



CHAPTER I INTRODUCTION

The fluvial deposits along the Mun river at Amphoe Non Sung, and in adjacent areas yield a rich diversity of fossils, probocidian, rhinocera, crocodile, turtle, petrified wood of gymnosperms, monocotyledon (Pine and Palm), and dicotyledon (Oak) and tektite. Several researchers attempted to estimate the age of the sediments, through animal fossils, plant fossils and tektite. They also establish a stratigraphical sequence, and interpret paleoecology as well as paleoclimatology. Researchers from the Geological Survey Division, Department of Mineral Resources (DMR) in cooperate with specialists from France studies paleo-elephant bones and dated the sediments to the Tertiary Era (15-2 Ma) (DMR, 2547, in Thai). Moreover, Mr. Bunopas study about environment of sediment and fossil where scatter around the Mun river, his point out that petrified woods which buried in sandy sediment, were effected from the large flood. This was occurring of rapid deposition of sand and wood. The sediment was dated Quaternary (about 0.75 Ma) (DMR, 2546). A study about thermoluminescence dating (TL dating) on purified quartz and tektites from the sand pit compared with geological reports at Ban Tha Chang, Amphoe Chaloe Pra Kiat, Changwat Nakhon Ratchasima, shows the age of the tektites is Pleistocene (0.75 Ma) and the sand was deposited at about 0.623 to 4.338 Ma (Charusiri *et al.*, 2002). Despite all of available data tried to interpretation of the age of a stratigraphic sequence, but the accurate age of fluvial system is often difficult to solved by one or two information. The palynology study is one alternate data for interpretation of age, stratigraphic sequence and palaeoclimate.

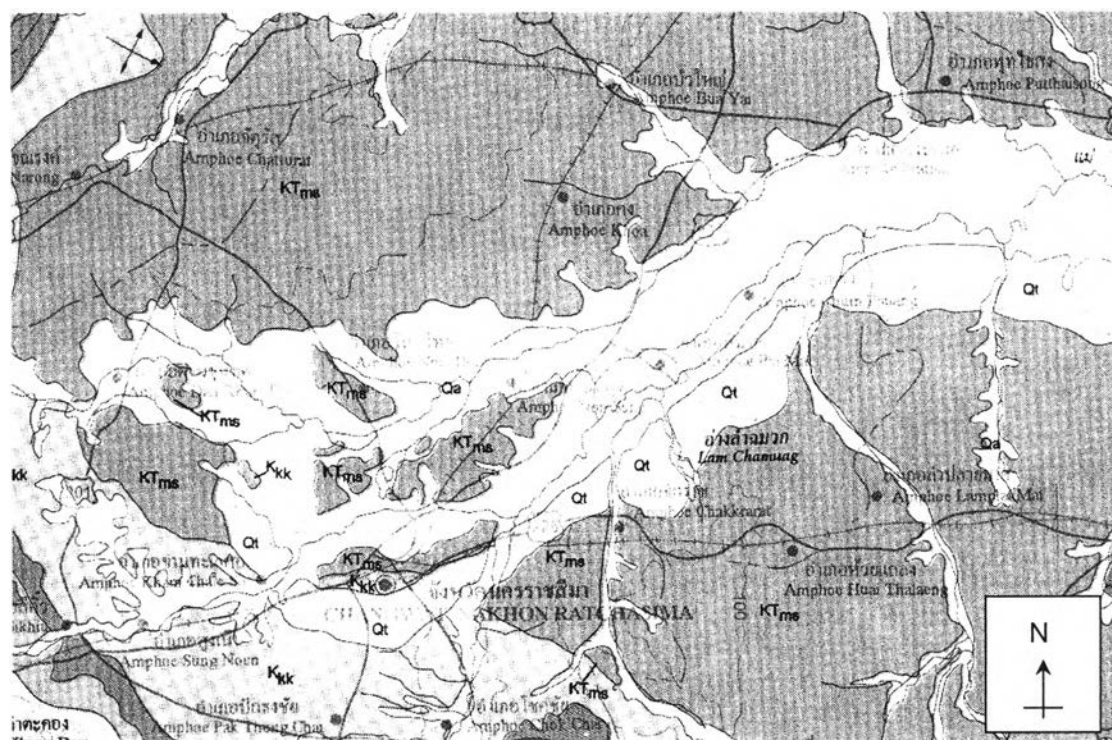
1.1 Study area

The study site (Mong Korn sand pit) is situated in Ban Som, Tambol Ban Tha Chang, Chaloe Pra Kiet District, Nakhon Ratchasima Province, Southern part of Khorat Plateau in Northeastern Thailand (Fig. 1). It lies between Kut Tayo and Kut Sa-nguan oxbow lakes of the old Mun River channel. The site can be accessed from highway no. 226 in Changwat Nakhon Ratchasima to Amphoe Chaloe Pra Kiet and accessed to local road to Ban Som. The site is situated at $15^{\circ} 02' 01.4''$ N latitude and $102^{\circ} 17' 33.5''$

E longitude. The area is shown on the topographical map, scale 1: 50,000, sheet 5439 II, series L7017, Amphoe Non Sung (Fig. 2). An observation site of Mun river is elevated on floodplain about 154 meter from mean sea level (msl.). The general vegetation along the river composes of rice fields, plantations, fresh water swamp forests and mound forests (Royal Thai Survey Department, n.d.). The climate of the area is classified as monsoon between based upon a critical alternation of wet and dry seasons. The meteorological data between 1973-2002 shown an 1,159.9 mm average annual rainfall, an annual relative humidity of 73% of, and an average annual temperature of 26.7°C (Wallakawin, 2546, in Thai). The seasons are divided as follows: the summer season lasts from March to May with an average temperature of 35°C . The rainy season is between May to October with an average temperature of 27°C . The winter season lasts from October to February with an average of 22°C (Thai LTD Travel, 2003). The sediments in the study area are mainly Quaternary fluvial deposits, originating either from sandstone, claystone or granitic rock. Wallakawin reported the geological structure of the site and adjacent areas are situated in fluvial deposits of Quaternary (Wallakawin, 2546, in Thai).



