



On the Jewish Ancestry of the Lemba people of South Africa

How genetics can provide information to support
historical claims of ancestry

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Theses for the degree of Bachelor of Arts in Anthropology

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HÁSKÓLI ÍSLANDS

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Ritgerð þessi er lokaverkefni til BA-gráðu í mannfræði og er óheimilt að afrita ritgerðina á nokkurn hátt nema með leyfi réttihafa.

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Abstract

This thesis will discuss what genetics can tell us about the claim of the Lemba people of South Africa about their Jewish ancestry. It gives historical account of the exiles of the Jewish people throughout the ages, as well as describing the current Jewish Diaspora. It describes the tools available to population genetics for determining whether groups share a common ancestry. For the particular discussion on the Lemba people, polymorphisms on the non-recombining part of the Y chromosome is a very valuable tool.

The oral tradition of the Lemba is described, and their tales of how their ancestors sailed from Yemen to settle in South Africa. Those claims have been supported finding a shared haplotype between modern Jews and the Lemba; the studies behind that discovery are described. Interpretation and discussion of this result is given.

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1 Introduction

Each population possesses clues about its ancient roots in their genetic material. This is due to each individual taking their genes along with them when they move, and they get passed on to their descendants in their new homes. It is therefore possible to confirm common ancestry, and trace human migration by comparing DNA sequences of present day populations (Shriver and Kittles, 2004; Owens and King, 1999). Genetic data sampled from different human populations can provide information about the history of those populations, and provide an assessment of ancestry. Attempts to prove origins or obtain information from the past concerning matters of descent are not unique to genetics; there is a long history of the use of various methodologies from genealogical research to measuring cranium size to confirm that an individual belongs to a certain group (Parfitt, 2006).

Molecular genetics has revolutionized the study of human evolution. For example, different theories about early migrations of modern humans out of Africa have been supported or challenged on the basis of analyses of DNA sequences. More recent human migrations have also been identified with the help of genetic analysis, so it can offer the possibility of understanding movements and events of more recent human history. The fact that it is possible to use genetic analysis to answer questions about human history is very exciting for a diverse group of scientists, including anthropologists, geneticists and historians. Genetic analysis can be helpful to answer questions about patterns of human genetic diversity, migration of ancient people, differences in migration patterns of males and females and historical demography of ancient cultures, to name a few. Genetic information and analyses of genetic records can thus complement archaeological evidence and analyses of historic records written by human observers. It can reveal the historical demography of different societies. Genomic analysis can also indicate genetic relationship between current populations, and often the extent and timing of their contacts (Owens and King, 1999).

Genetic studies of the Jews are a part of population genetics and are interesting since they can help understand the chronology of human migration in the past and complement other fields such as history and archaeology. The aim of this thesis is to discuss how genetic research can help explain the history of human populations. One particular case we focus on is what genetic research can tell us about the Lemba people's claim of their Jewish ancestry.

We start by discussing the history of the Jewish people in Chapter 2. We give overview of the early migrations of Jews, and the current three main groups of Jewish Diaspora. In

Chapter 3, we describe the necessary background of genetics used in population genetic studies, and in particular, what population genetics can tell us about the genetic relationship between the groups of the Jewish Diaspora.

In Chapter 4, we discuss the Lemba people of South Africa, giving accounts from their oral history about their Jewish background. We then describe how genetic research turned out to support the claim of the Lemba people about their Jewish ancestry. Finally, we discuss the results of this thesis in Chapter 5.

2 The history of the Jewish people

The Middle East is located at the crossroads of three continents. It played a crucial role in early human history. Its location alleviated the movements of people and the spread of new technologies and ideas. The Fertile Crescent of the Middle East was one of the few places where the transition from hunting and gathering to permanent settlement and farming took place at the beginning of the Neolithic period, around 10.000 BC (Nebel et. al., 2001). The Jewish people are thought to have emerged as a nation and religious group during the second millennium BC and Jewish religion and culture can be traced back to tribes that lived in the Middle East around that time (Atzmon, et. al., 2010; Hammer et. al., 2000; Ostrer, 2001).

According to the Biblical explanation from the Old Testament about the origin of the Hebrew people (who later became known as the Jews), is that they are the descendants of Abraham, a Mesopotamian patriarch, through his son Isaac and his grandson Jacob. Jacob's descendants settled in Egypt where they were enslaved before fleeing after they were liberated by God's intervention. They took a journey to a land that was promised to them in a sacred text, called the Promised Land, and formed a religious and legal state that became known as Israel (Zoloth, 2003).

2.1 Early migrations

The Jews entered Israel around 1200 BC and since then, three major migrations from the country have occurred (Sachs and Bat-Miriam, 1957). Some major dispersion of Jewish populations from the Middle East took place in 586 BC and resulted in the development of various Jewish communities outside of present-day Israel. In that year, Nebuchadnezzar

initiated the Jewish Diaspora by force by destroying the temple in Jerusalem and deporting much of the Jewish people to Babylon of ancient Mesopotamia (present-day Iraq) (Diamond 1993). These events marked the beginning of The Babylonian exile that followed, and the Babylonian captivity (Sachs and Bat-Miriam, 1957; Hammer et. al., 2000). Even though this exodus was officially terminated, many Jews remained in Babylon. The present Iraqi Jews are to a great extent thought to be descendants of that community (Sachs and Bat-Miriam, 1957).

The second migration which with Alexander the Great in 334 BC, and took Jews into Egypt, Syria and the Balkans. The third one took place in 70 A.D after the second destruction of the temple by the Romans. The third one took the Jews into the Roman world. This marked the foundation of settlements in Spain, Germany, Italy and France (Sachs and Bat-Miriam, 1957). The Diaspora was thus scattered outside the Land of Israel, but still continued the national culture. In addition to the three main migrations from Palestine mentioned above, there have been other smaller migrations to other parts of the world. At some point after the exile by the Romans at AD 70, the Jewish people migrated to Europe and North Africa. By AD 300, Jewish communities were established as far as in Yemen where they remained up until the fifth and early sixth centuries AD (Diamond, 1993). Jews that settled in Yemen have continuously lived there since that time. The present day community is an extremely religious one (Sachs and Bat-Miriam, 1957). Figure 1 shows these migrations out of Israel.

