

CONNECTING EMPIRES AND STATES

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Front cover image: Aerial view on the excavation at Tanah Lua, Tanah Datar in West Sumatra, Indonesia, April 2012 (Photo: D. Bonatz and M. Tonch).

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PART ONE

New Insights into the Archaeology and History of the Indonesian Archipelago





Chapter 1

The Peopling of Nias, from the Perspective of Oral Literature and Molecular Genetic Data

Ingo Kennerknecht, Johannes Maria Hämmerle and Roger M. Blench

Abstract

The origin of the native inhabitants of the island of Nias is unknown. Linguistics is not very helpful, as archaeology indicates settlement dates of at least 12,000 years BP, well before the expansion of Austronesian, the only language spoken there today. We investigated the genetic history of the paternal (Y-chromosomes) and the maternal (mitochondrial DNA) lineages from more than 900 people out of 11 representative clans throughout the island. The Pre-Austronesian peoples seem to have left no significant genetic footprint in the contemporary population studied, and there is also no admixture of South Asian and recent European Y-chromosomes. In contrast to around 20 selected Y-chromosome haplogroups representative for Southeast Asia, shockingly, only two were found. The Y-haplogroups that were found have been identified as a marker of East and Southeast Asian genetic origin with highest frequencies in Taiwanese indigenous population and in the Philippines. The mitochondrial haplogroups are more variable but still have a highly skewed distribution. Moreover, paternal lineages, and to a lesser extent the maternal lineages, exhibit greatly reduced overall genetic diversity, contrary to what would be expected. Over time a continuous genetic admixture would be expected as Nias lies within a chain of islands just 120km from the west coast of Sumatra. At present we have no idea what type of extreme selective pressure would lead to such a male-biased bottleneck or founder event with the subsequent isolation of the expanding population.

Abstrak

Penduduk Nias, dari perspektif tradisi lisan dan data molekul genetik

Asal-usul penduduk asli pulau Nias tidak diketahui. Linguistik tidak begitu membantu, karena penelitian arkeologis mengindikasikan umur hunian setidaknya 12.000 tahun BP, artinya eksistensinya sudah sebelum ekspansi bahasa Austronesia, yang merupakan satu-satunya bahasa yang dipergunakan disana dewasa ini. Kami telah meneliti sejarah genetik pihak ayah (Kromosom-Y) dan garis keturunan ibu (DNA mitokondria). Dalam penelitian itu termasuk lebih dari 900 orang yang dipilih dari keturunan 11 leluhur yang berbeda di seluruh pulau Nias itu. Di antara para penduduk yang diselidiki tidak ditemukan jejak genetik dari manusia pra-Austronesia dan juga tidak dari Asia Selatan dan Eropa. Dan sebagai kontras dengan sekitar 20 Kromosom Y haplogroups yang dipilih dan yang ada representativ untuk Asia Tenggara hanya dua (!) yang ditemukan di Nias. Kedua Haplogroups Y yang ditemukan telah diketahui sebagai penanda dengan asal-usul genetik orang Timur dan Asia Tenggara dengan frekuensi tertinggi pada penduduk pribumi di Taiwan dan di Filipina. Keanekaragaman Haplogroups mitokondria sedikit lebih besar, tetapi masih menunjukkan variasi yang sangat terbatas. Seterusnya garis keturunan ayah, dan tidak begitu ekstrim tingkat garis keturunan ibu, menunjukkan keanekaragaman genetik yang sangat kecil. Hal ini sangat mengherankan. Karena di Nias, yang terletak dalam barisan pulau-pulau yang berjarak hanya 120km dari pantai barat Sumatera, sebenarnya dapat diharapkan bahwa masuk banyak pengaruh genetik. Hasil



pemeriksaan kelihatan, seolah-olah pada waktu yang masih belum begitu lama sejumlah bapak leluhur yang sangat sedikit saja dengan beberapa perempuan datang ke pulau Nias ini.

Introduction

Nias is unique in terms of culture (Sundermann 1884; Rappard 1909; Kleiweg de Zwaan 1914; Schröder 1917; Hämmerle 1982, 1990, 1999, 2001, 2008; Beatty 1992; Bonatz 2002, 2009), language (Nothofer 1986; Brown 2005) and architecture (Gruber and Herbig 2009; Hämmerle and Lehner 2010). Indigenous Nias oral traditions, *ono Niha* (i.e., children of humans) reach back 30 to 40 generations and points to a “Chinese” immigration, although this must in fact be a recent accretion. But do molecular genetic studies correspond to other accounts of the peopling of Nias and in particular the dispersal of clans over the island from the founder village in the area of Sifalagö Gomo [Fig. 1.1]? This cannot be decided at present, as the geographical distribution of major genetic markers is of poor resolution. Present studies only allow us to differentiate between continents and subcontinents, for example India from Southeast Asia or Island Southeast Asia from Australia and Oceania but not Java from Sumatra, Malaysia, Philippines or South China (e.g., Jobling and Tyler-Smith 2003). Yet, as Nias lies in the centre of a long chain of islands between the Andamans, the Nicobars, Simeulue in the north and Batu Islands, Siberut, Mentawai Islands and Enggano in the south, one might expect signs of a genetic impact from South Asia. There could well be an echo from the time when early modern humans followed the “out of Africa” route, starting 50,000–70,000 years BP and reaching Australia 47,000 years BP (Karafet *et al.* 2005; Macaulay *et al.* 2005; Hua Liu *et al.* 2006). Although a few Nias people have frizzy hair [Fig. 1.2] there is otherwise no obvious negrito physiognomy in comparison with the Andamanese, or some Orang Asli groups in Malaysia.



Fig. 1.1: Map of Nias including Hinako and Batu islands and the coastal line of Sumatra with harbor towns next to Nias (Map: A. Reinecke).

Peter Bellwood (1997: 241) suggested that Palaeolithic populations of hunter-gatherers in Island Southeast Asia were displaced by people coming from Southern China and Taiwan between 5000 and 1600 years BP. However, Hubert Forestier *et al.* (2005) report on the Hoabinhian site of Tögi Ndrawa near Gunung Sitoli which contains deposits going back to 12,000 years BP. These caves were continuously occupied by hunter-gatherers until 850 years BP [Fig. 1.3].

