

Some of the supplementary figures for the Deleterious Alleles paper

```
#setwd("~/Documents/Github/pvpDiallel/")
knitr::opts_knit$set(root.dir=normalizePath('../'))
```

To reproduce the figures, we should set `pvpDiallel` as the root path, i.e. `setwd("~/Documents/Github/pvpDiallel/")`. And then use `knitr` package to get a pdf file. Or simply click Knit PDF icon on RStudio. Note, to produce panels into separate pdf files, we should set `getpdf` into `TRUE` (i.e. `getpdf=TRUE`) when calling the plotting functions.

First of all, determine font size and set the `getpdf` option:

```
#par(mar=c(5,4,4,2))
par(font=2, font.lab=2, font.axis=2)
fs = 1.6 # times bigger than default
fsize = 16 # absolute font size
getpdf = TRUE # get figures in separated pdf [TRUE] or not [FALSE]
```

Supplementary Fig

```
plot_supp1 <- function(outfile, getpdf){
  res1 <- read.csv("cache/gblup_var_1x.csv")
  #####
  library(ggplot2)
  library(reshape2)
  source("~/Documents/Github/zmSNPtools/Rcodes/multiplot.R")

  med <- read.csv("cache/loh_pBPHmax_median.csv")
  #bymed2 <- with(trait, reorder(trait, pBPHmax, median))
  bymed <- med[order(med$h),]

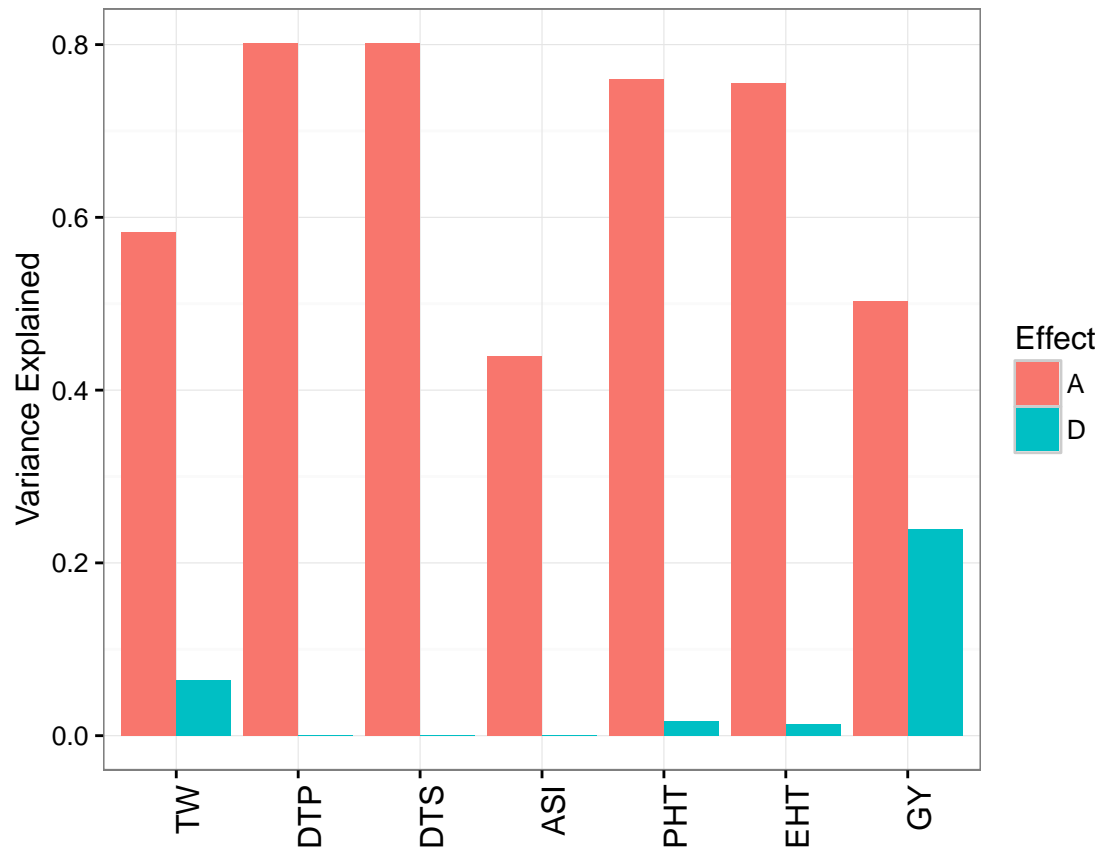
  #####
  theme_set(theme_grey(base_size = 18))

  out1 <- melt(res1, id.var="trait")
  p1 <- ggplot(out1, aes(x=factor(trait, levels=bymed$trait), y=value,
                           fill=factor(variable, levels =c("A", "D"), labels=c("A", "D")))) +
    geom_bar(position=position_dodge(), stat="identity") +
    xlab("") +
    ylab("Variance Explained") +
    ggtitle("") + theme_bw() +
    labs(fill="Effect") +
    theme(axis.text.x = element_text(angle = 90, hjust = 1, size=12))
  return(p1)
}
```

```
#####
p1 <- plot_supp1(outfile="graphs/suppl_fig_var.pdf", getpdf)
```

```
## Warning: package 'ggplot2' was built under R version 3.2.4
```

```
p1
```



```
if(getpdf){
  pdf("graphs/suppl_fig_var.pdf", width=6, height=5)
  p1
  dev.off()
}
```

```
## pdf
## 2
```

