

Univerzita Karlova v Praze
Pedagogická fakulta
Katedra biologie a environmentálních studií

Morfologické znaky jednoduchých listů dřevin

Příloha bakalářské práce

Autor: **Jana Křečková**

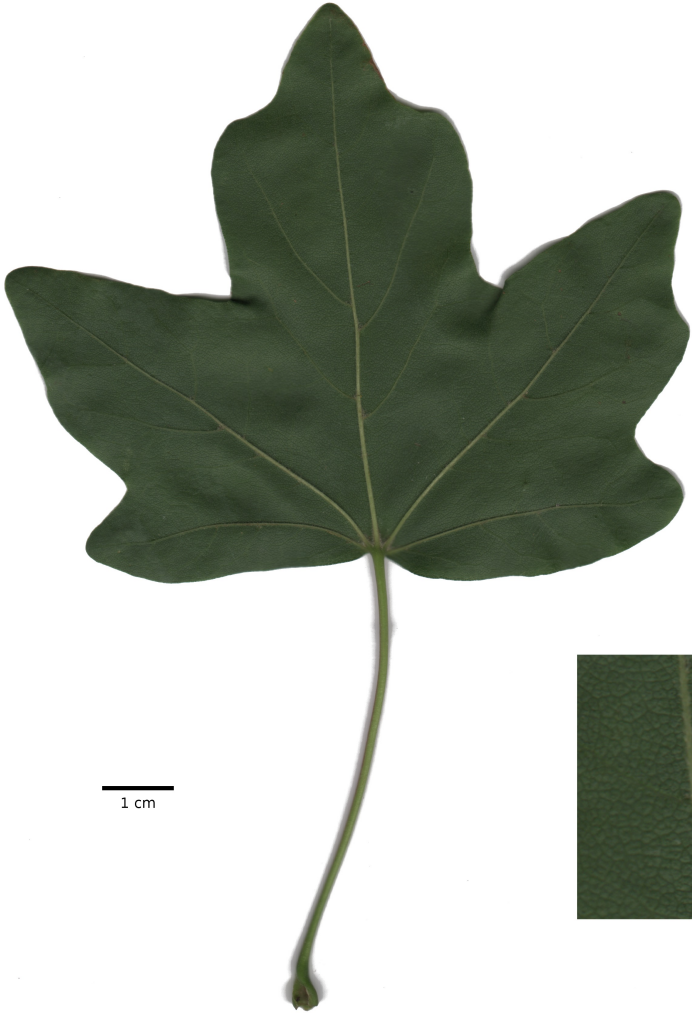
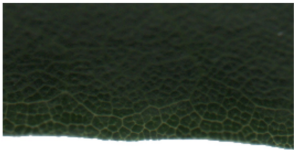
Vedoucí práce: **PhDr. Petr Novotný, Ph.D.**

Praha 2014

Příloha A

Morfologické tabulky

Acer campestre



Acer campestre

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	reticulodromous, brochidodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	brochidodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	smoothly decreasing proximally
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	parallel to major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	8,1	Intercostal tertiary vein fabric	irregular reticulate
lm	7,7	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	reticulate
lb	0,4	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminar width [cm]</i>	9,61	Distal course of percurrent epimedial tertiaries	absent
x	4,61	Exterior tertiary course	looped
y	5	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,92	Quinternary vein fabric	irregular reticulate
x'	4,2	Areolation	present good
y'	4,4	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,95	Marginal ultimate venation	looped
Laminar L/W Ratio	0,84/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	x
Laminar shape	elliptic oblate	Number of order of teeth	x
Medial symmetry	symmetrical	Number of teeth per cm	x
Base symmetry	symmetrical	Sinus shape	x
Lobation	palmately lobed	Tooth shape	x
Margin type	untoothed	Principal vein	x
Special margin features	undulate	Principal vein termination	x
Apex angle	acute	Course of major accessory vein	x
Apex shape	acuminate		
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

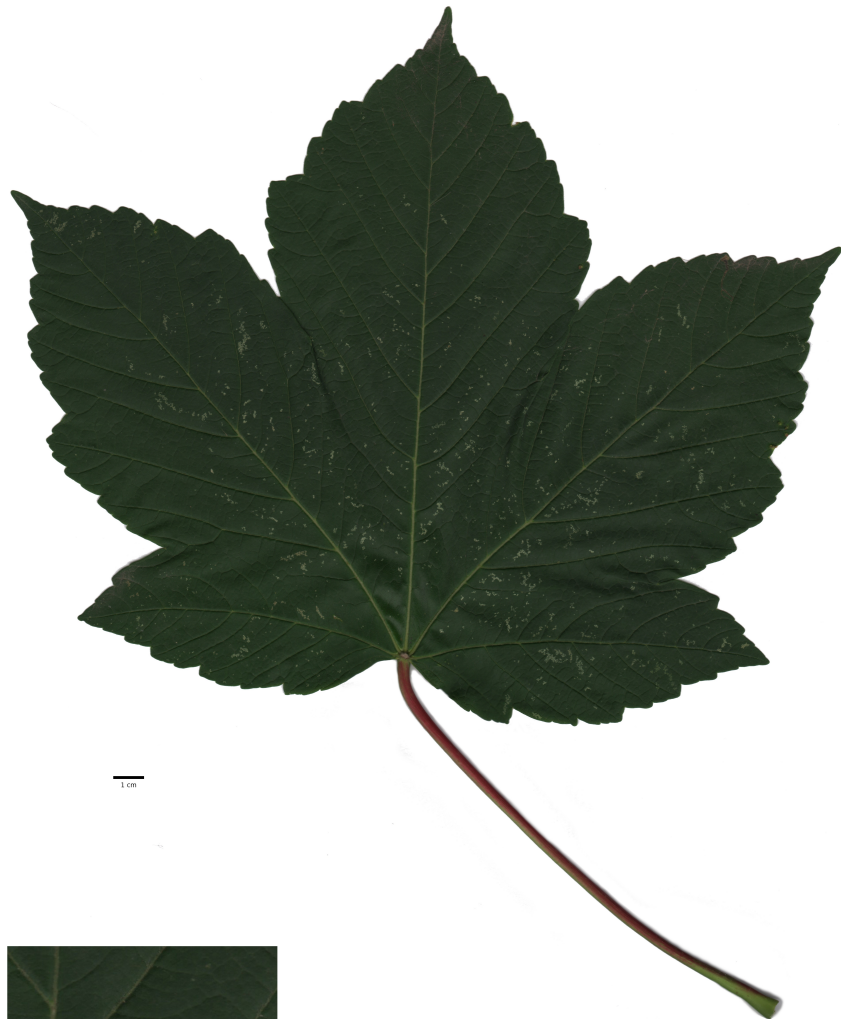
Acer platanoides



Acer platanoides

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	8-9
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	22,74	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	16,92	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	alternate percurrent
lb	5,82	Proximal course of percurrent epimedial tertiaries	obtuse to the midvein
<i>Laminar width [cm]</i>	24,66	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	11,32	Exterior tertiary course	looped
y	13,34	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,85	Quinternary vein fabric	irregular reticulate
x'	7,69	Areolation	present good
y'	7,98	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,96	Marginal ultimate venation	looped
Laminar L/W Ratio	0,92/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	irregular
Laminar shape	elliptic oblate	Number of order of teeth	two
Medial symmetry	asymmetrical	Number of teeth per cm	<1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	palmately lobed	Tooth shape	concave/concave
Margin type	serrate	Principal vein	present
Special margin features	undulate	Principal vein termination	at the apex of tooth
Apex angle	obtuse	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	lobate		
Terminal apex features	spinose		
Surface texture	pubescent		
Surficial glands	absent		

Acer pseudoplatanus



Acer pseudoplatanus

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	6
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	23,35	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	21,12	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	mixed percurrent
lb	2,23	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	24,72	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	12,24	Exterior tertiary course	variable
y	12,48	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,98	Quinternary vein fabric	not visible
x'	10,61	Areolation	not visible
y'	10,13	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,95	Marginal ultimate venation	looped
Laminar L/W Ratio	0,94/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	irregular
Laminar shape	elliptic oblate	Number of order of teeth	three
Medial symmetry	symmetrical	Number of teeth per cm	2
Base symmetry	symmetrical	Sinus shape	angular
Lobation	palmately lobed	Tooth shape	convex/convex, straight/convex
Margin type	crenate serrate	Principal vein	present
Special margin features	undulate	Principal vein termination	on the distal flank
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