T.M. Karafet *et al.* (2005) found only 2.2% traces of a pre-Neolithic gene pool in their studies of the paternal gene pool of the Balinese. Yet, there are an increasing number of arguments against a Neolithic large scale displacement of pre-existing populations in Island Southeast Asia (e.g., Donohue and Denham 2010; Blench this volume). One strategy to resolve this issue was to take more than 900 blood and spit samples from indigenous Nias people throughout the island. Small groups of recent immigrants, including Acehnese, Javanese, Malay and Chinese, were excluded.

The Peopling of Nias and Dispersal of Clans in the Local Oral Literature

A considerable amount of oral literature has been collected by one author, Pastor Hämmerle. As with all oral accounts, these records need to be deconstructed carefully to extract the useful kernels. The Nias language makes intensive use of symbolic language, further adding to the difficulties of interpreting these traditions.

Nias Toponymy

There are a variety of names for the island of Nias and its inhabitants. The Nias people call themselves simply *ono Niha* (*ono* = child, *Niha* = human) and the island *tanö Niha* (*tanö* = earth). Immigrants were called *ndrawa* (e.g., *ndrawa Aceh* = foreigners from Aceh). The *ono Niha* say that they are the real humans in contrast to an earlier population, the *ono Mbela*, said to live in trees (*ba hogu geu*) and be less developed. The habitat of this ancestral population is called *ölia ulidanö* (*ölia* = name of a liana [*wewe*] climbing high



Fig. 1.2: Four men from Nias, top and bottom left: with frizzy (afro-textured) hair (nias. *mo-gariti*, indon. *keriting*); bottom right: with curly hair (nias. *mo-götö*) (Photos: J. M. Hämmerle and I. Kennerknecht).



Fig. 1.3: Selected shell midden from hunter-gatherers we collected in 1m depth from the site Tögi Ndrawa, near Gunung Sitoli. The oldest deposits from the bottom in 4m depth are dated back around 12,000 years BP.

up the trees and binding the tops of several trees together). Other races are said to live in caves (*tögi*) with their ancestor Lature Danö (or Latura Danö), in rivers (*idanö*) with their ancestor Tuhangaröfa (or Cuhangaröfa), in gorges (*awuwukha*) with their ancestor Nadaoya or to have been drowned by a tsunami (e.g., on Sim[al]juk Island a lost village square is named *nibunu asi* (= killed by the sea). Other names are *Hulo Ge'e*, island of parrots (*hulo* = island, *Geé, e'e, keke* = parrot), and *Hulo Solaya-laya*, dancing island, because of the many earthquakes (Hämmerle 2001). The Chinese called it parasol island (Yoshiko Yamamoto 1986: 53).

Ancestral Myths

Nias oral tradition tells us that the ancestral foundress, Siraso, came from across the seas, landing either in the estuary of Susua River (Hämmerle 1982: 13), or in the nearby estuary of Nalawö (Hämmerle 2001: 165) just opposite Singkuang, a Sumatran harbor town. Later she (and her descendants / followers) moved up the Susua valley through a gorge (*baho Zusua*) to the confluence of the rivers Gomo and Susua and further up the Gomo to a protected valley where they founded Sifalagö Gomo behind a mountain range aside the river Gomo [Fig. 1.4].

Sirasö is the female ancestor of the people who named themselves *Niha* (humans) and whose genealogy begins with Siraso and her son Telögu. In South Nias, Siraso is usually called Nandrua and Telögu is called Ho or *Ho me mobörö* (Ho in the beginning) (Hämmerle 1990: 8). Later a great part of the descendents of Siraso left the Gomo area to the south and advanced as the nobles (*Si'ulu*) (Hämmerle 1986: 237). The genealogies of the noble clans in the south go back nearly 20 generations. Agner Möller

