

Chapter 24

Evolutionary Aside 24.2--Comparison Between Two Plant Genomes

The first plant genome to be sequenced was of *Arabidopsis thaliana*, the wall cress, a tiny member of the mustard family often used as a model organism for studying molecular genetics and development in the flowering plant. Its genome sequence, largely completed in 2000, revealed 25,948 genes, about as many as humans have, in a genome with a size of only 125 million base-pairs, a 30-fold smaller genome than that of humans.

Rice, *Oryza sativa*, belongs to the grass family, which includes maize (corn), wheat, barley, sorghum, and sugarcane. Unlike most grasses, rice has a relatively small genome of 430 million base-pairs. Its close relative maize, *Zea mays*, has a 60-fold larger genome and has also been sequenced. Although rice and *Arabidopsis* are distant relatives, they share many genes. More than 80% of the genes found in rice, including duplicates, are also found in *Arabidopsis*. Among the other 20% are genes that may be responsible for some of the physiological and morphological differences between rice and *Arabidopsis*. It is probable that many of the other differences between the two species reflect differences in gene expression, as discussed later in this chapter. (The morphological and physiological distinctions are described in chapter 31.)