



**Murdoch**  
UNIVERSITY

## MURDOCH RESEARCH REPOSITORY

*This is the author's final version of the work, as accepted for publication following peer review but without the publisher's layout or pagination.*

*The definitive version is available at*  
<http://dx.doi.org/10.1111/sjtg.12038>

**McHenry, M.P., Anwar McHenry, J., Balilla, V.S. and Parkinson, R.M. (2013) The Indigenous Aetas of Bataan, Philippines: extraordinary genetic origins, modern history, and land rights. Singapore Journal of Tropical Geography, 34 (3). pp. 292-306.**

<http://researchrepository.murdoch.edu.au/14608/>

Copyright: © 2013 The Authors.

It is posted here for your personal use. No further distribution is permitted.

# The Indigenous Aetas of Bataan, Philippines: Extraordinary genetic origins, modern history and land rights

Mark P. McHenry,<sup>1</sup> Julia Anwar-McHenry,<sup>2</sup> Vincent S. Balilla<sup>3</sup> and Riva Marris Parkinson<sup>3</sup>

<sup>1</sup>School of Energy and Engineering, Murdoch University, Western Australia, Australia

<sup>2</sup>Faculty of Health Sciences, Curtin University, Western Australia, Australia

<sup>3</sup>Peninsula Ecosystems and Health Foundation Inc., Manila, Philippines

Correspondence: Mark P. McHenry (email: mpmchenry@gmail.com)

The Aeta Magbukún of Bataan in Luzon, the Philippines remain one of the least known and documented Indigenous tribes. They retain primarily subsistence hunter-gathering strategies to supply their basic needs. They also strive for recognition of their ancestral connection with, and rights to inhabit their ancestral forest domains, which is threatened by the expansion of agriculture and urban development by non-Aetas, primarily the majority Tagalog population. The Aeta continue to endure dispossession, poverty and political discrimination through decades of protracted land rights processes. This review explores the potential use of recent genetic evidence in anthropology and human geography to legitimize the Aeta's status as Indigenous people and contradict the perspective of some governments in the Asia Pacific region who question the existence of Indigenous peoples generally, often from fear of land tenure and associated political repercussions. The acquisition and use of genetic research on Indigenous populations is both socially and politically contested through fear of the potential to jeopardize sovereignty claims and lead to biologically-based discrimination. However, the full implications of the potential use of genetic research to legitimize Indigenous status, as described within this research, has yet to be thoroughly explored. By exploring both the genetic and anthropological evidence using a case study of the Indigenous Aeta, this paper provides a unique approach to building a case for Indigenous rights, occupation, use of ancestral lands, self-determination, and ultimately, recognition as Indigenous people.

Keywords: Aeta, genetics, Indigenous rights, origins, self-determination, ancestral land

## Introduction

Geographically isolated peoples in the Asia Pacific face significant development challenges within the context of compounding economic, political, health and land rights barriers (Connell, 2010). The unique origins, modern history and land rights of one of the most isolated and least documented Indigenous groups in the Philippines, the Aeta Magbukún of Bataan, is a fascinating microcosm of human rights in the Asia Pacific. Barsh (1996) and Kingsbury (1998; 1999; 2008) note some national governments in the Asia Pacific region question the existence of Indigenous peoples, largely in the fear that recognizing 'Indigenesness' would create uncertainties for land tenure and generate political instability. In essence, such governments ask for a particularly demanding level of identity assessment of Indigenous people in the region, and if they experience a greater level of misfortune and dispossession directly due to the encroaching newcomers. This discouragingly 'high bar' introduces complexities well beyond the relatively simple distinctions and perceptions of European colonization of an Indigenous people (Barsh, 1996; Theriault, 2011). Furthermore, Watts (2003) notes that arbitrarily constructing 'Indigeneity' for harnessing international political support is often in practice

problematic and erroneous, and in contrast should be founded on shared customary rights to land, empowerment and a distinct ethnicity and culture. The advancing accessibility of information and communication technologies enable simultaneous popularization and threatening of claims to Indigeneity (Dove, 2006). For example, genetic research is being used to detail the human migration story and draw historical connections between different people of the world through the Genographic Project (Tallbear, 2007). This project has raised fears that such information could potentially justify biologically-based discrimination by highlighting discourses of difference, while threatening historical and territorial claims through the emphasis on discourses of sameness (Reardon, 2001; Hausman, 2008). However, the full implications of the potential use of recent genetic research to support Indigeneity and cultural integrity have yet to be thoroughly explored by researchers, Indigenous rights advocates and Indigenous communities themselves. In the Pacific, where such clear-cut distinctions have not been available in the past, the integration of recent genetic evidence in anthropology and human geography may satisfy particularly high demands over the complexities of identity and subsequent rights to self-governance and ancestral lands. Within this complex and largely unexplored arena, this work uses recent molecular genetic evidence to support the notion of a culturally parallel and genetically homogenous human occupation that predates Austronesian habitation in the Asia Pacific by up to several thousand years. This distinct Indigenous group continues to experience marginalization and dispossession in what remains of their ancestral lands. Paradoxically, this small population exist as primarily hunter-gatherers in the forests on Bataan, on the outskirts of the metropolis of Manila, the capital of the Philippines.

The Philippines exhibits a diversity of people, languages and cultures that have fascinated researchers over centuries (Delfin *et al.*, 2011). According to the various definitions of Indigenous people, around 10 per cent of the Philippine population are Indigenous, representing a large geographical and ethnic complex which includes over 100 major ethnolinguistic groups (Hirtz, 2003; Ting *et al.*, 2008). Protecting cultural heritage has become an important political concern in the region, and one approach is through the protection of Indigenous people's rights and the recognition for protection of their ancestral domains (Bryant, 2000). Of the 12 million Indigenous people in the Philippines, the Aeta are among the more well-known groups. The Aetas are also sometimes known as 'Negritos' (translated as small blacks in Spanish), although the authors prefer to use the term 'Aeta' when possible, unless when distinguishing between broader classifications of Indigenous groups in the Philippines. Aeta groups can be found in central (*Aeta, Ita*), eastern (*Dumagat*) and southeastern Luzon (*Agta*) and several islands in the Visayas (*Ati*). The Aetas of Luzon were gradually pushed to their current lands by successive waves of immigration from other Asia Pacific locales (Molintas, 2004), and now primarily exist in the provinces of Bataan, Zambales, Pampanga, Tarlac and other distributed areas (Figure 1). The Aetas of Luzon are the largest, most biologically homogenous Indigenous population in the Philippines (Krieger, 1945), as supported by more recent genetic evidence (Delfin *et al.*, 2011). Relatively recent historical documents illustrate the displacement of the Indigenous peoples into more remote areas of the Philippines; the third edition of John Foreman's (1906: 121) book *The Philippine Islands* (the first and second editions were published in 1880 and 1899) stated:

For a long time they were the sole masters of Luzon Island, where they exercised seigniorial rights over the Malay immigrants, until these arrived in such numbers, that the Negritos were

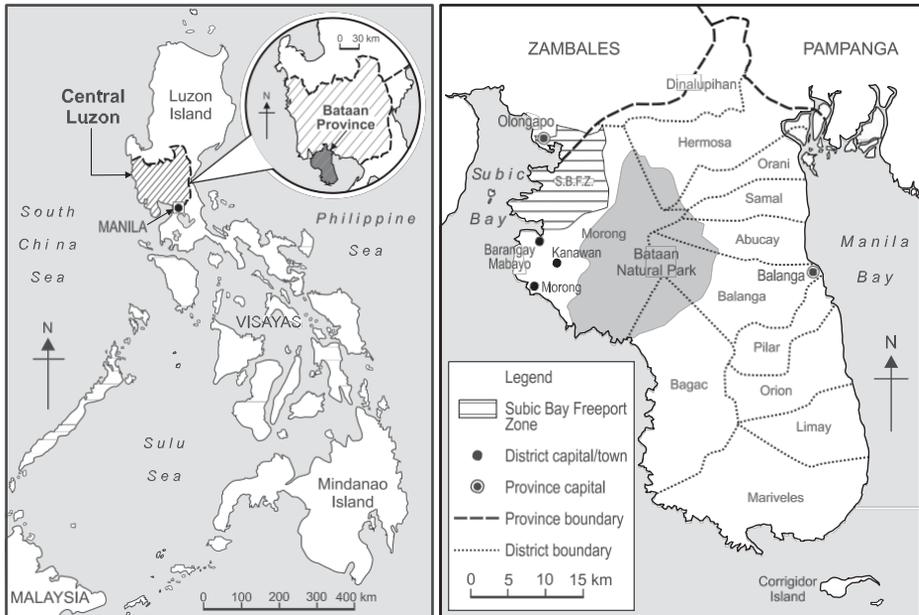


Figure 1. The Bataan peninsula in Central Luzon, Philippines.

forced to retire to the highlands. The taxes imposed upon primitive Malay settlers by the Negritos were levied in kind, and when payment was refused, they swooped down in a posse, and carried off the head of the defaulter.

The least known and researched Aeta group in Central Luzon is the Aeta of the Bataan Peninsula (Balilla *et al.*, 2012). The Aeta largely live a nomadic existence in the forest within ten municipalities, with some living in one of the 18 *bayan-bayanan* (villages/hamlets). The recent official use of the term ‘Aeta Magbukún’ refers to both the Indigenous language and people of Bataan peninsula, specifically that of the Aeta groups from Morong, Mariveles and Limay. Based on the language and orthography research done by UNESCO, SIL International and Translators Association of the Philippines (TAP), these Aeta communities unanimously decided among themselves that their people and language would be known as Aeta Magbukún. Modern molecular genetic evidence lends some support to many traditional narratives of origin, which were used in conjunction with an analysis of local languages and their similarities/differences for tracing ancestries. The Philippines as a whole exhibits an estimated 172 languages, of which 169 are living languages (Hirtz, 2003) of Austronesian origin (Delfin *et al.*, 2011). This includes the Aeta Magbukún language, which evolved from Sambal, the language of the Philippine inhabitants of Zambales, in line with traditional narratives detailing the origin of the Aeta Magbukún people.

This paper aims to determine the potential use of recent genetic evidence within anthropology and human geography in a case study of the Indigenous Aeta of Bataan in Luzon, Philippines. Specifically, with the considered combination of these distinct disciplines the objectives are to legitimize the Aeta’s status as Indigenous people and contradict the perspective of some governments in the Asia Pacific region who question the existence of Indigenous peoples. The rights of Indigenous people, particularly the Aeta of Bataan in the Philippines, are considered with a specific focus on current policies

and issues. Some of these issues concern ancestral domain rights, land conservation and use, and land tenure. In securing these rights through Indigenous heritage claims, we explore the juxtaposition of traditional narratives of ancestral origins with recent molecular anthropological evidence leading support to Indigeneity claims. The implications of the use of genetic research within anthropology for Indigenous self-determination and human rights are also discussed.

### **Aeta rights as Indigenous people**

The distinction between collective Indigenous rights as a people and Indigenous rights as an individual person is complex (Hirtz, 2003). Even the term 'Indigenous peoples' as a category creates a differentiated social status and confers a unique set of rights and responsibilities within a society (Kingsbury, 1998). Yet, questions often remain regarding the nature and limits of Indigenous rights, and which members of society are impacted (Hirtz, 2003). In the Philippines, Indigenous peoples have traditionally felt the brunt of pervasive social discrimination (Molintas, 2004), and subsequently live in the most undeveloped and agriculturally marginal lands (Rosaldo, 1988). More recently, Indigenous people's remaining ancestral lands have become attractive for non-traditional land uses, such as both officially sanctioned and clandestine mining, logging, plantations, military operations and other commodity-based activities (Molintas, 2004). As a result, the Philippine concepts of 'Indigenous' not only carry concepts of prior occupancy and strong group identity, but also prior and continued dispossession (Kingsbury, 1998). The very long occupancy and cultural distinctiveness of the Aeta Magbukún, as supported by recent genetic evidence detailed in the previous section, questions the continued lack of progress concerning the rights of access to ancestral lands and resources, enabling greater levels of preservation of their culture and traditions in the region.

