The Three Human Morphotypes in Indonesia

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Abstract

Indonesia has so many varieties of people and culture. Yet, not many scientists are interested in conducting research to the recent people. The purpose of this study was to try to find out the answer, if the Deuteromalayids, Dayakids, and Protomalayids were really three different morphological groups. Individual data were taken from Javanese students representing the Deuteromalayids, Haddon's data representing the Dayakids, and Bijlmer's data for Protomalayids. The data contain maximum head length (g -op), breadth (eu-eu), bizygomatic breadth (zy-zy), bigonial breadth (go-go), facial (n-gn) and nasal height (n-sn), nasal breadth (al-al) and stature. Cephalic, facial and nasal indices were calculated. The result of Standardized Canonical Discriminant Function Coefficients were above 80% with a mean of 89.0%. As many as 88.9% samples were correctly classified. It could be concluded that the morphological diversity of the three analysed groups – the Protomalayaids, the Deuteromalayaids and the Dayakids.

Key words: morphology, human diversity, Deuteromalayid, Dayakid, Protomalay id.

Introduction

Indonesia has so many varieties of people and culture. Yet, not many scientists are interested in conducting research to the recent people. The Indonesian Archipelago, a bridge between the Asian continent and Australia, consisting of mor e than seventeen thousand islands, has a very mixed population. There are more than three hundred different ethnic groups living more or less biologically isolated from each other because of prevalent ethnic endogamy. De Zwaan (1925) describes the Indonesian Archipelago as "one of the anthropologically most complicated sites of the world". There were some attempts to describe their morphological diversity as well as attempts to classify it. The

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purpose of this study was to try to find out the answer, if th e Deuteromalayids, Dayakids, and Protomalayids were really three different morphological groups.

Materials and Methods

Individual data were taken from Javanese students (Glinka, 2004) representing the Deuteromalayids, Haddon's (1912) data representing the Dayakids, and Bijlmer's (1929) data for Protomalayids. The data contain maximum head length (g -op), breadth (eu-eu), bizygomatic breadth (zy-zy), bigonial breadth (go-go), facial (n-gn) and nasal height (n-sn), nasal breadth (al-al) and stature. Cephalic, facial and nasal indices were calculated.

Results

Blumenbach (1795) for the first time used the taxon *Varietas Malaica* for the inhabitants of the whole Indonesian and Polynesian region. Intensive research was done here in the 20th century. From this time we have first attempts to build some racial classifications. Kleiweg de Zwaan (1925) formed the *Four Migrations* or *Four Layers Theory*, with the Negritos and Australoids as the oldest layer and two imigrations from the Asian continent – the Protomalays and the Deuteromalays. P. Sarasin (1902, 1905, 1908, 1935, 1938) added a Weddid element, coming from Ceylon or South India.

New palaeoanthropological discoveries, especially the one of the Wadjak -Man, reduced the racial components to two only – the Austromelanesoid and the Malayids. The difference between Proto- and Deutero-Malayids was interpreted only as a different grid of mongolodisation (Mijsberg, 1937). Coon (1962, 1965,1966) followed this division, with the difference that he changed the name Austrome lanesoid by Australoid. All these studies were based amalgam of morphological and ethnic data.

The first studies, based on fossils, were done by Jacob (1967). According to Jacob there are two racial elements in the Indonesian Region – the Austromelanesoids and the Mongoloids. The first living in the eastern part of this region, the last in the western and northern areas, and are imigrants from the Asian continent. Since the beginning of the Neolith there are more and more Mongolid elements in the fossils (J acob, 1967; Glinka, 1980).

From a comparative study on more than two hundred living Indonesian populations it seems that there are not two but at least three different morphotypes or

races in the Indonesian region (Glinka, 1978), as can be seen in Figure 1 and Table 1. Cluster A is of non-Mongolid character, cluser C, D, F and G has Mogolid features, but cluster G – Dayaks from Borneo – has a very low face and broad nose. These morphological differences could indicate that in the Indonesian region are not two, as Jacob asserts it, but three different morphotypes. We name them Protomalayids, Deuteromalayids and Dayakids. The Protomalayids are more or less same with as JACOB's Austromelanesoids. The main problem pertains to the Deuteromalayids and Dayakids, which both are commonly classified as Mongoloids, excepted in Glinka's work (1978). Because in his comparative study Glinka (1978) was limited by data from publications which mostly contain only mean values of the populations, here are used individual data for the analysis to confirm or reject the results of the cluster analysis.

