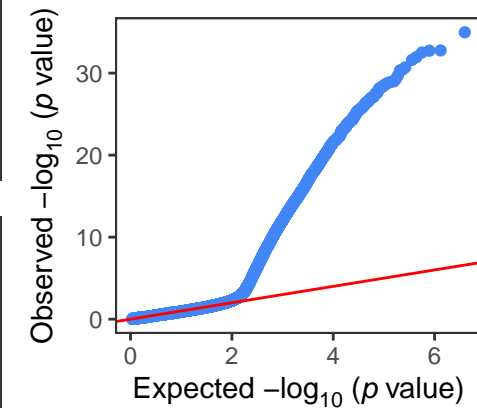
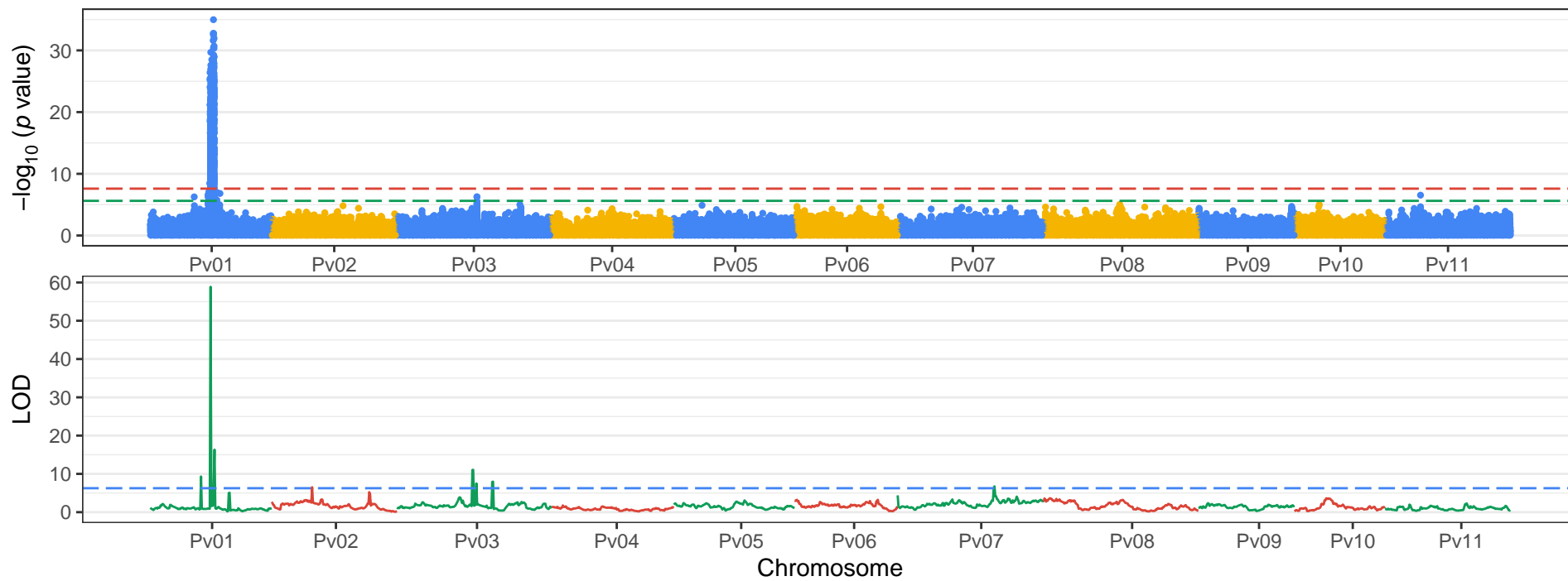
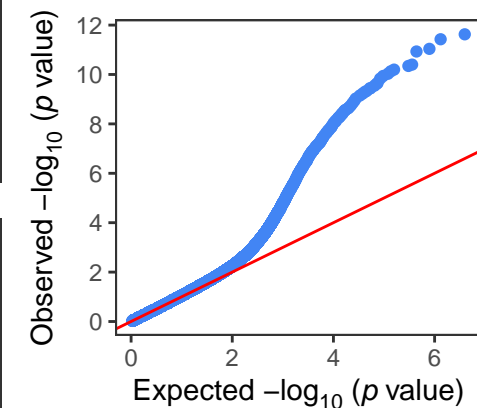
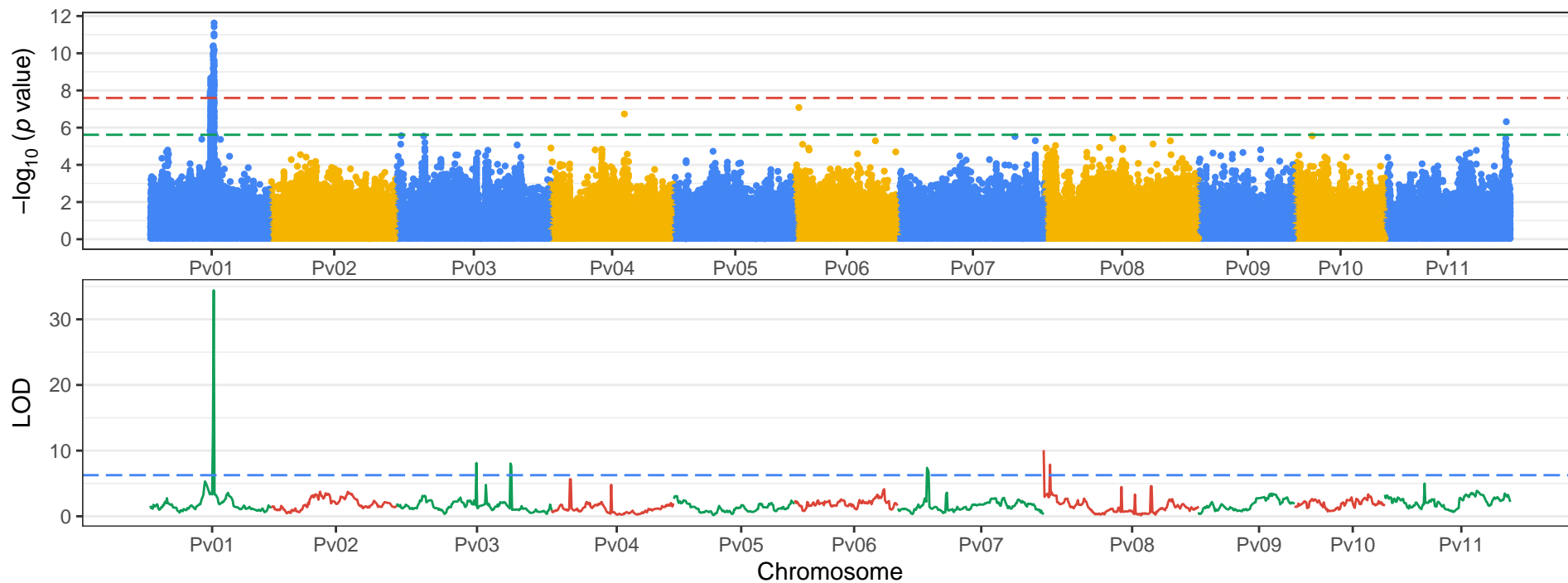


