

# STATISTICAL CONSULTING HW2

R26131086

Sheng-Yue Chang

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## 1. Data discription

Variable	Data Type	Definition	Note
family	character	Name of the family of mushroom species	Multinomial
name	character	Name of the mushroom species	Multinomial
class	binary	Edibility classification	p = poisonous, e = edible
cap-diameter	metrical	Cap diameter in cm	Min & Max values or Mean
cap-shape	nominal	Shape of the mushroom cap	b = bell, c = conical, x = convex, f = flat, s = sunken, p = spherical, o = others
cap-surface	nominal	Surface texture of the cap	i = fibrous, g = grooves, y = scaly, s = smooth, h = shiny, l = leathery, k = silky, t = sticky, w = wrinkled, e = fleshy
cap-color	nominal	Cap color	n = brown, b = buff, g = gray, r = green, p = pink, u = purple, e = red, w = white, y = yellow, l = blue, o = orange, k = black
does-bruise-bleed	nominal	Whether the mushroom bruises or bleeds	t = true, f = false
gill-attachment	nominal	How the gills attach to the stem	a = adnate, x = adnexed, d = decurrent, e = free, s = sinuate, p = pores, f = none, ? = unknown

Variable	Data Type	Definition	Note
gill-spacing	nominal	Distance between gills	c = close, d = distant, f = none
gill-color	nominal	Color of the gills	Same as cap-color + f = none
stem-height	metrical	Height of the mushroom stem in cm	Min & Max values or Mean
stem-width	metrical	Width of the mushroom stem in mm	Min & Max values or Mean
stem-root	nominal	Type of root structure	b = bulbous, s = swollen, c = club, u = cup, e = equal, z = rhizomorphs, r = rooted
stem-surface	nominal	Surface texture of the stem	Same as cap-surface + f = none
stem-color	nominal	Color of the stem	Same as cap-color + f = none
veil-type	nominal	Type of veil	p = partial, u = universal
veil-color	nominal	Color of the veil	Same as cap-color + f = none
has-ring	nominal	Whether the mushroom has a ring	t = true, f = none
ring-type	nominal	Type of ring	c = cobwebby, e = evanescent, r = flaring, g = grooved, l = large, p = pendant, s = sheathing, z = zone, y = scaly, m = movable, f = none, ? = unknown
spore-print-color	nominal	Color of the spore print	Same as cap-color
habitat	nominal	Where the mushroom is found	g = grasses, l = leaves, m = meadows, p = paths, h = heaths, u = urban, w = waste, d = woods
season	nominal	Season when the mushroom grows	s = spring, u = summer, a = autumn, w = winter