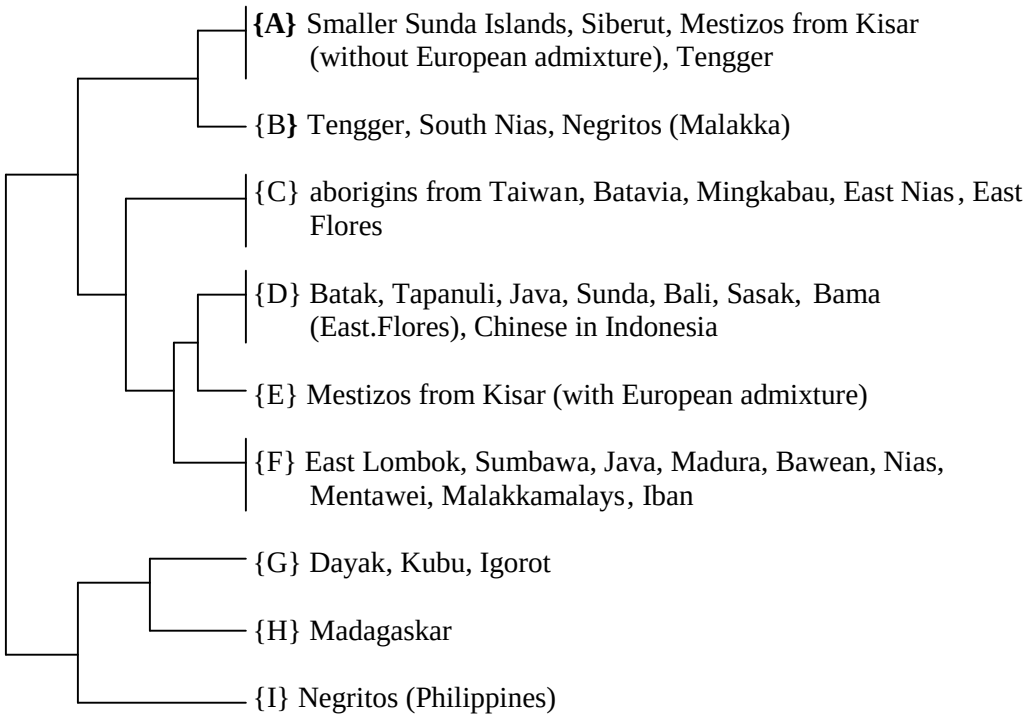

Figure 1. Clusters of the Indonesian ethnics (Glinka, 1978) simplified. Protomalayids – cluster {A}, Deuteromalayids – cluster {C}, {D}, {F}, Dayakids {G} (see also Table 1)

Table 1. Anthropometric Characteristic of each Cluster

cluster	stature	gop	eueu	ftft	zyzy	gogo	ngn	nsn	alal	i.ceph	i.facial	i.nasal
A	160.5	187.9	144.2	101.3	137.5	102.8	115.0	51.6	40.6	76.8	83.5	79.1
B	152.9	181.7	142.7	103.8	135.0	102.0	111.1	46.4	39.9	78.8	82.4	86.1
C	158.8	180.4	148.7	102.8	138.4	104.2	122.0	52.3	39.9	82.4	88.0	76.6
D	161.8	185.1	155.8	104.8	141.5	106.5	119.3	51.7	38.8	84.2	84.4	75.4
E	166.2	187.0	151.3	102.5	137.8	105.3	118.7	53.3	37.4	80.8	85.8	70.2
F	158.2	179.2	149.2	104.1	138.2	105.7	114.1	47.7	38.3	83.1	82.4	80.6
G	157.6	186.8	148.3	109.2	140.5	109.7	111.8	44.5	39.4	79.9	79.6	87.6
H	163.6	185.7	147.4	111.8	136.5	-	107.9	46.6	41.8	79.4	79.1	89.9
I	151.8	177.8	146.8	109.0	136.8	103.4	104.6	48.4	39.2	82.3	76.1	84.2

The anthropometric characteristics of the data used in the analysis are in Table 2 to Table 8.

