

Research Report

The profile of upper integument lip of Baduy and the nearby living Sundanese in South Banten, West Java, Indonesia

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ABSTRACT

Background: Based on the Two Migration Theory and on cultural anthropology, the Baduy is classified as Protomalay and the Sundanese as Deuteromalay. Historically and socioculturally the Baduy is part of the Nearby Living Sundanese (NS) who has isolated themselves and settled down in Kanekes. Linguistics and archaeology could not tell whether the culture's spread was due to a source population's migrating or to a destination population's copying the technology and language. Craniofacial anthropometry could resolve this because people's physiognomy does not change rapidly due to mere migration. **Purpose:** The objective of this study is to determine whether the people of Baduy are Protomalay or Deuteromalay based on Profile of Upper Integument Lips (PUIL), which is the size of the angle formed by (sn-Ls) line to Frankfurt Horizontal Plane. Angle size $< 90^\circ$ = Procheili, 90° = Orthocheili, and $> 90^\circ$ = Opisthocheili. Lip prominence is strongly influenced by racial and ethnical characteristics, its form is determined especially by genetic factor. **Method:** Subject sample consisted of 43 Inner Baduys (IB); 92 Outer Baduys (OB); and 135 NS of South Banten were measured using Fasiogoniometer to determine PUIL. Average value data was determined and analyzed by Testing Equal Variances to compare two variances between groups. **Result:** The result of this study showed that IB, OB as well as NS are Mild Procheili (angle size = 50° – 69.9°). PUIL of IB and OB compared to NS are slightly different, however, between IB and OB are similar. **Conclusion:** Based on the characteristic of PUIL, IB, OB, as well as NS, are classified as Mongoloid subrace, and physically should be classified as Deuteromalay.

Key words: upper integument lip, Baduy, Sundanese

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INTRODUCTION

The Baduy is an isolated tribal ethnic group living in an isolated inland area in Kanekes village, Leuwidamar district, Lebak sub-province, South Banten, West Java Province, Indonesia (Figure 1 and 2). Their taboos and prohibition order has separated this group from the nearby living Sundanese (NS).¹⁻³

Based on the Two Migration Theory about the origin of the Indonesian people,^{4,5} and on cultural anthropology, the Baduy is classified as Protomalay and the Sundanese is Deuteromalay. Historical and socio-cultural (language, history, culture) of the Baduy is part of the NS who has

isolated themselves and settled down in Kanekes.⁶ In 16th centuries in northern Banten there were three kingdoms: Wahanten Girang; Pulasari; and Panimbang which are under the power of Susuhunan Pakuan Pajajaran.^{6,7} Negara Kertabumi manuscript from Cirebon reported that king of Banten and his adherent were evacuated to Pakuan when Banten was attacked by moslem army alliance of Demak and Cirebon in 1527 AC,⁸ some of ruling family member evacuated to southland, looking for protection in the upper course area of Cijung river.⁶

The Baduy society consists of two groups. Those are the Inner Baduy (IB), which is the nucleus of the Baduy, and the Outer Baduy (OB) as the complement. The kinship