Figure 1 Map of Thailand showing Nakhon Ratchasima Province (Yahoo!® Travel. 2005).



มาตราส่วน
SCALE 1 : 1,000,000

10 5 0 5 10 20 30 40 50 60 70 80 90 กิโลเมตร
Kilometers

- | | |
|------------------|--|
| Q _s | Quaternary: Fluvial deposits; gravel, sand, and clay of channel, river bank, and flood basin. |
| Q _t | Quaternary: Terrace deposits; gravel, sand, and laterite of rejuvenated river. |
| KT _{ms} | Cretaceous: Maha Sarakham Formation; siltstone, reddish brown to pale red; claystone, and sandstone with frequent rock salt and gypsum. |
| K _{kk} | Cretaceous: Khok Kruat Formation; siltstone, gray to pale red; sandstone, claystone, and conglomerate with calcrete horizons. |
| K _{pp} | Cretaceous: Phu Phan Formation; sandstone, variegated colors (gray, brown, orange, pink), cross bedded, thick-bedded; siltstone and conglomeratic sandstone. |
| K _{sk} | Cretaceous: Sao Khua Formation; siltstone and sandstone, reddish brown, purple and red, calcareous, with abundant calcrete horizons. |
| bs | Quaternary: Igneous rock; Gem barren-alkali olivine basalt, hawaiite, mugearite and gem bearing-nephelinite, bazanite and nepheline hawaiite. |

Figure 3 Geological map of the study site, scale 1:1,000,000 (Geological Survey Division, DMR., 1997)

1.2 Objectives

- 1.2.1 To study lithostratigraphy of a fluvial system at the site.
- 1.2.2 To describe and identify spores and pollens.
- 1.2.3 To study palynostratigraphy within the lithostratigraphy.
- 1.2.4 To estimate the age of the sediments base on palynological data.
- 1.2.3 To interpret paleoclimate around the study site and adjacent area.

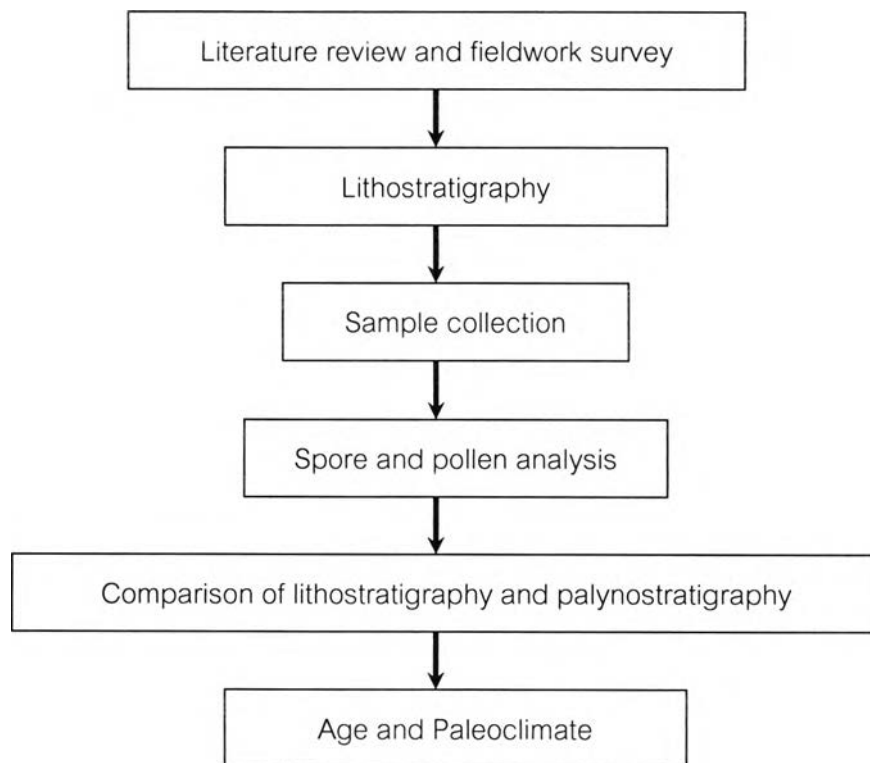
1.3 Scope of work

- 1.3.1 Study lithostratigraphy of a fluvial system at the site.
- 1.3.2 Describe and identify spores and pollens.
- 1.3.3 Estimate the age of the sediments and paleoclimate based on palynological data.

1.4 Methodology

- 1.4.1 Survey the previous investigation and several background theories.
- 1.4.2 Study lithostratigraphy of the site by columnar section construction.
- 1.4.3 Collecting samples (fine sand to clay sediments) from the profile of columnar section.
- 1.4.4 Extraction of spores and pollens from sediments.
- 1.4.5 Describe and identify spores and pollens.
- 1.4.6 Report the research results.

Research framework



1.5 Benefit of research

1.5.1 Understand the lithostratigraphy of a fluvial system at the site.

1.5.2 Understand the kind of spores, pollens and palynostratigraphy within the lithostratigraphy.

1.5.3 Understand the age of the sediments based on palynological data.

1.5.4 Understand the paleoclimate at the study site and adjacent area.