

THE NUCLEIC ACIDS OF COTTON

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All of the thirty diploid species of Gossypium recognized by botanists are separated into six genomic classes (A-F) on the basis of their morphological characters, geographic origin and crossing behavior. There are also three amphidiploid species, two cultivated and one wild that contain chromosomes from both the A and D genomes. It was of interest, therefore, to examine both the DNA and RNA content of representative diploid and amphidiploid species of Gossypium and to evaluate the results in light of the present genomic classification.

The DNA content of the species investigated in this study varies significantly, and apart from the tetraploid AD species, the diploid species are grouped in genome classes and follow the order C, F, E, A, B, D with respect to decreasing DNA content. The differences that contribute to the significant variance appear to exist between genome groupings as a whole.

Since there are no prior data on nuclear volume measurements in Gossypium the best information available from the laboratory of Meta S. Brown indicates that the order of decreasing size of Gossypium chromosomes with respect to genome groupings is C, E, F, B, A, D; except for the order of the B and A genomes (whose chromosomes are approximately equal in size) the data indicates a definite correlation between DNA content and chromosomal size.

This relationship is reflected quite well in the tetraploid AD species. The average amount of DNA from these species falls somewhat near the median value of the diploid array. This is due to the amount of DNA contributed by the twenty-six large and twenty-six small D chromosomes that make up the tetraploid.

Upon examination of the RNA content a significant variance between individual and groups of species was also noted. In contrast to DNA, however, there was no distinct correlation between genome grouping and RNA content.