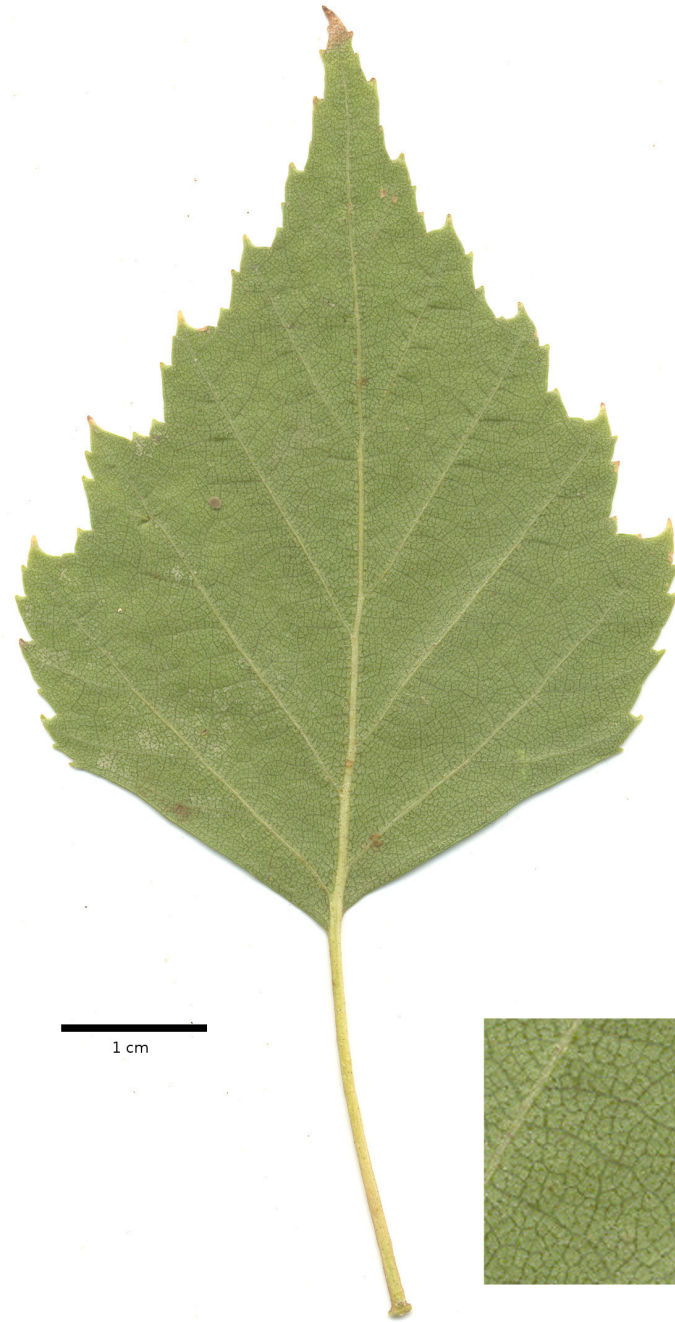
Acer saccharinum



Acer saccharinum

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	semicraspedodromous
Petiole base	pulvinate	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	gradually increasing proximally
Petiole-cross section	terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	more than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar length [cm]</i>	11,34	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	10,24	Intercostal tertiary vein angle variability	decreasing proximally
la	0	Epimedial tertiary fabric	mixed percurrent
lb	1,1	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	13,6	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	7,1	Exterior tertiary course	looped
y	6,5	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,92	Quinternary vein fabric	irregular reticulate
x'	5,55	Areolation	present good
y'	5,55	Freely ending veinlets	not visible
Basal width ratio (x'/y')	1	Marginal ultimate venation	looped
Laminar L/W Ratio	0,83/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	elliptic oblate	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	2
Base symmetry	symmetrical	Sinus shape	angular
Lobation	palmately lobed	Tooth shape	concave/concave, concave/convex
Margin type	serrate	Principal vein	present
Special margin features	absent	Principal vein termination	at the apex of tooth
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Betula pendula



Betula pendula

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	regular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	6,2	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	6,2	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	4,7	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,3	Exterior tertiary course	variable
y	2,4	Quarternary vein fabric	opposite percurrent
Width ratio (x/y)	0,96	Quinternary vein fabric	irregular reticulate
x'	2,13	Areolation	present good
y'	2	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,94	Marginal ultimate venation	not visible
Laminar L/W Ratio	1,32/1		
Laminar size	notophyll	III. Tooth characters	
Laminar shape	elliptic oblate (trullate)	Tooth spacing	regular
Medial symmetry	symmetrical	Number of order of teeth	three
Base symmetry	symmetrical	Number of teeth per cm	4
Lobation	unlobed	Sinus shape	angular
Margin type	serrate	Tooth shape	concave/convex, straight/straight
Special margin features	absent	Principal vein	present
Apex angle	acute	Principal vein termination	at the apex of tooth
Apex shape	acuminate	Course of major accessory vein	not visible
Base angle	obtuse		
Base shape	straight (cuneate)		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Buxus sempervirens



1 cm

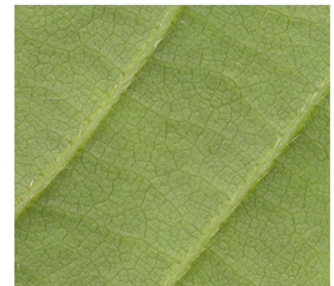


1 cm

Buxus sempervirens

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	evergreen	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	not visible
Leaflet Arrangement	x	Major secondary vein framework	not visible
Leaflet Attachment	x	Interior secondaries	not visible
Petiole features		Minor secondary course	not visible
Petiole base	x	Perimarginal veins	not visible
Glands	absent	Major secondary spacing	not visible
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	not visible
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	not visible
Phyllodes	absent	Intersecondary proximal course	not visible
<i>Stipules</i>	absent	Intersecondary length	not visible
Features of the blade		Intersecondary distal course	not visible
Position of lamina attachment	marginal	Intersecondary frequency	not visible
<i>Laminal lenght [cm]</i>	2,3	Intercostal tertiary vein fabric	not visible
lm	2,3	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	not visible
lb	0	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminal width [cm]</i>	1,2	Distal course of percurrent epimedial tertiaries	absent
x	0,7	Exterior tertiary course	not visible
y	0,5	Qurternary vein fabric	not visible
Width ratio (x/y)	0,71	Quinternary vein fabric	not visible
x'	0,46	Areolation	not visible
y'	0,47	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,98	Marginal ultimate venation	not visible
Laminar L/W Ratio	1,92/1	III. Tooth characters	
Laminar size	nanophyll	Tooth spacing	x
Laminar shape	elliptic	Number of order of teeth	x
Medial symmetry	asymmetrical	Number of teeth per cm	x
Base symmetry	symmetrical	Sinus shape	x
Lobation	unlobed (entire)	Tooth shape	x
Margin type	untoothed (entire)	Principal vein	x
Special margin features	revolute	Principal vein termination	x
Apex angle	obtuse	Course of major accessory vein	x
Apex shape	convex rounded		
Base angle	acute		
Base shape	convex		
Terminal apex features	retuse		
Surface texture	smooth		
Surficial glands	absent		

Carpinus betulus



Carpinus betulus

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite distichous	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	regular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminal length [cm]</i>	10,23	Intercostal tertiary vein fabric	opposite straight percurrent obtuse
lm	10,22	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0,01	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminal width [cm]</i>	5,28	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,6	Exterior tertiary course	terminating at the margin
y	2,68	Quaternary vein fabric	alternate percurrent
Width ratio (x/y)	0,97	Quinternary vein fabric	regular reticulate
x'	2,44	Areolation	present good
y'	2,27	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,93	Marginal ultimate venation	looped
Laminal L/W Ratio	1,94/1	III. Tooth characters	
Laminal size	notophyll	Tooth spacing	regular
Laminal shape	elliptic	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	5
Base symmetry	symmetrical	Sinus shape	angular
Lobation	unlobed	Tooth shape	flexuous/flexuous, concave/concave, concave/straight
Margin type	serrate	Principal vein	present
Special margin features	absent	Principal vein termination	at the apex of tooth
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pitted, pubescent		
Surficial glands	absent		

