

## **AUSTRONESIAN PREHISTORY FROM THE PERSPECTIVE OF SKELETAL ANTHROPOLOGY**

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A very relevant question before we discuss the human skeletal remains concerning the Austronesian prehistory is : who is really the Austronesian people? Most scholars agree that the term Austronesian has nothing to do with genetic-biological matters but related to linguistics one (see for example Jacob, 2003). That is why the Austronesian people should be considered as a group of the Austronesian speaking populations that are now widely dispersed from Taiwan (in the northern part), Madagascar (in the west), up to the Pacific islands (in the east). Archaeological studies on their cultural materials show some particular characteristics of this people : had an economy based on agriculture and animal domestication, and developed red-slipped pottery (Bellwood, 1997; Simanjuntak and Tanudirjo, 2003). As agricultural communities, they are no longer a hunter or gatherer, but highly related to the mechanism of the neolithic communities. Consequently, in terms of biological perspective, the Austronesian people are closely related to the people who lived since the Neolithic period, and therefore they could be assumed as Mongolid race. This principle must be agreed first upon this discussion to avoid confusion that potentially arises between the terms of Austronesian people as the Austronesian speaking populations and the Austronesian people as explained in biological context.

The strong domination of Australomelanesid race in the first half of the Holocene period in the Archipelago is significant, particularly in the western part in Sumatra and Java, and recently found in South Kalimantan as well (Widiyanto and Handini, 2003). The radiometrical datings show that this people lived in this area between 13,000 until at least 5,000 BP (Simanjuntak, 2002), before a physically different population, the Mongolids, replaced them. The latter --which is assumed to arrive in Indonesia on at least 4,000 BP-- is a part of Austronesian people that migrated from the north, Taiwan, and spread rapidly to the south (the Philippines and Indonesia), before reaching the Pacific region in about 2,000 BP (Bellwood, 1997). Their migration route is called as "out of Taiwan" theory, which mentions that Southern China, may be Fujian or Zhejiang, was their place of origin before they moved to Taiwan. Because of their very

rapid movement to reach Polynesia, which needs of 4,000 years only, the "out of Taiwan" theory is also known as the "Express Train to Polynesia" theory.

But it seems that the "out of Taiwan" is not the only theory related to the dispersal of Austronesian people. Among the experts that suggest a different opinion is Stephen Oppenheimer (1998), who believes that Sunda Plate is the place of origin of this people before they migrated to various directions. They reached Australia in the south, the Pacific in the east, they arrived to the Indian Ocean in the west, and reached the Asia Continental in the north. Floods and the rise of sea level between the end of Pleistocene and early Holocene on around 14,000 BP, 11,500 BP, and 8,000 BP have urged them to migrate and resettled in new places, bringing with them their various innovations.

In biological perspective, the Austronesian-speaking people in Southeast Asian archipelago, including Indonesia, is known as Southern Mongolid. Data of human skeletons from various sites shows that the Mongolid genetic flow has never been succeeded to penetrate Papua and the neighbouring islands in the eastern part of Indonesia. In the east, human remains are dominantly Australid-Melanesid-and Tasmanid (already perished), which was the Arafurid sub-race (Jacob, 2002). On the other hand, the Southern Mongolid --which flourished in the Southeast Asian archipelago-- is quite different from those in China and Japan, known as the Northern Mongolid. During his research on human remains in Southeast Asia and the Pacific, Howells identified similarities between Polynesian and Micronesian specimens with phenotype characteristics of Southern Mongolid, and he concludes that the inhabitants of those areas in the Pacific are the descendants of the Southern Mongolids (Howells, 1973). They are not of Northern Mongolid origin, and neither the Australid, Melanesid, and Papua New Guinea people living in that region. If this assumption is right, there is a great possibility that the Southern Mongolid migrants had replaced the Austromelanesid people who lived initially in the region.

