

# HW2

## STATISTICAL CONSULTING

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### Summary report

我們通過整理後的蘑菇資料並使用Table 1中的class（可食用與有毒）進行分類，可觀察到以下統計結果：在173個蘑菇樣本中，77個（44.5%）是可食用的，96個（55.5%）是有毒的，這些蘑菇可分為23種科（Family）。其中占比最多的科是傘菌科（Tricholoma Family，24.9%）和紅菇科（Russula Family，15.6%），且從Table1的描述中可明顯觀察到絲蓋傘科（Cortinari Family）的所有樣本都是有毒的。在菌蓋直徑（cap.diameter）方面，可食用蘑菇的菌蓋平均較大（平均7.81公分），而有毒蘑菇則較小（平均5.88公分）。在菌柄寬度（stem.width）方面，可食用蘑菇的菌柄明顯較粗（平均14.4毫米），而有毒蘑菇則較細（平均10.4毫米）。菌蓋顏色（cap.color）中，最常見的是咖啡色菌蓋[n]，在可食用蘑菇中更為常見（28.6%），而在有毒蘑菇中較少見（16.7%）。菌褶間距（gill.spacing）方面，雖然缺失數據較多（占了41.0%），但從觀測到的數據可發現具有緊密間距[c]的占比最多（40.5%）。菌褶顏色（gill.color）則可明顯觀察到白色菌褶[w]最常見（20.8%）。就棲息地而言，大多數蘑菇（60.1%）生長在落葉林中[d]。季節方面，大部分蘑菇（61.3%）的生長季節主要是夏季和秋季[u, a]。

```
library(dplyr) #
library(tidyr) # trimws( )
library(Hmisc)
library(reticulate) # R Python
library(readr) #

#
file_path <- "C:\\Users\\ \\Desktop\\ \\ \\mushroom_hw2\\primary_data.csv"
df <- read.csv(file_path, sep = ";", stringsAsFactors = FALSE, na.strings = c("", "NA"))

df_cleaned <- df

#
parse_range <- function(x) {
  if (is.character(x)) { #
    return(sapply(x, function(value) {
      if (grepl("\\[", value)) {
        #

```

```

      values <- as.numeric(unlist(strsplit(gsub("\\[|\\]", "", value), ",")))
      return(mean(values, na.rm = TRUE)) #
    } else {
      return(as.numeric(value))
    }
  })
} else {
  return(x)
}
}

#
# mutate():
# across():
# where():
# any_of():
df_cleaned <- df_cleaned %>%
  mutate(across(where(is.character), trimws)) %>% #
  mutate(across(any_of(c("cap.diameter", "stem.height", "stem.width")), parse_range))

#
df_cleaned <- df_cleaned %>%
  mutate(Edibility = case_when(
    class == "e" ~ "Edible",
    class == "p" ~ "Poisonous",
    TRUE ~ "Unknown"
  ))

# CSV
output_path <- "C:\\Users\\ \\Desktop\\ \\ \\mushroom_hw2\\primary_data_cleaned.csv"
write.csv(df_cleaned, output_path, row.names = FALSE)
mushroom <- read.csv(output_path, stringsAsFactors = FALSE)
summary <- describe(mushroom)
latex(summary, file = "")

```

mushroom  
24 Variables 173 Observations

family								
n	missing	distinct						
173	0	23						
lowest :	Amanita Family	Bolbitius Family	Bolete Family	Bracket Fungi	Chanterelle Family			
highest:	Russula Family	Saddle-Cup Family	Stropharia Family	Tricholoma Family	Wax Gill Family			

  

name								
n	missing	distinct						
173	0	173						
lowest :	Amethyst Deceiver	Aniseed Funnel Cap	Apricot Fungus	Bare-toothed Russula	Bay Bolete			
highest:	Yellow-gilled Russula	Yellow-staining Mushroom	Yellow-stemmed Bell Cap	Yellow Swamp Russula	Yellow Wax cap			