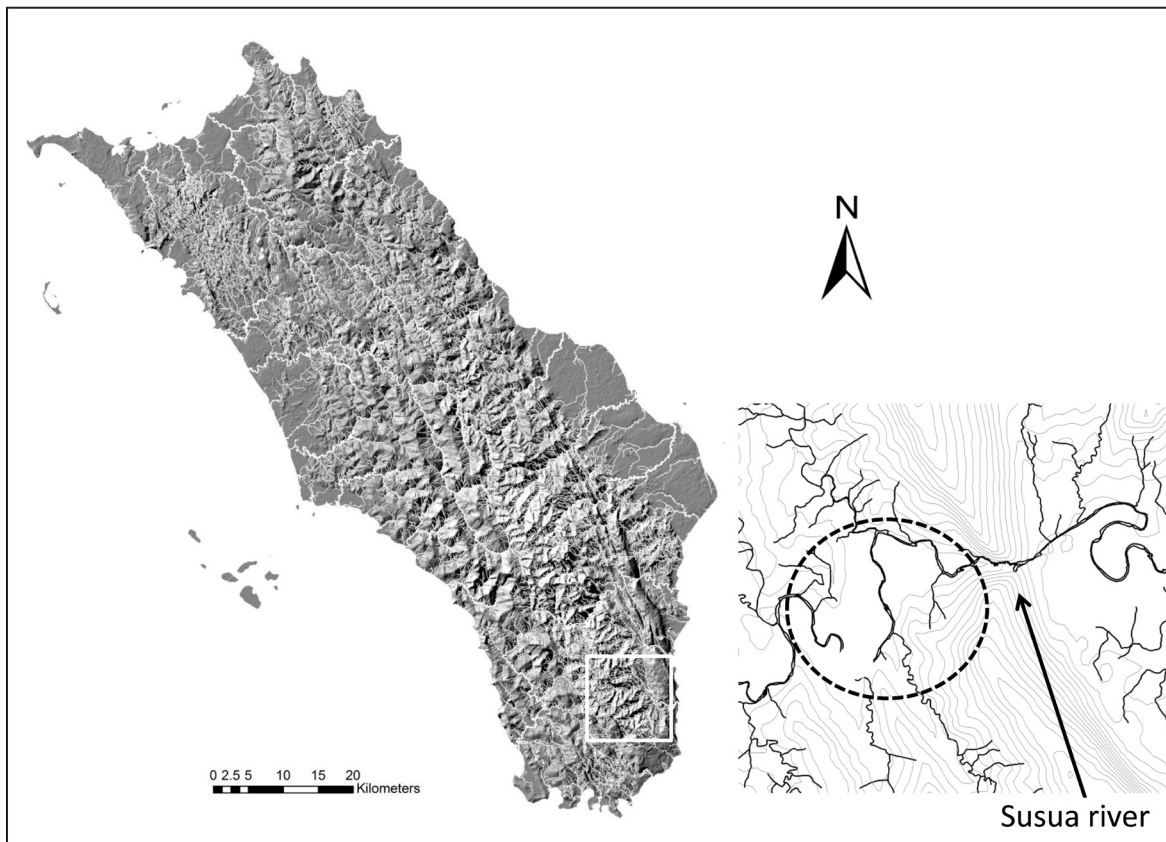


Fig. 1.4: Sifalagö Gomo lies in a fertile valley not far from the coast and well hidden behind a steep mountain range. Yet, the valley is accessible by the river Susua. In the overview the satellite map shows that this is — among other places just opposite Sumatra — for early settlers the most convenient place for a protected and successful settlement on Nias (Maps kindly provided by Jamil Djonie, Gunungsitoli).

(1934: 121) assumes that the oral traditions of the genealogies in the south are more reliable than those of the north.

Hohó (songs) also recount migration myths. In the years between 1984 to 1987 (Hämmerle 1990: 7) and during a meeting of *Hohó*-singers from Hilinawalö in Gunung Sitoli in 19–22 March 2007, 23 texts were collected by handwriting, tape recorder or on CD (this appears on the CD *Musik Tradisional Nias. Hoho Hilinawalö Fau*, recorded and edited 2007). One of these song-texts from the singer (*ere hohó*, *ere* = priest, expert) Mesozokhö Bu'ulölö, or Ama Sama, from the village Hilinawalö Fau, sub-district Fanayama, district South-Nias, states that Siraso is the daughter of a king from the other side, i.e. from Asia (Hämmerle 1990: 6). The following song text given by Ama Sama is one version which describes the location of the first settlements (Hämmerle 2001: 165).

<i>Raya sa mege da'ö,</i>	In the South, it had taken place,
<i>Raya ba Gomo sahaya-haya</i>	In the South, at the quiet river Gomo,
<i>Raya ba Nalawö sia'a mbanua,</i>	In the South, in Nalawö, the first settlement,
<i>Raya ba Mazinö hönö rozi,</i>	In the South, in Mazinö, the thousand fold,
<i>Raya ba Mazinö hönö fao.</i>	In the South, in Mazinö with thousand fold attendances.

In two other *hohó* by Ama Sama there is a quite different account. It is said that the son of Siraso is Hia Walani Adu (*Adu* = figure) also called Hia Walani Luo (*Luo* = sun) or Hia Ho. Ama Sama also says that the given name of Ho is Amaöndra and that only later he got the name Hia Walani. Twins were born to him, a boy named Telögu and a girl named Sorai Zisöma. Hia brought the girl to the source and the boy to the estuary of the river (the name of the river is not given but is probably the Gomo). In another song Ama Sama says that Ho married his mother as there were no other humans (i.e. *Niha*) on earth (*me lö Niha ba gulidanö*). Twins were born, a boy named Sadaŵa Mölö and a girl Sorai Zismö. They represent the founder population of the humans (*Niha*) on Nias (Hämmerle 1990). In central and north Nias only the name Siraso is used. In the south, besides her usual name Nandrua, additional poetic names are given to her, e.g., Sibowo Döfi Madala, “flower of the morning sun”, Ina Sakao Dödö, “mother bearing misery” (in the beginning when arriving on the island), Simadulo Hösi and Simadulo Rao Watua, i.e. symbolic terms for giving birth, and finally Samihara Luo Gögömi, “sun lightning the dark” and Samihara Luo Sambua, “the only sun”.

Written Records

Claudius Ptolemy (c. AD 87–150) was well aware of Sumatra and some of the other Barrier islands, so it is reasonable to assume that Greek traders may have visited Nias, in the search for camphor and other goods. In his historical introduction to Nias, Engelbertus Schröder (1917: 697) analyses the reports collected by Gabriel Ferrand (1913–14). The oldest one is from Sulayman (AD 851), an Arab trader who travelled several times to the region. He uses the name Niyān (“Ces îles ont dans leur dépendance d’autres îles, parmi lesquelles est celle de Niyān”). Muḥammad al-Idrīsī (1154) mentions a variety of ethnic groups; “Cette île est peuplée d’un grand nombre de tribus.” and writes that the Bataks [in contrast to Nias people] are of dark skin “dont les habitants sont noir.” Johann William Thomas (1879) and Heinrich Sundermann (1884) who were among the first missionaries on Nias, were also told of the existence of a variety of ethnic groups. Their informants identify themselves as immigrants, i.e. *ono Niha*. They were obviously highly motivated when recapitulating their own (*Niha*) genealogies but less so in recalling details of their predecessors.

Chinese Influence on Nias

The ports of Sumatra opposite Nias are Barus, Singkuang and Natal [Fig. 1.1]. Sibolga was unimportant as being far back in a bay surrounded by steep mountain sides. Before the arrival of the Portuguese and Dutch, Chinese traders were widespread in the archipelago. In the estuary of the river Batanggadis on the west coast of Northern Sumatra the Chinese occupied Muaralabuh in 1416 and founded a harbor and shipyard (Mangaradja Onggang Parlindungan 1964). Chinese trade and settlements are documented on

Sumatra through ceramics dated to between the 10th and 16th century (Wade 2009: 252; Perret and Heddy Surachman 2010; Erond L. Damanik and Edwards McKinnon this volume; Edwards McKinnon *et al.* this volume). In Nias myths the Chinese are called *gehai* or *kehai*.

Archaeology

Archaeology in Nias has been limited. There have been four excavations, all of them in the cave Tögi Ndrawa (near Gunung Sitoli); one by Yusuf Ernawan / University of Surabaya together with the Yayasan Pusaka Nias (Nias Heritage Foundation) in 1999 (Hämmerle 2001: 136), two by the Archaeological Institute of Medan (Ketut Wiradnyana *et al.* 2002; Ketut Wiradnyana 2003), and finally one by Forestier in collaboration with Truman Simanjuntak and the Archaeological Institute of Medan (Forestier *et al.* 2005). But, besides documentation and dating of the megalith culture (e.g., Bonatz 2002, 2009) there has been no systematic archaeological research on Nias and there is no archaeological evidence for Chinese settlement on Nias.