Supplementary Figure for variance explained by additive, dominance and k

```
library(wesanderson)
library(data.table)
```

```
##
## Attaching package: 'data.table'

## The following objects are masked from 'package:reshape2':
##
##      dcast, melt

source("lib/multiplot.R")

plot_adk_gerp <- function(outfile, getpdf){

  dat <- fread("largedata/gerpdat1x.csv", data.table=FALSE)
  dat$trait <- toupper(dat$trait)
  med2 <- read.csv("cache/loh_pBPHmax_median.csv")
  out <- read.csv("cache/eff_adk_1x.csv")
  #cols <- wes_palette(7, name = "Zissou", type = "continuous")
  cols <- c("#f6546a", "#daa520", "#00ff00", "#66cdaa", "#3b5998", "#8a2be2", "#ff00ff")
  theme_set(theme_grey(base_size = 18))

  getlty <- function(df, eff, cutoff=0.05){
    df$l <- 2
    if(nrow(df[df[, eff] < cutoff, ]) > 0) df[df[, eff] < cutoff, ]$l <- 1
    return(df)
  }

  lty4 <- getlty(df=out, eff="h2a", cutoff=0.05)$l
  p4 <- ggplot(dat, aes(x=RS, y=h2_mrk_A, colour=factor(trait, levels=med2$trait),
    linetype=factor(trait, levels=med2$trait))) +
    #geom_point(shape=1) + # Use hollow circles
    labs(colour="Traits") +
    theme_bw() +
    xlab("GERP Score") +
    ylab("Additive Variance") +
    scale_color_manual(values=cols) +
    scale_linetype_manual(values=lty4) +
    guides(colour=FALSE, linetype=FALSE) +

    theme(axis.text.y = element_text(angle = 90, hjust = 1),
      axis.text.x=element_blank(), axis.ticks.x=element_blank(),
      axis.text=element_text(size=fsize),
      axis.title=element_text(size=fsize, face="bold"),
      legend.title = element_text(size=fsize, face="bold"),
      legend.text = element_text(size=fsize)) +
    geom_smooth(method="gam", size=1.3)

  lty5 <- getlty(df=out, eff="h2d", cutoff=0.05)$l