### **Morphological features**

Compared to the preceding Austromelanesid, the skulls of the Mongolid race shows a very significant brachycephalization and general gracilization processes. Therefore, the Mongolid skulls are brachycephalic in shape with average brain capacity of 1,400 cc. Their vaults are high and round, with no sagittal keeling or para-sagittal depression in the central part. The foreheads look more vertical with torus supra-orbitalis

reduction and gradual disappearance of glabella, arcus superciliaris, and sulcus supratoralis. At the parietal, there is a rounded wall with well-developed of tuber parietale, where the maximum width of the skulls is located. There is no pre-lambdatic depressions at the rear part of the skulls, so the occipital profiles are round in shape with no torus or sulcus occipitalis, and in many cases there are multiplication of Inca bones around the lambda. Another characteristic of the Mongolid race, which is extremely dominant, is the flat and broad face, which is mainly due to the gracilization process of the skull's superstructure character, including gradually disappearance of prognathism. The broad face is also caused by lateral projection of the malar bone, as well as shallow nasion notch and nasal root, and narrow palatinus. The orbits are wide and square, and the infra-orbital margins are round. In line with the brachycephalization and gracilization processes, there was reduction of masticating apparatus. The maxilla and mandibula became increasingly smaller, and the teeth became more slender. Shovel-shaped of upper incisors are frequently found. The canine fossae were gradually disappear, followed by the agenesis process on the last molar (M3), among others through reduction process on the hypoconulid. There is no distinct development of torus mandibularis or torus lateralis, so the mandible looks more slender. The reduction of the mastication apparatus caused the increasing of prognathism and the flatness of the face.

The morphological situation of the skulls is very distinctive from the characteristics of the preceding colonies, the Australomelanesid. Their body posture and other bone biometric also show very significant gracilization among the Mongolids. The Australomelanesids have a taller and more robust bone size, skeletal components, and postures. No biological evolution process occurred between the two races, because the first race did not give any genetic characteristic to the other race. Based on their successive life period, we can be sure that the "replacement theory" model had occurred within the Australomelanesid and Mongolid races around 5,000-4,000 BP. The "replacement" process can also be seen on some human remains found at various prehistoric caves since the end of the Pleistocene period.

At the Niah cave, Sarawak, there are three clusters of human burial from three different groups of date. The Deep Skull definitely has the oldest date (Brothwell, 1960), while the youngest is the coffin burial cluster with a date of  $3,080 \pm 40$  BP and the pandanus mat burial from  $3,410 \pm 100$  BP (Harrison, 1975). Between those two is the squatted burial of  $13,640 \pm 130$  BP, considered as the pre-neolithic burial.

Interesting to note is the youngest burial group with individuals buried in coffins or on pandanus. Although it is not explicitly mentioned as Mongolid burial cluster, based on the extended position of the individuals and its radiometrical datings, it is assumed that the youngest burial was a Mongolid burial cluster. Thus far, the Mongolid burial custom is frequently found in extended position in caves, and the dating agrees with the period when the Mongolids fully occupied the Philippines after the Deep Skull era. The replacement process is clearly illustrated at this cave, from the Niah skull as one of the predecessors of the Australomelanesid in Southeast Asia, or their descendants with Australomelanesid characters that was represented by the middle burial cluster (in which the individuals were buried in squatted or seated positions), and ended by the appearance of the Mongolid race, represented by the extended burial, the youngest one.

Traces of the Mongolid race were also found at other caves in Java such as Braholo, Song Keplek (Widianto, 2003), and Song Tritis (Widianto and Handini, 2004), all located at Gunung Sewu area. The individual of Keplek 5, dated to  $7,020 \pm 180$  BP, is a real Mongolid individual that lived in co-existence with the Australomelanesids at Song Keplek sometimes around 7,000 years ago. This date led to the assumption that the Mongolids have existed and inhabited the cave before the last Austromelanesid extinct 4,000 years ago. If the date is accurate, Song Keplek is a witness of the earliest appearance of the Mongolid race in Southeast Asia, one thousand year earlier than what has ever been predicted by experts, based on the "out of Taiwan" theory. At Braholo cave, the indication of the existence of the Mongolids is seen in the Braholo 4, which according to its stratigraphic position, is the youngest individual at this site for it was found on Layer 2, the uppermost layer. Although the skull was not found, the Braholo 4 is believed to be the representation of the Mongolid race. This assumption is based on the size of the body bones and its quite slender posture.