## DF 2013

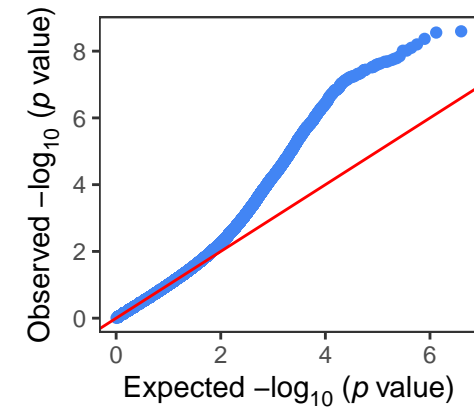
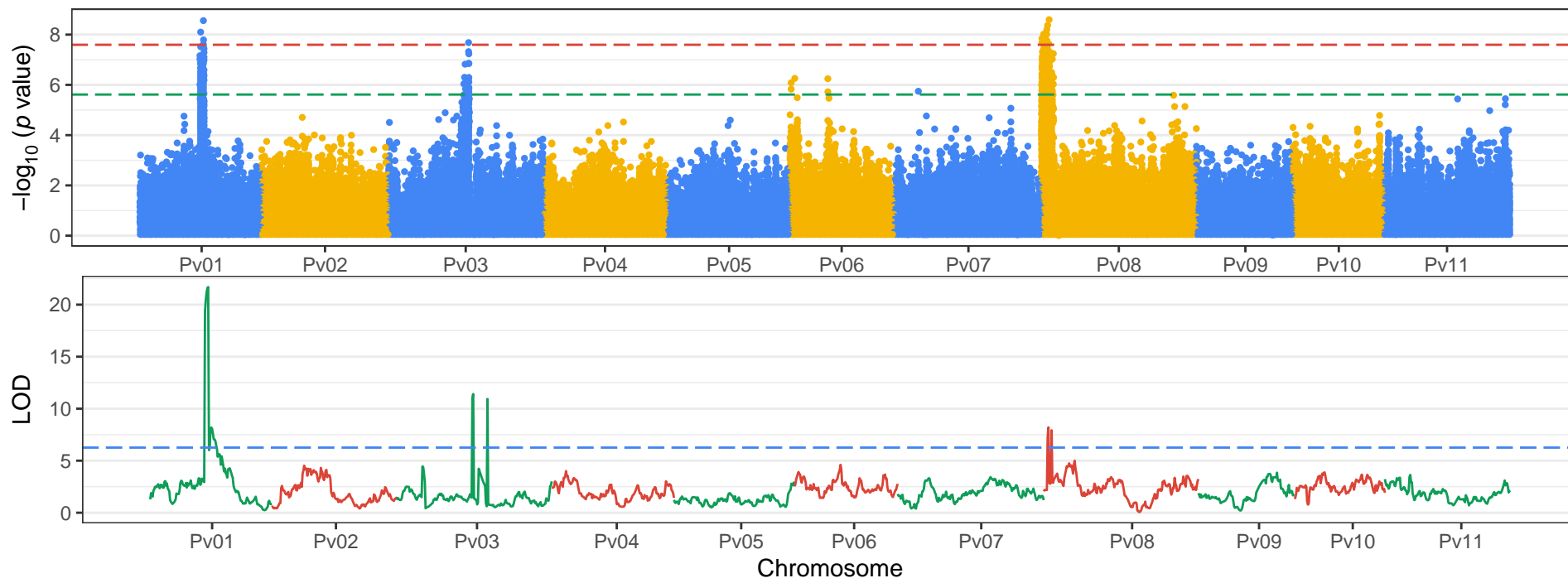