The Peopling of Nias and Dispersal of Clans From the Perspective of Molecular Genetics

The Paternal Lines of Nias By Y-Chromosome Perspective

In the Nias collection, 14 SNPs of Y haplogroup O and 17 loci containing Y-STRs were studied (for details see van Oven *et al.* 2011). Out of more than 900 blood and spit samples we selected 407 probes from probands who were not consanguineous, at least up to the grandparents. This represents around 0.06% of the total Nias population of 684,704 (Nias Dalam Angka 2001 [Statistical Yearbook of Nias 2001]). All 407 Nias lineages belong to the major haplogroup O-M175. This haplogroup consists of 15 sublineages from which only two very closely related sublineages, M119* and M110, are present in the Nias sample. There is one other sample with the haplogroup O-M95*(xM88) but this is still a sublineage of haplogroup O-M175. Notably, there is a strong north-south differentiation on Nias. In the south O-M110 is the major haplogroup, whereas in the north only one of the two haplogroups, O-M119*, is present [Fig. 1.5].

Such an extremely high frequency of O-M119 (which includes O-M110) is not found in the surrounding populations, e.g., Sumatra (17.5%), but is very common among Taiwanese aboriginals (89.6%) and frequent in the Karo Batak (a subpopulation of Sumatra) (45.5%), Philippines (41.0%); Malaysian (30.8%), Trobriand Islands (28.3%) Javanese (27.3%), Nusa Tenggara (22.6%), and Balinese (18.1%) (Bing Su *et al.* 1999; Karafet *et al.* 2005; Kayser *et al.* 2006; van Oven 2007). In a single patrilineal clan such a paternal bottleneck is a consequence of being descendents of a single ancestor. Even more surprising is the finding that the STR-marker variability is extremely reduced through all over the island. The diversity is even strikingly low compared to most of the isolated Oceanian populations (van Oven *et al.* 2011). STR-markers are generally very variable in the number of their repeats. Hence, they are good indicators for genetic diversity and allow us to test samples in forensic applications for individual identity or for paternity testing.

The Maternal Lines of Nias in mtDNA Perspective

The maternal genetic history of Nias is more diverse than the paternal one but still less than in control populations in Southeast Asia, East Asia and Oceania. The most common haplogroup, Y2, is present in all samples from Nias with an overall frequency of 40%. This is the highest frequency for this haplogroup so far reported. The haplogroup Y2 is next most often present in the Philippines (12.9%), Taiwanese indigenous peoples (9.5%), Sumatra (6.7%), combined sample from five distinct regions (Trejaut *et al.* 2005; Hill *et al.* 2007). Y2 might be a signal for a mid-Holocene out-of-Taiwan expansion (Hill *et al.* 2007).

Among the 17 other mitochondrial haplogroups B5b2 is noteworthy, as it is especially common in the Si'ulu clan (32.5%) but rare in the rest of Nias and outside, only reported in single individuals in Karo