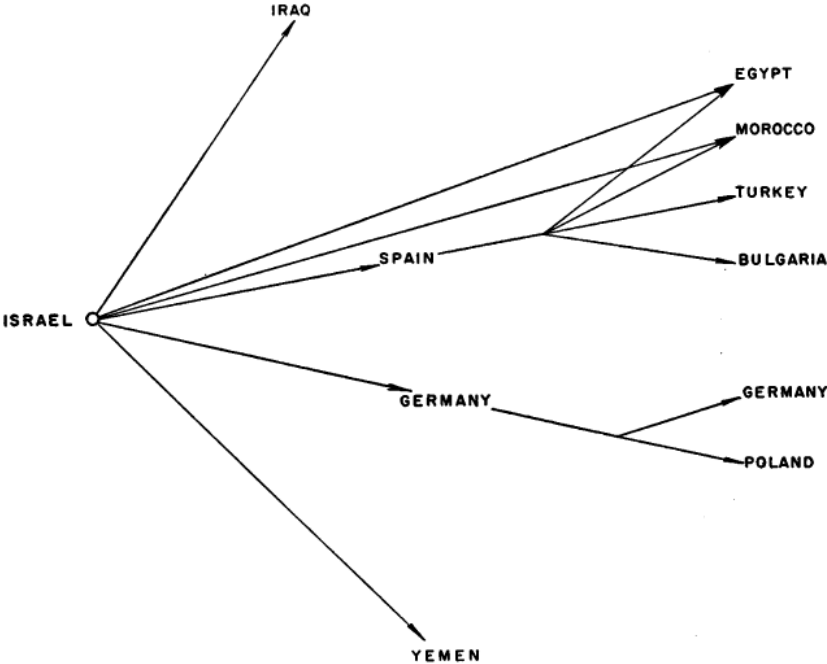


Fig 1. Jewish migrations out of Israel (Sachs and Bat-Miriam, 1957).

2.2 The Jewish Diaspora

In the last section, we described the numerous Jewish migrations. The migrants founded communities in the Middle East and the Mediterranean basin, along with residences in various countries in Europe, North Africa and West Asia. Some of their descendants remained in the communities the migrants founded for a long time. Present day Jews belong to several communities, which can be classified according to where they were founded. Three main groups have been identified based on their predominant residence in the world. These groups are:

- Ashkenazi Jews
- Sephardic Jews
- Middle-Eastern (Oriental Jews)

Ashkenazi Jews in communities of Central and Eastern Europe, Sephardic Jews in communities of the Mediterranean Basin and North Africa and Middle Eastern Jews include the communities of former Babylon and Palestine (Hammer et al., 2000, Ostrer, 2001). The present-day population contains approximately thirteen million Jewish people, with the majority living in the United States and Israel. In the United States, ninety percent of the population are of Ashkenazi origin whereas in Israel, the composition of the population is more evenly divided between the three groups (Ostrer, 2001). Contemporary Jews thus consist of clusters of communities scattered around the world, in Europe, America, Asia and Africa (Behar et. al., 2010). The members of these communities relate with each other through religion and tradition. They are linked by customs, marriage, language and have carried on maintaining their culture and tradition regardless of the distance between different populations of the Diaspora (Atzmon, et. al., 2010). We now provide an short overview of these three main groups.

2.2.1 Ashkenazi Jews

The word Ashkenazim is a form of the medieval Jewish word for Germany. It refers to Jewish people of recent European ancestry, separated from other major Jewish populations such as those in North Africa and the Middle-East (Behar, et. al., 2004, Sachs and Bat-Miriam, 1957). They migrated from the Middle-East into Central Europe, but many of them

moved from Europe to America and Australia in the nineteenth and twentieth century (Jobling, 2004). The contemporary Ashkenazi gene pool is thus thought to have originated from a founding population that migrated from the Middle-East within the last two millennia (Behar et. al., 2004). They are believed to have settled down in the Rhine Valley, and became a distinct ethnicity in Germany during the middle Ages (Nebel et al., 2001, Sachs and Bat-Miriam, 1957). They later migrated into Eastern Europe; spreading eastwards from Germany to Poland and Russia among other countries in Europe in the 13th century (Atzmon et al., 2010; Nebel et. al., 2001; Sachs and Bat-Miriam, 1957). After moving through Italy and the Rhine Valley, the Ashkenazi Jews presumably experienced a complex demographic history characterized by numerous migrations and fluctuations in population size (Behar et. al., 2004). It is believed that they moved around in Europe to avoid persecution (Jobling, 2004). Leading up to the Second World War was a period of rapid population growth, resulting in an estimated population size of eight million Ashkenazi Jews (Behar et. al., 2004). Today they form the majority of the present day North and South American, English, and South African Jewish communities (Behar, et al., 2004, Sachs and Bat-Miriam, 1957).

2.2.2 Sephardic Jews

The word Sephardim comes from the medieval Jewish word for Spain (Sachs and Bat-Miriam, 1957). Although both the Iraqi and North African Jews are considered to belong to the Sephardic Jews, these two communities have probably been separated for over a thousand of years. After the Assyrian and Babylonian exiles in 723 and 586 BC, the deported people founded a Jewish community in Iraq. Subsequently waves of more immigrants arrived in later centuries. During and after the Muslim conquest in 7th end 8th centuries AD, several communities were founded in various North African countries and countries of the Iberian Peninsula (Nebel et. al, 2001). The Sephardim who originally settled in Spain had to leave in AD 1492 due to being persecuted by the Spanish Inquisition. After this banishment, they spread from Spain and were dispersed to other Mediterranean countries, such as Italy, North Africa, the Balkans, and what was then the Turkish Empire (Jobling, 2004; Nebel et. al., 2001). The descendants of these migrants can be found in communities in Turkey and Bulgaria. Others went from Spain to North Africa. The Jewish community in Egypt was thriving at the time of Alexander the Great and continued to do so for some time into the Middle Ages (Sachs and Bat-Miriam, 1957).