## DF 2014

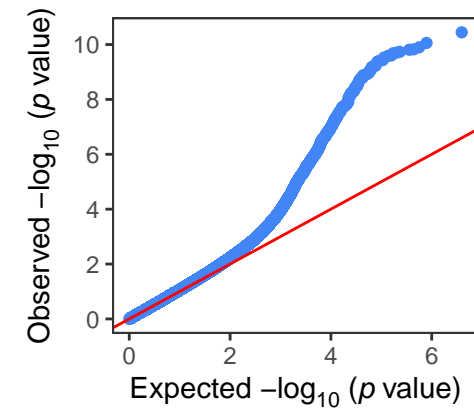
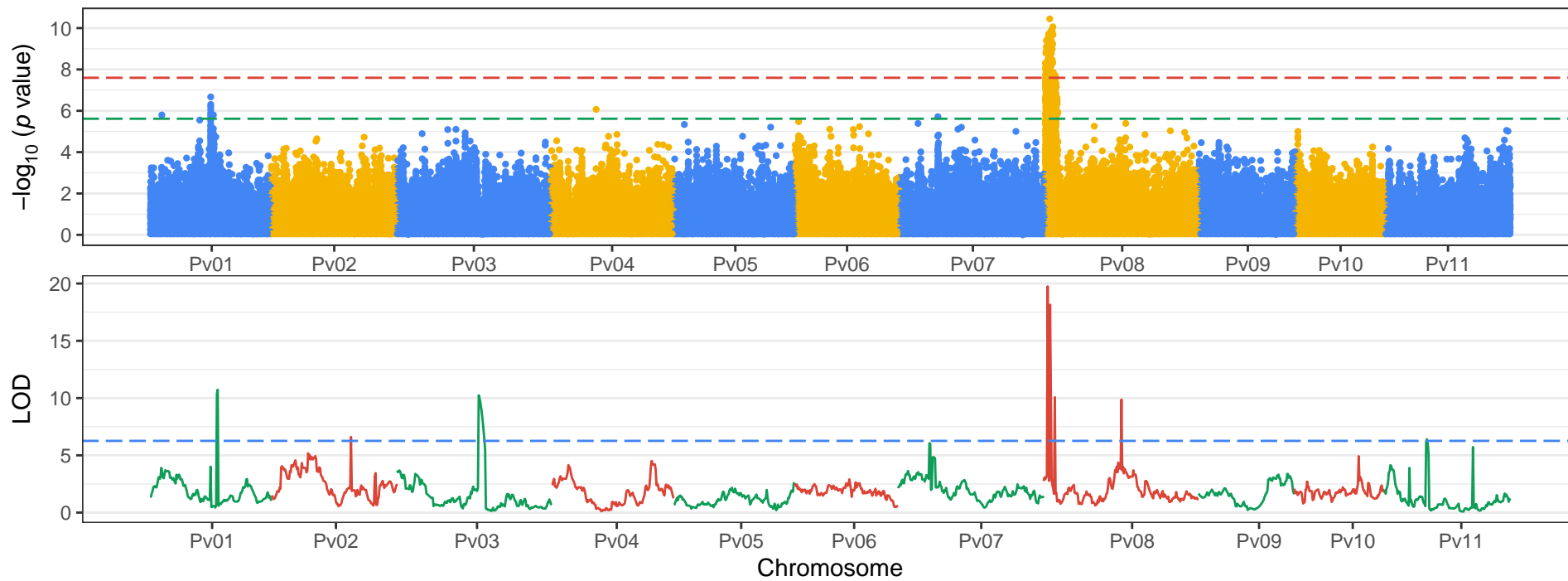


**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

### DPM 2013

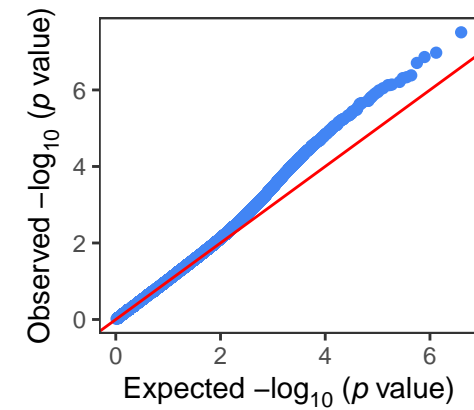
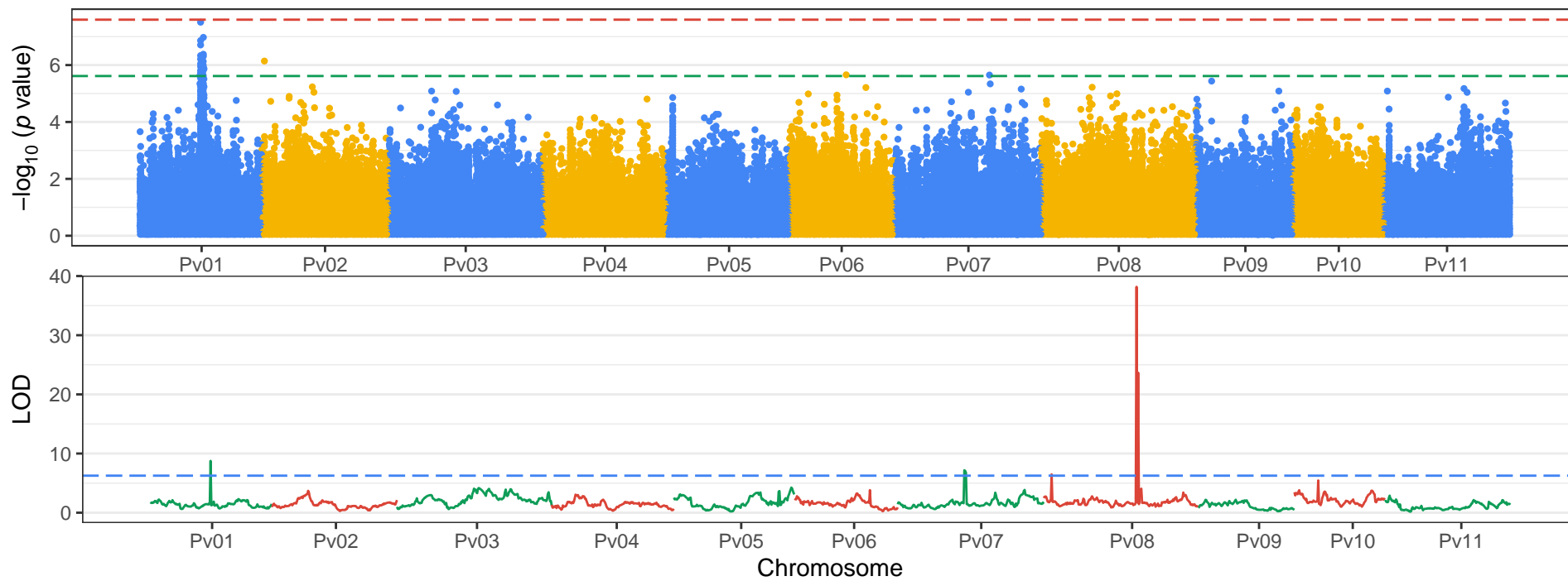