The development of the international concept of 'Indigenous peoples' led to a rapid evolution of political and legal implications in the Philippines several years ago. The 1993 Draft Declaration on the Rights of Indigenous Peoples, the International Labour Organization's (ILO) Convention No. 169 and the Philippine Republic Act No. 8371 (known as the Indigenous Peoples Rights Act (IPRA) of 1997) influenced the amalgamation of the Philippine category of Indigenous cultural communities with the international concept of 'Indigenous peoples' (Kingsbury, 1998). The landmark IPRA was only the second national Indigenous rights legislation in existence at the time, the first being Australian (Castro, 2000). It is the key legislation that recognizes Indigenous people's rights and extends the Philippine Constitutional definitions of Indigenous for preservation and historical continuity (Hirtz, 2003). Particularly important to the Aeta Magbukún, the IPRA provides for recognition of communal and individual rights of Indigenous people to their traditional lands, continued state support for self-governance and self-determination to freely pursue their economic, social and cultural development (Balilla *et al.*, 2013). This is of course within the Philippine Constitution and national unity aims and development objectives (Kingsbury, 1998).

### **Practical problems with Indigenous ancestral domain rights**

The concept of self-determination has always been a polarizing concept with respect to Indigenous peoples, especially to nation states and non-governmental organizations (NGOs). While the vast majority of nations respect notions of internal cultural self-determination, specific concerns often revolve around land tenure, secession to

independent 'statehoods' and the protection of national territorial integrity (Barsh, 1996). The parallel development of international concepts of Indigenous people's rights and their respective appropriateness to each Indigenous group, and the actual influence on respective governing nations is thus a complex and evolving space.

Treating Indigenous groups as homogenous with uniform needs fails to consider the complexity of their diverse lives and histories (Hirtz, 2003). For example, not all Indigenous communities in the Philippines share a common notion of territory (Castro, 2000), and the borders of ancestral domains often acquire meaning only within a geographically contextual aural narrative of Indigenous oral history, land use and associated cultural practices (Bryant, 2000). Land rights issues have even created disunity between some Indigenous peoples in the Philippines (Castro, 2000) and is further complicated by the practice of land grabbing and insecurity of land tenure, generally (Doedens *et al.*, 1995; Headland & Headland, 1997). Even though the Aeta Magbukún are one of the many ethnic minorities inhabiting the mountains of the Philippine islands (Gaillard, 2006), communal ancestral domain titles can be a divisive instrument, even within the Aeta Magbukún community. This is because each community has slightly differentiated kin relationships, requirements and collective perspectives on land tenure security (Castro, 2000), all in addition to individual personal viewpoints.

Since colonization by the Spanish in 1565, various governments have attempted to impose Western notions of land ownership on Indigenous peoples in the Philippines, and state laws are commonly intolerant of, or contradictory to, traditional Indigenous notions of land ownership (Molintas, 2004). Even the celebrated IPRA legislation was based on the Indigenous land laws of Australia, which operates in a very different cultural context to that of the Philippines (Castro, 2000). Paradoxically, modern methods to ensure local Indigenous rights and cultural preservation require the development of internationally legitimate levels of Indigenous organization and institutional strategies to participate with contemporary state institutions and NGOs (Hirtz, 2003). Such foreign concepts can be staggering for a largely traditionally nomadic culture that are undertaking the more fundamental challenge of attaining numeracy and literacy, provided primarily through NGOs.

The most prominent Indigenous government institution in the Philippines is the National Commission on Indigenous People (NCIP). Unfortunately, the NCIP's trifling budget has rendered it incapable of effectively exercising its mandate to implement the IPRA (Hirtz, 2003). Ironically, the NCIP seems to be preventing Indigenous people from attaining recognition of their ancestral lands, the right to inhabit their ancestral domains, to benefit from state support for self-governance and self-determination, and to pursue their economic, social and cultural development. The nuances of the various recent Philippine government policies and instruments, and their haphazard implementation related to Indigenous issues have made it necessary for Indigenous peoples to engage in sophisticated interactions with government agencies (Hirtz, 2003). For example, the NCIP has the legal authority to issue a Certificate of Ancestral Domain Title (CADT), which is a provision for Indigenous people to secure rights to their ancestral domain, and refers to a title formally recognizing the rights of possession and ownership in accordance with the law. In contrast, a Certificate of Ancestral Land Title (CALT) refers to a title only formally recognizing the rights of Indigenous peoples over their lands, with quite different and limited ends (Caballero, 2004). Detailed legal processes and the heavy financial investment required for obtaining a title is an example of a fundamental barrier to those with no assets, finance and poor literacy and numeracy. In

the authors' opinion, a considerable and genuine renewed effort is required to breathe life into the existing policies and undertake due diligence in any policy reforms.

#### *Issues related to conservation of ancestral lands*

Conservation and Indigenous rights policies have long been incompatible in the ancestral lands of the Aeta Magbukún living on the Bataan Peninsula. The Bataan Natural Park (BNP) is one of ten reserves of the Conservation of Priority Protected Areas Project, funded by the Global Environmental Facility to the value of USD16 million over seven years through the World Bank (Bryant, 2000). The BNP was originally established as Bataan *National* Park, by Legislative Act No. 3915 in 1932, which reserved 23 688 ha of land from the municipal jurisdictions of Abucay, Bagac, Balanga, Hermosa, Morong, Orani and Samal. Subsequent to the Act, the Aetas and other peoples living within the boundaries were removed and forced to resettle in mixed communities (Tebtebba Foundation, 2008). Thus, the Aeta were prohibited from roaming the forest to hunt and gather food, and some had to adopt agricultural production methods and provide domestic services to non-Aeta inhabitants to survive. Such enforced local community exclusions from ancestral lands has enabled officials to engage in clandestine resource extraction by external operators in protected lands (Bryant, 2000). However, even officially sanctioned land uses have been a known concern for people in the Philippines.

Subsequent proclamations by successive presidents reduced the original Bataan National Park area for specific land uses, including shrines, forestry and even a 1976 exclusion of 368 ha in the municipality of Morong for the construction of a nuclear power plant (Tebtebba Foundation, 2008). After the oil crisis of the 1970s, a nuclear diversification strategy saw the construction of the 621-megawatt Bataan Nuclear Power Plant in 1976, completed in 1984 at a cost of around USD2.3 billion. The plant has been maintained for over 35 years despite never being commissioned, as it was declared unsafe by international inspectors because of its location near major fault lines and the dormant (at the time) Mount Pinatubo. The Bataan Nuclear Power Plant is now the Philippines single biggest annual debt obligation of around USD55 million in interest (*Energy Bulletin*, 2004).