2.2.3 Middle-Eastern Jews

The so called Middle Eastern Jews come from Iran and Iraq. They are believed to have originated communities of Persia in the fourth to sixth century BC. Jewish communities came into being in the Balkans, Italy, South Africa and Syria in the classical period, and some admixture between those Jews and the Sephardic Jews from Spain and Portugal is believed to have taken place (Atzmon et al., 2010). Jews in Kurdistan lived in isolation as a closed ethnic group, mostly in northern Iraq and Iran and in eastern Turkey until their immigration into Israel in the early 1950s (Nebel et al., 2001).

In summary, the story of the Jewish people has been shaped by battles and exiles of their people, losing and reclaiming their land until the Roman Empire finally took over Palestine. The idea of the categorizing of the Jewish people then goes all the way back to these events when the Jews were held captive, and tales of lost tribes emerged in the medieval Christian and Jewish literature (Zoloth, 2003). But why in particular are the Jews, genetically interesting? One reason is that the Jewish people have a very unusual demographical history as we have seen; those who practice Jewish faith reside in many geographic locations over the world. It is thus interesting to wonder if modern day Jewish communities are in fact descendants of ancient Jews or if they consist mostly of converts from other faiths. In other words, is there somehow a biological basis to Jewishness?

2.3 Jewishness and the theory of the Ten Lost tribes

The Jewish tradition has been taken on board by groups insecure about their own identity. Jewishness has been used by those groups for self-identification or reinvention of their identity, as it has detailed history that those groups might lack. According to Parfitt (2002), who discusses this in his book *Judaizing Movements, studies in the margins of Judaism*, the idea of Jewishness does not need to be equal to traditional Judaism. Jewishness is not necessarily determined by common ancestry; it is important to bear in mind that it is also possible to convert to Judaism (Parfitt and Semi, 2002). Jews refer to themselves as *people* because this is an all-embracing term that encompasses everyone that follows the Jewish tradition, even converts (Ostrer, 2001). On the contrary, the previously favored term for self-identification was “the Children of Israel/Jacob” that highlights how Jewish identity was

based mainly on their belief that all its members shared a common ancestry (Parfitt and Semi, 2002).

But what is the essence of Judaism? Magdel le Roux describes the concept of Judaism as: "...both a religious and an ethnic community who reflect a particular way of life and who practice a unique set of beliefs and values" (le Roux, 2003, page 13). This particular way of life has tradition for a diet free of pork and circumcision of males. It has strong traditions of endogamy, although today, intermarriage is well known between Jews and their host population in America and Europe (Diamond, 1993). This emphasis on the ethnical aspect could also perhaps explain why many different groups around the world, such as in India, China and Africa to name a few, that follow the Jewish faith, or have Jewish customs embedded in their culture have also claimed shared ancestry.

The theory of the Ten Lost tribes of Israel addresses the exile of the Ten Tribes of Israel by the hands of the Assyrians in the 6th century BC. These tribes are said to have vanished and never returned. Many have been fascinated by the myths regarding what became of those tribes over the centuries. Multiple groups all over the world identify themselves to be descendants of those tribes, ranging from North American Indians to tribes in Africa (le Roux, 2003; Parfitt and Semi, 2002). Parfitt (2002) explains that it was a handy label to put on groups of unknown people which were somewhat different and hard to define. Indigenous people in Africa often got this label by the hands of missionaries in the seventeenth and eighteenth century, which could explain the emerging of groups with Jewish references in their customs to some extent. It is worth noting that in the course of time, only a small quantity of groups acknowledged this appointed Jewishness, although groups that consider themselves Jewish in Africa can be found in Uganda, Kenya, Somalia and Zambia. Missionaries in South Africa moreover assigned names to identify various tribes such as the Zulus and Bushmen, but those names were a European invention imposed upon them. It is thus important to bear the history of colonization in mind when discussing religious movements in Africa (le Roux, 2003; Parfitt and Semi, 2002). Many questionable claims of lost Jewish identity have emerged throughout the history from people in Africa, India, South-America and China (Zoloth, 2003). Jewishness has been adopted to serve different groups for various reasons and goals. Missionaries are thought to have influenced the adoption of Judaism of the Falashas of Ethiopia, Bene-Israel of Bombay and more (Parfitt and Semi, 2002). The question that remains is whether the scattered groups of modern Jews really are the descendants of ancient Jews of the Old Testament? Or are some of the groups rather

converted non-Jews, and others diluted by intermarriage with those converted non-Jews and the little remains of their originally Jewish genes? To begin to seek answers to those questions, we start by discussing the theory of the Lost Tribes, and the genetic studies that have been conducted on the Jewish people in the last decade. We will discuss the claim of Jewish identity by the Lemba people in greater detail later, but first we provide a genetic background for that discussion.

3 Genetic background

3.1 Genetic polymorphisms

Most of our DNA does not seem to have any impact on our well being and structure as over 98.5% of it does not have coding sequences of genes and about 70% is not even transcribed (Jobling, 2004). The rest of our genetic material codes for proteins that make up what we are, with each protein being composed of amino acids that are determined by the bases of the DNA. Mutations are the source of genetic diversity and they are defined by any change in DNA sequence; segments can be inserted, deleted or duplicated to name a few. This alters the structure of the DNA and makes it different from the original- hence, variant (Jobling, 2004). Genetic polymorphisms occur in nature when two or more variants of a DNA sequence exist in the same population of a species. They also recur within the population in such proportions that they cannot be maintained simply by mutation- that is, they have to be present in a significant frequency in a population (over 1 percent) (Jobling, 2004; Spurdle and Jenkins, 1996). The simplest difference between two homologous DNA sequences is when a single base is exchanged for another, called base substitution, or when a single base is inserted or deleted. Sites on the DNA that have found to exhibit such variety are called single nucleotide polymorphisms (SNP). These changes in the DNA, which occur in the coding regions of the DNA, can modify protein structure and bring some disadvantages to the organism, and such changes are usually weeded out of the population by natural selection (Jobling, 2004; Parfitt and Semi, 2002).