  p5 <- ggplot(dat, aes(x=RS, y=h2_mrk_D, colour=factor(trait, levels=med2$trait),
    linetype=factor(trait, levels=med2$trait))) +
    #geom_point(shape=1) + # Use hollow circles
    labs(colour="Traits") +
    theme_bw() +
    xlab("GERP Score") +
    ylab("Dominant Variance") +
    scale_color_manual(values=cols) +
```

```

scale_linetype_manual(values=lty5) +
guides(colour=FALSE, linetype=FALSE) +

theme(axis.text.y = element_text(angle = 90, hjust = 1),
      axis.text.x=element_blank(), axis.ticks.x=element_blank(),
      axis.text=element_text(size=fsize),
      axis.title=element_text(size=fsize, face="bold"),
      legend.title = element_text(size=fsize, face="bold"),
      legend.text = element_text(size=fsize)) +
geom_smooth(method="gam", size=1.3)

lty6 <- getlty(df=out, eff="h2k", cutoff=0.05)$1
p6 <- ggplot(dat, aes(x=RS, y=H2_mrk, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  #geom_point(shape=1) +      # Use hollow circles
  labs(colour="Traits") +
  theme_bw() +
  xlab("GERP Score") +
  ylab("Total Variance") +
  scale_color_manual(values=cols) +
  scale_linetype_manual(values=lty6) +
  guides(colour=FALSE, linetype=FALSE) +

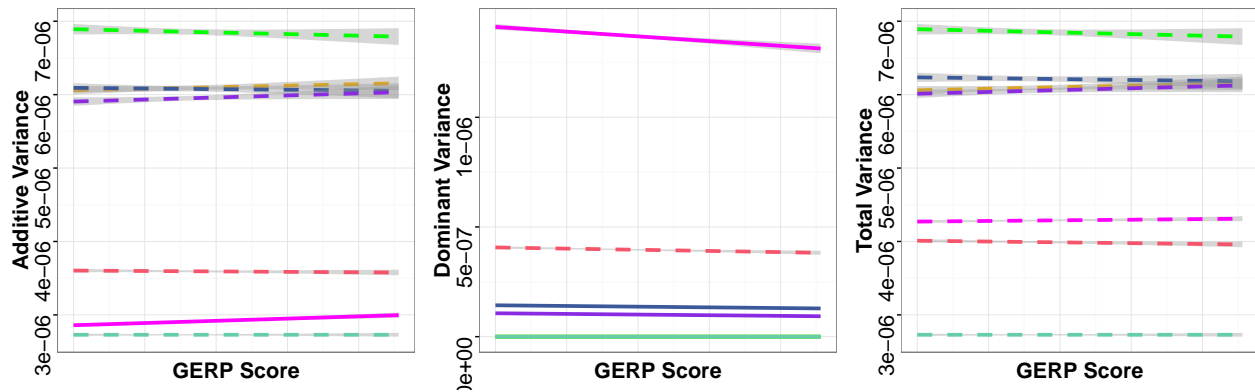
  theme(axis.text.y = element_text(angle = 90, hjust = 1),
        axis.text.x=element_blank(), axis.ticks.x=element_blank(),
        axis.text=element_text(size=fsize),
        axis.title=element_text(size=fsize, face="bold"),
        legend.title = element_text(size=fsize, face="bold"),
        legend.text = element_text(size=fsize)) +
  geom_smooth(method="gam", size=1.3)

multiplot(p4, p5, p6, cols=3)
if(getpdf == TRUE){
  pdf(outfile, width=13, height=4)
  multiplot(p4, p5, p6, cols=3)
  dev.off()
}

}

####
plot_adk_gerp(outfile="graphs/suppl_Fig_variance_adk.pdf", getpdf)