#### *Developments for Indigenous ancestral land rights*

Despite various examples of sub-optimal policymaking in the region, the Aeta Magbukún of Pastolan were issued a CADT of almost 4356 ha on 25 March 2004, representing around 45 per cent of the Subic Bay Freeport Zone (Caballero, 2004). While this particular application required six years, it was assisted by the World Bank, which accelerated the application processes in an effort to develop the Freeport Zone under conditions of known land tenure (Caballero, 2004). Although this was the first CADT awarded in Bataan, this was not the first reserve. In 1970, some Aeta Magbukún were voluntarily moving to higher elevation to Kanawan due to increasing non-Indigenous encroachment. In 1987, President Corazon C. Aquino proclaimed the creation of the Kanawan Negrito Reservation Area (KNRA). The KNRA is a mixed-use area of 227 ha inside the BNP, of which currently 41 ha is occupied by non-Indigenous families. This notable, yet small and vulnerable, land allocation was followed by a much larger CADT application 17 years later. In 2004, the Aeta Magbukún of Kanawan submitted an application to NCIP for a CADT of 10 970 ha of ancestral land, almost half the size of the entire BNP, with more than half of this claim inside the BNP (Tebtebba Foundation, 2008). More recently, in 2007, the Aeta Magbukún of Biaan near Mariveles

also submitted an application to the local NCIP office to initiate the long process of obtaining rights over their ancestral domains.

Despite some progress through the IPRA process for Indigenous peoples, there is an intricate web of requirements to obtain legal land ownership in the Philippines. As a consequence, there is a long history of families occupying lands for subsistence without a legal title. This history holds complexity even for instances when legally recognized land title holders exist, as very poor families who occupy the land will likely be displaced, because unoccupied or underutilized land is rare in the Philippines. Despite the numerous options for recourse in evicting non-Indigenous people from ancestral lands to prevent the continued encroachment, the non-Indigenous families often share the very low socio-economic status of peoples like the Aeta Magbukún. Therefore, implementing new resettlement policies are likely to be as disturbing as similar policies of the past, and will likely add to the present levels of tension between the various subsistence livelihoods that exist in the region. Several levels of transparent local consultations and negotiations will be required over an extended period of time.

### **Traditional narratives of ancestral origins**

Questions concerning identity are extremely complex and as such, primary to this analysis is understanding how the community identify themselves through their own traditional narrative (Elliot & Brodwin, 2002). Thus, oral histories and traditional practices, beliefs and ideologies transmitted through ritual and storytelling are fundamental to cultural self-identity and meaning, regardless of the implications of more recent genetic evidence (Tallbear, 2007). While the practice of traditional Aeta Magbukún storytelling and dancing are increasingly rare, one story of the first Aetas to visit Bataan has been documented by the Tebtebba Foundation. As described by a now deceased Aeta tribal leader Aquino Malunic, the story states that long before European settlement, the two Aetas Apo Alipon and Lola Moray (originally from Zambales in the north) settled in Morong, an area now called Barangay Mabayo. Mabayo is derived from *bayo*, meaning new in the Aeta Magbukún language. They never returned to Zambales, and their descendants were known ever since as the Magbukún tribe, meaning 'on their own' (Tebtebba Foundation, 2008). Before Apo Alipon's death, he requested his descendants to dip their hands in the waters at the Kabuyaw River in Kanawan—a practice referred to as *kanaw* – and make an oath to the *anitos* (spirits) and Apo Namalyari (the creator being) that they will live peacefully with each other and care for their land communally (Gaillard, 2006). Today, the Magbukún tribe descendants live in the Kanawan, Limay, Orani, Morong, Bagac, Hermosa, Balanga, Orion, Abucay, Pilar and Mariveles regions in Bataan. Traditional oral histories are not inconsistent with relatively recent historical anthropological literature. The available literature states that the Aeta are the oldest living descendents of the original inhabitants of the Philippines, and describes them as a people of dark skin, dense curly cranial hair, and often of small stature, making their appearance quite distinct from the dominate ethnolinguistic Tagalogs, and also from other Indigenous peoples found throughout the Philippines (Keane, 1899) (Figure 2). Historical explanations for their small stature phenotype (pygmies), cited widely within early anthropology and related work, also often speculated about their evolutionary history. Today, many traditional oral and historical hypotheses are either being supported or refuted through detailed genetic approaches. Though the use of genetic research in this way is contested largely because of both the historical European imperialism and colonialism of the term 'research' itself (Smith, 1999), there



Figure 2. An Aeta Magbukún family from Biaan, near Mariveles, Bataan. Photo by Nathaniel Salang.

are also collective risks to members of the group, despite not being directly involved in the original research and data collection sample (Foster *et al.*, 1998). These risks include the undermining of sovereignty, territorial or historical claims, the use of genetic differences to support or justify discrimination and racist policies or treatment, and the fundamental identity of the group under study, both how they perceive themselves and how non-group members perceive them (Hausman, 2008). The authors, however, support the assertion that identity is far more complex than genetics alone, and cannot be fully understood bereft of the historical, social, political and cultural context in which that identity was formed and is maintained (Elliot & Brodwin, 2002). While race, ethnicity and nationality are salient identity signifiers, regardless of biological legitimacy (Lindee *et al.*, 2003), recent molecular genetic research is uncovering an illuminatingly multifaceted ancestry of Indigenous peoples in the Asia Pacific generally, and also the diverse history of the Indigenous Philippine inhabitants.

