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Construction and characterization of a bacterial artificial chromosome library for the allotetraploid *Gossypium tomentosum*

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ABSTRACT. *Gossypium tomentosum* is a wild allotetraploid species with the $(AD)_5$ genome. It is characterized by many useful traits including finer fiber fineness, drought tolerance, and *Fusarium* and *Verticillium* resistance. We constructed the first bacterial artificial chromosome library for *Gossypium tomentosum*. With high quality and broad coverage, this library includes 200,832 clones, with an average insert size of about 122 kb and fewer than 3% empty clones. Our library is approximately 10-fold the size of the $(AD)_5$-genome (2400 Mb) and provides a 99.7% probability of isolating genes of interest or their sequences. Seven of eight simple sequence repeats markers that are located on five different chromosomes and linked with resistance to *Verticillium* wilt could amplify the 50 superpools and obtained one to five hits. This high capacity library will be an important genomic resource for classifying and analyzing the evolution of allotetraploid cotton species as well as for isolating disease-resistance and drought-tolerance

genes.

Key words: Wild cotton; *Gossypium tomentosum*; Drought tolerance; Bacterial artificial chromosome library; *Verticillium* wilt resistance; SSR marker