The first genetic polymorphism to be defined was one of the classical polymorphism, the ABO blood groups. It clearly affects the phenotype of the individual, but for the most part these differences have no influence on a phenotypic trait. These are changes in the non-coding

DNA that most often do not affect the survival of the individual. Therefore, they are often called neutral mutations. They are not affected by natural selection, they simply stay in the genetic material and get passed down from generation to generation (Jobling, 2004; Parfitt and Semi, 2002).

3.2 The Y chromosome

The Y chromosome is well known to give information on human variation. Since the Y-chromosome is inherited from father to son, it is possible to study gene flow that is male-specific by looking at Y chromosome polymorphisms (Spurdle and Jenkins, 1996). The Y-chromosome has extremely few genes, in fact it contains much less than one percent of the male genes and only encodes for 27 different proteins (Jobling, 2004; Owen and King, 1999). Not only is the Y chromosome is paternally inherited, but also, recombination does not affect most of the chromosome (Owens and King, 1999).¹ This non-recombining region spans around ninety five percent of the Y-chromosome, and this special trait makes it very potent for genetic research (Jobling, 2004; Owens and King, 1999).

The common view of scientists is that these polymorphisms occur by change and, most likely, have only appeared once during human evolution. The non-recombining part of the Y-chromosome includes such polymorphisms, and it can provide a record of the mutational events that have occurred along male lineages throughout evolution. These polymorphisms are thus useful for sorting people into different genealogical groups, and tracing their ancestry through history, ultimately to the points of common ancestry (Parfitt and Semi, 2002). These unique event polymorphisms have become effective tools for investigating genetic diversity in males. Another useful tool for study is the mitochondrial DNA (mtDNA) which is only maternally inherited, with no recombination. The mtDNA is very short (only 16569 base pairs) and thus has very few unique event polymorphisms. Despite that, it is very effective for investigating genealogical relationships between individuals and populations. While the unique event polymorphisms are not necessary for

¹ Recombination is a process (generally in meiosis) in which chromosomal pairs exchange genetic material by breaking up and re-joining to make new molecules. This causes the offspring to have different combinations of genes than the parents.

assessing genetic relationships, they can make things simpler. The mtDNA, along with the Y chromosome offers a record of the past that is gender specific (Mitchell and Hammer, 1996; Nebel et. al., 2001; Owens and King, 1999).

3.3 Haplotypes and migration

Around six hundred genetic markers were known in 2008 compared to 235 in the year 2002. This number increases rapidly with the discovery of more and more markers (Karafet, et. al., 2008). Population genetics have benefited from these findings because these markers differ in allele frequencies among the world's populations (Ostrer and Skorecki, 2012). An important concept for our discussion is that of haplotypes and haplogroups. Haplogroups are groups of haplotypes, a specific segment of DNA sequence that is inherited as a unit, which shares common ancestry and is defined by a shared sequence. Haplotypes in the same haplogroup are more closely related to each other, than they are to any other haplotypes because they share certain mutations that no other haplotype carries. They belong to the same branch on the phylogenetic tree (Shriver and Kittles, 2004). Parsimony analysis generates a single phylogenetic tree of Y haplotypes, which exhibits a star-like pattern, similar to those often seen with mtDNA haplotypes (Mitchell and Hammer, 1996). Y haplotypes that combine both sequence variation and microsatellites offer a very powerful tool in the study of human evolution and genetic variation (Shriver and Kittles, 2004). In 2008 these markers were mapped on the Y chromosome tree into 311 distinct haplogroups defined by the Y Chromosome Consortium. The oldest haplogroups are found in Africa (Karafet, et. al., 2008; Shriver and Kittles, 2004).

Haplotypes found in high frequencies in a population, either Y-chromosomal or mtDNA, can be used as “population markers” to trace descendants of historical Diasporas like the Jews. Doing so can be a little more complicated than it seems because no markers are exclusively present in only one population, and moreover, in all of their members. It is also essential to keep in mind that each individual has a lot of ancestors, and that such tracing focuses on only one of those ancestors (Jobling, 2004).

Migration can have many scenarios. Usually when people move to other areas occupied by other people and admixture takes place, gene flow occurs. It is unusual for the migrant population to be a haphazard sample from the original population. Often, the migrant

population is somehow limited to a certain factors such as age or sex. In that case it is called a kin-structured migration (Jobling, 2004). As we will see, this appears to have been the case for the Lemba people of South-Africa. Populations can also become isolated due to various factors such as geography or their culture. Isolated populations are often confined to certain geographic area and do not experience much gene flow with their neighbouring populations. Although this concept of isolation is a relative one, the criterion is that admixture is more frequent between the neighbouring populations than between the neighbours and the isolated population. So-called transnational isolates refers to groups that are spread over a wider geographical area, for example by migration, but remain isolated because of endogamous practices, that is, they marry within their group (Jobling, 2004). The Jewish people should in theory be an example of such transnational isolate.

3.4 Genetic relationship between groups in the Jewish Diaspora

Modern Jewish people do not share characteristic physical features across groups; in other words, the Diaspora is not a homogeneous unit. The interest of current Jewish population genetic studies is to investigate the origins of various modern Jewish populations, and whether there exists a common genetic heritage among various Jewish groups. Over the past twenty years, these studies have gained momentum with new technology and the discovery of more and more genetic markers as described in the previous section. Those who follow the Jewish faith live all over the world due to frequent migrations in the past. With the course of time, genetic research has provided more and more data for assessing their origins and relatedness. In this chapter, we seek to provide a rough overview of the information recent population genetic analysis has produced on the groups of the Jewish people.

