Supplemental Information

Biology Letters

Bark water vapor conductance is associated with drought performance in tropical trees

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Appendix S1

Testing the assumption that g_{bark} samples were at water vapor saturation

For measurements of vapor conductance, the driving force of evaporation (D) is conventionally calculated as the mole fraction difference of water vapor within the plant tissue and the turbulent air surrounding it. D was calculated as

$$D = N_{w_stem} - N_{w_air} \quad \text{(Equation S1)}$$

Where N_{w_stem} and N_{w_air} are the mole fractions of water vapor in the stem segment and the air, respectively (unitless). Both N_{w_stem} and N_{w_air} were calculated following the Buck equation [1]:

$$N_w = (RH / 100) \times (0.6135 \times \exp(17.502 \times T / (240.97 + T))) / 101.3 \quad \text{(Equation S2)}$$

Where RH is relative humidity (%), T is the temperature (°C), and 101.3 is the atmospheric pressure in the laboratory (kPa). RH of the laboratory air was measured (see Methods). RH within the stem segment was assumed to be at saturation (i.e., 100%), following conventional protocol for the 'mass loss' measurement of water vapor conductance in both leaves [2] and stems [3–5].

RH of the air within plant stems can be calculated with the following equation [6]:

$$RH = 100 \times \exp(\Psi_{wv} / (RT / V_w)) \quad \text{(Equation S3)}$$

Where Ψ_{wv} is the water potential of the stem internal water vapor (MPa), R is the gas constant (MPa mol^{-1} K^{-1}), T is the stem temperature (K), and V_w is the partial molal volume of water (mol^{-1}). At 25°C, (RT / V_w) is equal to 137.3 MPa [6]. Since Ψ_{wv} is in equilibrium with stem water potential (Ψ_{stem}), Ψ_{wv} can be measured with Ψ_{stem}.

Among the plant populations measured for stem water deficit in this study, Ψ_{stem} reached -4.0 MPa in the forest sites [7] and -6.6 MPa in the shadehouse drought experiment [8]. These Ψ_{stem}

values were associated with stem water deficits of 22% and 45% in the forest sites and shadehouse, respectively (Fig. 1), where stem water deficit is the difference in stem relative water content (RWC, %) between well-watered and drought conditions, and

RWC = 100 × (fresh mass – dry mass) / (saturated mass – dry mass) (Equation S4)

Using Equation S3 and Ψ_{stem} of -6.6 MPa, the minimum RH within living stems was 95.5%, associated with stem water deficit of 45%.

To test whether the stem segments measured for g_{bark} had RH within their stems that was negligibly different from 100%, I calculated their stem water deficit and compared the values to the those from the forest sites and shadehouse samples, where Ψ_{stem} and RH were known.

Because dry mass was not measured on all of the g_{bark} samples, I calculated dry mass with density values for each population [7,8] multiplied by segment volume. Likewise, the g_{bark} samples were not measured for saturated mass (which requires submerging the samples in distilled water for 24-48 hours [7,8]), so I calculated saturated mass following Simpson [9] (Equation S5). In a previous study, calculated saturated mass closely matched measured saturated mass [7].

Saturated mass = stem segment volume × (stem density + (1 – stem density / 1.54)) (Equation S5)

At the end of the dry down periods included in analyses, the water deficit of g_{bark} samples ranged among samples from 0.03% to 36.3% (mean ± SD = 4.5 ± 5.7%; Fig. S2). The stem water deficit of g_{bark} samples varied among species in accordance with their water storage capacity (Fig. S2) [7,8]. Since, in all cases, the stem water deficits of g_{bark} samples were lower than stem water deficit of living plants of the same species, which had RH > 95.5%, it is useful to test what would be the effect of stem sample RH = 95.5% on the calculation of g_{bark}. Using Equations S1 and S2 and setting air RH and T to 50% and 25°C, respectively, if stem RH is set to 95.5% vs 100%, D equals 0.0143 vs 0.0157, or 9% lower. Since g_{bark} is calculated as water loss rate divided by D, this would translate to a 10% increase in g_{bark}. Given that the stem water deficit in the g_{bark} samples was much higher than in stems with RH at 95.5%, these results confirm that the assumption that g_{bark} samples were at water vapor saturation had a negligible effect (<<10%) on g_{bark} values. Therefore, I used stem RH of 100% for all g_{bark} samples. This assumption facilitates comparisons with previously published g_{bark} and leaf vapor conductance values, which, to my knowledge, have all used the same assumption.

Testing the assumption that g_{bark} samples were at equilibrium with air temperature

The temperature of g_{bark} samples affects N_{w_stem} (Equation S2) and thus D (Equation S1) and the calculation of g_{bark}. It is generally assumed that sample temperature is in equilibrium with the turbulent air temperature when the 'mass-loss' method is used to measure vapor conductance of leaves and bark [2–5]. I followed this convention. Although temperature equilibrium between organisms and surrounding turbulent air is rarely achieved, when heat fluxes are minimal, the temperature of poikilotherms (such as stem segments in a lab) will approach air temperature

[10]. The following equation from Campbell and Norman [10] (Campbell and Norman's Equation 14.6) can be used to illustrate this for the g_{bark} samples.

$$T_{sample} = T_{air} + \frac{\gamma^*}{(s+\gamma^*)}\left[\frac{R_{abs}-\varepsilon_s \sigma T_{air}^4}{g_{Hr} c_p} - \frac{D}{P_a \gamma^*}\right] \quad \text{(Equation S6)}$$

T_{sample} is the of temperature of the g_{bark} sample (°C). T_{air} is the temperature of turbulent air surrounding the sample (°C), which was on average 25°C. γ^* is the apparent psychrometer constant (°C^{-1}), where

$$\gamma^* = \gamma\left(\frac{g_{Hr}}{g_v}\right) \quad \text{(Equation S7)}$$

and γ is the thermodynamic psychrometer constant (6.66 × 10^{-4} °C^{-1}). g_{Hr} is the sum of boundary layer conductance for heat and radiative conductances (mol m^{-2} s^{-1}) and g_v is vapor conductance (mol m^{-2} s^{-1}). g_{Hr} is calculated as

$$g_{Hr} = g_{Ha} + g_r \quad \text{(Equation S8)}$$

where g_{Ha} is the boundary layer conductance for heat (mol m^{-2} s^{-1}) and g_r is the radiative conductance (mol m^{-2} s^{-1}), which, at 25°C is equal to 0.205 mol m^{-2} s^{-1} [10]. g_{Ha} is calculated, following [10], as

$$g_{Ha} = 0.135\sqrt{\frac{u}{d}} \quad \text{(Equation S9)}$$

Where u is wind speed (m s^{-1}), which was set at 2 m s^{-1}, consistent with the wind speed produced by the fan that was directed towards the samples as they dried. d is the diameter of the stem sample (m), which was set at the mean of all the stem segments measured for g_{bark}, 0.01 m. g_v includes terms for vapor conductance of the sample, g_{bark} (here in mol m^{-2} s^{-1} rather than in mmol m^{-2} s^{-1} as reported in the main text so that units are consistent within the calculation), and the boundary layer of vapor conductance, g_{va} (mol m^{-2} s^{-1}), are summed as follows, since the inverse of conductances, i.e., resistances, are additive in series.

$$g_v = \frac{g_{bark} g_{va}}{g_{bark} + g_{va}} \quad \text{(Equation S10)}$$

g_{bark} was set at the mean value among all measurements in the study (0.006 mol m^{-2} s^{-1}). g_{va} was calculated following [10] as

$$g_{va} = 0.147\sqrt{\frac{u}{d}} \quad \text{(Equation S11)}$$

In Equation S6, s is calculated as

$$s = \frac{\Delta}{P_a} \quad \text{(Equation S12)}$$

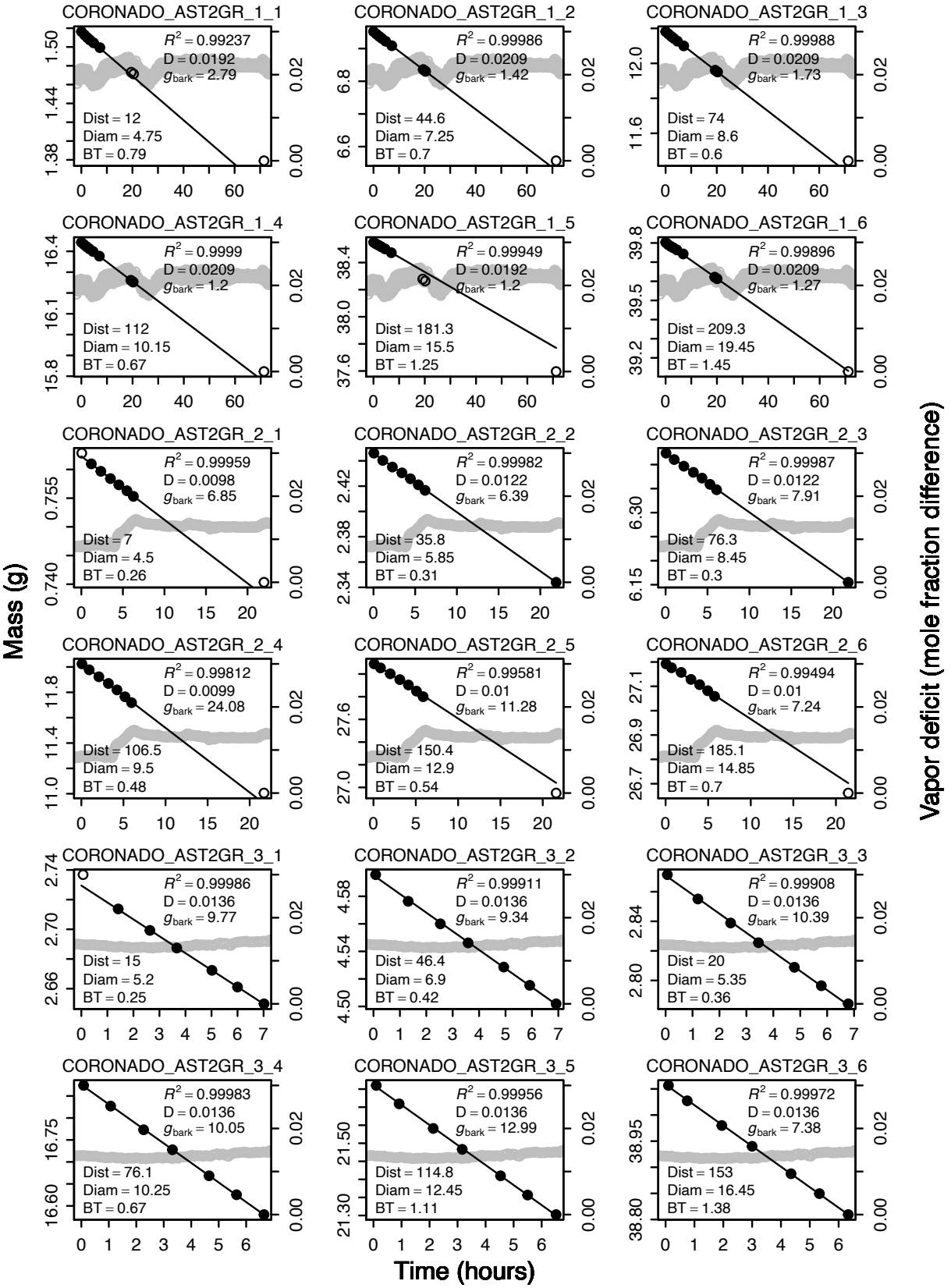
where Δ is the slope of the saturation vapor pressure function, which is temperature dependent, and was set at 0.189 kPa $°C^{-1}$ [10]. P_a is the atmospheric pressure and was set at 101.3 kPa.

In Equation S6, the terms R_{abs} (absorbed short- and longwave radiation, Watts m^{-2}), ε_s (surface emissivity, unitless), and σT_{air}^4(blackbody emittance, Watts m^{-2}) describe the balance of incoming and outgoing short- and longwave radiation that determine net radiation flux. Since the samples were equilibrated with air temperature before measurements and since they received no direct solar radiation and minimal indirect solar radiation from windows in the laboratory, these terms (i.e., net radiation flux) were set to 4 Watts m^{-2}. This is consistent with the output of laboratory fluorescent lighting. C_p is the specific heat of air (29.3 J mol^{-1} $°C^{-1}$). D is the vapor pressure deficit (kPa), which was set at the mean during measurements (1.71 kPa).

When the values shown above were input to Equation S6, T_{sample} was equal to 24.99°C. For an extreme example, to assess the maximum effect of evaporative cooling, net radiative flux was set to zero, g_{bark} was set to the highest measured value (0.029 mol m^{-2} s^{-1}), and D was set to the highest value in the lab during measurements (2.17 kPa), and all other parameters described above were unchanged. In this case, T_{sample} was equal to 24.57°C.

From Equations S1 and S2, when air RH is 50% and air T is 25°C and sample T is assumed to equal air T, D equals 0.0156. If air RH and T are maintained at 50% and 25°C, and sample T is set at 24.57°C, then D equals 0.0149, which is 5% lower than the case at temperature equilibrium. Since g_{bark} was calculated as the water loss rate divided by D, this would translate into a 5% higher value of g_{bark}. Given that the samples had g_{bark} and D typically lower than this extreme example, the assumption of temperature equilibrium had a negligible effect (<<5%) on g_{bark} values.