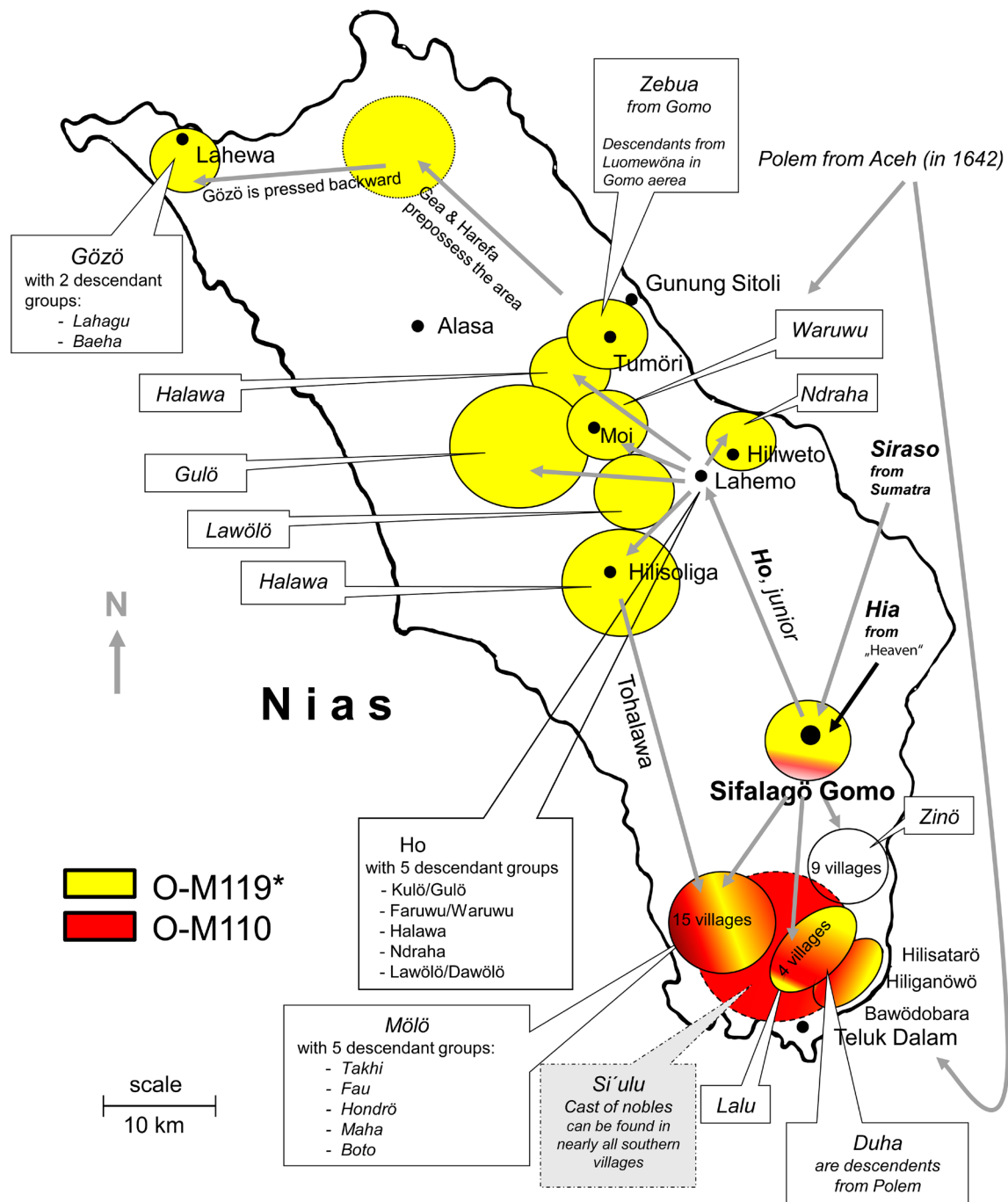


Fig. 1.5: Suggested migration of selected clans in their present area. Those areas included in our molecular genetic studies are colored. Shown here are the Y-chromosomal haplotypes. Only two out of 15 common sublineages are present on Nias. In the south the predominant haplogroup is O-M110 (red) with an admixture of the haplogroup O-M119* (yellow). The overlapping area includes Sifalagö Gomo. In the North only one haplogroup is present at all! For details see text (adopted and modified from Kennerknecht 2009).

Batak / Sumatra and Korea (van Oven *et al.* 2011). In summary, all major Nias mtDNA haplogroups are indicative of East Asian and Southeast Asian maternal ancestry.

For our studies, a set of around 20 genetic markers for the Y-chromosome and the mtDNA was taken. From previous studies in Southeast Asia and East Asia it was known that these markers are found in varying frequencies but are almost always present. On Nias the molecular genetic data reveal an extreme

population bottleneck. Only two of these markers are present, as if the samples had been taken from just two families. In addition, there is a strong north-south differentiation. In the north only one of the two markers is present, as if all samples were from a highly consanguineous clan with two male founders and a small group of female founders. Moreover, genetic diversity is dramatically reduced, which implies that the bottleneck “event” is fairly recent. Individuals with frizzy hair do not significantly differ from other Nias inhabitants, indicating they are not evidence of a Pleistocene heritage.

The samples are randomly taken from all major clans through all over Nias out of a population of 650,000. Only from Sirombu (west coast Nias; settled by members of the Daeli clan from the Idanoi region and by members from the Hia clan from the Gomo area), the Hinako Islands (8–15km southwest of Sirombu, settled by Buginese), and the Batu Islands (70–140km southeast of Teluk Dalam / south coast Nias, settled by people from south Nias and the Gomo area but also by a minority of Buginese) are samples missing [Fig. 1.4]. Beyond this we are not aware of any other selection bias.

Discussion and Conclusions

With significant gaps, the following chronological order of settlement on Nias is presumed. The presence of humans on Nias is documented since at least 12,000 years BP (Forestier *et al.* 2005). As the DNA probes are from the recent population we do not know the time-frame for this immigration. The oral narratives stretch back around 600 years and refer to resident archaic foragers which are replaced by a very small founder population of “real” humans coming from outside. The extremely reduced diversity indicates that there was no time to accumulate a significant number of genetic variations.

These findings mean that a number of earlier hypotheses can effectively be discarded. Ernst Denninger (1874) and Frederic Martin Schnitger (1939) proposed a potential homeland in Nagaland (India, Burma) on the basis of “[...] similarities between their megalith cultures [which] are so striking and so numerous that there can be no doubt of their relation”. Comparison with genetic data from this region negates this hypothesis (Metspalu *et al.* 2004; Cordeaux *et al.* 2004; Sanghamitra Sahoo *et al.* 2006; Adimoolam Chandrasekar *et al.* 2009; Suvendu Maji *et al.* 2009).

A more credible match is the large scale migration of Austronesian-speaking people out of mainland Asia or Taiwan 4,000 years ago. The protagonists presume that this was driven by advanced farming technologies and successive replacement of the indigenous population and establishing their culture and language, the so-called Austronesian “package” (Blust 1984; Bellwood 1984, 2005; Gray *et al.* 2009). Not all agree with this simple demographic model (Meacham 1984; Szabó and O’Connor 2004; Donohue and Denham 2010; Spriggs 2011, this volume; Blench this volume) and recent proposals



Fig. 1.6: Typical stone and wood carvings of Nias “stack” crown (Photo: I. Kennerknecht, Museum Pusaka Nias).

support a more nuanced history of Island Southeast Asia. An increasing number of observations show that linguistic evidence and genetic studies on domesticated plants and animals point to multiple distinct migrations, delinking the spread of agriculture and language (Hitomi Hongo *et al.* 2002; Kjær *et al.* 2004; Blench 2005; Piper *et al.* 2009; Donohue and Denham 2010). The diversity in linguistic and archaeological records may now allow a richer, multistage colonization model (Karafet *et al.* 2010).

The extremely reduced genetic diversity on Nias seems to be unique in Island Southeast Asia. The link with Taiwan and the Philippines is strong and suggests that Nias was directly populated from this region by maritime populations. Bernd Nothofer (1986) points to clear links between the so-called “Barrier Islands” and the west coast of Sumatra, and his evidence suggests that there was once a common population in this region with a shared lexical heritage (possibly excepting Enggano). Given our recent understanding of the rapid speed of Austronesian expansion (e.g., Spriggs 2011) this is quite credible. A small but intriguing piece of evidence is the characteristic Nias “crown” shown in many wood and stone carvings [Fig. 1.6]. The Ifugao people of Northern Luzon also made these tall, ridged head-dresses on carved wooden figures [Fig. 1.7]. Since this is not commonly found in Austronesian iconography, it does suggest strongly that this is a trace of a more direct connection between the two areas.

Puzzles remain, however. What happened to the indigenous population? Unless it was intentionally exterminated by the incoming ancestors of the Nias people, it is most likely that an epidemic disease eliminated all but a few remnant groups whose existence is remembered in oral traditions. As an island that had only limited contact with the mainland for millennia, the indigenous foragers would have had little resistance to disease. If the Austronesian Nias did not intermarry with these residual foragers, then there would be little or no trace of them, in terms of genetics.