Castanea sativa



1 cm



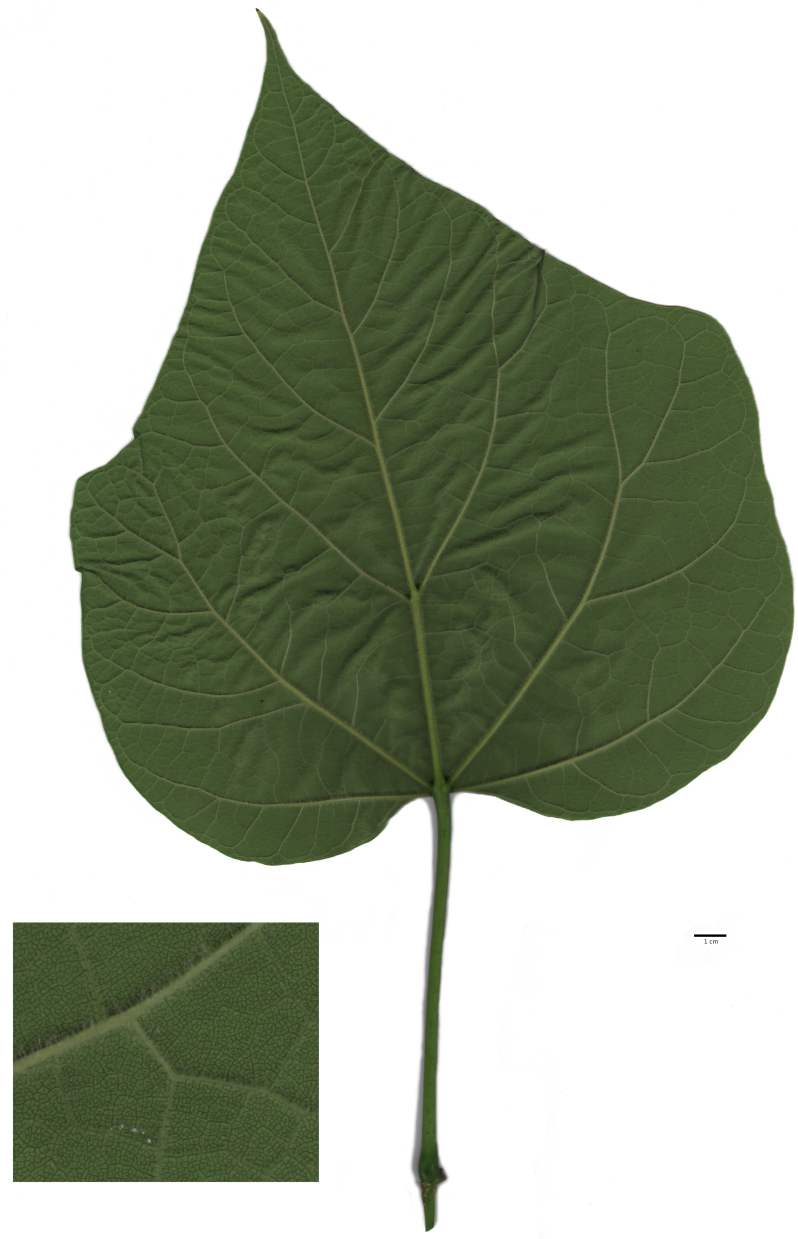
1 cm



Castanea sativa

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate (almost distichous)	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	base brochidodromous, craspedodromous (mixed)
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	21,2	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	20,7	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	mixed percurrent
lb	0,5	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	8,6	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	4,3	Exterior tertiary course	looped
y	4,3	Quaternary vein fabric	alternate percurrent
Width ratio (x/y)	1	Quinternary vein fabric	regular reticulate
x'	3,45	Areolation	present good
y'	3,46	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,99	Marginal ultimate venation	looped
Laminar L/W Ratio	2,47/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	oblong	Number of order of teeth	one
Medial symmetry	symmetrical	Number of teeth per cm	1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	unlobed	Tooth shape	concave/concave, concave/straight
Margin type	serrate	Principal vein	present
Special margin features	undulate	Principal vein termination	at the apex of tooth
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pitted, pubescent		
Surficial glands	non visible		

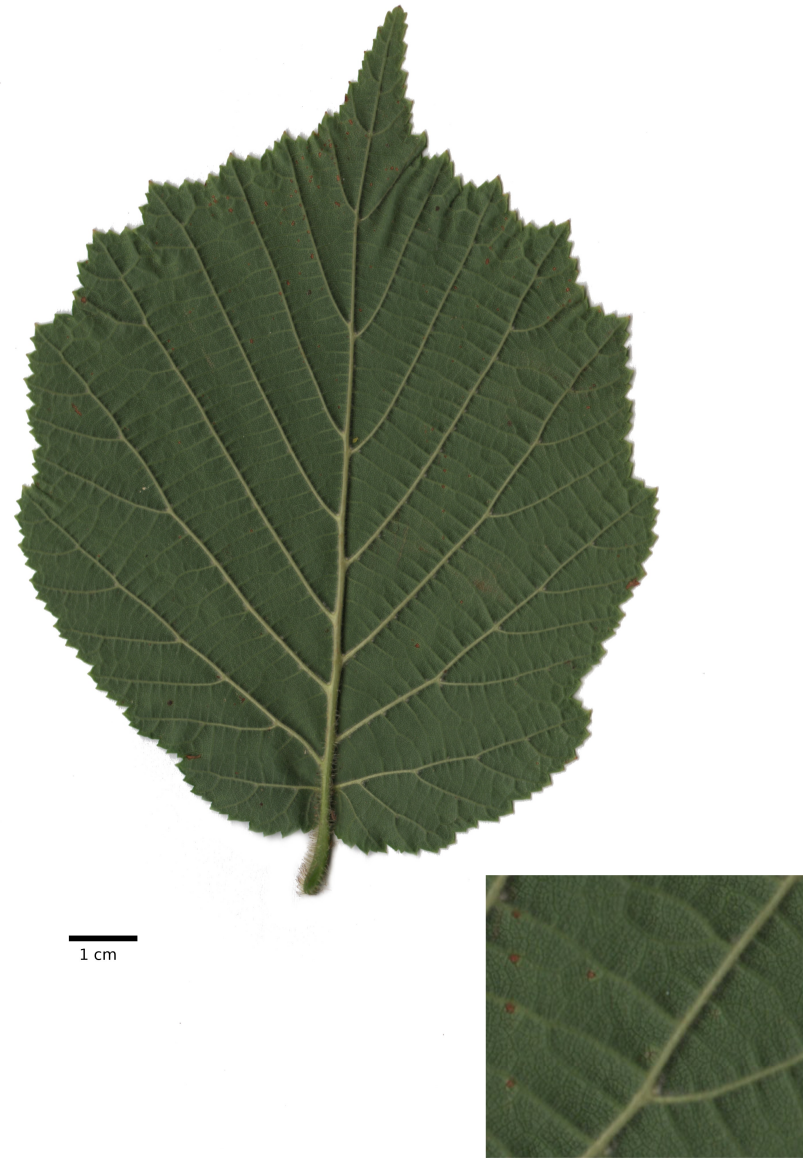
Catalpa ovata



Catalpa ovata

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	brochidodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	brochidodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	petiolar	Major secondary spacing	gradually increasing proximally
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	absent	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	26,68	Intercostal tertiary vein fabric	alternate percurrent obtuse
lm	25,32	Intercostal tertiary vein angle variability	inconsistent
la	0	Epimedial tertiary fabric	mixed percurrent
lb	1,36	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	22,79	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	12,36	Exterior tertiary course	looped
y	10,43	Qurternary vein fabric	alternate percurrent
Width ratio (x/y)	0,84	Quinternary vein fabric	irregular reticulate
x'	11,98	Areolation	present good
y'	10,41	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,87	Marginal ultimate venation	looped
Laminar L/W Ratio	1,17/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	x
Laminar shape	(cordate) ovate	Number of order of teeth	x
Medial symmetry	asymmetrical	Number of teeth per cm	x
Base symmetry	asymmetrical	Sinus shape	x
Lobation	unlobed	Tooth shape	x
Margin type	untoothed	Principal vein	x
Special margin features	undulate	Principal vein termination	x
Apex angle	acute	Course of major accessory vein	x
Apex shape	acuminate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Corylus avellana