Figure S1. (next 17 pages) Timeseries of measurements for each of the g_{bark} samples included in the study. Each panel is labeled with a sample code formed as site of collection, underscore, species code, underscore, plant number, underscore, sample number. Filled and open black circles represent measurements of sample mass that were included and excluded, respectively, from the linear ordinary least squares regression that was used to calculate the drying rate (black line). Gray circles represent measurements of vapor deficit (D). The values of R^2, D, and g_{bark} indicate the coefficient of determination the drying-rate regression, the mean D across the timepoints included in the drying-rate regression (mole fraction difference), and the bark vapor conductance (mmol m^{-2} s^{-1}), respectively. Dist, Diam, and BT indicate the distance from the stem apex where the sample was taken (cm), diameter of the sample (mm), and bark thickness of the sample (mm), respectively. NA indicates missing data (N = 5 for apex distance and 40 for bark thickness). Forest sites are labeled as Coronado for the Eugene Eisenmann Reserve ('dry forest' in Table 1) and PNM for the Parque Natural Metropolitano ('transitional forest' in Table 1). Species codes are *Astronium graveolens*, AST2GR; *Bursera simaruba*, BURSSI; *Genipa Americana*, GENIAM; *Cojoba rufescens*, PIT2RU; *Annona hayesii*, ANNOHA; *Cavanillesia platanifolia*, CAVAPL; *Cedrela odorata*, CEDROD; and *Hymenea courbaril*, HYMECO.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CORONADO_AST2GR_1_2
R^2 = 0.99986
D = 0.0209
g_{bark} = 1.42
Dist = 44.6
Diam = 7.25
BT = 0.7
CORONADO_AST2GR_1_3
R^2 = 0.99988
D = 0.0209
g_{bark} = 1.73
Dist = 74
Diam = 8.6
BT = 0.6
CORONADO_AST2GR_1_4
R^2 = 0.9999
D = 0.0209
g_{bark} = 1.2
Dist = 112
Diam = 10.15
BT = 0.67
CORONADO_AST2GR_1_5
R^2 = 0.99949
D = 0.0192
g_{bark} = 1.2
Dist = 181.3
Diam = 15.5
BT = 1.25
CORONADO_AST2GR_1_6
R^2 = 0.99896
D = 0.0209
g_{bark} = 1.27
Dist = 209.3
Diam = 19.45
BT = 1.45
CORONADO_AST2GR_2_1
R^2 = 0.99959
D = 0.0098
g_{bark} = 6.85
Dist = 7
Diam = 4.5
BT = 0.26
CORONADO_AST2GR_2_2
R^2 = 0.99982
D = 0.0122
g_{bark} = 6.39
Dist = 35.8
Diam = 5.85
BT = 0.31
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R^2 = 0.99987
D = 0.0122
g_{bark} = 7.91
Dist = 76.3
Diam = 8.45
BT = 0.3
CORONADO_AST2GR_2_4
R^2 = 0.99812
D = 0.0099
g_{bark} = 24.08
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Diam = 9.5
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R^2 = 0.99581
D = 0.01
g_{bark} = 11.28
Dist = 150.4
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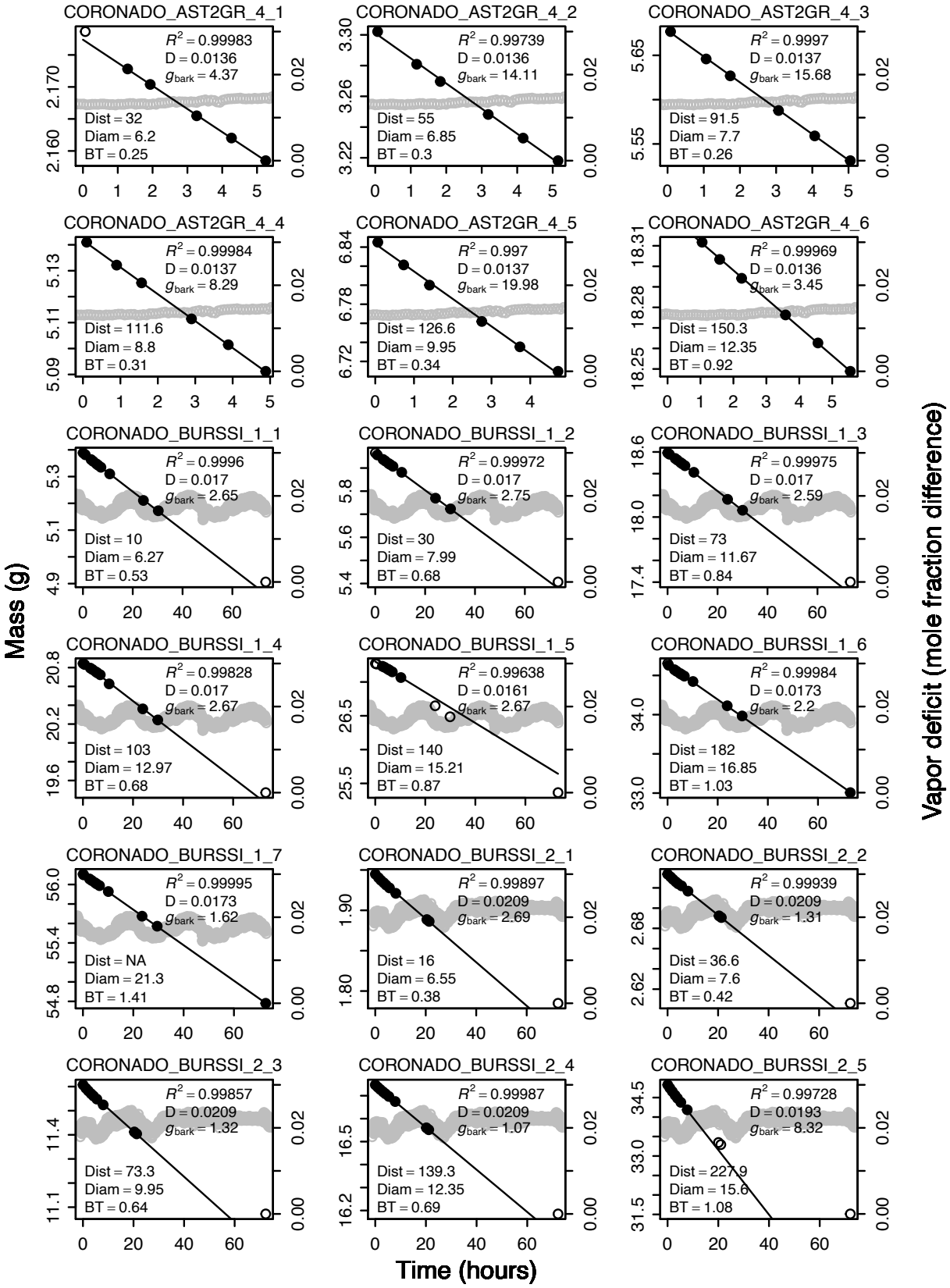
CORONADO_AST2GR_2_6
R^2 = 0.99494
D = 0.01
g_{bark} = 7.24
Dist = 185.1
Diam = 14.85
BT = 0.7
CORONADO_AST2GR_3_1
R^2 = 0.99986
D = 0.0136
g_{bark} = 9.77
Dist = 15
Diam = 5.2
BT = 0.25
CORONADO_AST2GR_3_2
R^2 = 0.99911
D = 0.0136
g_{bark} = 9.34
Dist = 46.4
Diam = 6.9
BT = 0.42
CORONADO_AST2GR_3_3
R^2 = 0.99908
D = 0.0136
g_{bark} = 10.39
Dist = 20
Diam = 5.35
BT = 0.36
CORONADO_AST2GR_3_4
R^2 = 0.99983
D = 0.0136
g_{bark} = 10.05
Dist = 76.1
Diam = 10.25
BT = 0.67
CORONADO_AST2GR_3_5
R^2 = 0.99956
D = 0.0136
g_{bark} = 12.99
Dist = 114.8
Diam = 12.45
BT = 1.11
CORONADO_AST2GR_3_6
R^2 = 0.99972
D = 0.0136
g_{bark} = 7.38
Dist = 153
Diam = 16.45
BT = 1.38
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)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g_{bark} = 4.37
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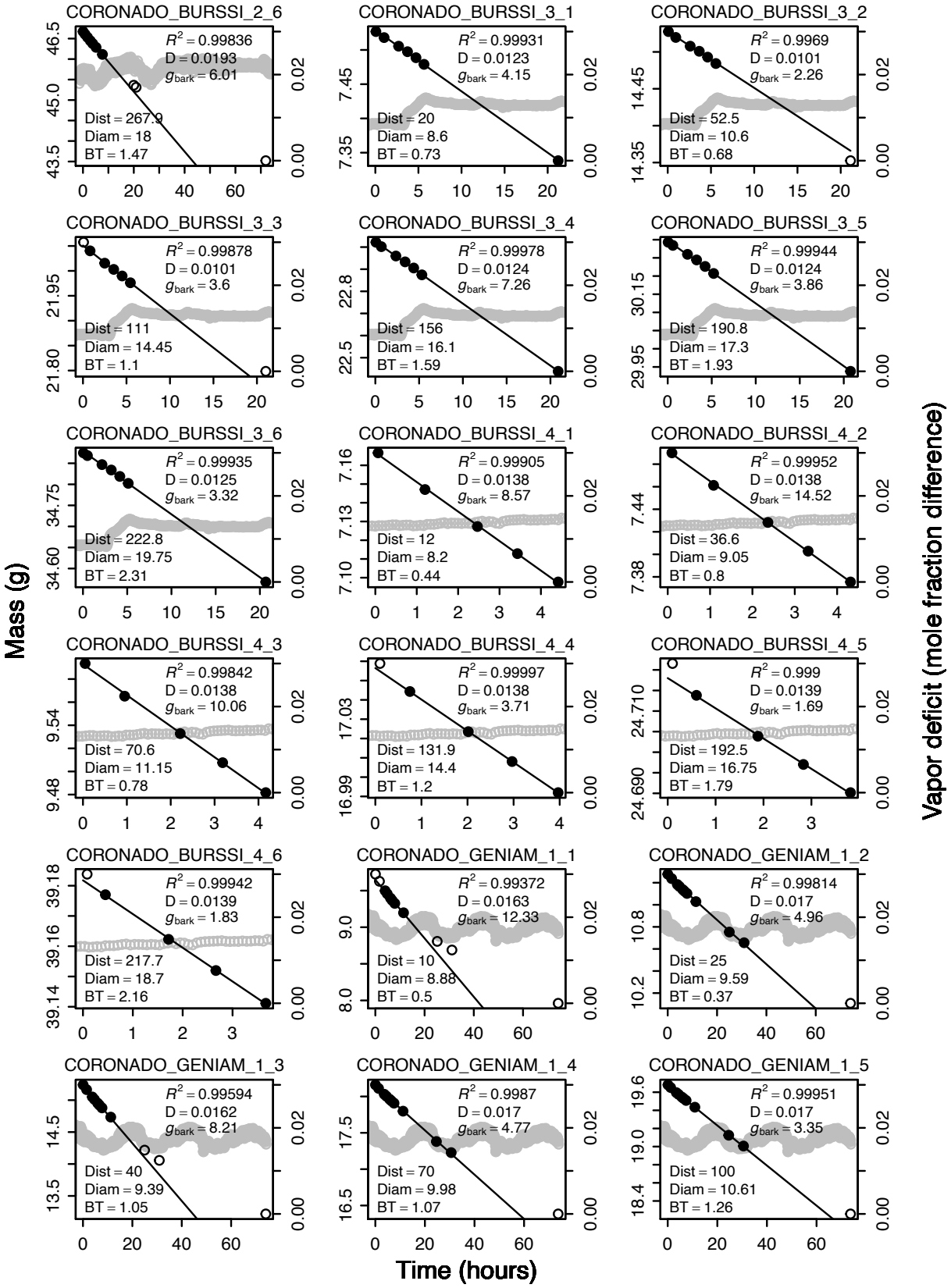
Diam = 6.2
BT = 0.25
CORONADO_AST2GR_4_2
R^2 = 0.99739
D = 0.0136
g_{bark} = 14.11
Dist = 55
Diam = 6.85
BT = 0.3
CORONADO_AST2GR_4_3
R^2 = 0.9997
D = 0.0137
g_{bark} = 15.68
Dist = 91.5
Diam = 7.7
BT = 0.26
CORONADO_AST2GR_4_4
R^2 = 0.99984
D = 0.0137
g_{bark} = 8.29
Dist = 111.6
Diam = 8.8
BT = 0.31
CORONADO_AST2GR_4_5
R^2 = 0.997
D = 0.0137
g_{bark} = 19.98
Dist = 126.6
Diam = 9.95
BT = 0.34
CORONADO_AST2GR_4_6
R^2 = 0.99969
D = 0.0136
g_{bark} = 3.45
Dist = 150.3
Diam = 12.35
BT = 0.92
CORONADO_BURSSI_1_1
R^2 = 0.9996
D = 0.017
g_{bark} = 2.65
Dist = 10
Diam = 6.27
BT = 0.53
CORONADO_BURSSI_1_2
R^2 = 0.99972
D = 0.017
g_{bark} = 2.75
Dist = 30
Diam = 7.99
BT = 0.68
CORONADO_BURSSI_1_3
R^2 = 0.99975
D = 0.017
g_{bark} = 2.59
Dist = 73
Diam = 11.67
BT = 0.84
CORONADO_BURSSI_1_4
R^2 = 0.99828
D = 0.017
g_{bark} = 2.67
Dist = 103
Diam = 12.97
BT = 0.68
CORONADO_BURSSI_1_5
R^2 = 0.99638
D = 0.0161
g_{bark} = 2.67
Dist = 140
Diam = 15.21
BT = 0.87
CORONADO_BURSSI_1_6
R^2 = 0.99984
D = 0.0173
g_{bark} = 2.2
Dist = 182
Diam = 16.85
BT = 1.03
CORONADO_BURSSI_1_7
R^2 = 0.99995
D = 0.0173
g_{bark} = 1.62
Dist = NA
Diam = 21.3
BT = 1.41
CORONADO_BURSSI_2_1
R^2 = 0.99897
D = 0.0209
g_{bark} = 2.69
