



Mam Ph

Reprinted from the Proceedings of the X International Congress of Genetics,
Volume II, 304—305, 1958.

WAHRMAN, J., and A. ZAHAVI. Cytogenetic Analysis of Mammalian Sibling Species
by Means of Hybridization. *Department of Zoology, The Hebrew University,
Jerusalem, Israel.*

Three allopatric forms of *Gerbillus pyramidum* (Rodentia: Gerbillinae) are indistinguishable by conventional taxonomic criteria, but differ widely in the form and numbers of their chromosomes:

| Population | 2n male | Metacentric chromosomes | Acrocentric chromosomes | Chromosome arms |
|--------------------------|------------|----------------------------|----------------------------|--------------------|
| 1 Algeria | 40 | 38 | 2 | 78 |
| 2 Israel-coastal plain | 52 | 22-24 | 28-30 | 74-76 |
| 3 Israel-Negev | 66 | 10 | 56 | 76 |
| 4 Hybrid between 1 and 3 | 53 | 24 | 29 | 77 |

These data suggest a Robertsonian relationship.

A male hybrid was obtained by mating a female from the Israel-Negev population ($2n = 66$) to a male from Beni-Abbes in Algeria ($2n = 40$). The fertility of the hybrid was not definitely ascertained but on dissection the testis proved to contain spermatozoa displaying no gross morphological deviations from the normal. Spermatogonial metaphase plates possess 53 elements. Diakineses and first metaphases reveal a considerable regularity in chromosome association: The 14—16 elements comprise 3 bivalents, 8—10 trivalents which result from the pairing of two acrocentrics with one metacentric chromosome and 3—4 chain configurations each made up of 5—7 chromosomes. A few cells contain a single univalent, which may have become detached from the end of a chain. Second metaphase plates are of many kinds differing in number of chromosomes and chromosome arms.

The analysis of the synapsis in the hybrid thus discloses a high degree of genetic affinity between populations which are some 4,000 km. apart and which differ by as many as 26 chromosomes. The numerous trivalents bear witness to the homology of acrocentrics from the Negev population to metacentrics of the Algerian form. The compound chains suggest that certain metacentrics of the two genomes are homologous for only one of their arms (Oenothera fashion) owing to independent Robertsonian changes.

The three strains are interpreted as a series of allopatric sibling forms of common ancestry. The main discrepancy between its members is due to organization of the genetic material in different numbers of linkage groups. The evolutionary significance of changes in chromosome numbers between related species are discussed.