

CHAPTER 5

CONCLUSION

In this study, morphological characters, nuclear DNA (nuDNA) and mitochondrial DNA (mtDNA) were used to analyse the genetic relationship and diversity of *Limnonectes* species collected from northern Thailand. After analysing the research findings, conclusion and suggestion are taken.

The key findings of the present research are:

6.1) Morphological character exploration of the *Limnonectes* specimens and morphometric measurements: The results in this study indicate that there are sexual differences in *Limnonectes* specimens in the northern specimens. In all cases, adult males were larger than adult females for statistical analyses showed considerable differences between sexes for measured characters. Although statistical difference was not detected, several characters tended to show difference between the northern and southern groups. Thus, the members of the two groups could be largely separated by using the combination of characters.

6.2) The phylogenetic tree and genetic distances analysis among *Limnonectes* species complex: The analyses are conducted using parsimony and maximum likelihood methods. The results in this study suggest that what has been recognised historically as a single species seems to be a complex with more than 6 distinct evolutionary lineages, in three species of which are currently subsumed under the nominal *L. blythii*, *L. taylori* and *L. gyldenstoepei* respectively.

Several cases of sympatric lineages were detected and in all cases co-occurring lineages were not each other's closest relatives.

6.3) Investigation of the two lineages (northern and southern Thailand): the two lineages of *L. taylori* from northern Thailand and two lineages of *L. blythii* from southern Thailand, taxonomic identification of the northern lineages and southern lineages population requires further morphological and microhabitat investigation.

6.4) The two lineages undescribed between *L. gyldenstoepei* here were observed in the samples collected from the northern mountain regions and separated from the range of *L. gyldenstoepei* (Chachoengsao Province, Thailand) by a large gap of central Thai lowlands. Considerably more work includes taxonomic identification will need to be done to examine the northern and eastern populations.