## class

n	missing	distinct
173	0	2

Value	e	p
Frequency	77	96
Proportion	0.445	0.555

## cap.diameter

n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95
173	0	35	0.997	6.739	6.25	4.755	1.5	2.0	3.5	6.0	8.5	11.4	15.0

lowest : 0.7 0.75 1 1.25 1.5 , highest: 16.5 17.5 18.5 19 50

## cap.shape

n	missing	distinct
173	0	27

lowest : [b, f, s] [b, f] [b, x, f] [b, x] [b]  
highest: [x, f] [x, o] [x, p] [x, s] [x]

## Cap.surface

n	missing	distinct
133	40	40

lowest : [d, e, y, i] [d, k, s] [d, k] [d, s] [d]  
highest: [t] [w, t] [w] [y, s] [y]

## cap.color

n	missing	distinct
173	0	67

lowest : [b, p, e, y] [b, u] [b] [e, n, p, w] [e, n, y]  
highest: [y, n] [y, o, g, n, r] [y, o, r, n] [y, o] [y]

## does.bruise.or.bleed

n	missing	distinct
173	0	2

Value	[f]	[t]
Frequency	143	30
Proportion	0.827	0.173

## gill.attachment

n	missing	distinct
145	28	8

Value	[a, d]	[a]	[d]	[e]	[f]	[p]	[s]	[x]
Frequency	8	32	25	16	10	17	16	21
Proportion	0.055	0.221	0.172	0.110	0.069	0.117	0.110	0.145

## gill.spacing

n	missing	distinct
102	71	3

Value	[c]	[d]	[f]
Frequency	70	22	10
Proportion	0.686	0.216	0.098

### gill.color

n missing distinct  
173 0 59

lowest : [b, p, w] [b, u] [b] [e] [f]  
highest: [y, o, e] [y, r, k] [y, r] [y, w] [y]

### stem.height

n missing distinct Info Mean pMedian Gmd .05 .10 .25 .50 .75 .90 .95  
173 0 30 0.993 6.59 6.25 3.228 3.0 3.5 4.5 6.0 7.5 10.0 12.2

lowest : 0 1.5 2 2.5 3 , highest: 16 16.5 17.5 19 25

### stem.width

n missing distinct Info Mean pMedian Gmd .05 .10 .25 .50 .75 .90 .95  
173 0 35 0.997 12.16 11 10.09 1.5 2.5 5.5 10.0 15.0 25.0 30.0

lowest : 0 0.75 1 1.5 2 , highest: 30 35 40 50 70

### stem.root

n missing distinct  
27 146 5

Value [b] [c] [f] [r] [s]  
Frequency 9 2 3 4 9  
Proportion 0.333 0.074 0.111 0.148 0.333

### stem.surface

n missing distinct  
65 108 14

Value [f] [g] [h] [i, s] [i, t] [i, y] [i] [k, s] [k] [s, h] [s] [t]  
Frequency 3 5 1 1 1 1 11 1 4 1 15 7  
Proportion 0.046 0.077 0.015 0.015 0.015 0.015 0.169 0.015 0.062 0.015 0.231 0.108  
Value [y, s] [y]  
Frequency 1 13  
Proportion 0.015 0.200

### stem.color

n missing distinct  
173 0 41

lowest : [b, u] [e, n] [e, u, y] [e, y] [e]  
highest: [w] [y, e, n] [y, n] [y, o, k] [y]

### veil.type

n missing distinct value  
9 164 1 [u]

Value [u]  
Frequency 9  
Proportion 1

### veil.color

n missing distinct  
21 152 7

Value [e, n] [k] [n] [u] [w] [y, w] [y]  
Frequency 1 1 1 1 15 1 1  
Proportion 0.048 0.048 0.048 0.048 0.714 0.048 0.048

### has.ring

n	missing	distinct
173	0	2

  