## 2. Data checking and fixing

```
mushdata <- read.csv("C:/Users/r2613/Rstudio/StatCons_hw/HW2/mushroom/primary_data.csv",
                    sep=";")

library(tidyr)
library(dplyr)

mushdata <- mushdata %>%
  mutate(
    cap.diameter_min = as.numeric(gsub("\\[|,.*|\\]", "", cap.diameter)),
    cap.diameter_max = as.numeric(gsub("\\[|,.*|\\]", "", cap.diameter)),
    stem.height_min = as.numeric(gsub("\\[|,.*|\\]", "", stem.height)),
    stem.height_max = as.numeric(gsub("\\[|,.*|\\]", "", stem.height)),
    stem.width_min = as.numeric(gsub("\\[|,.*|\\]", "", stem.width)),
    stem.width_max = as.numeric(gsub("\\[|,.*|\\]", "", stem.width))
  )

variab_to_clean <- names(mushdata)[sapply(mushdata, function(x) any(grepl("\\[|\\]", x)))]

variab_to_clean <- c(variab_to_clean, "family", "class")

mushdata[variab_to_clean] <- lapply(mushdata[variab_to_clean], function(x) {
  as.factor(gsub("\\[|\\]", "", as.character(x)))})

mushdata <- mushdata[, !(names(mushdata) %in%
  c("cap.diameter", "stem.height", "stem.width",
    "stem.height", "stem.width"))]

str(mushdata)
```

```
'data.frame': 173 obs. of 26 variables:
 $ family      : Factor w/ 23 levels "Amanita Family",...: 1 1 1 1 1 1 1 1 13 13 ...
 $ name        : chr "Fly Agaric" "Panther Cap" "False Panther Cap" "The Blusher" ...
 $ class       : Factor w/ 2 levels "e","p": 2 2 2 1 2 1 2 1 1 1 ...
 $ cap.shape    : Factor w/ 27 levels "b","b, f","b, f, s",...: 23 18 23 23 23 22 1 8 17 22 ...
 $ Cap.surface  : Factor w/ 41 levels "", "d", "d, e, y, i",...: 12 11 1 1 16 1 34 19 40 10 ...
 $ cap.color    : Factor w/ 67 levels "b","b, p, e, y",...: 8 26 14 26 49 61 56 26 58 26 ...
 $ does.bruise.or.bleed: Factor w/ 2 levels "f","t": 1 1 1 2 1 1 1 1 1 2 ...
 $ gill.attachment : Factor w/ 9 levels "", "a", "a, d",...: 5 5 5 1 1 5 5 5 1 5 ...
 $ gill.spacing  : Factor w/ 4 levels "", "c", "d", "f": 1 1 1 1 2 1 2 1 1 1 ...
 $ gill.color    : Factor w/ 59 levels "b","b, p, w",...: 38 38 38 38 38 38 38 38 38 38 ...
 $ stem.root     : Factor w/ 6 levels "", "b", "c", "f",...: 6 1 1 2 1 2 1 1 6 1 ...
 $ stem.surface  : Factor w/ 15 levels "", "f", "g", "h",...: 14 14 1 1 1 1 14 11 1 1 ...
 $ stem.color    : Factor w/ 41 levels "b, u", "e", "e, n",...: 32 32 32 32 32 37 32 34 16 32 ...
 $ veil.type     : Factor w/ 2 levels "", "u": 2 2 2 2 2 2 2 2 1 1 ...
 $ veil.color    : Factor w/ 8 levels "", "e, n", "k",...: 6 6 6 6 6 8 6 6 1 1 ...
 $ has.ring      : Factor w/ 2 levels "f","t": 2 2 2 2 2 2 2 1 2 2 ...
 $ ring.type     : Factor w/ 14 levels "", "e", "e, g",...: 6 12 3 5 6 5 8 4 11 1 ...
 $ Spore.print.color : Factor w/ 9 levels "", "g", "k", "k, r",...: 1 1 1 1 1 1 1 1 1 ...
 $ habitat       : Factor w/ 21 levels "d", "d, h", "g",...: 1 1 1 1 1 1 1 1 18 4 ...
 $ season        : Factor w/ 10 levels "a", "a, w", "s",...: 10 9 9 9 9 9 9 9 9 9 ...
```

```

$ cap.diameter_min : num 10 5 10 5 5 4 5 4 10 12 ...
$ cap.diameter_max : num 20 10 15 15 12 9 10 8 25 18 ...
$ stem.height_min  : num 15 6 10 7 10 5 10 10 15 8 ...
$ stem.height_max  : num 20 10 12 15 12 7 15 15 35 12 ...
$ stem.width_min   : num 15 10 10 10 10 10 10 10 15 15 ...
$ stem.width_max   : num 20 20 20 25 20 15 15 15 25 20 ...

```

```
library(Hmisc)
```

```
latex(describe(mushdata),file="")
```

mushdata  
26 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.shape

```

n      missing  distinct
173      0         27

```

```

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

```

---

#### Cap.surface

```

n      missing  distinct
173      0         41

```

```

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

```

---

#### cap.color

```

n      missing  distinct
173      0         67

```

```

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

```

---

### 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  
173 0 9

Value a a, d d e f p s x  
Frequency 28 32 8 25 16 10 17 16 21  
Proportion 0.162 0.185 0.046 0.145 0.092 0.058 0.098 0.092 0.121

### gill.spacing

n missing distinct  
173 0 4

Value c d f  
Frequency 71 70 22 10  
Proportion 0.410 0.405 0.127 0.058

### gill.color

n missing distinct  
173 0 59

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

### stem.root

n missing distinct  
173 0 6

Value b c f r s  
Frequency 146 9 2 3 4 9  
Proportion 0.844 0.052 0.012 0.017 0.023 0.052

### stem.surface

n missing distinct  
173 0 15

Value f g h i i, s i, t i, y k k, s s s, h t y  
Frequency 108 3 5 1 11 1 1 1 4 1 15 1 7 13  
Proportion 0.624 0.017 0.029 0.006 0.064 0.006 0.006 0.006 0.023 0.006 0.087 0.006 0.040 0.075