Dist = 16
Diam = 6.55
BT = 0.38
CORONADO_BURSSI_2_2
R^2 = 0.99939
D = 0.0209
g_{bark} = 1.31
Dist = 36.6
Diam = 7.6
BT = 0.42
CORONADO_BURSSI_2_3
R^2 = 0.99857
D = 0.0209
g_{bark} = 1.32
Dist = 73.3
Diam = 9.95
BT = 0.64
CORONADO_BURSSI_2_4
R^2 = 0.99987
D = 0.0209
g_{bark} = 1.07
Dist = 139.3
Diam = 12.35
BT = 0.69
CORONADO_BURSSI_2_5
R^2 = 0.99728
D = 0.0193
g_{bark} = 8.32
Dist = 227.9
Diam = 15.6
BT = 1.08
Mass (g)
Vapor deficit (mole fraction difference)
Time (hours)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CORONADO_BURSSI_3_1
R^2 = 0.99931
D = 0.0123
g_{bark} = 4.15
Dist = 20
Diam = 8.6
BT = 0.73
CORONADO_BURSSI_3_2
R^2 = 0.9969
D = 0.0101
g_{bark} = 2.26
Dist = 52.5
Diam = 10.6
BT = 0.68
CORONADO_BURSSI_3_3
R^2 = 0.99878
D = 0.0101
g_{bark} = 3.6
Dist = 111
Diam = 14.45
BT = 1.1
CORONADO_BURSSI_3_4
R^2 = 0.99978
D = 0.0124
g_{bark} = 7.26
Dist = 156
Diam = 16.1
BT = 1.59
CORONADO_BURSSI_3_5
R^2 = 0.99944
D = 0.0124
g_{bark} = 3.86
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Diam = 17.3
BT = 1.93
CORONADO_BURSSI_3_6
R^2 = 0.99935
D = 0.0125
g_{bark} = 3.32
Dist = 222.8
Diam = 19.75
BT = 2.31
CORONADO_BURSSI_4_1
R^2 = 0.99905
D = 0.0138
g_{bark} = 8.57
Dist = 12
Diam = 8.2
BT = 0.44
CORONADO_BURSSI_4_2
R^2 = 0.99952
D = 0.0138
g_{bark} = 14.52
Dist = 36.6
Diam = 9.05
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R^2 = 0.99842
D = 0.0138
g_{bark} = 10.06
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Diam = 11.15
BT = 0.78
CORONADO_BURSSI_4_4
R^2 = 0.99997
D = 0.0138
g_{bark} = 3.71
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Diam = 14.4
BT = 1.2
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R^2 = 0.999
D = 0.0139
g_{bark} = 1.69
Dist = 192.5
Diam = 16.75
BT = 1.79
CORONADO_BURSSI_4_6
R^2 = 0.99942
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g_{bark} = 1.83
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R^2 = 0.99372
D = 0.0163
g_{bark} = 12.33
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Diam = 8.88
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CORONADO_GENIAM_1_2
R^2 = 0.99814
D = 0.017
g_{bark} = 4.96
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Diam = 9.59
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R^2 = 0.99594
D = 0.0162
g_{bark} = 8.21
Dist = 40
Diam = 9.39
BT = 1.05
CORONADO_GENIAM_1_4
R^2 = 0.9987
D = 0.017
g_{bark} = 4.77
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BT = 1.07
CORONADO_GENIAM_1_5
R^2 = 0.99951
D = 0.017
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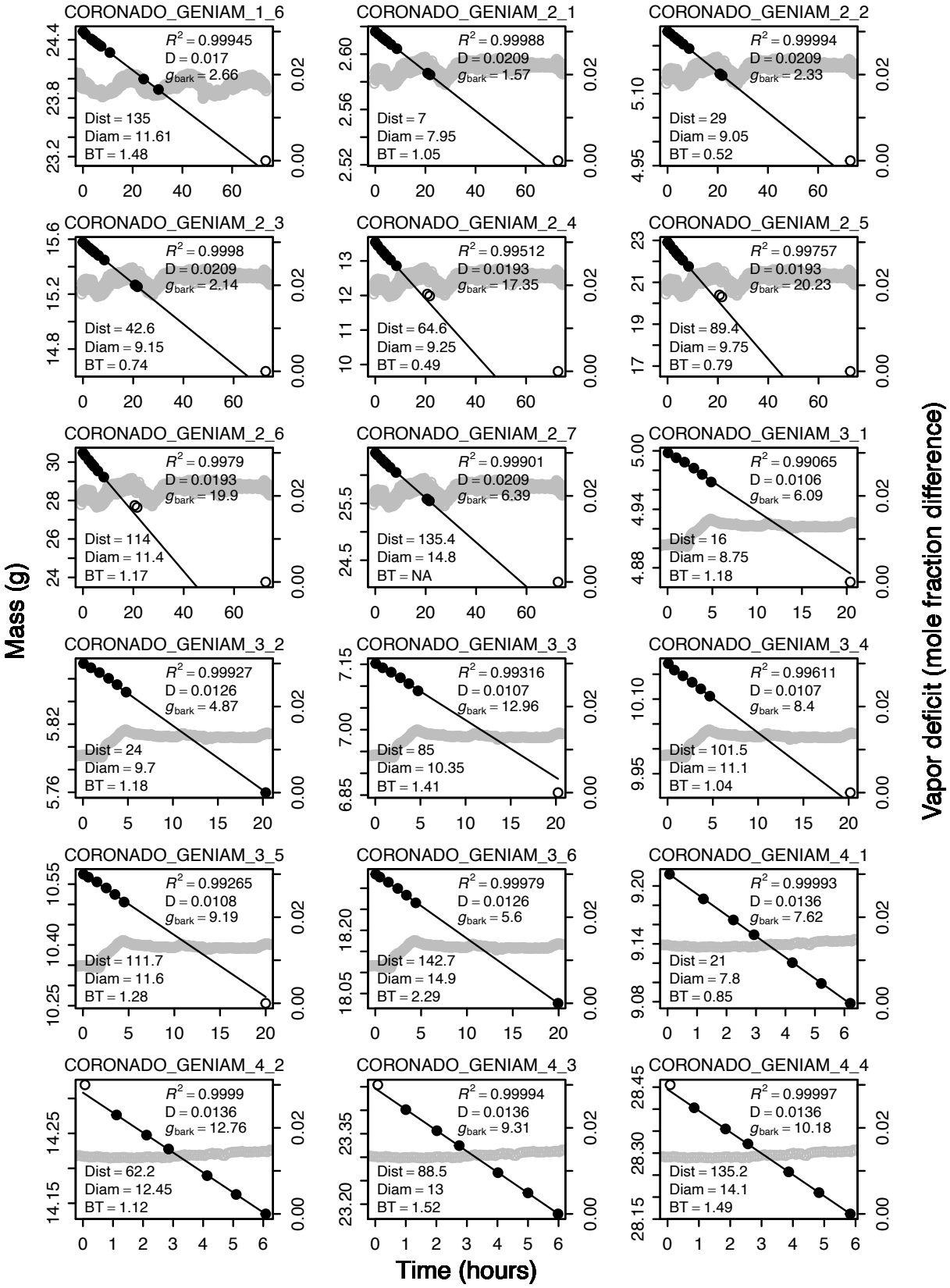
Diam = 10.61
BT = 1.26
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)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CORONADO_GENIAM_2_1
R^2 = 0.99988
D = 0.0209
g_{bark} = 1.57
Dist = 7
Diam = 7.95
BT = 1.05
CORONADO_GENIAM_2_2
R^2 = 0.99994
D = 0.0209
g_{bark} = 2.33
Dist = 29
Diam = 9.05
BT = 0.52
CORONADO_GENIAM_2_3
R^2 = 0.9998
D = 0.0209
g_{bark} = 2.14
Dist = 42.6
Diam = 9.15
BT = 0.74
CORONADO_GENIAM_2_4
R^2 = 0.99512
D = 0.0193
g_{bark} = 17.35
Dist = 64.6
Diam = 9.25
BT = 0.49
CORONADO_GENIAM_2_5
R^2 = 0.99757
D = 0.0193
g_{bark} = 20.23
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Diam = 9.75
BT = 0.79
CORONADO_GENIAM_2_6
R^2 = 0.9979
D = 0.0193
g_{bark} = 19.9
Dist = 114
Diam = 11.4
BT = 1.17
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R^2 = 0.99901
D = 0.0209
g_{bark} = 6.39
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Diam = 14.8
BT = NA
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R^2 = 0.99065
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R^2 = 0.99927
D = 0.0126
g_{bark} = 4.87
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D = 0.0107
g_{bark} = 12.96
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Diam = 10.35
BT = 1.41
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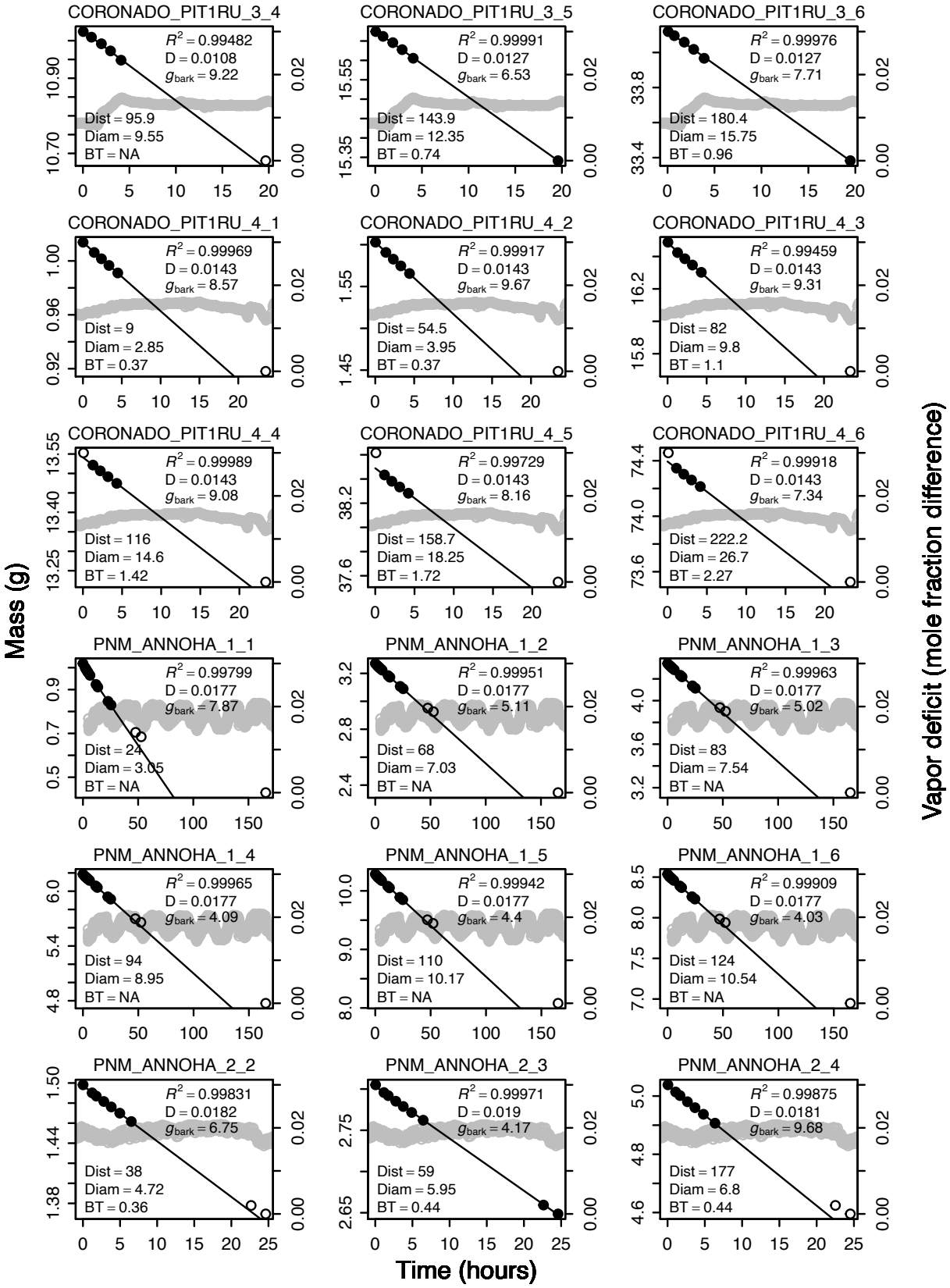
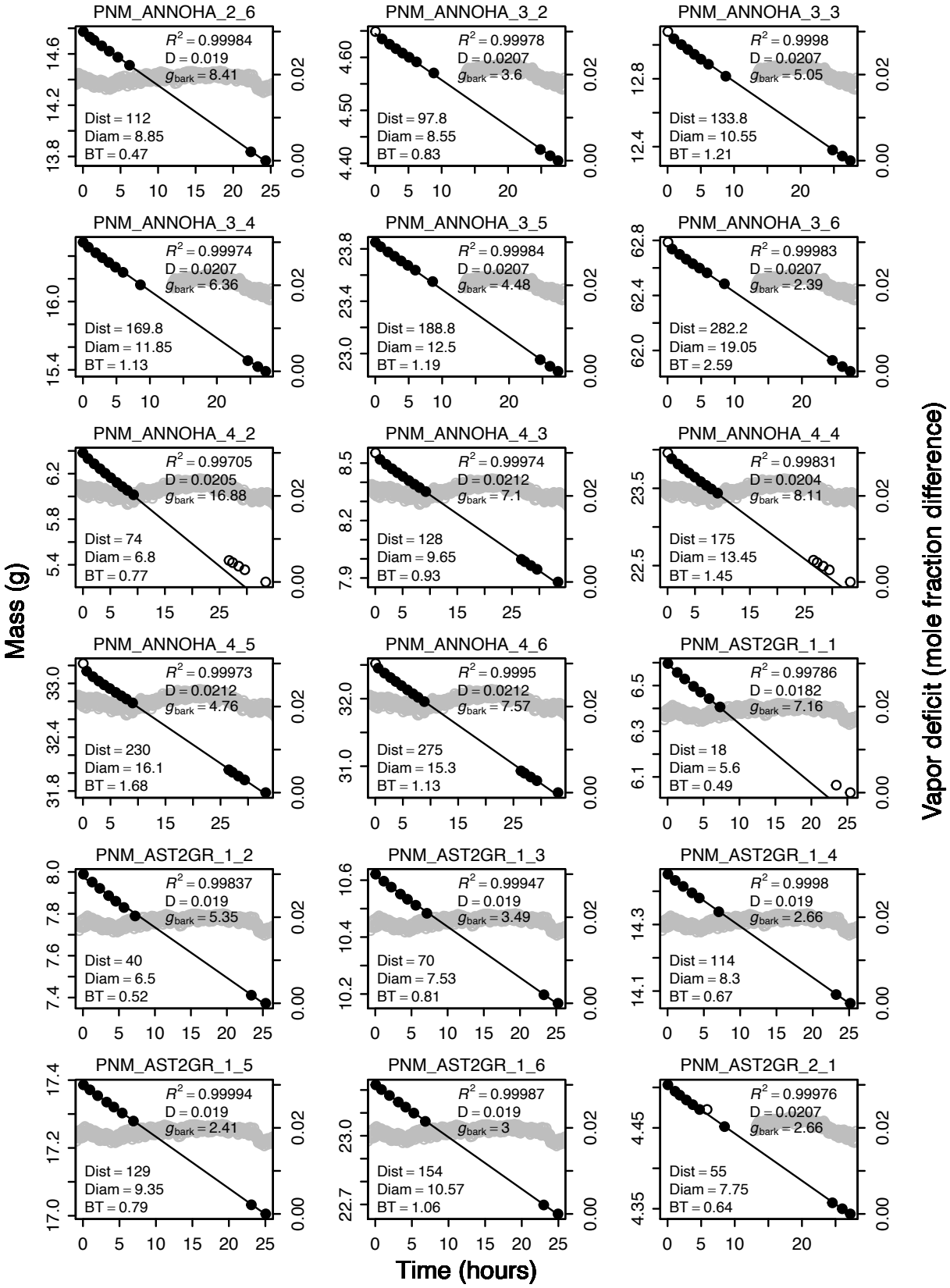
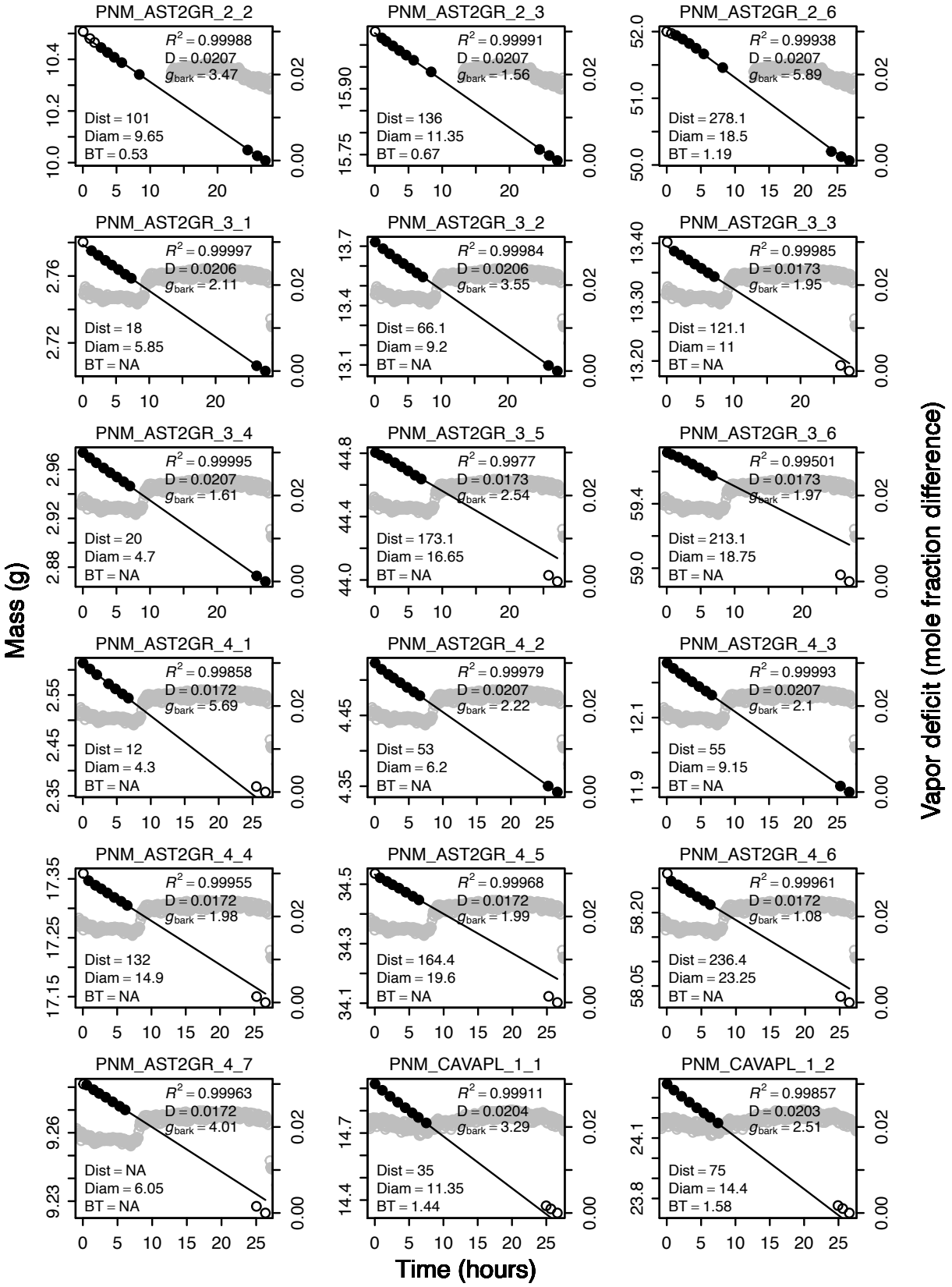
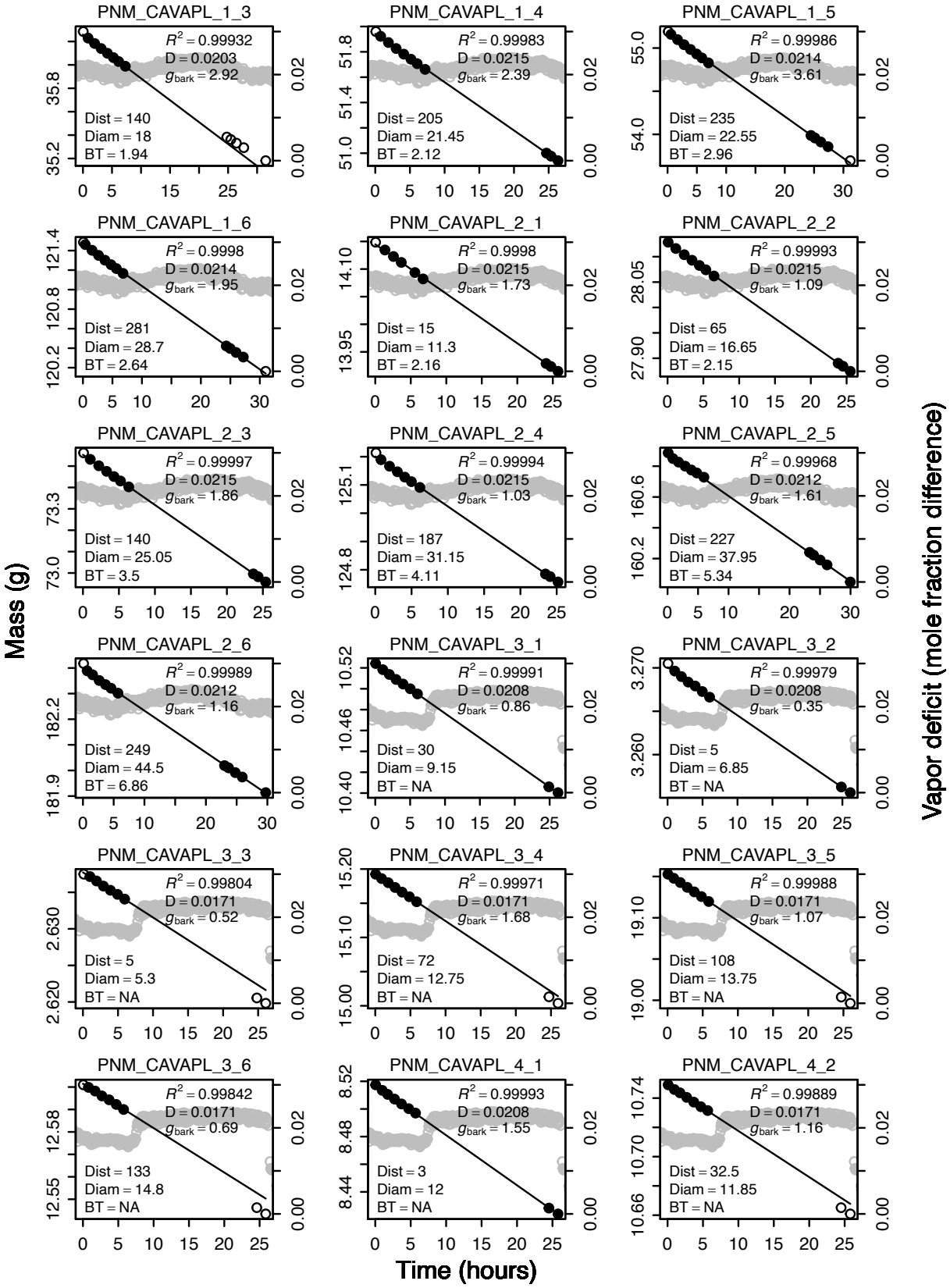
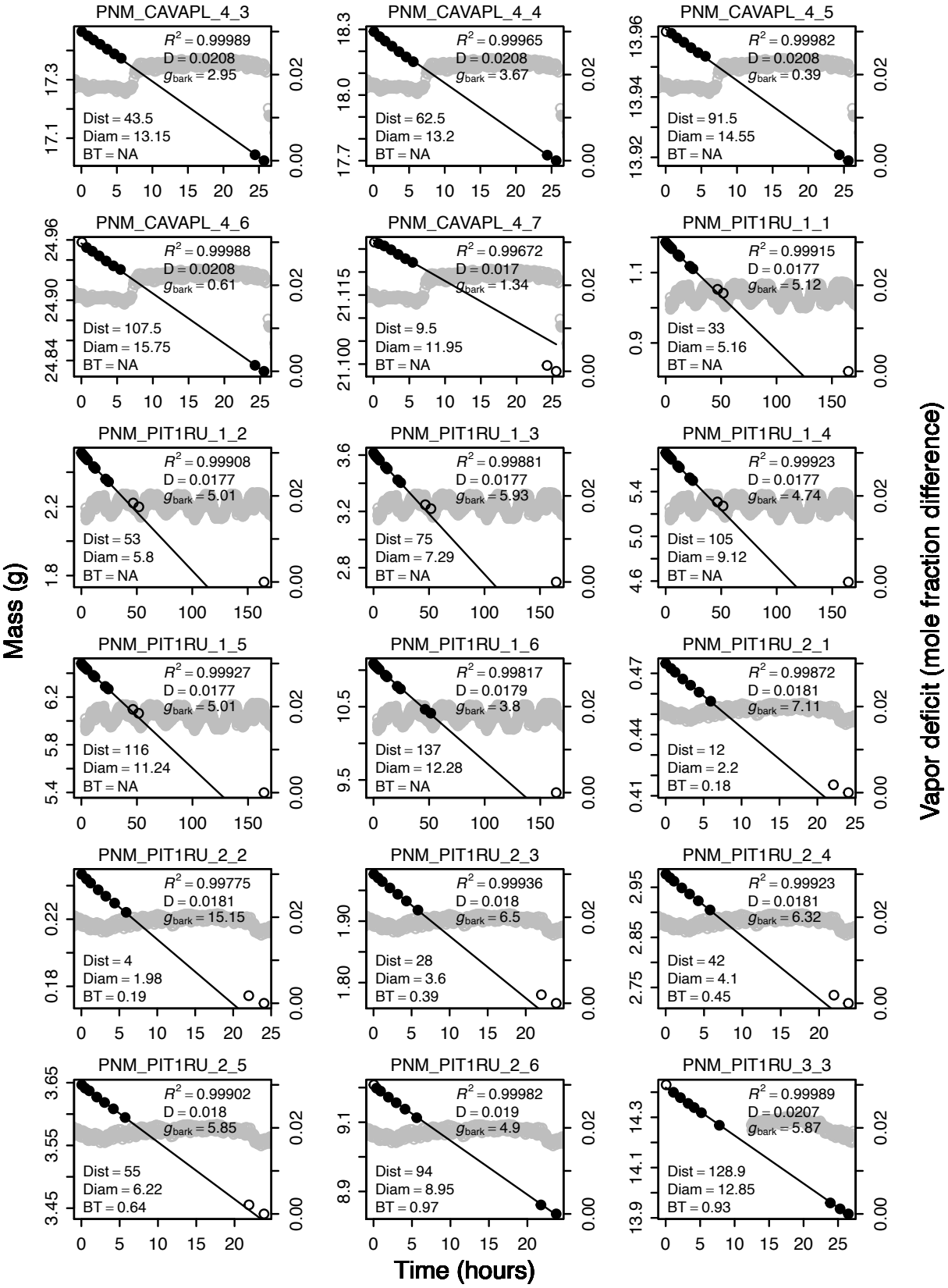
R^2 = 0.99611
D = 0.0107
g_{bark} = 8.4
Dist = 101.5
Diam = 11.1
BT = 1.04
CORONADO_GENIAM_3_5
R^2 = 0.99265
D = 0.0108
g_{bark} = 9.19
Dist = 111.7
Diam = 11.6
BT = 1.28
CORONADO_GENIAM_3_6
R^2 = 0.99979
D = 0.0126
g_{bark} = 5.6
Dist = 142.7
Diam = 14.9
BT = 2.29
CORONADO_GENIAM_4_1
R^2 = 0.99993
D = 0.0136
g_{bark} = 7.62
Dist = 21
Diam = 7.8
BT = 0.85
CORONADO_GENIAM_4_2
R^2 = 0.9999
D = 0.0136
g_{bark} = 12.76
Dist = 62.2
Diam = 12.45
BT = 1.12
CORONADO_GENIAM_4_3
R^2 = 0.99994
D = 0.0136
g_{bark} = 9.31
Dist = 88.5
Diam = 13
BT = 1.52
CORONADO_GENIAM_4_4
R^2 = 0.99997
D = 0.0136
g_{bark} = 10.18
Dist = 135.2
Diam = 14.1
BT = 1.49
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)

