An Evidence-Based Anthropological Exploration of Lanka's People

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Abstract

Sri Lanka's rich palaeoanthropological and archaeological record as well as the present demographic aspects have much to offer in aiding our understanding of the island's ancient past and recent population structure. Sri Lanka has yielded skeletal evidence for the earliest anatomically modern humans from South Asia indicating very early settlement of the region. Following early hunter-gatherer dispersals over 50,000 years ago, agricultural populations expanded to the region with historic settlements and urbanisation creating complex societies in the last three millennia. Through circum-Indian Ocean trade networks in historic times and colonial expansion in the last 500 years, population diversification has continued with groups of multiple genetic and ethno-linguistic backgrounds arriving and settling in the island. These early and later migrants share a gene pool that connects them to descendants of today, who form Sri Lanka's multi-ethnic, multicultural, and multi-religious society. Using an anthropological perspective, this article investigates how complex societal and biological diversity would have developed over time in island Lanka. An appreciation of deep time, beyond historic records, helps us recognize that human evolution and diversification has been shaped over thousands of years, while an evidence-based, scientific approach is proposed to eliminate flawed ethnocentric interpretations.

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Anthropological, paleoanthropological and archaeological background

Sri Lanka is an island nation state today. In this anthropological exploration, however, we will consider this unique island landmass as "Lanka" focusing on its rich geological and ecological backdrop that encouraged human habitation from ancient times, well before any state formation processes began. Anthropology is the study of humans in all places and all times, and a broad four-field anthropological approach (including biological anthropology, archaeology, cultural anthropology, and linguistic anthropology) is utilised to develop a holistic perspective on the island's people. Here a summary of scientific evidence that contradicts some biased and racist contemporary interpretations are presented.

Island populations offer fascinating opportunities to study evolutionary and cultural processes that contribute to human diversity. On the political map of the world appears the island Sri Lanka, located in the Indian Ocean, at the southern tip of peninsular South Asia. Today it is home to over 22 million people representing the species *Homo sapiens*. Today, Sri Lanka's people resemble a kaleidoscope of biological and cultural diversity that developed through millennia. Following early hunter-gatherer expansions over 50,000 years ago through agricultural population settlements from around 17,500 years ago (Premathilake, 2003; 2006) to historic settlements and urbanisation over 2500 years ago and colonial encounters in the last 500 years, the Lankan landmass has been settled by diverse groups (Allchin & Allchin, 1997; Allchin & Edrosy, 1995; Bandaranayake, 1994; Bandaranayake et al., 1990; Coningham & Young, 2015; S.U. Deraniyagala, 1992; de Silva, 1981; Perera, 2010).

Palaeoanthropology and archaeology provide scientific methods to reveal and reconstruct the human past. Palaeoanthropology is a subfield in biological anthropology that focuses on the biological aspects of ancient people themselves through the study of remains such as bones and teeth. The deep timeline explored in palaeoanthropology spans about 55 million years from the earliest findings of our non-human primate ancestors. Along with this palaeoanthropological view of deep time, archaeology, a major subfield in anthropology, provides insights on material culture - remains made or modified by ancient people. Artefacts like stone tools and pottery from archaeological contexts help us understand past lifeways and technological trends in the material culture and to reconstruct the past.

From about 3.3 million years ago, the earliest artefacts (e.g., stone tools) made by our hominin ancestors, *Australopithecus garhi*, *Paranthropus sp*. and *Homo habilis* are found in Africa (Harmand et al., 2015; Leakey et al., 1964; Susman, 2017). Starting from this three-million-year deep timeframe, palaeoanthropology and archaeology become intricately intertwined, where (1) human ancestors represented by biological remains and (2) their material culture recorded in the archaeological realm from artefacts such as stone tools, help reconstruct the past in a more comprehensive manner. Many scholars who incorporate biological anthropology or palaeoanthropology and archaeology in their work earn the title of "bioarchaeologist." For archaeologists, a tiny stone tool is as valuable as a gold relic casket. They both speak to human cultural innovation in technology that can reflect subsistence patterns, belief systems, and traditions.

"Deep time" and island Lanka in perspective

Geologically speaking, Lanka became an island separate from mainland South Asia some 7000 years ago in the Early Holocene, when a connecting land bridge was submerged by rising sea levels (S.U. Deraniyagala, 1992). This separation paved the way for many unique biological and cultural adaptations of the people who call it their home today. On a scale of deep geological history, the past 7000 years is but a minuscule fragment of time. It is imperative that we consider island Lanka in this context, to understand ancient population dispersals and cultural phases that preceded this geographical separation.

Evidence of Pleistocene fauna and early stone tools from Lanka comes from the Ratnapura gem pits and the Iranamadu formation (P.E.P. Deraniyagala, 1963; S.U. Deraniyagala, 1992). There is archaeological evidence that the island was inhabited by human ancestors at least 150,000 years ago (Abeyratne et al., 1997; S.U. Deraniyagala 1992). The archaeological culture represented around that time is known as the Middle Palaeolithic, as evidenced at sites such as Bundala, Miniha Galkanda and Patirajawela within the Iranamadu Formation (IFm) (S.U. Deraniyagala, 1992). While no hominin skeletal remains of the makers of these Middle Palaeolithic tools have been found so far, it is highly probable that archaic humans (e.g., late *Homo erectus* / *Homo heidelbergensis*) may have occupied Lanka at that time (Kulatilake, 2016). These hominins may have been relatives of the Narmada hominin of Central India, also associated with the Middle Palaeolithic (Kennedy, 1999, 2000; Patnaik & Chauhan, 2009; Sonakia & de Lumley, 2006). Based on evidence from scientific research, the archaeological and paleoanthropological story of Lanka begins at that time. Despite gaps in the fossil and archaeological record, the story of human habitation in Lanka is fascinating to reconstruct, based on the extensive surveys and excavations of early human habitation sites by pioneer scholars in the 20th and 21st centuries.

