

## CHAPTER I

### INTRODUCTION

The geography of northern Thailand differs from the rest of the country with respect to its environment, which comprises mountains, valleys and lowland. About 70% of the total area may be classified as “highland”, 20% as “upland” and a mere 10% “lowland” (Walker, 1992). The northern Thai population consists of many ethnic groups. Most of them live on the lowland, with each group having its own society, economics, politics, religion and culture. However, these ethnic groups abide by the general law of Thailand.

The earliest known inhabitants of northern Thailand were the Lua or Lawa, who were defined as an ethnic group belonging to the Mon-Khmer language family. These people were either absorbed by immigrants who moved into the area or they took to the hills and scattered where small groups can still be found today (May, 1999).

A majority of the current population in this area is called Khon Muang, or “peoples of the principalities”. The Khon Muang is native to northern Thailand, speaks Kam Muang, and has a traditional script called Tham Muang. As a distinct Tai language, Kam Muang differs from the national Thai language in native vocabulary, Indic borrowing and tonal systems. The Khon Muang are culturally related to the Lao of northeastern Thailand and Laos, the Shan (Tai Yai) of Shan State in Myanmar and Tai Lue of Sipsongpanna in Yunnan, southern China, and less closely linked with the nation’s politically dominant people, the Central Thai (Davis, 1984). The Khon Muang have been located in Chiang Mai, Chiang Rai, Lamphun, Lampang, Phrae, Nan, Phayao, Tak and Mae Hong Son. These provinces are situated mostly in the upper

north of Thailand, as shown in Figure 1.1. Among these cities, Chiang Mai has been the main one, as it used to be the capital of the former Lan Na Kingdom (Forbes and Henry, 1997).

Immigration from neighboring countries to northern Thailand often occurs, as in the era of Phya Tilokaraj of the Mangrai Dynasty from 1441-1487. The most important migration was in the Phya Kawila region of Chiang Mai in 1805. Phya Kawila pursued the policy, "Put Vegetables into the Baskets, People into Towns" by settling people from Chiang Tung (Kengtung), Chiang Rung, Mong Yawng and neighboring towns into Chiang Mai, Lampang and Lamphun, which were deserted areas following many years of war against the Burmese (Malasam, 1995).

Many groups of immigrants, who were prisoners of war from Mong Yawng in Burma, settled in Lamphun. Mong Yawng lies approximately 400 kilometers north of Lamphun (Figure 1.2). The Khon Yawng are essentially a part of the larger Tai Lue category, who are likely to identify themselves as specifically Tai Yong, rather than Tai Lue. Despite their environmental change, they have been able to conserve their culture, and especially their dialect that is clearly different from Kam Muang (Vrooman, 1884, Malasam, 1995).

At present, between 6 to 7 % of the total northern Thai population are non-ethnic Thais compared with 4 to 5 % for the country as a whole (Vatikiotis, 1984). Many minority groups of the northern Thai population are highlanders. These ethnic hill tribes are spread widely from the north to southwest of Thailand, but they live mostly in the northern highlands or in remote areas. They include Karen, Lua, Khamu, H'tin, Hmong (Meo), Yao, Lahu, Lisu, Akha and Mlabri. The Karen are the largest group (35.67 %) and the Mlabri the smallest (0.01 %) (Hill Tribe Development and Welfare Division, 1997).

