

Supplementary Figures

Identification of Seed Metabolites and Microbiota members associated with Germination and Emergence in Common Bean

Louna Colaert-Sentenac¹, Élisabeth Planchet¹, Cyril Abadie⁴, Julie Lalande¹, Sherif Hamdy², Coralie Marais¹, Audrey Dupont², Laurence Le Corre², Claude-Emmanuel Koutouan³, Marie-Hélène Wagner², Matthieu Barret¹, Guillaume Tcherkez¹, Béatrice Teulat^{1*}, Marie Simonin¹

Institutional addresses

1: Institut Agro, INRAE, IRHS, SFR QUASAV, Université d'Angers, F-49000 Angers, France

2: GEVES, Station Nationale d'Essais de Semences, F-49071 Beaucouzé, France

3: FNAMS, Impasse de verger, 49800 Brain sur l'Authion, France

4: Ecophysiologie et Génomique Fonctionnelle de la Vigne, University of Bordeaux, Bordeaux Science Agro, INRAE, ISVV, Villenave-d'Ornon, France

Correspondence

*corresponding author, email: beatrice.teulat@institut-agro.fr

Figure S1: **Supplementary data on Germination and Emergence**

Figure S2: **Supplementary data on Morphological characteristics**

Figure S3: **Supplementary data on Metabolomic characteristics**

Figure S4: **Supplementary data on Seed Microbiota characteristics**

Germination & Emergence

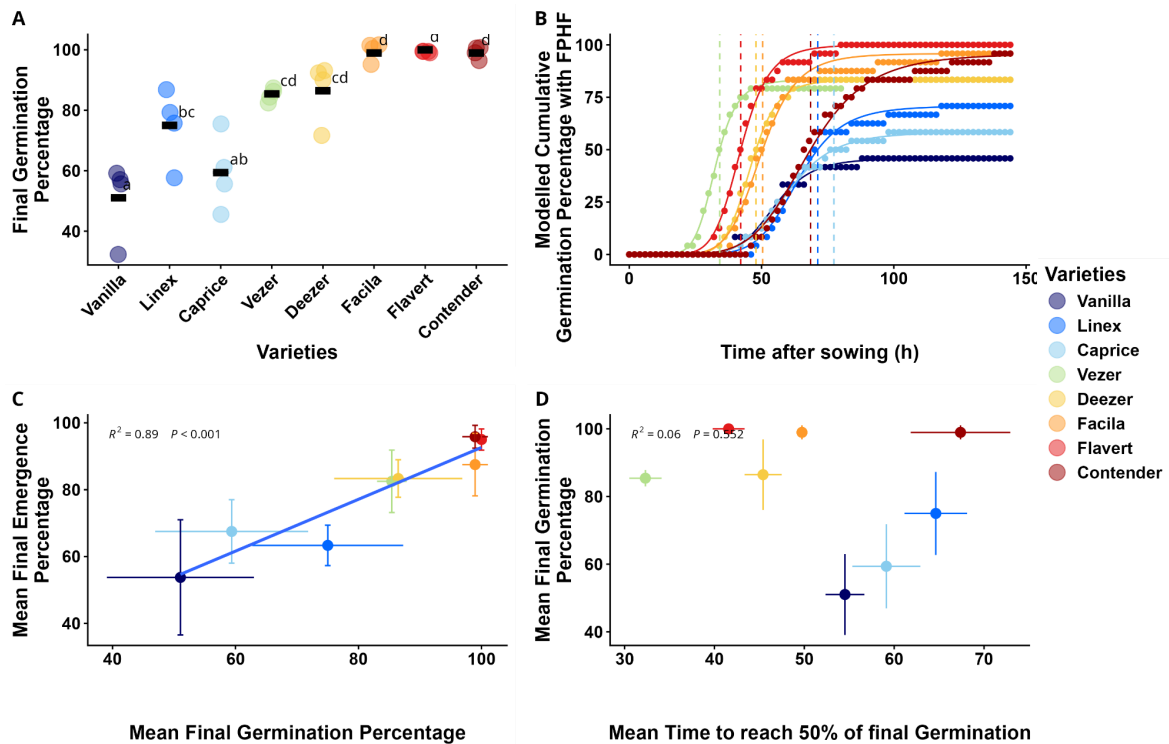


Figure S1: **Supplementary data on Germination and Emergence**

A: Final germination percentage for a germination assay on pleated paper, on Jacobsen germinators, at 20°C, 144 h (4*24 seeds)

