

CHAPTER I

INTRODUCTION

Freshwater leeches are segmented worms in the phylum Annelida, class Hirudinea (Moore, 1927). They are obligatory blood feeding ectoparasites of some animals such as fish, frogs, turtles, and mammals (Moore, 1927). Freshwater leeches spend the day under rocks or leaves in the lakes, streams, canals, or paddy field bottoms, and use water vibrations to detect their hosts (Klemm, 1972). Freshwater leeches play important roles in human history in several aspects. They have been used as medical devices for removing bad blood from patients (Elliott and Kutschera, 2011; Sket and Trontelj, 2008). They also have been used as model organisms in developmental genetics and neurobiology, in light of their large bodies, easily manipulated neurons, complex behaviors, and integrated locomotions (Kristan, Calabrese, and Friesen, 2005). All of leeches are hermaphrodites and perform cross fertilization. Each adult leech has an eversible penis for insertion into vagina of the partner reciprocally during copulation. After mating, both leeches can lay eggs. They lay eggs as small cocoons in the muddy bottom (Mann, 1962).

Freshwater leeches were classified into 4 families, namely Ichthyobdellidae, Glossiphonidae, Erpobdellidae, and Hirudidae, based mainly on external and internal morphological characters. They are body color, location and distance of male and female pores, vaginal stalk, and size of caudal (Moore, 1927). The most important leeches that strongly associated with human are freshwater leeches in the subfamily Hirudinae, which normally called "horse leech" or "buffalo leech" (Moore, 1927). Within the subfamily, six genera have been named. There are *Myxobdella* Oka, 1917;

Whitmonia Blanchard, 1887; *Dinobdella* Moore, 1927; *Hirudo* Linnaeus, 1758; *Limnatis* Moquin-Tendon, 1826; and *Hirudinaria* Whitman, 1886. In Thailand, only three species from the genus *Hirudinaria* have been recorded so far (Phillips, 2012) namely *Hirudinaria javanica* (Wahlberg, 1856); *Hirudinaria manillensis* (Lesson, 1842); and *Hirudinaria bpling* Phillips, 2012. Morphological similarity between the close related species and intraspecific variation of freshwater leeches have been gradually observed and reported recently (Phillips, 2012; Utevsky et al., 2009). Karyotype analysis has been selected as an alternative approach to compare with morphological characters for species identification (Utevsky et al., 2009). Karyotype analysis is an acceptable technique for assisting reliable identification and cheap. It is a process of pairing the homologous chromosomes and ordering all the chromosomes of an organism, so providing a genome-wide snapshot of an individual's chromosomes from an individual's cells. It can be used to confirm and clarify the taxonomic status that is previously classified by morphological characters, and the evolution of the organism could be more understandable (Sumner, 2003). Up to now, chromosomes and karyotypes techniques have been applied and still using in many taxonomic works, such as in the study of land operculate snails genus *Cyclophorus* (Kongim, Naggs, and Panha, 2006), polychaets family Nereididae (Ipucha et al., 2007), and also medical freshwater leeches genus *Hirudo* (Utevsky et al., 2009).

Objectives

1. To study taxonomy of freshwater leeches in the subfamily Hirudinae in northeastern Thailand.
2. To analyze the karyotype of freshwater leeches in the subfamily Hirudinae.

