# master_analysis

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```
library(tidyverse) #install.packages("tidyverse")
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.3     v purrr   0.3.4
## v tibble  3.1.2     v dplyr   1.0.6
## v tidyr   1.1.3     v stringr 1.4.0
## v readr   1.4.0     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(readxl) #install.packages("readxl")
library(here) #install.packages("here")
```

```
## here() starts at C:/Users/jacks/Documents/Archaeology Masters/Dissertation/Fallow_Deer
```

```
library(janitor) #install.packages("janitor")
```

```
##
## Attaching package: 'janitor'
```

```
## The following objects are masked from 'package:stats':
##
##     chisq.test, fisher.test
```

```
library(kableExtra) #install.packages("kableExtra")
```

```
##
## Attaching package: 'kableExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```
library(skimr) #install.packages("skimr")
library(dplyr) #install.packages("dplyr")
library(RColorBrewer) #install.packages("RColorBrewer")
library(formattable) #install.packages("formattable")
library(wesanderson)#install.packages("wesanderson")
library(reshape2)
```

```
##
## Attaching package: 'reshape2'
```

```
## The following object is masked from 'package:tidyr':
##
```

```
##     smiths
```

```
library(ggtext) #install.packages("ggtext")
```

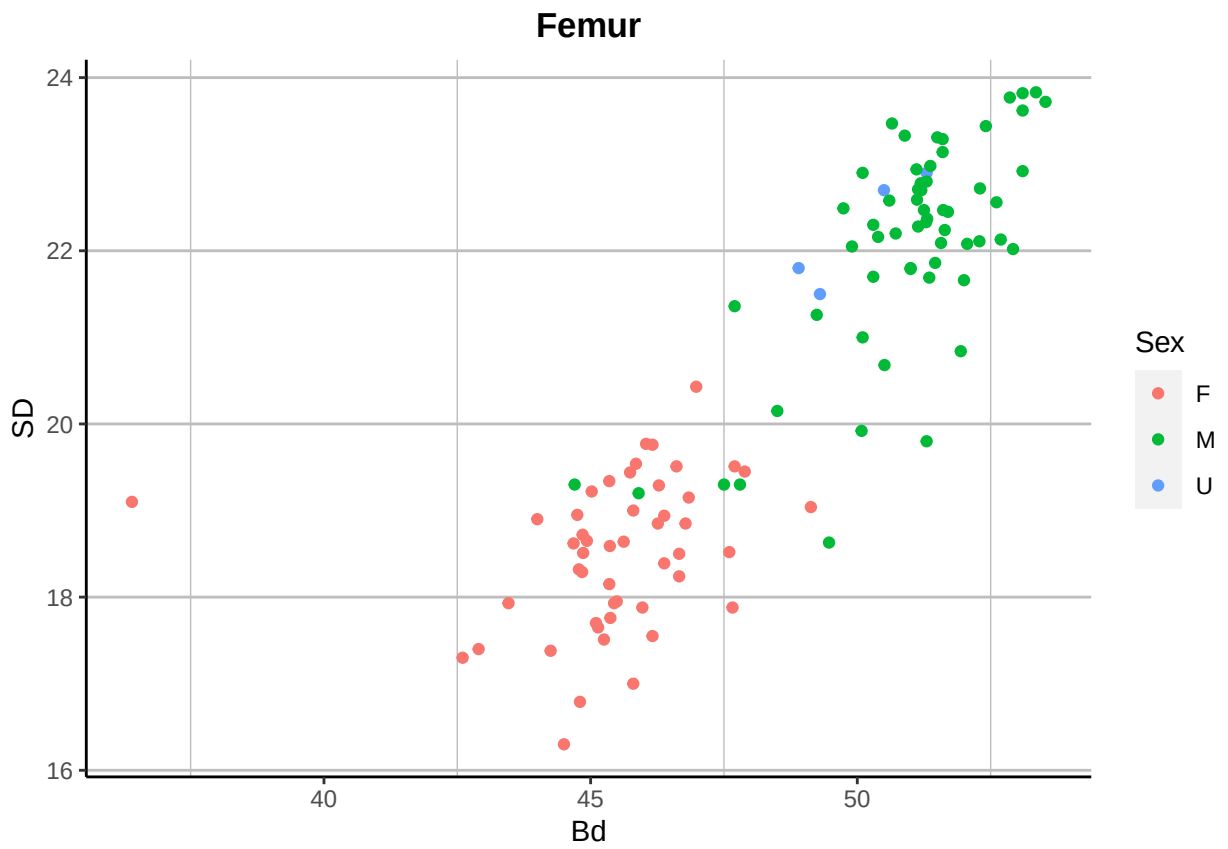
```
Plan_B <- read_excel(here("../data/master.xlsx"), range = "A1:AN993", sheet = "Plan_B")

Clarendon <- read_excel(here("../data/master.xlsx"), range = "A1:Y11", sheet = "data")
```

```
## New names:
## * Bd -> Bd...13
## * Bd -> Bd...21
```

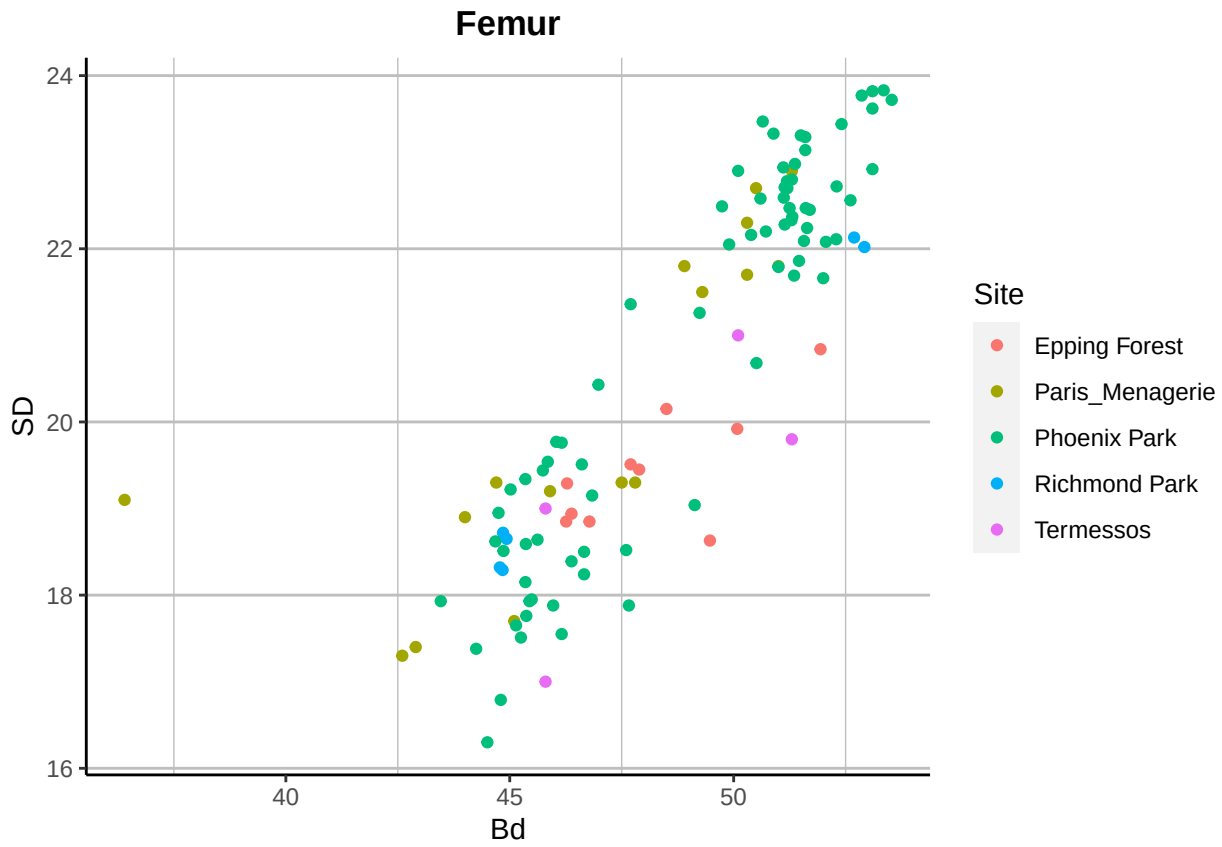
```
Plan_B_clean = Plan_B[rowSums(is.na(Plan_B)) <= 31, ]

B_femur = Plan_B_clean %>% filter(Element == "femur") %>% remove_empty("cols")
B_scapula = Plan_B_clean %>% filter(Element == "scapula") %>% remove_empty("cols")
B_humerus = Plan_B_clean %>% filter(Element == "humerus")%>% remove_empty("cols")
B_radius = Plan_B_clean %>% filter(Element == "radius")%>% remove_empty("cols")
B_tibia = Plan_B_clean %>% filter(Element == "tibia")%>% remove_empty("cols")
B_astragalus = Plan_B_clean %>% filter(Element == "astragalus")%>% remove_empty("cols")
B_metacarpal = Plan_B_clean %>% filter(Element == "metacarpal")%>% remove_empty("cols")
B_metatarsal = Plan_B_clean %>% filter(Element == "metatarsal")%>% remove_empty("cols")
B_calcaneus = Plan_B_clean %>% filter(Element == "calcaneus")%>% remove_empty("cols")
B_ulna = Plan_B_clean %>% filter(Element == "ulna")%>% remove_empty("cols")
```

```
Plan_B_elements <- Plan_B_clean %>%
  count(Element)

Plan_B_sex <- Plan_B_clean %>%
  count(Sex)