B: Modeled cumulative germination percentage through time with a Four Parameters Hill Function (FPHF). Curves represent the modeled data, while dots indicate the number of raw data points at given coordinates. Dashed vertical lines indicate the modeled mean time for 50% of final germinated seeds to germinate (mean t50germ)

C: Correlation of the eight varieties mean final germination percentage (mean FGP) with mean time for 50% of final germinated seeds to germinate (mean t50germ). Varieties are depicted with color according to t50germ.

D: Correlation of the eight varieties mean final germination percentage (mean FGP) with mean final emergence percentage (mean FEP).

Morphological characteristics

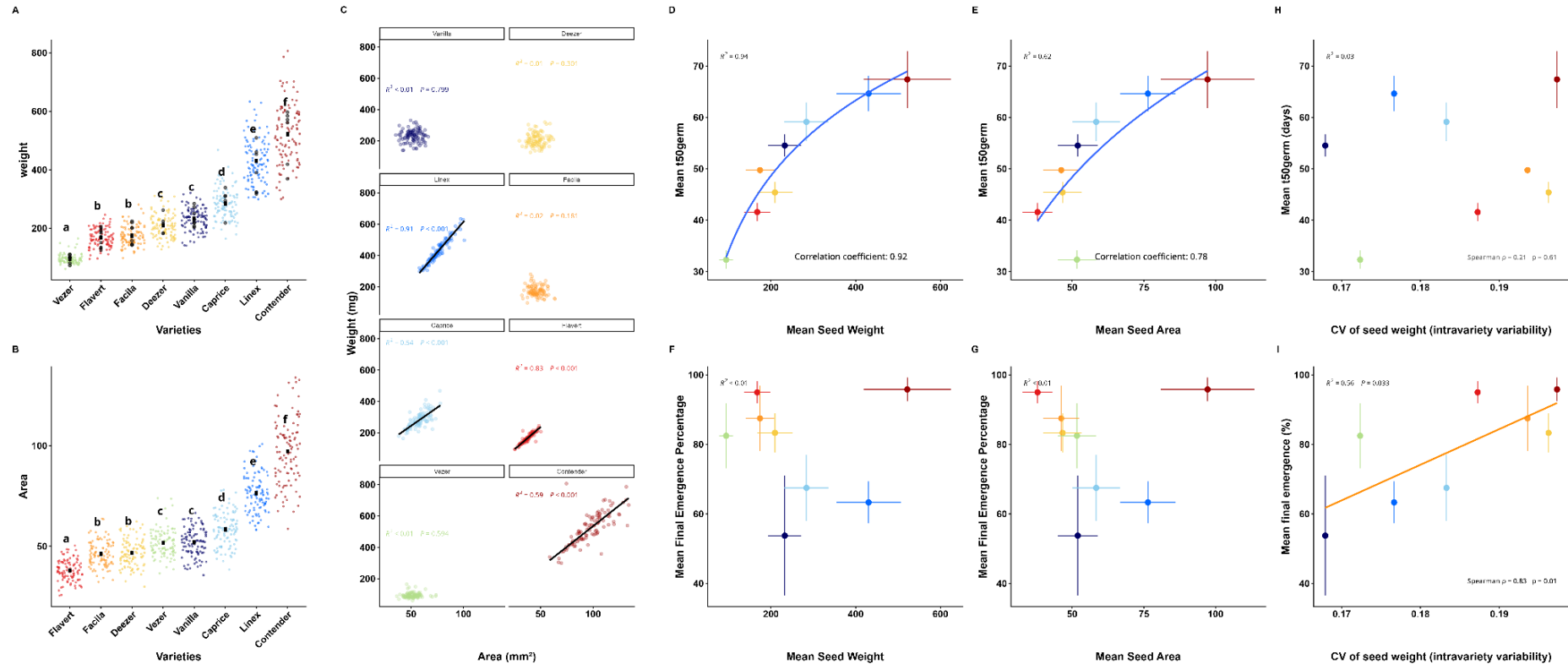


Figure S2: Supplementary data on Morphological characteristics

A-B: **Weight (A) or area (B) scatterplot of individual seeds.** Each dot represents one seed. Different letters indicate significantly different mean weight or area. (A): dark grey dots represent the additional seeds chosen for metabolomic analyses.