### DPM 2014

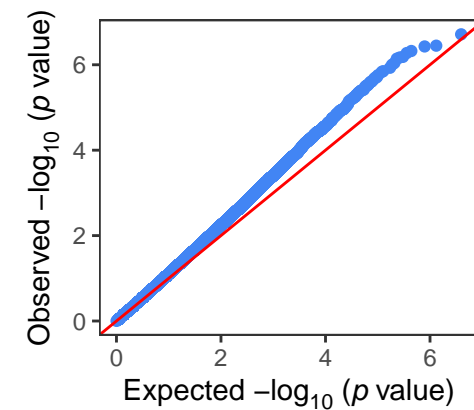
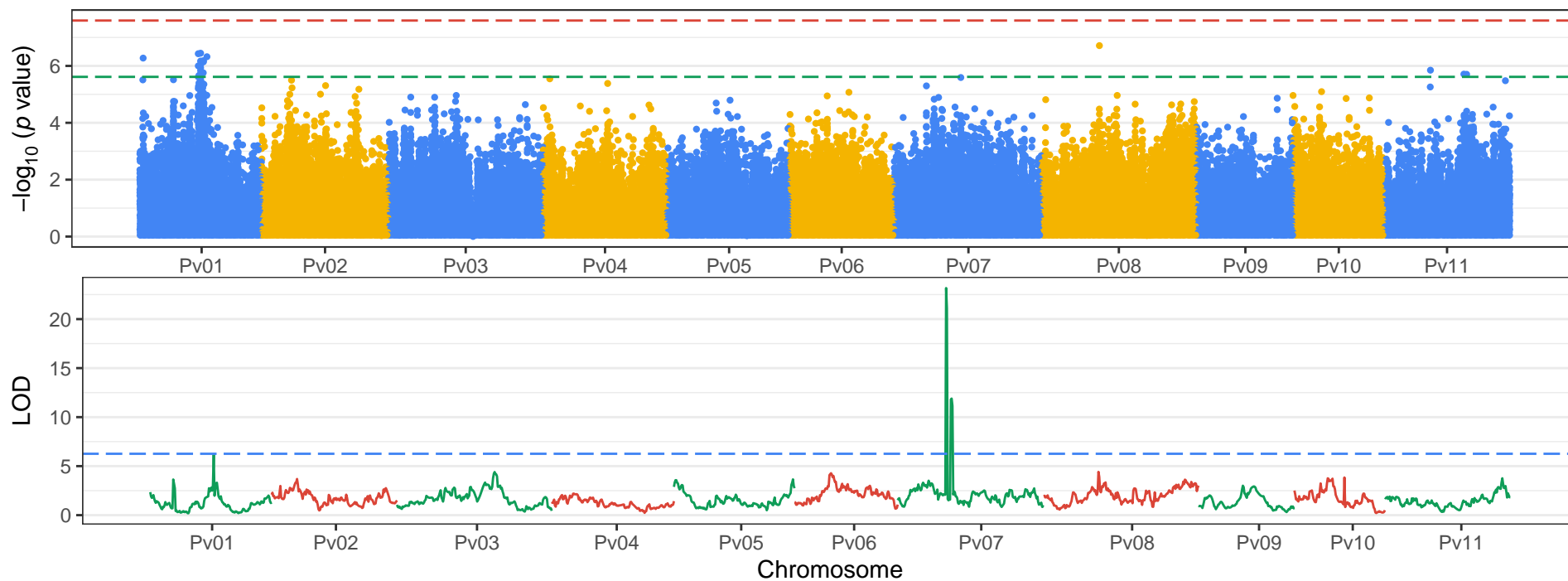