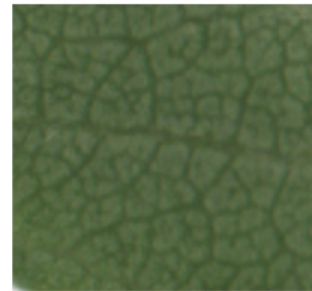


Corylus avellana

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate distichous	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar length [cm]</i>	12,51	Intercostal tertiary vein fabric	opposite straight percurrent obtuse
lm	12	Intercostal tertiary vein angle variability	increasing exmedially basally concentric?
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0,51	Proximal course of percurrent epimedial tertiaries	obtuse to the midvein
<i>Laminar width [cm]</i>	9,48	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary
x	4,56	Exterior tertiary course	variable
y	4,92	Quaternary vein fabric	mixed percurrent
Width ratio (x/y)	0,93	Quinary vein fabric	regular reticulate
x'	4,1	Areolation	present good
y'	4,67	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,88	Marginal ultimate venation	absent
Laminar L/W Ratio	1,32/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	obovate oblanceolate	Tooth spacing	irregular
Medial symmetry	symmetrical	Number of order of teeth	three
Base symmetry	asymmetrical	Number of teeth per cm	5
Lobation	unlobed	Sinus shape	angular
Margin type	serrate	Tooth shape	concave/convex, flexuous/flexuous, straight/straight
Special margin features	undulate	Principal vein	present
Apex angle	obtuse	Principal vein termination	at the apex of tooth
Apex shape	acuminate	Course of major accessory vein	not visible
Base angle	reflex		
Base shape	complex		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Crataegus sp.

1 cm



1 cm

Crataegus sp.

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	regular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	parallel to major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	3,8	Intercostal tertiary vein fabric	irregular reticulate
lm	3,8	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	reticulate
lb	0	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminar width [cm]</i>	2,69	Distal course of percurrent epimedial tertiaries	absent
x	1,74	Exterior tertiary course	variable
y	1,95	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,89	Quinternary vein fabric	irregular reticulate
x'	1,57	Areolation	present good
y'	1,61	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,98	Marginal ultimate venation	looped
Laminar L/W Ratio	1,41/1		
Laminar size	microphyll	III. Tooth characters	
Laminar shape	ovate	Tooth spacing	irregular
Medial symmetry	asymmetrical	Number of order of teeth	two
Base symmetry	symmetrical	Number of teeth per cm	6
Lobation	pinnately lobed	Sinus shape	angular
Margin type	serrate	Tooth shape	flexuous/convex, concave/convex,
Special margin features	absent	Principal vein	present
Apex angle	acute	Principal vein termination	at the apex of tooth
Apex shape	acuminate	Course of major accessory vein	convex looped
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Elaeagnus angustifolia



1 cm



1 cm

Elaeagnus angustifolia

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	not visible
Leaflet Arrangement	x	Major secondary vein framework	not visible
Leaflet Attachment	x	Interior secondaries	not visible
Petiole features		Minor secondary course	not visible
Petiole base	x	Perimarginal veins	not visible
Glands	absent	Major secondary spacing	not visible
Petiole-cross section	terete	Variation of major secondary angle to midvein	not visible
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	not visible
Phyllodes	absent	Intersecondary proximal course	not visible
<i>Stipules</i>	absent	Intersecondary length	not visible
Features of the blade		Intersecondary distal course	not visible
Position of lamina attachment	marginal	Intersecondary frequency	not visible
<i>Laminal lenght [cm]</i>	8,6	Intercostal tertiary vein fabric	not visible
lm	8,6	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	not visible
lb	0	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminal width [cm]</i>	0,78	Distal course of percurrent epimedial tertiaries	absent
x	0,37	Exterior tertiary course	not visible
y	0,41	Qurternary vein fabric	not visible
Width ratio (x/y)	0,9	Quinternary vein fabric	not visible
x'	0,34	Areolation	not visible
y'	0,31	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,91	Marginal ultimate venation	not visible
Laminal L/W Ratio	11,03/1		
Laminal size	microphyll	III. Tooth characters	
Laminal shape	linear	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	symmetrical	Number of teeth per cm	x
Lobation	unlobed (entire)	Sinus shape	x
Margin type	untoothed (entire)	Tooth shape	x
Special margin features	revolute	Principal vein	x
Apex angle	obtuse	Principal vein termination	x
Apex shape	convex rounded	Course of major accessory vein	x
Base angle	acute		
Base shape	straight (cuneate)		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Fagus sylvatica



1 cm



1 cm



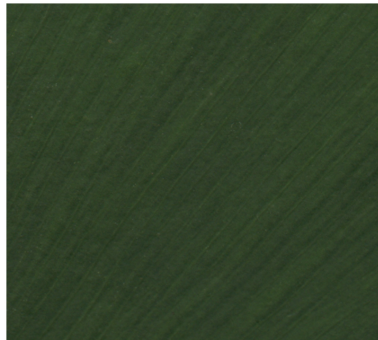
Fagus sylvatica

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite distichous	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	reticulodromous, distally craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	pulvinate	Perimarginal veins	not visible
Glands	acropetiole	Major secondary spacing	decreasing proximally
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar length [cm]</i>	6,34	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	6,34	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	4,92	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,52	Exterior tertiary course	looped
y	2,4	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,95	Quinary vein fabric	irregular reticulate
x'	2,3	Areolation	not visible
y'	2,08	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,9	Marginal ultimate venation	looped
Laminar L/W Ratio	1,29/1		
Laminar size	notophyll	III. Tooth characters	
Laminar shape	elliptic	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	symmetrical	Number of teeth per cm	x
Lobation	unlobed (entire)	Sinus shape	x
Margin type	untoothed (entire)	Tooth shape	x
Special margin features	undulate	Principal vein	x
Apex angle	obtuse	Principal vein termination	x
Apex shape	acuminate	Course of major accessory vein	x
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	pitted, pubescent		
Surficial glands	absent		

Ginkgo biloba



1cm



1cm



Ginkgo biloba

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	flabellate
<i>Deciduousness</i>	deciduous	Naked basal veins	present
Leaf Arrangement	alternate	Number of basal veins	more than 6
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	absent / craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	absent
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	absent
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	absent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	absent	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	7,2	Intercostal tertiary vein fabric	absent
lm	5,4	Intercostal tertiary vein angle variability	absent
la	1,8	Epimedial tertiary fabric	absent
lb	0	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminar width [cm]</i>	10,9	Distal course of percurrent epimedial tertiaries	absent
x	5,6	Exterior tertiary course	absent
y	5,3	Qurternary vein fabric	absent
Width ratio (x/y)	0,95	Quinternary vein fabric	absent
x'	1,59	Areolation	lacking
y'	1,58	Freely ending veinlets	not visible
Basal width ratio (x'/y')	1	Marginal ultimate venation	absent
Laminar L/W Ratio	0,66/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	obovate (cuneatum)	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	2
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	bilobed	Tooth shape	convex/retroflexed
Margin type	crenate dentate	Principal vein	absent
Special margin features	undulate	Principal vein termination	x
Apex angle	reflex	Course of major accessory vein	x
Apex shape	emarginate		
Base angle	obtuse		
Base shape	concave		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

