

CHAPTER 4

Discussion

In this study, identification of adult *Lutzia* followed Rattanaarithikul et al. (2005), based on the abdominal banding patterns, and three morphospecies, *Lt. fuscana*, *Lt. halifaxii* and *Lt. vorax* were found. There has been no difficulty to identify *Lt. fuscana* and *Lt. halifaxii*. However, *Lt. vorax* found on Doi Inthanon clearly differs from *Lt. vorax* from Ban Pang Mai Daeng in the adult, larval and pupal stages, but resembles all stages of *Lt. vorax* from Tokyo, Japan (the type locality of this species). All adult specimens from Doi Inthanon and Tokyo examined have the crossvein mcu beyond the rm which was not observed in *Lt. vorax* and the other two species from the plains. Edwards (1921) described *Lt. vorax* as a new species based mainly on the adult male characteristics and genitalia. He also emphasized that the crossvein mcu of *Lt. vorax* is placed beyond the rm or in a straight line whereas it is before the rm in *Lt. fuscana* (as *Lt. concolor*) and *Lt. halifaxii*. I therefore have considered this crossvein character to be diagnostic for *Lt. vorax* from Doi Inthanon and Tokyo. The color of apical bands on abdominal terga in *Lt. vorax* from Doi Inthanon is creamy white and appears different from *Lt. vorax* from Ban Pang Mai Daeng which is pale yellowish. However, *Lt. vorax* adults from Lampang Province show similar color of abdominal banding to Doi Inthanon, although the crossveins are similar to *Lt. vorax* Ban Pang Mai Daeng.

Previous studies did not find satisfactory morphological key to separate larvae of *Lt. vorax*, *Lt. halifaxii* and *Lt. fuscana* (Barraud, 1923, 1934; Belkin, 1962, Bram 1967; Tanaka et al., 1979; Rattanaarithikul et al., 2005). However, Tanaka et al. (1979) noted that *Lt. vorax* (as *Cx. (Lut.) halifaxii*) had weaker spicules on thoracic and abdominal integument compared with *Lt. fuscana*. The spicules of *Lt. vorax* from Doi Inthanon and Tokyo are sparsely and relatively shorter than *Lt. vorax* from Ban Pang Mai Daeng and the other two species. I therefore consider this to be a diagnostic character. In addition,

setae 1-M and 8-II,III and number of comb scales, when use in combination, are useful to separate *Lt. vorax* on Doi Inthanon and Tokyo from *Lutzia* species in the plains. Previous authors (Bram, 1967; Rattanaarithikul et al., 2005) did not recognized any differences between the larvae of *Lutzia* species found in Thailand, probably because all the specimens examined were collected from the plains.

The pupae exuviae have also been used for identification of *Lutzia* (Toma and Miyaki, 1986; Tanaka, 2003). The branching setae of pupae of *Lt. vorax* from Doi Inthanon closely match with those of *Lt. vorax* from Tokyo, particularly setae 1 and 5 of abdominal terga V and VI, which clearly differ from the pupae of *Lutzia* species from the plains. No clear differences were observed in pupae of *Lt. fuscana*, *Lt. halifaxii* and *Lt. vorax* from Ban Pang Mai Daeng.

The results of this study indicate that *Lt. vorax* from Doi Inthanon is closely related with *Lt. vorax* from Japan whereas *Lt. vorax* from Ban Pang Mai Daeng is not. The former has been collected with other mosquito larvae, i.e. *Anopheles baileyi*, *An. lindesayi cameronensis*, *An. bengalensis*, *Culex mimeticus*, *Cx. spiculothorax* and *Gilesius pulchrivent* - all of which are found at high altitudes in northern Thailand. Its distribution in other high mountains in Thailand needs to be explored. It is possible that *Lt. vorax* from Doi Inthanon is conspecific with topotypic *Lt. vorax* from Tokyo. The present results further suggest that *Lt. vorax* in the plains may be an unknown species. Further study including DNA analyses incorporated with taxonomy and life history is required to determine the specific status of *Lt. vorax* on Doi Inthanon and in the plains.

Copyright© by Chiang Mai University
All rights reserved