**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

Yd 2013

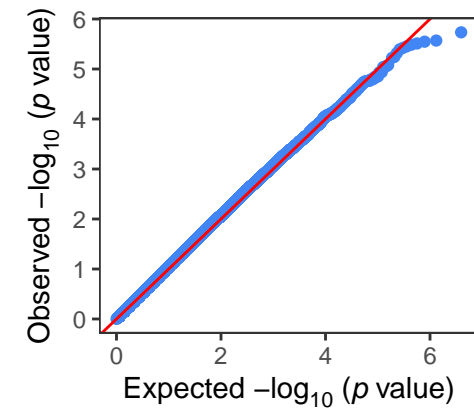
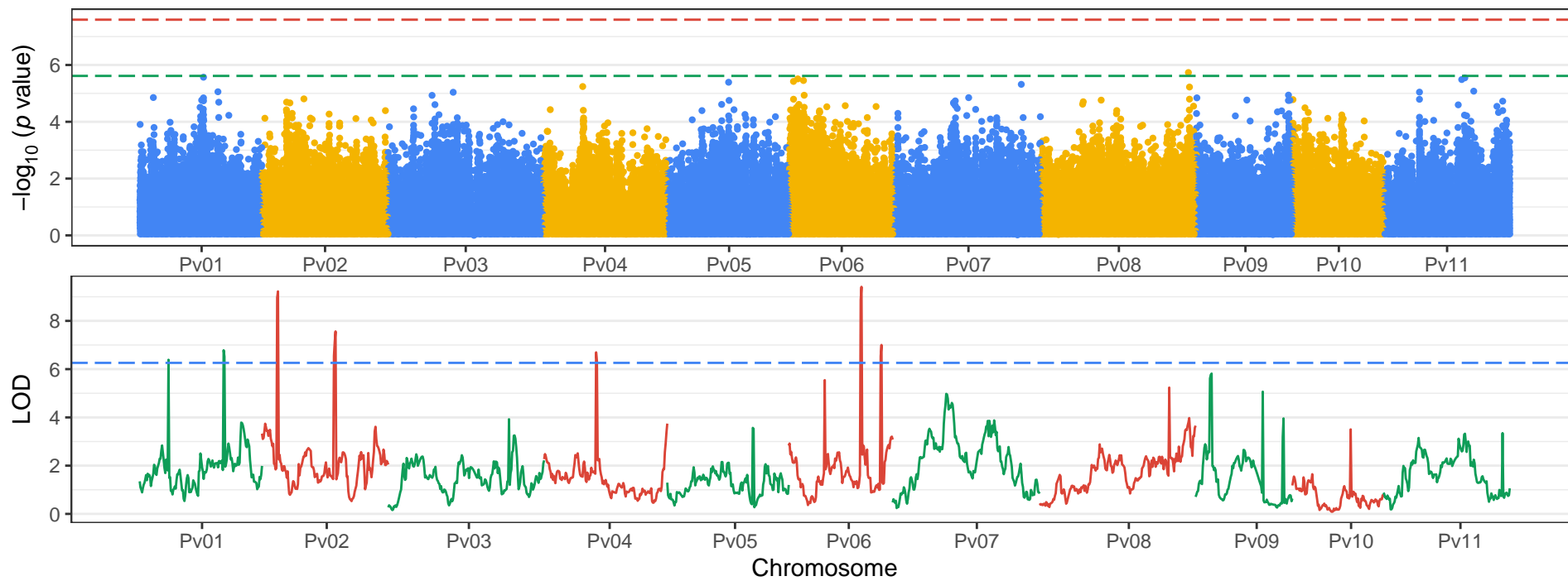


Yd 2014

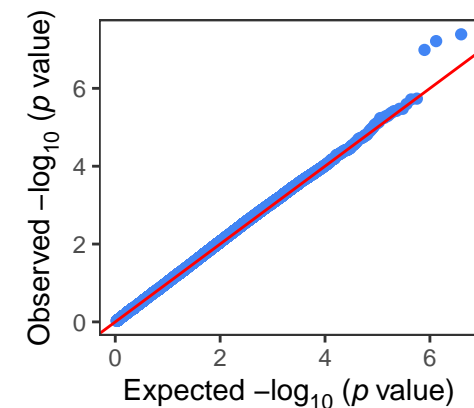
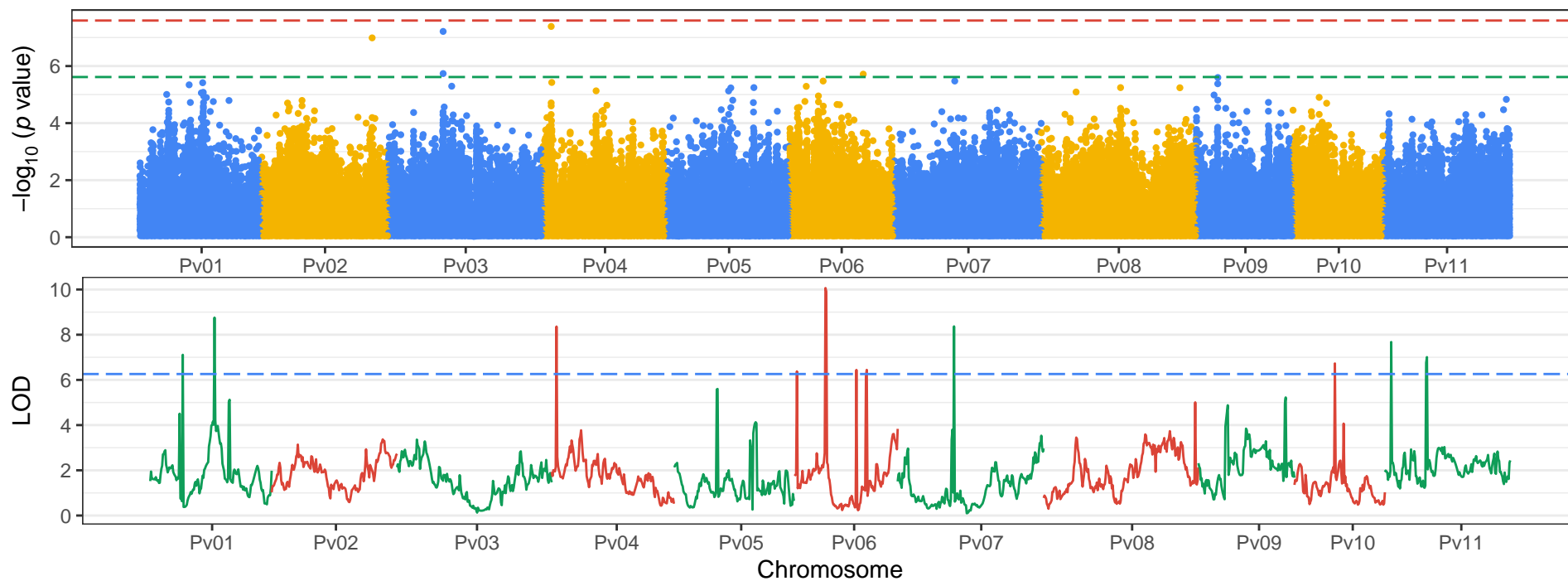