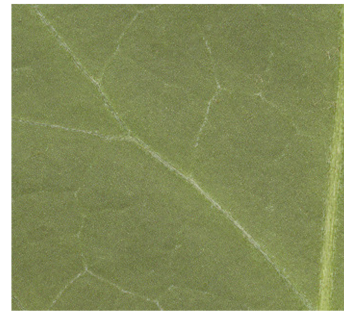
Hedera helix 1



1cm



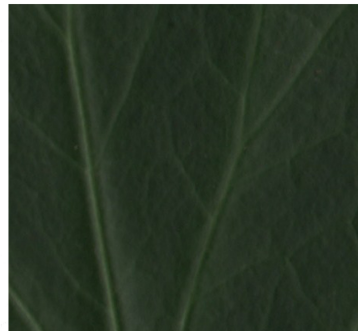
1cm



Hedera helix 1

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	evergreen	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	7
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	festooned brochidodromous, craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	brochidodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar length [cm]</i>	8	Intercostal tertiary vein fabric	irregular reticulate
lm	6,5	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	1,5	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	8,2	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	4	Exterior tertiary course	looped
y	4,2	Quaternary vein fabric	not visible
Width ratio (x/y)	0,95	Quinternary vein fabric	not visible
x'	2,55	Areolation	not visible
y'	2,87	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,89	Marginal ultimate venation	not visible
Laminar L/W Ratio	0,97/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	ovate (trullate)	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	asymmetrical	Number of teeth per cm	x
Lobation	palmately lobed	Sinus shape	x
Margin type	untoothed	Tooth shape	x
Special margin features	undulate	Principal vein	x
Apex angle	acute	Principal vein termination	x
Apex shape	straight	Course of major accessory vein	x
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Hedera helix 2



Hedera helix 2

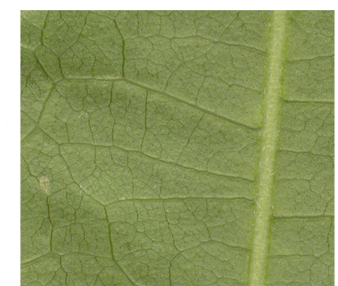
I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	evergreen	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	7
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	base brochidodromous, craspedodromous (mixed)
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	9,69	Intercostal tertiary vein fabric	exmedially ramified
lm	9,69	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	mixed percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein, parallel to the intersecondary
<i>Laminar width [cm]</i>	7,37	Distal course of percurrent epimedial tertiaries	basiflexed
x	3,59	Exterior tertiary course	not visible
y	3,78	Qurternary vein fabric	not visible
Width ratio (x/y)	0,95	Quinternary vein fabric	not visible
x'	3,41	Areolation	not visible
y'	3,49	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,98	Marginal ultimate venation	not visible
Laminar L/W Ratio	1,43/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	x
Laminar shape	ovate	Number of order of teeth	x
Medial symmetry	symmetrical	Number of teeth per cm	x
Base symmetry	symmetrical	Sinus shape	x
Lobation	unlobed	Tooth shape	x
Margin type	untoothed	Principal vein	x
Special margin features	undulate	Principal vein termination	x
Apex angle	acute	Course of major accessory vein	x
Apex shape	acuminate		
Base angle	obtuse		
Base shape	concavo-convex		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Hibiscus syriacus

1 cm



1 cm



Hibiscus syriacus

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	semicraspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	perpendicular to midvein
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	10,6	Intercostal tertiary vein fabric	irregular reticulate
lm	10,6	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	7,2	Distal course of percurrent epimedial tertiaries	basiflexed
x	3,5	Exterior tertiary course	variable
y	3,7	Qurternary vein fabric	mixed percurrent
Width ratio (x/y)	0,95	Quinternary vein fabric	irregular reticulate
x'	3,2	Areolation	not visible
y'	3,22	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,99	Marginal ultimate venation	looped
Laminar L/W Ratio	1,47/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	ovate	Tooth spacing	regular
Medial symmetry	symmetrical	Number of order of teeth	two
Base symmetry	symmetrical	Number of teeth per cm	1
Lobation	palmately lobed	Sinus shape	angular
Margin type	crenate serrate	Tooth shape	convex/convex
Special margin features	undulate	Principal vein	present
Apex angle	acute	Principal vein termination	on the proximal flank
Apex shape	acuminate on the left, straight on the right	Course of major accessory vein	convex looped
Base angle	obtuse		
Base shape	convex rounded		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Kerria japonica



1 cm



1 cm

Kerria japonica

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	not visible
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	abruptly increasing proximally
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	present	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	8,65	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	8,35	Intercostal tertiary vein angle variability	inconsistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0,3	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	3,8	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	1,7	Exterior tertiary course	terminating at the margin
y	2,1	Quaternary vein fabric	not visible
Width ratio (x/y)	0,81	Quinternary vein fabric	not visible
x'	1,61	Areolation	not visible
y'	1,74	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,93	Marginal ultimate venation	not visible
Laminar L/W Ratio	2,28/1		
Laminar size	notophyll	III. Tooth characters	
Laminar shape	ovate (almost lanceolate)	Tooth spacing	irregular
Medial symmetry	asymmetrical	Number of order of teeth	three
Base symmetry	symmetrical	Number of teeth per cm	8
Lobation	pinnately lobed	Sinus shape	angular
Margin type	serrate	Tooth shape	concave/convex, flexuous/flexuous
Special margin features	absent	Principal vein	present
Apex angle	acute	Principal vein termination	at the apex of tooth
Apex shape	acuminate	Course of major accessory vein	not visible
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Ligustrum vulgare



1 cm



1 cm

Ligustrum vulgare

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous/semideciduous	Naked basal veins	absent
Leaf Arrangement	opposite, subopposite	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	brochidodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	sheathing	Perimarginal veins	not visible
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	inconsistent
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	4,5	Intercostal tertiary vein fabric	not visible
lm	4,5	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	not visible
lb	0	Proximal course of percurrent epimedial tertiaries	absent
<i>Laminar width [cm]</i>	1,45	Distal course of percurrent epimedial tertiaries	absent
x	0,75	Exterior tertiary course	not visible
y	0,7	Quaternary vein fabric	not visible
Width ratio (x/y)	0,93	Quinternary vein fabric	not visible
x'	0,7	Areolation	not visible
y'	0,7	Freely ending veinlets	not visible
Basal width ratio (x'/y')	1	Marginal ultimate venation	not visible
Laminar L/W Ratio	3,1/1		
Laminar size	microphyll	III. Tooth characters	
Laminar shape	elliptic	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	symmetrical	Number of teeth per cm	x
Lobation	unlobed (entire)	Sinus shape	x
Margin type	untoothed (entire)	Tooth shape	x
Special margin features	revolute	Principal vein	x
Apex angle	acute	Principal vein termination	x
Apex shape	convex	Course of major accessory vein	x
Base angle	acute		
Base shape	straight (cuneate)		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Liriodendron tulipifera



Liriodendron tulipifera

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	brochidodromous, craspedodromous (mixed)
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	brochidodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	parallel to major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	21,6	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	19,4	Intercostal tertiary vein angle variability	increasing proximally
la	1,6	Epimedial tertiary fabric	mixed percurrent
lb	0,6	Proximal course of percurrent epimedial tertiaries	acute to the midvein, parallel to the intersecondary
<i>Laminar width [cm]</i>	23,8	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	12,5	Exterior tertiary course	looped
y	11,3	Qurternary vein fabric	alternate percurrent
Width ratio (x/y)	0,9	Quinternary vein fabric	irregular reticulate
x'	10,2	Areolation	present good
y'	9,5	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,93	Marginal ultimate venation	looped
Laminar L/W Ratio	0,91/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	x
Laminar shape	elliptic oblate	Number of order of teeth	x
Medial symmetry	symmetrical	Number of teeth per cm	x
Base symmetry	symmetrical	Sinus shape	x
Lobation	pinnately lobed	Tooth shape	x
Margin type	untoothed	Principal vein	x
Special margin features	revolute	Principal vein termination	x
Apex angle	reflex	Course of major accessory vein	x
Apex shape	emarginate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	mucronate		
Surface texture	pubescent		
Surficial glands	absent		