Clarendon_elements <- Clarendon %>%
  count(Element)
```

```
ggplot(B_femur, aes(x=Bd, y=SD, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "SD",
    title = "Femur"
  )
```

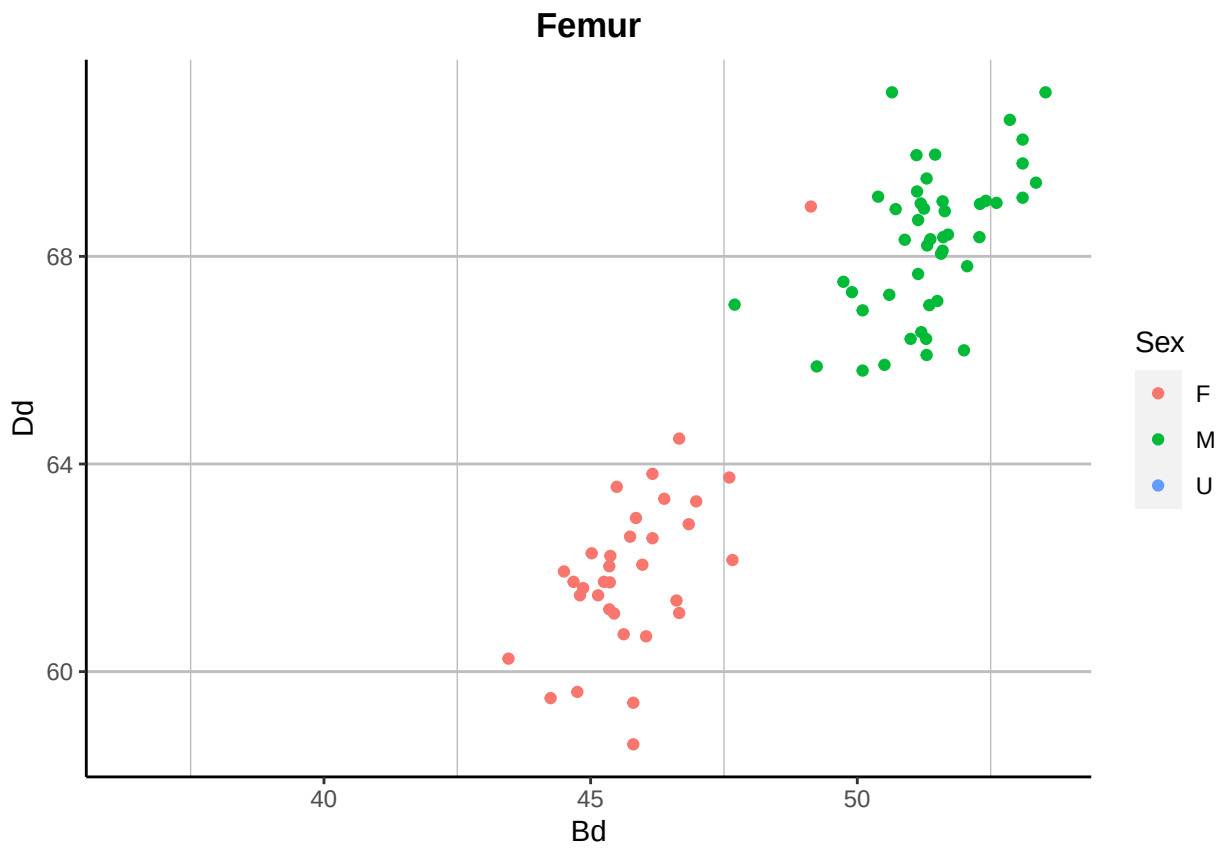



```
ggplot(B_femur, aes(x=Bd, y=SD, colour = Site)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "SD",
    title = "Femur"
  )
```



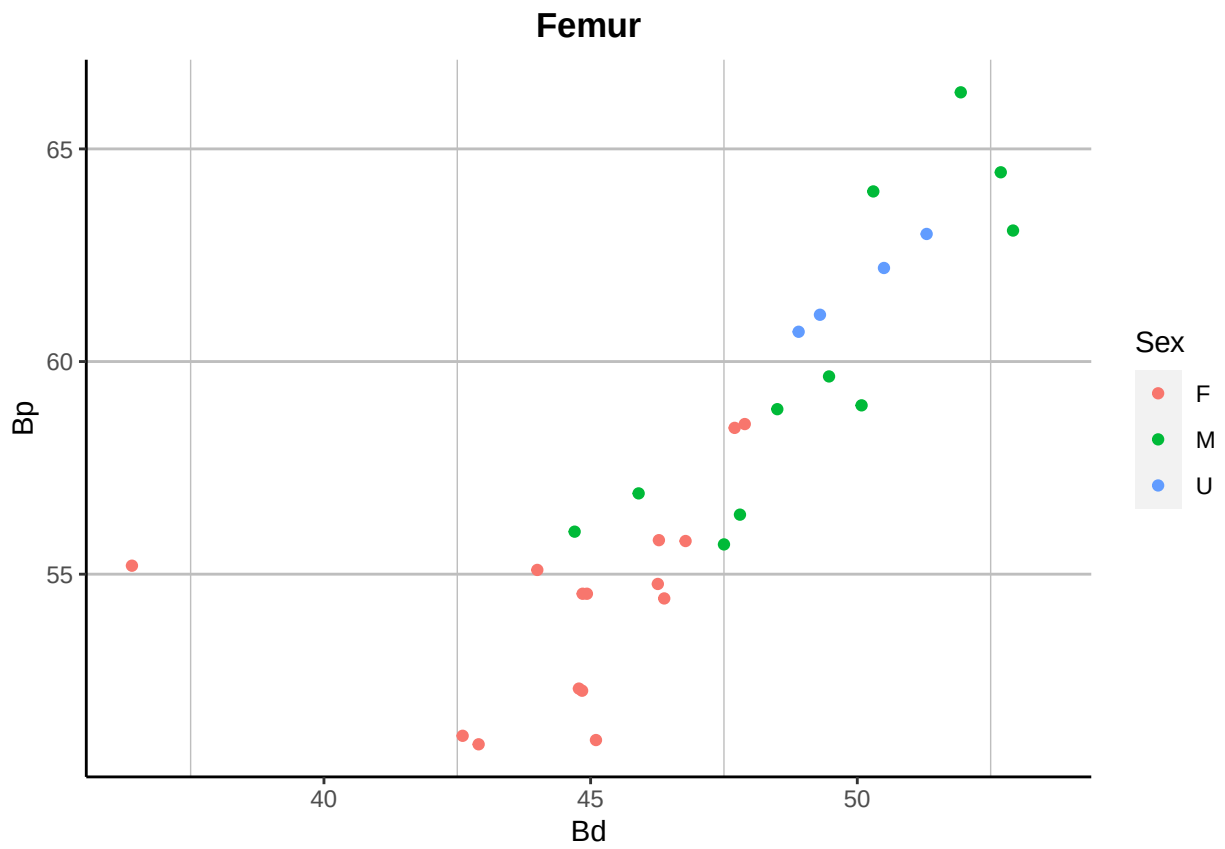

```
ggplot(B_femur, aes(x=Bd, y=Dd, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Dd",
    title = "Femur"
  )
```

```
## Warning: Removed 32 rows containing missing values (geom_point).
```



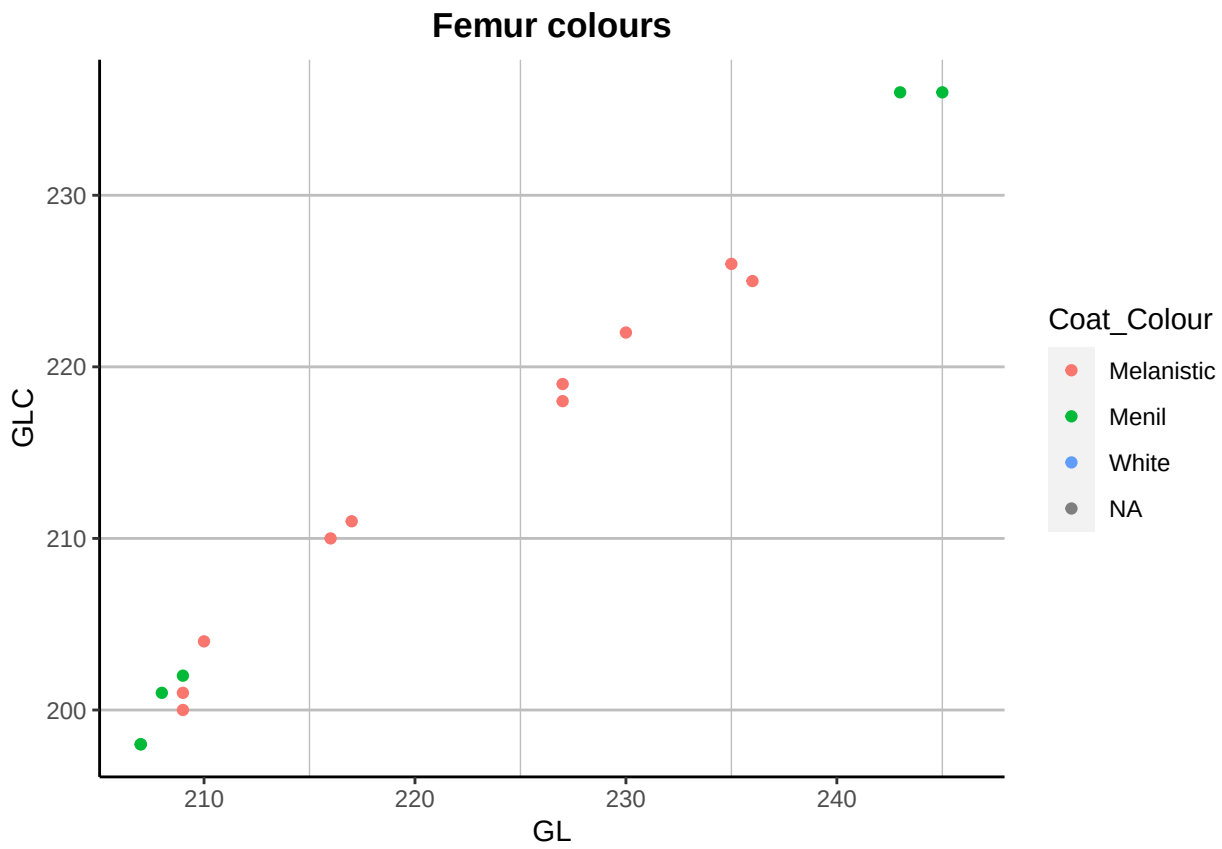

