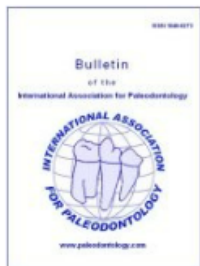


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# Aims and scope

Bulletin of the International Association for Paleodontology ([www.paleodontology.com](http://www.paleodontology.com)) is an interdisciplinary open access online journal inviting and welcoming contributions from anthropology, bioarchaeology, paleodontology and related fields. The journal publishes papers and develops discussions on a wide range of research problems, e.g. methodology and methods of bioarchaeological, and anthropological research, including field and laboratory study techniques; information technologies; bioarchaeological reconstruction; human evolution; etc. The journal also publishes results of field investigations conducted by bioarchaeologists, anthropologists, osteologists, and announcements of symposia and professional meetings. It is the goal of this publication to provide authors with an international forum for the presentation of their materials and ideas. Bulletin of the International Association for Paleodontology features eight types of articles: original scientific papers, reviews, case reports, letters to the editor, book reviews, meetings reports and preliminary communications. Bulletin of the International Association for Paleodontology is primarily a scientific journal, but submissions from scholars and students in this field are also encouraged.



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# Social identity: an interpretation of dental modification practices on Indonesian historical human remains

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## Abstract

This research objective is to describe the social identity of the skeletal human remains based on dental modification. The research material is skeletal human remains from Kedaton Temple and Upas Well which consists of five individuals. These human remains are located in the residential complex of the kingdom of Majapahit (ca. 1300-1500), thus it can be assumed that they are associated with Indonesian classical period. The applied method of research is observation and comparison. Based on the observation of teeth, all individuals underwent dental modification. The male had the "T" pattern and the females had the "diamond" pattern. Comparison with other types of dental modifications in Indonesia shows that the pattern of dental modification among human remains from Kedaton Temple and Upas Well is different from the other modification patterns in Indonesia. If we relate the location of the grave and the location of the temple where are in the royal family residential area, hence it can be concluded that these human remains belonged to the high social status.

**Keywords:** dental modification; Indonesian classic period; social status

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## Introduction

Indonesian history records that the Kingdom of Majapahit was one of the largest kingdom after the Kingdom of Sriwijaya. Kingdom of Majapahit (situated in Trowulan, Mojokerto, East Java) reigned during the 13th until the 15th century. Majapahit stood as the continuity of the collapse Singhasari Kingdom. The first king of Majapahit was Raden Wijaya who was given the formal name of Kertarajasa Jayawardhana during his coronation. He began to lead Majapahit in 1293 AD. These events were reinforced by Kudadu inscription which was written by Raden Wijaya himself.

During the reign of King Hayam Wuruk and Mahapatih Gajah Mada, Majapahit power covered almost all Indonesia and some parts of Southeast Asia. Majapahit kingdom's urban center was situated in Trowulan and it covered 99 square kilometers. It was comprised of residential area and many other important buildings. The Majapahit remnants that still remain to date are the temple buildings and bathing complex, such as Wringin Lawang Temple, Brahu Temple, Bajang Ratu Temple, Kedaton Temple and Segaran bathing complex. The other remains that are perpetually discovered are ceramics, potteries, miniature of statues or figurines, terracotta, building structures, irrigation systems and many other monumental objects (1).

The result of excavation conducted in 1996 in the complex of Kedaton Temple and Upas Well is the discovery of five human skeletal remains located at the foot of the temple and in the tunnel of Upas Well (2,3). According to the available excavation records, the skeletal human remains in Kedaton temple is the only human remains belonged to the classical period of Indonesia. This is interesting because the human remains from classical period work as the link between the prehistorical and modern human remains.

## Materials and methods

The material of this study is the skeletal human remains taken from Kedaton Temple and Upas Well complex. They belonged to five individuals and their identifications were carried out according to the method of Byers (4) in forensic anthropology. Dental modification was determined by observation then it was

compared with the other dental modification pattern previously existing in Indonesia.

## Results

According to the excavation photographs and reports from Supriyo (2), it can be seen that the human remains headed to the north and to the south. Their heads were generally heading to west with different postures. RI and RII were on supine positions and partially tilted to the right side of the body with pelvis against the wall as pedestals. Lower limbs lain straight. RI and RII's heads were facing to the west. Photographs of RIII and RV were not found, but based on the description of Surpijo (2) RIII and RV were on supine position, while RIV on the prone position. No jewelery found in any excavation in 1996. Forensic anthropological inspection of the demographic data (4) from these skeletal remains is listed on table 1.

Individual	Population affiliation	Sex	Age	Stature
R I	Mongoloid	Male	20-30	ca. 167 cm
R II	Mongoloid	Female	30-40	ca. 150 cm
R III	Mongoloid	Female	25-30	
R IV	Mongoloid	Female	16-20	
R V	Mongoloid	Female		

Table 1. Result of identification on human remains.

