

the synthesis of elviral by the Australian workers<sup>9</sup> on similar lines.

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#### CHROMOSOME NUMBER AND DNA, RNA VALUES IN SOME INDIAN BATS (CHIROPTERA)

OUR knowledge about the chromosomes of bats has been very meagre till todate despite their wide distribution. A survey of the literature reveals that cytogenetic reports of only a few Indian species of bats are available. The present studies were therefore, undertaken with a view to exploring the chromosomal data on as many representatives of bats as possible. The present findings, which are a part of a larger programme of research work on Indian bats, have been made on nine species. Of these, the chromosomal number of four species, viz., *Rhinopoma microphyllum kinneari*, *Taphozous nudiventris kachensis*, *Taphozous perforatus perforatus* and *Hipposideros fulvus pallisidus* is being reported for the first time, whereas that for the remaining five species, viz., *Cynopterus sphinx sphinx*<sup>1</sup>, *Rhinopoma hardwickei hardwickei*<sup>1-2</sup>, *Scotophilus heathi heathi*<sup>3</sup>, *Megaderma lyra lyra*<sup>4</sup> and *Rousettus leschenaulti*<sup>5</sup> had been known beforehand

also. The studies also include the estimation of DNA and RNA in mg/gm of known weight of tissues like liver and spleen in order to find out the possible relationship between these biochemical components of the nucleus and the chromosome number in the various species of bats under report.

For chromosomal studies, 0.5% of colchicine per kg body weight<sup>6</sup> was injected intraperitoneally and 2½ hours later the specimens were sacrificed and the marrow from the long bones was collected. After hypotonic treatment in sodium citrate (0.9%) for half an hour and fixation in acetic-alcohol (1 : 3) overnight<sup>6</sup>, the usual air-drying technique<sup>7</sup> was followed.

The quantitative estimation of DNA and RNA contents from the tissues was confined to a known weight (100 mg) by employing perchloric acid method<sup>8-9</sup>. The readings for DNA and RNA were taken from at least five different samples of the same species for every tissue on Bausch and Lomb Spectronic-20. The mean values in mg/gm were thus calculated from the standard graphs prepared by using the standard DNA's and RNA's of calf thymus gland and yeast respectively. The standard deviations and standard errors of the 'mean' were also calculated which refer to variation among the averages obtained from different individuals of the same species.

The studies of chromosomal slides reveal the diploid number of chromosomes varying from 34-54 in these various species (Table I). It is 34 in two, 42 in two, 36 in four and 54 in one species. The studies point out that the 2N number of chromosomes varies not only in the species belonging to different genera but also in the species of the same genus. Thus the species are rather indistinguishable on the basis of chromosome number alone.

The mean values for DNA, RNA in mg/gm. of the known weight of the various tissues obtained through repeated experimentation are also mentioned in Table I and Figs. 1 and 2.

Considering the chromosome number and DNA and RNA values on a collective basis, one finds that the species with the same diploid number of chromosomes possess a variable amount of DNA and RNA in their tissues. This has also been reported in the various species of the genus *Bufo* and in Amphibia in general<sup>10</sup> where the total nuclear DNA amount is the most variable cytogenetic character while the chromosome numbers are relatively constant. Similarly, in the two species, viz., *Hipposideros fulvus pallisidus* (Microchiroptera) and *Cynopterus sphinx sphinx* (Megachiroptera) both with a diploid number of 34 chromosomes, the DNA values are higher in the former than in the latter. Similarly, *Rhinopoma hardwickei hardwickei*, *Taphozous nudiventris kachensis*

TABLE I

Name, locality, diploid number and deoxyribose nucleic acid (DNA) and ribose nucleic acid (RNA) values in mg/gm with standard deviation (S.D.) and standard error (S.E.) in nine species\* of bats