To visualise geological time and archeological periods noted in this article, a summary timeline with archaeological sites is shown in Table 1. The two major geological epochs depicted are the Pleistocene (Late/Upper) and Holocene. Therein the overlap of cultural periods is apparent, where microlithic cultures of hunter-gatherers continue from ca. 48,000 cal BP in the Late Pleistocene till ca. 3000 cal BP in the Mid Holocene. When some of their contemporaries in peninsular South Asia were becoming settled agriculturalists, hunting and gathering continued to be a viable and enduring subsistence pattern in Lanka. Upon considering deep time, note that the Late Pleistocene spans a large timeframe in Lankan contexts, a period of about 40,000 years, whereas the Holocene (Early, Middle and Late) when rapid cultural changes happen, is limited to a mere 10,000 years. In the map of Sri Lanka in Figure 1., several sites listed in Table 1 are shown.

Table 1. A representation of the geological timeline and associated selected archaeological cultures and sites of Lanka.

Geological Epoch with approximate timeframe	**Cultural Trends**	**Selected sites (available dates)**
Late Holocene (ca. 3 kyr - present)	Modern/Industrial Colonial/Modern Historic Microlithic/hunter-gatherers	Nation state of Sri Lanka (1948 - present) Colonised by Portuguese, Dutch and British (ca. 1500 - 1900 CE) Late Historic - Kandy (~1400 CE) Middle Historic - Polonnaruwa (~1000 CE) Early Historic - Anuradhapura, Kantharodai 500 BCE
Mid-Holocene (ca. 6 kyr - 3 kyr)	Iron Age/Protohistoric Microlithic/ hunter-gatherers	Ibbankatuwa (700 BCE) Mini-athiliya (4000 cal BP)
Early Holocene (ca. 10 kyr - 6 kyr)	Microlithic/ hunter-gatherers	Fa Hien-lena Kitulgala Kuragala Bellan-bendi Palassa Fa Hien-lena
Late (Upper) Pleistocene (ca. 50 kyr - 10 kyr)	Domesticated plants (In other regions: Upper Palaeolithic/Late Stone Age Epipalaeolithic/ Mode 5) Microlithic/ hunter-gatherers Earliest anatomically modern humans in Lanka	Horton Plains (ca. 17.5 kyr) Appearance and evolution of very early microlithic cultures Beli-lena Kitulgala Batadomba-lena Fa Hien-lena (From ca. 48 kyr)

In this depiction, the Late Pleistocene spans approximately 48,000 years, and is shown as a larger time block, but not to scale. Note that there is no established “Neolithic” in Lanka and the significant diversity of subsistence patterns and techno-cultural variations in the Mid to Late-Holocene times. (kyr: thousand years).

The terms “prehistory” and “history” are used to refer to periods of time in the past. In Europe and Asia, the “prehistoric” archaeological record is generally assumed to be older than the “historic” archaeological record. In South Asia historic records begin to emerge along with state formation and urbanisation by the 6th century BCE (Allchin & Allchin, 1995; Alchin & Edrosy, 1997; Coningham et al., 1996; S.U. Deraniyagala, 1992). Convention dictates that “prehistoric” times and “historic” times be distinguished through recognizing a boundary where historic records begin to emerge in a given region. This linear evolutionary pattern is not supported in many regions of the world where people who do not use written communication strategies live contemporaneously with people who do. For instance, in Lanka, hunter-gatherer societies existed alongside people who practised intensive irrigated agriculture and used written forms of communication such as stone inscriptions (Deraniyagala, 1992).

The preoccupation with historic “valuables” and monumental architecture is a biased perspective that drives many archaeological projects around the world. The Archaeological Survey of Sri Lanka, the apex archaeological institution of the island, was founded during colonial rule (in 1890), with an initial focus on researching historic sites. Over time, research on prehistoric times and palaeoanthropology were deemed as important as studying the numerous historic sites. While historic archaeology has remained of primary interest, in consideration of deep time, prehistoric sites such as cave sites and open-air sites dated to the Late Pleistocene and Early Holocene (Deraniyagala, 1992; Perera, 2010; S.U. Wijeyapala, 1997) have gained importance. It is also evident in recent research that the so-called “protohistoric” people such as Iron Age people of Lanka are being given due recognition (Dissanayake, 2022; Karunaratne, 2010; Seneviratne, 1984; Somadeva, 2021).

Today archaeological research in Sri Lanka is diversified and carried out by the central government-funded authorities of the National Department of Archaeology (formerly Archaeological Survey), the Central Cultural Fund (CCF), as well as archaeology departments of several universities (e.g., University of Peradeniya, University of Sri Jayewardenepura, Rajarata University) and affiliated research institutes, for instance the Postgraduate Institute of Archaeology (PGIAR), University of Kelaniya.

Early anatomically modern humans in Lanka

The origin of anatomically modern humans in Africa is recorded through skeletal and archaeological evidence from around 200,000 years ago. Subsequently, early sites with evidence of our species manifesting behavioural modernity begin to dot archaeological landscapes along coastal belts of the Middle East and South Asia (Mellars, 2006; Stringer, 2016; White et al., 2003). It is hypothesised that the South Asian landmass, especially its coastal regions, was accessed early and frequently by early modern humans. A more southerly migration path out of Africa along Africa’s eastern horn into coastal Arabia and towards South Asia has been established using archaeological and genetic evidence (Dennel & Petraglia, 2012; Field et al., 2007; Lahr & Foley, 1994; Majumder, 2010; Mellars et al., 2013; Reyes-Centeno et al., 2014; Stock et al., 2007). Lanka, the southernmost region of the South Asian peninsula, was within this expansion range. In Table 2, a series of selected sites and dates, along

with biological evidence of anatomically modern human (*Homo sapiens sapiens*) presence in Lanka are listed.

