

## The Karyotype of Indochinese Tiger

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### Introduction

There are five subspecies of tigers that are still alive today: Siberian, Bengal, Sumatran, Amur and Indochinese (Mondadori, 1988). The Siberian tiger can be found in Russia whilst the Bengal comes from India, Bangladesh and Nepal. The Sumatran tiger as its name suggested, originated from the island of Sumatra in Indonesia. South China is known to be the place where Amur tigers can be found. Finally, Indochinese tigers are found in South East Asia (Jackson et al. 1998). In general, the male tiger measures over a meter in height at the shoulder and the female a little less. The documentation on Indochinese tigers especially the cytogenetic nomenclature has not been reported. Therefore, the objectives of this study are to determine the diploid number (2n) of the Indochinese tiger, to depict the morphology of the autosomes and sex chromosomes and to compare the karyotypes with those of the Bengal and Siberian tigers and the domestic cat, previously reported.

### Materials and Methods

Blood samples were collected in heparinised venoject tubes from either the femoral or coccygeal vein. Then, the blood samples were centrifuged to obtain the buffy coat containing the leucocytes. The buffy coat was then aspirated into a MacCartney bottle containing RPMI 1640 culture medium (Gibco), foetal bovine serum, pokeweed mitogen and penicillin-streptomycin. The cultures were incubated at 37°C for 72 hours. One hour before harvest, colcemid was added into each bottle. The cultures were agitated and transferred into centrifuge tubes and spun. The supernatant was decanted leaving behind the cell button. Prewarmed potassium chloride was introduced into each tube and incubated for another 20 minutes. The

tubes were again centrifuged, after which the supernatant was decanted, leaving behind the cell button. The cell button was broken up with a pasteur pipette and Carnoy's fixative was added before recentrifugation to discard the supernatant. Two drops of the cell suspension were placed on a pre-chilled glass slide, air dried and later stained with 10% Giemsa. Slides were later examined under a light microscope and metaphase spreads were scored and photographed.

### Results and Discussion

The morphological characteristics of chromosomes of both sexes are depicted as follows: 5 pairs of large metacentrics, 6 pairs of large submetacentrics, 3 pairs of medium-sized metacentrics, 2 pairs of medium-sized submetacentrics and 2 pairs of telocentrics. The X chromosome is a large metacentric while the Y chromosome is a telocentric. Photokaryotypes of the male and female Indochinese tigers are shown in Figures 1.0 and 2.0.

The diploid number (2n) of the Indochinese tiger in this study was 38, as reported previously (Hsu et al. & Bernirscke, 1971). The numbers of autosomes are 16 metacentrics, 16 submetacentrics and 4 telocentrics. While the sex chromosomes are comprised of a large metacentric X and in the male, the Y is a telocentric. From previous reports, the Bengal, Siberian and the domestic cat have chromosome complements of 38. However, they differ significantly in the chromosome morphologies (Table 1.0). This means that through evolution, although the number of chromosome is maintained throughout their ancestral line, polymorphisms do exist in the family, Felids. Thus, attempts to breed Indochinese tiger with Bengal or Siberian tiger either by natural or artificial insemination may not be successful. Since the

Indochinese tigers are categorised as endangered species probably having the Bengal or Siberian tigers as surrogate females could be taken into consideration.

### Conclusions

Metaphase spreads of the Indochinese tiger exhibited 38 chromosomes in a majority of lymphocytes. The karyotype of the female Indochinese tiger consisted of 5 pairs of large metacentrics, 6 pairs of large submetacentrics, 3 pairs of medium-sized metacentrics, 2 pairs of medium-sized submetacentrics and 2 pairs of telocentrics. The X chromosome is characterised by a large metacentric while the Y chromosome is a telocentric.

### Benefits from the study

We were able to establish the diploid number and depict the morphology of the chromosomes of the Indochinese tigers. A comparison was also done on the chromosome number and morphology of other species of tigers, previously studied by other workers. This cytogenetic work is the first to have been performed in this protected species of Indochinese tigers in Malaysia. We hoped to extend our work on all *ex situ* mammalian wild life of Malaysia and eventually to produce an atlas of mammalian chromosomes. This would benefit the public in general and contribute to the science of basic cytogenetics, especially to the society of cytogeneticists.

### Literature cited in the text

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