Value y, s  
Frequency 1  
Proportion 0.006

### stem.color

n missing distinct  
173 0 41

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

### veil.type

n	missing	distinct
173	0	2

Value		u
Frequency	164	9
Proportion	0.948	0.052

### veil.color

n	missing	distinct
173	0	8

Value		e, n	k	n	u	w	y	y, w
Frequency	152	1	1	1	1	15	1	1
Proportion	0.879	0.006	0.006	0.006	0.006	0.087	0.006	0.006

### has.ring

n	missing	distinct
173	0	2

Value		f	t
Frequency	130	43	
Proportion	0.751	0.249	

### ring.type

n	missing	distinct
173	0	14

Value		e	e, g	f	g	g, p	l	l, e	l, p	l, r	m	p	r	z
Frequency	7	6	1	137	2	2	2	1	1	2	1	2	3	6
Proportion	0.040	0.035	0.006	0.792	0.012	0.012	0.012	0.006	0.006	0.012	0.006	0.012	0.017	0.035

### Spore.print.color

n	missing	distinct
173	0	9

Value		g	k	k, r	k, u	n	p	p, w	w
Frequency	155	1	5	1	1	3	3	1	3
Proportion	0.896	0.006	0.029	0.006	0.006	0.017	0.017	0.006	0.017

### habitat

n	missing	distinct
173	0	21

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

### season

n	missing	distinct
173	0	10

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

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

### cap.diameter\_min

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95	
	173	0	14	0.976	4.043	3.5	3.038	1	1	2	3	5	7	8	
Value		0.4	0.5	0.7	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10.0	12.0	50.0
Frequency		2	4	1	17	39	24	26	29	11	4	9	4	2	1
Proportion		0.012	0.023	0.006	0.098	0.225	0.139	0.150	0.168	0.064	0.023	0.052	0.023	0.012	0.006

For the frequency table, variable is rounded to the nearest 0

### cap.diameter\_max

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95	
	173	0	20	0.991	9.435	8.5	6.548	2	3	5	8	12	15	20	
Value		1.0	1.3	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0
Frequency		3	1	4	7	6	12	18	16	7	16	3	28	18	3
Proportion		0.017	0.006	0.023	0.040	0.035	0.069	0.104	0.092	0.040	0.092	0.017	0.162	0.104	0.017
Value		15.0	18.0	20.0	25.0	30.0	50.0								
Frequency		15	3	5	5	2	1								
Proportion		0.087	0.017	0.029	0.029	0.012	0.006								

For the frequency table, variable is rounded to the nearest 0

### stem.height\_min

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95
	173	0	12	0.957	4.306	4	2.233	2.0	2.0	3.0	4.0	5.0	6.8	8.0
Value		0	1	2	3	4	5	6	7	8	10	12	15	
Frequency		3	2	21	38	52	24	15	3	7	5	1	2	
Proportion		0.017	0.012	0.121	0.220	0.301	0.139	0.087	0.017	0.040	0.029	0.006	0.012	

For the frequency table, variable is rounded to the nearest 0

### stem.height\_max

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95	
	173	0	19	0.977	8.873	8	4.37	4.0	5.0	6.0	8.0	10.0	14.8	15.0	
Value		0	2	3	4	5	6	7	8	9	10	11	12	14	15
Frequency		3	1	2	6	14	25	16	37	2	35	1	12	1	10
Proportion		0.017	0.006	0.012	0.035	0.081	0.145	0.092	0.214	0.012	0.202	0.006	0.069	0.006	0.058
Value		18	20	25	30	35									
Frequency		1	4	1	1	1									
Proportion		0.006	0.023	0.006	0.006	0.006									

For the frequency table, variable is rounded to the nearest 0

### stem.width\_min

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90		
	173	0	16	0.98	8.529	8	6.804	1	2	4	8	10	19		
Value		0.0	0.5	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10.0	12.0	15.0	20.0
Frequency		3	1	9	18	12	12	19	7	1	10	42	1	20	16
Proportion		0.017	0.006	0.052	0.104	0.069	0.069	0.110	0.040	0.006	0.058	0.243	0.006	0.116	0.092
Value		30.0	40.0												
Frequency		1	1												
Proportion		0.006	0.006												