## Factor of Individualization

### *Pathological condition*

We observed several pathological conditions on these human remains. RI arm bones had rough surface and osteoporosis was present on metacarpal bones, indicating rheumatoid lesion. Antemortem tooth loss and inflammatory lesion on mandible (M1) were present in RII allegedly due to oral hygiene issue.

### *Dental Modification*

Dental mutilation is a part of body modification. Some studies show that dental mutilation is still a common practice in many places. Romero documented many patterns of dental mutilations carried out by residents of South

America. The habit of mutilating teeth is also found in Africa, Europe (Viking) and also in the region of Australasia (5). Domett study (6) showed that the prehistoric inhabitants in the region of Cambodia and Thailand had also practiced this dental mutilation. In Indonesia, dental mutilation habit is not something new as well. The human remains of the prehistoric era who practiced dental mutilations had been found as well (5).

The common pattern of dental mutilation was tooth sharpening, ablation, occlusal filing, labial filing and also tooth inlay (7). The main reasons for these dental modifications were initiation, beauty and also other factor such as mourning. Dental mutilation is still a common practice to date. Some places in Borneo have a habit of dental mutilation (8). In Bali, a teenager who has reached adulthood age will undergo a ceremony to cut his/her teeth as an obedience to the religion.

The human remains found in the complex of Kedaton Temple and Upas Well indicated that they did mutilate their teeth. RI clearly show dental mutilation with the pattern of "T" (see Figure 1). This pattern has never been found in Indonesia so far. RII showed dental sharpening with diamond-like pattern (see Figure 2). The teeth were not only sharpened, but it was also honed in their labial surfaces and the upper labial surfaces were shaped to produce diamond-like teeth. The same pattern was found also in the teeth of RII, IV and V. The RIII

could not be observed. Study of Supriyo also does not describe the pattern of teeth in RIII. Pattern of modification that similar to diamond was also found in human remains from Leran (Middle Java).

Observations indicated that the male skeletal remains had "T" pattern on their modification of teeth and the female ones had diamond pattern on their modification of teeth. This difference indicated that sex differentiation was also applicable for dental modification practice. In regards of the grave location, tombs for men were outside of the temple and tombs for women were inside the temple.

## Discussion

### *The Scope of Kedaton Temple and Upas Well Complex*

Upas Well is a 16 square meter well located on the southern part of Kedaton Temple. Kedaton temple was built in 1370 (9). This well is assumed to be the part of the bathing complex accompanying the building of the holy Kedaton Temple. It is believed that Upas Well is located between the Kedaton Temple and the royal residential areas of Majapahit kingdom. Upas Well is believed to be the place where the last king of Majapahit, King Majapahit V, disappeared (10).



Figure 1. Dental mutilation with the pattern of "T".



Figure 2. Diamond type of dental modification.

Kedaton Temple dimension is 9.5 meters x 12.6 meters with 158 cm remaining height (3). The temple foot was made of bricks accomplished with rubbing system. Around the Kedaton Temple and Upas Well complex, there is a complex of buildings with hexagonal floors. In addition, pedestals are found which indicate the presence of a large housing estate around the temple.

The remaining building of Kedaton Temple leaves a unique building structure; it has six layers of the construction period or the period of use. Brick structure in the complex of Upas Well and Kedaton Temple formed small cubicles. Upas Well complex and Kedaton Temple is thought to be the well-managed residential areas with high social class inhabitants during the reign of Majapahit kingdom.

In Nayati (11) it is stated that these buildings settled on the top of drainage systems referring to the order of bricks of unknown function and the distribution of artifactual findings. The layout of Upas Well and Kedaton Temple complex is uncommon. The distance between Kedaton Temple and the residential area is very close, thus raising opinion that Kedaton Temple was established to meet the spiritual needs of the royal elite. This is a real contrast to the other temples in the area of Trowulan. Tikus Temple, for example, does not have any remnant of residential building. Several other temples are also situated far enough to the residential area.

#### *Religion and public beliefs in the Majapahit Kingdom*

The main outcome of culture is a result of religious and belief thoughts. Usually the result of culture is also dedicated to religious purposes (12). This can be seen in many buildings with the spirit of religious background, such as temples, statues and several types of artifacts that indicate their function as objects used for worship and the interests of a particular religious symbolism.

In the book of Negarakertagama and Arjuna Wijaya, it is stated that the kingdom of Majapahit had three government officials in charge of religion, namely Dharmadyaksa Kasewan who took care of Shiva religion, Dharmadyaksa Kasogatan who took care of the Buddhist religion and minister Herhaji Karsyan who was in charge of religious matters. Based on the inscriptions, religious officials were assisted by Dharma-Upapatti (12,13). In other words, he religion of Shiva, Buddha and Karsyan along with the existing sects were recognized by the government of Majapahit.

