

Arabidopsis Lipid Composition

Figure 1: Relative distribution of lipids and other components of Arabidopsis leaf.

Table 1: Fatty Acid Composition of Arabidopsis Tissues

Table 2: Fatty Acid Composition of Leaf Glycerolipids

Table 3: Membrane Glycerolipid Composition of Organs and Subcellular Fractions

Table 4: Fatty Acid Composition and Oil Content of Arabidopsis Seeds

Table 5: Composition of Sphingolipids

Table 6: Tocopherols of Leaf and Seed

Figure 2: Composition of Surface Waxes of Stems

Figure 3: Composition of Aliphatic Monomers of Stem Polyesters (cutin)

Figure 4: Composition of Aliphatic Monomers of Root Polyesters (suberin)

Figure 1

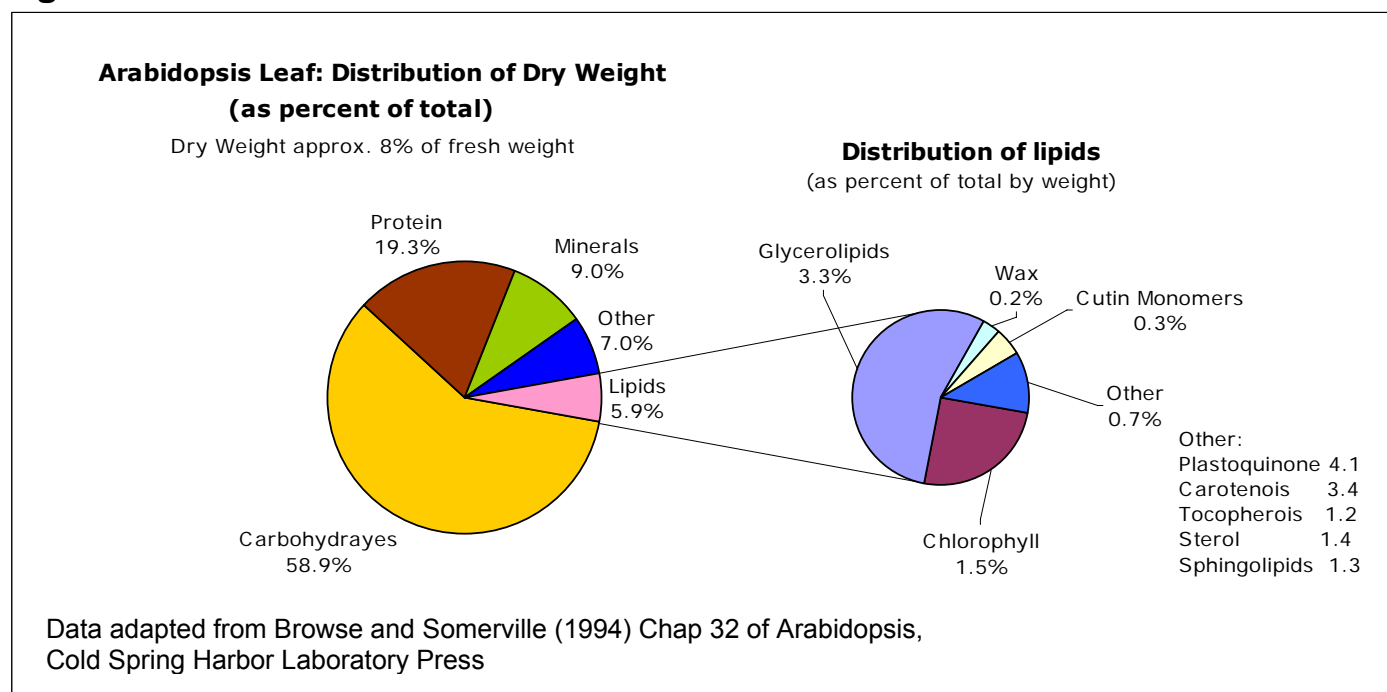


Table 1. Fatty Acid Composition of Wild-Type (Ws) Arabidopsis Tissues

Tissue Type	16:0	16:1 Δ^9	16:1 Δ^3	16:3	18:0	18:1 Δ^9	18:2	18:3	Other
Leaf	17.5	0.6	3.7	11.8	1.5	2.6	14.4	47.7	
Flower	27.4	1.7		1.2	2.4	3.2	30.6	31.3	
Root	25.3	0.9			6.6	3.6	28.8	21.3	13.2
Seed	8.3	0.3			3.5	13.0	27.5	18.6	28.6

Values shown are mol%. Data from Bonaventure et al (2003) Plant Cell. 15:1020-1033.