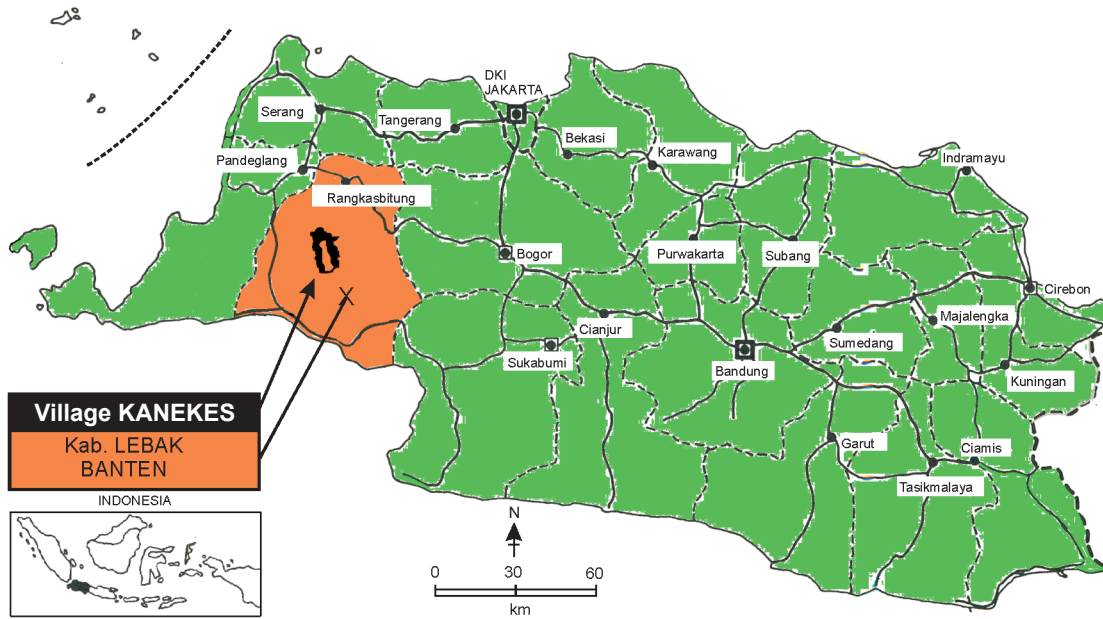


Figure 1. The map of West Java (in 1992).¹

system and marriage system of the Baduy is endogamy. Infringement against this prohibition order will cause an IB sent into exile to OB, and an OB expelled out of Kanekes.^{1-3,9}

Lip is part of the mouth and its outer form is influenced by anterior part of alveolar process and anterior teeth. On the other hand, its form depends on its race. Lips consist of two parts, the integument lip and mucous membrane lip. Integument lip is part of the skin of the face that closes over Orbicularis oris muscle, which edge continues to become skin of the cheek and base of the nose. In medial part of upper lip there is philtrum or Sulcus nasolabialis, which is a deep channel that began from nose downwards. The end part between upper and lower mucous membrane lip is called Angulus oris or cheilion. In many situations, the whole part of the mouth is ranging from looking like bulbar to looking like snout. This characteristic can be found in black race. If curve profile of upper integument lip is vertical to the nose-ear line (FHP=OAE=Ohr-Augen-Ebene)¹⁰ called Orthocheili, if heel up to posterior called Opisthocheili, and Procheili if heel to anterior. Curve profile of integument lip may form straight line, concave, or convex.¹¹ Like facial divergence, lip prominence is strongly influenced by racial and ethnical characteristics. Whites of northern European and middle-eastern origin normally have more prominent lip and incisor than their northern cousins. Greater degrees of lip and incisor prominence normally occur in individuals of Asians and African descent. The PUIL in Mongoloid is mild procheili, in Negroid extreme procheili.¹¹ Lip posture and incisor prominence are evaluated by viewing the profile with the patient's lips relaxed.¹²

Lips development in boys were larger than in girls, and attainment of adult dimensions was faster in the upper

than in the lower.¹³ The lips and the other soft tissues of the face sag downward with aging, and become progressively thinner with less vermilion display. Environmental influences during growth and development of the face, jaws, and teeth consist largely of pressures related to the physiologic activity. A relationship between anatomical form and physiological function is apparent in animals. Over evolutionary time, adaptations in the jaws and

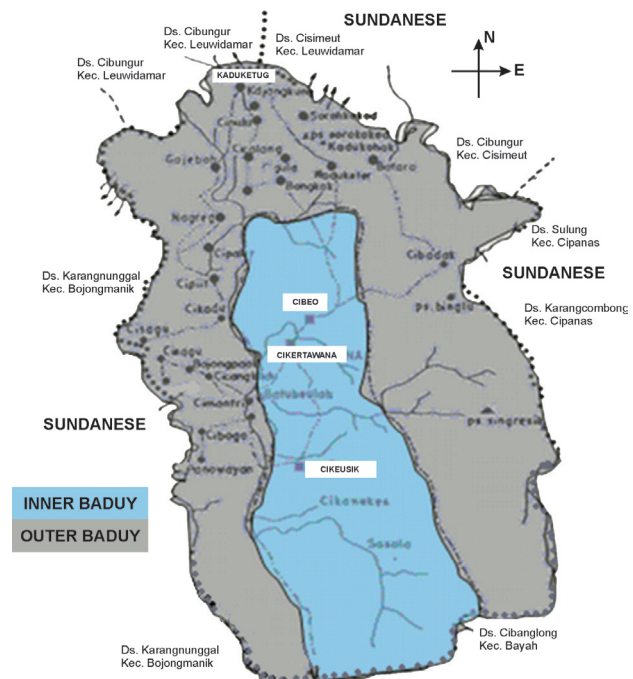


Figure 2. The map of Kanekes village (Baduy). Inner Baduy (blue colour); Outer Baduy (grey colour), and Nearby Living Sundanese (white colour).¹

dental apparatus are prominent in the fossil record. Form-function relationship at this level is controlled genetically. A careful examination of the facial profile yields the same information, though in less detail for the underlying skeletal relationships, as that obtained from analysis of lateral cephalometric radiographs.¹²