### **Molecular anthropological research of ancestral origins<sup>1</sup>**

Recent molecular genetic evidence indicates prior occupation, subsequent genetic isolation from successive waves of Austronesian migration to the Philippines over the previous several thousand years, and a common ancient lineage with Indigenous peoples of Papua New Guinea and Australia. Consistent with historical accounts and the findings of linguistics and anthropological research, molecular anthropological research

suggests there are extensive heterogeneities in the genetic history of Philippine groups, supporting various migrations, genetic drift and admixture (Delfin *et al.*, 2011). For example, using an analysis of the human T-lymphotropic retrovirus (HTLV-1) in blood sera collected before 1975 from 746 healthy Aetas from various regions in the Philippines (Ishida *et al.*, 1988; Delfin *et al.*, 2011), 19 of the 746 Aetas (2.55 per cent) located on the largest island of the Philippines, Luzon, were found to be HTLV-1 positive. This is considered a reasonably high prevalence of the virus in blood sera of the group. HTLV-1 is primarily transmitted vertically through the generations by breastfeeding, and horizontally through sexual contact via semen. The three possible ways of HTLV-1 introduction to the Luzon Aetas are via Japanese carriers from the sixteenth century, African carriers arriving with Europeans, or virus-carrying ancestors of the Aetas. The Tagalog, meaning people who live near the river (the major ethnolinguistic population of the Philippines), were known as 'lowlanders' and thus, had contact with the Japanese and African carriers; yet they exhibited a lower HTLV-1 seroprevalence than the Aetas. As the Aetas were both geographically isolated in inaccessible mountainous regions and culturally isolated due to strict kinship rules, this means that the virus was carried by migrating Indigenous tribe ancestors since the last glacial era, 12 000–15 000 years ago. This also implies little genetic admixture between the Aeta and other populations in the region. Interestingly, Indigenous peoples with a higher seroprevalence of HTLV-1 (like the Indigenous Ainu<sup>2</sup> of Japan, some Arctic peoples and the Aetas of the Philippines) are all traditional hunter-gatherer groups and are often isolated, maintaining connections to subsistence lifestyles (Ishida *et al.*, 1988).

Aeta genetic research by Horai *et al.* (1981) used human leukocyte antigen (HLA) histocompatibility<sup>3</sup> typing from blood samples obtained from 86 Aeta Magbukún in the reservation near Abucay, Bataan in 1977. The Aetas were found to share genetic similarities with Papua New Guineans in the Eastern Highlands with very low A2 and BW35<sup>4</sup> antigen frequencies. This research also 'distanced' the Aetas from the Moluccan Indigenous people of the Maluccan (or Malukan) Islands, historically known as the Spice Islands in Indonesia on the island of New Guinea, and the Chamorro people of the Mariana Islands and Guam, east of the Philippines, who recorded high values of A2 and BW35 antigen frequencies (Horai *et al.*, 1981). Other blood serum group marker systems have been used to study genetic drift and gene flow of the Aetas. For example, research by Matsumoto *et al.* (1979) included blood serum samples from 87 Aeta Magbukún, also collected near Abucay, found marker system patterns<sup>5</sup> that suggested an ancient link with the Guinean-Australians. This link is prior to the Austronesian expansion from the Taiwan region less than 6000 years ago, yet the Austronesians are currently the dominant population in this region of the Pacific (Kayser *et al.*, 2008). Furthermore, the Aeta Magbukún marker systems showed notable differences between northern Australians and Melanesians (Matsumoto *et al.*, 1979), implying a largely separate genetic history of the Aetas and the Austronesians (Indonesians, Melanesians, Micronesians and Polynesians) (Kayser *et al.*, 2008; Matsumoto *et al.*, 1979). Genetic research by Kayser *et al.* (2001)<sup>6</sup> focusing on the origins and relationships of Australian, Melanesian and eastern/southeastern Asian populations indicated a potential shared history (up to 50 000 years) of Australian and New Guinean populations, yet an independent history for Australians and Melanesians. While this is in agreement with mitochondrial DNA research evidence, it seemingly contradicts some analyses that do not use sex chromosomes. The latter tend to show a close relationship between Australian and Melanesian populations, and in particular highland Papua New Guineans. To clarify, it is nonetheless known

Table 1. Selected Philippine groups frequency of selected Y-SNP haplogroups (per cent). The totals do not sum due to rounding. Source: Delfin *et al.*, 2011.

Group	Samples	C-RPS4Y	K-M9	O-M119	O-M110	O-M122	O-M7	O-M95
Aeta (Bataan)	15	–	87	7	7	–	–	–
Aeta (Zambales)	19	–	100	–	–	–	–	–
Agta	39	26	21	23	5	8	13	3
Iraya	16	–	25	–	–	63	–	13
Ati	36	14	22	3	39	6	14	–
Mamanwa	55	2	11	42	–	42	–	2
<b>Negrito</b>	<b>180</b>	<b>8.9</b>	<b>32.2</b>	<b>18.9</b>	<b>9.4</b>	<b>21.1</b>	<b>5.6</b>	<b>2.2</b>
<b>Non-Negrito</b>	<b>210</b>	<b>7.1</b>	<b>8.1</b>	<b>43.3</b>	<b>20.0</b>	<b>11.4</b>	<b>3.8</b>	<b>1.4</b>
<b>Philippines</b>	<b>390</b>	<b>7.9</b>	<b>19.2</b>	<b>32.1</b>	<b>15.1</b>	<b>15.9</b>	<b>4.6</b>	<b>1.8</b>

that HLA loci analyses do not include all relevant populations, and/or do not analyse the chromosome fully, and are also unable to provide an estimated age of specific genetic mutations. Therefore, a possible means to reconcile such genetic research analysis inconsistencies is to infer that the Y chromosome and mitochondrial DNA results reflect the last 8000 years of independent history since Australian and New Guinean landmass separation through post-glacial sea level rise, and the HLA information reflects the common origin. A comparison of the haploid chromosomes (that is, cells that have half the complete set of chromosomes cells, and in particular the non-recombining components of the Y chromosome) can reconcile some of the several population-origin discrepancies of autosomal (non-sex chromosomal) HLA research described above. This is because Y chromosome polymorphisms (Y-SNPs), which are heritable mutations in DNA that can be used to compare ancestries are viewed as more informative at tracing population relationships over specific evolutionary timescales than mitochondrial DNA (Kayser *et al.*, 2001).

