Karyotypes of seven species of bats from Thailand (Chiroptera, Mammalia)

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Summary. Karyotypes of *Myotis siligorensis, Myotis mystacinus, Pipistrellus pulveratus, Tylonycteris robustula, Miniopterus schreibersi fuliginosus, Hipposideros fulvus* and *Aselliscus stoliczkanus* from Thailand are investigated.
Key words. Karyotype; Chiroptera; Thailand.

In a previous paper, we described the conventional karyotypes of 12 species of bats from Thailand[2]. Nonetheless, karyotypic data of bats from Thailand are few. Karyotypic data are a useful indicator of bat phylogenetic relationships. Our purpose here is to describe the chromosomes of seven species of bats representing two families.

Materials and methods. Seven species of bats from different localities in Thailand were used in the present study. The scientific names of these bats are listed following Lekagul and McNeely[3]. *Myotis siligorensis, Pipistrellus pulveratus, Miniopterus schreibersi fuliginosus, Hipposideros fulvus* and *Aselliscus stoliczkanus* were collected in Chiang Mai, *Myotis mystacinus* in Pattani, *Tylonycteris robustula* in Songkhla.

To analyze the karyotype in this study, bone-marrow cells from the humerus were used in air-dried preparations. For some specimens, cultured cells from lung tissue were used in accordance with the procedure described previously[4].

Results and discussion. As shown in figures 1 and 2, the autosomal complement in two *Myotis* species, *M. siligorensis;* $2n = 44$; FN = 56 (♀), 55 (♂) and *M. mystacinus;* $2n = 44$, FN = 56 (♀), 55 (♂), consists of three pairs of large metacentrics, one pairs of small submetacentrics, one pair of minute submetacentrics and a graded series of 16 pairs of acrocentrics. The X chromosome is a submetacentric, and the Y is an acrocentric. The karyotype of *M. mystacinus* from Thailand is indistinguishable from that described for specimens from Czechoslovakia[5]. The chromosomal complement of *Pipistrellus pulveratus;* $2n = 44$, FN = 56 (♀), 55 (♂), consists of three large metacentric pairs, one small submetacentric pair, one minute metacentric pair and a graded series of 16 acrocentric pairs. The X chromosome is a submetacentric, and the Y is an acrocentric chromosome. Visible secondary constrictions are present in the regions adjacent to the centromeres in the acrocentric pair 14 (fig. 3). The karyotype of this species is very similar to that of the species *P. pipistrellus*[6-8], *P. savii*[9], *P. kuhli*[10,11] and *P. nathusii*[7].

The autosomal complement of *Tylonycteris robustula;* $2n = 32$, FN = 52 (♀ + ♂) consists of eight pairs of meta-submetacentrics, two pairs of subacrocentrics and five pairs of acrocentrics. The X chromosome is an acrocentric, and the Y is an acrocentric (fig. 4). This species has been karyotyped from Malaysia[12]. Karyotypic data of the present investigation are identical with that from the former report.

The autosomal complement of *Miniopterus schreibersi fuliginosus;* $2n = 46$, FN = 56 (♀) consists of two pairs of large metacentrics, one pair of medium-sized submetacentrics, one of subacrocentrics and a graded series of 18 acrocentric pairs. The X chromosome is a submetacentric (fig. 5). Karyotypes of this species have been reported from Italy[13], Turkumen, USSR[14], Japan[15-17], Czechoslovakia[8] and Borneo[18]. *M. magnater* and

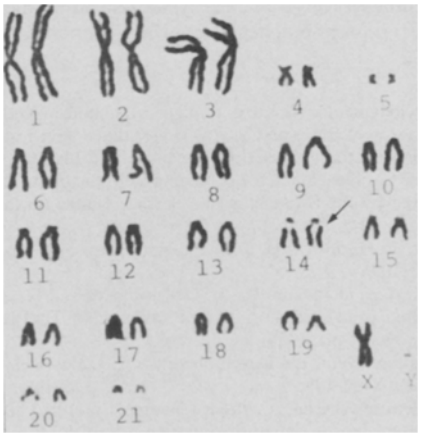

Figure 2. Karyotype of *Myotis mystacinus.*

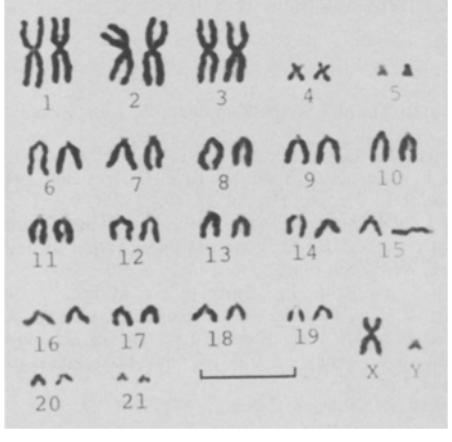

Figure 1. Karyotype of *Myotis siligorensis.* Scale indicates 10 μm.