Several Wet Zone cave sites such as Fa Hien-lena, Batadomba-lena and Beli -lena-Kitulgala have yielded archaeological and biological evidence of early modern human habitation in the Late Pleistocene, with some finds dated to as early as 45,000 years ago (45 kyr) (Abeyratne et al., 1997; Kennedy et al., 1987; Kennedy & Deraniyagala, 1989; Perera, 2010; Wedage et al., 2020). In technological terms, these earliest Lankan cultures are microlithic cultures, subsumed under Mode 5 technologies that make their first appearance in Africa. We avoid using the term "Mesolithic" to denote these early periods as it is a Eurocentric term that encompasses a more recent period (ca. 12-3 kyr) that is not applicable to Lanka. A strong body of recent work has shown that the southern dispersal route of modern humans out of Africa populated South Asia (and Lanka) earlier (starting around 65, 000 years ago) than the settlement of Europe, which was settled through more northerly migrations out of Africa later (around 45,000 years ago) (Langley et al., 2020; Mellars et al., 2013; Perera et al., 2011; Perera et al., 2016).

Table 2. Sample of Human Remains from Lankan Contexts

Archaeological Sites	**Dates* / Approximate Geologic Time**	**MNI****
Fa Hien-lena	~47 - 30 kyr, and 8 - 5 kyr	14
Batadomba-Lena	37- 32 kyr, and 19 - 15.5 kyr	35
Beli-lena Kitulgala	15.5 - 13,5 kyr	13
Bellan-bendi Palassa	12 kyr	30
Kuragala	7,170-6,950 kyr	2
Mini-athiliya	3.5 - 4.5 kyr	6
Pallemalala	Mid-Holocene?	7
Godavaya	Mid-Holocene?	3
Sigiriya- Potana	Mid-Holocene	2
Nilgala shelter	Mid-late Holocene	3

*14 C dates and approximate dates from publications below and Nimal Perera, pers comm. 2022.
** Minimum Number of Individuals (*Homo sapiens sapiens*) data from:
Kennedy & Elgart, 1998; Kanthilatha et al., 2012; Kulatilake et al., 2014; 2018; Ranaweera & Adikari, 2022; Stock et al., 2022, Wahl, n.d.). kyr: thousand years.

The regional Lankan microlithic culture is called the Balangoda culture (S.U. Deraniyagala, 1992). While the term "Balangoda People" ("Balangoda Man") could be used to describe the people associated with the Balangoda culture, human skeletal remains associated with these finds are strictly those of anatomically modern *Homo sapiens sapiens* and not of a different species or subspecies (Kennedy & Deraniyagala, 1989; Kulatilake, 2000). In common parlance, early anatomically modern *Homo sapiens sapiens* of Europe have been called "Cro-Magnon People" ("Cro-Magnon Man"). Likewise, it is appropriate to refer to early anatomically modern *Homo sapiens sapiens* of Lanka as the Balangoda People (using "People" instead of "Man" to reflect inclusive language). Denoting them as a separate subspecies (e.g., "Homo sapiens balangodensis") is inaccurate.

The site of Fa Hien-lena has yielded the earliest fossil evidence of modern humans in South Asia (ca. 47 kyr) (Kennedy & Zahorsky, 1997; Perera, 2010), followed by evidence from Batadomba Lena (ca. 28.5 kyr) (Abeyratne et al., 1997; Perera, 2010). Hunting, gathering and fishing were the main subsistence activities carried out by these earliest peoples (Langley et al., 2020; Perera, 2010). Numerous sites that date to the Early and Middle Holocene have yielded human remains and large quantities of faunal remains representing food refuse. Bellan-bendi Palassa, Kuragala, Pallemalala, Mini-athiliya and Godavaya are among these sites identified as hunter-gatherer microlithic sites of the Early to Late Holocene (10,000-3000 years ago) (S.U. Deraniyagala, 1994; Eragama, 2022; Karunaratne et al., n.d.; Kennedy, 2000; Kulatilake et al., 2014; Perera, 2010; Roberts et al., 2022; Somadeva & Ranasinghe, 2006; Stock et al., 2022).

In the latter stages of the Holocene, in addition to wild game, bones of domesticated animals occur in sites across Lanka (Benecke et al., 2022; S.U. Deraniyagala, 1992; Helwing et al., 2022; Kulatilake et al., 2018; Perera, 2010). Evidence from palaeobotanical studies of the central regions have been used to infer early domestication of rice in the late Pleistocene/early Holocene (Premathilake, 2006). Clear and abundant evidence of sites with domesticated plants and animals date to the mid-Holocene (S.U. Deraniyagala, 1992; Kennedy, 2000; Perera, 2010).

Settlements, population expansions and diversification

Settled agriculture became the predominant mode of subsistence in Lanka by the Late Holocene (S.U. Deraniyagala, 1992; Coningham & Young, 2015), and evidence of wide use of metallurgy is prominent in the Early Iron Age sites (Bandaranayake, 1994; Bandaranayake et al., 1990; S.U. Deraniyagala, 1992; Karunaratne; 2010). Early Iron Age people had constructed cist burials, so far noted as unique to Lanka as an Iron Age mortuary practice (e.g., at Kalotuwawa, Ibbankatuwa, Ranchamadama) (Perera, 2010; Somadeva, 2021). Megalithic cemeteries belonging to the Iron Age that share archaeological affinities with South Indian megalithic cultures are also found in many parts of Lanka (e.g., Ibbankatuwa, Kok Ebe, Pomparippu) (Allchin & Allchin, 1997; Dissanayake, 2022, Karunaratne, 2010; Kennedy, 1975; Seneviratne, 1984). These semi-nomadic/pastoral and/or horticultural people from the Iron Age who represent very early agriculturalists of Lanka have been under-represented in archaeological discourse, due to the

prominence given to historic records kept by later intensive agricultural communities who had centralised governance.

Culturally and biologically diverse people (e.g., pastoral people, settled agriculturalists, urban dwellers) are represented in many parts of South Asia during the Bronze Age/Chalcolithic and Iron Age (Kulatilake, 2000). Eased by long distance migration across lands and oceans, Dravidian and Indo-European language speakers would have intermingled at this time. As a result, rapid diversification of South Asia's people is observed from approximately 5000 years ago through to historic times (Kulatilake, 2000; 2016). Lanka would not have been exempt from these regional demographic processes contributing to this biological and cultural diversity of South Asia. The legendary record of settling Lanka by elite groups such as Prince Vijaya and his followers from northern parts of South Asia (as shown in *Dipavamsa* and *Mahavamsa*) must be considered as a symbolic representation of one and not the sole socioeconomic group that migrated and settled island Lanka in those times. It is obvious that diverse groups representing many regional and cultural backgrounds settled Lanka over millennia.