**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

### 100SdW 2013

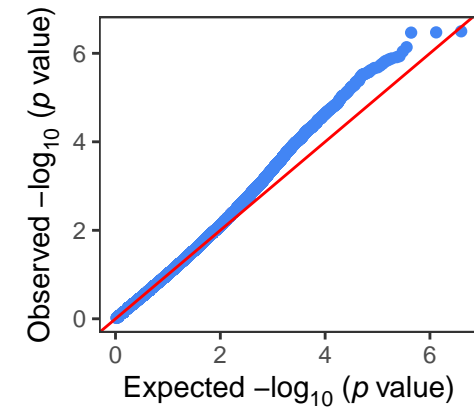
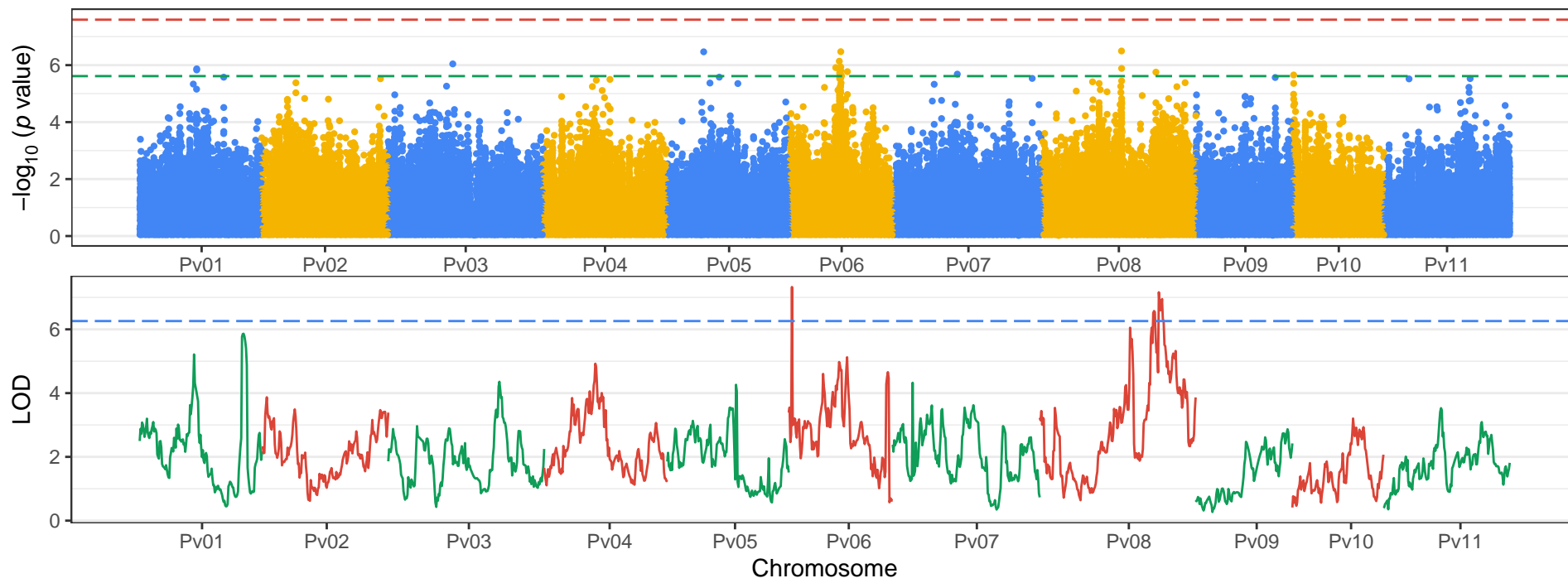


### 100SdW 2014

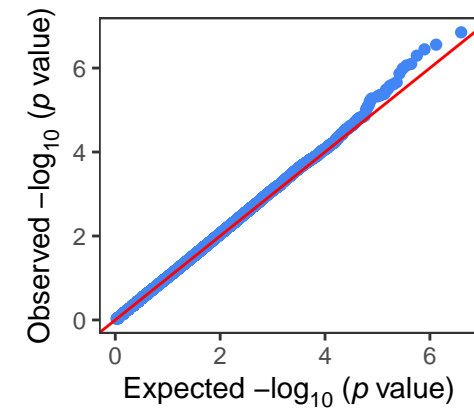
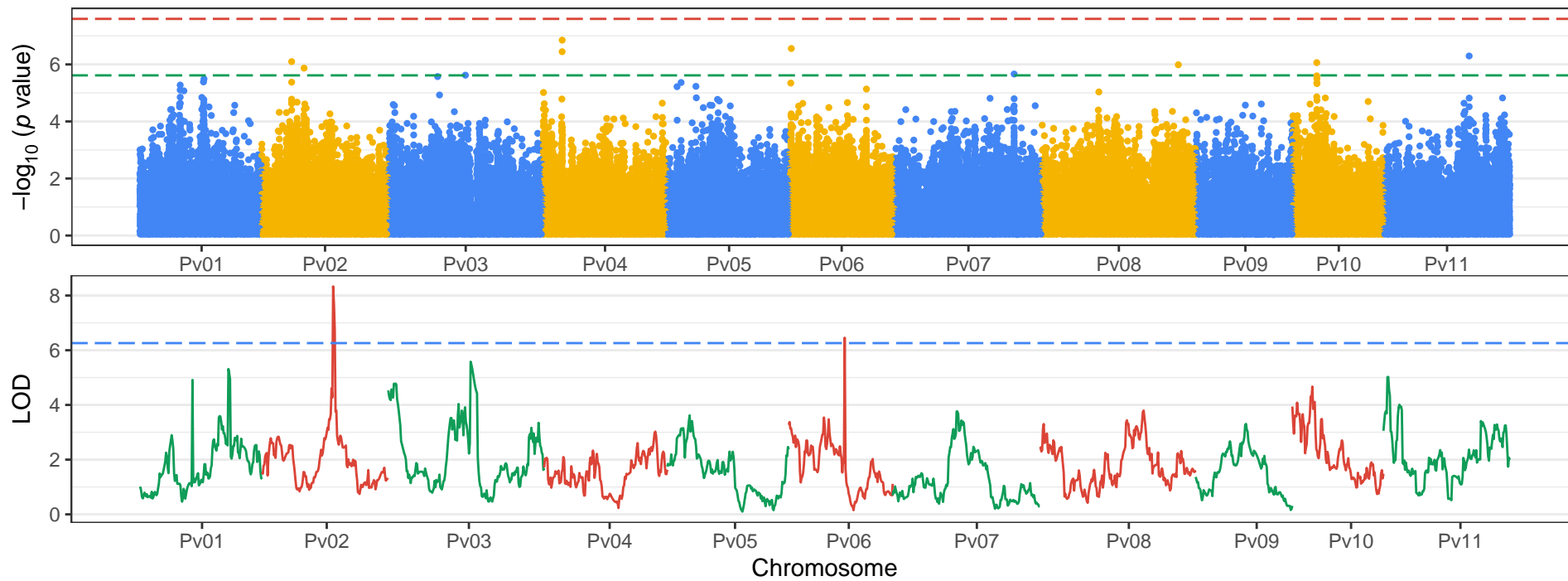