Platanus hispanica

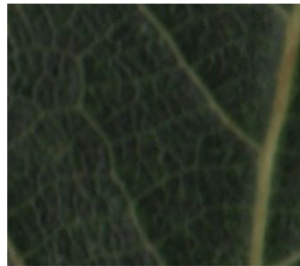


Platanus hispanica

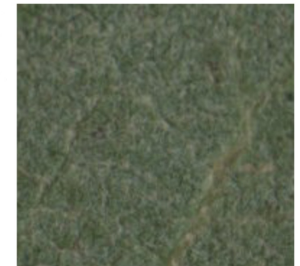
I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate suprabasal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous, semicraspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	regular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	uniform
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	19,4	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	18,2	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	1,2	Proximal course of percurrent epimedial tertiaries	acute to the midvein, parallel to the intersecondary
<i>Laminar width [cm]</i>	19,9	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	9,4	Exterior tertiary course	looped
y	10,5	Qurternary vein fabric	alternate percurrent
Width ratio (x/y)	0,9	Quinternary vein fabric	irregular reticulate
x'	8,54	Areolation	present good
y'	8,61	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,99	Marginal ultimate venation	looped
Laminar L/W Ratio	0,97/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	irregular
Laminar shape	elliptic oblate	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	<1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	palmately lobed	Tooth shape	concave/retroflexed
Margin type	serrate	Principal vein	present
Special margin features	revolute	Principal vein termination	at the apex of tooth
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Populus alba 1

1 cm



1 cm



Populus alba 1

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	3
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	absent
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	uniform, one pair of acute basal secondaries
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminal lenght [cm]</i>	4,5	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	4,5	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminal width [cm]</i>	3,65	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	1,79	Exterior tertiary course	variable
y	1,86	Qurternary vein fabric	opposite percurrent
Width ratio (x/y)	0,96	Quinternary vein fabric	not visible
x'	1,72	Areolation	not visible
y'	1,41	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,82	Marginal ultimate venation	looped
Laminal L/W Ratio	1,23/1		
Laminal size	microphyll	III. Tooth characters	
Laminal shape	ovate	Tooth spacing	irregular
Medial symmetry	symmetrical	Number of order of teeth	two
Base symmetry	asymmetrical	Number of teeth per cm	1
Lobation	unlobed	Sinus shape	rounded
Margin type	crenate dentate	Tooth shape	convex/retroflexed – straight/retroflexed
Special margin features	revolute	Principal vein	present
Apex angle	acute	Principal vein termination	on the distal flank
Apex shape	straight on the left acuminate on the right	Course of major accessory vein	not visible
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Populus alba 2



Populus alba 2

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	6
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	absent
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurent, deflected
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	more than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	7,81	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	7,35	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0,46	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	8,09	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	4,07	Exterior tertiary course	variable
y	4,02	Qurternary vein fabric	mixed percurrent
Width ratio (x/y)	0,99	Quinternary vein fabric	not visible
x'	3,46	Areolation	not visible
y'	3,21	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,93	Marginal ultimate venation	looped
Laminar L/W Ratio	0,97/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	elliptic oblate	Tooth spacing	irregular
Medial symmetry	symmetrical	Number of order of teeth	two
Base symmetry	symmetrical	Number of teeth per cm	1
Lobation	palmately lobed	Sinus shape	rounded
Margin type	crenate dentate	Tooth shape	convex/retroflexed, retroflexed/retroflexed
Special margin features	undulate	Principal vein	present
Apex angle	acute	Principal vein termination	on the distal flank
Apex shape	straight on the right acuminate on the left	Course of major accessory vein	not visible
Base angle	reflex		
Base shape	lobate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

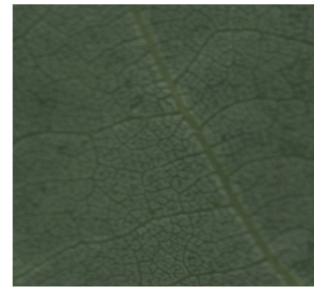
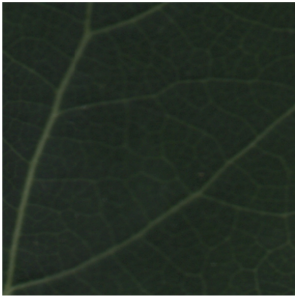
Populus nigra



Populus nigra

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	3
Leaf Organisation	simple	Agrophic veins	present simple
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	marginal secondary
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	inconsistent, one pair of acute basal secondaries
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	decurrent, deflected
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	6,22	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	6,22	Intercostal tertiary vein angle variability	inconsistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	6,95	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,93	Exterior tertiary course	variable
y	4,02	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,73	Quinternary vein fabric	irregular reticulate
x'	2,68	Areolation	present good
y'	2,91	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,92	Marginal ultimate venation	absent
Laminar L/W Ratio	0,89/1	III. Tooth characters	
Laminar size	notophyll	Tooth spacing	regular
Laminar shape	elliptic oblate (trullate)	Number of order of teeth	two
Medial symmetry	asymmetrical	Number of teeth per cm	3
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	unlobed	Tooth shape	convex/retroflexed
Margin type	crenate serrate	Principal vein	present
Special margin features	absent	Principal vein termination	on the proximal flank
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	straight on the left acuminate on the right		
Base angle	obtuse		
Base shape	straight (cuneate)		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Populus tremula



Populus tremula

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	5
Leaf Organisation	simple	Agrophic veins	present simple
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	smoothly decreasing proximally, one pair of acute basal secondaries
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent, deflected
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar length [cm]</i>	6,45	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	6,2	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	mixed percurrent
lb	0,25	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	6,47	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	3,41	Exterior tertiary course	looped
y	3,06	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,9	Quinternary vein fabric	irregular reticulate
x'	2,75	Areolation	present good
y'	2,83	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,97	Marginal ultimate venation	looped
Laminar L/W Ratio	1/1	III. Tooth characters	
Laminar size	notophyll	Tooth spacing	regular
Laminar shape	elliptic orbiculate	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	unlobed	Tooth shape	straight/retroflexed – concave/retroflexed
Margin type	crenate serrate	Principal vein	present
Special margin features	absent	Principal vein termination	on the distal flank
Apex angle	obtuse	Course of major accessory vein	convex looped
Apex shape	convex		
Base angle	reflex		
Base shape	convex		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Quercus palustris

1 cm



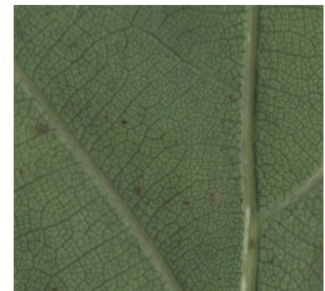
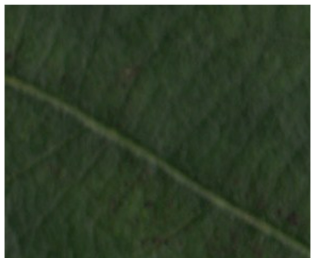
1 cm



Quercus palustris

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	brochidodromous, craspedodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	gradually increasing proximally
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform, one pair of acute basal secondaries
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	18,02	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	18,02	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein, parallel to the intersecondary
<i>Laminar width [cm]</i>	13,76	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	6,84	Exterior tertiary course	looped
y	6,92	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,99	Quinternary vein fabric	irregular reticulate
x'	4,03	Areolation	present good
y'	4,3	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,94	Marginal ultimate venation	looped
Laminar L/W Ratio	1,31/1	III. Tooth characters	
Laminar size	macrophyll	Tooth spacing	irregular
Laminar shape	elliptic	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	pinnately lobed	Tooth shape	concave/concave
Margin type	serrate	Principal vein	present
Special margin features	revolute	Principal vein termination	at the apex of tooth
Apex angle	acute	Course of major accessory vein	straight
Apex shape	acuminate		
Base angle	obtuse		
Base shape	concave		
Terminal apex features	spinose		
Surface texture	smooth		
Surficial glands	absent		

