**Figure S3** Analysis of the allele count data from dataset 2. (A) Kullback–Leibler divergence (KLD) measure between the posterior of $\delta_j$ and its centering distribution for all simulated loci. Loci under positive selection are depicted in red, loci under balancing selection in blue, and neutral markers are in grey. (B) $F_{ST}$ as a function of the KLD measure for all loci. (C) False positive (neutral loci detected as outliers) and false negative (selected loci not detected as outliers) rates as a function of the KLD measure. (D) Relationship between the Bayes factor $\log_{10}(BF)$ from the BAYESCAN analysis of dataset 2 and the KLD. The horizontal lines in (A) and the vertical lines in (B–D) indicate the KLD thresholds corresponding to the 95%-, the 99%- and the 99.9%-quantile of the of the KLD distribution from the pod analysis of dataset 2. In (D), the horizontal lines indicate the $\log_{10}(BF) = 1$, $\log_{10}(BF) = 1.5$ and $\log_{10}(BF) = 2$ thresholds, which correspond to ''strong'', ''very strong'' and ''decisive'' support, respectively, following Jeffreys' (1961) scale of evidence.

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