal is present in the sample with only pig (one incisor) and goat (two fragments of metapodial) being identifiable. The rest of the mammal sample was comprised only of broken longbone fragments. Goats were common in Batanes when Dampier visited in 1687, and were also noted by contact era missionaries (Bel 1720 and Huelva y Melgarejo 1781 in Elica 2002). It is thus considered likely that the metapodial originates from a goat rather than sheep. On paper, the fish sample seems larger here than other sites, however the vast majority of fish remains recorded were isolated scales recovered during flotation. The only identifiable fish bone was a diodontid spine. One crab dactyl was recovered along with two bones of a small bird and vertebrae of a small reptile.

The shell assemblage from Mavuyok a Ahchip was the largest of the five shell assemblages excavated. It is very diverse with eighty-two species represented in total, however few of these species are represented by more than a handful of individuals (see Figure 3 for histogram of most common species). The diversity is attributable to a combination of factors that reflect both environmental and cultural tendencies. The littoral areas close to the site are predominantly hard substrate. In this sort of environment, non-colonial gastropods normally dominate over colonial bivalves translating to high species diversity and generally greater molluscan heterogeneity. This natural diversity in the littoral environment close to the site is reflected in the Mavuyok a Ahchip shell midden through the employment of a fine-grained gathering strategies by human collectors. This means that there was a relatively low degree of selectivity when collecting shellfish, and as a consequence, the species in the midden are a fair reflection of those available in the surrounding environment. Also in support of a fine-grained gathering strategy is the fact that the shell assemblage contains many small species, as well as juvenile specimens. While the employment of a fine-grained gathering strategy coupled with the collection of small and juvenile individuals may be an indication of pressure on reef mollusc populations, it is felt that there is not enough evidence to firmly draw this conclusion.

Also of note within the mollusc sample is substantial evidence for exploitation of particularly terrestrial, but also freshwater environments. As can be seen in Figure 4, 44%

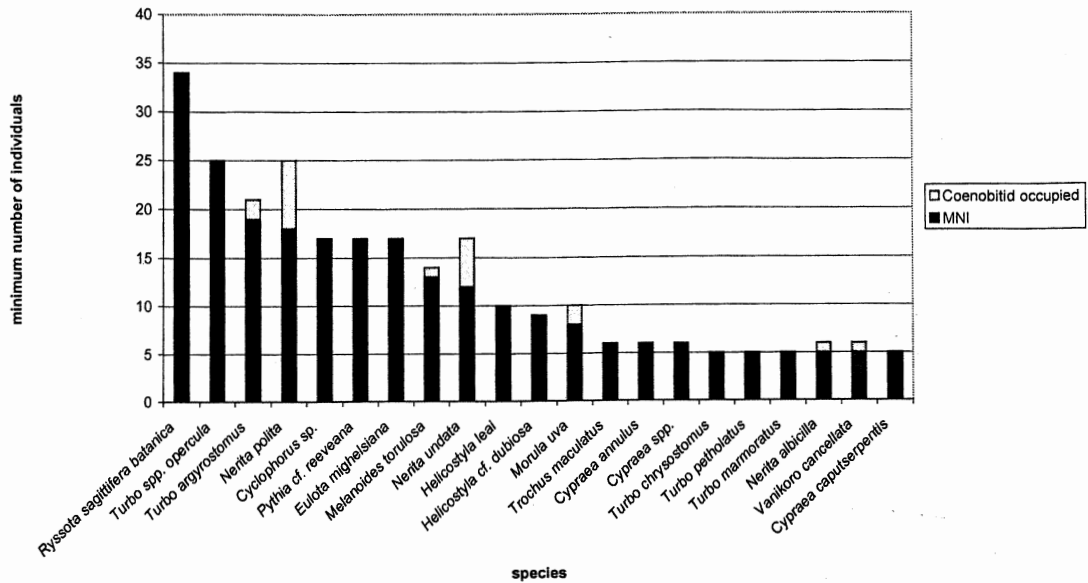


Figure 3: Histogram to show frequencies of mollusc species represented by more than four individuals within the Mavuyok a Ahchip deposits.