| Sr. No. | Names of the Species                            | Locality        | Diploid No. | DNA value (mg/gm) $\pm$ S.D. $\pm$ S.E. |                                | RNA value (mg/gm) $\pm$ S.D. $\pm$ S.E. |                               |
|---------|---|-----------------|-------------|---|--------------------------------|---|-------------------------------|
|         |   |                 |             | Liver                                   | Spleen                         | Liver                                   | Spleen                        |
|         | Order Chiroptera                                |                 |             |   |                                |   |                               |
|         | Suborder Megachiroptera                         |                 |             |   |                                |   |                               |
|         | Family—Pteropodidae                             |                 |             |   |                                |   |                               |
| I.      | <i>Cynopterus sphinx sphinx</i>                 | Ambala          | 34          | 0.960 $\pm$ 0.054 $\pm$ 0.027           | 1.005 $\pm$ 0.017 $\pm$ 0.008  | 6.400 $\pm$ 0.200 $\pm$ 0.090           | 4.200 $\pm$ 0.240 $\pm$ 0.110 |
| II.     | <i>Rousettus leschenaulti</i> (Desmarest)       | do.             | 36          | 0.240 $\pm$ 0.040 $\pm$ 0.020           | 0.180 $\pm$ 0.020 $\pm$ 0.010  | 5.200 $\pm$ 0.200 $\pm$ 0.090           | 7.500 $\pm$ 0.230 $\pm$ 0.110 |
|         | Suborder Microchiroptera                        |                 |             |   |                                |   |                               |
|         | Family—Rhinopomatidae                           |                 |             |   |                                |   |                               |
| III.    | <i>Rhinopoma microphyllum kimnari</i> Wroughton | Agra            | 42          | 0.270 $\pm$ 0.050 $\pm$ 0.020           | 0.105 $\pm$ 0.005 $\pm$ 0.002  | 2.250 $\pm$ 0.440 $\pm$ 0.200           | 0.225 $\pm$ 0.090 $\pm$ 0.040 |
| IV.     | <i>Rhinopoma hardwicki</i>                      | Jodhpur         | 36          | 1.395 $\pm$ 0.0005 $\pm$ 0.0004         | 1.380 $\pm$ 0.081 $\pm$ 0.030  | 3.500 $\pm$ 0.014 $\pm$ 0.007           | 3.000 $\pm$ 0.500 $\pm$ 0.230 |
|         | Family—Emballonuridae                           |                 |             |   |                                |   |                               |
| V.      | <i>Taphozous nudiventris kachensis</i>          | Ambala          | 36          | 0.510 $\pm$ 0.060 $\pm$ 0.030           | 0.536 $\pm$ 0.001 $\pm$ 0.0005 | 2.470 $\pm$ 0.750 $\pm$ 0.340           | 2.500 $\pm$ 0.100 $\pm$ 0.040 |
| VI.     | <i>Taphozous perforatus</i>                     | Jodhpur         | 42          | 0.490 $\pm$ 0.230 $\pm$ 0.100           | 0.460 $\pm$ 0.160 $\pm$ 0.070  | 2.800 $\pm$ 0.150 $\pm$ 0.070           | 2.050 $\pm$ 0.050 $\pm$ 0.020 |
|         | Family—Megadermatidae                           |                 |             |   |                                |   |                               |
| VII.    | <i>Megaderma lyra lyra</i> (Geoffroy)           | Ambala and Agra | 54          | 1.530 $\pm$ 0.150 $\pm$ 0.070           | 1.530 $\pm$ 0.040 $\pm$ 0.010  | 7.700 $\pm$ 0.230 $\pm$ 0.100           | 3.400 $\pm$ 0.100 $\pm$ 0.040 |
|         | Family—Hipposideridae                           |                 |             |   |                                |   |                               |
| VIII.   | <i>Hipposideros fulvus pallisidus</i>           | Jodhpur         | 34          | 1.360 $\pm$ 0.150 $\pm$ 0.070           | 1.270 $\pm$ 0.100 $\pm$ 0.040  | 2.000 $\pm$ 0.100 $\pm$ 0.040           | 1.000 $\pm$ 0.200 $\pm$ 0.090 |
|         | Family—Vespertilionidae                         |                 |             |   |                                |   |                               |
| IX.     | <i>Scotophilus heathi heathi</i>                | Ambala          | 36          | 0.250 $\pm$ 0.040 $\pm$ 0.020           | 0.380 $\pm$ 0.010 $\pm$ 0.005  | 2.800 $\pm$ 0.270 $\pm$ 0.100           | 2.600 $\pm$ 0.350 $\pm$ 0.160 |

\* The species have been identified by Zoological Survey of India, Calcutta.