Almost similar case is the Tritis 1, the only human skeleton found so far at Song Tritis, a pre-neolithic cave lied around 3 km south of the Braholo cave. The skeleton was found on Layer 2, between a  $1,100 \pm 180$  BP pottery layer and a  $2,860 \pm 150$  BP fireplace ash layer, so that it is assumed to be 2,000 - 2,500 years old. The Tritis 1 is a primary flexed burial, a very complete skeleton except its calvarium. Its mandibula and all its teeth are very well conserved. Although it was buried in flexed position, the Tritis 1 do not show Australomelanesid characteristics. Its mandibula is gracile, the teeth are small, the posture and the size are extremities slender. Furthermore, in relation to its assumed date, the individual must have been part of Neolithic individuals, which

corresponds morphologically to the typical features of the Mongolid. It is suggested that the Tritis 1 is the representation of the Mongolids that lived at Song Tritis about 2,500 years ago.

Another example of the existence of the Mongolids that lived in prehistoric caves is a skeleton from Leang Cadang in Soppeng, South Sulawesi. The human remains consisted of mandibula, maxilla, and more than 2,700 isolated teeth are related to the Upper Toala culture and their age is about 4,000 years (Heekeren, 1941). Most of the teeth, particularly the incisors and the canines (more than 85 % of upper incisors and more than 32 % of lower canines) show a distinct shovel-shape, the strong characteristic of the Mongolid race (Jacob 1967). Based on their dimensions, they are compatible to the teeth from Bola Batu located in the southeast of Leang Cadang. In this case, both Leang Cadang and Bola Batu are the sites in South Sulawesi that were inhabited by the Mongolids about 4,000 BP.

Besides in a number of prehistoric caves, data on human remains from the second half of the Holocene were collected from urn burial sites. The leading urn burial sites were those in coastal areas like Anyer (Banten, West Java), Plawangan (Rebang, Central Java), Gilimanuk (Bali), and Melolo (Sumba, East Nusa Tenggara). Moreover, elements of urn burial --in more inferior quality-- were also discovered in Sumatra and Central Sulawesi. Based on the existence of artifacts that were commonly used as burial gifts, such as Neolithic objects, pottery, and metal objects, those urn burials are considered to come from a Neolithic or even palaeometallic period.

At Anyer Lor, Banten, human skeletons were usually buried in flexed position with earthenware plates and bowls as burial gifts; no metal objects were found there (Heekeren, 1958). In addition to urn burials, extended burials (in which the individuals were buried with face downward or in stretched position) were also found. This burial custom is nowadays still practiced near Lake Batur and East Buleleng, Bali (Stein Callenfels, 1940). One of the urns contains a human skeleton in a good condition with slight mineralization process. The skull is low but shows thick bones, reaches up to 10.4 mm, a robust mandible with normal size teeth. There is a possibility that it belongs to a male individual. Van Heekeren was of the opinion that Anyer site is a proto-historical burial, dated from 200-500 AD (Heekeren, 1956). A mandible was also studied by T. Jacob, and was identified as a dolichognathic mandible of a  $\pm$  20 years old adult female. The very high and thick corpus but with normal sized teeth suggest the Australomelanesid characters, which reappear in the urn burial in the coastal area of West

Java (Jacob, 1964). The race with the robust mandible seems to have inhabited vast areas in Southeast Asia, and the specimen from Anyer could possibly be the link of the sites in Malaysia and East Java.

At Plawangan, in the shoreline of Rembang, Central Java, the situation is somewhat different. This burial site, with burial gifts of beads, bronze and iron objects, and pottery, is a dense and vast site, and yielded not less than 40 individuals, adult and children, male and female (Soegondho, 1990). Seen from the burial gifts, this site is assumed to be a variation of the urn burial sites developed at the end of the prehistoric period in Indonesia. The individuals have round and rather tall brachycephal skulls, with broad and flat faces, flat nasal bones, medium eye sockets, and medium prognathisms. Their jaws (maxilla and mandible) are not robust, with medium average sized teeth and shovel-shaped front teeth as well, and show molar rotations in some individuals. Their postures are small to medium. The physical characteristics of the human remains from Plawangan demonstrate the characteristics of the Mongolids (Boedhisampoerno, 1990).

