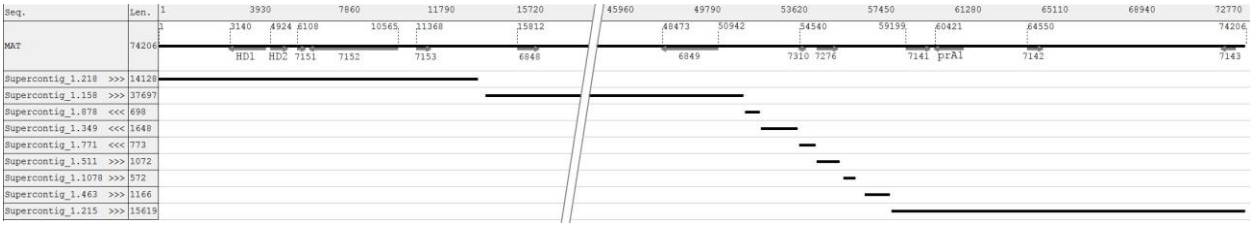

Figure S1 Assembly of extended matA1 scaffold from lam1 supercontigs. The first column lists the names of supercontigs from the lam1 genome assembly; the second column shows orientation of these contigs in the top scaffold; the third column shows the length of each of the sequences in base pairs. The arrows below the top scaffold show the genes according to current annotation of lam1 genome by Broad Institute (except prA1, which was absent from the annotation and was added by us). Note that for brevity the original gene names "MVLG_0xxxx" were shortened to xxxx, where xxxx are gene numbers shown on the figure. The two homeodomain genes involved in mating type determination are shown by their names (HD1 and HD2) and correspond to Broad Institute gene numbers MVLG_07141 and MVLG_07150, respectively.

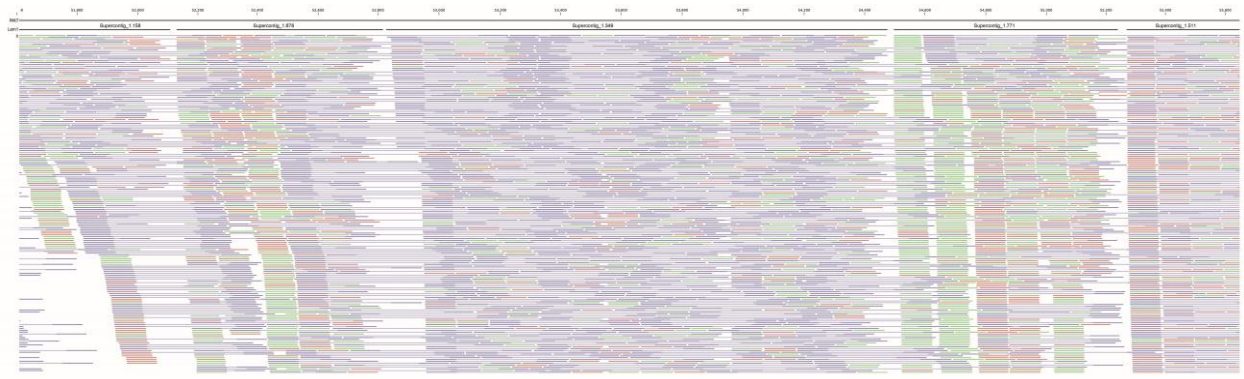

Figure S2 A fragment of paired-end read mapping to the matA1 scaffold illustrating 'stepping' across the gaps approach and supporting linkage of the supercontigs into the longer scaffold. The black line at the top shows the resulting matA1 scaffold; horizontal black lines immediately under it show the location of individual supercontigs joined together. Thick coloured lines show individual reads; paired reads (blue) connected by a thin blue line, indicate paring. Many such paired reads map on both sides of the gaps between the supercontigs, providing support for joining them into a longer scaffold.

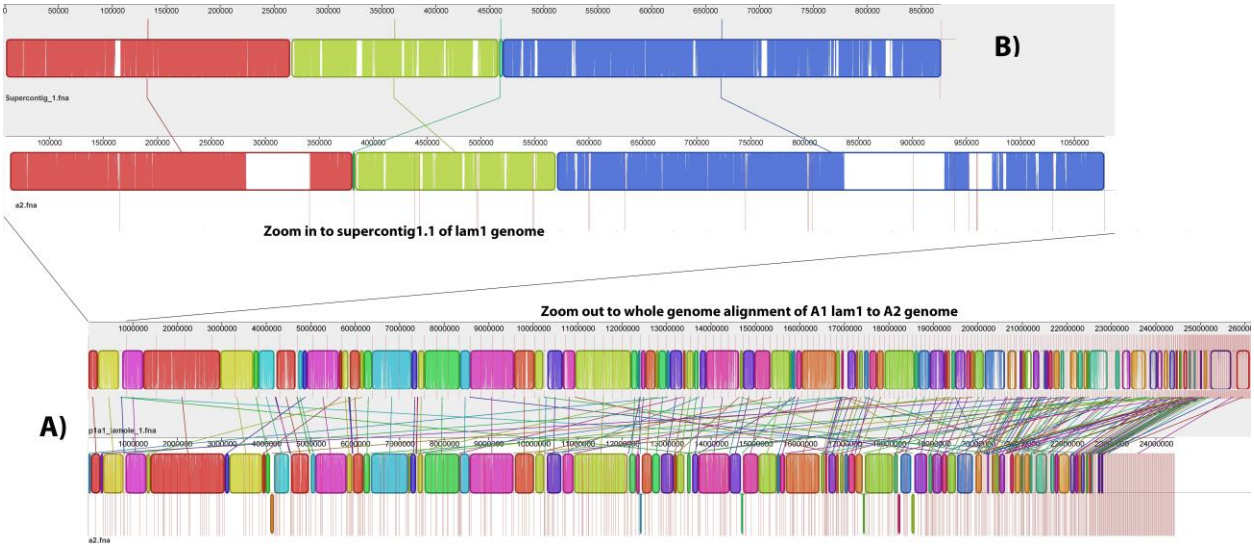

Figure S3 Alignment of A1 lam1 and *de novo* assembled A2 genomes. As in Figure 2, the blocks show regions of homology and the coloured bars in the blocks indicate the extent of local sequence similarity (see Figure 2 legend for details). The alignment of A1 and A2 genomes is shown in panel A, while panel B represents an alignment supercontig1_1 of the lam1 genome with homologous regions in the A2 genome.

Table S1 A list of lam1 contig names, their locations in the SR or NSR and sequence coverage in each of the samples sequenced.

Available for download as an Excel file at
http://www.genetics.org/lookup/suppl/doi:10.1534/genetics.114.171702/-/DC1