Table 2. Fatty Acid Composition of Leaf Glycerolipids of Wild-Type (Ws) Arabidopsis Plants

Glycerolipid	Percent of Total	16:1		16:3	18:0	18:1 ^{Δ9}	18:1 ^{Δ11}	18:2	18:3
		16:0	^{Δ3}						
Phosphatidylcholine	11.2 ± 0.3	21.1			2.4	6.1		34.7	35.5
Phosphatidylethanolamine	10.0 ± 0.2	29.0			2.1	2.8		35.1	30.8
Phosphatidylserine	0.9 ± 0.1	30.8			6.8	2.9		27.1	32.3
Phosphatidylinositol	5.5 ± 0.1	40.0			2.0	2.2		25.3	30.3
Phosphatidylglycerol	12.0 ± 0.3	29.2	22.0		1.1	4.5		10.8	32.1
Sulfoquinovosyldiacylglycerol	4.3 ± 0.1	34.6			1.5	3.6	0.7	21.5	37.8
Digalactosyldiacylglycerol	20.2 ± 0.3	12.8		4.2	1.0	1.1		6.7	73.9
Monogalactosyldiacylglycerol	35.5 ± 0.1	1.6		38.1		0.8		3.0	53.4

Values shown are mol%. Data from Bonaventure et al (2003) *Plant Cell*. 15:1020-1033.

Table 3 Membrane glycerolipid composition of different organs and subcellular fractions of Arabidopsis

Lipid Class	Source of Lipid Extract				
	Leaves	Chloroplasts	Extrachloroplast	Roots	Seeds
PC	11.2	12	47.8	45.4	48.1
PE	10		36.5	27.5	22.1
PI + PS	6.4		10.9	12.9	18.9
SL	4.3	3.9			
DGD	20.2	20.9		2	3.3
PG	12	9.5	4.4	3.8	4.6
MGD	35.5	53.7		3.4	3
Total lipid mg/g F.W.	3.2	2.3	0.9	1.5	350

(Data are expressed as mole%.)

Data adapted from Browse and Somerville (1994) Chap 32 of *Arabidopsis*, Cold Spring Harbor Laboratory Press and Bonaventure et al (2003) *Plant Cell*. 15:1020-1033.

Table 4: Fatty Acid Composition and Oil Content of Arabidopsis Seeds

Fatty acids	mol %	µg/mg dry wt
16:0	8.7±0.01	27.9±0.48
18:0	3.6± 0.01	13.2±0.22
18:1	15.0±0.01	58.9±0.92
18:2	29.0±0.05	104.2±1.8
18:3	19.2±0.05	63.3±1.41
20:0	2.2±0.01	8.6±0.15
20:1	20.2±0.02	80.6±1.5
20:2	2.0±0.01	7.0±0.16
22:1	1.7±0.01	7.1±0.11

Oil % by weight 37.3 ± 0.68

*Note: adapted from Li et al (2006)
Phytochemistry 69: 904-15*

**Table 5:
Sphingolipids**

Long chain base content of Arabidopsis Leaf

	nmol g fr wt ⁻¹	Mol %
t18:1(Z)	51.5	18%
t18:1(E)	173	61%
t18:0	35.3	13%
d18:1(Z)	2.0	1%
d18:1(E)	14.9	5%
d18:0	4.8	2%
TOTAL	282±5.8	100%

Sphingolipid Class

	nmol g fr wt ⁻¹
Ceramide	1.37
GlucosylCeramide	26.7
GIPC	50.1

Data adapted from Table 1, Markham et al, JBC (2006)

Table 6: Tocopherol levels and composition of Arabidopsis leaf and seed (pmol/mg FW)

	Total	alpha	gamma	delta
Leaf	20	19	<1	<1
Seed	838	28	780	25

Data from Collakova and DellaPenna, Plant Physiol (2003)