Phylogeography craniofacial anthropometry is used to identify and track major long-distance migrations that bands of humans undertook, especially in prehistoric time. Linguistics can follow the movement of languages and archaeology can follow the movement of artifact styles, but neither can tell whether a culture's spread was due to a source population's physically migrating or to a destination population's simply copying the technology and learning the language. Craniofacial anthropometry helped resolve this because a people physiognomy does not change rapidly due to mere migration.¹⁴ The facial appearance also would clearly help in the objective assessment of treatment quality, and be useful in monitoring growth changes,¹⁵ and disease diagnosis which have important facial feature.¹⁶ In forensic dentistry race determination in skeletal remains traditionally focuses on craniofacial characteristic, and mandible and dentition reflect racial characteristic.¹⁷

The objective of this study is to determine whether people of Baduy are Protomalay or Deuteromalay based on Profile of Upper Integument Lips (PUIL) which is the size of the angle formed by the profile of the upper integument lip to Frankfurt Horizontal Plane. The PUIL is part of the lip, and its form conform with the race, and it is useable in comparing groups of people.¹¹

MATERIALS AND METHODS

The research method was a descriptive analytic survey, held in South Banten area in 1992, in Leuwidamar district and Bojongmanik district, sub-province Lebak, West Java, Indonesia to be precise. The 270 people randomly sampled

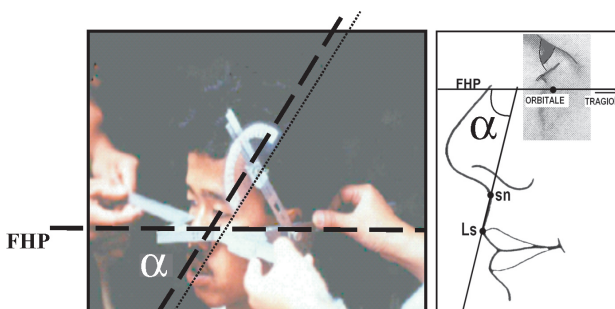


Figure 3. Fasiogoniometer used in measurement. Two bars which can slide to each other represent Frankfurt Horizontal Plane (One Tragion point and both of Orbitale points). The base of the top end are paralleled to the measured surface. The scale of top end are and lower end are determine the size of the angle.

from populations of Inner Baduy (IB), Outer Baduy (OB), and Nearby Living Sundanese (NS) from surrounding area, are: aged between 17–30 years, no facial defect that will cause measurement error, and descendant of at least two generations of the population group (IB, OB, or NS) (Table 1), all were measured by using a self-designed instrument called Fasiogoniometer (Figure 3),¹⁸ which is especially designed to measure the angle between each part of the face and the Frankfurt Horizontal Plane (FHP). The design of this instrument is simple and it is very easy to use, and also very practical and portable, because it can be detached into four parts. The material of this instrument is rigid, light, and strong. Reliability test in stability of measurement is good.¹⁸

Some points of orientation were used in measurement. Profile line of the upper integument lip is the line that passes through Labrale superiores (Ls) and Subnasion (Sn). Frankfurt Horizontal Plane is the plane that passes Tragion (Tr) and Orbitale (Or). We used one Tragion point and two Orbitale point. By using fasiogoniometer we can determine the size of the angle formed by the profile line of the upper integument lip (Sn-Ls) with the Frankfurt Horizontal Plane (FHP). Average value data was determined and analyzed by Testing Equal Variances to compare two variances value between groups.

RESULT

The measurement was conducted to 270 randomly sampled subjects consisted of 43 Inner Baduy (IB), 92 Outer Baduy (OB), and 135 Nearby Living Sundanese (NS). The criteria of subject samples are: aged between 17–30 years; no facial defect that will cause measurement error; descendant of at least two generations of the populations (IB, OB, or NS (Table 1)).