Quercus robur



Quercus robur

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	brochidodromous, craspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	decreasing proximally
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	9,91	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	9,6	Intercostal tertiary vein angle variability	increasing proximally
la	0,07	Epimedial tertiary fabric	alternate percurrent
lb	0,24	Proximal course of percurrent epimedial tertiaries	obtuse to the midvein
<i>Laminar width [cm]</i>	7,52	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	4,01	Exterior tertiary course	looped
y	3,51	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,88	Quinternary vein fabric	irregular reticulate
x'	2,29	Areolation	present good
y'	2,3	Freely ending veinlets	not visible
Basal width ratio (x'/y')	1	Marginal ultimate venation	looped
Laminar L/W Ratio	1,32/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	obovate	Number of order of teeth	one
Medial symmetry	asymmetrical	Number of teeth per cm	<1
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	pinnately lobed	Tooth shape	convex/retroflexed, retroflexed/retroflexed
Margin type	crenate serrate	Principal vein	present
Special margin features	revolute	Principal vein termination	on the distal flank
Apex angle	obtuse	Course of major accessory vein	convex looped
Apex shape	convex rounded		
Base angle	reflex		
Base shape	lobate		
Terminal apex features	retuse		
Surface texture	smooth		
Surficial glands	absent		

Salix alba



1 cm



1 cm

Salix alba

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	sheathing	Perimarginal veins	fimbrial vein
Glands	acropetiole	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar length [cm]</i>	13,02	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	13,02	Intercostal tertiary vein angle variability	inconsistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	2,06	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	1,08	Exterior tertiary course	terminating at the margin
y	0,98	Quaternary vein fabric	alternate percurrent
Width ratio (x/y)	0,9	Quinary vein fabric	not visible
x'	0,95	Areolation	not visible
y'	0,92	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,97	Marginal ultimate venation	looped
Laminar L/W Ratio	6,32/1	III. Tooth characters	
Laminar size	microphyll	Tooth spacing	irregular
Laminar shape	ovate lanceolate	Number of order of teeth	one
Medial symmetry	symmetrical	Number of teeth per cm	4
Base symmetry	symmetrical	Sinus shape	rounded
Lobation	unlobed	Tooth shape	straight/retroflexed, concave/retroflexed
Margin type	crenate serrate	Principal vein	present
Special margin features	absent	Principal vein termination	on the distal flank
Apex angle	acute	Course of major accessory vein	not visible
Apex shape	straight		
Base angle	acute		
Base shape	convex		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Salix caprea



1 cm



1 cm



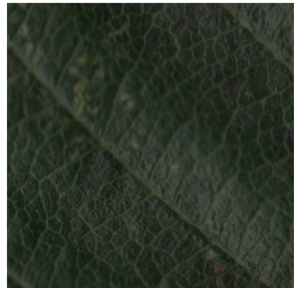
Salix caprea

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	present
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	festooned brochidodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	sheathing	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	excurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	perpendicular to subjacent major secondary
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	9,45	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	9,45	Intercostal tertiary vein angle variability	inconsistent
la	0	Epimedial tertiary fabric	mixed percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	5,38	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,74	Exterior tertiary course	looped
y	2,64	Quaternary vein fabric	mixed percurrent
Width ratio (x/y)	0,96	Quinternary vein fabric	irregular reticulate
x'	1,99	Areolation	not visible
y'	2,17	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,92	Marginal ultimate venation	looped
Laminar L/W Ratio	1,76/1	III. Tooth characters	
Laminar size	notophyll	Tooth spacing	x
Laminar shape	elliptic	Number of order of teeth	x
Medial symmetry	symmetrical	Number of teeth per cm	x
Base symmetry	symmetrical	Sinus shape	x
Lobation	unlobed (entire)	Tooth shape	x
Margin type	untoothed (entire)	Principal vein	x
Special margin features	erose	Principal vein termination	x
Apex angle	acute	Course of major accessory vein	x
Apex shape	convex		
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	rugose, pubescent		
Surficial glands	absent		

Sorbus aria



1 cm



1 cm



Sorbus aria

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	regular
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	11,05	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	11,05	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	8,23	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	4,11	Exterior tertiary course	variable
y	4,12	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	1	Quinternary vein fabric	not visible
x'	3,34	Areolation	present good
y'	3,09	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,93	Marginal ultimate venation	looped
Laminar L/W Ratio	1,34/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	elliptic	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	4
Base symmetry	symmetrical	Sinus shape	angular
Lobation	unlobed	Tooth shape	concave/convex, flexuous/flexuous
Margin type	serrate	Principal vein	present
Special margin features	undulate	Principal vein termination	at the apex of tooth
Apex angle	obtuse	Course of major accessory vein	convex looped
Apex shape	convex		
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Sorbus intermedia



1 cm



1 cm



Sorbus intermedia

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	alternate	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	absent
Glands	absent	Major secondary spacing	gradually increasing proximally
Petiole-cross section	semi-terete	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	deciduous	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	parallel to major secondary
Position of lamina attachment	marginal	Intersecondary frequency	~1 per intercostal area
<i>Laminar lenght [cm]</i>	8,11	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	8,11	Intercostal tertiary vein angle variability	increasing exmedially
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	5,47	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,81	Exterior tertiary course	variable
y	2,66	Quaternary vein fabric	irregular reticulate
Width ratio (x/y)	0,95	Quinternary vein fabric	irregular reticulate
x'	2,27	Areolation	present good
y'	1,68	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,74	Marginal ultimate venation	looped
Laminar L/W Ratio	1,48/1		
Laminar size	notophyll	III. Tooth characters	
Laminar shape	elliptic	Tooth spacing	irregular
Medial symmetry	symmetrical	Number of order of teeth	two
Base symmetry	asymmetrical	Number of teeth per cm	3
Lobation	pinnately lobed	Sinus shape	angular
Margin type	serrate	Tooth shape	concave/convex, flexuous/flexuous
Special margin features	undulate	Principal vein	present
Apex angle	obtuse	Principal vein termination	at the apex of tooth
Apex shape	convex	Course of major accessory vein	convex looped
Base angle	obtuse		
Base shape	concavo-convex		
Terminal apex features	absent		
Surface texture	rugose, pubescent		
Surficial glands	absent		

Symphoricarpos albus



1 cm



1 cm

Symphoricarpos albus

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	present
Leaf Arrangement	opposite	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	brochidodromous
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	inconsistent
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	7,87	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	7,87	Intercostal tertiary vein angle variability	consistent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	5,93	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	2,93	Exterior tertiary course	looped
y	3	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,98	Quinternary vein fabric	irregular reticulate
x'	2,9	Areolation	present good
y'	2	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,69	Marginal ultimate venation	looped
Laminar L/W Ratio	1,33/1		
Laminar size	notophyll	III. Tooth characters	
Laminar shape	ovate	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	asymmetrical	Number of teeth per cm	x
Lobation	pinnately lobed	Sinus shape	x
Margin type	crenate serrate	Tooth shape	x
Special margin features	absent	Principal vein	x
Apex angle	obtuse	Principal vein termination	x
Apex shape	convex	Course of major accessory vein	x
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