Figure 2

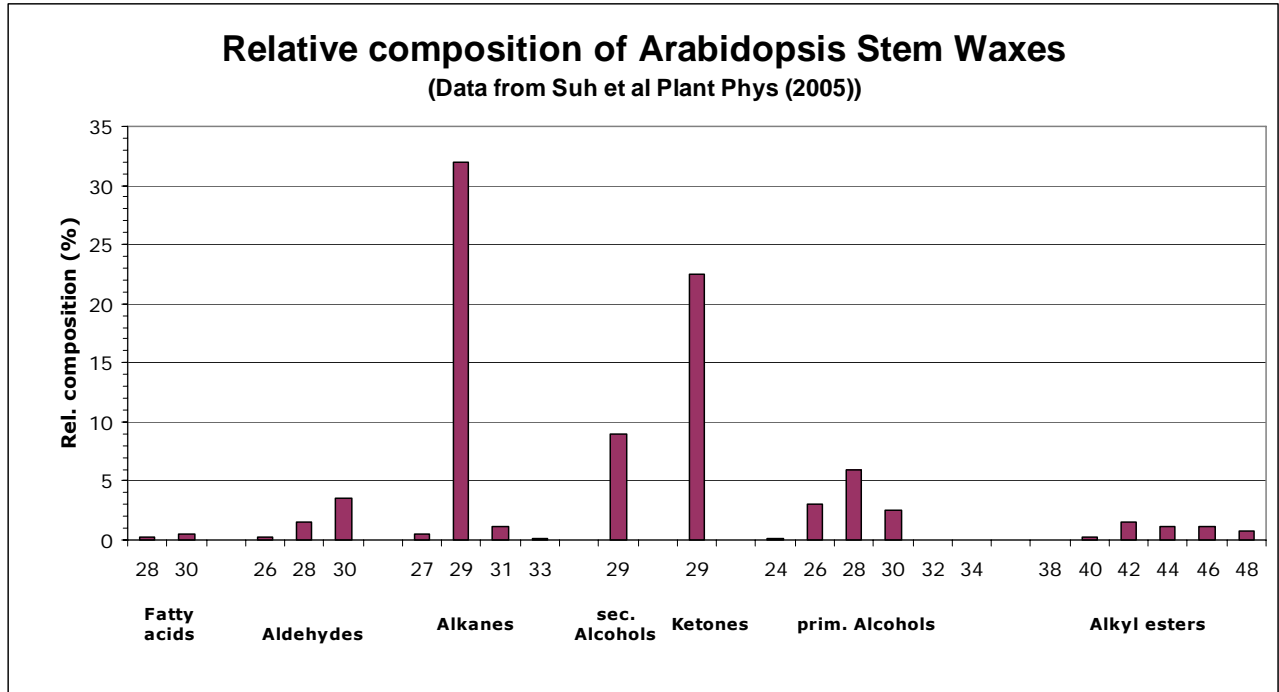


Figure 3

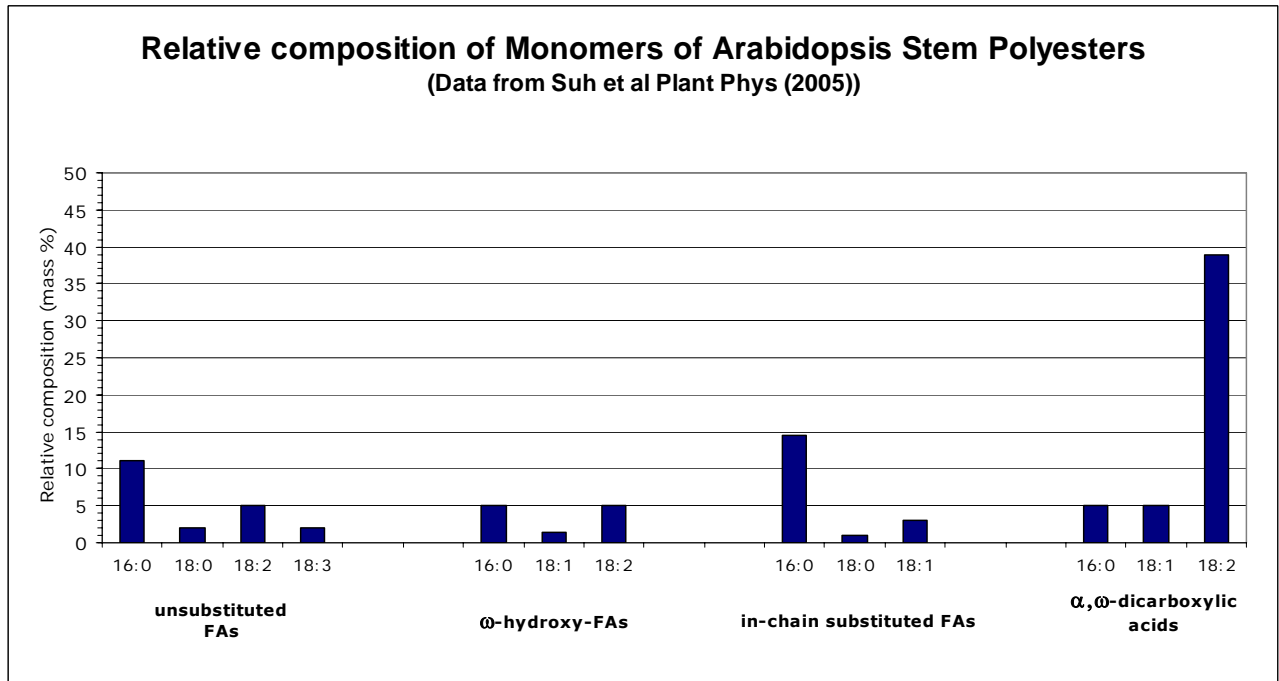


Figure 4 (Data obtained with roots from 3-week-old Col0 plants)