```
ggplot(B_femur, aes(x=Bd, y=Bp, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Bp",
    title = "Femur"
  )
```

```
## Warning: Removed 82 rows containing missing values (geom_point).
```



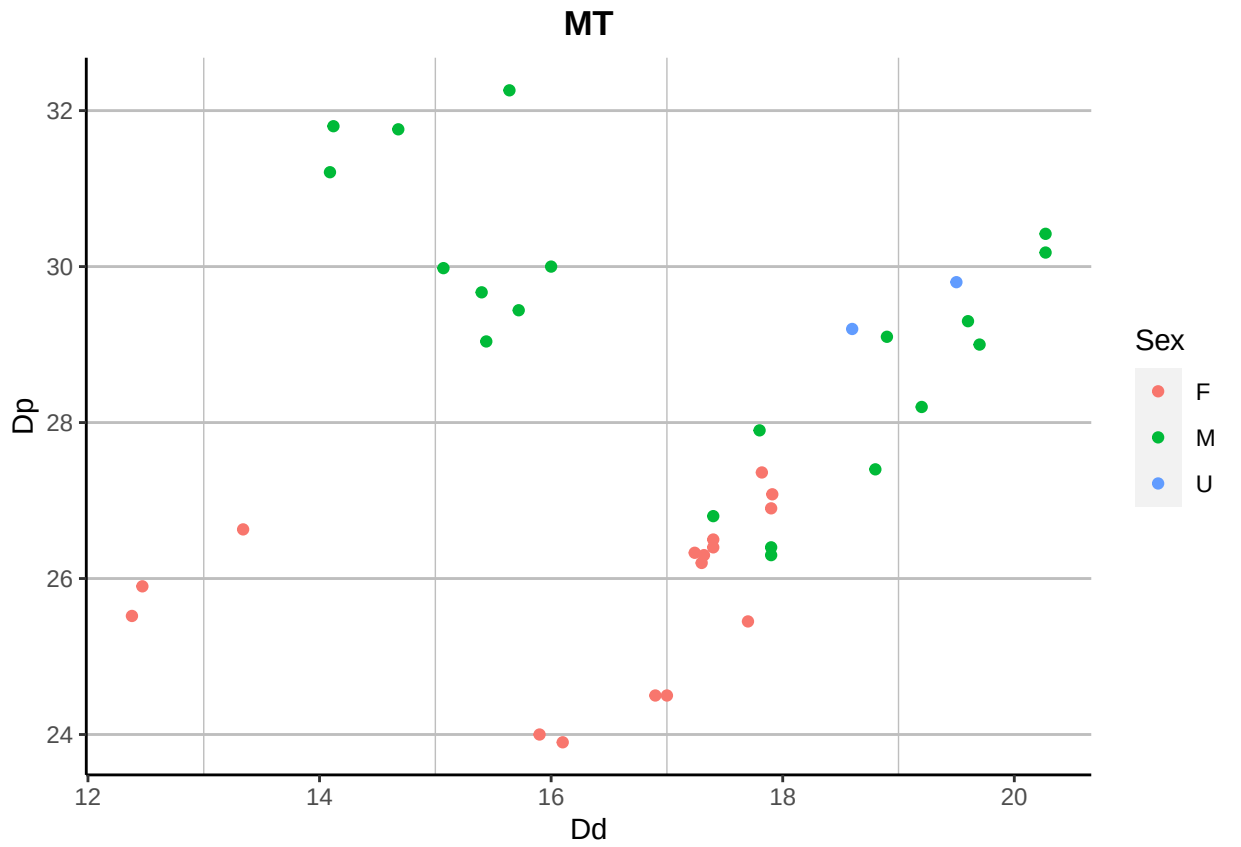

```
ggplot(B_femur, aes(x=GL, y=GLC, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "GL",
    y = "GLC",
    title = "Femur colours"
  )
```

```
## Warning: Removed 96 rows containing missing values (geom_point).
```



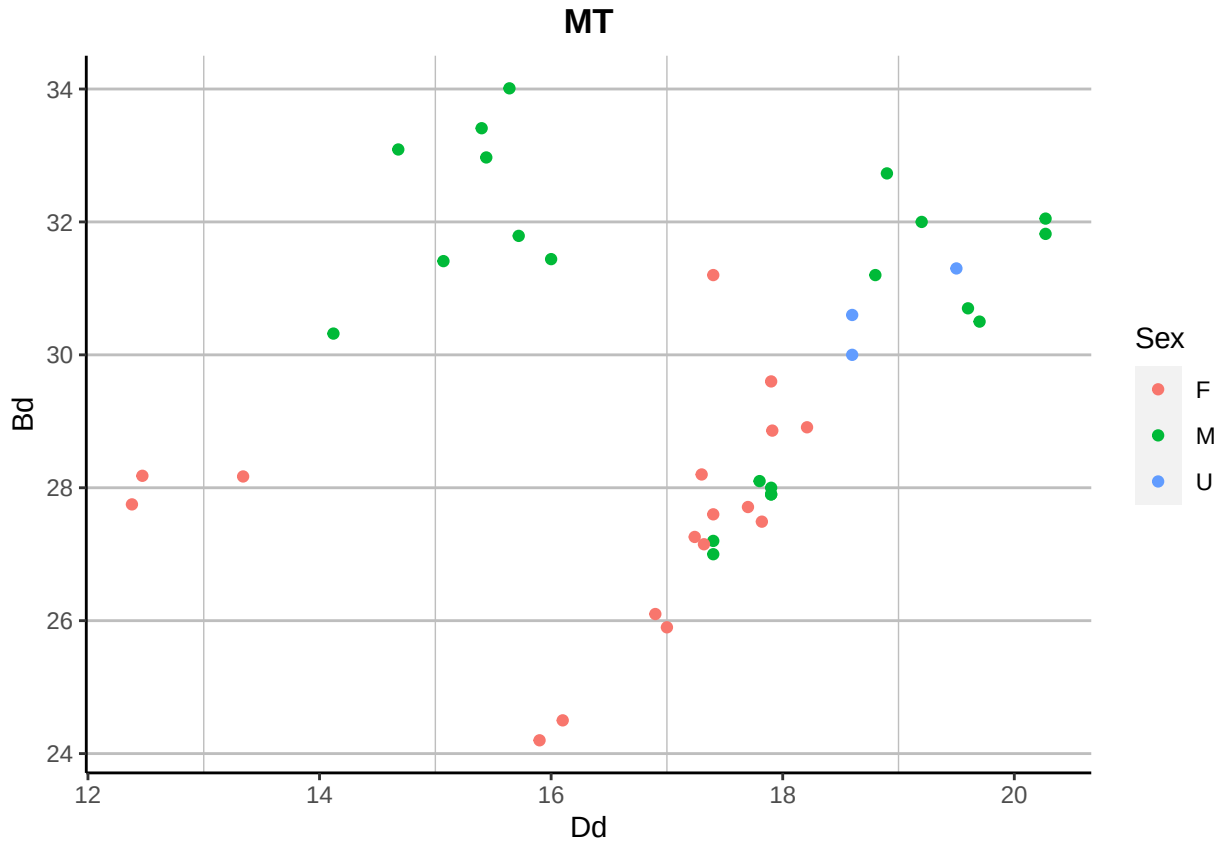

```
ggplot(B_metatarsal, aes(x=Dd, y=Dp, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Dd",
    y = "Dp",
    title = "MT"
  ) #+  facet_wrap(~Site)
```

```
## Warning: Removed 9 rows containing missing values (geom_point).
```



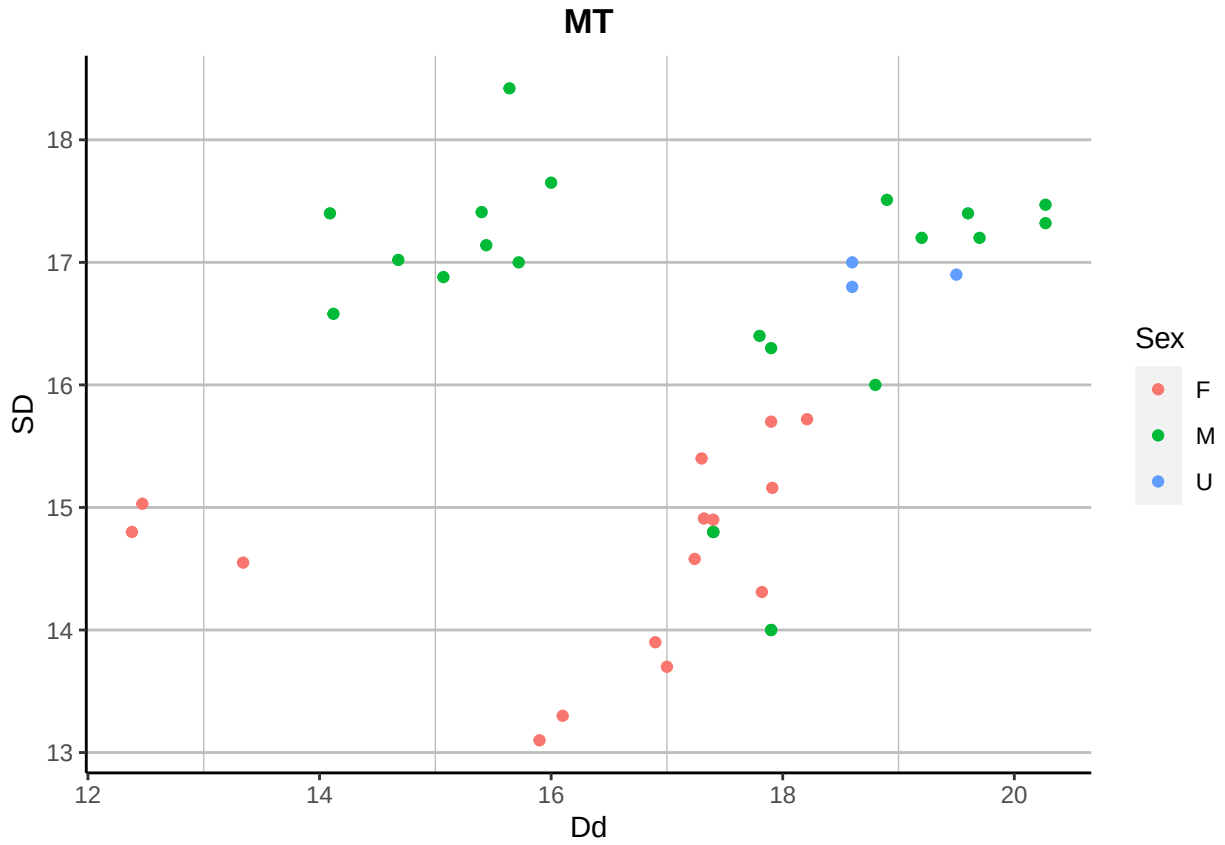