In early population genetic studies, blood groups and serum markers were used to give information about the relationship between Jewish and non-Jewish populations. The results suggested that Jewish populations were genetically more similar to one-another than Jewish and non-Jewish populations. Also they provided evidence that most Jewish Diaspora groups originated in the Middle East (Ostrer and Skorecki, 2013). These studies reported different results regarding the degree of admixture with local populations. In 2001, Nebel et al. reported a high degree of genetic affinity among the three main Jewish communities, and findings argued against substantial admixture of Sephardic or Ashkenazi males with their host populations (Nebel et al., 2001).

More recent and extensive studies by Atzmon et al. and Behar et al., both from 2010, used whole genome data from groups from the Jewish Diaspora, and compared that data with existing data on neighbouring populations. These studies analysed different populations, and the number of individuals included from each population also varied. Behar et al. (2010) included more communities while Atzmon et al. (2010) included more individuals in his study.

The seven groups studied by Atzmon et al. (2010) were well established communities from the three main groups of the Jewish Diaspora: Ashkenazi, Sephardic and Middle Eastern Jews. The Ashkenazi Jews were represented by Eastern Europe, the Sephardim Jews by Jewish populations from Greek, Turkey and Italy and the Middle Eastern Jews by Iranian, Iraqi and Syrian Jews. Each Jewish group was found to be genealogically distinctive from others, which is in accordance to their relative isolation through the centuries. The common Jewish origin of these groups is demonstrated by that even though they are diverse and geographically dispersed, they share more frequent and longer genetic segments with each other, than with the non-Jewish ones. The genetic segments shared span the entire genome (Atzmon et. al., 2010). But the study also found strong genetic ties to non-Jewish groups, with the closest genetic neighbours on the European side being Italians, and on the Middle Eastern side the Druze, Bedouin and Palestinians. Although the groups had strong genetic commonalities, the results also showed a varying degree of genetic mixing with nearby non-Jewish populations. The most genetically distinct Jewish communities compared both to other Jewish groups and to nearby non-Jews, were those from Iran and Iraq (Atzmon et. al., 2010). This indicates that these groups branched off from a common ancestry the earliest, which is in accordance with the historical background of the Jewish exiles in Section 2.1. This also indicates that since their settlement, they have had the least admixture with their neighbours of all the Jewish groups.

Behar et al (2010) also provides a genome-wide analysis of a large sample of Jewish communities, their non-Jewish host populations as well as samples from the Middle-East. The study revealed a close relationship between most contemporary Jews and non-Jewish populations from the Levant. They share a common genetic origin, which is consistent with an historical formulation of the Jewish people as descending from ancient Hebrew and Israelite residents of the Levant.

We summarise the conclusions of the two studies described above as follows. Most of the communities of the Diaspora are more closely related to one another than they are to the populations of the countries in which they have lived for centuries or millennia. This provides

evidence for shared genetic ancestries. Moreover, the DNA evidence backs up the history of common Middle Eastern origin. The important difference from earlier studies lies in the degree of admixture discovered between the Jewish populations and the local populations. The recent studies were able to apply the whole genome data to provide evidence for such admixture (Atzmon et al, 2010; Behar et al, 2010; Ostrer and Skorecki, 2013). The results of such admixture should not come as a surprise; for as we saw in Chapter 2, non-Jews converted and joined the Jewish people over the last several millennia.

4 The Lemba people of South Africa

The Lemba people are black Africans who today speak Bantu languages, follow Jewish customs and claim Jewish ancestry (Johnston, 2003; Spurdle and Jenkins, 1996). They differ from other groups in South-Africa in one aspect- they are the only group which has an oral tradition that claiming they initially came to Africa by boat (le Roux, 2003). In this chapter, we discuss their culture and oral history.

The first historic account of the Lemba comes from a Dutch report from 1721, written by an officer from the Dutch East India Company at a trading centre in Delagoa Bay (in what today is Mozambique) (le Roux, 2003; Thomas et. al., 2000). The majority of the Lemba people can be found in north-east South Africa, but about 15.000 of them can be found in Zimbabwe and other southern and central African countries (Parfitt and Semi, 2002; Parfitt, 2003; Spurdle and Jenkins, 1996; Thomas et. al., 2000). The Lemba is different from their Bantu-speaking neighbors in a number of ways. Their customs differ considerably as described in a number of references (Johnston, 2003; Spurdle and Jenkins, 1996; Thomas et. al., 2000). We begin our discussion of the Lemba with looking at these differences.

The livelihood of the Lemba people consists of an endogamous tribe, of estimated 50,000-70,000 people. The fact that they are endogamous means that they mostly mate within their own group; such mating is encouraged in marriage laws. Men that are not Lemba are usually not accepted into the community and it is impossible for them to convert to the faith of the Lemba (Buijs, 1998; Spurdle and Jenkins, 1996). This seems not to be true for females; because according to Buijs (1998) girls that are not Lemba can marry into the group and convert to the faith if they undergo a ritual ceremony, similar to the Jewish ritual bath. The Lemba people live in over 12 clans, spread amongst other Bantu-speaking groups. Today they

speak different languages based on where they live (le Roux, 2003). The Lemba keep up with known Jewish traditions, customs and rituals such as circumcision of males and the exclusion of pork from their diet. They also keep one holy day a week (Johnston, 2003; Spurdle and Jenkins, 1996; Thomas et. al., 2000).

