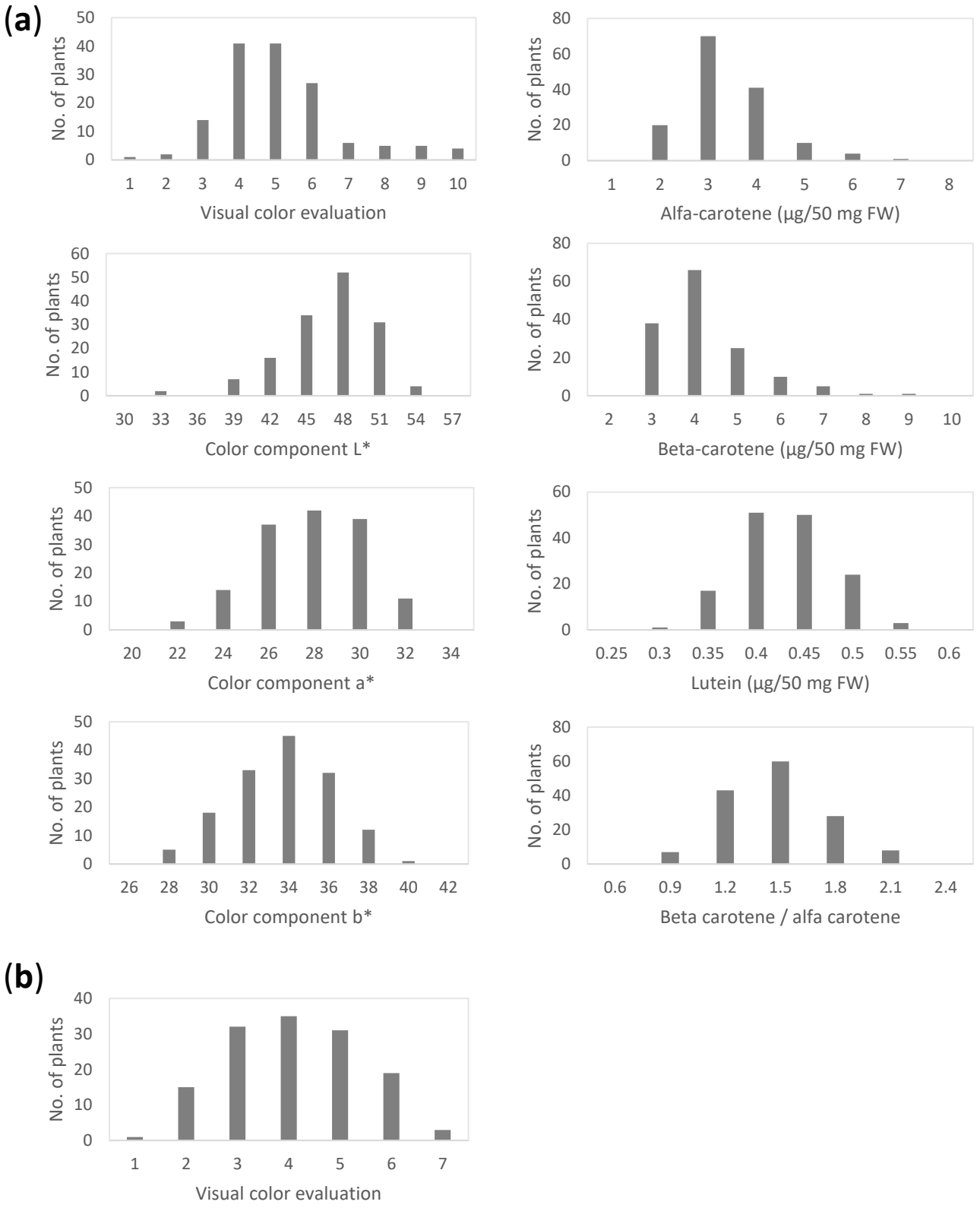
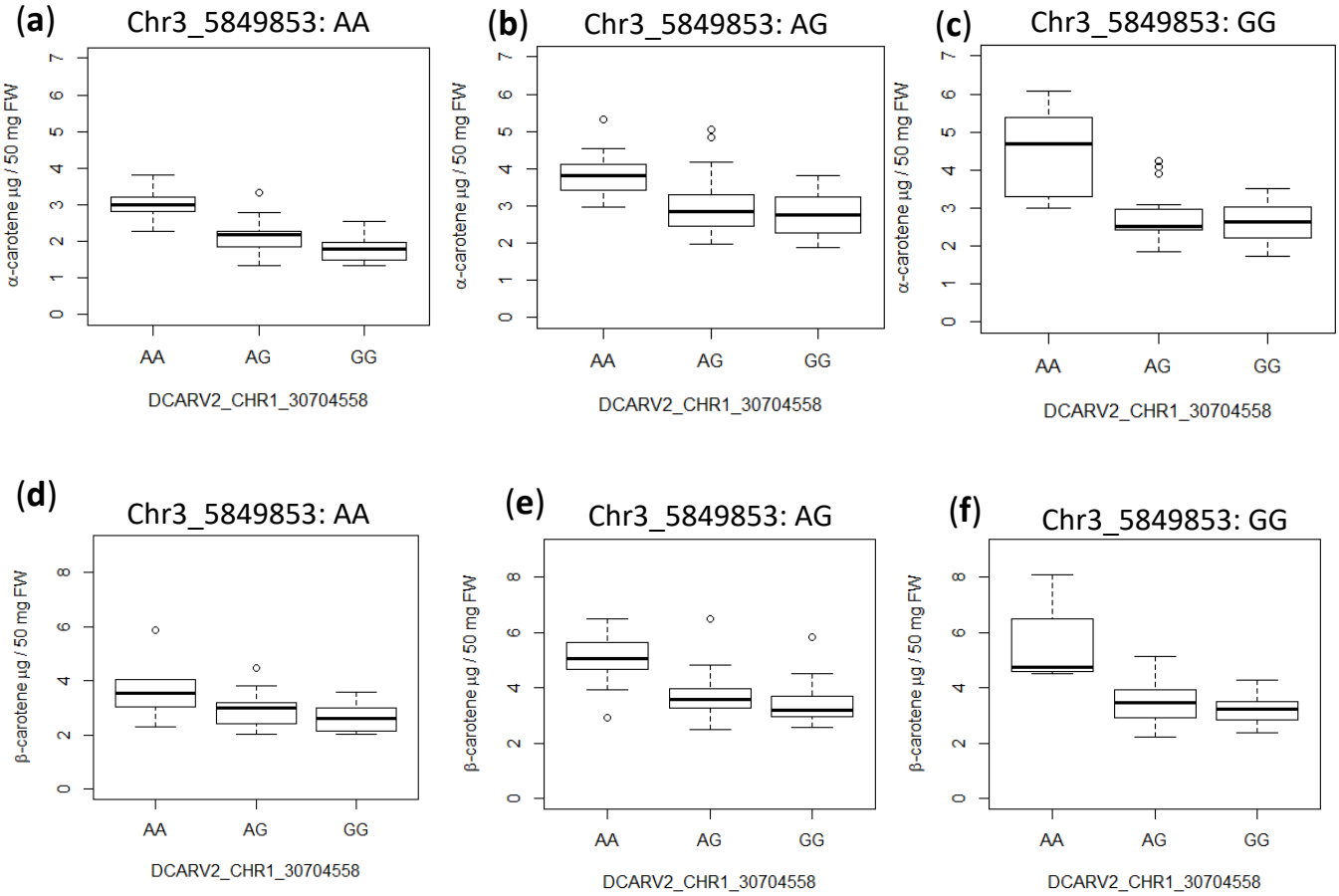


Suppl. Fig. S1. The frequency distributions of carrot root color in F_2 population A **(a)** and F_2 population B **(b).** In F_2 population A, roots were visually evaluated, and color components (L*, a*, and b*) and α- and β-carotene contents were examined (a). In F_2 population B, roots were only visually evaluated (b). In the visual color evaluation, root color was categorized in ten grades (1: light orange to 10: dark orange) in F_2 population A (a) and seven grades (1: light to 7: dark orange) in F_2 population B (b).



Suppl. Fig. S2. Examination of allelic interactions between associations detected by GWAS on chromosomes 1 and 3 for the α-carotene **(a–c)** and β-carotene **(d–f)** content in carrot root surface. Carotene contents were box-plotted by the SNP showing the highest –log10P in the GWAS for the α-carotene content on the chromosomes 1 and 3. The SNPs of chromosome 3 at physical position 5,849,853 were AA (a, d), AG (b, e), and GG (c, f).