For the frequency table, variable is rounded to the nearest 0

### stem.width\_max

	n	missing	distinct	Info	Mean	pMedian	Gmd	.05	.10	.25	.50	.75	.90	.95
	173	0	21	0.992	15.79	14	13.49	2	3	8	12	20	30	40

lowest : 0 1 2 3 4, highest: 40 50 60 80 100

### 3. Table1

```
mushdata$name <- NULL

library(table1)

table1(~.|class, mushdata)
```

	e	p	Overall
	(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%)
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%)
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%)
Jelly Discs Family	0 (0%)	1 (1.0%)	1 (0.6%)
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%)
Paxillus Family	0 (0%)	3 (3.1%)	3 (1.7%)
Pluteus Family	2 (2.6%)	0 (0%)	2 (1.2%)
Russula Family	11 (14.3%)	16 (16.7%)	27 (15.6%)
Saddle-Cup Family	0 (0%)	1 (1.0%)	1 (0.6%)
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%)
cap.shape			
b	2 (2.6%)	8 (8.3%)	10 (5.8%)
b, f	2 (2.6%)	3 (3.1%)	5 (2.9%)
b, f, s	0 (0%)	1 (1.0%)	1 (0.6%)
b, x	0 (0%)	3 (3.1%)	3 (1.7%)
b, x, f	0 (0%)	1 (1.0%)	1 (0.6%)
c	1 (1.3%)	2 (2.1%)	3 (1.7%)
c, f	0 (0%)	2 (2.1%)	2 (1.2%)
c, x	1 (1.3%)	0 (0%)	1 (0.6%)
c, x, f	1 (1.3%)	0 (0%)	1 (0.6%)
f	4 (5.2%)	4 (4.2%)	8 (4.6%)
f, s	3 (3.9%)	5 (5.2%)	8 (4.6%)
f, x	1 (1.3%)	1 (1.0%)	2 (1.2%)
o	1 (1.3%)	7 (7.3%)	8 (4.6%)
p	0 (0%)	1 (1.0%)	1 (0.6%)
p, b	1 (1.3%)	2 (2.1%)	3 (1.7%)
p, c, o	1 (1.3%)	0 (0%)	1 (0.6%)



	e	p	Overall
p, f	2 (2.6%)	0 (0%)	2 (1.2%)
p, x	3 (3.9%)	1 (1.0%)	4 (2.3%)
p, x, f	2 (2.6%)	0 (0%)	2 (1.2%)
s	4 (5.2%)	5 (5.2%)	9 (5.2%)
s, o	2 (2.6%)	0 (0%)	2 (1.2%)
x	23 (29.9%)	25 (26.0%)	48 (27.7%)
x, f	14 (18.2%)	15 (15.6%)	29 (16.8%)
x, f, s	7 (9.1%)	6 (6.3%)	13 (7.5%)
x, o	0 (0%)	1 (1.0%)	1 (0.6%)
x, p	1 (1.3%)	1 (1.0%)	2 (1.2%)
x, s	1 (1.3%)	2 (2.1%)	3 (1.7%)
Cap.surface	19 (24.7%)	21 (21.9%)	40 (23.1%)
d	4 (5.2%)	5 (5.2%)	9 (5.2%)
d, e, y, i	0 (0%)	1 (1.0%)	1 (0.6%)
d, k	1 (1.3%)	1 (1.0%)	2 (1.2%)
d, k, s	0 (0%)	1 (1.0%)	1 (0.6%)
d, s	1 (1.3%)	0 (0%)	1 (0.6%)
e	3 (3.9%)	2 (2.1%)	5 (2.9%)
e, k, s, h	0 (0%)	1 (1.0%)	1 (0.6%)
e, t, k	0 (0%)	1 (1.0%)	1 (0.6%)
e, y	1 (1.3%)	0 (0%)	1 (0.6%)
g	5 (6.5%)	7 (7.3%)	12 (6.9%)
g, h	0 (0%)	1 (1.0%)	1 (0.6%)
g, s, d	0 (0%)	1 (1.0%)	1 (0.6%)
g, s, h, t	1 (1.3%)	0 (0%)	1 (0.6%)
g, s, t	1 (1.3%)	0 (0%)	1 (0.6%)
h	3 (3.9%)	2 (2.1%)	5 (2.9%)
h, s, d	1 (1.3%)	0 (0%)	1 (0.6%)
h, s, t	0 (0%)	1 (1.0%)	1 (0.6%)
h, t	6 (7.8%)	4 (4.2%)	10 (5.8%)
h, t, w	0 (0%)	1 (1.0%)	1 (0.6%)
h, t, y	0 (0%)	1 (1.0%)	1 (0.6%)
i	0 (0%)	4 (4.2%)	4 (2.3%)
i, e	0 (0%)	1 (1.0%)	1 (0.6%)
i, y	2 (2.6%)	0 (0%)	2 (1.2%)
k	0 (0%)	4 (4.2%)	4 (2.3%)
k, e	0 (0%)	1 (1.0%)	1 (0.6%)
l	2 (2.6%)	2 (2.1%)	4 (2.3%)
s	8 (10.4%)	5 (5.2%)	13 (7.5%)
s, d	1 (1.3%)	0 (0%)	1 (0.6%)
s, h	0 (0%)	1 (1.0%)	1 (0.6%)
s, i	0 (0%)	1 (1.0%)	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%)
t	2 (2.6%)	10 (10.4%)	12 (6.9%)
t, h	1 (1.3%)	1 (1.0%)	2 (1.2%)
t, h, s	1 (1.3%)	0 (0%)	1 (0.6%)
t, w, d	0 (0%)	1 (1.0%)	1 (0.6%)
w	2 (2.6%)	3 (3.1%)	5 (2.9%)
w, t	1 (1.3%)	0 (0%)	1 (0.6%)
y	7 (9.1%)	7 (7.3%)	14 (8.1%)