Table 2. Frequency Distribution – Cephalic Index

Category	Protomalayids	Deuteromalayids	Dayakids
hyperdolichocephalic	5.3	0.0	0.3
dolichocephalic	30.4	0.9	16.0
mesocephalic	44.2	10.5	44.0
brachycephalic	13.0	38.7	27.2
hyperbrachycephalic	5.7	43.1	11.0
ultrabrachycephalic	1.4	6.8	1.5

Table 3. Frequency Distribution – head length (g-op)

	protomalayids	Deuteromalayids	Dayakids
Very short	1.2	0.4	1.2
Short	14.3	10.7	17.5
Middle	45.1	36.8	37.9
Long	48.6	40.9	30.6
Very long	10.8	11.2	12.8

Table 4. Frequency Distribution – head breadth (eu-eu)

	protomalayids	Deuteromalayids	Dayakids
Very narrow	24.0	0	6.7
narrow	49.5	2.0	41.1
Middle	21.6	25.8	42.3
Broad	4.9	63.0	9.9
Very broad	0	9.2	0

Table 5. Frequency Distribution – Facial Index

Category	Protomalayids	Deuteromalayids	Dayakids
hypereuryprosop	17.0	14.7	56.3
euryprosop	38.5	33.8	30.9
mesoprosop	25.5	29.6	8.7
leptoprosop	14.5	18.2	2.7
hyperleptoprosop	4.5	3.7	1.2

Table 6. Frequency Distribution – facial hight (n-gn)

	protomalayids	Deuteromalayids	Dayakids
Very low	35.2	7.2	60.1
Low	38.6	24.7	25.9
Middle	18.0	34.0	11.7
high	6.8	26.5	2.0
Very high	1.4	7.6	0.3

Table 7. Frequency Distribution – Bizygomatic Breadth

	protomalayids	Deuteromalayids	Dayakids
Very narrow	0	0	0
Narrow	7.9	0	0.9
Middle	42.9	0.1	23.0
broad	36.0	9.1	50.2
Very broad	13.2	90.9	25.9

Table 8. Frequency Distribution – Nasal Index

Category	Protomalayids	Deuteromalayids	Dayakids
hyperleptorrhin	0.1	0.0	0.0
leptorrhin	14.1	31.2	1.7
mesorrhin	70.9	61.3	33.5
chamaerrhin	14.5	7.2	44.5
hyperchamaerrhin	0.4	0.3	30.3

The Protomalayids are predominantly dolicho- until mesocephalic, they have a low face and are predominantly mesorrhin; the Deuteromalayids are brachy- to hyperbrachycephalic with a big variation of the face form and a relative narrow nose; the Dayakids are from dolicho- to brachycephalic, have a very low face and very bread nose (Table 1 – 8).

For the analysis we use the univariate-ANOVA and Stepwise Discriminant Function with Wilk's Lambda as indicator for the selection of variables to be used or rejected in this analysis.

Results of the ANOVA are in Table 9. The most different and discriminant variable is the maximum head breadth (F = 1123.00), followed by the nasal height (F = 593.88), the cephalic index (F = 572.08), the stature (F = 439.20) and the nasal index (F = 419.17). The lowest, not significant F-value, is for the maximum head length (2.16).

Table 9. Mean, Standard Deviation and ANOVA's F

Variable	mean	s.d.	Mean	s.d.	Mean	s.d.	F
	Protomalayid		Deuteromalayid		Dayakid		
g-op	185.2	7.14	185.7	6.61	184.8	7.55	2.15
eu-eu	144.0	6.22	158.5	5.33	148.0	5.91	1123.00
n-gn	113.6	7.87	120.5	6.43	110.3	6.70	283.44
zy-zy	136.3	6.13	143.2	5.27	139.9	6.37	242.34
go-go	101.7	5.73	107.9	5.35	109.4	6.05	299.37
n-sn	51.0	3.78	52.9	4.23	43.6	4.07	593.88
al-al	39.3	3.11	38.8	2.41	38.7	3.06	7.60
stature	1582.6	67.54	1664.2	58.39	1556.5	62.35	439.20
cephalic index	77.9	4.63	85.4	3.69	80.2	4.36	572.08
facial index	83.5	6.15	84.2	4.95	78.9	5.09	109.21
Jugomandibular index	74.7	3.87	75.4	3.25	78.3	4.42	105.10
nasal index	77.3	7.66	73.8	7.22	89.2	9.91	419.17

Table 10. Standardized Canonical Discriminant Function Coefficients

variable	function	
	1	2
eu-eu	0.917	0.210
n-gn	1.342	1.924
go-go	-1.417	-0.886
n-sn	-0.086	1.321
al-al	-0.039	-2.083
stature	0.416	-0.152
facial index	-1.312	-1.775
Jugomadibular index	1.311	1.346
nasal index	-0.337	2.725

The Standardized Canonical Discriminant Function Coefficients are given in Table 10. The classification results are very high (Table 11). All are above 80% with a

mean of 89.0% resp. 88.9% are correctly classified. Figure 2 shows a ver y good classification. Each population can by classified by the function coefficients given in Table 12.