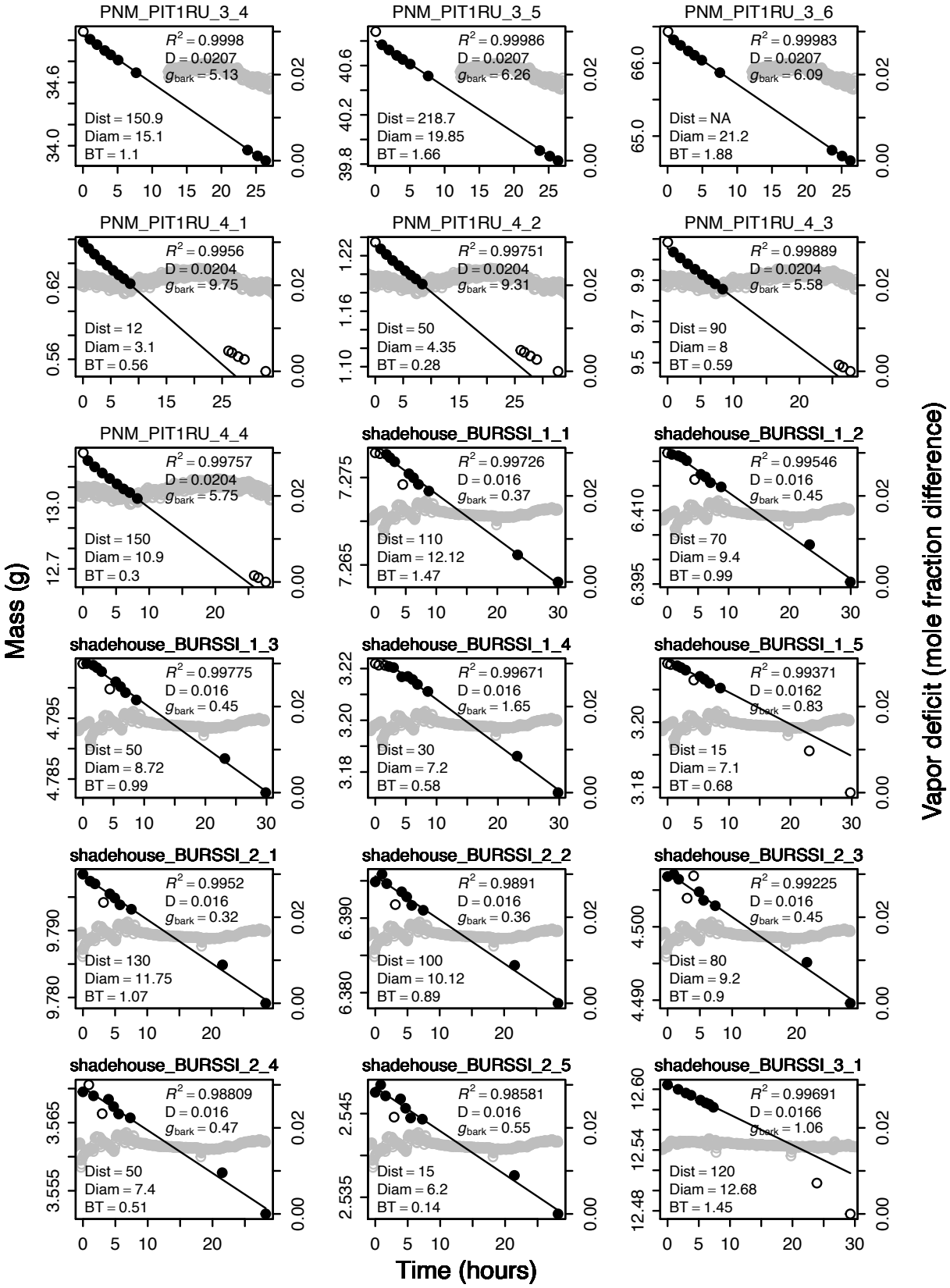

CORONADO_PIT1RU_3_4
R^2 = 0.99482
D = 0.0108
g_{bark} = 9.22
Dist = 95.9
Diam = 9.55
BT = NA
CORONADO_PIT1RU_3_5
R^2 = 0.99991
D = 0.0127
g_{bark} = 6.53
Dist = 143.9
Diam = 12.35
BT = 0.74
CORONADO_PIT1RU_3_6
R^2 = 0.99976
D = 0.0127
g_{bark} = 7.71
Dist = 180.4
Diam = 15.75
BT = 0.96
CORONADO_PIT1RU_4_1
R^2 = 0.99969
D = 0.0143
g_{bark} = 8.57
Dist = 9
Diam = 2.85
BT = 0.37
CORONADO_PIT1RU_4_2
R^2 = 0.99917
D = 0.0143
g_{bark} = 9.67
Dist = 54.5
Diam = 3.95
BT = 0.37
CORONADO_PIT1RU_4_3
R^2 = 0.99459
D = 0.0143
g_{bark} = 9.31
Dist = 82
Diam = 9.8
BT = 1.1
CORONADO_PIT1RU_4_4
R^2 = 0.99989
D = 0.0143
g_{bark} = 9.08
Dist = 116
Diam = 14.6
BT = 1.42
CORONADO_PIT1RU_4_5
R^2 = 0.99729
D = 0.0143
g_{bark} = 8.16
Dist = 158.7
Diam = 18.25
BT = 1.72
CORONADO_PIT1RU_4_6
R^2 = 0.99918
D = 0.0143
g_{bark} = 7.34
Dist = 222.2
Diam = 26.7
BT = 2.27
PNM_ANNOHA_1_1
R^2 = 0.99799
D = 0.0177
g_{bark} = 7.87
Dist = 24
Diam = 3.05
BT = NA
PNM_ANNOHA_1_2
R^2 = 0.99951
D = 0.0177
g_{bark} = 5.11
Dist = 68
Diam = 7.03
BT = NA
PNM_ANNOHA_1_3
R^2 = 0.99963
D = 0.0177
g_{bark} = 5.02
Dist = 83
Diam = 7.54
BT = NA
PNM_ANNOHA_1_4
R^2 = 0.99965
D = 0.0177
g_{bark} = 4.09
Dist = 94
Diam = 8.95
BT = NA
PNM_ANNOHA_1_5
R^2 = 0.99942
D = 0.0177
g_{bark} = 4.4
Dist = 110
Diam = 10.17
BT = NA
PNM_ANNOHA_1_6
R^2 = 0.99909
D = 0.0177
g_{bark} = 4.03
Dist = 124
Diam = 10.54
BT = NA
PNM_ANNOHA_2_2
R^2 = 0.99831
D = 0.0182
g_{bark} = 6.75
Dist = 38
Diam = 4.72
BT = 0.36
PNM_ANNOHA_2_3
R^2 = 0.99971
D = 0.019
g_{bark} = 4.17
Dist = 59
Diam = 5.95
BT = 0.44
PNM_ANNOHA_2_4
R^2 = 0.99875
D = 0.0181
g_{bark} = 9.68
Dist = 177
Diam = 6.8
BT = 0.44
Mass (g)
Vapor deficit (mole fraction difference)
Time (hours)

