

In Figure 2 the degree of anaemia (hematocrit values) is plotted against $T^{1/2}\text{Cr}$, and even here a correlation is detectable, even though a marked scatter is apparent for the individual values.

Discussion. The correlation between the values of $T^{1/2}\text{Cr}$ and the rates of the spontaneous autohemolysis indicates that this in vitro measurement is a valuable tool to detect and to measure approximately the rate of hemolysis in chronic uraemics. Furthermore, such a correlation strongly suggests that the same factors are

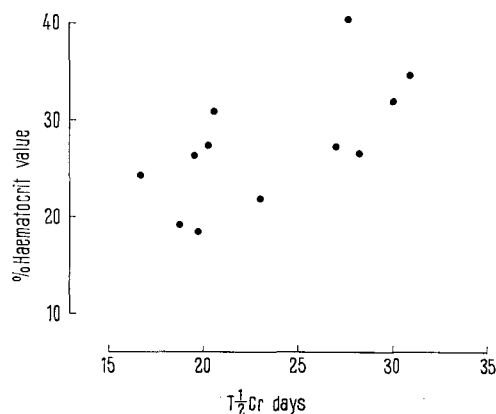


Fig. 2. The relationship between the degree of anaemia (hematocrit mean values) and the values of the $T^{1/2}\text{Cr}$ (Kendall rank correlation coefficient: $\tau = 0.545$; $0.01 < P < 0.02$).

responsible both for the in vitro and for the in vivo hemolysis in these patients.

Our previous studies (GIOVANNETTI et al.³) demonstrated a correlation between the rates of in vitro hemolysis and the severity of the patient's anaemia, which has been found to be correlated by the values of the $T^{1/2}\text{Cr}$ in the present research. Similar results are detectable in the anaemic uraemics whose $T^{1/2}\text{Cr}$ was measured by JOSKE et al.¹

These findings support the belief that in the genesis of anaemia of chronic uraemia an important role is played by the increased red cell destruction. If this is balanced by production, a steady state anaemia develops whose degree is related to the red cell survival, otherwise the anaemia is rapidly progressive as has been the case in 3 patients of our series.

Riassunto. In 12 uremici cronici non complicati ed in condizioni stazionarie della malattia, si è osservata una correlazione fra i valori del $T^{1/2}\text{Cr}$, l'entità della auto-emolisi spontanea in vitro e la gravità dell'anemia. Tali risultati dimostrano che questa metodica in vitro è un utile mezzo per la determinazione approssimativa della emolisi negli uremici cronici e che l'anemia di questi malati dipende in larga misura dalla aumentata distruzione eritrocitaria.

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Somatic Chromosomes of the Common Palm Civet, *Paradoxurus hermaphroditus* (Viverridae - Carnivora)

The first report on the chromosomes of a primitive carnivore, the small Indian mongoose *Herpestes auro-punctatus*, by FREDGA¹ in 1964 is highly interesting because of a new type of sex-determining mechanism in males of this species. Almost at the same time the present authors working at Banaras with a number of individuals belonging to the same species found, as reported by FREDGA, males with 35 and females with 36 chromosomes. Our observations of a trivalent association during meiosis also agreed with that of FREDGA, and we came to the same conclusion that the males are apparently XO, and it may be that the Y chromosome is translocated to one of the autosomes.

Until that date, this was the only species of the family Viverridae cytologically investigated. On finding this unusual type of sex chromosome constitution, FREDGA¹ suggested that the study of the chromosomes of the common palm civet, *Paradoxurus hermaphroditus*, would be most interesting. He has remarked that the scientific name suggests intriguing possibilities.

We could, however, procure only one young male of *P. hermaphroditus*. The somatic chromosomes alone could be studied; the preparation from the testis did not have any meiotic stages. A very large number of metaphase plates, most of them wellspread, were obtained

from colchicized femoral bone marrow cells. Slides were prepared by the air-drying technique after treating the cells with hypotonic sodium citrate solution and subsequently fixing them with aceto-alcohol.

The diploid number of chromosomes is 42 (Figure 1). Following the terminology of LEVAN et al.² the arrangement of the chromosomes into a karyotype, as shown in Figure 2, shows 4 pairs of median (m), 6 pairs of submedian (sm), 7 pairs of subterminal (st), and 3 pairs of terminal (T) chromosomes. The fourth pair of median chromosomes frequently have a distinct achromatic gap in one of the arms. On critically analysing the karyotype of 12 selected plates, it has been noticed that in all the plates the chromosomes of pair No. 10 are heteromorphic, being different in the length of the long arms. Whether this aberrant karyotype is a sporadic occurrence in the specimen studied, or is a common feature of this species, can only be known after studying other individuals. The X chromosome is submedian and is morphologically almost similar to the sixth and seventh pairs of autosomes, and therefore its true identity remains to be confirmed. The smallest chromosome in the complement is presumed to be the Y. The position of the centromere in the Y

¹ K. FREDGA, *Hereditas* 52, 411 (1964).

² A. LEVAN, K. FREDGA, and A. A. SANDBURG, *Hereditas* 52, 201 (1964).

chromosome is rather difficult to determine; in some plates it appears to be submedian.

The male of *P. hermaphroditus* has XY sex chromosomes – unlike XO male of *H. auropunctatus*. Besides these two, only one more species belonging to the family Viverridae, *Genetta genetta*, has been similarly examined.