The Lemba have for a long time considered themselves Jewish and they have for a long time been identified as Jews by missionaries and outside observers (Buijs, 1998; Parfitt, 2003). Even the work of historian and geographer Leo Africanus from 1528-1529, *Description of Africa*, refers to the Jews of Africa. This book was the only source on Sub-Saharan Africa for a long time (Parfitt and Egorova, 2005). In terms of physical appearance, some of the early ethnographic work mentioned their “Jewish noses”, a term usually used to describe somehow finer built noses (Buijs, 1998; Parfitt, 2003). In spite of their dark skin color, the Lemba were referred to by themselves and others as *white men*, suggesting their skin was fairer than that of their neighbors. Parfitt and Egorova (2005) report that these physical features were of interest to nineteenth century anthropologists, although today the Lemba are indistinguishable from neighboring tribes. This gives rise to the question whether the Lemba were made to fit some stereotypical image in the ethnographic literature (Buijs, 1998; Parfitt, 2003).

Buijs (1998) mentions few of these early ethnographic accounts with the greatest emphasis on the writings of Henri Junod (1863-1934), a Swiss missionary and anthropologist, from 1908. He proposed the idea that the Lemba had been living in South Africa since the end of the eighteenth century. He describes the Jewish characteristics of the Lemba by noting how their type of residence, being scattered among other tribes, was similar to the living conditions of Jews in Europe at that time. He also mentions that at that time, they still spoke their own language (Buijs, 1998). The Lemba were very skilled metal workers, and had knowledge how to use copper, gold and iron. They were also highly regarded as potters and “medicine-men” (Spurdle and Jenkins, 1996). In accounts from another ethnographic writer, Hugh Stayt, he reports how the Lemba people were able to make a living trading their pottery and metalwork, a skill which made them valuable for the community. Both Junod and Stayt reported that the endogamy customs of the tribe was similar to the Jewish communities they were familiar with (Buijs, 1998). In the past, the Lemba are thought to have spoken a Karanga language that their neighbors did not understand. However, in the early twentieth century, they only used it in ceremonies, speaking their local Bantu language in everyday life (Buijs, 1998; Spurdle and Jenkins, 1996).

4.1 The oral history of the Lemba

The oral history of a community refers to the oral transmission of common knowledge, tradition or other cultural materials from one generation to another (Vansina, 1985). The theories of the origin of the Lemba are mostly grounded on such narratives and oral accounts of their history. Lemba people from Zimbabwe have an oral tradition claiming that they came from the north, either from Yemen, Egypt, Judea or Ethiopia, and that their forefathers did metalwork for the Arabs. Sometimes this place in the north, which they often call Sena, is of an unknown location (Spurdle and Jenkins, 1996; le Roux, 2003).

On the other hand, the Lemba people of South Africa have on the other hand a very detailed, and to some extent a different, oral description. The oldest one was recorded by Junod, the Swiss missionary mentioned above, in 1908. It tells the tale of how their forefathers, skilled craftsmen, came across the sea (often referred to as the Pusela) from Sena to the shores of South Africa to trade their craft for gold. They established trading posts along the shore, where they stored cargo, and unsold goods, and kept men to guard those. At some point, they received news that they could not return to Sena due to it being captured by enemies. They then settled in the trading post along the shore, as well as inland, and took local wives. They supposedly lived in small groups among other tribes, and this was believed to mark the foundation of the 12 clans of Lemba known today (le Roux, 2003; Spurdle and Jenkins, 1996).

Yet another tale of the origin of the Lemba people of South Africa was told by a respected member of the Lemba Cultural Association². It describes how the Jewish ancestors of the Lemba travelled to Sena in Yemen where they established a community in the 7th century BC. According to this version, the community in Sena got larger when exiles from the Babylonian destruction of Jerusalem in 586 BC immigrated. Later on, splitting up of the community followed in AD 600 due to a quarrel between the Lemba and the Arabs in Yemen. The Phoenicians supposedly introduced them to trading with Africa and Asia. Two migrations to Africa took place, one to Ethiopia and the other to South Africa where they established posts along the east African coast for goods trading. Later they became dispersed amongst

² The LCA is an ethnic association founded in 1947 as an attempt to preserve the Lemba culture

other powerful tribes, where they made their living as traders, metalworkers and medicine men. Both accounts thus claim that the Lemba came to South Africa by boat with the founding population being composed only of males (Spurdle and Jenkins, 1996; Parfitt, 2003; Thomas et. al., 2000).

The Lemba explanations about their origins are not identical, but still tell somewhat similar stories- it is clear that an origin outside of Africa is assumed. But is the oral narrative of the Lemba sufficient on its own to confirm their origin as Jewish? This claim, although exciting as it is and rooted in the history of the Lemba, is somewhat questionable. As noted above, it is very similar to claims from different groups of people all over the world. The important question of whether the Lemba accepted the idea of Jewishness, imposed on them by others (such as missionaries and ethnographers) or if they accepted it to strengthen the customs they already had and their oral tradition (le Roux, 2003). Zoloth (2003) proposes a reason for why the story of the Lemba was generally agreed upon. The idea of such a lost tribe is familiar to the Jewish history, a history marked by exiles and migrations. The migration of the Lemba to Africa could be looked upon as one of those migrations. But are the descendants of converted Africans, as their physical appearance might suggest, or are they descendants of ancient Jews? Genetic research has helped shed a light on this issue.

4.2 How does genetic research support the oral history of Lemba origin?

The traditional Cohanim priesthood of the Jews is thought to have been founded around 3300 years ago in accordance with old biblical texts (Hammer et. al., 1997; Jobling et. al, 2004). The rules about who can call himself a Cohanim priest is very stringent, and the title brings with it some social and religious responsibilities. Moreover, this title can only be paternally transmitted from father to son down generations. Men claiming this religious status often bear surnames transmitted along male lines such as Cohen, or other similar names derived from the word Cohanim (Hammer et. al., 1997; Jobling et. al, 2004; Nebel et. al., 2001). According to tradition, these priests are male descendants of Aaron, the brother of Moses, and out of the whole present-day Jewish population, only about 5% claim this status (Bolster et. al., 1998; Johnston, 2003).

Particularly high frequency of one ancestral haplotype has been shown to be associated with religious status and specific surnames of the Jewish Cohanim priests. One

specific Y-chromosome microsatellite haplotype, the Cohen modal haplotype (CMH), is particularly interesting, because it seems to be inherited alongside this Cohanim priesthood.