C: **Weight-Area correlations of individual seeds.** Each dot represents one seed. One color is attributed to each variety and is consistent across panels. Correlation coefficients are written in each by-variety subpanel. Robust regression lines are shown in black.

D-G: **Correlation of average seed weight (D, F) or average seed area (E, G) of the eight varieties to mean time for 50% of final germinated seeds (mean t50germ) (D, E) or mean final emergence percentage (F, G).** Blue curves show logarithmic regression.

H-I: **Correlation of average coefficient of variation of seed weight (cv-weight) of the eight varieties to mean time for 50% of final germinated seeds (mean t50germ) (H) or mean final emergence percentage (I).**

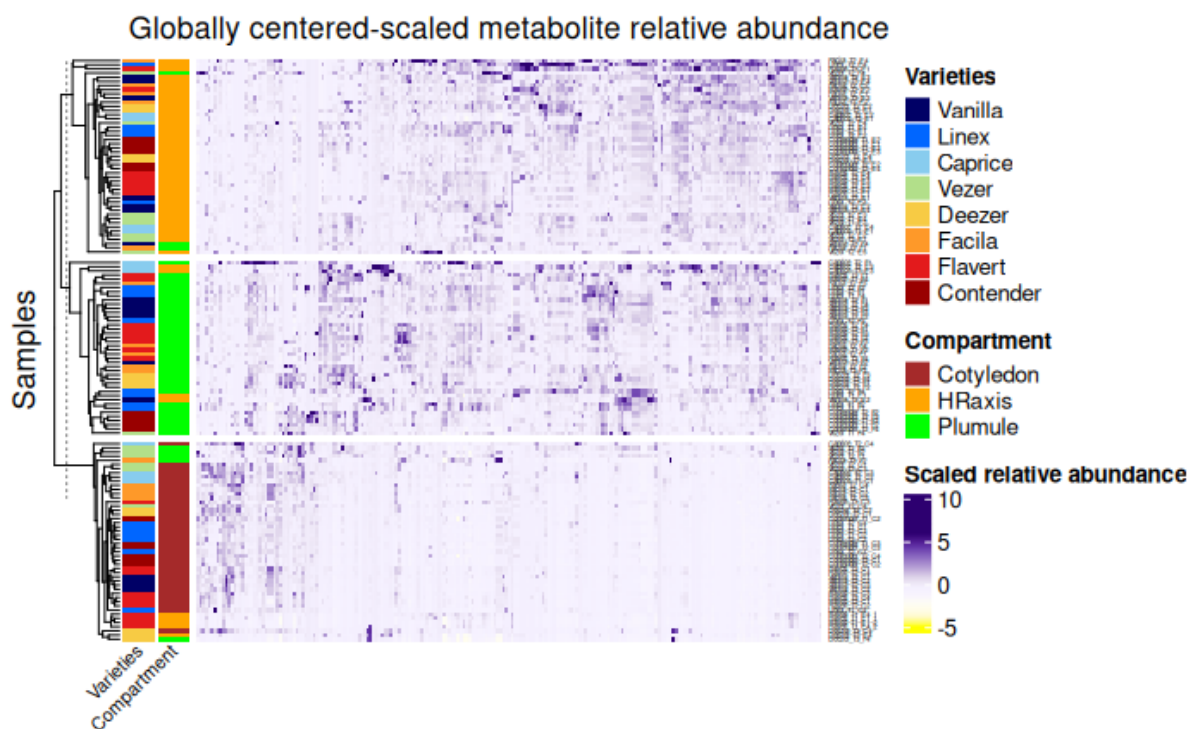


Figure S3. **Heatmap of the relative metabolic abundance of the samples**, clustered in three blocs, with samples in rows and metabolites in columns. Colors on the left-hand side represent sample variety (first column) and sample organ (second column). Metabolite abundance was centered-scaled on the whole three-organs dataset.

