Tetraploid oat species *Avena abyssinica*, *A. vaviloviana*, *A. barbata*, and *A. agadiriana* were studied using C-banding technique, in situ hybridization with the 45S and 5S rDNA probes, and RAPD analysis in comparison with the diploid species carrying different types of the A-genome (*A. wiestii*, *As*; *A. longiglumis*, *Al*; *A. canariensis*, *Ac*; *A. damascena*, *Ad*, *A. prostrata*, *Ap*). The investigation confirmed that all four tetraploids belong to the same AB-genome group; however *A. agadiriana* occupies distinct position among others. The C-banding, FISH, and RAPD analyses showed that *Avena abyssinica*, *A. vaviloviana*, and *A. barbata* are very similar; most probably they originated from a common tetraploid ancestor as a result of minor translocations and alterations of C-banding polymorphism system. AB-genome species are closely related with the A-genome diploids, and an As-genome species may be regarded as the most probable donor of their A-genome. Although their second diploid progenitor has not been identified, it seems unlikely that it belongs to the As-genome group. The exact diploid progenitors of *A. agadiriana* have not been determined; however our results suggest that at least one of them could be related to *A. damascena*.

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