Similar to the Plawangan human remains is the urn burial site of Gilimanuk in Bali. On a plain 5 meters above sea level, at the coast of Gilimanuk, urn burials were discovered, among which are double jar burials (Soejono, 1977). More than 100 individuals are found in this site in various burial positions: primary burial (single, double with one individual on top of another, in extended, semi-flexed, flexed, dorsal, and downed face position), secondary burial, mixed burial (primary and secondary), and double jar burial. Among more than 100 individuals buried at this site, most are complete. The burial gifts include pots/jars, jewellery (beads, bracelets, etc.), bronze and iron objects, sacrificial animals (boars, dogs, and aves), and daily implements like pots, fishhooks, and tools made of mollusks' shells.

There were two phases of human occupation at this site. The youngest was on the depth of 50-60 cm ( $1,650 \pm 55$  BP) and the older was on the depth of 150 cm ( $1,850 \pm 55$  BP to  $1,800 \pm 85$  BP) (Soejono, 1977). Based on the dates, the Gilimanuk site is considered to be an urn burial site from the end of the prehistoric period. The characteristics of the skulls, faces, and teeth led T. Jacob to the conclusion that the Gilimanuk individuals belong to the Mongolid race (Jacob, 1967). The teeth of the Gilimanuk individuals are comparable to those of the Neolithic people found at Leang Cadang and Bola Batu in South Sulawesi, and similar to those belong to the modern Buginese and the Javanese people. The Gilimanuk people that lived during the palaeo-metallic period were assumed to be the ancestors of the modern Balinese people.

Further to the east, urn burials were also found at Melolo, Sumba, by A.C. Kruyt, then L. Dannenberger and Rodewaldt. They transferred 34 individuals discovered during the excavation to J.P. Kleiweg de Zwaan and C.A.R.D. Snell in Surabaya. The human skeletons have never been found in complete condition, in general only the skulls with or without mandible, and sometimes they were found with long bones, therefore, it is regarded as a secondary burial complex (Heekeren, 1958). The burial gifts consist of beads made of mollusc's shells or stone, bracelets and rings made of mollusc's shells, rectangular adzes, and pottery. The artifacts reflect a burial culture in Neolithic context. Snell's study on human remains at Melolo states that they belong to the mesodolichocephalic skull group, and are a mixture of Palaeo-Melanesid/Negroid and Mongolid (Snell, 1948).

Besides the sites mentioned above, there are also urn burial sites in Sumatra and South Sulawesi. However, not much information can be obtained from them, especially concerning the human remains. From the Lesungbatu village, Muara Danau, Tebing Tinggi in West Sumatra, J.C. Noorlander reported a discovery of a couple of urn burials, each contains some fragments of human skeletal remains. Similar type of burial is also found near the megalithic complex of Bada in Central Sulawesi, but it is not known yet whether it is part of the megalithic culture or not. At Sa'bang, about 50 km north of Paloppo, ten urn burials were found in association with pottery, bark cloth beater, grinding stone, and iron arrow head. It is assumed that those are secondary burials. There is no further explanations regarding the human remains at the Sumatra and Sulawesi sites, hence the bearer of this culture has not been able to be identified clearly.

Studies on the mechanism of human habitation during the second half of the Holocene up to the end of the prehistoric period in Indonesia show that the Mongolids, which more specifically are called the Southern Mongolids, seem to have thoroughly conquered the archipelago, except Papua and some small islands in the eastern part of Indonesia, which are dominated by the Papua-Melanesids. Various data on human remains with Mongolid characteristics at different types of prehistoric settlements --both in prehistoric caves and urn burials in the coastal areas-- have given us a very important illustration regarding the mobility of the Mongolids since their first arrival in the archipelago. As I have mentioned before, it seems there is a strong indication of "replacement" process in the migration and colonization in the archipelago during the second half of the Holocene.