All of the subjects in each population group are procheili, after which divided into three categories (classes): extreme procheili (value = 30°–49.9°); mild procheili (value = 50°–69.9°); and less procheili (value = 70°–89.9°) (Table 2). Profile of Upper Integument lip data was obtained by measurement at the site, and was analyzed to compare variability value difference of two variances between groups (Table 3).

Table 1. Sample distribution

Popu- lation	Target Population	Sample		
		Men	Women	Men & Woman
IB	61	24	19	43
OB	662	52	40	92
NS	835	75	60	135
Σ	1558	151	119	270

IB, OB and NS are procheili. In each population group, the mild procheili is the most represented, the second is the less procheili, and the last is the extreme procheili (very rare) (Table 2).

Table 2. Percentage of PUIL in each population group Inner Baduy (IB), Outer Baduy (OB) and Nearby Living Sundanese (NS).

Classification	IB	OB	NS
	%	%	%
	n = 43	n = 92	n = 135
Extreme Procheili (30°–49.9°)	2.3	9.8	0.7
Mild Procheili (50°–69.9°)	69.8	71.7	51.9
Less Procheili (70°–89.9°)	27.9	18.5	47.4
TOTAL	100.0	100.0	100.0

Table 3. Testing equal variances of mean values of PUIL between Inner Baduy (IB), Outer Baduy (OB) and Nearby Living Sundanese (NS)

	IB	OB	NS	
n	= 43	92	135	F (calculated) = 14,75
\bar{x}	= 63,70	61,73	67,64	P < 0,001* (IB – NS) ; (OB – NS)
SD	= 7,6	9,2	7,7	

n = sample size; \bar{x} = mean value; SD = Standard Deviation; * = very significant

DISCUSSION

The value of PUIL (α) = 90° indicates that the inclination of upper integument lip is vertical, and if the value of the PUIL is less than 90° indicates that the inclination of upper integuments lip inclines to anterior (procheili). The mean value of PUIL in IB = 63.70°, OB = 61.73°, and in NS = 67.64°, therefore, the PUIL in IB, OB, and NS is procheili (Table 2). Prognatism of the alveolus caused procheili. Soelarko¹⁹ who studied the position of the tip of Dentes canini in upper jaw revealed that in Indonesian the position of the tip of Dentes canini in upper jaw is always anterior to orbital plane. According to Snell, profile of maxilla in Caucasoid is nasal orthognatism with alveolar mesognatism, in Mongoloid is nasal orthognatism with alveolar prognatism, and in Negroid is nasal mesognatism with alveolar hyperprognatism. The result of this study is similar with the study of Soemardi²⁰ that Indonesian people have maxillary and mandibular alveolar prognatism. Negroid is extreme procheili, Mongoloid is mild procheili, and Caucasoid is orthocheili.¹¹

According to Garna^{1,3} and Danasasmita⁶ the Baduy was the intermixture between local population with evacuated

population which came to South Banten from North Banten when the moslems of Demak and Cirebon conquered North Banten in 1527 AC.⁸ Jacob⁴ based on findings of human fossils, concluded that at Mesolitical period (+ 11.000 years past) Melanesian feature was dominant physically, whereas at Neolitical period (+ 4.000 years past) Mongoloid feature (Deuteromalay) was dominant physically, especially in West Indonesia. If Banten was under the power of Susuhunan Pajajaran, attacked by alliance of moslem army of Demak and Cirebon, Mongoloid feature (Deuteromalay) should have been dominant. The PUIL of IB, OB, as well as NS are mild procheili (Mongoloid feature). So IB, OB, and NS are Deuteromalay.

On the other hand, socioculturally (language, history, culture) the Baduy is part of the NS who has isolated themselves and settled down in Kanekes. The language of IB and OB are Sundanese, and they confess themselves as “Sunda Wiwitan” (Early Sundanese).^{1-3,6,9}

The PUIL difference between NS and IB as well as between NS and OB resulted from endogamy marriage pattern, and genetic flow to outside (infringement against prohibition order will cause an IB sent into exile to OB, and an OB expelled out of Kanekes.^{8,12} The NS itself is still open to genetic flow from outside.

The result of this study showed that IB, OB and also NS are mild Procheili (69.8 %; 71.7 %; and 51.9 %). Based on the characteristic of PUIL, IB, OB, as well as NS are Mongoloid subrace, and physically should be classified as Deuteromalay. The result of this research also strengthens the opinion that, depending on Neolithic fossil finding, history, cultures, the people of Baduy (IB and OB) are classified as Deuteromalay.

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