Value	[f]	[t]
Frequency	130	43
Proportion	0.751	0.249

### ring.type

n	missing	distinct
166	7	13

Value	[e, g]	[e]	[f]	[g, p]	[g]	[l, e]	[l, p]	[l, r]	[l]	[m]	[p]	[r]
Frequency	1	6	137	2	2	1	1	2	2	1	2	3
Proportion	0.006	0.036	0.825	0.012	0.012	0.006	0.006	0.012	0.012	0.006	0.012	0.018

  

Value	[z]
Frequency	6
Proportion	0.036

### Spore.print.color

n	missing	distinct
18	155	8

Value	[g]	[k, r]	[k, u]	[k]	[n]	[p, w]	[p]	[w]
Frequency	1	1	1	5	3	1	3	3
Proportion	0.056	0.056	0.056	0.278	0.167	0.056	0.167	0.167

### habitat

n	missing	distinct
173	0	21

lowest :	[d, h]	[d]	[g, d, h]	[g, d]	[g, h, d]
highest:	[m, d]	[m, h]	[m]	[p, d]	[w]

### season

n	missing	distinct
173	0	10

Value	[a, w]	[a]	[s, a, w]	[s, u, a, w]	[s, u, a]	[s, u]
Frequency	15	16	1	13	5	3
Proportion	0.087	0.092	0.006	0.075	0.029	0.017

  

Value	[s]	[u, a, w]	[u, a]	[u]
Frequency	1	12	106	1
Proportion	0.006	0.069	0.613	0.006

### Edibility

n	missing	distinct
173	0	2

Value	Edible	Poisonous
Frequency	77	96
Proportion	0.445	0.555

## Table 1

以單一的變數class進行描述的table 1(e : Edible ; p : Poisonous)

```
table1(~class, data = mushroom)
```

	Overall
	(N=173)
class	
e	77 (44.5%)
p	96 (55.5%)

用class作為分類變數對其他變數做描述的table 1

```
table1(~ family + cap.diameter + cap.shape + Cap.surface + cap.color + does.bruise.or.bleed
+ gill.attachment + gill.spacing + gill.color + stem.height + stem.width
+ stem.root + stem.surface + stem.color + veil.type + veil.color
+ has.ring + ring.type + Spore.print.color + habitat + season
| class, data = mushroom, overall = "Total")
```

	e	p	Total
	(N=77)	(N=96)	(N=173)
family			
Amanita Family	3 (3.9%)	5 (5.2%)	8 (4.6%)
Bolbitius Family	1 (1.3%)	2 (2.1%)	3 (1.7%)
Bolete Family	11 (14.3%)	3 (3.1%)	14 (8.1%)
Bracket Fungi	1 (1.3%)	6 (6.3%)	7 (4.0%)
Chanterelle Family	3 (3.9%)	0 (0%)	3 (1.7%)
Entoloma Family	1 (1.3%)	6 (6.3%)	7 (4.0%)
Hydnum Family	1 (1.3%)	0 (0%)	1 (0.6%)
Ink Cap Family	6 (7.8%)	7 (7.3%)	13 (7.5%)
Lepiota Family	2 (2.6%)	1 (1.0%)	3 (1.7%)
Morel Family	1 (1.3%)	0 (0%)	1 (0.6%)
Mushroom Family	4 (5.2%)	1 (1.0%)	5 (2.9%)
Oyster Mushroom Family	2 (2.6%)	0 (0%)	2 (1.2%)
Pluteus Family	2 (2.6%)	0 (0%)	2 (1.2%)
Russula Family	11 (14.3%)	16 (16.7%)	27 (15.6%)
Stropharia Family	1 (1.3%)	7 (7.3%)	8 (4.6%)
Tricholoma Family	23 (29.9%)	20 (20.8%)	43 (24.9%)
Wax Gill Family	4 (5.2%)	4 (4.2%)	8 (4.6%)
Cortinarius Family	0 (0%)	11 (11.5%)	11 (6.4%)
Crepidotus Family	0 (0%)	1 (1.0%)	1 (0.6%)
Ear-Pick Family	0 (0%)	1 (1.0%)	1 (0.6%)
Jelly Discs Family	0 (0%)	1 (1.0%)	1 (0.6%)
Paxillus Family	0 (0%)	3 (3.1%)	3 (1.7%)
Saddle-Cup Family	0 (0%)	1 (1.0%)	1 (0.6%)
cap.diameter			
Mean (SD)	7.81 (6.26)	5.88 (3.85)	6.74 (5.14)
Median [Min, Max]	6.50 [1.00, 50.0]	5.00 [0.700, 19.0]	6.00 [0.700, 50.0]
cap.shape			
[b, f]	2 (2.6%)	3 (3.1%)	5 (2.9%)
[b]	2 (2.6%)	8 (8.3%)	10 (5.8%)
[c, x, f]	1 (1.3%)	0 (0%)	1 (0.6%)