Secondly, the Nias language is remarkably uniform throughout the island, with little more than dialect variation. This is not what would be expected after 4,000 years of diversification. The language, therefore, must have undergone massive leveling in the recent past and its prior diversity eliminated. It is not unlikely that the migration from Sumatra of the order of 500–600 years ago, recorded in oral tradition was responsible for this. The ancestress mentioned in the songs and myths was a symbol for the establishment of political domination by a mainland group, which effectively eliminated political, cultural and linguistic diversity. However, the existing language of Nias, rather than being displaced, was taken up by the new elite and spread to every part of the island. A useful parallel to this is the invasion of England by the Normans. French was the elite language of the court in England for some time, but eventually English began to dominate and eventually the descendants of the French invaders were propagating the use of mainstream English and replacing strong varieties of regional speech within England.

Did the visitors, Chinese or Malay, have any genetic impact on the population of Nias? Present evidence suggests not, although this might turn up with more intensive sampling and high resolution genetic signature. The failure to intermarry with both residual foragers and incoming trader groups, points to a very strict marital pattern which effectively made outside marriage extremely difficult and created an extreme paternal “bottleneck”, accounting for the idiosyncratic pattern of haplotypes seen today.

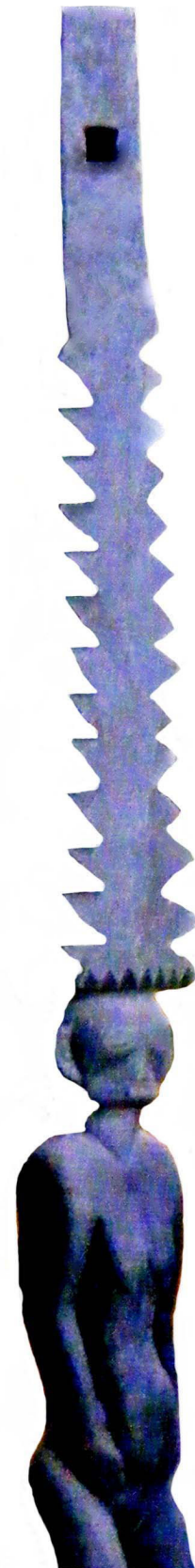


Fig. 1.7: Wooden ancestor figure, Ifugao of Kiangan, Philippines (Photo: R. Blench, Kiangan Museum).

Further Work

Archaeology in Nias needs to clearly establish the antiquity of settlement of the island and the point at which incoming Austronesian speakers arrived. They presumably spread gradually over the island and this can be established through dated sites. However, there must also be evidence for the purported migration from Sumatra that put in place the current ruling elites and which is recorded in oral traditions. What is most striking, however, is the extreme genetic uniformity of the population, suggesting that the original Austronesian migration consisted of a small nucleus of already similar individuals, who spread and colonized the island, rather like, for example Vanuatu (Bedford *et al.* 2010). In Vanuatu, however, the result was one of the most linguistically diverse nations on earth (Lynch 1981); in Nias the opposite result was obtained. The challenge is to understand the reason for such different outcomes. The bottleneck history of Nias should have an impact on the epidemiology of diseases. One might expect diseases with a high prevalence on Nias but otherwise rare on the surrounding islands and *vice versa*. Thus a population-based clinical genetic screening might further show that Nias is genetically unique.

Declaration

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References

Adimoolam Chandrasekar, Satish Kumar, Jwalapuram Sreenath, Bishwa Nath Sarkar, Bhaskar Pralhad Urade, Sujit Mallick, Syam Sundar Bandopadhyay, Pinuma Barua, Subihra Sankar Barik, Debasish Basu, Uttaravalli Kiran,