Microbiota

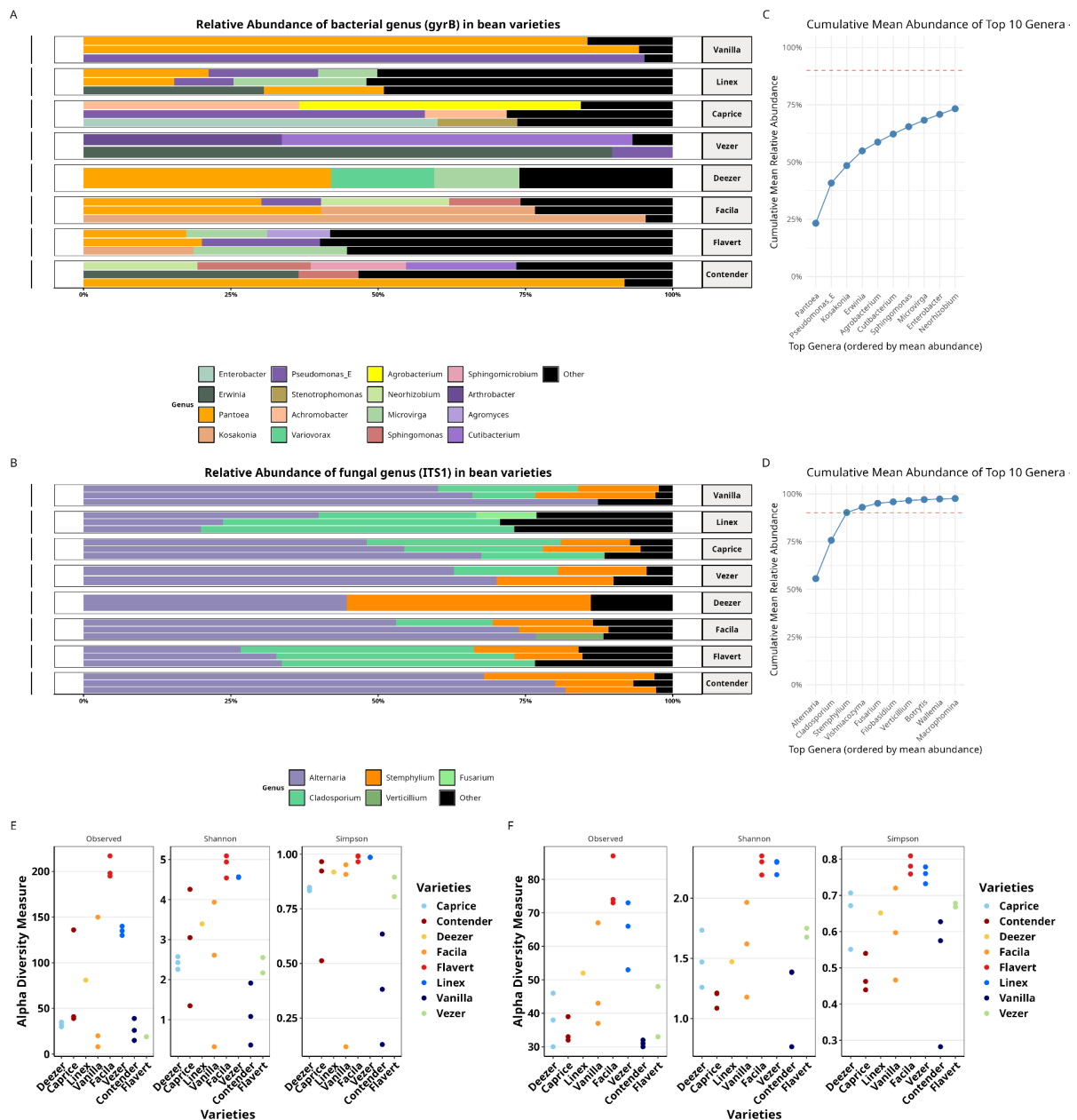


Figure S4: Supplementary data on seed microbiota characteristics

A-B: **Relative abundance** of bacterial (C) or fungal (D) taxa, grouped at the genus level. ASVs were filtered on predominance (at least two samples), total count (> 50 across all samples). Genus with relative abundance below 1% were gathered as “Other”.

C-D: **Cumulative relative abundance** of top 10 most abundant bacterial (E) or fungal (F) genera.

E-F: **Alpha diversity indices** for bacterial (A, *gyrB* marker) or fungal (B, ITS1 marker) communities.