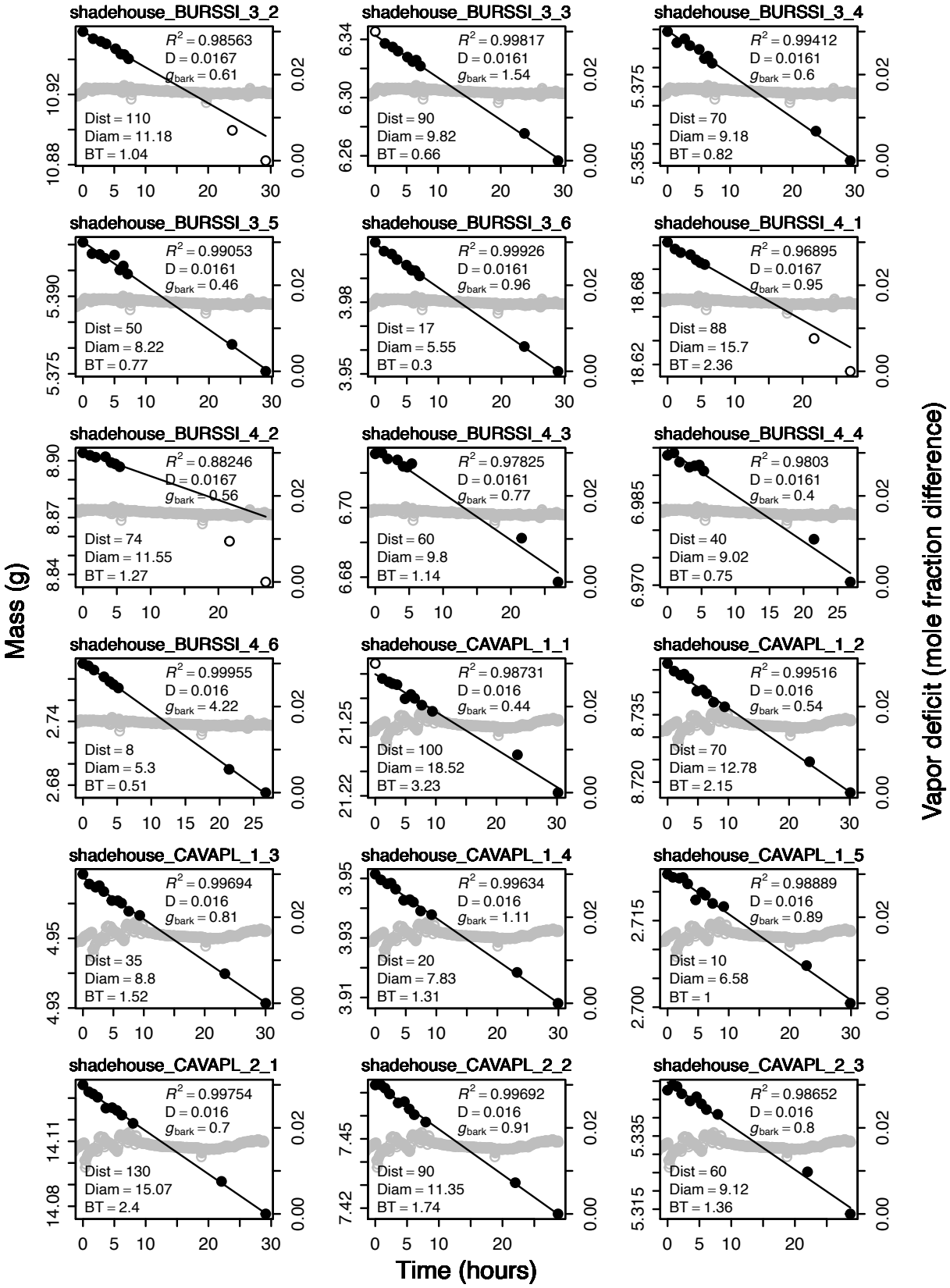

PNM_ANNOHA_2_6
R^2 = 0.99984
D = 0.019
g_{bark} = 8.41
Dist = 112
Diam = 8.85
BT = 0.47
PNM_ANNOHA_3_2
R^2 = 0.99978
D = 0.0207
g_{bark} = 3.6
Dist = 97.8
Diam = 8.55
BT = 0.83
PNM_ANNOHA_3_3
R^2 = 0.9998
D = 0.0207
g_{bark} = 5.05
Dist = 133.8
Diam = 10.55
BT = 1.21
PNM_ANNOHA_3_4
R^2 = 0.99974
D = 0.0207
g_{bark} = 6.36
Dist = 169.8
Diam = 11.85
BT = 1.13
PNM_ANNOHA_3_5
R^2 = 0.99984
D = 0.0207
g_{bark} = 4.48
Dist = 188.8
Diam = 12.5
BT = 1.19
PNM_ANNOHA_3_6
R^2 = 0.99983
D = 0.0207
g_{bark} = 2.39
Dist = 282.2
Diam = 19.05
BT = 2.59
PNM_ANNOHA_4_2
R^2 = 0.99705
D = 0.0205
g_{bark} = 16.88
Dist = 74
Diam = 6.8
BT = 0.77
PNM_ANNOHA_4_3
R^2 = 0.99974
D = 0.0212
g_{bark} = 7.1
Dist = 128
Diam = 9.65
BT = 0.93
PNM_ANNOHA_4_4
R^2 = 0.99831
D = 0.0204
g_{bark} = 8.11
Dist = 175
Diam = 13.45
BT = 1.45
PNM_ANNOHA_4_5
R^2 = 0.99973
D = 0.0212
g_{bark} = 4.76
Dist = 230
Diam = 16.1
BT = 1.68
PNM_ANNOHA_4_6
R^2 = 0.9995
D = 0.0212
g_{bark} = 7.57
Dist = 275
Diam = 15.3
BT = 1.13
PNM_AST2GR_1_1
R^2 = 0.99786
D = 0.0182
g_{bark} = 7.16
Dist = 18
Diam = 5.6
BT = 0.49
PNM_AST2GR_1_2
R^2 = 0.99837
D = 0.019
g_{bark} = 5.35
Dist = 40
Diam = 6.5
BT = 0.52
PNM_AST2GR_1_3
R^2 = 0.99947
D = 0.019
g_{bark} = 3.49
Dist = 70
Diam = 7.53
BT = 0.81
PNM_AST2GR_1_4
R^2 = 0.9998
D = 0.019
g_{bark} = 2.66
Dist = 114
Diam = 8.3
BT = 0.67
PNM_AST2GR_1_5
R^2 = 0.99994
D = 0.019
g_{bark} = 2.41
Dist = 129
Diam = 9.35
BT = 0.79
PNM_AST2GR_1_6
R^2 = 0.99987
D = 0.019
g_{bark} = 3
Dist = 154
Diam = 10.57
BT = 1.06
PNM_AST2GR_2_1
R^2 = 0.99976
D = 0.0207
g_{bark} = 2.66
Dist = 55
Diam = 7.75
BT = 0.64
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)

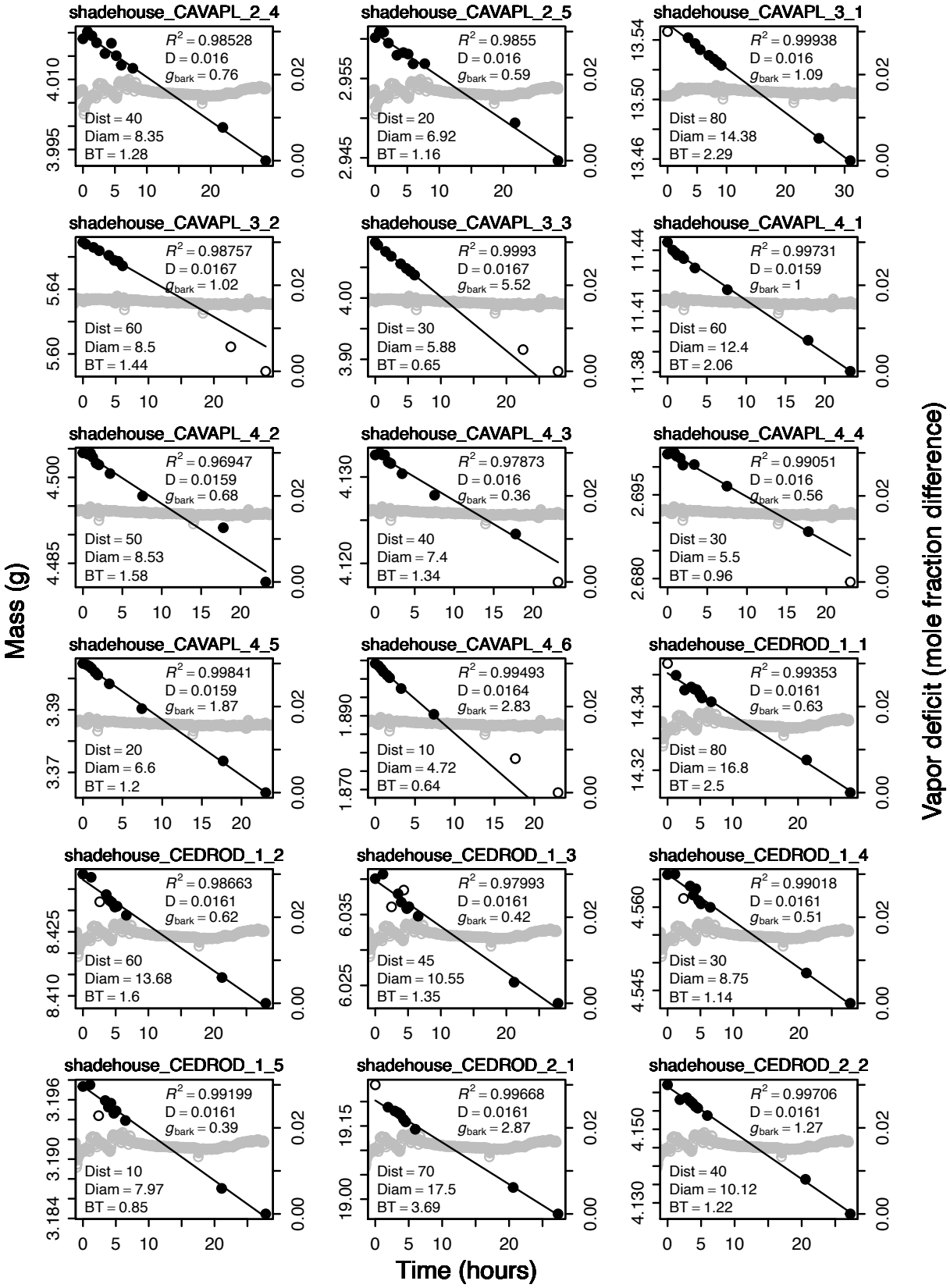

PNM_AST2GR_2_2
R^2 = 0.99988
D = 0.0207
g_{bark} = 3.47
Dist = 101
Diam = 9.65
BT = 0.53
PNM_AST2GR_2_3
R^2 = 0.99991
D = 0.0207
g_{bark} = 1.56
Dist = 136
Diam = 11.35
BT = 0.67
PNM_AST2GR_2_6
R^2 = 0.99938
D = 0.0207
g_{bark} = 5.89
Dist = 278.1
Diam = 18.5
BT = 1.19
PNM_AST2GR_3_1
R^2 = 0.99997
D = 0.0206
g_{bark} = 2.11
Dist = 18
Diam = 5.85
BT = NA
PNM_AST2GR_3_2
R^2 = 0.99984
D = 0.0206
g_{bark} = 3.55
Dist = 66.1
Diam = 9.2
BT = NA
PNM_AST2GR_3_3
R^2 = 0.99985
D = 0.0173
g_{bark} = 1.95
Dist = 121.1
Diam = 11
BT = NA
PNM_AST2GR_3_4
R^2 = 0.99995
D = 0.0207
g_{bark} = 1.61
Dist = 20
Diam = 4.7
BT = NA
PNM_AST2GR_3_5
R^2 = 0.9977
D = 0.0173
g_{bark} = 2.54
Dist = 173.1
Diam = 16.65
BT = NA
PNM_AST2GR_3_6
R^2 = 0.99501
D = 0.0173
g_{bark} = 1.97
Dist = 213.1
Diam = 18.75
BT = NA
PNM_AST2GR_4_1
R^2 = 0.99858
D = 0.0172
g_{bark} = 5.69
Dist = 12
Diam = 4.3
BT = NA
PNM_AST2GR_4_2
R^2 = 0.99979
D = 0.0207
g_{bark} = 2.22
Dist = 53
Diam = 6.2
BT = NA
PNM_AST2GR_4_3
R^2 = 0.99993
D = 0.0207
g_{bark} = 2.1
Dist = 55
Diam = 9.15
BT = NA
PNM_AST2GR_4_4
R^2 = 0.99955
D = 0.0172
g_{bark} = 1.98
Dist = 132
Diam = 14.9
BT = NA
PNM_AST2GR_4_5
R^2 = 0.99968
D = 0.0172
g_{bark} = 1.99
Dist = 164.4
Diam = 19.6
BT = NA
PNM_AST2GR_4_6
R^2 = 0.99961
D = 0.0172
g_{bark} = 1.08
Dist = 236.4
Diam = 23.25
BT = NA
PNM_AST2GR_4_7
R^2 = 0.99963
D = 0.0172
g_{bark} = 4.01
Dist = NA
Diam = 6.05
BT = NA
PNM_CAVAPL_1_1
R^2 = 0.99911
D = 0.0204
g_{bark} = 3.29
Dist = 35
Diam = 11.35
BT = 1.44
PNM_CAVAPL_1_2
R^2 = 0.99857
D = 0.0203
g_{bark} = 2.51
Dist = 75
Diam = 14.4
BT = 1.58
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


PNM_CAVAPL_1_3
R^2 = 0.99932
D = 0.0203
g_{bark} = 2.92
Dist = 140
Diam = 18
BT = 1.94
PNM_CAVAPL_1_4
R^2 = 0.99983
D = 0.0215
g_{bark} = 2.39
Dist = 205
Diam = 21.45
BT = 2.12
PNM_CAVAPL_1_5
R^2 = 0.99986
D = 0.0214
g_{bark} = 3.61
Dist = 235
Diam = 22.55
BT = 2.96
PNM_CAVAPL_1_6
R^2 = 0.9998
D = 0.0214
g_{bark} = 1.95
Dist = 281
Diam = 28.7
BT = 2.64
PNM_CAVAPL_2_1
R^2 = 0.9998
D = 0.0215
g_{bark} = 1.73
Dist = 15
Diam = 11.3
BT = 2.16
PNM_CAVAPL_2_2
R^2 = 0.99993
D = 0.0215
g_{bark} = 1.09
Dist = 65
Diam = 16.65
BT = 2.15
PNM_CAVAPL_2_3
R^2 = 0.99997
D = 0.0215
g_{bark} = 1.86
Dist = 140
Diam = 25.05
BT = 3.5
PNM_CAVAPL_2_4
R^2 = 0.99994
D = 0.0215
g_{bark} = 1.03
Dist = 187
Diam = 31.15
BT = 4.11
PNM_CAVAPL_2_5
R^2 = 0.99968
D = 0.0212
g_{bark} = 1.61
Dist = 227
Diam = 37.95
BT = 5.34
PNM_CAVAPL_2_6
R^2 = 0.99989
D = 0.0212
g_{bark} = 1.16
Dist = 249
Diam = 44.5
BT = 6.86
PNM_CAVAPL_3_1
R^2 = 0.99991
D = 0.0208
g_{bark} = 0.86
Dist = 30
Diam = 9.15
BT = NA
PNM_CAVAPL_3_2
R^2 = 0.99979
D = 0.0208
g_{bark} = 0.35
Dist = 5
Diam = 6.85
BT = NA
PNM_CAVAPL_3_3
R^2 = 0.99804
D = 0.0171
g_{bark} = 0.52
Dist = 5
Diam = 5.3
BT = NA
PNM_CAVAPL_3_4
R^2 = 0.99971
D = 0.0171
g_{bark} = 1.68
Dist = 72
Diam = 12.75
BT = NA
PNM_CAVAPL_3_5
R^2 = 0.99988
D = 0.0171
g_{bark} = 1.07
Dist = 108
Diam = 13.75
BT = NA
PNM_CAVAPL_3_6
R^2 = 0.99842
D = 0.0171
g_{bark} = 0.69
Dist = 133
Diam = 14.8
BT = NA
PNM_CAVAPL_4_1
R^2 = 0.99993
D = 0.0208
g_{bark} = 1.55
Dist = 3
Diam = 12
BT = NA
PNM_CAVAPL_4_2
R^2 = 0.99889
D = 0.0171
g_{bark} = 1.16
Dist = 32.5
Diam = 11.85
BT = NA
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


