Additional file materials

(Buchmann, C.M., Dreyling, L., Constantin, M., Schurr, F.M.: What acceleration data from wildlife collars and animal body mass tell us about seed dispersal)

Additional information on an experiment to investigate seed detachment in dependence of fur acceleration

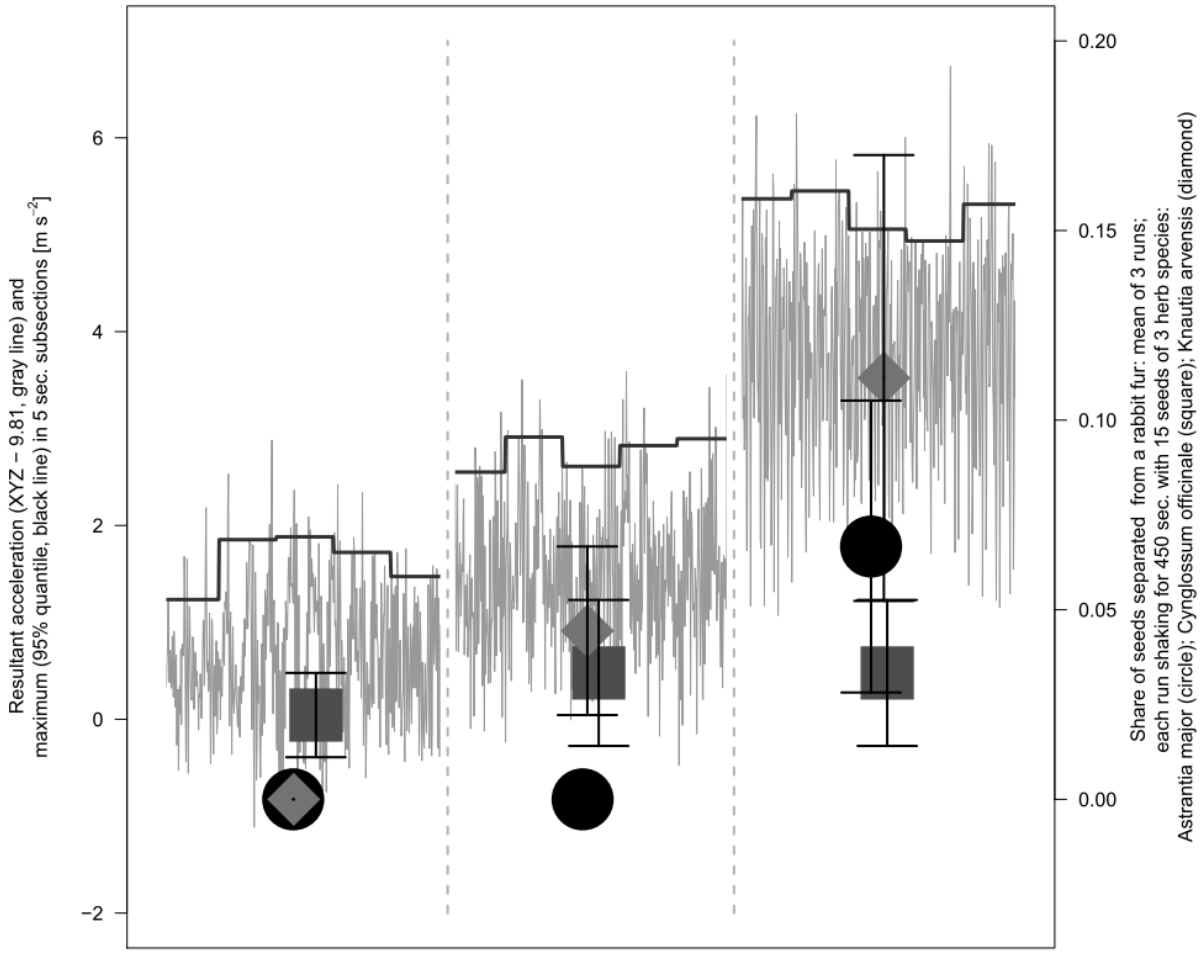

FIGURE S1: Acceleration (grey lines) measured on a laboratory shaker running at three different intensities (160, 200 and 240 revolutions/min) for 25 s, and maximum acceleration (black lines), quantified as the 95% quantile of the resultant acceleration in subsections of 5 s (same method as in the main manuscript). The acceleration created by this laboratory shaker is comparable to the acceleration measured on the animal bodies. Symbols show the proportion of three herb seeds that were separated from a rabbit fur (fixed upside down to the laboratory shaker) after running in each intensity for 450 s (mean +/-S.E. of three runs, each with 15 seeds of any species placed on the fur). Note: some noise is added to the x-coordinates of the symbols to improve readability.