```
ggplot(B_metatarsal, aes(x=Dd, y=Bd, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Dd",
    y = "Bd",
    title = "MT"
  ) #+ facet_wrap(~Site)
```

```
## Warning: Removed 6 rows containing missing values (geom_point).
```



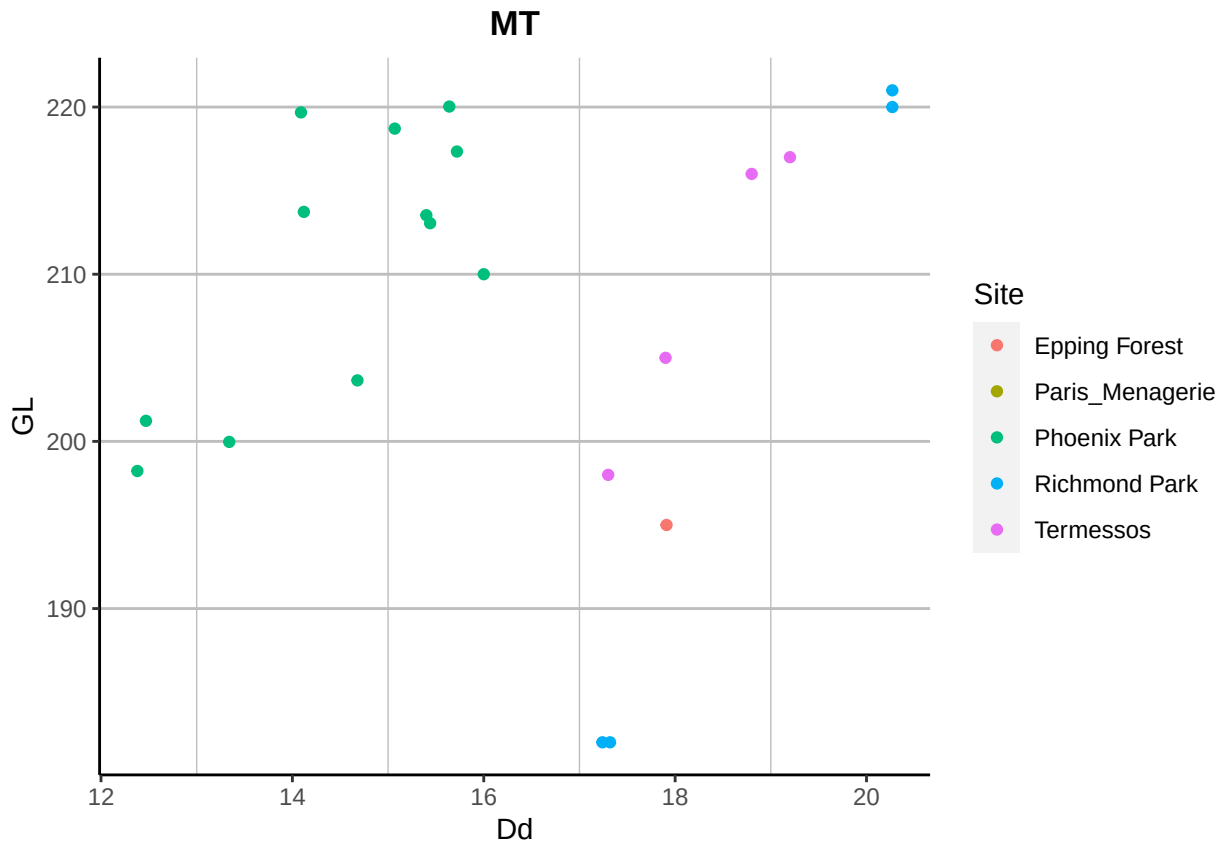

```
ggplot(B_metatarsal, aes(x=Dd, y=SD, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Dd",
    y = "SD",
    title = "MT"
  ) #+ facet_wrap(~Site)
```

```
## Warning: Removed 6 rows containing missing values (geom_point).
```



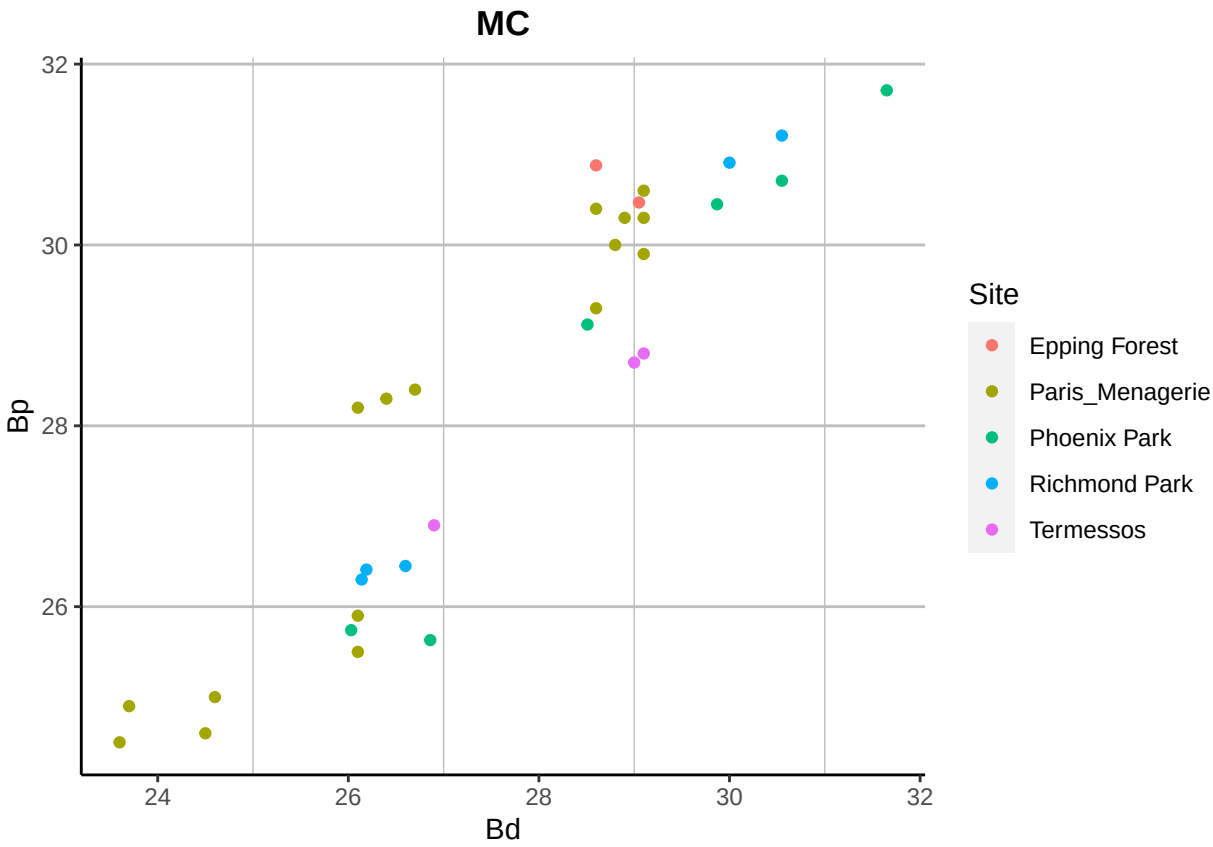

```
ggplot(B_metatarsal, aes(x=Dd, y=GL, colour = Site)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Dd",
    y = "GL",
    title = "MT"
  ) #+ facet_wrap(~Site)
```