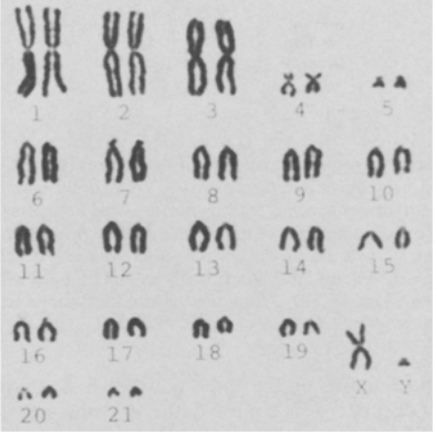

Figure 3. Karyotype of *Pipistrellus pulveratus.* Arrow indicates pair of chromosomes with secondary constriction.

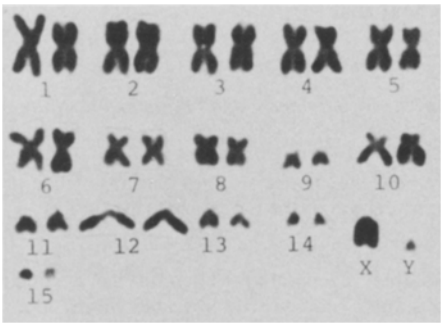

Figure 4. Karyotype of *Tylonycteris robustula*.

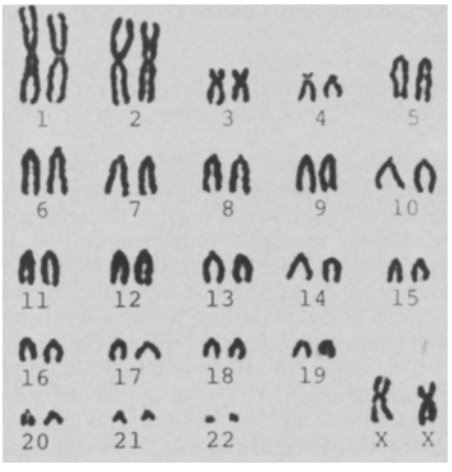

Figure 5. Karyotype of *Miniopterus schreibersi fuliginosus*.

Figure 6. Karyotype of *Hipposideros fulvus*. Arrow indicates pair of chromosomes with secondary constriction.

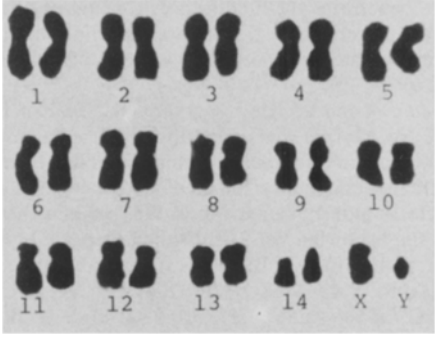

Figure 7. Karyotype of *Aselliscus stoliczkanus*.

M. australis have been karyotyped also from Borneo[18]. Karyotypes of *M. schreibersi* in Japan classified the smallest dot-like autosome pair as biarmed. It is possible to observe the biarmed shape only on well spread metaphases. In all other respects, karyotypes of *Miniopterus* species so far reported are indistinguishable from each other. But the karyotype of our Thai material has one pair of uniquely biarmed autosomes (no. 4). The short arm of this subacrocentric chromosome is totally heterochromatic (unpublished data).

The autosomal complement of *Hipposideros fulvus;* $2n = 32$, FN = 64 (♀), 63 (♂) consists of 12 meta-submetacentric pairs and three pairs graded in size from large to small. The X chromosome is a submetacentric, and the Y is a large acrocentric (fig. 6). One pair of large-sized metacentric autosomes (no. 9) possesses a secondary constriction. This species has been karyotyped from India[19,20].

The autosomal complement of *Aselliscus stoliczkanus;* $2n = 30$, FN = 60 (♀), 59 (♂) consists of 14 meta-submetacentric pairs grading in size from large to small. The X chromosome is a submetacentric and the Y is an acrocentric (fig. 7). The karyotype of this genus has not been published. The present investigation reveals that the karyotype of this species is almost identical with that of *Coelops frithi formosanus*[21], with the exception of the Y chromosome.

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