```



```
## pdf
## 2
```

Supplementary Figure ADK vs GERP after filtering low recombination regions

```
library(wesanderson)
library(data.table)
source("lib/multiplot.R")

plot_adk_filtered <- function(outfile, getpdf){

  gerp <- read.csv("cache/gerpsnp_506898_gp_withcm_mb.csv")
  mysnp <- subset(gerp, gen > quantile(gerp$gen)[2])

  dat <- fread("largedata/gerpdat1x.csv", data.table=FALSE)
  dat <- subset(dat, snpid %in% mysnp$marker)

  dat$trait <- toupper(dat$trait)
  med2 <- read.csv("cache/loh_pBPHmax_median.csv")
  out <- read.csv("cache/eff_adk_1x.csv")
  #cols <- wes_palette(7, name = "Zissou", type = "continuous")
  cols <- c("#f6546a", "#daa520", "#00ff00", "#66cdaa", "#3b5998", "#8a2be2", "#ff00ff")
  theme_set(theme_grey(base_size = 18))

  getlty <- function(df, eff, cutoff=0.05){
    df$l <- 2
    if(nrow(df[df[, eff] < cutoff, ]) > 0) df[df[, eff] < cutoff, ]$l <- 1
    return(df)
  }

  lty1 <- getlty(df=out, eff="effa", cutoff=0.05)$l
  p1 <- ggplot(dat, aes(x=RS, y=Effect_A, colour=factor(trait, levels=med2$trait),
    linetype=factor(trait, levels=med2$trait))) +
    labs(colour="Traits") +
    theme_bw() +
    xlab("GERP Score") +
```

```

ylab("Additive Effect") +
scale_color_manual(values=cols) +
scale_linetype_manual(values=lty1) +
guides(colour=FALSE, linetype=FALSE) +
geom_smooth(method="gam", size=1.3) +
theme(axis.text.y = element_text(angle = 90, hjust = 1),
      axis.text.x=element_blank(), axis.ticks.x=element_blank(),
      axis.text=element_text(size=fsize),
      axis.title=element_text(size=fsize, face="bold"),
      legend.title = element_text(size=fsize, face="bold"),
      legend.text = element_text(size=fsize))

lty2 <- getlty(df=out, eff="effd", cutoff=0.05)$l
p2 <- ggplot(dat, aes(x=RS, y=Effect_D, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  labs(colour="Traits") +
  theme_bw() +
  xlab("GERP Score") +
  ylab("Dominant Effect") +
  scale_color_manual(values=cols) +
  scale_linetype_manual(values=lty2) +
  guides(colour=FALSE, linetype=FALSE) +
  geom_smooth(method="gam", size=1.3) + # Add linear regression line
  theme(axis.text.y = element_text(angle = 90, hjust = 1),
        axis.text.x=element_blank(), axis.ticks.x=element_blank(),
        axis.text=element_text(size=fsize),
        axis.title=element_text(size=fsize, face="bold"),
        legend.title = element_text(size=fsize, face="bold"),
        legend.text = element_text(size=fsize))

lty3 <- getlty(df=out, eff="effk", cutoff=0.05)$l
p3 <- ggplot(dat, aes(x=RS, y=k, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  labs(colour="Traits") +
  theme_bw() +
  xlab("GERP Score") +
  ylab("Degree of Domiance (k)") +
  scale_color_manual(values=cols) +
  scale_linetype_manual(values=lty3) +
  guides(colour=FALSE, linetype=FALSE) +
  theme(axis.text.y = element_text(angle = 90, hjust = 1),
        axis.text.x=element_blank(), axis.ticks.x=element_blank(),
        axis.text=element_text(size=fsize),
        axis.title=element_text(size=fsize, face="bold"),
        legend.title = element_text(size=fsize, face="bold"),
        legend.text = element_text(size=fsize)) +
  geom_smooth(method="gam", size=1.3) # Add linear regression line

lty4 <- getlty(df=out, eff="h2a", cutoff=0.05)$l
p4 <- ggplot(dat, aes(x=RS, y=h2_mrk_A, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  #geom_point(shape=1) + # Use hollow circles
  labs(colour="Traits") +