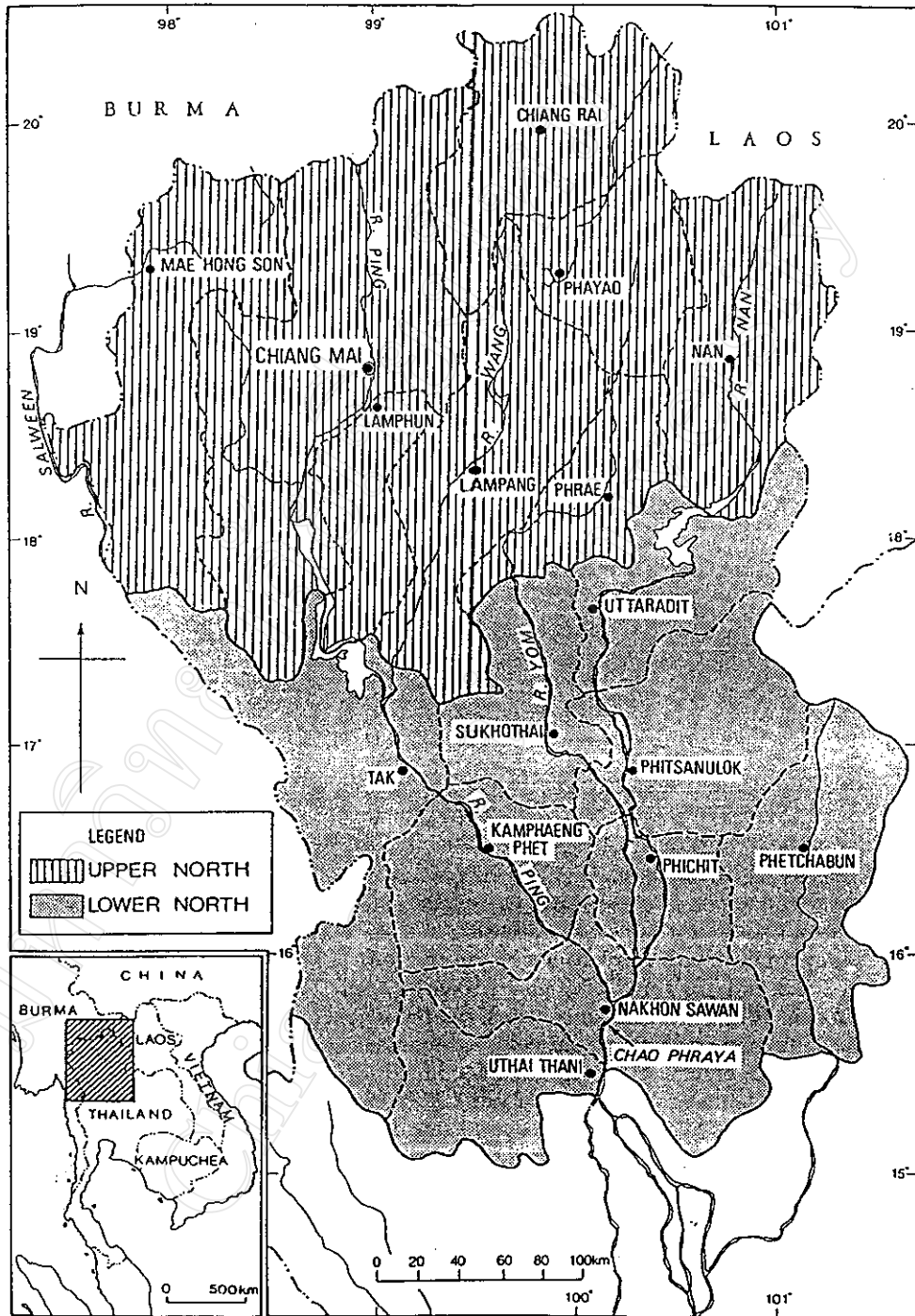
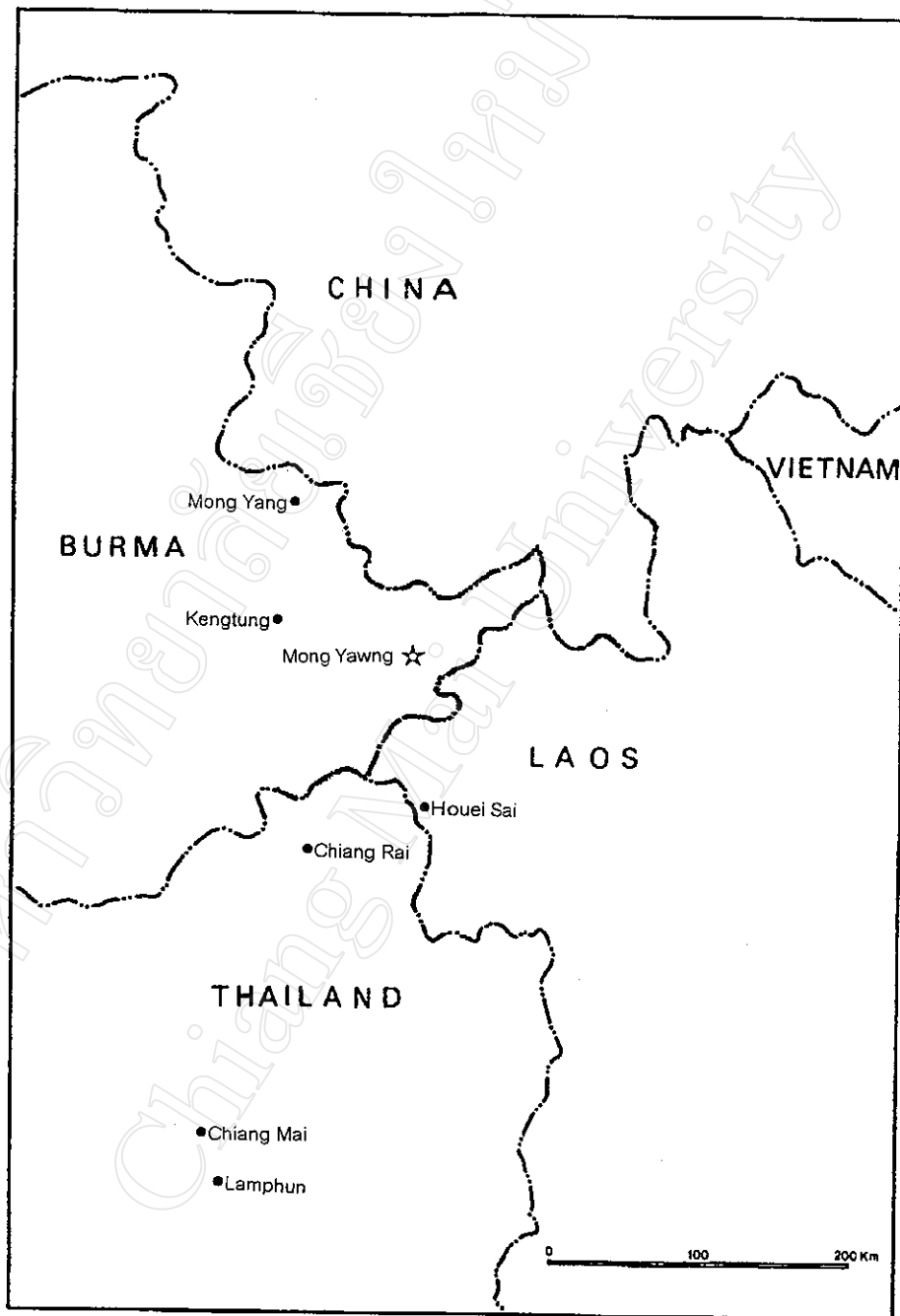