The historic age of South Asia is characterised by several large cities that arose between about 600-300 BCE (Allchin & Allchin, 1995; S.U. Deraniyagala, 1992; Bandaranayake, 1996; Silva, 2004; Coningham & Young, 2015). In Lanka, Anuradhapura, Kantharodai, Matota (Manthai) and Mahagama (Tissamaharama) are such large settlements (or cities) (Deraniyagala, 1972; Coningham & Young, 2015; Helwing et al, 2022; Weisshaar & Wijeyapala). The earliest deciphered written records of South Asia appear on potsherds found in Anuradhapura. Dated to around 400-500 BCE, these inscriptions are in an early Indo-European (Middle Indo-"Aryan") Brahmi script (S.U. Deraniyagala, 1992; Coningham et al., 1996). Archaeological evidence points to large scale and enduring colonisation of island Lanka by Indo-European language speakers of North India, from ca. 500 BCE (S.U. Deraniyagala, 1992; Allchin, 1996; Coningham & Young 2015). Lankans' biological and cultural makeup today indicate clear assimilation, borrowing and acculturation between the Dravidian (e.g., Tamil) and Indo-European (Sinhala) language speakers.

The succession of people who entered South Asia in the recent past have led to significant changes in the composition and culture of peoples already living in the area. Here, historic accounts relate events that can often be corroborated with archaeological evidence. For instance, the official state supported Buddhism as written in historic records is manifested in associated archaeological remains of monumental architecture such as stupas and monasteries (Allchin & Allchin, 1997). During rapid expansion of agriculturalists (both Dravidian and Indo-European farming populations), complex societies have been established and land has been claimed aggressively for intensive agriculture. As a result, Indigenous people (described in the chronicles and legends as the Yakka and Naga communities) who subsisted by hunting and gathering or by following nomadic horticultural practices (e.g., Megalithic communities) may have retreated into remote marginal areas, their people dwindling or assimilating with the dominant groups. Although some such societies retain their original subsistence patterns (e.g., "Chena": shifting or swidden cultivation) and belief systems (e.g., animism), while being in symbiotic contact with complex societies; more often, small-scale groups become assimilated into the larger societies that engulf them. Globally and in Lanka, this pattern of cultural assimilation is observed from the past to present times. Selected key sites are shown on Figure 1.