- Prodyot Gangopadhyay, Ramesh Sahani, Bhagavatula Venkata Ravi Prasad, Shampa Gangopadhyay, Gandikota Rama Lakshmi, Rajasekhara Reddy Ravuri, Koneru Padmaja, Pulamaghatta N. Venugopal, Madhu Bala Sharma and Vadlamudi Raghavendra Rao. Updating phylogeny of mitochondrial DNA macrohaplogroup M in India: Dispersal of modern human in South Asian corridor. *Public Library of Science [PLoS] One* 4(2009): e7447.
- Beatty, A. *Society and exchange in Nias*. Oxford: Clarendon Press, 1992..
- Bedford, S., Spriggs, M., Buckley, H., Valentin F., Regenvanu, R. and Abong, M. A Cemetery of First Settlement: the Site of Teouma, South Efate, Vanuatu. In *Lapita: Ancêtres océaniens*, ed. Ch. Sand and S. Bedford. Paris: Musée du quai Branly / Somogy Editions d'Art, 2010, pp. 140–61.
- Bellwood, P. A hypothesis of Austronesian origins. *Asian Perspectives* 20 (1984): 107–17.
- . *Prehistory of the Indo-Malaysian Archipelago*. Honolulu: University of Hawaii Press, 1997.
- . *First farmers: the origins of agricultural societies*. Oxford: Blackwell, 2005.
- Bing Su, Junhua Xiao, Underhill, P., Ranjan Deka, Weiling Zhang, Joshua Akey, Wei Huang, Di Shen, Daru Lu, Jingchun Luo, Jiayou Chu, Jiazhen Tan, Peidong Shen, Davis, R., Cavalli-Sforza, L., Ranajit Chakraborty, Momiao Xiong, Ruofu Du, Oefner, P., Zhu Chen and Li Jin. Y-chromosome evidence for a northward migration of modern humans into eastern Asia during the last Ice Age. *American Journal of Human Genetics* 65 (1999): 1718–24.
- Blench, R.M. Fruits and arboriculture in the Indo-Pacific region. *Bulletin of the Indo-Pacific Prehistory Association* 24 (2005): 31–50.
- Blust, R.A. The Austronesian homeland. *Asian Perspectives* 20 (1984): 45–67.
- Bonatz, D. Megaliths on Nias: the retention of identity. *Indonesia and the Malay World* 30, 88 (2002): 253–76.
- . The megaliths on Nias. In *Traditional Architecture and Art on Nias, Indonesia*, ed. P. Gruber and U. Herbig. Vienna: IVA-ICR, 2009, pp. 64–71.
- Brown, L. Nias. In *The Austronesian Languages of Asia and Madagascar*, ed. A. Adelaar and N.P. Himmelman. London: Routledge, 2005, pp. 562–89.
- Cordaux, R., Weiss, G., Saha, N., and Stoneking, M. The northeast Indian passageway: A barrier or corridor for human migrations? *Molecular Biology and Evolution* 21 (2004): 1525–33.
- Denninger, L.E. *Turia amusola dödö gamonita tesua wa Luka [The gospel according to St. Luke]*. London: British and Foreign Bible Society, 1874.
- Donohue, M. and Denham, T. Farming and languages in Island Southeast Asia. *Current Anthropology* 51 (2010): 223–56.
- Ferrand, G. *Relations de voyages de textes géographiques arabes, persans et turks, relatifs à l'Extrême-Orient du VIIIe au XVIIIe siècles. Traduits, revus et annotés par Gabriel Ferrand*. 2 vol., Paris: Ernest Leroux, 1913–14.
- Forestier, H., Truman Simanjuntak, Guillaud, D., Dubel Driwantoro, Ketut Wiradnyana, Darwin Siregar and Rokus Due Awe. Le site de Tögi Ndrawa, île de Nias, Sumatra nord: les premières traces d'une occupation hoabinhienne en grotte en Indonésie. *Comptes Rendues Palévolutio* 4 (2005): 727–33.
- Gray, R.D., Drummond, A.J. and Greenhill, S.J. Language phylogenies reveal expansion pulses and pauses in pacific settlement. *Science* 323 (2009): 479–83.
- Gruber, P. and Herbig, U., ed. *Traditional Architecture and Art on Nias, Indonesia*. Vienna: IVA-ICRA, 2009.
- Hämmerle, J.M. *Nias: Land der Menschen. Ein Beitrag aus Zentral Nias*. Münster: Missionsprokur der Kapuziner, 1982.
- . *Famatö harimao. Pesta harimao – fondrakö – Börönadu dan kebudayaan lainnya di wilayah Maenamölö – Nias Selatan [The breaking of the tiger: Tigerfestival – reconfirmation of the law – Börönadu festival and other cultural performances in the area of Maenamölö in south Nias]*. Gunungsitoli: Yayasan Pusaka Nias, 1986.
- . *Omo Sebua [The chief's house]*. Gunung Sitoli: Yayasan Pusaka Nias, 1990.
- . *Nias eine eigene Welt. Sagen Mythen, Überlieferungen*. Collectanea Instituti Anthropos 43, Sankt Augustin: Academia, 1999.
- . *Asal usul masyarakat Nias, Suatu interpretasi [The origin of the Nias society, an interpretation]*. Gunung Sitoli: Yayasan Pusaka Nias, 2001.
- . *Geschichten und Gesänge von der Insel Nias in Indonesien*. Frankfurter Forschungen zu Südostasien 5. Wiesbaden: Harrassowitz, 2008.
- Hämmerle, J.M. and Lehner, E., ed. *Gomo und das traditionelle Haus auf Nias. Baukultur in Indonesien*. Vienna: IVA-ICR, 2010.
- Hill, C., Soares, P., Mormina, M., Macaulay, V., Clarke, D., Blumbach, P.B., Vizuete-Forster, M., Forster, P., Bulbeck, D., Oppenheimer, S. and Richards, M. A mitochondrial stratigraphy for island Southeast Asia. *American Journal of Human Genetics* 80 (2007): 29–43.
- Hitomi Hongo, Naotaka Ishiguro, Takuma Watanobe, Nobuo Shigehara, Tomoko Anezaki, Vu The Long, Dang Vu Binh, Nguyen Trong Tien and Nguyen Huu Nam. Variation in mitochondrial DNA of Vietnamese pigs: Relationships with Asian domestic pigs and Ryukyu wild boars. *Zoological Science* 19 (2002): 1329–35.

