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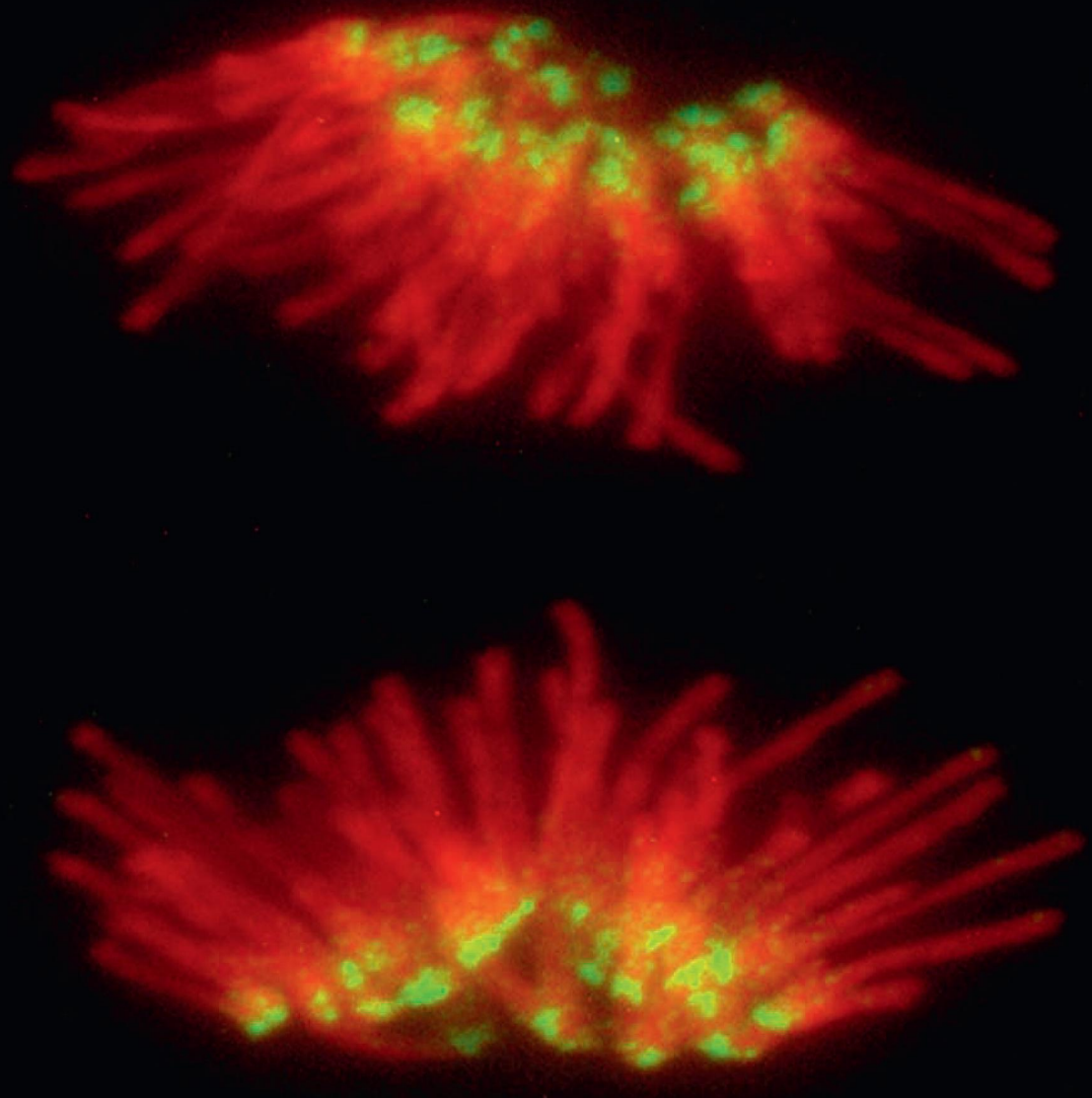