	e	p	Total
[c, x]	1 (1.3%)	0 (0%)	1 (0.6%)
[c]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[f, s]	3 (3.9%)	5 (5.2%)	8 (4.6%)
[f, x]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[f]	4 (5.2%)	4 (4.2%)	8 (4.6%)
[o]	1 (1.3%)	7 (7.3%)	8 (4.6%)
[p, b]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[p, c, o]	1 (1.3%)	0 (0%)	1 (0.6%)
[p, f]	2 (2.6%)	0 (0%)	2 (1.2%)
[p, x, f]	2 (2.6%)	0 (0%)	2 (1.2%)
[p, x]	3 (3.9%)	1 (1.0%)	4 (2.3%)
[s, o]	2 (2.6%)	0 (0%)	2 (1.2%)
[s]	4 (5.2%)	5 (5.2%)	9 (5.2%)
[x, f, s]	7 (9.1%)	6 (6.3%)	13 (7.5%)
[x, f]	14 (18.2%)	15 (15.6%)	29 (16.8%)
[x, p]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[x, s]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[x]	23 (29.9%)	25 (26.0%)	48 (27.7%)
[b, f, s]	0 (0%)	1 (1.0%)	1 (0.6%)
[b, x, f]	0 (0%)	1 (1.0%)	1 (0.6%)
[b, x]	0 (0%)	3 (3.1%)	3 (1.7%)
[c, f]	0 (0%)	2 (2.1%)	2 (1.2%)
[p]	0 (0%)	1 (1.0%)	1 (0.6%)
[x, o]	0 (0%)	1 (1.0%)	1 (0.6%)
Cap.surface			
[d, k]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[d, s]	1 (1.3%)	0 (0%)	1 (0.6%)
[d]	4 (5.2%)	5 (5.2%)	9 (5.2%)
[e, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[e]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[g, s, h, t]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, s, t]	1 (1.3%)	0 (0%)	1 (0.6%)
[g]	5 (6.5%)	7 (7.3%)	12 (6.9%)
[h, s, d]	1 (1.3%)	0 (0%)	1 (0.6%)
[h, t]	6 (7.8%)	4 (4.2%)	10 (5.8%)
[h]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[i, y]	2 (2.6%)	0 (0%)	2 (1.2%)
[l]	2 (2.6%)	2 (2.1%)	4 (2.3%)
[s, d]	1 (1.3%)	0 (0%)	1 (0.6%)
[s, t]	2 (2.6%)	2 (2.1%)	4 (2.3%)
[s, y]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[s]	8 (10.4%)	5 (5.2%)	13 (7.5%)
[t, h, s]	1 (1.3%)	0 (0%)	1 (0.6%)
[t, h]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[t]	2 (2.6%)	10 (10.4%)	12 (6.9%)
[w, t]	1 (1.3%)	0 (0%)	1 (0.6%)
[w]	2 (2.6%)	3 (3.1%)	5 (2.9%)
[y, s]	1 (1.3%)	0 (0%)	1 (0.6%)
[y]	7 (9.1%)	7 (7.3%)	14 (8.1%)
[d, e, y, i]	0 (0%)	1 (1.0%)	1 (0.6%)
[d, k, s]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, k, s, h]	0 (0%)	1 (1.0%)	1 (0.6%)