More recent research by Delfin *et al.* (2011) explored 48 of these non-combining regions of Y-SNP marker variations in 390 apparently unrelated males from 16 Philippine ethnolinguistic groups, including 6 of the more than 20 existing Philippine Indigenous groups. Table 1 shows 9 Y-SNP markers (known as haplogroups) and the relative prevalence in each Indigenous group in per cent, where 100 means all of the individuals exhibited the Y-SNPs haplogroups and a common genetic ancestry, and ‘–’ means no individual sample exhibited the Y-SNP haplogroup. The table shows that two specific Y-SNPs haplogroups (i.e. Km(9) and C-RPS4Y) from six Philippine ethnolinguistically Indigenous groups indicate a close genetic association and common ancestry between the Indigenous Aetas, Ati and Agta<sup>7</sup> (Table 1), and also for non-Negrito Indigenous Philippine groups such as the Hanunoo (Delfin *et al.*, 2011).<sup>8</sup> In addition to indicating the degree of relatedness between Indigenous groups, the research found that a simple distinction between Negrito and non-Negrito groups in the Philippines did not exist. As shown in Table 2, the Km(9) haplogroup diversity ranged from zero in the Aetas of Zambales to 0.83 in the Agta, with the Aetas of Bataan recording the lowest diversity (0.28) to the Zambales Aetas, showing a high relatedness consistent with oral history. Interestingly the research also found an ancient shared ancestry with Southeast Asian and Australian groups, and gene flow from Arnhem Land Australians to the Aeta of Bataan, Aeta of Zambales and the Agta, and also from the Great Sandy Desert Australians to the Agta<sup>9</sup> (Table 3). The research offered an estimated divergence time of around 15 000–20 000 years, which is 20 000–30 000 years after initial human Pleistocene

Table 2. Genetic diversity indices estimated for selected Philippine groups. Source: Delfin *et al.*, 2011.

Group	Sample	nHg	HgD	S.E.
Aeta Bataan	15	3	0.28	0.14
Aeta Zambal	19	1	0.00	0.00
Agta	39	8	0.83	0.03
Iraya	16	3	0.57	0.11
Ati	36	7	0.78	0.04
Mamanwa	55	6	0.65	0.04
<b>Negrito</b>	<b>180</b>	<b>10</b>	<b>0.80</b>	<b>0.01</b>
<b>Non-Negrito</b>	<b>210</b>	<b>10</b>	<b>0.75</b>	<b>0.02</b>
<b>Philippines</b>	<b>390</b>	<b>11</b>	<b>0.81</b>	<b>0.01</b>

Abbreviations: HgD, haplogroup diversity; nHG, number of Y-SNP haplogroups.

Table 3. Scaled estimates of divergence times in years (T) and migration rates (M), where M1 is migration from Philippine groups to Australian groups, and M2 is from Australian groups to Philippine groups. Source: Delfin *et al.*, 2011.

Philippines	Australian Arnhem Land	Australian Great Sandy Desert
<b>Aeta Bataan</b>		
T	19 710 (6 540 – 74 258)	15 350 (6 184 – 73 101)
M1	0.072 (0.055 – 7.267)	0.072 (0.042 – 9.587)
M2	1.690 (0.009 – 15.348)	0.047 (0.009 – 12.852)
<b>Aeta Zambales</b>		
T	15 528 (4 939 – 65 360)	14 549 (5 740 – 68 029)
M1	0.072 (0.054 – 8.275)	0.073 (0.043 – 8.101)
M2	0.007 (0.003 – 7.729)	0.008 (0.003 – 7.913)
<b>Agta</b>		
T	19 799 (9 210 – 75 059)	15 083 (6 451 – 69 453)
M1	0.072 (0.056 – 6.548)	0.074 (0.044 – 9.290)
M2	3.611 (0.327 – 18.094)	1.897 (0.018 – 13.359)

The analyses were based on seven Y-short tandem repeats (STR) haplotypes with divergence times measured in units of years, while population migration data indicate the rate of gene transfer per generation. Credible intervals are indicated in brackets.

occupation, and well before the Austronesian expansion. This genetic research is consistent with an extended geographical isolation of the ancestors of the Aetas and Agta groups for several thousand years after they separated from the common ancestor with Australian Indigenous peoples, and since the Austronesian expansion, there has been strong cultural isolation between the Aeta and Agta groups with ‘outsiders’ since (Delfin *et al.*, 2011). However, while there was little genetic admixture between Indigenous Philippine inhabitants and subsequent migrations of Austronesians, including the ‘Tagalogs’ to the Philippines, there was clearly cultural exchange. It is estimated that the Aetas lost their original languages around 4500 years ago and adopted Austronesian migrant languages soon after the new migrants arrived, which suggests major inter-ethnic symbiotic social relationships (Headland, 1987). The presence of genetic differences, yet the loss of their original language imply the existence of social barriers preventing intermixed relationships between both the Aeta of Bataan and Zambales, and the successive waves of Austronesian immigrants. Thus, while many Indigenous

groups across the world remained isolated due to geographical barriers, it appears the Aeta's maintenance of genetic isolation can also be attributed to social and cultural elements. This demonstrates a convergence of genetic evidence with the cultural and political history of this particular region and its inhabitants (Elliot & Brodwin, 2002), yet genetic evidence adds much more detail to the questions of ancestry and cohabitation, bringing to the fore intercultural nuances. This paper, however, is careful not to speculate on the origin and/or existence of possible historical barriers and kinship ties. In recent decades, the Aeta Magbukún language and peoples have increasingly mixed with non-Indigenous Austronesian Tagalog, Pampanga and Pangasinan languages and peoples.

## Conclusion

The associated challenges of the social and political environment in which Indigenous people live adds further complexity to negotiations over their rights, and particularly their sovereignty rights and claims to Indigeneity (Coombes *et al.*, 2011). At its heart, the debate over the use and implications of genetic research are essentially a debate regarding authority over legitimizing identity and meaning (Tallbear, 2007). That is, a fear that existing identities forged through historical and cultural practices may be undermined by the findings of genetic research (Hausman, 2008). Yet, questions of identity (quite separate from genetic ancestry) are decidedly more complex, with demonstrated limitations in use of genetic material, rendering conclusions that are speculative in the absence of the historical and social context (Elliot & Brodwin, 2002). Yet, genetic information is a relatively simple and increasingly useful means of adding to the existing context, and can clarify assumptions and often extinguish simple false dichotomies. For example, a straightforward investment in research and methods can resolve apparently conflicting chromosomal/mitochondrial information to determine population origins and relatedness within the context of existing narratives of origin (Kayser *et al.*, 2001). This will likely be a fundamental tool in recognizing the rights of Indigenous peoples in the Asia Pacific region where it is uncommon to do so at present. In contrast to the swiftly progressing technical tools, the currently slow pace of policy reform and/or development will be required to facilitate wider international progress in Indigenous people's rights to their ancestral lands and in determining suitable socio-economic development. In detangling conflicting interests, while simultaneously considering issues around poverty of both Indigenous and non-Indigenous peoples, national policies will require attention, while maintaining their appropriateness to the often differentiated needs of Indigenous peoples. It is clear that the history of Indigenous peoples, land, resources and space will remain an evolving debate for some time (Cleary, 2006).