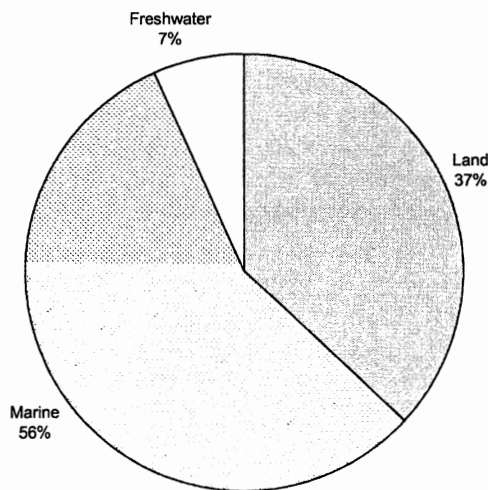


Figure 4: Pie chart to show the relative importance of environments exploited in the collection of molluscs at Mavuyok a Ahchip.

of the molluscs do not originate from the littoral environment. Given the fact that Mavuyok a Ahchip is located only metres from the reef, it seems to indicate that landsnails had a position of particular importance within the subsistence regime. Although landsnails can often be self-introduced into archaeological deposits – particularly sites where marine shells are breaking down and offering a source of available calcium in the calcium-starved terrestrial environment – it is

believed that the landsnails in the Mavuyok a Ahchip deposits are primarily introduced through a human vector. There are a number of reasons for this revolving around ecology, taphonomy, the spread of species represented and archaeological context.

Members of sub-family Helicostyliinae, including *Helicostyla leai*, *Helicostyla cf. dubiosa* and *Chloraea sp.*, are all tree dwellers. Only a few members of this group ever come to ground, and that is only to lay eggs in damp earth (Abbot 1989:112, 167). Their presence within dry cave deposits can thus be seen as unnatural and self-introduction is highly unlikely. Although it is possible landsnails were introduced to archaeological deposits through an animal vector other than human, the fact that most of the specimens are whole makes this unlikely; both birds and rats tend to break or damage gastropods to access the animal within (Claassen 1998:71; Brooke 2000). Unlike the marine shell sample, which represents the employment of a fine-grained gathering strategy, the terrestrial snail sample seems to represent selectivity. Only relatively large species of landsnail are present within the Mavuyok a Ahchip deposits, which is a pattern not seen in the natural environment. In addition, the landsnail sample is composed primarily of many specimens of a few species, rather than few specimens of many species as seen in the marine component. The presence of large *Ryssota sagittifera batanica* specimens within hearths at Mavuyok a Ahchip also lends weight to the argument that landsnails were specifically collected for consumption.

Diosdipun

Dios Dipun is the largest of a series of rockshelters near the top of a long, sharp ridge that extends from the sea inland just south of the village of Mahatao. Three testpits were set up, though the main excavation focused on testpit 2. Most of the cultural materials were concentrated in the top three stratigraphic layers, however an isolated bundle burial was encountered in layer five, 1.85m below the surface. The bulk of the faunal material came from the upper 60cm of the excavation, with only a few isolated finds below this.

As with all other sites, the bone assemblage is small and fragmentary. Pig is again represented by a single incisor, while rat is represented by a right humerus and a rib. A proximal end of a radius has been tentatively identified as deer based on reference specimens, however this identification is by no means certain. Deer were present until quite recently on the P'eng Hu Islands in the Taiwan Strait (Tsang 1992:7). Cervids are still present on many islands of the Philippines, though have somewhat mysteriously been extinct in Palawan since the Late Pleistocene (Lopez 1977:77). Whether deer were ever present on Batanes is uncertain. Eleven unidentifiable fragments of mammal longbone were also recovered. The only fish remains recovered were a scale, a subopercular and a dorsal spine and none of these were identifiable to family. Two dactyls and a carpus of a coenobitid terrestrial hermit crab were also recovered, though this undoubtedly represents intrusion. No animal bone or crustacean material was found beneath 60cm below surface.

The shell assemblage is the second-largest, after Mavuyok a Ahchip (see Figure 5 for histogram of the most