It is almost certain that the real inhabitants of pre-neolithic caves, the Australomelanesids, had been replaced by the Mongolids that came later at about 4,000 BP. The "replacement" can occur normally, in the sense of : the Australomelanesids came earlier then replaced afterward by the Mongolids, or a co-habitation like what happened at Song Keplek : the Mongolids came before the last Australomelanesids disappeared. In this case, the Keplek 5 is very exceptional because it is the oldest Mongolid specimen ever found in Southeast Asia so far.

The indication of the habitation process is more interesting seen from the human remains of at least 37 individuals at Gua Kepah (Kepah Cave), a site that is more related to the *kjökkenmodinger* (molluscs' shell mound) culture in the west coast of the Melacca peninsula, considered as a pre-neolithic site. The dominant character of the human remains is the mixture of the Mongolid and the Australomelanesid (Jacob, 1967). Taken into account the existence of the Mongolids, Melanesids, and Australids nowadays, we could witness a hybridization and evolution processes that work together. Furthermore, related to the similar type of hybridization as shown by the Wajak specimens, it can be assumed that the Mongolid traits had existed in the archipelago since the first half of the Holocene, and there is a great possibility that the arrival of this race in Indonesia happened far earlier than ever supposed before. The hybridization occurred during the end of Pleistocene and early Holocene was then crystallized as the real Mongolid at 7,000 BP, as proved by the Keplek 5 from Gunung Sewu. In a smaller data quantity compared to the above "replacement" process, the hybridization cases of Wajak and Gua Kepah can be seen as the indication of the "local evolution" related to the appearance of the Mongolid race in those areas.

The cave habitation process, which was the common trend by the Australomelanesids in early Holocene, seems not automatically replaced by habitation in open areas in early Neolithic in line with the arrival and domination by the Mongolid race in Indonesia. The Mongolids did not automatically inhabited open spaces when they first arrived in Indonesia, but still used caves as their initial habitation places. The evidences are shown not only by the discovery of human remains with Mongolid characters at Leang Cadang, Gua Braholo, Song Keplek, and Song Tritis, for instance, but also indicated indirectly by the existence of pottery on the upper layers of their caves. The Mongolids came out completely from the caves and stayed at open site, differs from one site to another. The datings from Song Keplek and Gua Braholo indicate that they moved to open site within Gunung Sewu occurred at about 2,000 years ago, by the

development of rectangular adze and arrowhead industry (Simanjuntak, 2002). Data from other places has not been confirmed due to the insufficient of Neolithic habitation sites, especially related to the human remains from the Neolithic sites.

T. Jacob mentioned the Melanesid context regarding the human remains from the Kalumpang site in South Sulawesi, therefore the bearer of the Neolithic culture at Kalumpang is more related to the migration process in the eastern part of Indonesia. On the other hand, no human remains were found at Kendenglembu and Ponjen, although the latter is identified from  $1,180 \pm 70$  BP and  $870 \pm 40$  BP (Simanjuntak, 1995). More intensive researches on Neolithic habitation sites are needed in relation to gather data on the movement of the Mongolids from cave sites to open sites at around 4,000 years ago. In the prehistory of Indonesia, our knowledge on the habitation mechanism of the Mongolid race in open site within the Neolithic context is blank.

The void of information situation for quite a long time, until at last burials -- generally urn burials-- were found in coastal areas. They were from early AD, when the palaeometallic technology well developed at the end of the prehistoric period. The skeletal evidences show the domination of the Mongolids at the sites of Plawangan and Gilimanuk. However, the Australomelanesid characters are still clearly seen at Anyer, while at Melolo, there is a mixture of Palaeo-Melanesid and Mongolid. This situation indicates that the Australomelanesid was still existed until early AD in the archipelago, while the Mongolids, on the other hand, obviously inhabited Song Keplek around 7,000 BP. Therefore, the existence of both races cannot be separated in clear-cut fashion. There was a flexibility of genetic flow in the archipelago during the Holocene, even since late Pleistocene, which enabled the two races to be co-existed. In this case, each race survived beyond its theoretical life-span period.

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