Table 11. Classification Results[b,c]

		Predicted membership			
	population	proto	deutero	dayak	total
Original count	proto	615	61	20	696
	deutero	39	645	12	696
	dayak	38	21	284	343
%	proto	88.4	8.8	2.9	100.0
	deutero	5.6	92.7	1.7	100.0
	dayak	11.1	6.4	88.2	100.0
Cross-validated[a] count	proto	616	60	20	696
	deutero	40	644	12	696
	dayak	39	22	282	343
%	proto	88.5	8.6	2.9	100.0
	deutero	5.7	92.5	1.7	100.0
	dayak	11.4	6.4	82.2	100.0

a. cross validation in done only for those cases in the analysis. In cross validation, each case is classified by functions derived from all cases other than that case.
b. 89.0% of original grouped cases correctly classified.
c. 88.9% of cross-validated grouped cases correctly classified.

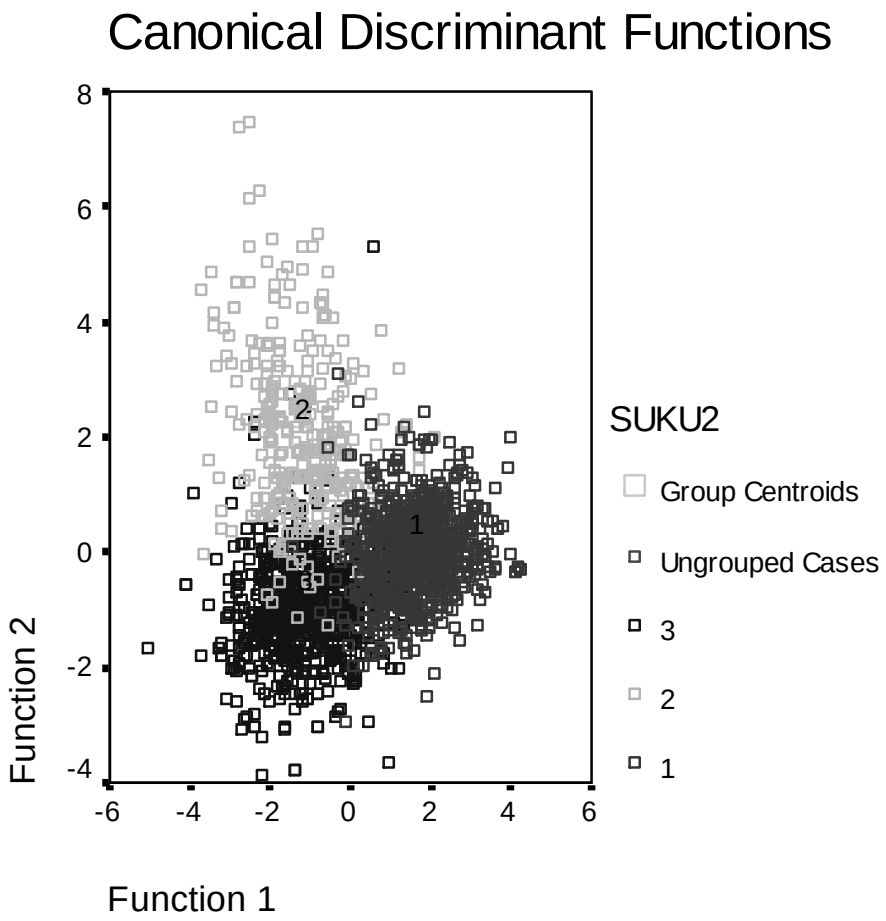

Figure 2. Distribution after Canonical Discriminant Functions (Table 10)

Table 12. Classification Function Coefficients

variable	population		
	proto	deutero	dayak
eu-eu	6.589	7.059	6.681
n-gn	2.832	3.623	3.620
go-go	-8.193	-9.042	-8.636
n-sn	68.120	68.389	69.098
al-al	-84.856	-85.527	-87.039
stature	0.342	0.358	0.334
facial index	-2.243	-3.223	-3.182
jugomandibular index	15.911	17.232	16.945
nasal index	44.097	44.322	45.118
constant	-2767.251	-2885.402	-2859.126

Discussion

Statistical results (Table 11) confirm the morphological diversity of the three analysed groups – the Protomalayaids, the Deuteromalayaids and the Dayakids; may be elder anthropologists would see them as three different races, because they differ in more than 75%. Pertaining to the diversity of the Protomalayaids and the Deuteromalayaids there was no doubt (Glinka, 1978; 2000) that they differ from each other. Another question was the morphological diversity between the Deuteromalayids and the Dayakids. Both look very Mongolid and until now they were unified as Mongoloids. More, often Dayaks are misclassified as Chinese for their very strong Mongoloid appearance. But it is clear that they differ from each other especially in the shape of the head, the face and the nose (Table 9). Another question is their genetic difference, which will confirm or deny their deeper diversity.