```

```

theme_bw() +
xlab("GERP Score") +
ylab("Additive Variance") +
scale_color_manual(values=cols) +
scale_linetype_manual(values=lty4) +
guides(colour=FALSE, linetype=FALSE) +
theme(axis.text.y = element_text(angle = 90, hjust = 1),
      axis.text.x=element_blank(), axis.ticks.x=element_blank(),
      axis.text=element_text(size=fsize),
      axis.title=element_text(size=fsize, face="bold"),
      legend.title = element_text(size=fsize, face="bold"),
      legend.text = element_text(size=fsize)) +
geom_smooth(method="gam", size=1.3)

lty5 <- getlty(df=out, eff="h2d", cutoff=0.05)$l
p5 <- ggplot(dat, aes(x=RS, y=h2_mrk_D, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  #geom_point(shape=1) + # Use hollow circles
  labs(colour="Traits") +
  theme_bw() +
  xlab("GERP Score") +
  ylab("Dominant Variance") +
  scale_color_manual(values=cols) +
  scale_linetype_manual(values=lty5) +
  guides(colour=FALSE, linetype=FALSE) +
  theme(axis.text.y = element_text(angle = 90, hjust = 1),
        axis.text.x=element_blank(), axis.ticks.x=element_blank(),
        axis.text=element_text(size=fsize),
        axis.title=element_text(size=fsize, face="bold"),
        legend.title = element_text(size=fsize, face="bold"),
        legend.text = element_text(size=fsize)) +
  geom_smooth(method="gam", size=1.3)

lty6 <- getlty(df=out, eff="h2k", cutoff=0.05)$l
p6 <- ggplot(dat, aes(x=RS, y=H2_mrk, colour=factor(trait, levels=med2$trait),
                    linetype=factor(trait, levels=med2$trait))) +
  #geom_point(shape=1) + # Use hollow circles
  labs(colour="Traits") +
  theme_bw() +
  xlab("GERP Score") +
  ylab("Total Variance") +
  scale_color_manual(values=cols) +
  scale_linetype_manual(values=lty6) +
  guides(colour=FALSE, linetype=FALSE) +
  theme(axis.text.y = element_text(angle = 90, hjust = 1),
        axis.text.x=element_blank(), axis.ticks.x=element_blank(),
        axis.text=element_text(size=fsize),
        axis.title=element_text(size=fsize, face="bold"),
        legend.title = element_text(size=fsize, face="bold"),
        legend.text = element_text(size=fsize)) +
  geom_smooth(method="gam", size=1.3)

```

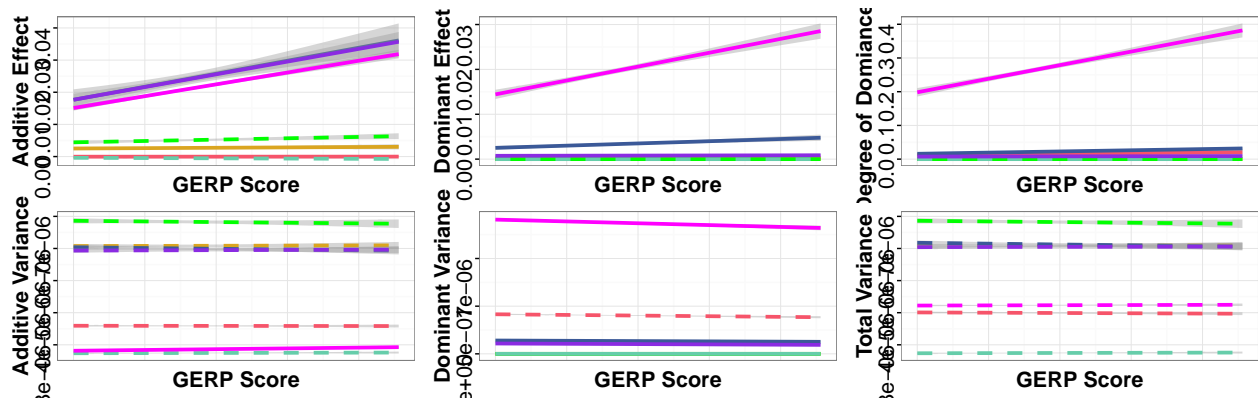
```

multiplot(p1, p4, p2, p5, p3, p6, cols=3)
if(getpdf == TRUE){
  pdf(outfile, width=13, height=8)
  multiplot(p1, p4, p2, p5, p3, p6, cols=3)
  dev.off()
}

}

####
plot_adk_filtered(outfile="graphs/suppl_Fig_adk_filtered.pdf", getpdf)

```



```

## pdf
## 2

```