PNM_CAVAPL_4_3
R^2 = 0.99989
D = 0.0208
g_{bark} = 2.95
Dist = 43.5
Diam = 13.15
BT = NA
PNM_CAVAPL_4_4
R^2 = 0.99965
D = 0.0208
g_{bark} = 3.67
Dist = 62.5
Diam = 13.2
BT = NA
PNM_CAVAPL_4_5
R^2 = 0.99982
D = 0.0208
g_{bark} = 0.39
Dist = 91.5
Diam = 14.55
BT = NA
PNM_CAVAPL_4_6
R^2 = 0.99988
D = 0.0208
g_{bark} = 0.61
Dist = 107.5
Diam = 15.75
BT = NA
PNM_CAVAPL_4_7
R^2 = 0.99672
D = 0.017
g_{bark} = 1.34
Dist = 9.5
Diam = 11.95
BT = NA
PNM_PIT1RU_1_1
R^2 = 0.99915
D = 0.0177
g_{bark} = 5.12
Dist = 33
Diam = 5.16
BT = NA
PNM_PIT1RU_1_2
R^2 = 0.99908
D = 0.0177
g_{bark} = 5.01
Dist = 53
Diam = 5.8
BT = NA
PNM_PIT1RU_1_3
R^2 = 0.99881
D = 0.0177
g_{bark} = 5.93
Dist = 75
Diam = 7.29
BT = NA
PNM_PIT1RU_1_4
R^2 = 0.99923
D = 0.0177
g_{bark} = 4.74
Dist = 105
Diam = 9.12
BT = NA
PNM_PIT1RU_1_5
R^2 = 0.99927
D = 0.0177
g_{bark} = 5.01
Dist = 116
Diam = 11.24
BT = NA
PNM_PIT1RU_1_6
R^2 = 0.99817
D = 0.0179
g_{bark} = 3.8
Dist = 137
Diam = 12.28
BT = NA
PNM_PIT1RU_2_1
R^2 = 0.99872
D = 0.0181
g_{bark} = 7.11
Dist = 12
Diam = 2.2
BT = 0.18
PNM_PIT1RU_2_2
R^2 = 0.99775
D = 0.0181
g_{bark} = 15.15
Dist = 4
Diam = 1.98
BT = 0.19
PNM_PIT1RU_2_3
R^2 = 0.99936
D = 0.018
g_{bark} = 6.5
Dist = 28
Diam = 3.6
BT = 0.39
PNM_PIT1RU_2_4
R^2 = 0.99923
D = 0.0181
g_{bark} = 6.32
Dist = 42
Diam = 4.1
BT = 0.45
PNM_PIT1RU_2_5
R^2 = 0.99902
D = 0.018
g_{bark} = 5.85
Dist = 55
Diam = 6.22
BT = 0.64
PNM_PIT1RU_2_6
R^2 = 0.99982
D = 0.019
g_{bark} = 4.9
Dist = 94
Diam = 8.95
BT = 0.97
PNM_PIT1RU_3_3
R^2 = 0.99989
D = 0.0207
g_{bark} = 5.87
Dist = 128.9
Diam = 12.85
BT = 0.93
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


PNM_PIT1RU_3_4
R^2 = 0.9998
D = 0.0207
g_{bark} = 5.13
Dist = 150.9
Diam = 15.1
BT = 1.1
PNM_PIT1RU_3_5
R^2 = 0.99986
D = 0.0207
g_{bark} = 6.26
Dist = 218.7
Diam = 19.85
BT = 1.66
PNM_PIT1RU_3_6
R^2 = 0.99983
D = 0.0207
g_{bark} = 6.09
Dist = NA
Diam = 21.2
BT = 1.88
PNM_PIT1RU_4_1
R^2 = 0.9956
D = 0.0204
g_{bark} = 9.75
Dist = 12
Diam = 3.1
BT = 0.56
PNM_PIT1RU_4_2
R^2 = 0.99751
D = 0.0204
g_{bark} = 9.31
Dist = 50
Diam = 4.35
BT = 0.28
PNM_PIT1RU_4_3
R^2 = 0.99889
D = 0.0204
g_{bark} = 5.58
Dist = 90
Diam = 8
BT = 0.59
PNM_PIT1RU_4_4
R^2 = 0.99757
D = 0.0204
g_{bark} = 5.75
Dist = 150
Diam = 10.9
BT = 0.3
shadehouse_BURSSI_1_1
R^2 = 0.99726
D = 0.016
g_{bark} = 0.37
Dist = 110
Diam = 12.12
BT = 1.47
shadehouse_BURSSI_1_2
R^2 = 0.99546
D = 0.016
g_{bark} = 0.45
Dist = 70
Diam = 9.4
BT = 0.99
shadehouse_BURSSI_1_3
R^2 = 0.99775
D = 0.016
g_{bark} = 0.45
Dist = 50
Diam = 8.72
BT = 0.99
shadehouse_BURSSI_1_4
R^2 = 0.99671
D = 0.016
g_{bark} = 1.65
Dist = 30
Diam = 7.2
BT = 0.58
shadehouse_BURSSI_1_5
R^2 = 0.99371
D = 0.0162
g_{bark} = 0.83
Dist = 15
Diam = 7.1
BT = 0.68
shadehouse_BURSSI_2_1
R^2 = 0.9952
D = 0.016
g_{bark} = 0.32
Dist = 130
Diam = 11.75
BT = 1.07
shadehouse_BURSSI_2_2
R^2 = 0.9891
D = 0.016
g_{bark} = 0.36
Dist = 100
Diam = 10.12
BT = 0.89
shadehouse_BURSSI_2_3
R^2 = 0.99225
D = 0.016
g_{bark} = 0.45
Dist = 80
Diam = 9.2
BT = 0.9
shadehouse_BURSSI_2_4
R^2 = 0.98809
D = 0.016
g_{bark} = 0.47
Dist = 50
Diam = 7.4
BT = 0.51
shadehouse_BURSSI_2_5
R^2 = 0.98581
D = 0.016
g_{bark} = 0.55
Dist = 15
Diam = 6.2
BT = 0.14
shadehouse_BURSSI_3_1
R^2 = 0.99691
D = 0.0166
g_{bark} = 1.06
Dist = 120
Diam = 12.68
BT = 1.45
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


shadehouse_BURSSI_3_2
R^2 = 0.98563
D = 0.0167
g_{bark} = 0.61
Dist = 110
Diam = 11.18
BT = 1.04
shadehouse_BURSSI_3_3
R^2 = 0.99817
D = 0.0161
g_{bark} = 1.54
Dist = 90
Diam = 9.82
BT = 0.66
shadehouse_BURSSI_3_4
R^2 = 0.99412
D = 0.0161
g_{bark} = 0.6
Dist = 70
Diam = 9.18
BT = 0.82
shadehouse_BURSSI_3_5
R^2 = 0.99053
D = 0.0161
g_{bark} = 0.46
Dist = 50
Diam = 8.22
BT = 0.77
shadehouse_BURSSI_3_6
R^2 = 0.99926
D = 0.0161
g_{bark} = 0.96
Dist = 17
Diam = 5.55
BT = 0.3
shadehouse_BURSSI_4_1
R^2 = 0.96895
D = 0.0167
g_{bark} = 0.95
Dist = 88
Diam = 15.7
BT = 2.36
shadehouse_BURSSI_4_2
R^2 = 0.88246
D = 0.0167
g_{bark} = 0.56
Dist = 74
Diam = 11.55
BT = 1.27
shadehouse_BURSSI_4_3
R^2 = 0.97825
D = 0.0161
g_{bark} = 0.77
Dist = 60
Diam = 9.8
BT = 1.14
shadehouse_BURSSI_4_4
R^2 = 0.9803
D = 0.0161
g_{bark} = 0.4
Dist = 40
Diam = 9.02
BT = 0.75
shadehouse_BURSSI_4_6
R^2 = 0.99955
D = 0.016
g_{bark} = 4.22
Dist = 8
Diam = 5.3
BT = 0.51
shadehouse_CAVAPL_1_1
R^2 = 0.98731
D = 0.016
g_{bark} = 0.44
Dist = 100
Diam = 18.52
BT = 3.23
shadehouse_CAVAPL_1_2
R^2 = 0.99516
D = 0.016
g_{bark} = 0.54
Dist = 70
Diam = 12.78
BT = 2.15
shadehouse_CAVAPL_1_3
R^2 = 0.99694
D = 0.016
g_{bark} = 0.81
Dist = 35
Diam = 8.8
BT = 1.52
shadehouse_CAVAPL_1_4
R^2 = 0.99634
D = 0.016
g_{bark} = 1.11
Dist = 20
Diam = 7.83
BT = 1.31
shadehouse_CAVAPL_1_5
R^2 = 0.98889
D = 0.016
g_{bark} = 0.89
Dist = 10
Diam = 6.58
BT = 1
shadehouse_CAVAPL_2_1
R^2 = 0.99754
D = 0.016
g_{bark} = 0.7
Dist = 130
Diam = 15.07
BT = 2.4
shadehouse_CAVAPL_2_2
R^2 = 0.99692
D = 0.016
g_{bark} = 0.91
Dist = 90
Diam = 11.35
BT = 1.74
shadehouse_CAVAPL_2_3
R^2 = 0.98652
D = 0.016
g_{bark} = 0.8
Dist = 60
Diam = 9.12
BT = 1.36
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)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g_{bark} = 0.76
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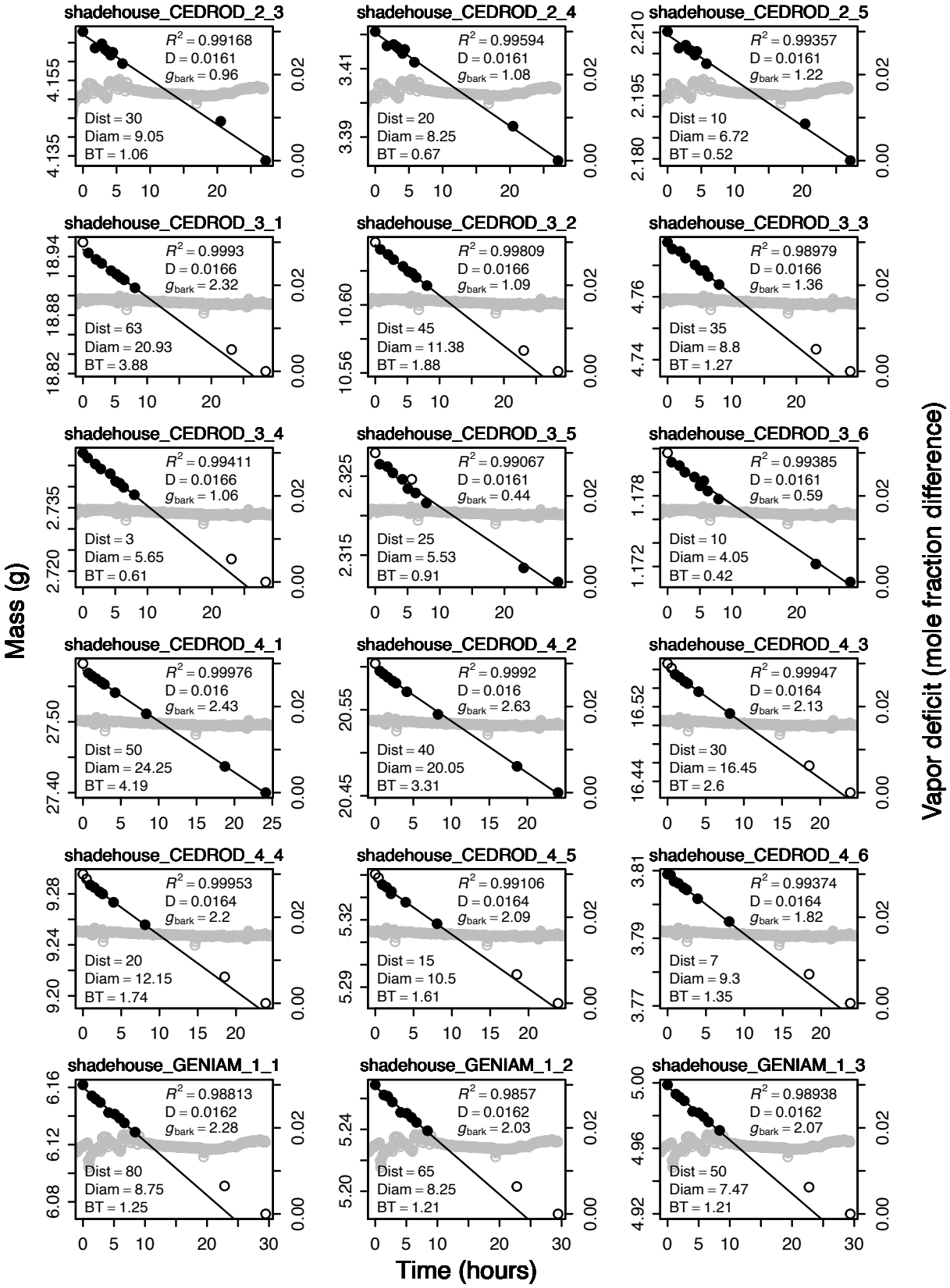
shadehouse_CAVAPL_2_5
R^2 = 0.9855
D = 0.016
g_{bark} = 0.59
Dist = 20
Diam = 6.92
BT = 1.16
shadehouse_CAVAPL_3_1
R^2 = 0.99938
D = 0.016
g_{bark} = 1.09
Dist = 80
Diam = 14.38
BT = 2.29
shadehouse_CAVAPL_3_2
R^2 = 0.98757
D = 0.0167
g_{bark} = 1.02
Dist = 60
Diam = 8.5
BT = 1.44
shadehouse_CAVAPL_3_3
R^2 = 0.9993
D = 0.0167
g_{bark} = 5.52
Dist = 30
Diam = 5.88
BT = 0.65
shadehouse_CAVAPL_4_1
R^2 = 0.99731
D = 0.0159
g_{bark} = 1
Dist = 60
Diam = 12.4
BT = 2.06
shadehouse_CAVAPL_4_2
R^2 = 0.96947
D = 0.0159
g_{bark} = 0.68
Dist = 50
Diam = 8.53
BT = 1.58
shadehouse_CAVAPL_4_3
R^2 = 0.97873
D = 0.016
g_{bark} = 0.36
Dist = 40
Diam = 7.4
BT = 1.34
shadehouse_CAVAPL_4_4
R^2 = 0.99051
D = 0.016
g_{bark} = 0.56
Dist = 30
Diam = 5.5
BT = 0.96
shadehouse_CAVAPL_4_5
R^2 = 0.99841
D = 0.0159
g_{bark} = 1.87
Dist = 20
Diam = 6.6
BT = 1.2
shadehouse_CAVAPL_4_6
R^2 = 0.99493
D = 0.0164
g_{bark} = 2.83
Dist = 10
Diam = 4.72
BT = 0.64
shadehouse_CEDROD_1_1
R^2 = 0.99353
D = 0.0161
g_{bark} = 0.63
Dist = 80
Diam = 16.8
BT = 2.5
shadehouse_CEDROD_1_2
R^2 = 0.98663
D = 0.0161
g_{bark} = 0.62
Dist = 60
Diam = 13.68
BT = 1.6
shadehouse_CEDROD_1_3
R^2 = 0.97993
D = 0.0161
g_{bark} = 0.42
Dist = 45
Diam = 10.55
BT = 1.35
shadehouse_CEDROD_1_4
R^2 = 0.99018
D = 0.0161
g_{bark} = 0.51
Dist = 30
Diam = 8.75
BT = 1.14
shadehouse_CEDROD_1_5
R^2 = 0.99199
D = 0.0161
g_{bark} = 0.39
Dist = 10
Diam = 7.97
BT = 0.85
shadehouse_CEDROD_2_1
R^2 = 0.99668
D = 0.0161
g_{bark} = 2.87
Dist = 70
Diam = 17.5
BT = 3.69
shadehouse_CEDROD_2_2
R^2 = 0.99706
D = 0.0161
g_{bark} = 1.27
Dist = 40
Diam = 10.12
BT = 1.22
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