	e	p	Total
[e, t, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, h]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, s, d]	0 (0%)	1 (1.0%)	1 (0.6%)
[h, s, t]	0 (0%)	1 (1.0%)	1 (0.6%)
[h, t, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[h, t, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[i, e]	0 (0%)	1 (1.0%)	1 (0.6%)
[i]	0 (0%)	4 (4.2%)	4 (2.3%)
[k, e]	0 (0%)	1 (1.0%)	1 (0.6%)
[k]	0 (0%)	4 (4.2%)	4 (2.3%)
[s, h]	0 (0%)	1 (1.0%)	1 (0.6%)
[s, i]	0 (0%)	1 (1.0%)	1 (0.6%)
[t, w, d]	0 (0%)	1 (1.0%)	1 (0.6%)
Missing	19 (24.7%)	21 (21.9%)	40 (23.1%)
cap.color			
[b, u]	1 (1.3%)	0 (0%)	1 (0.6%)
[b]	1 (1.3%)	0 (0%)	1 (0.6%)
[e, n, y]	2 (2.6%)	0 (0%)	2 (1.2%)
[g, k]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[g, n]	6 (7.8%)	4 (4.2%)	10 (5.8%)
[g, u, n, p]	1 (1.3%)	0 (0%)	1 (0.6%)
[k, n, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, g, b, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, r, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, u, g, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, b]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n, e]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[n, g]	3 (3.9%)	0 (0%)	3 (1.7%)
[n, o, e]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, o]	2 (2.6%)	2 (2.1%)	4 (2.3%)
[n, p, e]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n, r, u, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, w]	1 (1.3%)	3 (3.1%)	4 (2.3%)
[n, y, e]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, y, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, y]	3 (3.9%)	6 (6.3%)	9 (5.2%)
[n]	22 (28.6%)	16 (16.7%)	38 (22.0%)
[o, b]	1 (1.3%)	0 (0%)	1 (0.6%)
[o, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[o, p, e]	1 (1.3%)	0 (0%)	1 (0.6%)
[u, k]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, g]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[w, n]	2 (2.6%)	2 (2.1%)	4 (2.3%)
[w, p, o]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, y]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[w]	6 (7.8%)	6 (6.3%)	12 (6.9%)
[y]	6 (7.8%)	4 (4.2%)	10 (5.8%)
[b, p, e, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, n, p, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, n]	0 (0%)	2 (2.1%)	2 (1.2%)



	e	p	Total
[e, o, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, o]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, p, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[e, u, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[e]	0 (0%)	3 (3.1%)	3 (1.7%)
[g, n, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, r, k, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, r, n]	0 (0%)	2 (2.1%)	2 (1.2%)
[g, u, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[g]	0 (0%)	1 (1.0%)	1 (0.6%)
[l, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, e, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, o, y, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[o, e, n, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[o, y, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[o, y]	0 (0%)	3 (3.1%)	3 (1.7%)
[o]	0 (0%)	2 (2.1%)	2 (1.2%)
[p]	0 (0%)	2 (2.1%)	2 (1.2%)
[r, l]	0 (0%)	1 (1.0%)	1 (0.6%)
[r, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[r, p, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[r, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[r]	0 (0%)	1 (1.0%)	1 (0.6%)
[u]	0 (0%)	2 (2.1%)	2 (1.2%)
[w, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, y, g, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, n]	0 (0%)	3 (3.1%)	3 (1.7%)
[y, o, g, n, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, o, r, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, o]	0 (0%)	1 (1.0%)	1 (0.6%)
does.bruise.or.bleed			
[f]	63 (81.8%)	80 (83.3%)	143 (82.7%)
[t]	14 (18.2%)	16 (16.7%)	30 (17.3%)
gill.attachment			
[a, d]	5 (6.5%)	3 (3.1%)	8 (4.6%)
[a]	11 (14.3%)	21 (21.9%)	32 (18.5%)
[d]	9 (11.7%)	16 (16.7%)	25 (14.5%)
[e]	10 (13.0%)	6 (6.3%)	16 (9.2%)
[f]	4 (5.2%)	6 (6.3%)	10 (5.8%)
[p]	12 (15.6%)	5 (5.2%)	17 (9.8%)
[s]	7 (9.1%)	9 (9.4%)	16 (9.2%)
[x]	9 (11.7%)	12 (12.5%)	21 (12.1%)
Missing	10 (13.0%)	18 (18.8%)	28 (16.2%)
gill.spacing			
[c]	29 (37.7%)	41 (42.7%)	70 (40.5%)
[d]	13 (16.9%)	9 (9.4%)	22 (12.7%)
[f]	4 (5.2%)	6 (6.3%)	10 (5.8%)
Missing	31 (40.3%)	40 (41.7%)	71 (41.0%)
gill.color			
[b, u]	1 (1.3%)	0 (0%)	1 (0.6%)
[b]	1 (1.3%)	0 (0%)	1 (0.6%)
[f]	4 (5.2%)	6 (6.3%)	10 (5.8%)