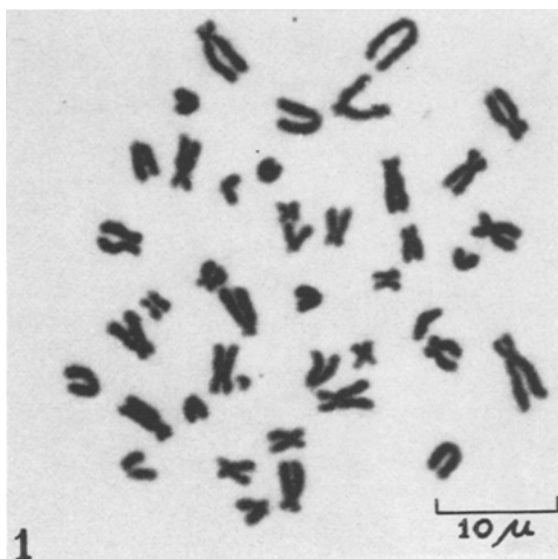


Fig. 1. Mitotic metaphase.

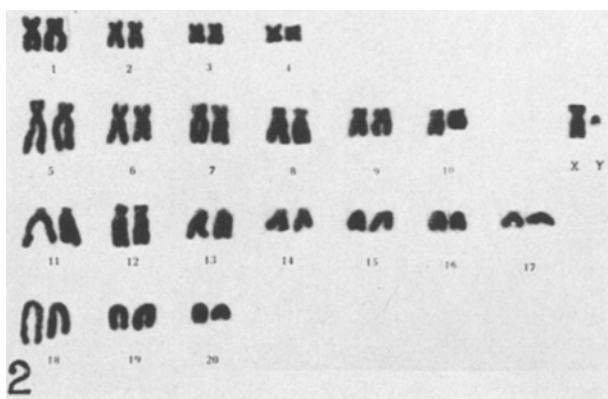


Fig. 2. Karyotype.

MATHEY³ studied the chromosomes of *G. genetta* and he found the diploid number to be 54 with XY males. It appears that the unusual type of XO sex chromosome constitution in males is of restricted occurrence in the family Viverridae. We, however, do not know whether this peculiarity is confined only to *H. auropunctatus*. It will therefore be highly interesting to study the chromosomes of other species belonging to the genus *Herpestes*.

Of the 6 living subfamilies under the family Viverridae (SIMPSON⁴), only 3 have been studied cytologically, one species from each subfamily. The chromosome complements of *H. auropunctatus* and *P. hermaphroditus* show very close similarity. *G. genetta* has a higher number of chromosomes and the morphology of the chromosomes is also different from that of the other 2 species. Only 1 pair of chromosomes have an achromatic gap in *G. genetta* and *P. hermaphroditus* but not in *H. auropunctatus*. The karyotypes of *H. auropunctatus* and *P. hermaphroditus* indicate the possibility of the evolution of chromosomal structure and number in the Robertsonian manner. The total number of arms in both the species is the same. *P. hermaphroditus* has a higher number of acrocentrics than *H. auropunctatus* and correspondingly there is a smaller number of meta- and submetacentrics in the former species.

The peculiar sex-determining mechanism in males of certain species, the problem of mechanism of evolution of karyotypes, and the nearness of the family to the primitive stem of Carnivora make the species of the cytologically inadequately explored family Viverridae an interesting group for further chromosomal study.

Zusammenfassung. *Paradoxurus hermaphroditus* Männchen haben XY Geschlechtschromosomen, im Unterschied zu den ungewöhnlichen XO Männchen von *Herpestes auropunctatus*. Beide Species gehören zu der Familie Viverridae der Ordnung Carnivora und demonstrieren die Robertsonsche Chromosomen-Evolution in Zahl und Struktur.

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³ R. MATHEY, Mammalian Chromosomes Newsl. 17, 74 (1965).

⁴ G. G. SIMPSON, Bull. Am. Mus. nat. Hist. 85, 228 (1945).

Abbauprodukte von Simazin in Gramineen

Bei der Behandlung von Gramineen, mit dem phytotoxischen Wirkstoff Simazin¹ (2-Chlor-4,6-diaethylamino-s-triazin), zeigen diese gegenüber der herbiziden Wirkung sehr unterschiedliche Resistenz. Verschiedene Autoren² schreiben die Fähigkeit, dieses Molekül zu inaktivieren, dem pflanzlichen Inhaltstoff Benzoxazinon (2,4-Dihydroxy-7-methoxy-1,4-benzoxazin-3-on) zu. Unter seinem Einfluss wird Simazin, in vitro, zu Hydroxysimazin (2-Hydroxy-4,6-diaethylamino-s-triazin) oxydiert. Weitere Analysen an resistenten Pflanzen zeigen jedoch, dass diese kein Benzoxazinon enthalten. Die Vermutung, das

verwendete Herbizid könnte anderen Abbauwegen folgen, war daher berechtigt.

Für die anschliessenden Untersuchungen diente eine Wasserkultur von *Coix lacryma-jobi* L., deren Gewebe erhebliche Mengen an Benzoxazinon enthalten³. Diese Pflanzen, ca. 20 Tage alt, wurden mit ¹⁴C-ringmarkiertem Simazin⁴ gefüttert. Dabei betrug die totale Aktivität 7,6 µc.

¹ Herbizides Handelsprodukt der Firma J. R. GEIGY AG, Basel.

² W. ROTH und E. KNÜSLI, Experientia 17, 312 (1961). R. H. HAMILTON und D. E. MORELAND, Science 135, 373 (1962).

³ R. H. HAMILTON, Agric. Food Chem. 12, 14 (1964).