The rate of this Y chromosome haplotype differs between the Cohanim (it does not matter whether they belong to the Ashkenazy or Sephardic population) and other Jewish men (Owens and King, 1999). Indeed, over sixty percent of Cohen males carry this unique Y haplotype, compared to fewer than fifteen percent of other Jewish males according to Jobling (2001). Thomas et al (2000) reports these number to be around fifty percent in Cohen males and around twelve percent in other Jewish males, and furthermore the CMH being in a very low frequency or even completely absent in other non-Jewish populations, even for the Palestine Arabs. This is the most important observation for us; the CMH is almost non-existent in other groups other than the Jews. This haplotype has therefore become an interesting tool to support or reject claims of Jewish ancestry. To clarify, if the CMH is found in high frequencies of men belonging to a particular group, it supports Jewish ancestry (Johnston, 2003). To apply this to the Lemba, it is of great interest to investigate if the CMH is found in their population but not in their neighbors.

Two studies have tried to shed a light on the paternal origin of the Lemba. In a paper published in 1996, Spurdle and Jenkins concluded that the Lemba had received a contribution from both Jewish males and African males, which tells us that African males must have been accepted into the Lemba community to some extent (Spurdle and Jenkins, 1996). In an attempt to try to provide a more accurate account of the Lemba paternal heritage, Thomas et al. (2000) used the twelve genetic markers or polymorphisms that make up the CMH for comparison of the Lemba Y chromosome to the Y chromosome of five other groups: the Bantu from Africa, Ashkenazi Jews, Sephardic Jews and two groups of Yemeni Jews. Results suggested Middle Eastern origin of the Lemba, either Arab or Jewish origin, compatible with their oral tradition. The interesting and unexpected thing was that the Lemba carried the CMH on their Y-chromosome and those findings suggested ancient Hebrew origin (Johnston, 2003; Parfitt, 2003, Thomas et. al., 2000). In fact, the study by Thomas et al. (2000) found the frequency of the CMH in the Lemba population to be just under nine percent, while none in the Bantu population. This is comparable with the frequency of CMH in the Jews (about 10% in the general Jewish population), and moreover CMH is found in their population but not their neighbors. Even more interesting is the fact that members of one of the 12 South African sub-clans of the Lemba, the Buba clan, is often thought to be the oldest and the most supreme,

carried the CMH at a very high frequency of over 50% of the Buba in this study (Thomas et al., 2000).

In light of this information, it is worth noting that the female contribution to the Lemba gene pool has most likely been very different, and mtDNA analysis does not provide any proof of Jewish origin of the female line. This is also compatible with the oral history of the Lemba, which claims that they took local African wives upon settling in South Africa (Thomas et. al., 2000). This result is also in agreement with the findings of Spurdle and Jenkins in 1996, where mtDNA studies revealed an African female genetic background of the Lemba (Spurdle and Jenkins, 1996).

5 Discussion

The aim of this thesis was to discuss human population genetics, and how it can be used to gain knowledge about the shared ancestry of the Jewish people, and in particular, what it can tell us about the claim of the Lemba people of their Jewish ancestry. We gave historical background of the Jewish migrations which have happened frequently throughout history, and described the current Jewish Diaspora. Through population genetics, one is able to find evidence of a shared common ancestry of the Diaspora, rooting back to the Middle East. At the same time, evidence can be found of admixture between the Diaspora and neighboring populations. However, common ancestry is not a requirement for Jewishness – for example, converts are considered to be Jewish.

The Lemba people have claimed for a long time to be of the common Jewish ancestry. Their oral tradition tells that their ancestors were the Jews in Yemen, who sailed to Africa for setting up trading posts. This claim was for a long time based on little evidence other than the narrative of the tribe (Zoloth, 2003; Thomas et. al., 2000). The Lemba people certainly share a number of rituals and customs with the Jewish tradition, not found in their neighboring groups. This indicates at least some Jewish influence on their culture. Since, Jewishness is not decided on biological basis alone, regardless of the authenticity of the claims of their ancestry, the Lemba could surely be regarded as Jewish in some sense.

One the question which arose by scholars was why the Lemba people should consider themselves to be Jewish in the first place. One explanation held was that the Jewish identity was imposed upon them by missionaries and ethnographers in the 18th and 19th century, who identified their rituals with those of the Jews at the time. Another explanation was that the

Lemba desired to be associated with Judaism to maintain a “separate and distinct cultural identity”, to combat cultural dilution as the European colonization of Africa took place (le Roux, 2003). The account of the Yemeni Jews sailing to Africa and having to stay there also reminds one of the exiles of Jewish people through the ages.

The use of genetic knowledge to confirm narratives of origins such as of the Lemba people is an exciting possibility. An important tool for such studies is the use of polymorphisms, particularly on the non-recombining part of the chromosome. Modern genetic research can provide information to support or reject the oral history of the Lemba, and their claim for Jewish ancestry. The discovery of the Cohen Modal Haplotype (CMH) in the Lemba people, almost exclusively found in males of Jewish ancestry, suggests that the Lemba male genetic line originated outside of Africa, and that there has been a Jewish input to the Lemba gene pool (Parfitt, 2003). At the same time, mtDNA evidence suggests that there has not been any Jewish input to the female gene pool of the Lemba. What makes the oral tradition of the Lemba of their Jewish ancestry and how they maintained it even more interesting is that traditionally, being a Jew is assigned maternally. Thus, while evidence suggests Jewish ancestry of the Lemba, they would never be considered to be Jews.