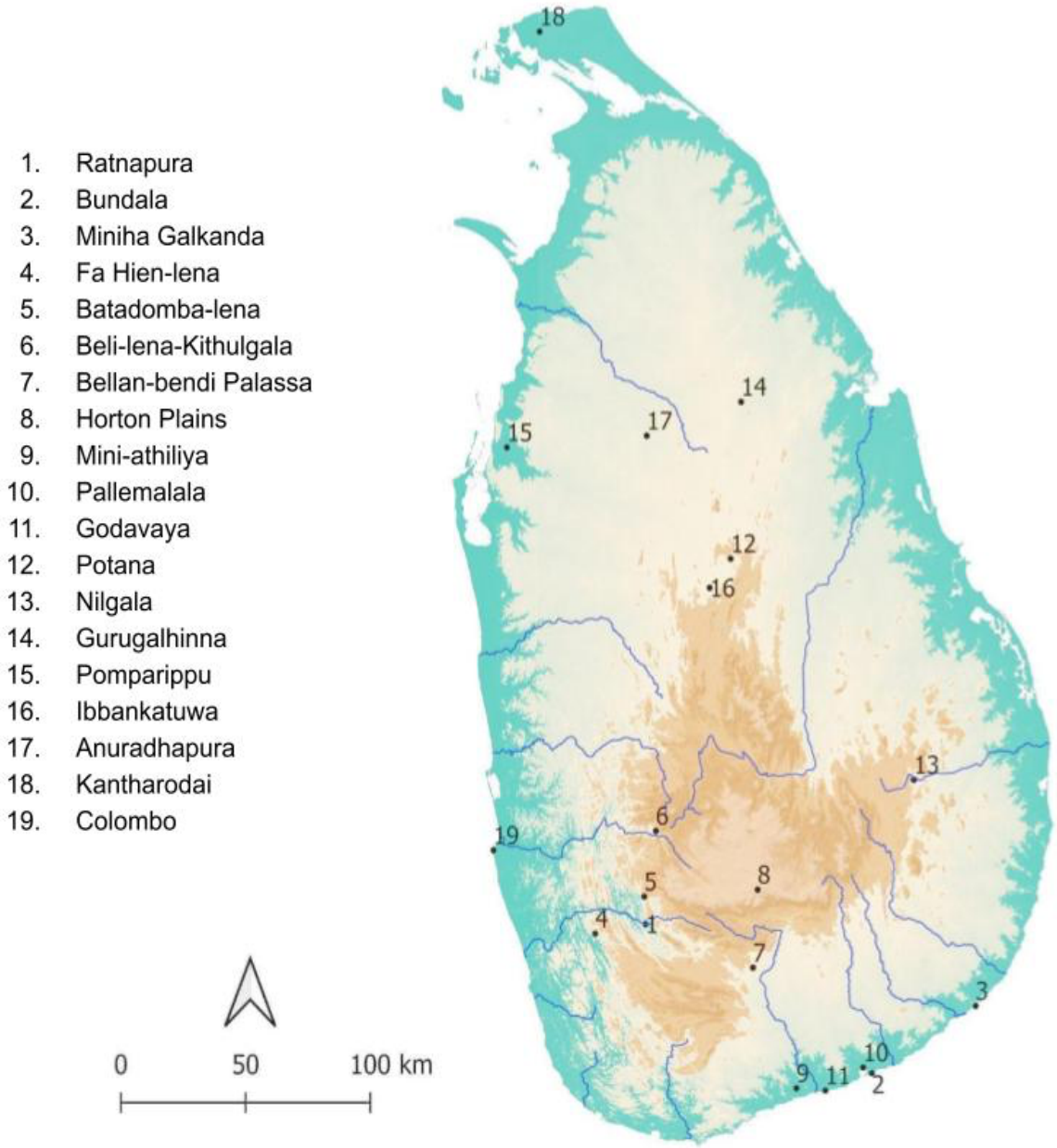

Figure 1. Map of Sri Lanka with key sites

Biological, cultural and linguistic anthropology of Lankans

Evidence from biological anthropology

Biological anthropology considers humans as biological organisms, subject to the evolutionary processes as are all living beings. Evolutionary processes encompass (1) mutation - changes in the genetic code producing variation, (2) natural selection - leading to enhanced reproductive success of individuals that possess beneficial traits, (3) gene flow via interbreeding, and (4) genetic drift - random fluctuation of gene frequencies significantly affecting small populations. Humans are subject to all these evolutionary processes, while also being bound by prescribed cultural criteria that often dictate non-random mate selection. For example, caste endogamy and sex-biased migratory patterns (where male seafarers select female mates in distant lands) play a role in human gene flow and interbreeding.

Advances in the field of genetics have revolutionised our understanding of human biology, and among the many applications of genetic analyses are those describing past population genetic composition that aids in tracing ancestors among living groups. Recall that island Lanka and peninsular South Asia was one continuous landmass till around 7000 years ago (S.U. Deraniyagala, 1992) and as such there was continued gene flow of all recent South Asians. In other words, modern languages and ethnicities of South Asia and by extension of Lanka (e.g., Tamil and Sinhala) began to diversify, assuming cultural distance only very recently.

Evidence from linguistic anthropology

Linguistic anthropology, especially historical linguistics along with genetic data, can offer important insights on how humans spread to occupy vast areas of land on many continents. Today a large information database exists on many Indigenous and ethno-linguistic groups of South Asia (Cavalli-Sforza et al, 1994). With links to biological anthropology, these linguistic affiliations have helped to reveal past migrations and group demographic variables. Cavalli-Sforza and colleagues (1994) concluded that there are at least four major linguistic subgroups in South Asia with corresponding genetic affiliations within each group. Of these groups, the Indigenous (possibly pre-Dravidian language speakers), the Dravidians and Indo-Europeans are represented in Sri Lanka as the “Vedda”, Tamil, and Sinhala people, respectively. The term “Vedda” is given in quotation marks to signify that it is not used here in a pejorative sense as seen in historic records.

More recent studies in population genetics have identified two broad groups of South Asia: Ancestral Ancient South Indians (AASI or ASI) and Ancient North Indians (ANI). The AASI/ASI groups represent early hunter-gatherers dating approximately 65,000 years ago whereas Ancestral North Indians (ANI) are represented by Eurasian pastoralist expansions (i.e., Proto-Indo-European/Yamnaya of Eurasian Steppes) adding diversity to the gene pool from approximately 5,000 years ago (Majumder, 2010; Moorjani et al., 2013; Reich, 2018; Narasimhan et al., 2019).

Modern day major ethnolinguistic variations including Dravidian and Indo-European (“Aryan”) language families of South Asia began to establish themselves in

the Bronze Age and historic times, approximately 5000 years ago. Here the neutral geographically oriented, anthropologically sound "Indo-European" term is used to denote the latter thus avoiding the term "Indo-Aryan" with its notorious racist and ethnocentric connotations of historic and modern times. Prior to this time, hunter-gatherer populations may have spoken vastly different languages. South Asians (including island Lanka) regardless of language, ethnic group, "tribe", caste, and geography would inevitably share a combination of genetic markers from both the ancient hunter-gatherer people and later pastoralist/agricultural people and intensive farming (Bronze/Iron Age) populations (Moorjani et al., 2013; Narasimhan et al., 2019).

The people of Sri Lanka today

Ethnic conflicts of the modern day highlight recent cultural differences, fuelled by misleading and prejudiced interpretations of historic records. A broad understanding of timelines and how human diversity evolved helps us to recognize that some of these interpretations are shortsighted, questionable and biased towards elevating one ethnic group over another. There is zero biological evidence to suggest the existence of any "pure" ethnic group: not in Lanka nor in the world. The present-day inhabitants of Lanka are representatives of the earliest people of peninsular South Asia and later arrivals during historic times, forming a multi-ethnic, multicultural, and multi-religious society (Kulatilake, 2000; 2016; 2020).

The biocultural traits shaping the people of Lanka from ancient times to the present is described as follows:

> *"The peoples of (Lanka) are heterogeneous, and this heterogeneity is multilayered, akin to a palimpsest, where traits have been introduced by ancient migrants, superimposed with the traits of more recent arrivals, then erased or highlighted over time as the result of a combination of evolutionary, historical, and cultural processes and events."* (Kulatilake, 2016).

Linguistic anthropological evidence shows two major language families represented in Lanka: The Dravidian language family and the Indo-European language family. Tamil, which belongs to the Dravidian family, is a language with a deep history and is widely spoken in South India. Tamil ("Dravida" or "Damila") speakers of Lanka share closer genetic and cultural ties to the descendants of the "Ancestral Ancient South Indian" (AASI/ASI) populations (Majumder, 2010; Moorjani et al., 2013). In contrast, Sinhala is an Indo-European language with roots traced to Pali and Sanskrit, (Gair, 1982; Bernhard, 1983; S.U. Deraniyagala 1992; Ranaweera et al, 2012), whose speakers would share cultural and linguistic affinities primarily with "Ancestral North Indians" (ANI), yet have been in geographic proximity to Ancestral South Indians (AASI/ASI) for millennia, sharing a common gene pool in the South Asian region, including the landmass of Lanka. The ethnolinguistic groups of modern-day Sri Lanka based on 2012 Census data are presented in Figure 2.