	e	p	Overall
y, s	1 (1.3%)	0 (0%)	1 (0.6%)
cap.color			
b	1 (1.3%)	0 (0%)	1 (0.6%)
b, p, e, y	0 (0%)	1 (1.0%)	1 (0.6%)
b, u	1 (1.3%)	0 (0%)	1 (0.6%)
e	0 (0%)	3 (3.1%)	3 (1.7%)
e, n	0 (0%)	2 (2.1%)	2 (1.2%)
e, n, p, w	0 (0%)	1 (1.0%)	1 (0.6%)
e, n, y	2 (2.6%)	0 (0%)	2 (1.2%)
e, o	0 (0%)	1 (1.0%)	1 (0.6%)
e, o, k	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%)
g	0 (0%)	1 (1.0%)	1 (0.6%)
g, k	1 (1.3%)	1 (1.0%)	2 (1.2%)
g, n	6 (7.8%)	4 (4.2%)	10 (5.8%)
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, 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, k	0 (0%)	1 (1.0%)	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	22 (28.6%)	16 (16.7%)	38 (22.0%)
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, e, y	0 (0%)	1 (1.0%)	1 (0.6%)
n, g	3 (3.9%)	0 (0%)	3 (1.7%)
n, o	2 (2.6%)	2 (2.1%)	4 (2.3%)
n, o, e	1 (1.3%)	0 (0%)	1 (0.6%)
n, o, y, w	0 (0%)	1 (1.0%)	1 (0.6%)
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	3 (3.9%)	6 (6.3%)	9 (5.2%)
n, y, e	1 (1.3%)	0 (0%)	1 (0.6%)
n, y, w	1 (1.3%)	0 (0%)	1 (0.6%)
o	0 (0%)	2 (2.1%)	2 (1.2%)
o, b	1 (1.3%)	0 (0%)	1 (0.6%)
o, e, n, k	0 (0%)	1 (1.0%)	1 (0.6%)
o, n	1 (1.3%)	0 (0%)	1 (0.6%)
o, p, e	1 (1.3%)	0 (0%)	1 (0.6%)
o, y	0 (0%)	3 (3.1%)	3 (1.7%)
o, y, r	0 (0%)	1 (1.0%)	1 (0.6%)
p	0 (0%)	2 (2.1%)	2 (1.2%)
r	0 (0%)	1 (1.0%)	1 (0.6%)
r, l	0 (0%)	1 (1.0%)	1 (0.6%)