```
## Warning: Removed 26 rows containing missing values (geom_point).
```



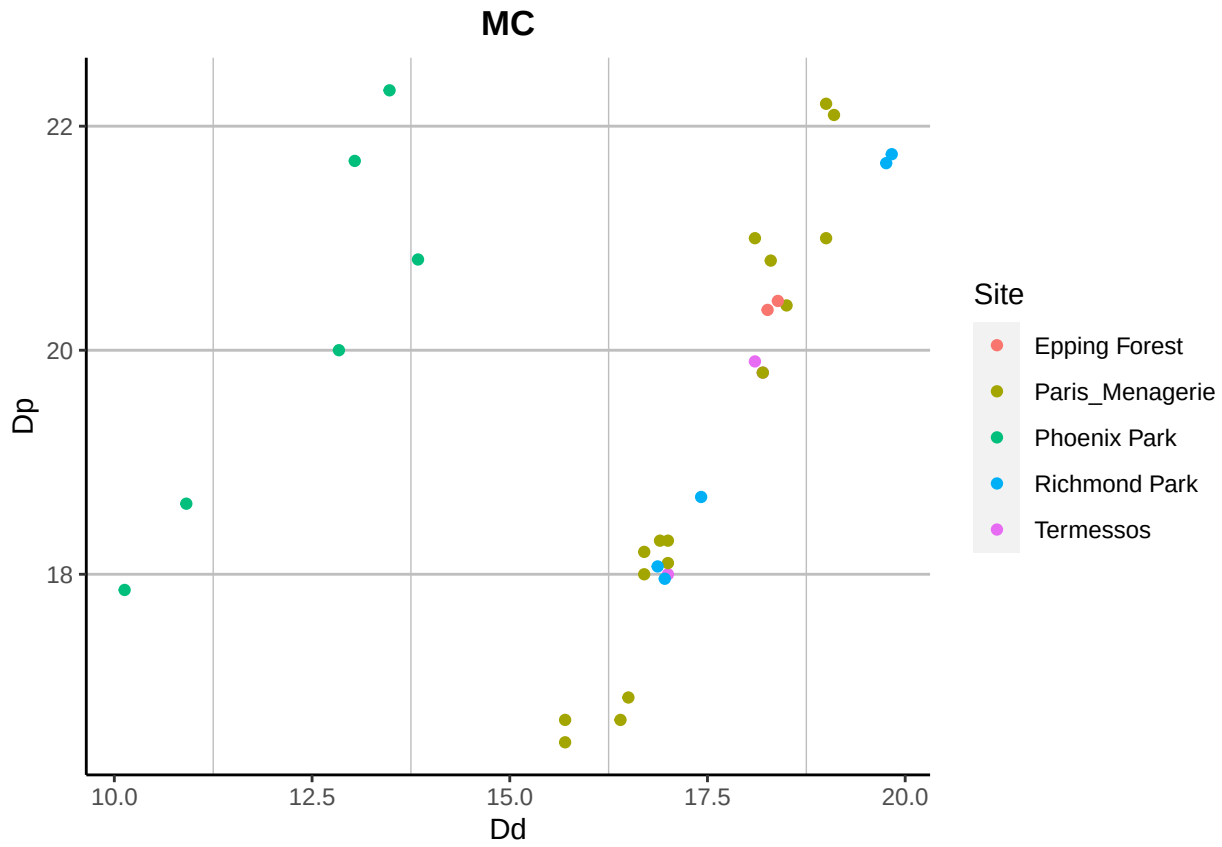

```
ggplot(B_metacarpal, aes(x=Bd, y=Bp, colour = Site)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Bp",
    title = "MC"
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 3 rows containing missing values (geom_point).
```



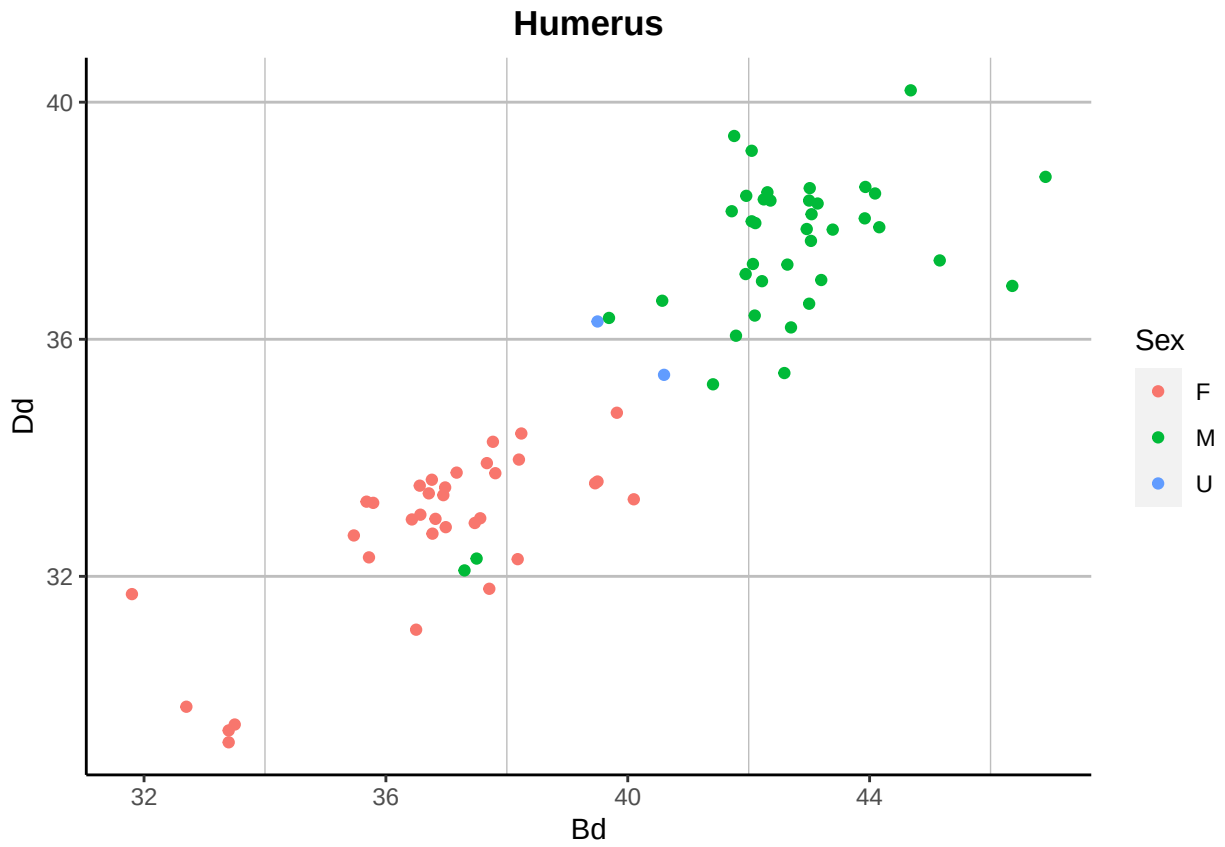

```
ggplot(B_metacarpal, aes(x=Dd, y=Dp, colour = Site)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Dd",
    y = "Dp",
    title = "MC"
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 3 rows containing missing values (geom_point).
```



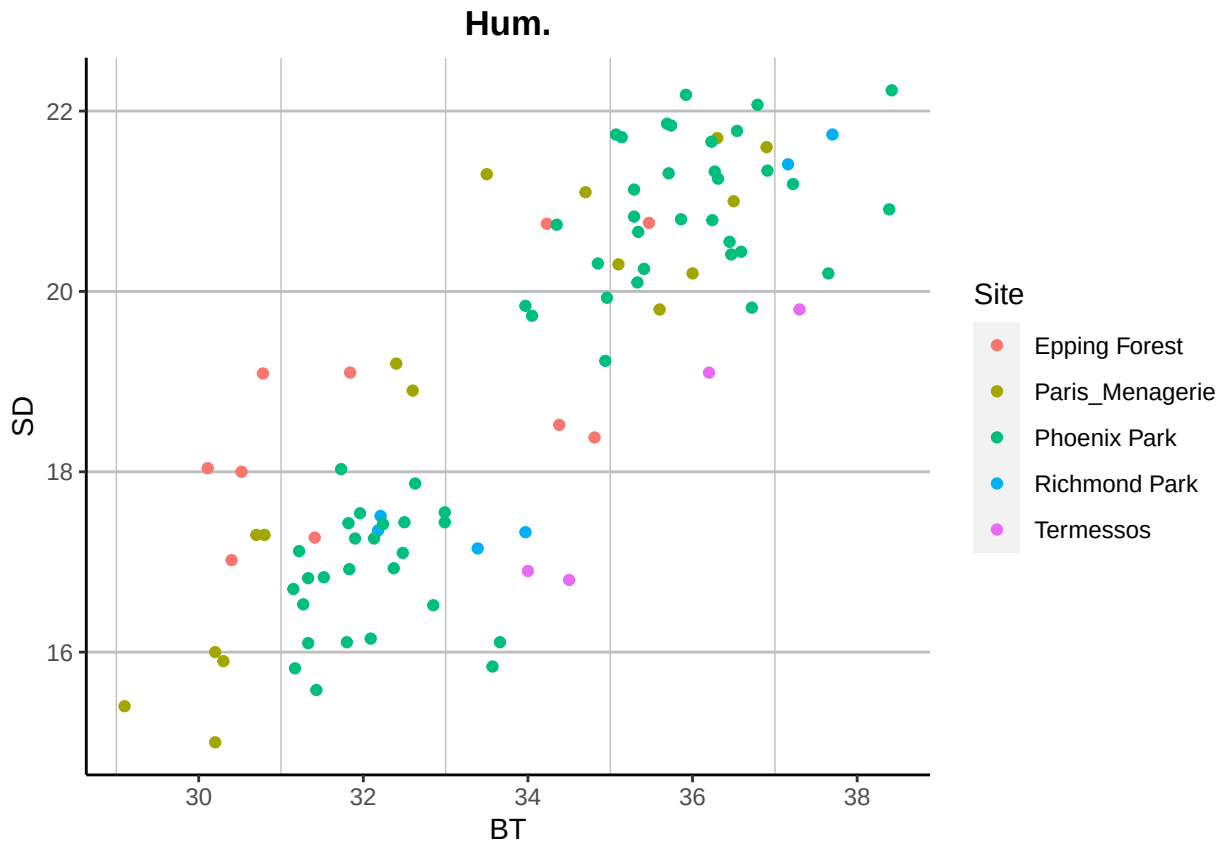