King Hayam Wuruk was also concerned about religious diversity and the growing beliefs. Hayam Wuruk was said to regulate the clergy residence and place of the ceremony. Religious education centers were built in various areas, especially in remote places like the slopes of Mount Wilis, Mount Arjuno, Mount Lawu, Mount

Welirang and deserted beaches. Hayam Wuruk also regulated a complex for religious ceremony at the residences of the royal family and the nobles. The country also provided vast opportunity for the development of a local religion or belief. During his trips, Hayam Wuruk also maintained interaction with the people to discuss about cultural diversity. He also visited centers for religious education and held discussion with their leaders (resi). The book of *Negarakertagama* mentioned that Hayam Wuruk went to Pawitra which was Mount Penanggungan; the sacred place of the Resi.

#### *Grave location, temple building and dental modification*

It was explained in the previous section that the graves of the five individuals located in the temple complex of Kedaton and Upas Well. Kedaton temple and the Upas Well is a unity holy building intended for worshipping especially for the royal family and the nobles of Majapahit. Therefore, only the members of the royal family and nobles who could perform activities of worship in the temple complex of Kedaton and Upas Well. From the aspect of the function of the temple, it can be concluded that these human remains belonged to the high class society. It is also possible that they were members of the royal family.

From the aspect of the location of the grave, all the human remains found in the complex of sacred buildings. RI is located in the hallway of the building Upas Well, while the remaining four (RII, RIII, RIV, RV) located within the building Kedaton temple. Location of the men's tombs are different from the women's tombs. Then the location of the grave enhances the opinion that they were not commoners. It is also possible that they were religious leaders. Hindu or Buddhist religious leaders could be buried inside the temple or temple area. This fact is

reinforced by the absence of tomb's stock or jewelery. Buddhist teaching says that the dead must be buried in simplicity.

From the aspect of tooth modification, there is a differentiation between men and women. The men had teeth modification with the pattern of "T", while the women had diamond-like pattern. This indicated that the five human remains were individuals with high social status. It is true that there is not any evidence supporting that the other member of the society did not practice dental modification with the same patterns as those five remains, but when it is associated with the location of the grave and the holy buildings inside the royal family residential complex, it can be concluded that the remaining five human skeleton are individuals with high social status.

#### **Conclusion**

The pattern of modification of the teeth, the location of the grave and sacred buildings where the human remains were discovered give indication that the five human remains belonged to the royal family or the nobles, but there is also a possibility that they were religious leaders during the reign of Majapahit kingdom.

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#### **References**

1. Rangkuti, N. Batas Kota Majapahit. Dalam: Inajati Adrisijanti, ed. Majapahit. 2012:4-21
2. Supriyo, A. Laporan ekskavasi Candi Kedaton dan Sumur Upas. 1996.
3. Taim, E.A.P., Soeroso, Ekawati, L. Penelitian Permukiman Situs Sumur Upas Dusun Kedaton, Desa Sentonorejo Kecamatan Trowulan Kabupaten Mojokerto, Provinsi Jawa Timur. Asisten Deputi Kantor Urusan Arkeologi Kementerian Kebudayaan dan Pariwisata. 2004.
4. Byers, S. Introduction of Forensic Anthropology. Academic Press. 2008.
5. Koesbardiati, T., Suriyanto, R. Murti, D.B. Cultural Dental Modification in Prehistoric Population in Indonesia. 2015.
6. Domett, K.M., Newton, J., O'Reilly, D.J.W., Tyles, N., Shevan, L., Beavan, N. Cultural Modification of the Dentition in Prehistoric Cambodia. *International Journal of Osteoarchaeology*. 2013. 23(3):274-286



7. Scott, G.R., Christy, G. Turner. *The Anthropology of Modern Human Teeth*. 2000
8. Jones, A. *Dental Transfigurements in Borneo*. *British Dental Journal*, 191:98-102
9. Sukmono, Romli, I.A. *Peninggalan-Peninggalan Purbakala Masa Majapahit*. Dalam: Kartodirjo, S., Soekmono., Atmadi, P., Sedyawati, E. Eds. *700 Tahun Majapahit*. 1993, 65-88
10. Sjamsudin, R., Bullough, N., Mujiyono, PH. *Memories of Majapahit*. 1993. 46
11. Najati, W. *Belajar Manajemen di Kompleks Sumur Upas dan Candi Kedaton*. Dalam: Daud Aris Tanudirjo, ed. *Inspirasi Majapahit*. PT. Intan Sejati, Klaten. 2014. 71-98
12. Kusen, Sumijati, A.S., Inajati, A.R. *Agama dan Kepercayaan Masyarakat Majapahit*. Dalam: Kartodirjo, S., Soekmono., Atmadi, P., Sedyawati, E. Eds. *700 Tahun Majapahit*. 1993, 89-116
13. Santiko, H. *Multikulturalisme dan Toleransi Beragama Pada Zaman Majapahit*. Dalam: Daud Aris Tanudirjo, ed. *Inspirasi Majapahit*. PT. Intan Sejati, Klaten. 2014..