	e	p	Overall
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%)
u	0 (0%)	2 (2.1%)	2 (1.2%)
u, k	1 (1.3%)	0 (0%)	1 (0.6%)
w	6 (7.8%)	6 (6.3%)	12 (6.9%)
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, u	0 (0%)	1 (1.0%)	1 (0.6%)
w, y	1 (1.3%)	1 (1.0%)	2 (1.2%)
w, y, g, n	0 (0%)	1 (1.0%)	1 (0.6%)
y	6 (7.8%)	4 (4.2%)	10 (5.8%)
y, n	0 (0%)	3 (3.1%)	3 (1.7%)
y, o	0 (0%)	1 (1.0%)	1 (0.6%)
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%)
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			
	10 (13.0%)	18 (18.8%)	28 (16.2%)
a	11 (14.3%)	21 (21.9%)	32 (18.5%)
a, d	5 (6.5%)	3 (3.1%)	8 (4.6%)
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%)
gill.spacing			
	31 (40.3%)	40 (41.7%)	71 (41.0%)
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%)
gill.color			
b	1 (1.3%)	0 (0%)	1 (0.6%)
b, p, w	0 (0%)	1 (1.0%)	1 (0.6%)
b, u	1 (1.3%)	0 (0%)	1 (0.6%)
e	0 (0%)	1 (1.0%)	1 (0.6%)
f	4 (5.2%)	6 (6.3%)	10 (5.8%)
g	3 (3.9%)	1 (1.0%)	4 (2.3%)
g, k	1 (1.3%)	1 (1.0%)	2 (1.2%)
g, n	1 (1.3%)	2 (2.1%)	3 (1.7%)
g, n, u	0 (0%)	1 (1.0%)	1 (0.6%)
g, p	1 (1.3%)	0 (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%)
g, w	2 (2.6%)	0 (0%)	2 (1.2%)
g, w, y	1 (1.3%)	0 (0%)	1 (0.6%)
k, n	2 (2.6%)	4 (4.2%)	6 (3.5%)
k, p	0 (0%)	1 (1.0%)	1 (0.6%)

	e	p	Overall
k, p, w	1 (1.3%)	0 (0%)	1 (0.6%)
n	3 (3.9%)	8 (8.3%)	11 (6.4%)
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%)
n, y	1 (1.3%)	1 (1.0%)	2 (1.2%)
o	2 (2.6%)	2 (2.1%)	4 (2.3%)
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%)
p	3 (3.9%)	5 (5.2%)	8 (4.6%)
p, n	1 (1.3%)	0 (0%)	1 (0.6%)
p, n, k	1 (1.3%)	0 (0%)	1 (0.6%)
p, w	3 (3.9%)	2 (2.1%)	5 (2.9%)
p, y	0 (0%)	1 (1.0%)	1 (0.6%)
p, y, r	0 (0%)	1 (1.0%)	1 (0.6%)
r	1 (1.3%)	0 (0%)	1 (0.6%)
r, y	0 (0%)	1 (1.0%)	1 (0.6%)
u, w	1 (1.3%)	0 (0%)	1 (0.6%)
w	21 (27.3%)	15 (15.6%)	36 (20.8%)
w, b, n	0 (0%)	1 (1.0%)	1 (0.6%)
w, g	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, n	3 (3.9%)	2 (2.1%)	5 (2.9%)
w, p	1 (1.3%)	2 (2.1%)	3 (1.7%)
w, p, y	1 (1.3%)	0 (0%)	1 (0.6%)
w, r	0 (0%)	1 (1.0%)	1 (0.6%)
w, u, g, n	1 (1.3%)	0 (0%)	1 (0.6%)
w, y	3 (3.9%)	2 (2.1%)	5 (2.9%)
w, y, g, n	0 (0%)	1 (1.0%)	1 (0.6%)
y	6 (7.8%)	7 (7.3%)	13 (7.5%)
y, e, n	1 (1.3%)	0 (0%)	1 (0.6%)
y, g, k	0 (0%)	1 (1.0%)	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, o, e	0 (0%)	1 (1.0%)	1 (0.6%)
y, r	1 (1.3%)	0 (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.root	67 (87.0%)	79 (82.3%)	146 (84.4%)
b	6 (7.8%)	3 (3.1%)	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%)
s	4 (5.2%)	5 (5.2%)	9 (5.2%)
stem.surface	53 (68.8%)	55 (57.3%)	108 (62.4%)