common species). The *Diosdipun* sample is heavily dominated by terrestrial snails, with only 16% of individuals deriving from marine environments (see Figure 6). Given the distance between the sea and the shelter however, (about 40 minutes walk – most of it uphill) this is unsurprising. Forty different species of mollusc are represented, though the terrestrial snail *Bradybaena mighelsiana* is clearly dominant. Although *B. mighelsiana* is endemic to Batanes, it is cosmopolitan with regards to its distribution within Batanes. As well as being found on trees and shrubs, it is also found close to human habitation on the sides of walls and buildings (Vaught 1989). Given this, it is rather hard to rule it out as a self-introduction to the site, however, the large numbers found within the deposits coupled with the fact that it is a recognised food-source on Batanes today (Rey Santiago pers. comm. 2002) certainly opens up the possibility that they represent subsistence remains. The large endemic terrestrial snail *Ryssota sagittifera batanica* also appears in some numbers. Members of genus *Ryssota* are still gathered actively throughout parts of the Philippines for food and bait (Parkinson *et al.* 1987:47), and the presence of this species within hearths at Mavuyok a Ahchip indicates they were indeed a food-source on Batanes. The only obviously intrusive terrestrial mollusc is *Pupina cf bicanelliculata*. This mollusc is tiny (less than 5 mm in height) and was generally recovered through flotation. Pupinids live and feed on damp moss (Abbot 1989:46), and specimens could have been introduced into the archaeological deposits either by inhabiting moss growing in/near the cave, or the human introduction of moss to the cave from elsewhere.

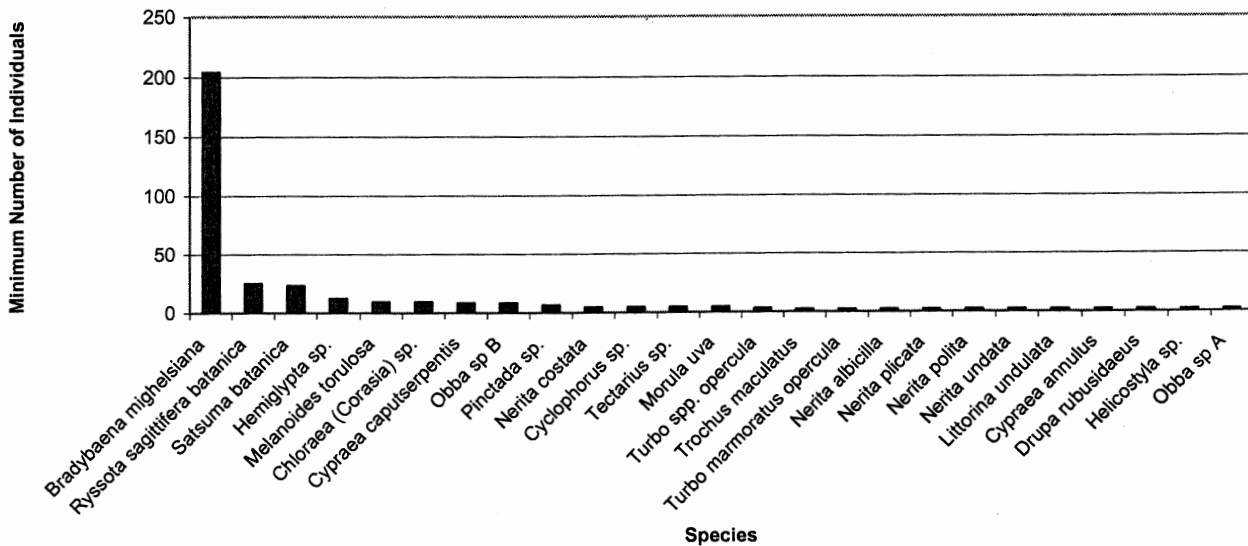


Figure 5: Histogram to show frequencies of mollusc species represented by two or more individuals within the *Diosdipun* deposits.

No particular species dominate the marine portion of the sample. As with Mavuyok a Ahchip, most are hard-substrate gastropod species, and specimens are typically small. Rather than making a serious contribution to subsistence, perhaps the collection of these shells provided occasional variety in diet.

Disvayangan

Disvayangan is a deeply-incised gully in a narrow valley just south of the village of Mahatao. It was evident in the exposed profile that all the material was redeposited – washed down from slopes above. Material was recovered through a process of profile-cleaning rather than excavation, and thus retention of material was selective. Although some shell was present, none was collected, and the only bone recovered was the right upper mandible of a pig and two loose pig molars as well as a pig atlas.

Mahatao Patio

The Mahatao Patio site, next to the church in the centre of Mahatao, was located through the presence of a large number of sherds on the surface exposed through recent grading. Upon excavation, it was found that this process, along with the digging of a nearby well, had substantially disturbed deposits, with modern materials being found in the lowest layers of excavation alongside clearly prehistoric earthenware. For this reason, the faunal assemblage is difficult to interpret and only presence/absence can really be denoted with cultural associations being rather ambiguous.