shadehouse_CEDROD_2_3
R^2 = 0.99168
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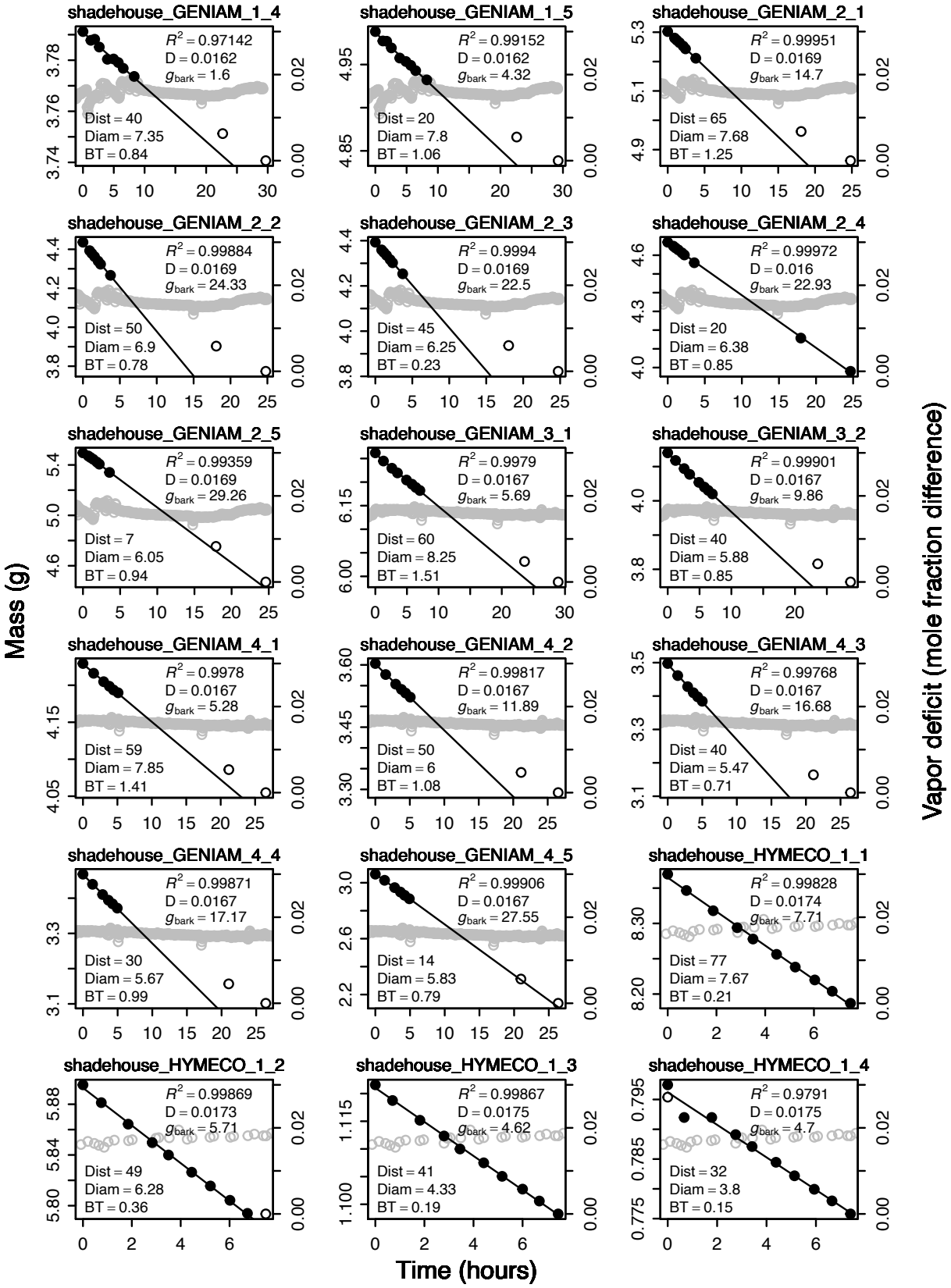
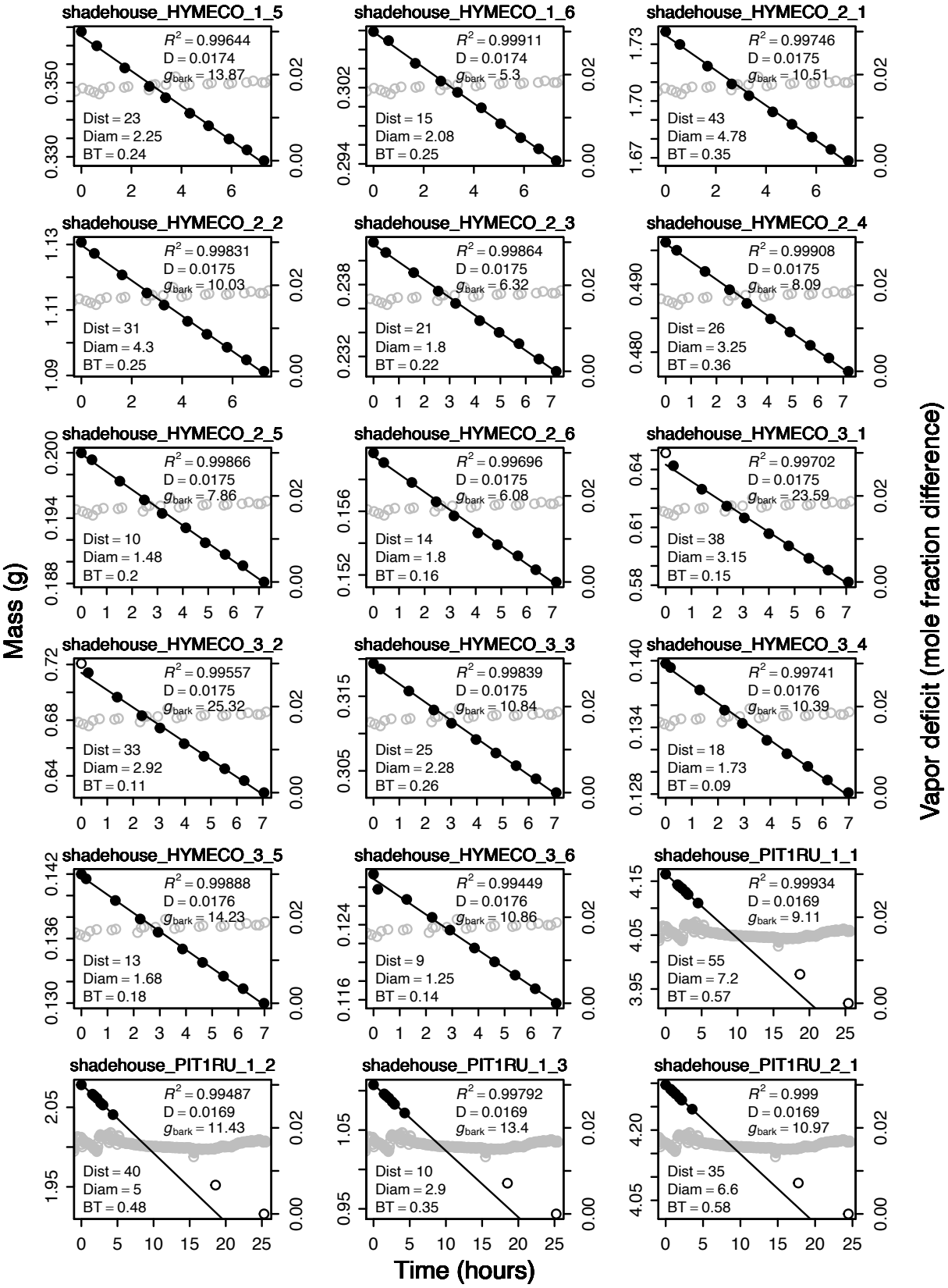
g_{bark} = 0.96
Dist = 30
Diam = 9.05
BT = 1.06
shadehouse_CEDROD_2_4
R^2 = 0.99594
D = 0.0161
g_{bark} = 1.08
Dist = 20
Diam = 8.25
BT = 0.67
shadehouse_CEDROD_2_5
R^2 = 0.99357
D = 0.0161
g_{bark} = 1.22
Dist = 10
Diam = 6.72
BT = 0.52
shadehouse_CEDROD_3_1
R^2 = 0.9993
D = 0.0166
g_{bark} = 2.32
Dist = 63
Diam = 20.93
BT = 3.88
shadehouse_CEDROD_3_2
R^2 = 0.99809
D = 0.0166
g_{bark} = 1.09
Dist = 45
Diam = 11.38
BT = 1.88
shadehouse_CEDROD_3_3
R^2 = 0.98979
D = 0.0166
g_{bark} = 1.36
Dist = 35
Diam = 8.8
BT = 1.27
shadehouse_CEDROD_3_4
R^2 = 0.99411
D = 0.0166
g_{bark} = 1.06
Dist = 3
Diam = 5.65
BT = 0.61
shadehouse_CEDROD_3_5
R^2 = 0.99067
D = 0.0161
g_{bark} = 0.44
Dist = 25
Diam = 5.53
BT = 0.91
shadehouse_CEDROD_3_6
R^2 = 0.99385
D = 0.0161
g_{bark} = 0.59
Dist = 10
Diam = 4.05
BT = 0.42
shadehouse_CEDROD_4_1
R^2 = 0.99976
D = 0.016
g_{bark} = 2.43
Dist = 50
Diam = 24.25
BT = 4.19
shadehouse_CEDROD_4_2
R^2 = 0.9992
D = 0.016
g_{bark} = 2.63
Dist = 40
Diam = 20.05
BT = 3.31
shadehouse_CEDROD_4_3
R^2 = 0.99947
D = 0.0164
g_{bark} = 2.13
Dist = 30
Diam = 16.45
BT = 2.6
shadehouse_CEDROD_4_4
R^2 = 0.99953
D = 0.0164
g_{bark} = 2.2
Dist = 20
Diam = 12.15
BT = 1.74
shadehouse_CEDROD_4_5
R^2 = 0.99106
D = 0.0164
g_{bark} = 2.09
Dist = 15
Diam = 10.5
BT = 1.61
shadehouse_CEDROD_4_6
R^2 = 0.99374
D = 0.0164
g_{bark} = 1.82
Dist = 7
Diam = 9.3
BT = 1.35
shadehouse_GENIAM_1_1
R^2 = 0.98813
D = 0.0162
g_{bark} = 2.28
Dist = 80
Diam = 8.75
BT = 1.25
shadehouse_GENIAM_1_2
R^2 = 0.9857
D = 0.0162
g_{bark} = 2.03
Dist = 65
Diam = 8.25
BT = 1.21
shadehouse_GENIAM_1_3
R^2 = 0.98938
D = 0.0162
g_{bark} = 2.07
Dist = 50
Diam = 7.47
BT = 1.21
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


shadehouse_GENIAM_1_4
R^2 = 0.97142
D = 0.0162
g_{bark} = 1.6
Dist = 40
Diam = 7.35
BT = 0.84
shadehouse_GENIAM_1_5
R^2 = 0.99152
D = 0.0162
g_{bark} = 4.32
Dist = 20
Diam = 7.8
BT = 1.06
shadehouse_GENIAM_2_1
R^2 = 0.99951
D = 0.0169
g_{bark} = 14.7
Dist = 65
Diam = 7.68
BT = 1.25
shadehouse_GENIAM_2_2
R^2 = 0.99884
D = 0.0169
g_{bark} = 24.33
Dist = 50
Diam = 6.9
BT = 0.78
shadehouse_GENIAM_2_3
R^2 = 0.9994
D = 0.0169
g_{bark} = 22.5
Dist = 45
Diam = 6.25
BT = 0.23
shadehouse_GENIAM_2_4
R^2 = 0.99972
D = 0.016
g_{bark} = 22.93
Dist = 20
Diam = 6.38
BT = 0.85
shadehouse_GENIAM_2_5
R^2 = 0.99359
D = 0.0169
g_{bark} = 29.26
Dist = 7
Diam = 6.05
BT = 0.94
shadehouse_GENIAM_3_1
R^2 = 0.9979
D = 0.0167
g_{bark} = 5.69
Dist = 60
Diam = 8.25
BT = 1.51
shadehouse_GENIAM_3_2
R^2 = 0.99901
D = 0.0167
g_{bark} = 9.86
Dist = 40
Diam = 5.88
BT = 0.85
shadehouse_GENIAM_4_1
R^2 = 0.9978
D = 0.0167
g_{bark} = 5.28
Dist = 59
Diam = 7.85
BT = 1.41
shadehouse_GENIAM_4_2
R^2 = 0.99817
D = 0.0167
g_{bark} = 11.89
Dist = 50
Diam = 6
BT = 1.08
shadehouse_GENIAM_4_3
R^2 = 0.99768
D = 0.0167
g_{bark} = 16.68
Dist = 40
Diam = 5.47
BT = 0.71
shadehouse_GENIAM_4_4
R^2 = 0.99871
D = 0.0167
g_{bark} = 17.17
Dist = 30
Diam = 5.67
BT = 0.99
shadehouse_GENIAM_4_5
R^2 = 0.99906
D = 0.0167
g_{bark} = 27.55
Dist = 14
Diam = 5.83
BT = 0.79
shadehouse_HYMECO_1_1
R^2 = 0.99828
D = 0.0174
g_{bark} = 7.71
Dist = 77
Diam = 7.67
BT = 0.21
shadehouse_HYMECO_1_2
R^2 = 0.99869
D = 0.0173
g_{bark} = 5.71
Dist = 49
Diam = 6.28
BT = 0.36
shadehouse_HYMECO_1_3
R^2 = 0.99867
D = 0.0175
g_{bark} = 4.62
Dist = 41
Diam = 4.33
BT = 0.19
shadehouse_HYMECO_1_4
R^2 = 0.9791
D = 0.0175
g_{bark} = 4.7
Dist = 32
Diam = 3.8
BT = 0.15
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)


shadehouse_HYMECO_1_5
R^2 = 0.99644
D = 0.0174
g_{bark} = 13.87
Dist = 23
Diam = 2.25
BT = 0.24
shadehouse_HYMECO_1_6
R^2 = 0.99911
D = 0.0174
g_{bark} = 5.3
Dist = 15
Diam = 2.08
BT = 0.25
shadehouse_HYMECO_2_1
R^2 = 0.99746
D = 0.0175
g_{bark} = 10.51
Dist = 43
Diam = 4.78
BT = 0.35
shadehouse_HYMECO_2_2
R^2 = 0.99831
D = 0.0175
g_{bark} = 10.03
Dist = 31
Diam = 4.3
BT = 0.25
shadehouse_HYMECO_2_3
R^2 = 0.99864
D = 0.0175
g_{bark} = 6.32
Dist = 21
Diam = 1.8
BT = 0.22
shadehouse_HYMECO_2_4
R^2 = 0.99908
D = 0.0175
g_{bark} = 8.09
Dist = 26
Diam = 3.25
BT = 0.36
shadehouse_HYMECO_2_5
R^2 = 0.99866
D = 0.0175
g_{bark} = 7.86
Dist = 10
Diam = 1.48
BT = 0.2
shadehouse_HYMECO_2_6
R^2 = 0.99696
D = 0.0175
g_{bark} = 6.08
Dist = 14
Diam = 1.8
BT = 0.16
shadehouse_HYMECO_3_1
R^2 = 0.99702
D = 0.0175
g_{bark} = 23.59
Dist = 38
Diam = 3.15
BT = 0.15
shadehouse_HYMECO_3_2
R^2 = 0.99557
D = 0.0175
g_{bark} = 25.32
Dist = 33
Diam = 2.92
BT = 0.11
shadehouse_HYMECO_3_3
R^2 = 0.99839
D = 0.0175
g_{bark} = 10.84
Dist = 25
Diam = 2.28
BT = 0.26
shadehouse_HYMECO_3_4
R^2 = 0.99741
D = 0.0176
g_{bark} = 10.39
Dist = 18
Diam = 1.73
BT = 0.09
shadehouse_HYMECO_3_5
R^2 = 0.99888
D = 0.0176
g_{bark} = 14.23
Dist = 13
Diam = 1.68
BT = 0.18
shadehouse_HYMECO_3_6
R^2 = 0.99449
D = 0.0176
g_{bark} = 10.86
Dist = 9
Diam = 1.25
BT = 0.14
shadehouse_PIT1RU_1_1
R^2 = 0.99934
D = 0.0169
g_{bark} = 9.11
Dist = 55
Diam = 7.2
BT = 0.57
shadehouse_PIT1RU_1_2
R^2 = 0.99487
D = 0.0169
g_{bark} = 11.43
Dist = 40
Diam = 5
BT = 0.48
shadehouse_PIT1RU_1_3
R^2 = 0.99792
D = 0.0169
g_{bark} = 13.4
Dist = 10
Diam = 2.9
BT = 0.35
shadehouse_PIT1RU_2_1
R^2 = 0.999
D = 0.0169
g_{bark} = 10.97
Dist = 35
Diam = 6.6
BT = 0.58
Mass (g)
Time (hours)
Vapor deficit (mole fraction difference)