It is hard to speculate when this haplotype entered the Lemba gene pool. Perhaps this was a recent event, and a CMH carrier introduced this genetic element later than the oral tradition tells. That would refute the claim of a shared Jewish ancestry. On the other hand, one might interpret the evidence so that at least some of the ancestors of the Lemba carried the CMH when they arrived in Africa from Yemen. The high frequency of the CMH, usually associated with the Cohen priests, which is present in the Buba clan has evoked theories and speculation whether this clan led the Lemba population out of the Middle East. The discovery of CMH in the Lemba can be interpreted to support the historical belief mentioned in the Chapter 2 that at some time in the past, Jews inhabited Yemen. Regardless of how the haplotype entered the gene pool, it indicates that at some point in the past, Jews, or their descendants, immigrated to South Africa (le Roux, 2003). What the reason for the immigration was, might remain impossible to determine.

As Parfitt and Semi (2002) describe, the Lemba identification with Jewry has grown more intense as a result of media interest over genetic findings. The story of the Lemba and how genetics was used to discover evidence for some shared ancestry with modern day Jews is a great example of how natural sciences can have an impact on religious identity of groups.

6 Bibliography

- Atzmon, G., Hao, L., Pe'er, I., Velez, C., Pearlman, A., Palamara, P. F., Morrow, B. et al. (2010). Abraham's Children in the Genome Era: major Jewish Diaspora populations comprise distinct genetic clusters with shared Middle Eastern Ancestry. *The American Journal of Human Genetics*, 86(6), 850-859.
- Behar, D. M., Hammer, M. F., Garrigan, D., Villems, R., Bonne-Tamir, B., Richards, M. et al, (2004). MtDNA evidence for a genetic bottleneck in the early history of the Ashkenazi Jewish population. *European Journal of Human Genetics*, 12(5), 355-364.
- Behar, D. M., Yunusbayev, B., Metspalu, M., Metspalu, E., Rosset, S., Parik, J. et. al. (2010). The genome-wide structure of the Jewish people. *Nature*, 466(7303), 238-242.
- Bolster, J.S., Hudson, R. R., Gaulin, S. J. (1998). High Paternity Certainties of Jewish Priests. *American Anthropologist*, 100(4), 967-971.
- Diamond, J. (1993). Who are the Jews? *Natural History*, 102(11), 12-19.
- Hammer, M. F., Redd, A. J., Wood, E. T., Bonner, M. R., Jarjanazi, H., Karafet, T, et. al. (2000). Jewish and Middle Eastern non-Jewish populations share a common pool of Y-chromosome biallelic haplotypes. *PNAS USA*, 97(12), 6769-6774.
- Hammer, M. F., Skorecki, K., Selig, S., Blazer, S., Rappaport, B., Bradman, R. (1997). Y chromosomes of Jewish priests. *Nature*, 385 (32).
- Jobling, M. A. (2001). In the name of the father: surnames and genetics. *Trends in Genetics*, 7(6), 353-357.
- Jobling, M.A., Hurles, M.E. and Tyler-Smith, C. (2004) *Human Evolutionary Genetics: origins, peoples and disease*. London/New York: Garland Science Publishing.

- Johnston, J. (2003). Case study: the Lemba. *Developing World Bioethics*, 3(2), 109-111.
- Karafet, T. M., Mendez, F. L., Meilerman, M. B., et. al. (2008). New binary polymorphisms reshape and increase resolution of the human chromosomal haplogroup tree. *Genome Research*, 18(5), 830-838.
- le Roux, M. (2003). The Lemba- a lost tribe of Israel in Southern Africa? Pretoria: Unisa press.
- Mitchell, R. J. and Hammer, M. F. (1996). Human evolution and the Y chromosome. *Current Opinion in Genetics and Development*, 6(6), 737-742.
- Nebel, A., Filon, D., Brinkmann, B., Majumder, P. P., Faerman, M., and Oppenheim, A. (2001). The Y chromosome pool of Jews as part of the genetic landscape of the Middle East. *American Journal of Human Genetics*, 69(5), 1095-1112.
- Ostrer, H. (2001). A genetic profile of contemporary Jewish populations. *Nature Reviews Genetics*, 2(11), 891-898.
- Ostrer, H. and Skorecki, K. (2013). The population genetics of the Jewish people. *Human genetics*, 132(2), 119-127.
- Owens, K. and King, M. C. (1999). Genomic views of human history. *Science*, 286(5439), 451-453.
- Parfitt, T. (2003). Constructing black Jews: genetic tests and the Lemba--the 'black Jews' of South Africa. *Developing World Bioethics*, 3(2), 112-118.
- Parfitt, T. (2006). *Genetics, Mass Media and Identity: A case study of the genetic research on the Lemba and Bene Israel*. Abingdon: Routledge.
- Parfitt, T. and Egorova, Y. (2005). Genetics, History and Identity: The case of the Bene Israeli and the Lemba. *Culture, Medicine and Psychiatry*, 29(2). 193-224.

- Parfitt, T. and Semi, E. T. (2002). *Judaising movements, studies in the margins of Judaism*. Routledge Curzon.
- Sachs, L., and Bat-Miriam, M. (1957). The Genetics of Jewish Populations: 1. Finger Print Patterns in Jewish Populations in Israel. *American Journal of Human Genetics*, 9(2), 117.
- Shriver, M. D. and Kittles, R. A. (2004). Genetic ancestry and the search for personalized genetic histories. *Nature Reviews Genetics*, 5(8), 611-618.
- Spurdle, A. B. and Jenkins, T. (1996). The origins of the Lemba "Black Jews" of southern Africa: evidence from p12F2 and other Y-chromosome markers. *American Journal of Human Genetics*, 59(5), 1126-1133.
- Thomas, M. F., M. G., Parfitt, T., Weiss, D. A., Skorecki, K., Wilson, J. F., le Roux, M. et. al (2000). Y chromosomes travelling south: the Cohen modal haplotype and the origins of the Lemba--the "Black Jews of Southern Africa". *American Journal of Human Genetics*, 66(2), 674-686.
- Vansina, J. (1985). *Oral Tradition as History*. James Currey Publishers.
- Zoloth, L. (2003). Yearning for the long lost home: the Lemba and Jewish narrative of genetic return. *Developing World Bioethics*, 3(2), 128-132.