**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

### SdFe 2014

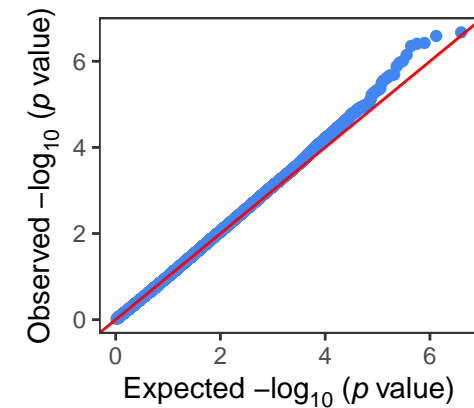
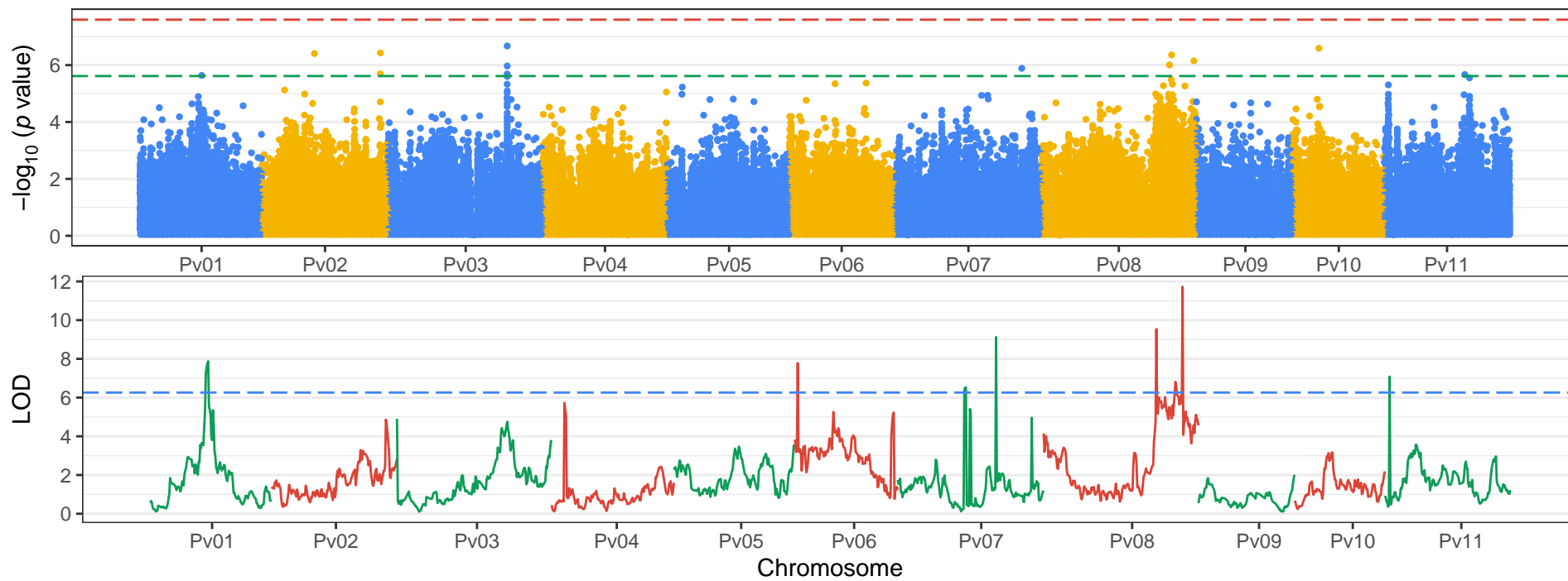