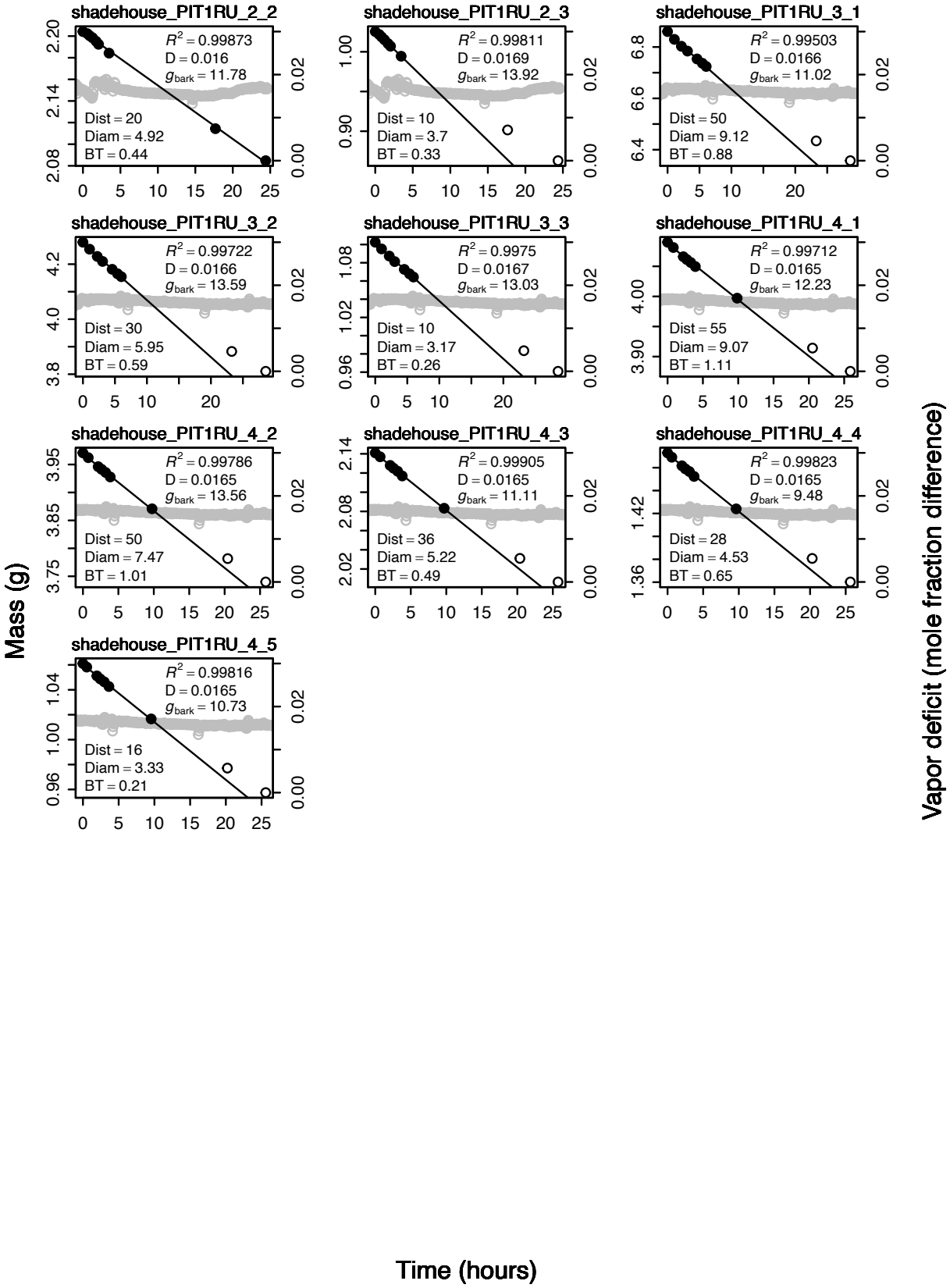

shadehouse_PIT1RU_2_2
R^2 = 0.99873
D = 0.016
g_{bark} = 11.78
Dist = 20
Diam = 4.92
BT = 0.44
shadehouse_PIT1RU_2_3
R^2 = 0.99811
D = 0.0169
g_{bark} = 13.92
Dist = 10
Diam = 3.7
BT = 0.33
shadehouse_PIT1RU_3_1
R^2 = 0.99503
D = 0.0166
g_{bark} = 11.02
Dist = 50
Diam = 9.12
BT = 0.88
shadehouse_PIT1RU_3_2
R^2 = 0.99722
D = 0.0166
g_{bark} = 13.59
Dist = 30
Diam = 5.95
BT = 0.59
shadehouse_PIT1RU_3_3
R^2 = 0.9975
D = 0.0167
g_{bark} = 13.03
Dist = 10
Diam = 3.17
BT = 0.26
shadehouse_PIT1RU_4_1
R^2 = 0.99712
D = 0.0165
g_{bark} = 12.23
Dist = 55
Diam = 9.07
BT = 1.11
shadehouse_PIT1RU_4_2
R^2 = 0.99786
D = 0.0165
g_{bark} = 13.56
Dist = 50
Diam = 7.47
BT = 1.01
shadehouse_PIT1RU_4_3
R^2 = 0.99905
D = 0.0165
g_{bark} = 11.11
Dist = 36
Diam = 5.22
BT = 0.49
shadehouse_PIT1RU_4_4
R^2 = 0.99823
D = 0.0165
g_{bark} = 9.48
Dist = 28
Diam = 4.53
BT = 0.65
shadehouse_PIT1RU_4_5
R^2 = 0.99816
D = 0.0165
g_{bark} = 10.73
Dist = 16
Diam = 3.33
BT = 0.21
Mass (g)
Vapor deficit (mole fraction difference)
Time (hours)

Figure S2. Histogram of maximum stem water deficit in the g_{bark} samples for each population included in the study. Populations are labeled as site, underscore, species code. Site and species codes are as in Figure S1.

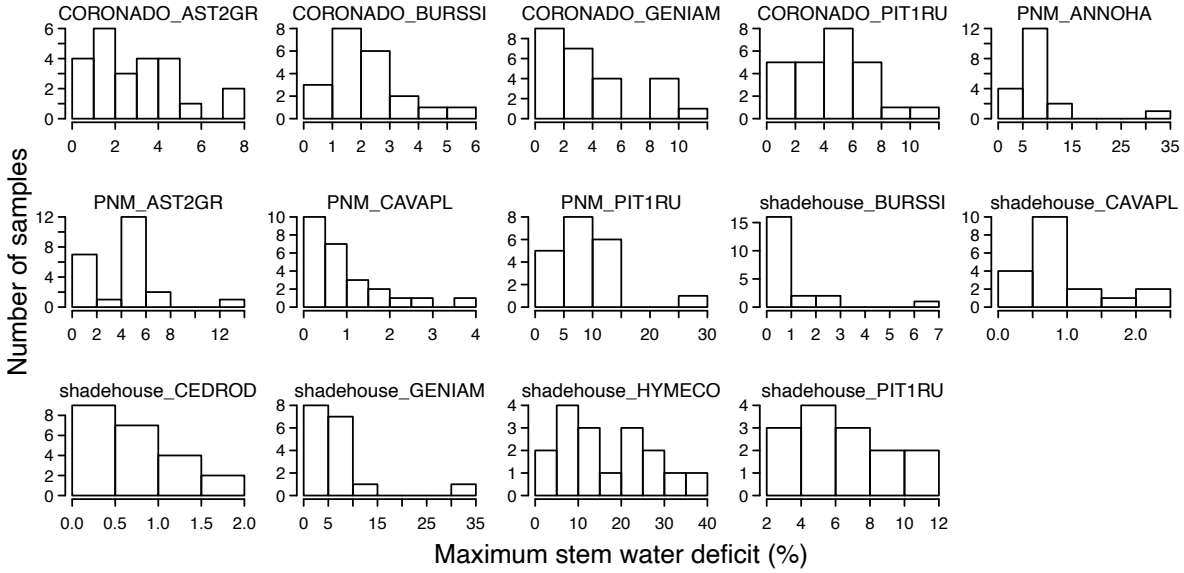


Figure S3. Bark water vapor conductance (g_{bark}) as a function of (a) distance from the stem apex, (b) stem diameter, and (c) bark thickness. Each symbol represents an individual sample. Symbols represent species-site combinations as in Figure 1. Here, red symbols represent samples that were collected in the shadehouse and black symbols represent samples that were collected in the forests. The lines represent fits from linear mixed models with the trait on the x axis as a fixed effect and plant, population, and species as nested random effects. g_{bark} was log transformed for analyses. Note that the y axis is on a log scale.

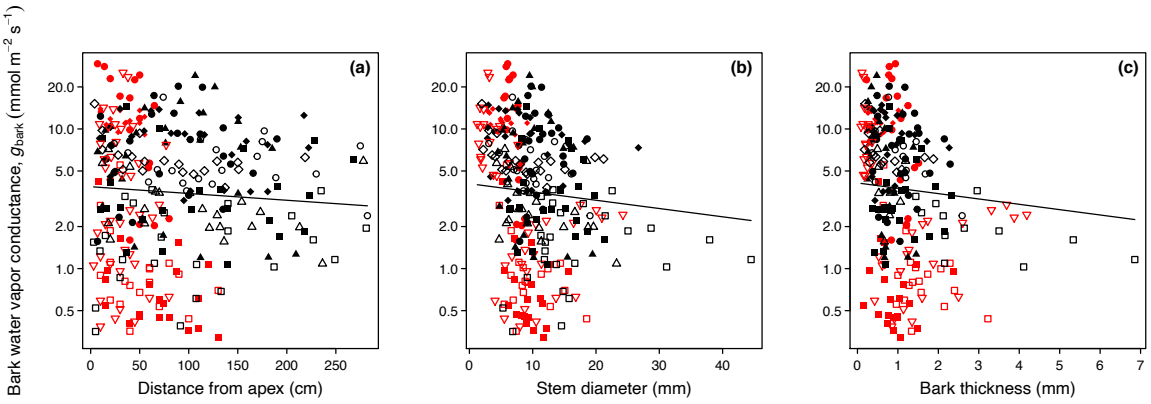


Figure S4. Bark water vapor conductance (g_{bark}) as a function of (a) air temperature and (b) vapor pressure deficit during measurements. Symbols are drawn as in Figure S2.

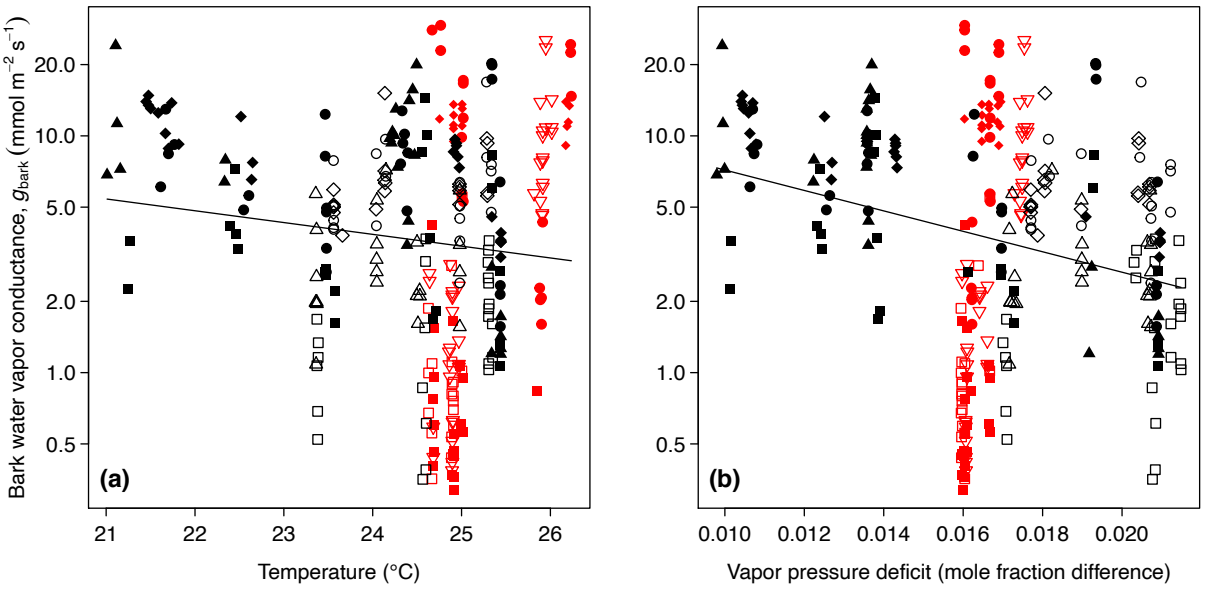
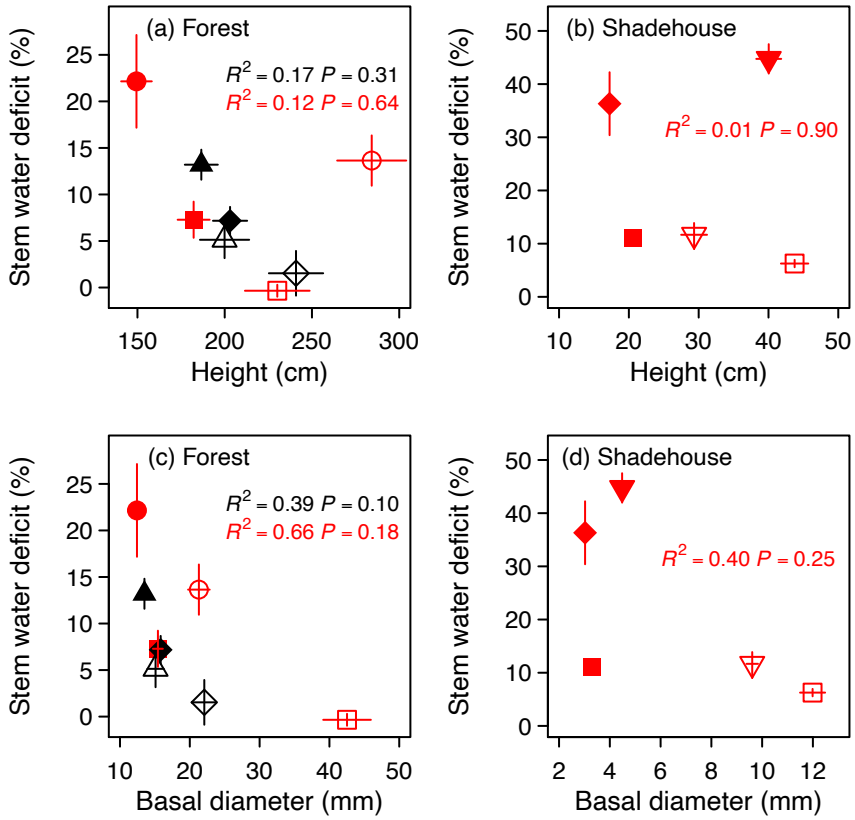


Figure S5. Stem water deficit in relation to plant height (a,b) and basal diameter (c,d) for saplings in during a dry season in two Panamanian forests ('Forest') and potted saplings in a shadehouse drought treatment ('Shadehouse'). Symbols are drawn as in Fig. 1. *R* and *P* values are for standardized major axis regression on all species (black) and on the deciduous species (red).



Supplemental Information References

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