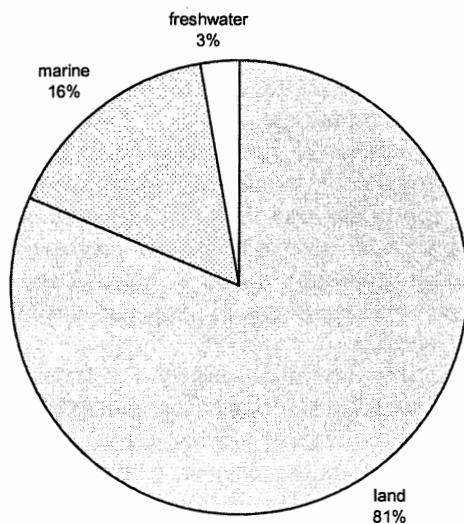


Figure 6: Pie chart to show the relative importance of environments exploited in the collection of molluscs at Diosdipun.

Pig is represented by a fragment of mandible as well as a number of loose teeth. Dog is also present in the deposits represented both by teeth and the distal end of a humerus. Dog is only represented at two of the Batan Island sites – Mahatao Patio and Sunget End Terrace. Unfortunately both sites are so heavily disturbed that no conclusions can be drawn as to whether the dog was present in Batanes prehistorically. Twenty-nine other fragments of mammal bone were excavated – primarily unidentifiable longbone fragments. Despite the site’s proximity to the sea (c.100m now, though closer in the past), only three fish bones were recovered; two vertebrae and one unidentified dorsal spine. Five bones of marine turtle were recovered, though whether these – or indeed any of the other bone material – represent human food remains cannot be speculated upon given the disturbed nature of the site.

The shell assemblage is dominated by marine species including twenty-two species derived from the littoral zone and only two terrestrial species (*Cyclophorus* sp. and *Ryssota sagittifera batanica*) (see Figure 7). Unlike marine shells in the other assemblages, the specimens from Mahatao Patio are from medium-large rather than small-sized species such as the larger turbinids (e.g. *Turbo argyrostomus*, *Turbo marmoratus*) and cypraeids (*Cypraea arabica*). Their presence here clearly indicates that these larger shells were present in the local environment, though apparently not being collected at other sites.

All of the shells from Mahatao Patio are in a chalky and degraded condition. Given the robust nature of shells present in the excavated sample, it is highly likely that frailer shells have long since dissolved. This would explain the unusual absence of both terrestrial snails and smaller, lighter marine species.

Sunget End Terrace

This was a very small scale excavation, with only 40 cm of a 1x1 m test pit being dug before bedrock was reached. Deposits were highly disturbed with modern material being found alongside tradeware and earthenware at the lowest levels. Pig, dog and rat were all represented by small numbers of bones and teeth with a further seven fragments of mammal longbone also being recovered. Five fish bones, including two dorsal spines and three vertebrae, were present in the sample, though none were identifiable. A small species of bird was also represented by three longbone fragments.

The shell assemblage consisted of only thirteen individuals/fragments in five different species plus two generic groupings. The large turbinids *Turbo marmoratus* and *Turbo argyrostomus* are represented by shell fragments as well as opercula. Terrestrial snails are represented by a single *Bradybaena mighelsiana*. Although very little can be said about so small an assemblage, it can be noted that,