### SdFe 2016

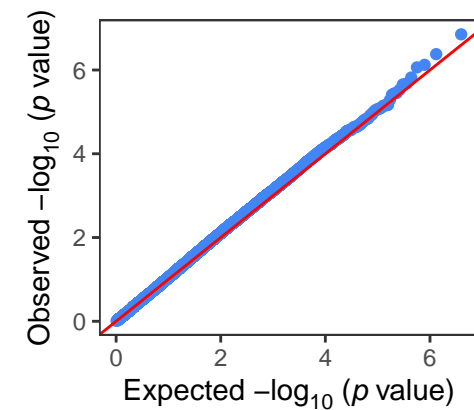
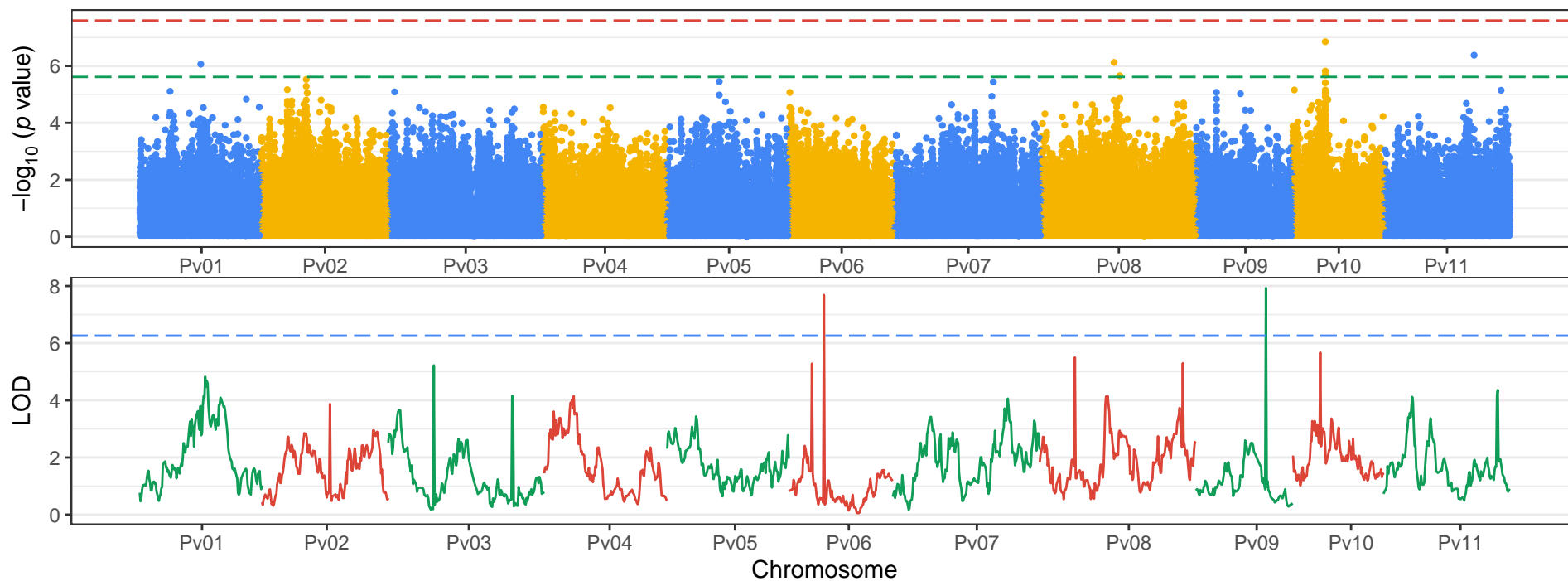


**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

### SdZn 2014

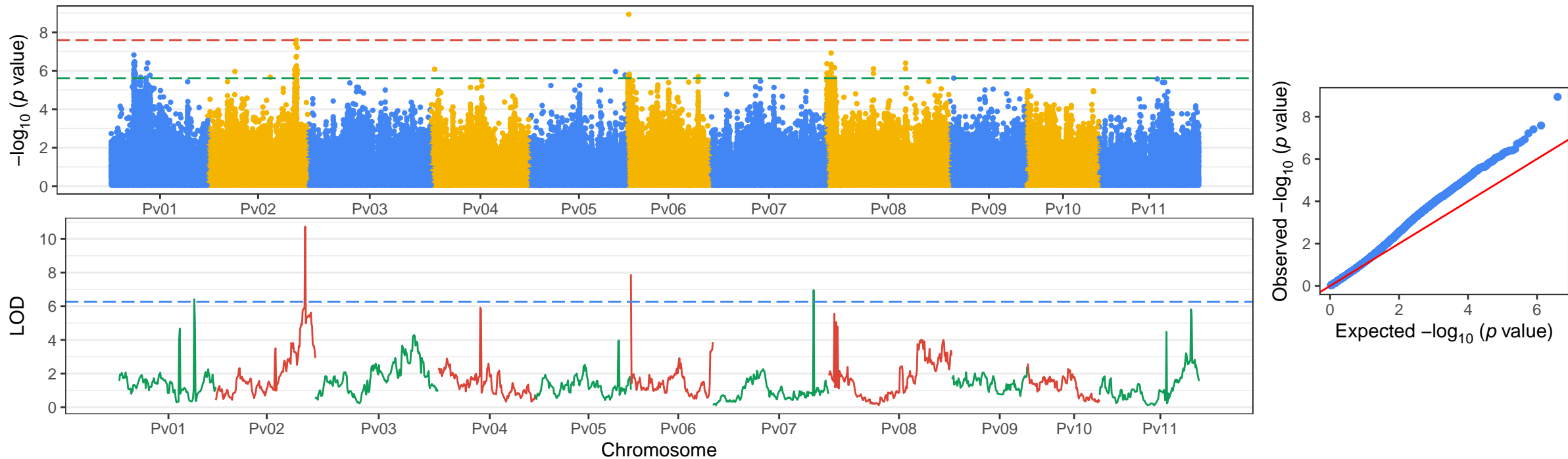


### SdZn 2016



**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.

## PHI 2013



**Additional file 12.** Manhattan, quantile–quantile and LOD plots of the association and linkage mapping for each of the evaluated traits. The Bonferroni correction threshold ( $p = 0.05$ ) using the WGS (1,972,528) and the GBS (20,615) markers are depicted as red and green horizontal dashed lines, respectively, in the Manhattan plot. The significance threshold for the QTL mapping analysis is depicted as a blue dashed line in the LOD plot.