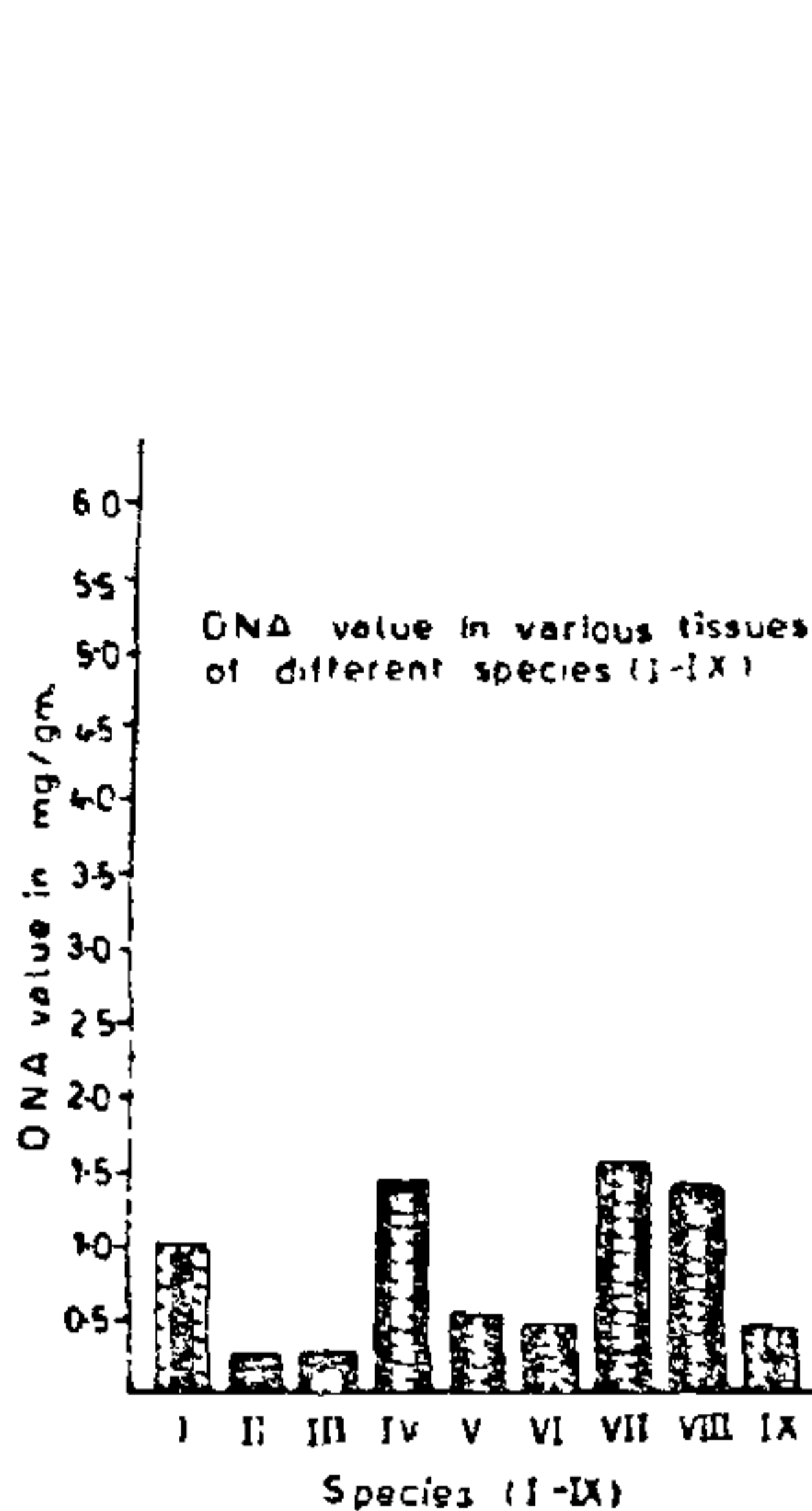


FIG. 1

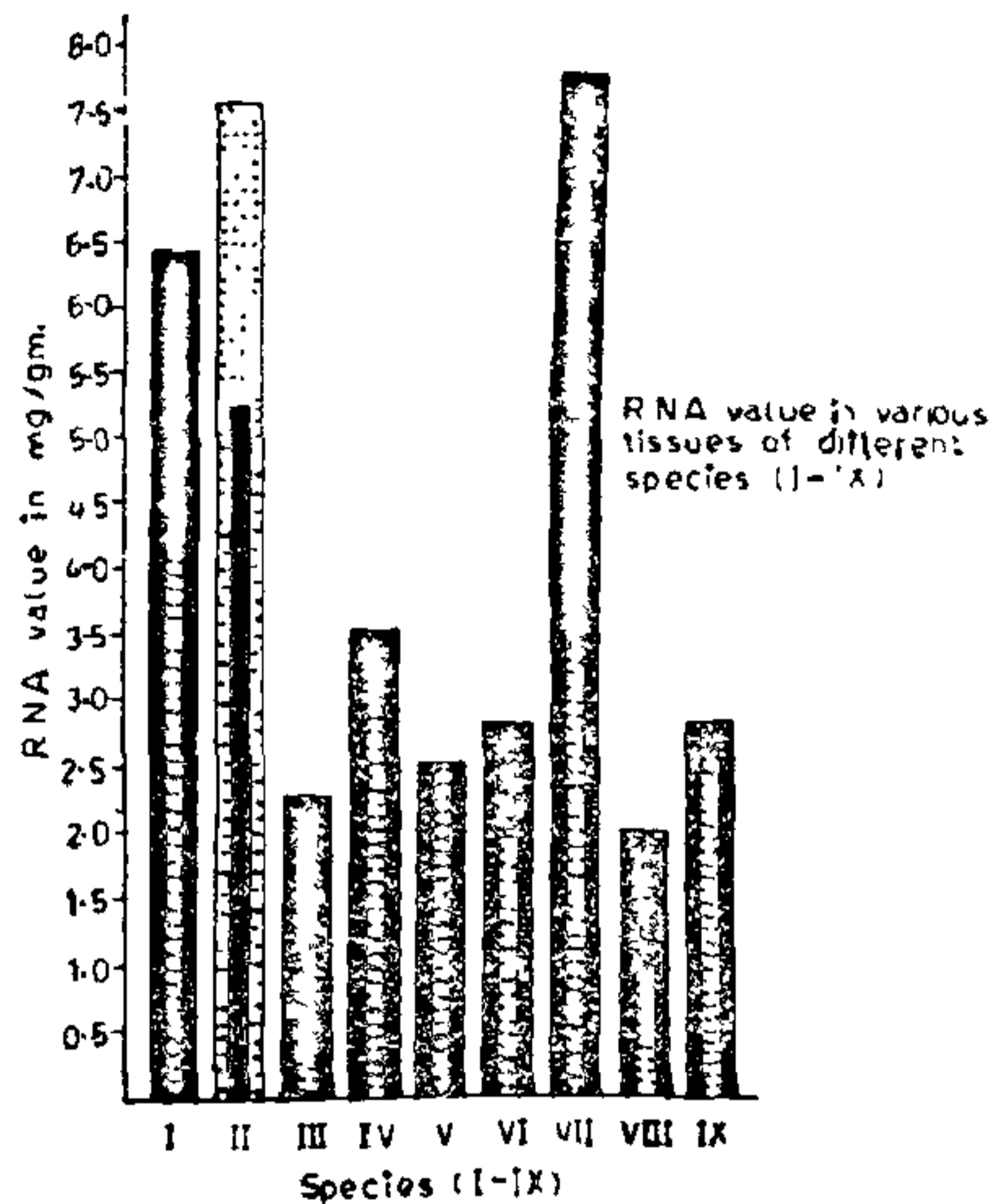


FIG. 2

FIGS. 1-2. DNA, RNA values in different species (I-IX) of bats.

Species: I—*Cynopterus sphinx sphinx*; II—*Rousettus leschenaulti*; III—*Rhinopoma microphyllum kinneari*; IV—*Rhinopoma hardwickei hardwickei*; V—*Taphozous nudiventris kachensis*; VI—*Taphozous perforatus perforatus*; VII—*Megaderma lyra lyra*; VIII—*Hipposideros fulvus pallisidus*; IX—*Scotophilus heathi heathi*.

and *Scotophilus heathi heathi* each with 36 chromosomes in their diploid sets possess different amount of DNA and RNA. This is also true for *Rhinopoma microphyllum kinneari* and *Taphozous perforatus perforatus* having diploid number of 42 chromosomes. The studies thus suggest that the amount of DNA and RNA in a tissue of a species forms a distinctive and a characteristic parameter for differentiating the species having the same number of chromosomes in their diploid sets.

The present findings also reveal that except for *Rousettus leschenaulti*, *Rhinopoma microphyllum* and *Scotophilus heathi heathi*, the DNA values in the rest of the species are nearly constant in the two tissues dealt with. This, however, does not hold true for the RNA values which vary not only in the two tissues of the same species but also in a specific tissue of different species.

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#### ISOLATION OF *CORYNEBACTERIUM PYOGENES* FROM AN ABORTED EQUINE FOETUS

THE bacterium *Corynebacterium pyogenes*, first described by Lucet in 1893 from suppurative lesions in cattle, is widespread amongst domestic animals affecting cattle, sheep, goats and pigs. The common disease conditions caused by this organism are suppurative pneumonia, suppurative arthritis and other