	e	p	Overall
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	4 (5.2%)	7 (7.3%)	11 (6.4%)
i, s	0 (0%)	1 (1.0%)	1 (0.6%)
i, t	1 (1.3%)	0 (0%)	1 (0.6%)
i, y	0 (0%)	1 (1.0%)	1 (0.6%)
k	1 (1.3%)	3 (3.1%)	4 (2.3%)
k, s	1 (1.3%)	0 (0%)	1 (0.6%)
s	9 (11.7%)	6 (6.3%)	15 (8.7%)
s, h	0 (0%)	1 (1.0%)	1 (0.6%)
t	3 (3.9%)	4 (4.2%)	7 (4.0%)
y	4 (5.2%)	9 (9.4%)	13 (7.5%)
y, s	1 (1.3%)	0 (0%)	1 (0.6%)
stem.color			
b, u	1 (1.3%)	0 (0%)	1 (0.6%)
e	0 (0%)	1 (1.0%)	1 (0.6%)
e, n	1 (1.3%)	2 (2.1%)	3 (1.7%)
e, u, y	0 (0%)	1 (1.0%)	1 (0.6%)
e, y	1 (1.3%)	0 (0%)	1 (0.6%)
f	0 (0%)	3 (3.1%)	3 (1.7%)
g	2 (2.6%)	0 (0%)	2 (1.2%)
g, w	1 (1.3%)	0 (0%)	1 (0.6%)
g, n	1 (1.3%)	3 (3.1%)	4 (2.3%)
g, r, n	0 (0%)	2 (2.1%)	2 (1.2%)
g, u, n	0 (0%)	1 (1.0%)	1 (0.6%)
g, w	2 (2.6%)	0 (0%)	2 (1.2%)
k	0 (0%)	1 (1.0%)	1 (0.6%)
k, n	1 (1.3%)	1 (1.0%)	2 (1.2%)
l, r, w	1 (1.3%)	0 (0%)	1 (0.6%)
n	15 (19.5%)	20 (20.8%)	35 (20.2%)
n, e	0 (0%)	2 (2.1%)	2 (1.2%)
n, g	1 (1.3%)	1 (1.0%)	2 (1.2%)
n, o	1 (1.3%)	1 (1.0%)	2 (1.2%)
n, p	0 (0%)	1 (1.0%)	1 (0.6%)
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%)
o	0 (0%)	1 (1.0%)	1 (0.6%)
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%)
p	0 (0%)	2 (2.1%)	2 (1.2%)
r, y	0 (0%)	1 (1.0%)	1 (0.6%)
u	1 (1.3%)	1 (1.0%)	2 (1.2%)
u, e	0 (0%)	1 (1.0%)	1 (0.6%)
w	32 (41.6%)	25 (26.0%)	57 (32.9%)
w, l, n	0 (0%)	1 (1.0%)	1 (0.6%)
w, n	2 (2.6%)	1 (1.0%)	3 (1.7%)
w, o	1 (1.3%)	0 (0%)	1 (0.6%)
w, u	0 (0%)	1 (1.0%)	1 (0.6%)
w, y	1 (1.3%)	2 (2.1%)	3 (1.7%)

	e	p	Overall
y	5 (6.5%)	8 (8.3%)	13 (7.5%)
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	74 (96.1%)	90 (93.8%)	164 (94.8%)
u	3 (3.9%)	6 (6.3%)	9 (5.2%)
veil.color	68 (88.3%)	84 (87.5%)	152 (87.9%)
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%)
w	7 (9.1%)	8 (8.3%)	15 (8.7%)
y	1 (1.3%)	0 (0%)	1 (0.6%)
y, w	1 (1.3%)	0 (0%)	1 (0.6%)
has.ring	60 (77.9%)	70 (72.9%)	130 (75.1%)
f	17 (22.1%)	26 (27.1%)	43 (24.9%)
t	4 (5.2%)	3 (3.1%)	7 (4.0%)
ring.type	3 (3.9%)	3 (3.1%)	6 (3.5%)
e	0 (0%)	1 (1.0%)	1 (0.6%)
e, g	61 (79.2%)	76 (79.2%)	137 (79.2%)
f	2 (2.6%)	0 (0%)	2 (1.2%)
g	0 (0%)	2 (2.1%)	2 (1.2%)
g, p	1 (1.3%)	1 (1.0%)	2 (1.2%)
l	0 (0%)	1 (1.0%)	1 (0.6%)
l, e	1 (1.3%)	0 (0%)	1 (0.6%)
l, p	2 (2.6%)	0 (0%)	2 (1.2%)
l, r	1 (1.3%)	0 (0%)	1 (0.6%)
m	1 (1.3%)	1 (1.0%)	2 (1.2%)
p	1 (1.3%)	2 (2.1%)	3 (1.7%)
r	0 (0%)	6 (6.3%)	6 (3.5%)
z	72 (93.5%)	83 (86.5%)	155 (89.6%)
Spore.print.color	1 (1.3%)	0 (0%)	1 (0.6%)
g	1 (1.3%)	4 (4.2%)	5 (2.9%)
k	0 (0%)	1 (1.0%)	1 (0.6%)
k, r	0 (0%)	1 (1.0%)	1 (0.6%)
k, u	0 (0%)	3 (3.1%)	3 (1.7%)
n	1 (1.3%)	2 (2.1%)	3 (1.7%)
p	0 (0%)	1 (1.0%)	1 (0.6%)
p, w	2 (2.6%)	1 (1.0%)	3 (1.7%)
w	47 (61.0%)	57 (59.4%)	104 (60.1%)
habitat	1 (1.3%)	3 (3.1%)	4 (2.3%)
d	1 (1.3%)	10 (10.4%)	11 (6.4%)
d, h	6 (7.8%)	4 (4.2%)	10 (5.8%)
g	1 (1.3%)	0 (0%)	1 (0.6%)
g, d	1 (1.3%)	2 (2.1%)	3 (1.7%)
g, d, h	0 (0%)	1 (1.0%)	1 (0.6%)
g, h, d	0 (0%)	1 (1.0%)	1 (0.6%)
g, l, d			