```
ggplot(B_humerus, aes(x=Bd, y=Dd, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Dd",
    title = "Humerus"
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 22 rows containing missing values (geom_point).
```



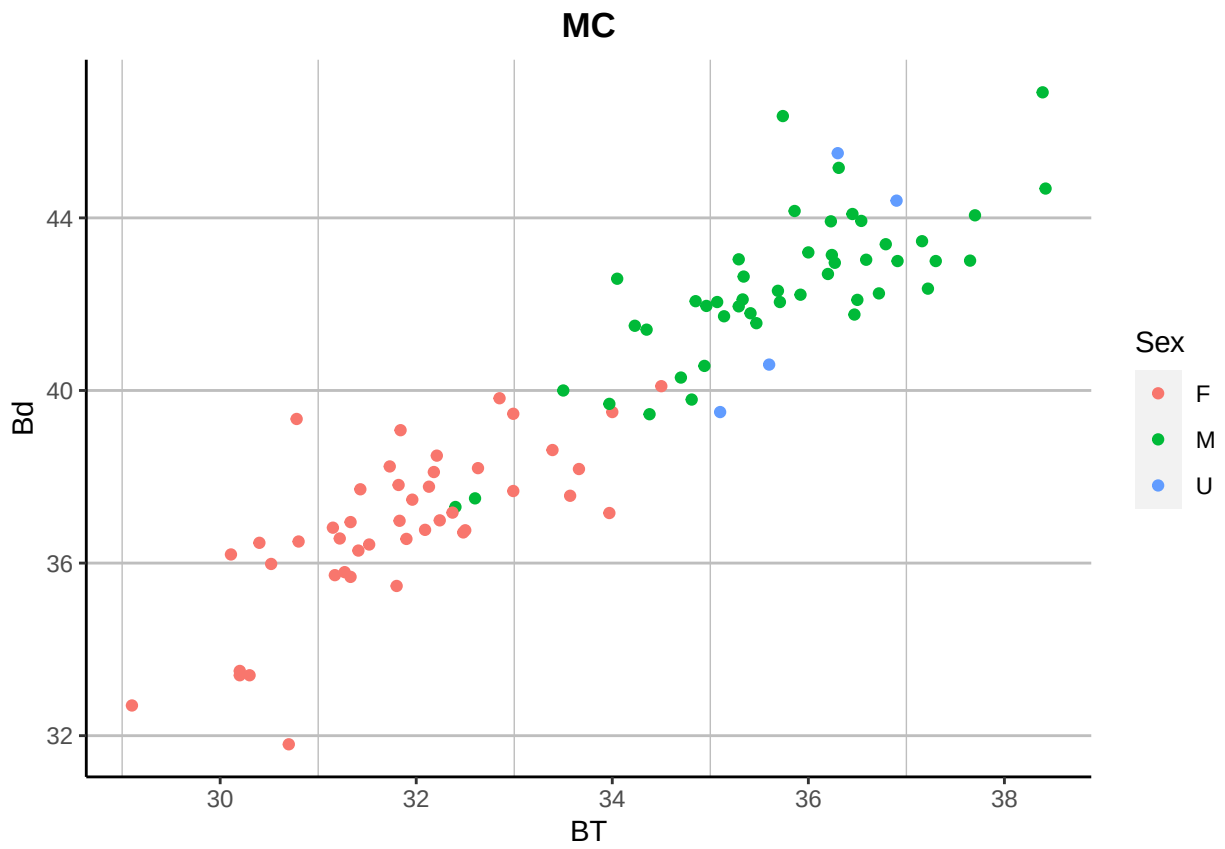

```
ggplot(B_humerus, aes(x=BT, y=SD, colour = Site)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "BT",
    y = "SD",
    title = "Hum."
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```



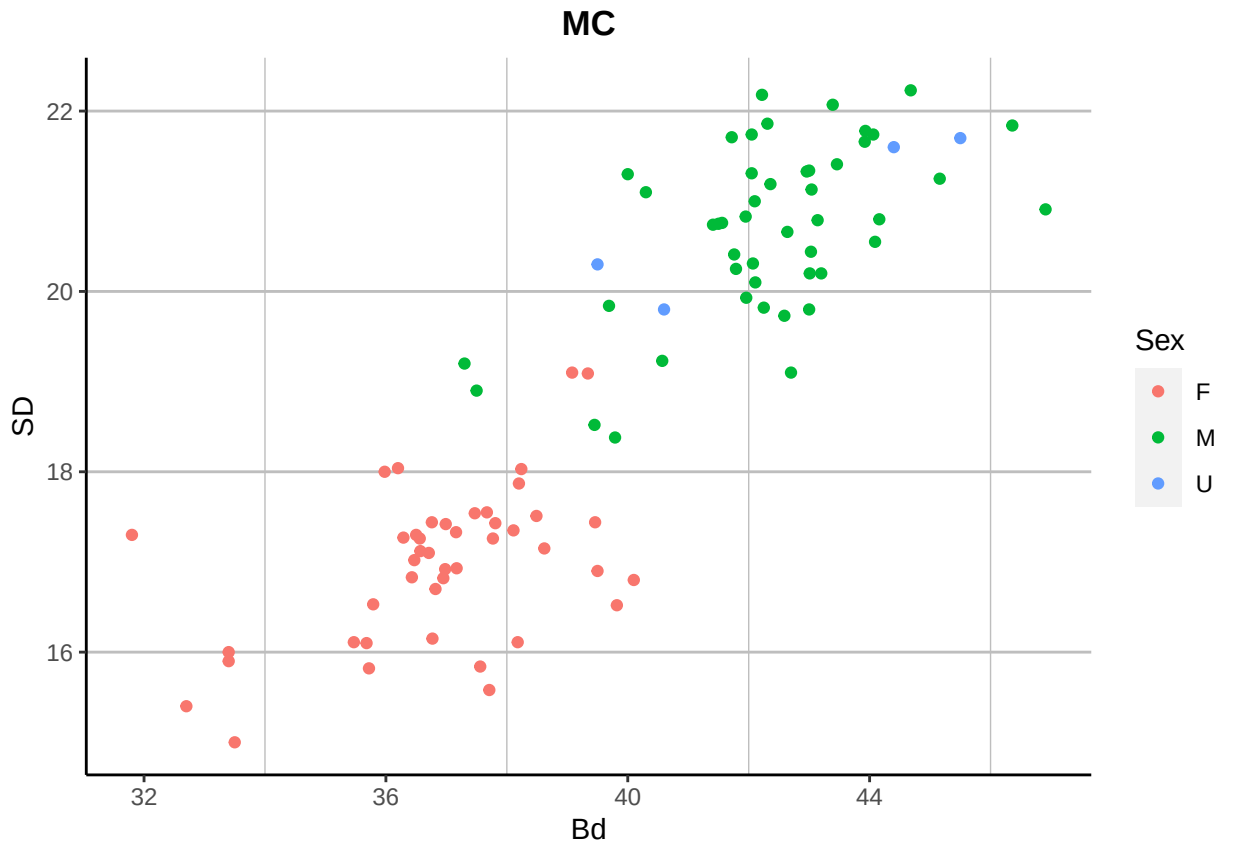

```
ggplot(B_humerus, aes(x=BT, y=Bd, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "BT",
    y = "Bd",
    title = "MC"
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```



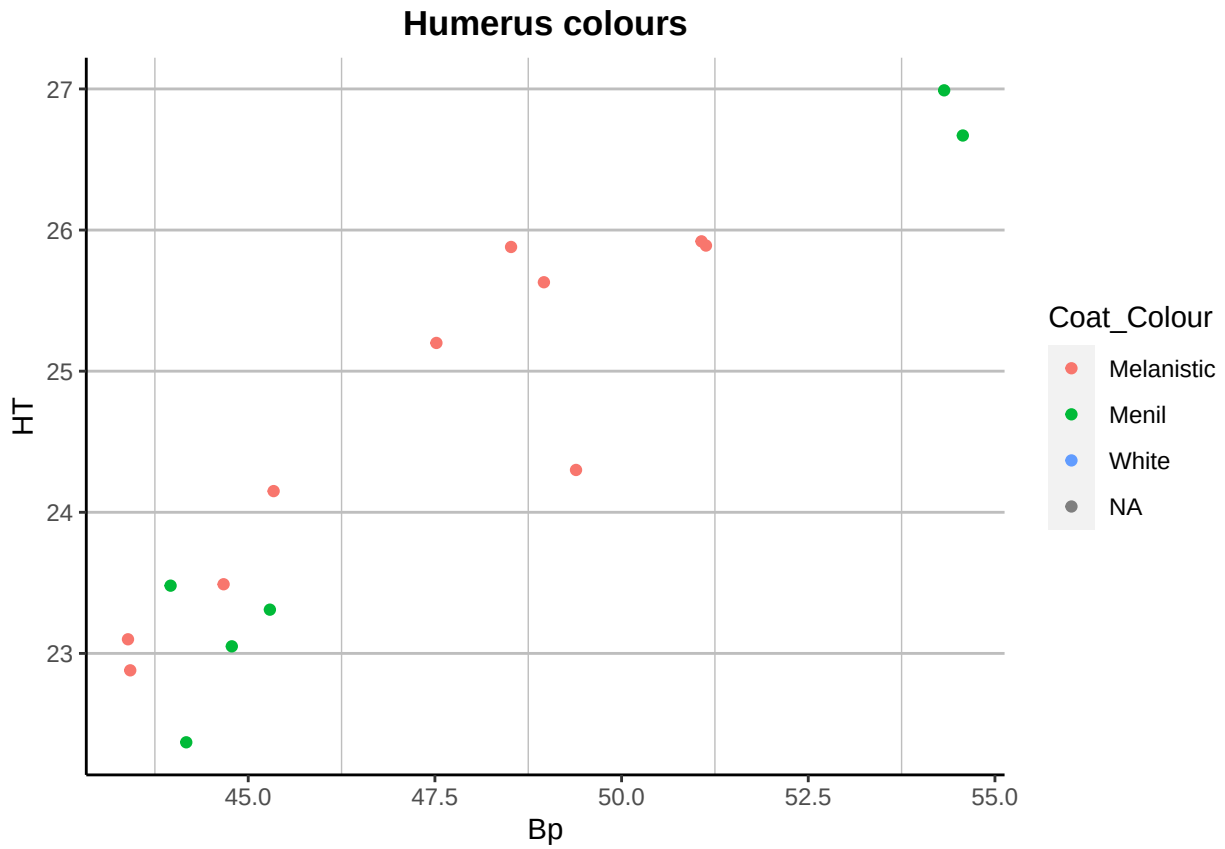