- Hua Liu, Prugnolle, F., Manica, A. and Balloux, F. A geographically explicit genetic model of worldwide human-settlement history. *American Journal of Human Genetics* 79 (2006): 230–7.
- Jobling, M.A. and Tyler-Smith, C. The human Y chromosome: An evolutionary marker comes of age. *Nature Review Genetics* 4 (2003): 598–612.
- Karafet, T.M., Lansing, J.S., Redd, A.J. and Reznikova, S. Balinese Y-chromosome perspective on the peopling of Indonesia: Genetic contributions from pre-neolithic hunter-gatherers, Austronesian farmers, and Indian traders. *Human Biology* 77 (2005): 93–114.
- Karafet, T.M., Hallmark, B., Cox, M.P., Herwati Sudoya, Downey, S., Lansing, J.S. and Hammer, M. F. Major east-west division underlies Y chromosome stratification across Indonesia. *Molecular Biology and Evolution* 27 (2010): 1833–44.
- Kayser, M., Brauer, S., Cordaux, R., Casto, A., Lao, O., Zhivotovsky, Lev A., Moyses-Faurie, C., Rutledge, R.B., Schiefenhoewel, W., Gil, D., Lin, A.A., Underhill, P.A., Oefner, P. J., Trent, R.J. and Stoneking, M. Melanesian and Asian origins of Polynesians: mtDNA and Y chromosome gradients across the Pacific. *Molecular Biology and Evolution* 23 (2006): 2234–44.
- Kennerknecht, I. The genetics of Nias — concepts and first data. In *Traditional Architecture and Art on Nias, Indonesia*, ed. P. Gruber, and U. Herbig. Vienna: IVA-ICR, 2009, pp. 54–61.
- Ketut Wiradnyana. Peralatan berbahan cangkang moluska dari Gua Tögi Ndrawa, Nias [Tools made of mussels from the cave Tögi Ndrawa, Nias]. *Berkala Arkeologi "Sangkhakala"* 11. Medan: Pusat Penelitian Arkeologi Balai Arkeologi Medan, 2003, pp. 47–54.
- Ketut Wiradnyana, Nengguh Susilowati, and Lucas Partanda Koestoro. Gua tögi Ndrawa, hunian mesolitik di pulau Nias [The cave Tögi Ndrawa, mesolithic settlement on the island of Nias]. *Berita Penelitian Arkeologi* 8. Balai Arkeologi Medan, Pusat Penelitian Arkeologi, Badan Pengembangan Kebudayaan dan Pariwisata, 2002, pp. 1–89.
- Kjær, A., Barfod, A.S., Asmussen, C.B. and Seberg, O. Investigation of genetic and morphological variation in the sago palm (metroxylon sagu; arecaceae) in Papua New Guinea. *Annals of Botany* 94 (2004): 109–17.
- Kleiweg de Zwaan, J.P. *Anthropologische Untersuchungen über die Niasser*. Haag: Nijhoff, 1914.
- Lynch, J. Melanesian Diversity and Polynesian Homogeneity: The other Side of the Coin. *Oceanic Linguistics* 20, 2 (1981): 95–129.
- Macaulay, V., Hill, C., Achilli, A., Rengo, C., Clarke, D., Meehan, W., Blackburn, J., Semino, O., Scozzari, R., Cruciani, F., Adi Taha, Norazila Kassim Shaari, Raja, J.M., Patimah Ismail, Zafarina Zainuddin, Goodwin W., Bulbeck, D., Bandelt, H.J., Oppenheimer, S., Torroni, A. and Richards, M. Single, rapid coastal settlement of Asia revealed by analysis of complete mitochondrial genomes. *Science* 308 (2005): 1034–36.
- Mait Metspalu, Toomas Kivisild, Ene Metspalu, Jüri Parik, Georgi Hudjashov, Kaldma K., Piia Serk, Karmin, M., Doron M. Behar, Gilbert, M.T., Endicott, P., Sarabjit Mastana, Surinder S. Papiha, Skorecki, K., Torroni, A. and Villems, R. Most of the extant mtDNA boundaries in south and southwest Asia were likely shaped during the initial settlement of Eurasia by anatomically modern humans. *BioMedCentral [BMC] Genet* 5 (2004): 26.
- Mangaradja Onggang Parlindungan. *Pongkinangoingolan Sinambela gelar Tunaku Rao [Pongkinangoingolan Sinambela with the title Tunaku Rao]*. Jakarta: Tandjung Pengharapan 35, 1964.
- Meacham, W. On the improbability of Austronesian origins in South China. *Asian Perspectives* 26 (1984): 89–106.
- Møller, A. Beitrag zur Beleuchtung des religiösen Lebens der Niasser. *Internationales Archiv für Ethnographie* 32 (1934): 121–71.
- Nias Dalam Angka [The statistical yearbook of Nias], 2001.
- Nothofer, B. The Barrier Island languages in the Austronesian language family. In *FOCAL II: Papers from the Fourth International Conference on Austronesian Linguistics*, ed. P. Geraghty, L. Carrington and S.A. Wurm. Pacific Linguistics Series C-94, Canberra: ANU, 1986, pp. 87–109.
- Oven, M. van. Genetic History of the people of Nias from a Y-chromosome perspective. Thesis (PhD), Erasmus University Rotterdam, 2007.
- Oven, M. van, Hämmerle, J.M., Schoor, M. van, Kushnik, G., Pennekamp, P., Idaman Zega, Oscar Lao, Brown, L., Kennerknecht, I. and Kayser, M. Unexpected island effects at an extreme: reduced Y-chromosome and mitochondrial DNA diversity in Nias. *Molecular Biology and Evolution* 28 (2011): 1349–61.
- Perret, D. and Heddy Surachman. The 2009 archaeological excavations at the Si Pamutang site in Padang Lawas, North Sumatra. Paper presented at the 13th International Conference of the European Association of Southeast Asian Archaeologists, 27 September–1 October 2010, Berlin.
- Piper, P.J., Hsiao Chun Hung, Campos, F.Z., Bellwood, P. and Santiago, R. A 4,000 year-old introduction of domestic pigs into the Philippine archipelago: Implications for understanding routes of human migration through island Southeast Asia and Wallacea. *Antiquity* 83 (2009): 687–95.
- Rappard, Th. C. Het eiland Nias en zijne bewoners. *Bijdragen tot de Taal, Land en Volkenkunde* 62 (1909): 477–648.

- Sanghamitra Sahoo, Anamika Singh, Himabindu, G., Jheelam Banerjee, Sitalaximi, T., Sonali Gaikwad, Trivedi R., Endicott P., Toomas Kivisild, Mait Metspalu, Villems R. and Kashyap, V. K. A prehistory of Indian Y chromosomes: Evaluating demic diffusion scenarios. *Proceedings of the National Academy of Sciences USA* 103 (2006): 843–48.
- Schnitger, F.M. *Forgotten kingdoms in Sumatra*. Leiden: Brill, 1939.
- Schröder, E.E.W.G. *Nias, ethnographische, geographische en historische aanteekeningen en studien*. Leiden: Brill, 1917.
- Spriggs, M. Archaeology and the Austronesian expansion: where are we now?. *Antiquity* 85 (2011): 510–28.
- Sundermann, H. Die Insel Nias und die Mission daselbst. *Allgemeine Missions-Zeitschrift* 11 (1884): 345–54.
- Suwendu Maji, Krithika, S. and Vasulu, T.S. Phylogeographic distribution of mitochondrial DNA macrohaplogroup M in India. *Journal of Genetics* 88 (2009): 127–39.
- Szabó, K. and O'Connor, S. Migration and complexity in Holocene Island Southeast Asia. *World Archaeology* 36, 4 (2004): 621–28.
- Thomas, J.W. Niassische Götter und Geisterlehre. *Berichte der Rheinischen Missionsgesellschaft*, 1879, pp. 210–6.
- Trejaut, J.A., Kivisild, T., Jun Hun Loo, Chien Liang Lee, Chun Lin He, Chia Jung Hsu, Zheng Yuan Li and Lin, M. Traces of archaic mitochondrial lineages persist in Austronesian-speaking Formosan populations. *Public Library of Science [PLoS] Biology* 3 (2005): e247.
- Wade, G. An early age of commerce in Southeast Asia, 900–1300 CE. *Journal of Southeast Asian Studies* 40, 2 (2009): 221–65.
- Yoshiko Yamamoto. A sense of tradition. *An ethnographic approach to Nias material culture*. Thesis (PhD), Cornell University (Ann Arbor, Michigan, University Microfilms International 1987, 53), 1986.