	e	p	Overall
g, l, m, d	1 (1.3%)	0 (0%)	1 (0.6%)
g, m	3 (3.9%)	2 (2.1%)	5 (2.9%)
g, m, d	1 (1.3%)	4 (4.2%)	5 (2.9%)
g, u, d	1 (1.3%)	0 (0%)	1 (0.6%)
h, d	0 (0%)	2 (2.1%)	2 (1.2%)
l	1 (1.3%)	0 (0%)	1 (0.6%)
l, d	7 (9.1%)	6 (6.3%)	13 (7.5%)
l, d, h	1 (1.3%)	0 (0%)	1 (0.6%)
l, h	1 (1.3%)	0 (0%)	1 (0.6%)
m	1 (1.3%)	1 (1.0%)	2 (1.2%)
m, d	2 (2.6%)	1 (1.0%)	3 (1.7%)
m, h	0 (0%)	1 (1.0%)	1 (0.6%)
p, d	0 (0%)	2 (2.1%)	2 (1.2%)
w	1 (1.3%)	0 (0%)	1 (0.6%)
season			
a	5 (6.5%)	11 (11.5%)	16 (9.2%)
a, w	9 (11.7%)	6 (6.3%)	15 (8.7%)
s	1 (1.3%)	0 (0%)	1 (0.6%)
s, a, w	1 (1.3%)	0 (0%)	1 (0.6%)
s, u	2 (2.6%)	1 (1.0%)	3 (1.7%)
s, u, a	1 (1.3%)	4 (4.2%)	5 (2.9%)
s, u, a, w	7 (9.1%)	6 (6.3%)	13 (7.5%)
u	0 (0%)	1 (1.0%)	1 (0.6%)
u, a	43 (55.8%)	63 (65.6%)	106 (61.3%)
u, a, w	8 (10.4%)	4 (4.2%)	12 (6.9%)
cap.diameter_min			
Mean (SD)	4.75 (5.74)	3.47 (2.27)	4.04 (4.22)
Median [Min, Max]	4.00 [0.500, 50.0]	3.00 [0.400, 10.0]	3.00 [0.400, 50.0]
cap.diameter_max			
Mean (SD)	10.9 (7.29)	8.29 (5.58)	9.44 (6.50)
Median [Min, Max]	10.0 [1.50, 50.0]	7.00 [1.00, 30.0]	8.00 [1.00, 50.0]
stem.height_min			
Mean (SD)	4.52 (2.20)	4.14 (2.31)	4.31 (2.26)
Median [Min, Max]	4.00 [2.00, 15.0]	4.00 [0, 15.0]	4.00 [0, 15.0]
stem.height_max			
Mean (SD)	9.58 (5.03)	8.30 (4.03)	8.87 (4.53)
Median [Min, Max]	8.00 [3.00, 35.0]	8.00 [0, 20.0]	8.00 [0, 35.0]
stem.width_min			
Mean (SD)	10.1 (6.80)	7.26 (5.71)	8.53 (6.36)
Median [Min, Max]	10.0 [1.00, 40.0]	5.00 [0, 20.0]	8.00 [0, 40.0]
stem.width_max			
Mean (SD)	18.6 (15.7)	13.5 (11.8)	15.8 (13.9)
Median [Min, Max]	15.0 [1.00, 100]	10.0 [0, 60.0]	12.0 [0, 100]