Additional file 3:
Simpson Diversity Index as a function of animal weight for (A) all the samples and for the sub-categories; (B) diet; (C) phylogeny; (D) gut structure; (E) age and (F) group size. The power law relationship $\log_{\text{diversity}} = c \log_{\text{weight}}$ is displayed as a red line. Intercept $c$ and slope $z$ of the regression are indicated at the bottom of each panel, with the range of values (p-value 0.05) in brackets. The prevision and confidence intervals of the linear regression are displayed as dashed and dotted lines respectively.

(A) All the samples

![Graph showing Simpson diversity index as a function of body mass for all samples. The regression line is red, and the prevision and confidence intervals are indicated with dashed and dotted lines respectively.](image)
(B) Diet

Granivorous (n=54)

Body mass (kg)

Simpson diversity (1/D)

Intercept 3.828 [3.524 – 4.133]
Slope 0.298 [0.205 – 0.391]

Omnivorous (n=60)

Body mass (kg)

Simpson diversity (1/D)

Intercept 4.269 [3.494 – 5.044]
Slope 0.361 [0.214 – 0.508]

Herbivorous (n=44)

Body mass (kg)

Simpson diversity (1/D)

Slope 0.137 [0.018 – 0.256]
(C) Phylogeny

**Birds (n=85)**

![Graph showing the relationship between Simpson diversity (1/D) and body mass (kg) for birds.](image)

- **Regression**
- **Prediction**
- **Confidence**

Intercept: 4.084 [3.795 – 4.373]

Slope: 0.202 [0.116 – 0.288]

**Mammals (n=101)**

![Graph showing the relationship between Simpson diversity (1/D) and body mass (kg) for mammals.](image)

- **Regression**
- **Prediction**
- **Confidence**

Intercept: 5.170 [4.454 – 5.885]

Slope: 0.272 [0.153 – 0.391]
(D) Gut structure

**Hindgut caecum (n=46)**

![Graph showing Simpson diversity vs. body mass for Hindgut caecum.](image)

- **Intercept**: 4.309 [3.689 – 4.930]
- **Slope**: 0.397 [0.203 – 0.591]

**Hindgut colon (n=124)**

![Graph showing Simpson diversity vs. body mass for Hindgut colon.](image)

- **Intercept**: 4.518 [4.243 – 4.794]
- **Slope**: 0.293 [0.236 – 0.350]
(E) Age

Adults (n=173)

Body mass (kg)

Simpson diversity (1/D)

- Regression
- Prediction
- Confidence

Intercept 4.624 [4.349 – 4.898]
Slope 0.337 [0.283 – 0.391]
(F) Group size

Large groups (n=85)

- Slopes: Slope 0.380 [0.303 – 0.457]

Small groups (n=104)

- Slopes: Slope 0.300 [0.227 – 0.372]