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Cover Illustration: Mitotic anaphase in an F_1 hybrid between wheat (*Triticum turgidum* L.; Poaceae) and rye (*Secale cereale* L.; Poaceae). The centromeres fluoresce green from fluorescein isothyocyanate (FITC) conjugated to an anti-dig-oxygenin-antibody used to detect a dig-oxygenin-labeled, centromere-specific DNA probe; chromosomes fluoresce red from propidium iodide. Magnification ca. 1000x, standard epifluorescence optics. Interspecific hybrids such as this one are usually sterile because the chromosomes do not pair in meiosis and no functional gametes are formed. However, the wheat parent of this F_1 hybrid carries a genetic mechanism that abbreviates meiosis to a single division. In this version of meiosis, called first division restitution (FDR) or single division meiosis (SDM), unpaired chromosomes (univalents) align at the metaphase plate in what should be the first meiotic division, and sister chromatids separate in anaphase, as if in normal mitosis. There is no reduction of chromosome number and no second division. The resulting gametes carry somatic sets of chromosomes; the hybrids are fertile and create fertile progeny with twice the chromosome number of the F_1 hybrid. This pathway is the most likely for creating natural allopolyploids. Of considerable surprise was the recent discovery that, while many such allopolyploids do have the expected chromosome numbers, the constitution of their chromosomes deviates from the expected. These deviations include nulli-tetrasomics and monotrisomics, usually compensating (that is, involving genetically equivalent—homoeologous—chromosomes from parental genomes), and often accompanied by translocations of homoeologues. Such variation in chromosome constitutions of newly formed allopolyploids is generated by minor changes in the pattern of the first division restitution: pairing of homoeologues, even if rare, generates gametes that are nullisomic for one of the paired chromosomes and disomic for the other, and as metaphase I pairing is based on crossing over, at least one of the two sister chromatids in each homoeologue is recombined. Since genetically equivalent parental chromosomes are involved, the resulting gametes are functional. On the other hand, precocious migration of univalents to the poles of a meiocyte undergoing single division meiosis, in advance of sister chromatids separating from remaining univalents, generates nulli-disomic gametes involving random chromosomes and without translocations. Such meiotic events, even if relatively rare, greatly expand the range of chromosome constitutions of new allopolyploids and may account for their evolutionary success. See Oleszczuk and Lukaszewski—The origin of unusual chromosome constitutions among newly formed allopolyploids, pp. 318–326 in this issue. Image credit: Sylwia Oleszczuk.

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Corrigendum

Volume 101(1): 1–5. Jernstedt, J.— "The *American Journal of Botany*: Into the Second Century of Publication." In Table 1 of this article, the author wrote that the first color plate to appear in the *American Journal of Botany* was from Fosket and Miksche in 1966. The first use of color in the *AJB* was actually: Ownbey, M. 1950. Natural hybridization and amphiploidy in the genus *Tragopogon*. 37: 487–499. The Fosket and Miksche paper contained the first color micrographs published in the *AJB*.

The author apologizes for this error. The online article has been corrected.

Abbreviations

Miscellaneous: AFLP, amplified fragment length polymorphisms; a.s.l., above sea level; bp, base pair; BP, before present; BSA, bovine serum albumin; cpDNA, chloroplast DNA; CTAB, hexadecyltrimethylammonium bromide; cv., cultivar; ddH_2O, double-distilled water; dNTP, deoxyribonucleotide E.C., Enzyme Commission; EDTA, ethylene diamine tetra-acetic acid; f. sp., forma specialis; indels, insertions and deletions; ITS, internal transcribed spacer; LM, light microscopy; mya, million years ago; PAGE, polyacrylamide gel electrophoresis; PCR, polymerase chain reaction; RAPD, random amplified polymorphic dimorphism; SDS, sodium dodecyl sulfate; SEM, scanning electron microscopy; s.l., sensu lato; s.s., sensu stricto; subsp., subspecies; TEM, transmission electron microscopy

Genetics: A, mean number of alleles per locus; D, mean genetic distance; CI, consistency index; F, fixation index; F_{IT}, total deviation from Hardy-Weinberg expectations; F_{ST}, genetic diversity among populations; F_{IS}, inbreeding within populations; G_{ST}, the proportion of genetic diversity among populations; H_e, Hardy–Weinberg expected heterozygosity; H_o, observed heterozygosity; MP, most parsimonious tree; n, individual chromosome number; Nm, mean number of migrants per generation; P_p, percentage of polymorphic loci; RI, retention index; x, base chromosome number

Statistics and math: ANOVA, analysis of variance; CV, coefficient of variation; df, degrees of freedom; N, number of individuals; p, probability; P, level of significance; PCA, principal components analysis; r, coefficient of correlation; SE, standard error; SD, standard deviation