Despite new genetic evidence bolstering their traditional ancestral history, the fundamental concern among the Aeta Magbukún tribes is the continued non-Indigenous encroachment into remaining ancestral domains, primarily non-subsistence encroachment and large-scale forest clearing. The Aeta Magbukún fear they will yet again be displaced into smaller parcels of land.<sup>10</sup> As the hunter-gatherer livelihood of the Aeta Magbukún remains fundamentally tied to their ancestral domains, their leaders acknowledge the need for securing their tenure. This is despite understanding that they are embarking on a new, complex and lengthy politico-legal process that they do not fully grasp, with an intrinsically undefined path, all within a developing economy and with no guarantee of success. Facing this process will require the Aeta Magbukún to establish their status alongside national and local power structures. Such relations are

fundamentally limited due to poor literacy and numeracy, and language and cultural barriers. Furthermore, local power structures include not only sizable populations of poor non-Indigenous neighbours who share similar experiences of disadvantage, poverty, and to an extent, inequity, but also several wealthy and influential families on which many Aeta families are economically dependent. Despite the challenges, the Aeta Magbukún in Bataan have initiated periodic tribal council assemblies in close partnership with their provincial counterpart PANABAT (Pinagkaisang Asosasyon ng mga Aeta sa Bataan). This is in the hope of establishing further dialogue and understanding with the local non-Indigenous inhabitants to improve mutual understanding and discuss basic needs. How newly available genetic (and other scientific) evidence supporting a group's Indigeneity and cultural integrity is digested by the local, national and international community is an interesting question, particularly in the Pacific where such clear-cut distinctions have not been available in the past.

### Endnotes

- 1 This research has not attempted to integrate the various genetic nomenclature systems, and preserves the nomenclature system used by the authors of the original research.
- 2 The Ainu are the Indigenous hunter-gatherer peoples of Japan and parts of Russia.
- 3 The term 'histocompatibility' is basically having similar or the same set of genes, or groups of genes in a particularly location that encodes for many immune system related functions. In vertebrates this includes suitability for transplants, susceptibility to autoimmune and infectious diseases, and some cancers. The human leukocyte antigen (HLA) is the name given to the human 'major histocompatibility complex' (MHC) of which most reside on the (non-sex) chromosome six, and which are intensively researched for medical applications, and also can be used for ancestry comparisons.
- 4 The A2 antigen is associated with the recognition of the Influenza A virus, and the BW35 antigen is related to immune system response to inflammation.
- 5 The genetic markers of immunoglobulin class IgG<sup>5</sup> are single-nucleotide polymorphism (SNP) haplotypes reminiscent of HLA and Rhesus systems. These serum samples were tested for distribution of the marker systems G1m(1,2,3 and 17), G3m(5,6,11,13,14,15,16 and 21), and Km(1) allotype variants.<sup>5</sup> The results found the marker system patterns very similar to the haplotype Gm<sup>1,17,5,11,13,14</sup>. The Aeta Magbukún Km<sup>1</sup> allele frequency was 0.257, higher than northern Australians and lower than Melanesians (Matsumoto *et al.*, 1979).
- 6 Kayser *et al.* (2001) used SNP loci and seven short-repeat loci on the Y chromosome.
- 7 The Ati are the Indigenous peoples inhabiting Panay Island in the western Visayas, Philippines. The Agta are Indigenous peoples inhabiting Sierra Madre of eastern Luzon, Philippines.
- 8 The Hanunoo are also known as the Bulalakao, the Hampangan, or the Mangyan, and are Indigenous inhabitants of the Island of Mindoro, Philippines.
- 9 Arnhem Land Australians traditional lands are the northeastern tip of the Northern Territory of Australia. Great Sandy Desert Indigenous Australians inhabit the lands surrounding the desert in Western Australia, and are also known as Western Desert Peoples.
- 10 This assertion is based on conversations, observation and field diary notes made by the co-authors, two of whom have spent a combined two years and seven months living and working with the Aeta Magbukún as employees of the NGO, Peninsula Ecosystems and Health Foundation (PEHF).

### References

- Balilla VS, Anwar McHenry J, McHenry MP, Parkinson RM, Banal DT (2012) Aeta Magbukún of Mariveles: traditional Indigenous forest resource use practices and the sustainable economic development challenge in remote Philippine regions. *Journal of Sustainable Forestry* **31** (7), 687–709.