As information some details about some non-metric morphological traits will be helpful to understand the diversity. The Protomalayids are commonly dark-skined, curly-haired and have a clear pilosity, which is clearly not present in the two other groups. The lateral bones of the neurocranium are more or less flat collateral to each other, while in the Deuteromalayids and the Dayakids the same bones are convex. Their skin is relative light with a very scarce pilosity, their hair is straight.

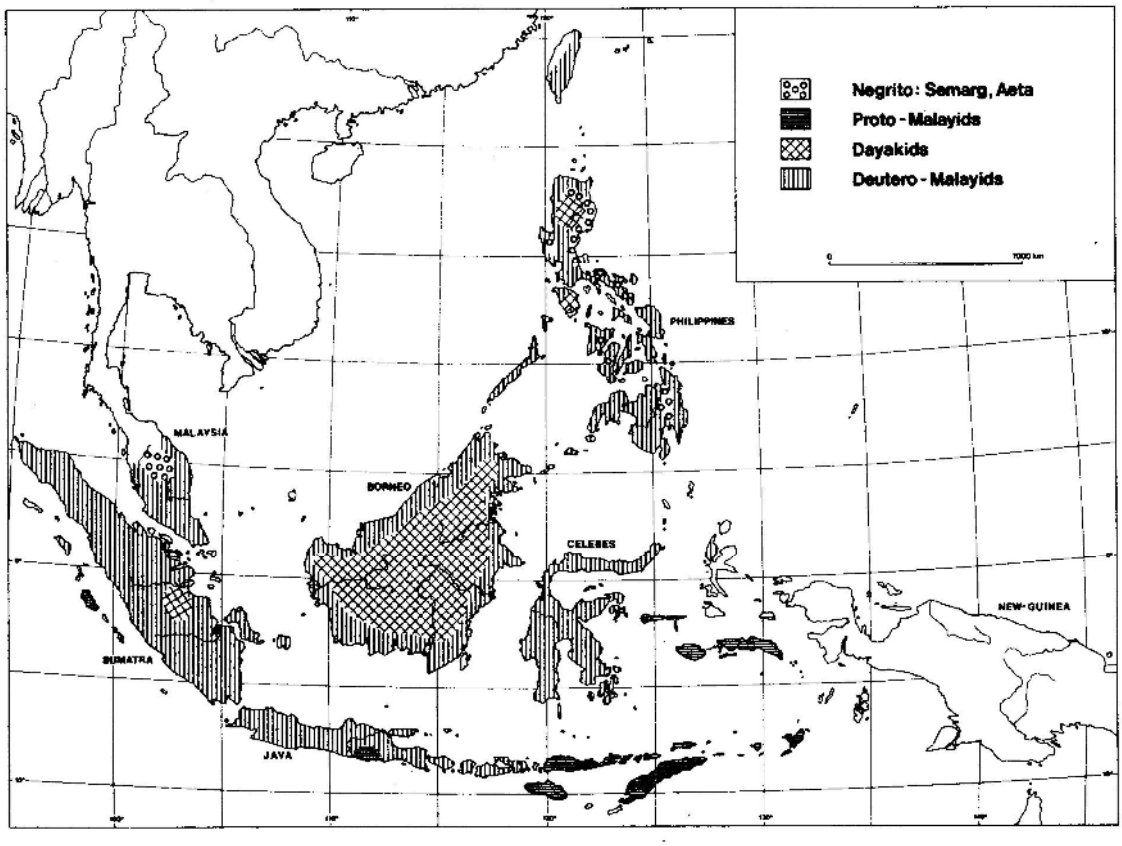

Figure 3. Hypothetical Geographic Distribution of the Morphotypes GLINKA (1978)

Conclusion

Statistical results confirm the morphological diversity of the three analysed groups – the Protomalayaids, the Deuteromalayaids and the Dayakids. Though it is not discussed here, from the diversity found here arise a question about the former orig in, migrations, contacts and isolation of hundreds of ethnical groups in the Indonnesian region. Glinka (1978) has given a general picture about the morphological diversity and similarity of them (Figure 3), but it would be very helpful to explain this que stion more detail and those give some additional informations about the origines of the ethnic groups and so the praehistory of the Indonesian Archipelago.

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