	e	p	Total
[g, k]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[g, n]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[g, p]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, w, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, w]	2 (2.6%)	0 (0%)	2 (1.2%)
[g]	3 (3.9%)	1 (1.0%)	4 (2.3%)
[k, n]	2 (2.6%)	4 (4.2%)	6 (3.5%)
[k, p, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, y]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n]	3 (3.9%)	8 (8.3%)	11 (6.4%)
[o, b]	1 (1.3%)	0 (0%)	1 (0.6%)
[o, e]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[o, y]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[o]	2 (2.6%)	2 (2.1%)	4 (2.3%)
[p, n, k]	1 (1.3%)	0 (0%)	1 (0.6%)
[p, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[p, w]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[p]	3 (3.9%)	5 (5.2%)	8 (4.6%)
[r]	1 (1.3%)	0 (0%)	1 (0.6%)
[u, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, n]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[w, p, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, p]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[w, u, g, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, y]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[w]	21 (27.3%)	15 (15.6%)	36 (20.8%)
[y, e, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[y, k]	1 (1.3%)	0 (0%)	1 (0.6%)
[y, n]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[y, r]	1 (1.3%)	0 (0%)	1 (0.6%)
[y]	6 (7.8%)	7 (7.3%)	13 (7.5%)
[b, p, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[e]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, n, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, r, w]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[k, p]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, e, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, p]	0 (0%)	2 (2.1%)	2 (1.2%)
[n, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, w]	0 (0%)	2 (2.1%)	2 (1.2%)
[p, y, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[p, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[r, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, b, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, g, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, g, p, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, g, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, g]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, y, g, n]	0 (0%)	1 (1.0%)	1 (0.6%)