SZABÓ: PREHISTORIC SUBSISTENCE STRATEGIES, BATANES ISLANDS

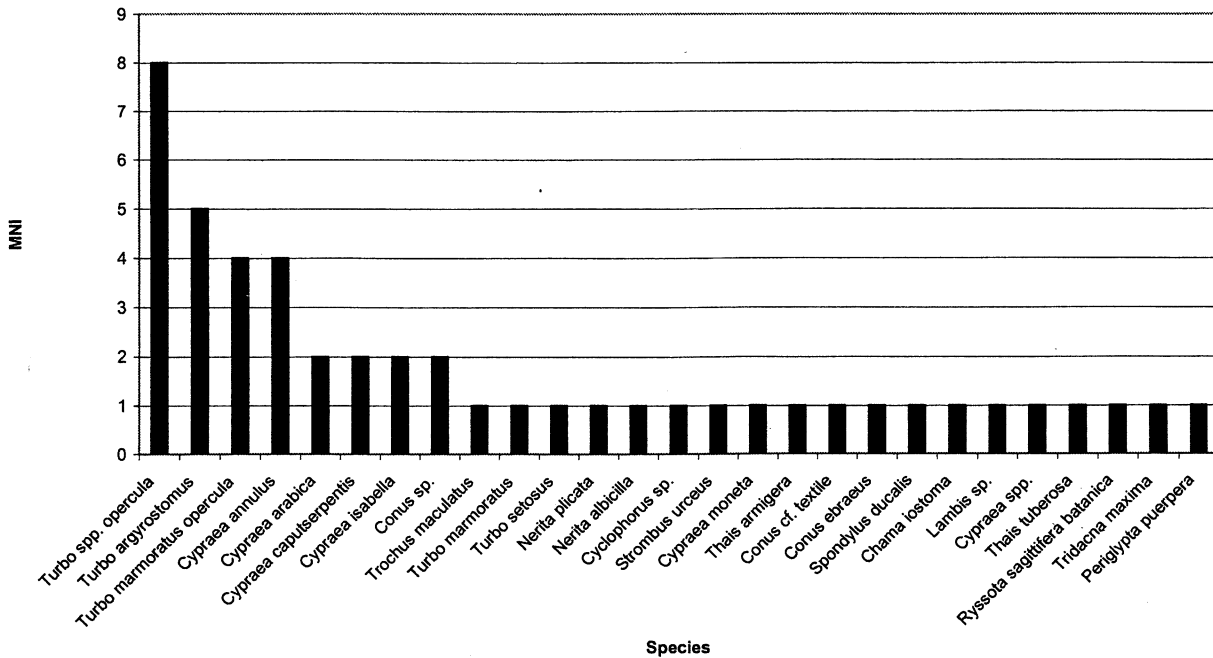


Figure 7: Histogram to show frequencies of mollusc species represented within the Mahatao Patio deposits.

as with Mahatao Patio, medium to large sized marine shells are being collected rather than the smaller species that predominate in Mavuyok a Ahchip and Diosdipun deposits.

DISCUSSION

Despite the small size of most of the faunal samples, some conclusions can be drawn. The main pattern evident in both the bone and shell assemblages is the terrestrial rather than marine focus of remains. Given the fact that Batan is a relatively small island with the major landmasses of Taiwan and Luzon being over 100km away in either direction, this low level of marine exploitation was not expected and does not accord with ethnohistorical accounts of Batanes subsistence practices. The presence of fish bones and net sinkers at Sunget would indicate that fishing has been practiced since earliest-known times on Batanes, however no assemblage attests to fishing being a particularly important pursuit in day-to-day subsistence.

Likewise, marine shellfish were clearly exploited, however numbers present are small, and individuals are typically also small in size. Terrestrial snails appear to have been more important with targeted selection of species and, on average, larger-sized individuals. The two sites that show a greater marine-shell focus, Mahatao Patio and Sunget End Terrace, are very small samples with disturbance very likely having affected preservation of frailer-shelled individuals and cannot be seen as a significant challenge to the terrestrial/marine pattern. What these latter two assemblages do demonstrate, however, is that large marine species were

available in the local environment and were apparently not selected for at other sites. Although it is possible that marine shells were processed at the collection point with only the animals being returned to the site, or indeed consumed at the point of collection, surveys produced no evidence of coastal middens.

Why are terrestrial snails seemingly more important than marine shellfish in Batanes subsistence? Although it is impossible to do anything but speculate, a possible influencing factor could be the role of agriculture in prehistoric Batanes. Using 'optimal foraging' principles, it would be more profitable to collect terrestrial snails from amongst gardens and surrounding forest than to make a separate trip down to the shoreline for marine shellfish. This is particularly the case if fishing was only of secondary importance with regards to overall subsistence patterns. Further work on both botanical remains and settlement patterns and landscape use will hopefully shed further light on this question.

Overall, the prehistoric residents of Batanes appear to be much more land-oriented than residents of the island today. The importance of fish, and particularly pelagic fish, seems to be a recent phenomenon, with even inshore fishing appearing to be nothing more than supplementary in the past. The low occurrence of marine shellfish reinforces the stance that inshore resources were not of great importance prehistorically. This pattern would imply that residents were perhaps not only just 'land-focused' but 'land-bound'. Assemblages show little evidence of venturing out to sea,

and a corresponding low frequency of tradewares compared to other locales in the Philippines also implies that few from outside ventured to Batanes.

On one level, this pattern is unsurprising given the roughness of the seas and isolation of the islands. On another level, this observation has interesting implications for theories involving the Batanes as stepping-stone islands between Taiwan and Luzon. Although the islands of the Batanes no doubt acted in this capacity at various points in history, the faunal and material culture evidence suggests that contact between Batanes and the rest of Island Southeast Asia was sporadic at best.

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