```
ggplot(B_humerus, aes(x=Bd, y=SD, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "SD",
    title = "MC"
  ) #+ facet_wrap(~Sex)
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```

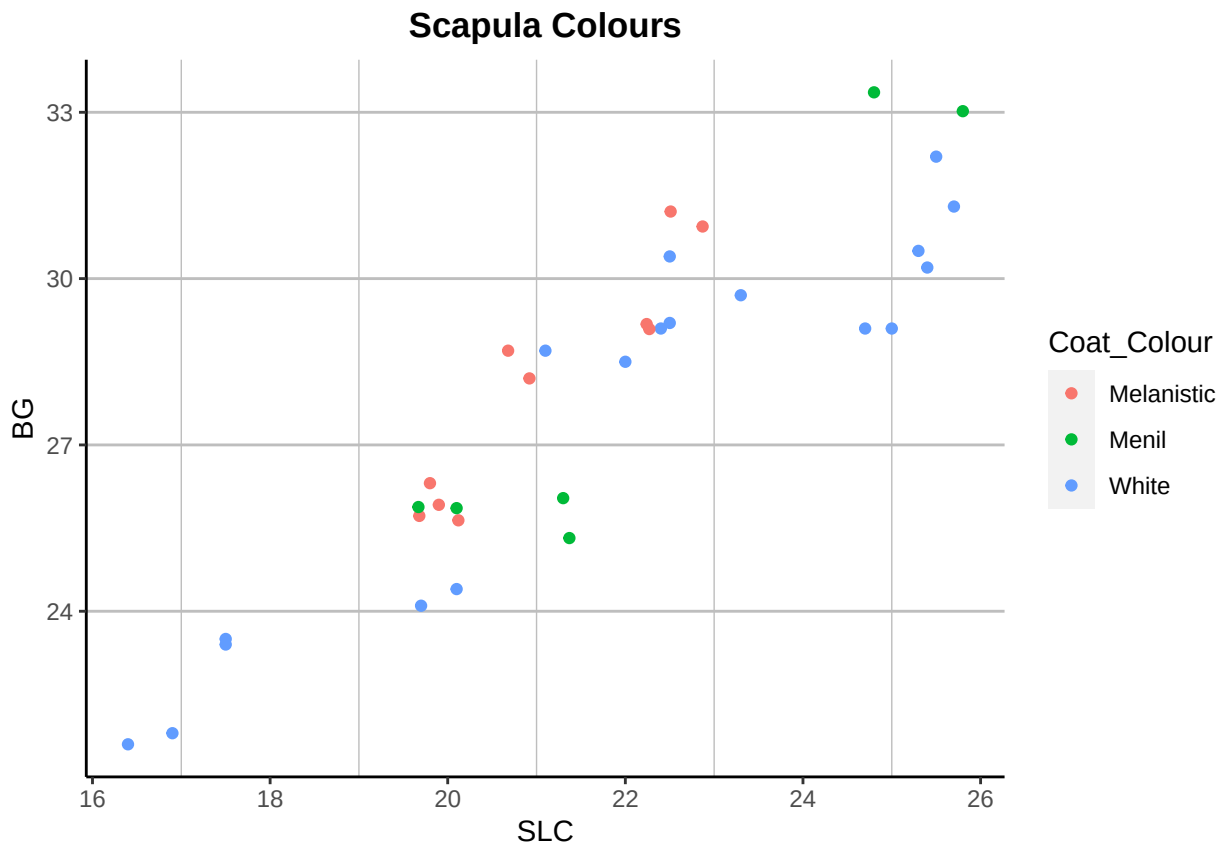



```
ggplot(B_humerus, aes(x=Bp, y=HT, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bp",
    y = "HT",
    title = "Humerus colours"
  ) #+ facet_wrap(~Sex)
```

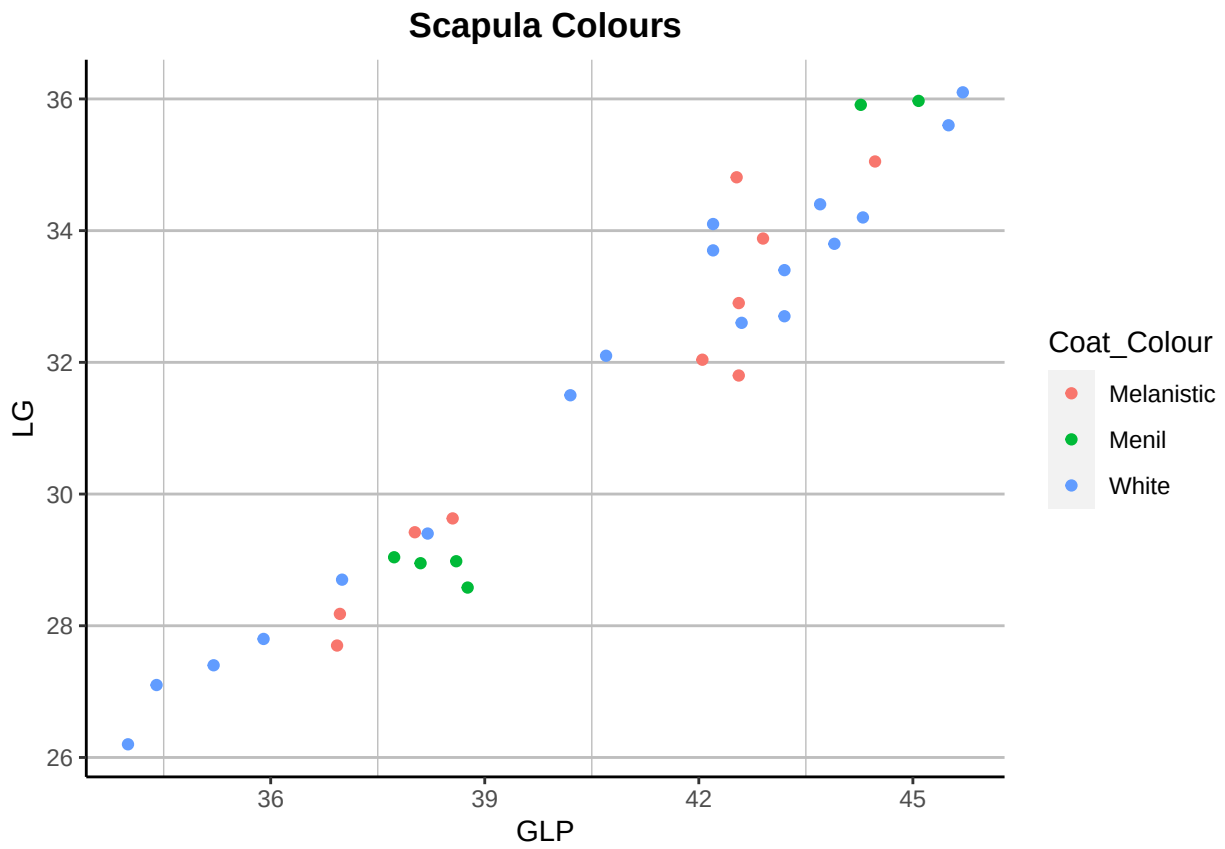
```
## Warning: Removed 81 rows containing missing values (geom_point).
```




```
ggplot(subset(B_scapula, !is.na(Coat_Colour)), aes(x=SLC, y=BG, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "SLC",
    y = "BG",
    title = "Scapula Colours"
  ) #+ facet_wrap(~Sex)
```

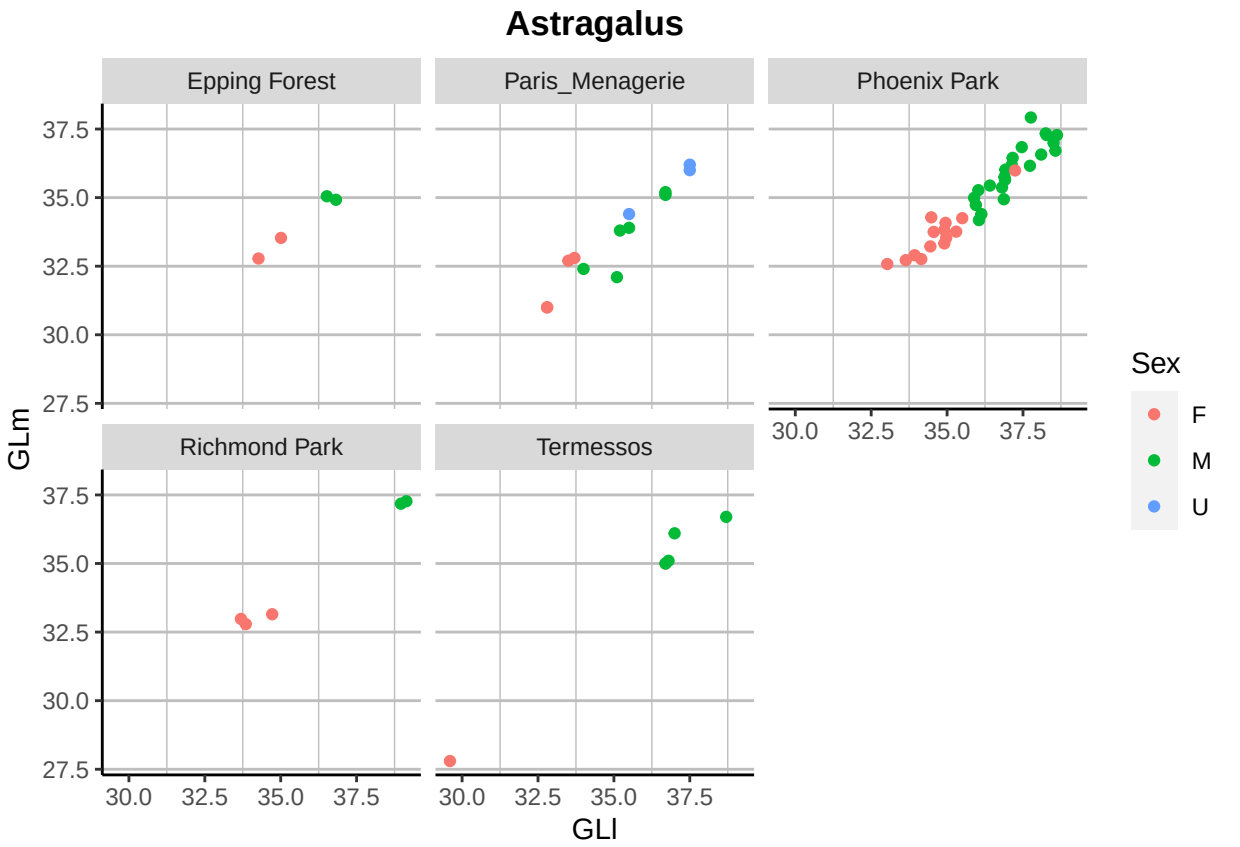



```
ggplot(subset(B_scapula, !is.na(Coat_Colour)), aes(x=GLP, y=LG, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "GLP",
    y = "LG",
    title = "Scapula Colours"
  ) #+ facet_wrap(~Sex)
```