	e	p	Total
[y, g, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, o, e]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, r, k]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, w]	0 (0%)	1 (1.0%)	1 (0.6%)
stem.height			
Mean (SD)	7.05 (3.48)	6.22 (3.05)	6.59 (3.26)
Median [Min, Max]	6.00 [2.50, 25.0]	5.50 [0, 17.5]	6.00 [0, 25.0]
stem.width			
Mean (SD)	14.4 (10.8)	10.4 (8.66)	12.2 (9.86)
Median [Min, Max]	12.5 [1.00, 70.0]	7.50 [0, 40.0]	10.0 [0, 70.0]
stem.root			
[b]	6 (7.8%)	3 (3.1%)	9 (5.2%)
[s]	4 (5.2%)	5 (5.2%)	9 (5.2%)
[c]	0 (0%)	2 (2.1%)	2 (1.2%)
[f]	0 (0%)	3 (3.1%)	3 (1.7%)
[r]	0 (0%)	4 (4.2%)	4 (2.3%)
Missing	67 (87.0%)	79 (82.3%)	146 (84.4%)
stem.surface			
[i, t]	1 (1.3%)	0 (0%)	1 (0.6%)
[i]	4 (5.2%)	7 (7.3%)	11 (6.4%)
[k, s]	1 (1.3%)	0 (0%)	1 (0.6%)
[k]	1 (1.3%)	3 (3.1%)	4 (2.3%)
[s]	9 (11.7%)	6 (6.3%)	15 (8.7%)
[t]	3 (3.9%)	4 (4.2%)	7 (4.0%)
[y, s]	1 (1.3%)	0 (0%)	1 (0.6%)
[y]	4 (5.2%)	9 (9.4%)	13 (7.5%)
[f]	0 (0%)	3 (3.1%)	3 (1.7%)
[g]	0 (0%)	5 (5.2%)	5 (2.9%)
[h]	0 (0%)	1 (1.0%)	1 (0.6%)
[i, s]	0 (0%)	1 (1.0%)	1 (0.6%)
[i, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[s, h]	0 (0%)	1 (1.0%)	1 (0.6%)
Missing	53 (68.8%)	55 (57.3%)	108 (62.4%)
stem.color			
[b, u]	1 (1.3%)	0 (0%)	1 (0.6%)
[e, n]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[e, y]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, n]	1 (1.3%)	3 (3.1%)	4 (2.3%)
[g, w]	2 (2.6%)	0 (0%)	2 (1.2%)
[g]	2 (2.6%)	0 (0%)	2 (1.2%)
[k, n]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[l, r, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, g]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n, o]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n, p, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[n, w]	2 (2.6%)	1 (1.0%)	3 (1.7%)
[n, y]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[n]	15 (19.5%)	20 (20.8%)	35 (20.2%)
[o, e]	1 (1.3%)	0 (0%)	1 (0.6%)
[o, n]	1 (1.3%)	0 (0%)	1 (0.6%)
[o, y]	1 (1.3%)	4 (4.2%)	5 (2.9%)

	e	p	Total
[u]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[w, n]	2 (2.6%)	1 (1.0%)	3 (1.7%)
[w, o]	1 (1.3%)	0 (0%)	1 (0.6%)
[w, y]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[w]	32 (41.6%)	25 (26.0%)	57 (32.9%)
[y]	5 (6.5%)	8 (8.3%)	13 (7.5%)
[e, u, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[e]	0 (0%)	1 (1.0%)	1 (0.6%)
[f]	0 (0%)	3 (3.1%)	3 (1.7%)
[g, r, n]	0 (0%)	2 (2.1%)	2 (1.2%)
[g, u, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[k]	0 (0%)	1 (1.0%)	1 (0.6%)
[n, e]	0 (0%)	2 (2.1%)	2 (1.2%)
[n, p]	0 (0%)	1 (1.0%)	1 (0.6%)
[o]	0 (0%)	1 (1.0%)	1 (0.6%)
[p]	0 (0%)	2 (2.1%)	2 (1.2%)
[r, y]	0 (0%)	1 (1.0%)	1 (0.6%)
[u, e]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, l, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[w, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, e, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[y, n]	0 (0%)	4 (4.2%)	4 (2.3%)
[y, o, k]	0 (0%)	1 (1.0%)	1 (0.6%)
veil.type			
[u]	3 (3.9%)	6 (6.3%)	9 (5.2%)
Missing	74 (96.1%)	90 (93.8%)	164 (94.8%)
veil.color			
[w]	7 (9.1%)	8 (8.3%)	15 (8.7%)
[y, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[y]	1 (1.3%)	0 (0%)	1 (0.6%)
[e, n]	0 (0%)	1 (1.0%)	1 (0.6%)
[k]	0 (0%)	1 (1.0%)	1 (0.6%)
[n]	0 (0%)	1 (1.0%)	1 (0.6%)
[u]	0 (0%)	1 (1.0%)	1 (0.6%)
Missing	68 (88.3%)	84 (87.5%)	152 (87.9%)
has.ring			
[f]	60 (77.9%)	70 (72.9%)	130 (75.1%)
[t]	17 (22.1%)	26 (27.1%)	43 (24.9%)
ring.type			
[e]	3 (3.9%)	3 (3.1%)	6 (3.5%)
[f]	61 (79.2%)	76 (79.2%)	137 (79.2%)
[g]	2 (2.6%)	0 (0%)	2 (1.2%)
[l, p]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, r]	2 (2.6%)	0 (0%)	2 (1.2%)
[l]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[m]	1 (1.3%)	0 (0%)	1 (0.6%)
[p]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[r]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[e, g]	0 (0%)	1 (1.0%)	1 (0.6%)
[g, p]	0 (0%)	2 (2.1%)	2 (1.2%)
[l, e]	0 (0%)	1 (1.0%)	1 (0.6%)
[z]	0 (0%)	6 (6.3%)	6 (3.5%)