Additional information on individual variation of body acceleration

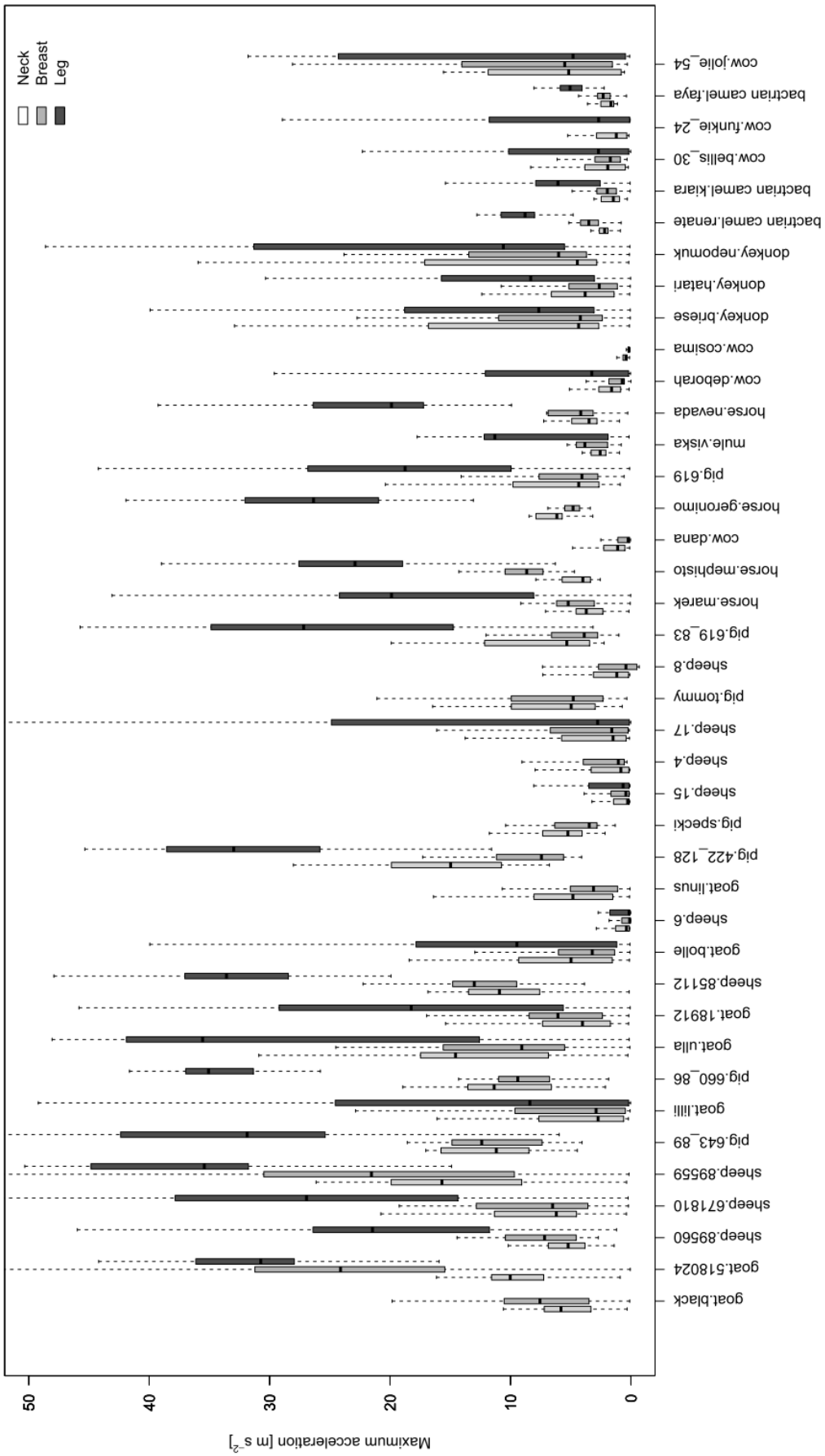

FIGURE S2: Boxplots showing maximum acceleration (95% quantile of resultant acceleration) determined for five second subsections of acceleration data measured at the neck, breast and leg of 40 individuals of 13 breeds of 8 mammal species; ordered after individual body mass. Outliers are omitted for clarity.

Additional information on model specification

$$\text{lmer}(\text{scale}(\log(A_{breast})) \sim \text{scale}(\log(A_{neck})) * \text{scale}(\log(mass)) + (\text{scale}(\log(A_{neck}))|species/individual) \quad \text{(Eqn. S1)}$$

$$\text{lmer}(\text{scale}(\log(A_{leg})) \sim \text{scale}(\log(A_{neck})) * \text{scale}(\log(mass)) + (\text{scale}(\log(A_{neck}))|species/individual) \quad \text{(Eqn. S2)}$$

A: maximum acceleration (in m s^{-2},calculated as the 95% quantile of resultant acceleration minus gravitational acceleration per 5 s interval) measured at the neck, breast and leg; mass: individual body mass in kg.

Additional information on the fitted models

TABLE S1: Summary of fitted linear mixed-effects models for breast and leg acceleration (Abreast and Aleg). Model coefficients are for models with log-transformed and scaled variables (center and scale parameters: Aneck 0.305, 1.533, Abreast 0.050, 1.808, Aleg 1.432, 2.209, mass 4.862, 0.831). Likelihood-ratio tests were performed between full model (Aneck * mass) and additive model (Aneck + mass) for the interaction term, and for Aneck and mass they were performed between the additive model and the model containing only mass and Aneck (i.e. the additive model with Aneck and mass being exluded), respectively.

Model for Abreast	**R^2 cond.: 0.8903 (full model)**	**R^2 marg.: 0.8120 (full model)**		**Likelihood-ratio test results**	
Full model coefficients	**Estimate**	**Std. Error**		**Chi-sq. (d.f.)**	**p-Value**
Intercept	0.0517	0.03839			
Aneck : mass	-0.07522	0.02672		5.7463 (1)	0.01652
Aneck	0.87157	0.03913		31.872 (1)	< 0.001
mass	0.02828	0.02919		0.0154 (1)	0.9011
Model for Aleg	**R^2 cond.: 0.7077 (full model)**	**R^2 marg.: 0.6159 (full model)**			
Full model coefficients	**Estimate**	**Std. Error**		**Chi-sq. (d.f.)**	**p-Value**
Intercept	-0.21406	0.08818			
Aneck : mass	0.02542	0.03645		0.4358 (1)	0.5092
Aneck	0.78861	0.05707		26.796 (1)	< 0.001
mass	-0.05896	0.05344		0.9188 (1)	0.3378

TABLE S2: AIC values of the full linear mixed-effects models for breast and leg acceleration (Abreast and Aleg, all log-transformed and scaled variables) and reduced simplified model versions.

Model for Abreast	**AIC**
Full model (Aneck * mass)	2600.97
Additive model (Aneck + mass)	2604.71
Aneck only	2602.73
mass only	2634.58
0-model	2632.585
Model for Aneck	**AIC**
Full model (Aneck * mass)	3268.29
Additive model (Aneck + mass)	3266.73
Aneck only	3265.647
mass only	3291.53
0-model	3290.804