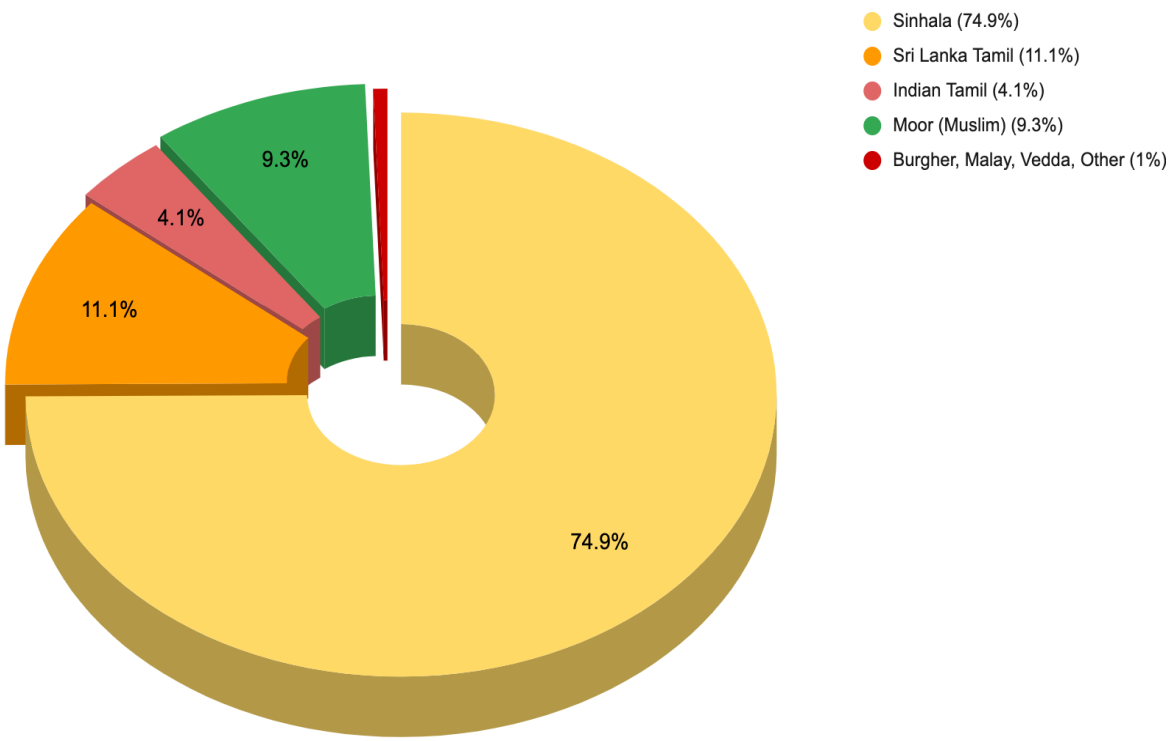

Figure 2. Ethno-Linguistic Groups of Sri Lanka (2012 Census Data)

The Indigenous people of Sri Lanka

The Indigenous "Vedda'' people are considered descendants of original hunter-gatherers based on Sinhala legends (e.g., *Dipavamsa* and *Mahavamsa*) and colonial-era literature (e.g., Knox, 1681; Tennent, 1860; Parker, 1909). Bioarchaeological studies corroborate such historic accounts (S.U. Deraniyagala, 1992; Kennedy, 2000; Hawkey, 2002). Both Sinhala and Tamil ethnic groups of Lanka share biological and cultural connections with the "Vedda'' people (Kennedy, 2000; Ranasinghe et al., 2015, Kulatilake, 2020). Non-metric dental traits of the "Vedda'' show that they also share affinities with early South Asian populations including Indian and Lankan Mesolithic ancestral groups, while not being significantly different from modern South Asians, due to long-term gene flow between groups (Hawkey, 2002; Peiris et al., 2011). Early studies on the anthropometric and anthroposcopic aspects of living Lankan people indicate some biological similarities and differences amongst the major ethnic groups (Hill, 1932, 1941; Stoudt, 1961).

Genetic evidence of South Asians shows sustained isolation leading to genetic drift among small populations, differentiating groups such as the "Vedda" people from later agriculturalist settlers (i.e., Sinhala and Tamil) (Peiris et al., 2011; Ranaweera et al., 2014). However, while being characterised as a culturally distinct ethnic group, the "Vedda" or "Wannila Atto" (people of the forest) do not subsist

primarily on hunting and gathering and speak an Indo-European language akin to Sinhala (Wijesekera, 1964; Dharmadasa, 1974). Geographic proximity and historic contact with Sinhala and Tamil cultures would all have contributed towards this homogenisation process (Kulatilake, 2000; 2020).

When biological anthropologists describe human diversity today, they strictly avoid drawing conclusions that perpetuate racist views based on early evolutionary classification systems. The possibility that Lanka was occupied by the earliest AASI groups migrating out of Africa but have not left genetic descendants is a possibility. The Eurasian (or ANI) links of the "Vedda" have been identified by many researchers (Howells, 1995; Peiris et al, 2011; Kulatilake, 2000; Ranaweera et al, 2014, Ranasinghe et al., 2015; Kulatilake, 2020). In terms of cranial shape, the "Vedda" most closely resemble Dynastic Egyptians in (Howells 1995) and to North Indians and people from the Middle East such as Saudi Arabians (Kulatilake, 2000). Therefore, the Vedda may be descendants of Eurasians who had affinities from the Middle East, arriving sometime during the Upper Palaeolithic (Howells, 1959). Dynastic Egyptians are of Eurasian origin and by extension are closer to ANI populations. It is possible that ancestors of the "Vedda" were connected to the ANI and may be more recent in time. Thus, traces of early AASI populations who would have been in the region appear to be obliterated.