	e	p	Total
Missing	4 (5.2%)	3 (3.1%)	7 (4.0%)
Spore.print.color			
[g]	1 (1.3%)	0 (0%)	1 (0.6%)
[k]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[p]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[w]	2 (2.6%)	1 (1.0%)	3 (1.7%)
[k, r]	0 (0%)	1 (1.0%)	1 (0.6%)
[k, u]	0 (0%)	1 (1.0%)	1 (0.6%)
[n]	0 (0%)	3 (3.1%)	3 (1.7%)
[p, w]	0 (0%)	1 (1.0%)	1 (0.6%)
Missing	72 (93.5%)	83 (86.5%)	155 (89.6%)
habitat			
[d, h]	1 (1.3%)	3 (3.1%)	4 (2.3%)
[d]	47 (61.0%)	57 (59.4%)	104 (60.1%)
[g, d, h]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, d]	6 (7.8%)	4 (4.2%)	10 (5.8%)
[g, h, d]	1 (1.3%)	2 (2.1%)	3 (1.7%)
[g, l, m, d]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, m, d]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[g, m]	3 (3.9%)	2 (2.1%)	5 (2.9%)
[g, u, d]	1 (1.3%)	0 (0%)	1 (0.6%)
[g]	1 (1.3%)	10 (10.4%)	11 (6.4%)
[l, d, h]	1 (1.3%)	0 (0%)	1 (0.6%)
[l, d]	7 (9.1%)	6 (6.3%)	13 (7.5%)
[l, h]	1 (1.3%)	0 (0%)	1 (0.6%)
[l]	1 (1.3%)	0 (0%)	1 (0.6%)
[m, d]	2 (2.6%)	1 (1.0%)	3 (1.7%)
[m]	1 (1.3%)	1 (1.0%)	2 (1.2%)
[w]	1 (1.3%)	0 (0%)	1 (0.6%)
[g, l, d]	0 (0%)	1 (1.0%)	1 (0.6%)
[h, d]	0 (0%)	2 (2.1%)	2 (1.2%)
[m, h]	0 (0%)	1 (1.0%)	1 (0.6%)
[p, d]	0 (0%)	2 (2.1%)	2 (1.2%)
season			
[a, w]	9 (11.7%)	6 (6.3%)	15 (8.7%)
[a]	5 (6.5%)	11 (11.5%)	16 (9.2%)
[s, a, w]	1 (1.3%)	0 (0%)	1 (0.6%)
[s, u, a, w]	7 (9.1%)	6 (6.3%)	13 (7.5%)
[s, u, a]	1 (1.3%)	4 (4.2%)	5 (2.9%)
[s, u]	2 (2.6%)	1 (1.0%)	3 (1.7%)
[s]	1 (1.3%)	0 (0%)	1 (0.6%)
[u, a, w]	8 (10.4%)	4 (4.2%)	12 (6.9%)
[u, a]	43 (55.8%)	63 (65.6%)	106 (61.3%)
[u]	0 (0%)	1 (1.0%)	1 (0.6%)