Figure 1.1 Map of upper and lower northern Thailand (Walker, 1992).



**Figure 1.2** Map of Mong Yawng indicates the distance from northern Thailand  
(modified from Walker, 1992).

The Karen belongs to the Sino-Tibetan linguistic family. They moved eastward from Burma to Thailand more than 200 years ago. In the late-eighteenth and early-nineteenth centuries the Karen emerged into Thai history. Western missionary and official accounts and Thai surveys in the late 1800s recorded the Karen's existence along the border with Burma (Renard, 1980). Today, there are 4 groups of Karen: Skaw (Pga-gan-Yaw, Pwo (Plong), Bwe (Kayah) and Pa-O (Taungthu). The Skaw represents the majority (80%) and most of them live in the north's mainly mountainous areas of the western provinces along the Thai-Burmese border, especially in Mae Hong Son, Chiang Mai, Chiang Rai, Lamphun and Tak. They follow their own customs strictly according to their culture and traditions (Mckinnon, 1995). Besides studying these peoples' culture and traditions along with their history and sociology, their genetic background should be included in this study.

The human leukocyte antigen (HLA) is the polymorphic genetic system, located on the short arm of chromosome 6 (Francke and Pellegrino, 1997). There are 3 sub regions: HLA class I, encoding for HLA-A, -B and -C; HLA class II, encoding for HLA-DR, -DQ and -DP; and HLA class III, which contains a rather diverse collection of over 20 genes, including some that encode complement system molecules (C4, C2, factor B) and others that are involved in processing an antigen. Both HLA class I and II molecules consist of a heterodimeric cell surface glycoprotein and they play an important role in the modulation of the immune recognition and response (Roitt et al., 1996).

HLA polymorphism and the linkage disequilibrium of alleles at distinct HLA loci show a considerable ethnic difference that has been widely used in anthropological studies (Bugawan et al., 1999). Also, successful organ transplants are well defined by selecting donors by using HLA typing (Terasaki et al., 1996). This method has also been used for studying the association of diseases (Thorsby, 1997).

Three methods have been used to detect HLA: serological typing, cellular typing and DNA based method (Tyler, 1996). Serological typing by using the standard microlymphocytotoxicity test is still used as a conventional method for HLA class I (Terasaki and McClelland, 1964). HLA DNA typing is now commonly used in many laboratories because of its specificity and clear definition of HLA alleles. (Bunce et al., 1999).

In previous studies, the difference between ethnic groups could be observed only in the field of culture, tradition and language. From the characteristic benefit of the HLA system, the differences between ethnic groups could be observed at the level of the HLA loci.

Three ethnic groups of the northern Thai population were used in this study: Khon Muang, Khon Yawng and Karen. The Khon Muang was selected because they represent a majority of northern Thai people and the Khon Yawng because of the extensive knowledge acquired about their history and location. The Karen was chosen because they are the biggest of all the minority groups in northern Thailand. They have at least three generations resident in northern Thailand and they were defined selectively for this study. HLA-A11 was chosen as a model for the development of the HLA typing method because of the high antigen frequencies in northern Thai populations that were detected by using the standard serological method (Greiner et al., 1978). Many subtypes of HLA-A11 could be defined by the DNA based method, as seen in a previous study (Moribe et al., 1997). The methods used in this study were the standard microlymphocytotoxicity test compared with polymerase chain reaction-sequence specific primers (PCR-SSP). The results of this study would provide basic information for further studies of the HLA system in anthropological studies, organ transplantation, bone marrow transplantation and disease association in northern Thai populations.

**Aim of this study**

1. Determination of HLA-A11 subtypes by using the molecular analysis.
2. Determination of the concordance of the result between serological typing and molecular typing.
3. Determination of the distribution of HLA-A11 subtypes in Khon Muang, Khon Yawng and Karen.