- Balilla VS, Anwar McHenry J, McHenry MP, Parkinson RM, Banal DT (2013) Indigenous Aeta Magbukún self-identity, sociopolitical structures, and self-determination at the local level in the Philippines. *Journal of Anthropology* **2013** (Article ID 391878), 1–6.
- Barsh RL (1996) Indigenous peoples and the UN Commission on Human Rights: a case of the immovable object and the irresistible force. *Human Rights Quarterly* **18** (4), 782–813.
- Bryant RL (2000) Politicizing moral geographies. Debating biodiversity conservation and ancestral domain on the Philippines. *Political Geography* **19**, 673–705.
- Caballero EJ (2004) Ancestral domain delineation and recognition: CADT of Aytas of Bataan. Philippine Environmental Governance (EcoGov) Project. Department of Environment and Natural Resources, and the United States Agency for International Development's (DENR-USAID).
- Castro NT (2000) Three years of the Indigenous Peoples Rights Act: its impact on Indigenous communities. *Kasarinlan* **15** (2), 35–54.
- Cleary M (2006) Valuing the tropics: discourses of development in the farm and forest sectors of French Indochina, circa 1900–40. *Singapore Journal of Tropical Geography* **26** (3), 359–74.
- Connell J (2010) Pacific islands in the global economy: paradoxes of migration and culture. *Singapore Journal of Tropical Geography* **31**, 115–29.
- Coombes B, Johnson JT, Howitt R (2011) Indigenous Geographies I: mere resource conflicts? The complexities in Indigenous land and environmental claims. *Progress in Human Geography*, DOI:10.1177/0309132511431410.
- Delfin F, Salvador JM, Calacal GC, Perdigon HB, Tabbada KA, Villamor LP, Halos SC, Gunnarsdottir E, Myles S, Hughes DA, Xu S, Jin L, Kayser M, Hurler ME, Stoneking M, De Ungria MCA (2011) The Y-chromosome landscape of the Philippines: extensive heterogeneity and varying genetic affinities of Negrito and non-Negrito groups. *European Journal of Human Genetics* **19**, 224–30.
- Doedens A, Persoon G, Wedda C (1995) The relevance of ethnicity in the depletion and management of forest resources in Northeast Luzon, Philippines. *Sojourn: Journal of Social Issues in Southeast Asia* **10** (2), 259–79.
- Dove MR (2006) Indigenous people and environmental politics. *Annual Review of Anthropology* **35**, 191–208.
- Elliot C, Brodwin P (2002) Identity and genetic ancestry tracing. *British Medical Journal* **325**, 1469–71.
- Energy Bulletin* (2004) Philippines: Bataan nuclear plant costs \$155,000 a day but no power. Wilson K, 30 June. Available at: <http://www2.energybulletin.net/node/866> (accessed 12 December 2010).
- Foreman JRGS (1906) *The Philippine Islands: a political, geographical, ethnographical, social and commercial history of the Philippine Archipelago embracing the whole period of Spanish rule with an account of the succeeding American insular government*, 3rd edition. T. Fisher Unwin, London.
- Foster MW, Bernsten D, Carter TH (1998) A model agreement for genetic research in socially identifiable populations. *American Journal of Human Genetics* **63**, 696–702.
- Gaillard JC (2006) Traditional societies in the face of natural hazards: the 1991 Mt. Pinatubo eruption and the Aetas of the Philippines. *International Journal of Mass Emergencies and Disasters* **24** (1), 5–43.
- Hausman D (2008) Protecting groups from genetic research. *Bioethics* **22** (3), 157–65.
- Headland TN (1987) The wild yam question: how well could independent hunter-gatherers live in a tropical rain forest ecosystem? *Human Ecology* **15** (4), 463–91.
- Headland TN, Headland JD (1997) Limitation of human rights, land exclusion, and tribal extinction: the Agta Negritos of the Philippines. *Human Organisation* **56** (1), 79–90.
- Hirtz F (2003) It takes modern means to be traditional: on recognizing Indigenous cultural communities in the Philippines. *Development and Change* **34** (5), 887–914.
- Horai S, Omoto K, Juji T, Sonozaki H, Mitsui H, Misawa S, Sumpaico JS, Mercado AS (1981) The HLA antigens of two Negrito populations in Philippines. *Tissue Antigens* **17** (3), 343–8.

- Ishida T, Yamamoto K, Omoto K (1988) A seroepidemiological survey of HTLV-1 in the Philippines. *International Journal of Epidemiology* **17** (3), 625–8.
- Kaysner M, Brauer S, Weiss G, Schiefenhover W, Underhill PA, Stoneking M (2001) Independent histories of human Y chromosomes from Melanesia and Australia. *American Journal of Human Genetics* **68**, 173–90.
- Kaysner M, Choi Y, van Oven M, Mona S, Brauer S, Trent RJ, Suarkia D, Schiefenhover W, Stoneking M (2008) The impact of the Austronesian expansion: evidence from mtDNA and Y chromosome diversity in the Admiralty Islands of Melanesia. *Molecular Biology and Evolution* **25** (7), 1362–74.
- Keane AH (1899) *Man past and present*. Cambridge University Press, Cambridge, UK.
- Kingsbury B (1998) “Indigenous peoples” in international law: a constructivist approach to the Asian controversy. *The American Journal of International Law* **92** (3), 414–44.
- Kingsbury B (1999) The applicability of the international legal concept of “Indigenous peoples” in Asia. In Bell D, Bauer J (eds) *The East Asian Challenge for Human Rights*, 336–78. Cambridge University Press, Cambridge & New York.
- Kingsbury B (2008) “Indigenous Peoples” in international law: A constructivist approach to the Asian controversy. In Erni C (ed) *The concept of Indigenous Peoples in Asia – a resource book*, 103–60. International Work Group for Indigenous Affairs & Asia Indigenous Peoples Pact Foundation, Copenhagen & Chang Mai.
- Krieger HW (1945) Races and peoples in the Philippines. *The Far Eastern Quarterly* **4** (2), 94–101.
- Lindee MS, Goodman AH, Heath D (2003) Anthropology in an age of genetics: practice, discourse, and critique. In Goodman AH, Heath D, Lindee M (eds) *Genetic Nature/Culture: Anthropology and Science Beyond the Two-culture Divide*, 1–19. University of California Press, Berkeley.
- Matsumoto M, Miyazaki T, Omoto K, Misawa S, Harada S, Hirai M, Sumpaico JS, Medado PM, Ogonuki H (1979) Population genetic studies of the Philippine Negritos. II Gm and Km allotypes of three population groups. *American Journal of Human Genetics* **31**, 70–6.
- Molintas JM (2004) The Philippine Indigenous peoples; struggle for land and life: challenging legal texts. *Arizona Journal of International & Comparative Law* **21** (1), 269–306.
- Reardon J (2001) The human genome diversity project: a case study in coproduction. *Social Studies of Science* **31** (3), 357–88.
- Rosaldo R (1988) Ideology, place, and people without culture. *Cultural Anthropology* **3** (1), 77–87.
- Smith LT (1999) *Decolonizing Methodologies: Research and Indigenous Peoples*. Zed Books and University of Otago Press, London and Dunedin, UK.
- Tallbear K (2007) Narratives of race and indigeneity in the geographic project. *Journal of Law, Medicine and Ethics* **Fall**, 412–24.
- Tebtebba Foundation (2008) Philippine Indigenous peoples and protected areas: review of policy implementation. Forest People’s Programme series on forest peoples and protected areas. A contribution to the World Conservation Congress, 6 October. Working draft (August). Forest Peoples Programme, UK and the Netherlands.
- Theriault N (2011) The micropolitical of Indigenous environmental movements in the Philippines. *Development and Change* **42** (6), 1417–40.
- Ting MTGJ, Bagsic AC, Equilos-Ryan Jaen MM, Respicio MLP, Tan CRT (2008) Modernity vs. culture: protecting the Indigenous peoples of the Philippines. *European Journal of Economic and Political Studies* **1** (1), 77–98.
- Watts M (2003) Development and governmentality. *Singapore Journal of Tropical Geography* **24** (1), 6–34.