Following many years of colonial occupation and nationalistic political upheavals in Sri Lanka, the "Vedda" have diminished in number (Brow 1978, Jasinghe & Fernando, 2012) and with urbanisation and modernisation "Vedda" cultural heritage is rapidly disappearing. These losses significantly compromise the retention of cultural diversity in Lanka (Blundell, 2012). Today the "Vedda" people either engage in promoting professional indigeneity for tourism and/or have been marginalised victims of development (Jasinghe & Fernando, 2012; Attanapola & Lund, 2013; Ranasinghe & Cheng, 2017).

The Sinhala and Tamil people of Sri Lanka

The nation state of Sri Lanka's two major ethnic groups are Sinhalese and Tamils where they constitute the majority of the population. The Sinhala ethnic group makes up approximately 75% of the population, while the Sri Lankan Tamil (11.1%) and Indian Tamil (4.1%) ethnic groups together make up approximately 15% of the population. Sri Lankan Tamils trace their ancestry to early Dravidian expansions while the Indian Tamil population of Sri Lanka were settled by European colonists as indentured labourers. Linguistic, cultural and religious differences among the Tamil and Sinhala people exist, but when considered holistically these differences can be traced to a relatively recent time (Indrapala, 2015).

One early genetic study revealed that the Sinhalese are genetically affiliated with the people of northeast India and South India (Kirk, 1976). These shared South Indian affinities are not surprising when considering geographic proximity and deep time during which interbreeding between ancient ancestral groups took place. The Sinhala and Tamil people of Sri Lanka are genetically closer to each other than either of them is to their ancestral groups in northern and southern India, respectively. For instance, Sri Lankan Tamils are more closely genetically related to the Sinhalese than they are to Tamils of South India (Kshatriya, 1995; Ranasinghe et al., 2015; Liu et al.,

2017). Interestingly, a recent genetic study showed that the Sri Lankan ethnic groups - Sinhala, Sri Lankan Tamil, Moor and Indian Tamil – all share affinities with the Bhil (an Indigenous group) of northwestern South Asia and Bangladeshi populations to the northeast (Perera et al., 2021).

Tamil is spoken by 600 million people worldwide, whereas Sinhala is spoken by approximately 16 million speakers. On a global scale, Sinhala is a minority language isolated to southern parts of South Asia (Gair, 1982), where Dravidian languages predominate. Sinhala is an example of island-based linguistic divergence following isolation after early migrations from a mainland source, that is, northern peninsular South Asia. However, due to deep ancestral roots on the mainland, where gene flow between Tamil and Sinhala speakers' ancient ancestors took place, the two groups currently living in Sri Lanka share strong biological links with each other; but less so with their ancestral groups in mainland South Asia.

Drawing deep biological divisions between these ethno-linguistic groups, who share ties from ancient times in mainland South Asia prior to Neolithic cultural and linguistic divergence, is a futile exercise (Kulatilake, 2016). Within Lanka, following dispersals throughout prehistoric and historic times, there has been considerable gene flow between the Tamil and Sinhala groups. An example of past diversity comes from recent scientifically conceived studies on Kantharodai in the Jaffna peninsula where the site embodies South Indian and Sri Lankan megalithic traditions of ancestor worship, Hinduism and Buddhism of both Tamil and Sinhala people (Harris, 2019; Thiagarajah, 2016).

Other ethnic groups of Sri Lanka

Over 9% of the Sri Lankan population is Muslim, following Islam as their religion. Muslims of Lanka comprise mainly of the Moors who trace their ancestry to the Middle East (Arabian regions). A smaller number of Muslims, the Malay people of Sri Lanka, trace their ancestry to Southeast Asia (Indonesia). It was very recently, less than 1500 years ago, around the 7th century CE when Muslim (Arab) traders began settling in large numbers in Lanka (de Silva, 1981). These Middle Eastern male traders intermarried with local women of Tamil or Sinhala ethnic origin. Thus, most Muslim people in Lanka have strong ancestral biological affinities with the Sinhala and Tamil ethnic groups of the island.

The Malay people arrived and settled in the island even later, in the 18th and 19th centuries CE starting during the Dutch occupation of Lanka. Accordingly, the genetic structure of the Muslim people of Lanka today would be a mix of the most diverse backgrounds, with shared links across multiple regional ethnicities and linguistic affiliations (Sinhala, Tamil, Moor-Arabic, Muslim-Malay). An analysis of X-chromosomal (maternally inherited) genetic polymorphisms among Sri Lankan ethnic groups has shown that the Sinhala and Moor people share the closest genetic links (Perera et al., 2021). Once again, while religious and cultural differences exist, we cannot draw firm biological boundaries to separate the Muslim (Islamic) people of Lanka from the Sinhala and Tamil people due to centuries of interbreeding between the people of these ethno-linguistic groups.

The Burgher community of Sri Lanka today, are descendants of Sinhala and Tamil people who interbred with European colonists representing islander links to Europe's colonial legacy. The Burgher people (associated with Eurasian ethnicities) are predominantly affiliated with Catholicism and Christianity. Prior to the introduction of Catholicism/Christianity, the Sinhalese were Buddhist and Tamils were Hindus. However, the colonial practice of spreading Christianity has found its recruits among both the Sinhala and Tamil ethnic groups. Accordingly, in modern times, someone from the Tamil ethnic community could be religiously affiliated with Hinduism or Christianity and someone from the Sinhala ethnic community could be a Buddhist or a Christian.

Discussion: evidence-based approaches

Large scale population changes and small-scale changes over large swathes of time continue to shape human population biology and demographic makeup. The palaeoanthropological and archaeological record of Lanka has much to offer in aiding our understanding of the ancient past and recent population structure. However, we use the perspective of deep time to clearly understand how present day biological, cultural, and linguistic composition of people has been shaped over thousands of years. We investigate how complex societal structures developed over time and appreciate the innovative and creative spirit of our ancestors and obtain perspective on human adaptability to changing environments.