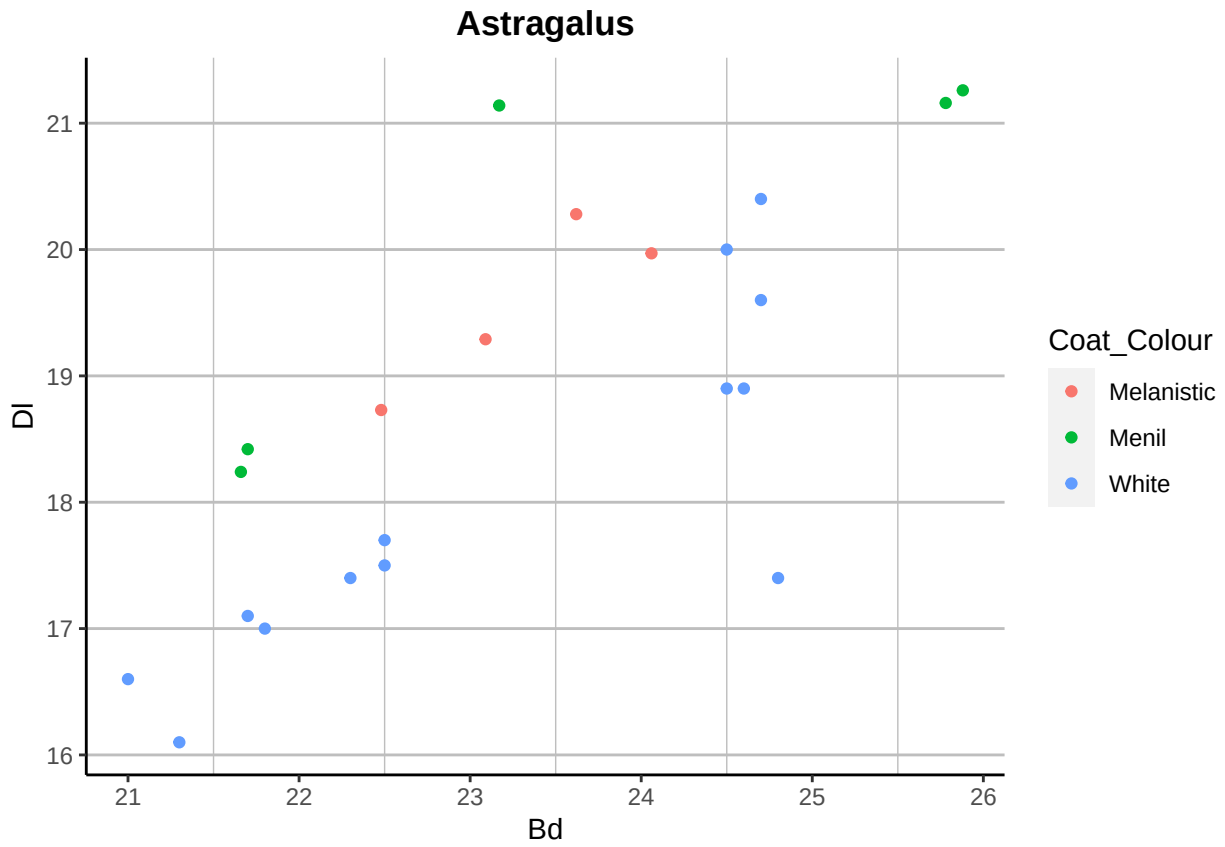



```
ggplot(B_astragalus, aes(x=GLl, y=GLm, colour = Sex)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "GLl",
    y = "GLm",
    title = "Astragalus"
  ) + facet_wrap(~Site)
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

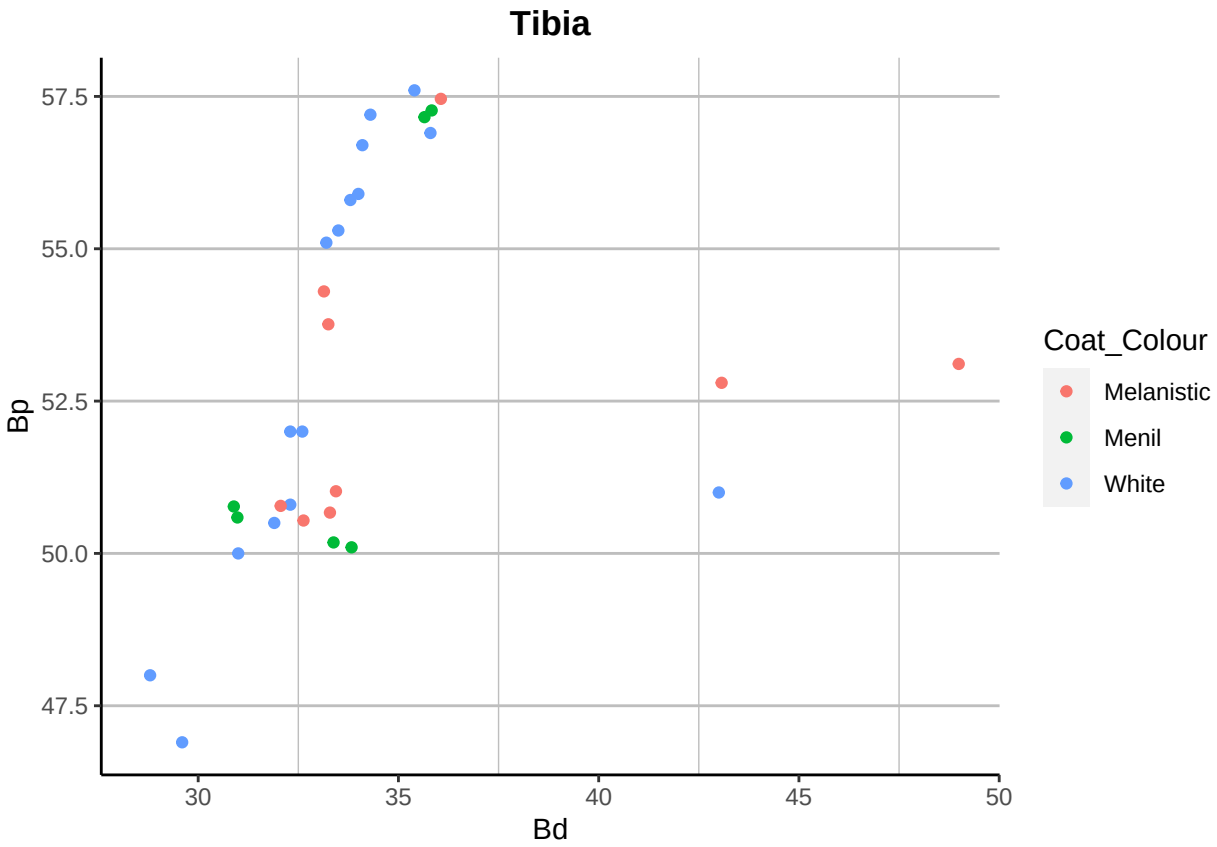



```
ggplot(subset(B_astragalus, !is.na(Coat_Colour)), aes(x=Bd, y=Dl, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Dl",
    title = "Astragalus"
  ) #+ facet_wrap(~Site)
```




```
ggplot(subset(B_tibia, !is.na(Coat_Colour)), aes(x=Bd, y=Bp, colour = Coat_Colour)) +
  geom_point() +
  theme(
    plot.title = element_text(hjust = 0.5, face = 'bold'),
        panel.background = element_rect(fill = 'white'),
        panel.grid.major.x = element_blank(),
        panel.grid.major.y = element_line(color = 'gray'),
        axis.line = element_line(color = "black"),
        panel.grid.minor.x = element_line(color = 'gray'),
        panel.grid.minor.y = element_blank()
    ) +
  labs(
    x = "Bd",
    y = "Bp",
    title = "Tibia"
  )
```

```
## Warning: Removed 5 rows containing missing values (geom_point).
```


Tibia
Bp
Bd
57.5
55.0
52.5
50.0
47.5
30
35
40
45
50
Coat_Colour
Melanistic
Menil
White