Archaeology - the science of spatial and temporal analysis of the past - has powerful tools to understand and reconstruct past events and conditions. "ology" in archaeology denotes the "scientific study" of the past. Genuine, scientifically conceived site archaeology is an absolute requirement in the exploration of Lanka's past to inform present and future generations. Unfortunately, the scientific endeavour is often buried under the hype generated by the media, often prioritising the relentless search for sites and finds in an attempt to curate ancient objects and to locate monuments. Problem-oriented archaeological surveys and research that prioritise relative dating chronologies (e.g., stratigraphic sequences) and absolute dating (e.g., radiocarbon dating) (Perera, 2022), must replace unscientific pursuits.

Lanka's historic chronicles such as *Mahavamsa*, which are integral works stemming from the Buddhist monastic tradition, are sources that show a sequential timeline of events and rulers in historic times. These highly prized written records present coherence with the archaeological record and are in close agreement on broad phenomena including the history and impact of agricultural and irrigation works and large-scale transcontinental trade networks. Yet, some interpretations and hyperbole in historic sources (while useful and delightful as human literary creations in their own right), can be inherently biased. These historic authors speak to facets of human experiences they thought were relevant and useful for them (i.e., for the writers themselves or the religious and secular leaders of that time who sponsored these writings). We know that monuments are built through the sweat and toil of the masses. Yet, it is the king's name or politician's name that goes on the stone inscription or plaque in written format, minimising all the efforts and thereby erasing the existence of the majority of people. Therefore, it is the task of archaeologists to perceive historical records as (hi)stories, use and evaluate them for their value, but

follow the scientific method to decipher hidden facts that can reconstruct the past more holistically.

Historic records must be viewed objectively. They are subjective accounts. Believing them without questioning them or using them to justify a group's agenda is unscientific and problematic. Religious difference is a significant source of conflict on a global scale. Any organised religion justifies the subjugation of others who do not subscribe to said religion. Misusing historic records by a few (e.g., elites, priests, politicians, fanatics) and highlighting stories told by the "winners" that create biased interpretations have time and again caused much suffering to many others. Lankans have not been spared of discrimination and violence based on religious fanaticism. On a global scale, taking the written word from historic records as absolute truth to guide actions, has wreaked havoc among humans, leading to discrimination, sexism, racism, homophobia, violence and genocide (e.g., globally - Abrahamic religions' *Old Testament* and the *Quran*; regionally - the *Mahabharata*, *Ramayana*, and locally in Sri Lanka - *Mahavamsa* etc.). World history, Lanka's history and unfolding events of the modern day offer many lessons on how to avoid such negative outcomes that are fuelled by misinterpreting and justifying accounts in historic chronicles. The anthropological perspective highlights that discrimination based on religious and cultural affiliations have no ethical nor scientific support. Such discrimination not only violates human rights but specifically in the case of Lanka, cannot be justified when considering blurred biological boundaries that exist between the Sinhala, Tamil, Muslim, Burgher and other ethno-linguistic groups as shown above.

Scientists test hypotheses while being open to changing their interpretations should new evidence emerge and acknowledging ignorance when there is no supporting evidence. Starting with a "theory" based on historic accounts and following it to prove it using haphazard phenomena does not constitute science. This approach is aptly called pseudoscience and in the case of unscientific, but so-called "archaeological" pursuits, pseudoarchaeology. Pseudoscience and pseudoarchaeology form limiting beliefs that perpetuate ignorance, leading to conflict and suffering. Until strong evidence is found, scientists are happy to remain objective, whereas pseudoscientists or pseudoarchaeology panders to the public and offer definitive "theories" and statements. For a comprehensive treatment of pseudoscience and pseudoarchaeology see Archaeological *Fantasies: How pseudoarchaeology misrepresents the past and misleads the public (*Fagan, G., 2007).

Often pseudoarchaeological claims and statements are heavily biased and are not supported by evidence. For instance, recent claims that significant locales associated with the historic Gautama Buddha are found in Lanka, remain unsupported by any scientific evidence, whereas strong archaeological and linguistic evidence indicate that Gautama Buddha can be traced to the Iron Age / protohistoric times and sites located in what is now India and Nepal (Allchin, 1995; Coningham, 2002; Coningham & Young, 2015). Important Lankan archaeological sites and the people who built them are demeaned and dismissed in these flawed interpretations. Origin myths and ancestry legends honoured by people, are subject to interpretation and distortion over many years and must be viewed with caution. For instance, we recognize that the settlement of Lanka by ANI groups from northerly regions of the peninsula cannot have been only by royalty (e.g., Prince Vijaya and his followers) as noted in the chronicles. Diverse groups from diverse socioeconomic, genetic and ethno-linguistic backgrounds would have settled Lanka in the last 10,000 years and

would have been sharing a gene pool for an even longer period. It has also become popular to devote time and energy to justify legends and beliefs that situate ancient events and people noted in such legends (e.g., Legend of King Ravana). Anthropologically speaking, legends and folk tales are invaluable to obtain perspective on humanity. However, certain misconceived and misguided endeavours in attempts to study the past, which disregard methodological rigour and real evidence shape public opinion.

It is timely to prevent and/or mitigate the damage caused by pseudoscientific and pseudoarchaeological work characterised by sensationalism that misleads the public. Although historic sources support archaeological data and archaeological data support historic references, historic records are only a recent addition to the human cultural tool kit. Developing an appreciation of deep time is essential to understand human evolution and diversification within geographic regions and in this case, to apply that knowledge to appreciate the diversity of modern-day Sri Lankans.

Island Lanka offers remarkable evidence to study the rise of urbanisation and social complexities in historic times. Yet, it is imperative to consider population processes that preceded and continue to shape these more recent events. If you go back in time to the early Holocene - a mere 10,000 years ago - the extant ethno-linguistic groups such as Sinhala, Tamil, Muslim of modern-day Sri Lanka did not exist. This knowledge is critical to build enduring peaceful relations of coexistence with each other. Strong, hypothesis-driven, empirically sound scholarly work must guide anthropological and archaeological research in Lanka. It is important to use an evidence-based approach, relying on a holistic anthropological perspective to obtain a broad understanding of Lanka's people, while eliminating ethnocentric interpretations that lead to flawed evaluations and social injustices.

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