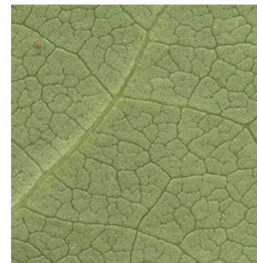
Syringa vulgaris



1 cm



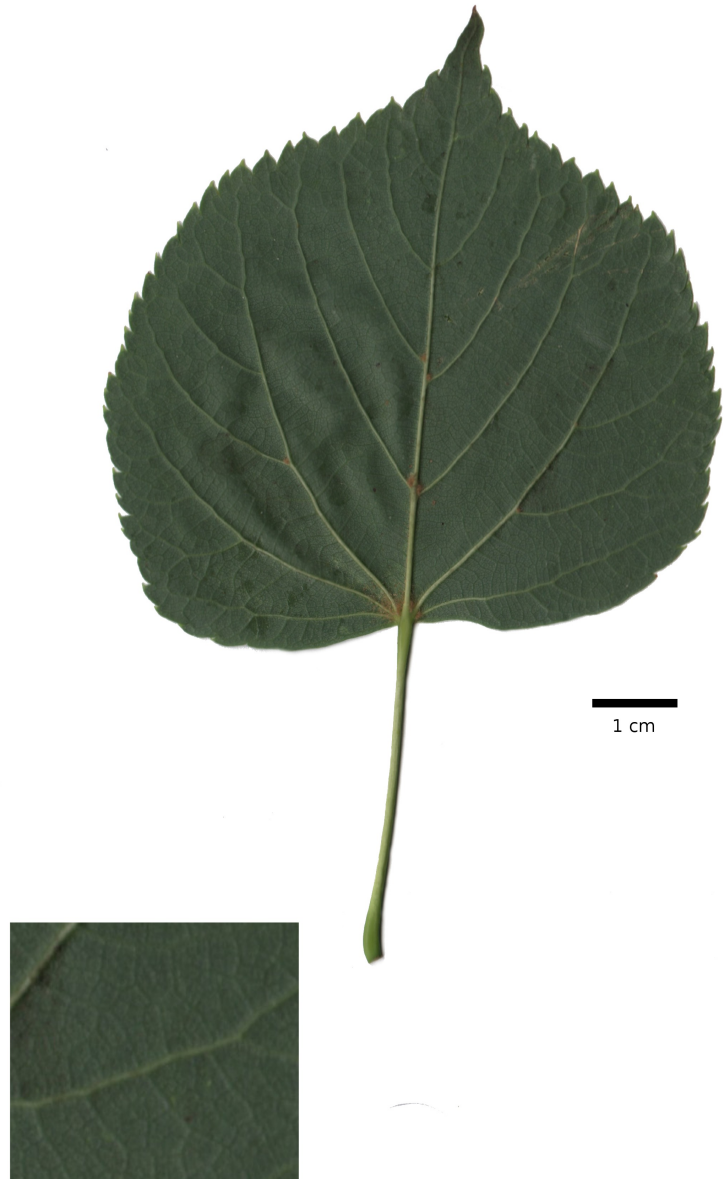
1 cm



Syringa vulgaris

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	3
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	reticulodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	pulvinate	Perimarginal veins	fimbrial vein
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	smoothly increasing proximally
<i>Petiole trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	parallel to major secondary
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar lenght [cm]</i>	9,86	Intercostal tertiary vein fabric	opposite convex percurrent obtuse
lm	9,35	Intercostal tertiary vein angle variability	decreasing exmedially
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0,51	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	7,29	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	3,5	Exterior tertiary course	looped
y	3,79	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,92	Quinternary vein fabric	irregular reticulate
x'	3,62	Areolation	present good
y'	3,62	Freely ending veinlets	not visible
Basal width ratio (x'/y')	1	Marginal ultimate venation	looped
Laminar L/W Ratio	1,35/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	ovate	Tooth spacing	x
Medial symmetry	symmetrical	Number of order of teeth	x
Base symmetry	symmetrical	Number of teeth per cm	x
Lobation	unlobed (entire)	Sinus shape	x
Margin type	untoothed (entire)	Tooth shape	x
Special margin features	revolute	Principal vein	x
Apex angle	acute	Principal vein termination	x
Apex shape	acuminate	Course of major accessory vein	x
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

Tilia cordata

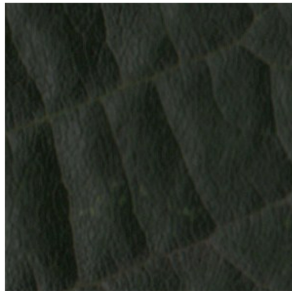


Tilia cordata

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite distichous	Number of basal veins	6
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous, semicraspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	7,88	Intercostal tertiary vein fabric	opposite sinuous percurrent obtuse
lm	7,38	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0,5	Proximal course of percurrent epimedial tertiaries	perpendicular to the midvein
<i>Laminar width [cm]</i>	7,38	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	3,59	Exterior tertiary course	terminating at the margin
y	3,79	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,95	Quinternary vein fabric	irregular reticulate
x'	3,49	Areolation	present good
y'	3,65	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,96	Marginal ultimate venation	not visible
Laminar L/W Ratio	1,07/1	III. Tooth characters	
Laminar size	notophyll	Tooth spacing	regular
Laminar shape	ovate	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	4
Base symmetry	basal extension asymmetrical	Sinus shape	angular
Lobation	unlobed	Tooth shape	flexuous/flexuous, concave/convex
Margin type	serrate	Principal vein	present
Special margin features	revolute	Principal vein termination	at the apex of tooth
Apex angle	obtuse	Course of major accessory vein	not visible
Apex shape	acuminate		
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Tilia platyphyllos

1 cm



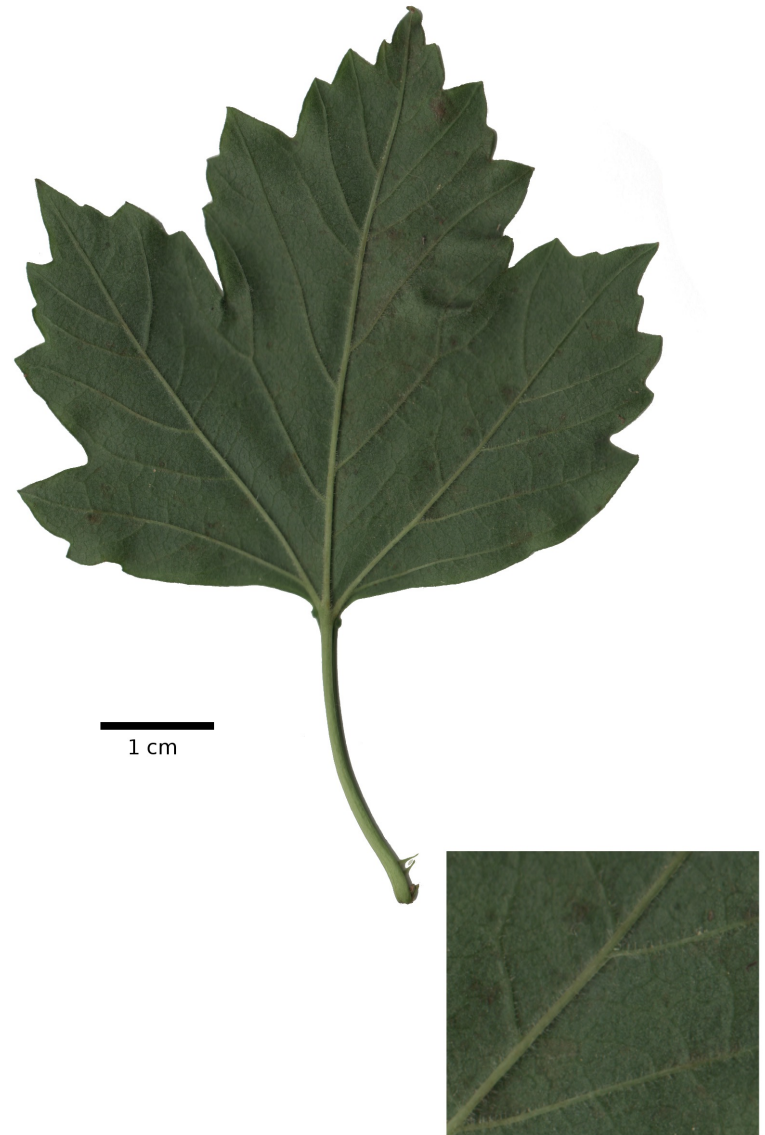
1 cm



Tilia platyphyllos

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite distichous	Number of basal veins	8
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	pulvinate	Perimarginal veins	absent
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	terete	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	present	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	absent
<i>Stipules</i>	deciduous	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	8,73	Intercostal tertiary vein fabric	opposite straight percurrent obtuse
lm	7,97	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	opposite percurrent
lb	0,76	Proximal course of percurrent epimedial tertiaries	obtuse to the midvein
<i>Laminar width [cm]</i>	7,22	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary
x	3,44	Exterior tertiary course	terminating at the margin
y	3,78	Qurternary vein fabric	irregular reticulate
Width ratio (x/y)	0,91	Quinternary vein fabric	irregular reticulate
x'	3,25	Areolation	present good
y'	3,84	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,85	Marginal ultimate venation	not visible
Laminar L/W Ratio	1,21/1		
Laminar size	mesophyll	III. Tooth characters	
Laminar shape	ovate	Tooth spacing	regular
Medial symmetry	symmetrical	Number of order of teeth	one
Base symmetry	asymmetrical, basal extension asymmetrical	Number of teeth per cm	3
Lobation	unlobed	Sinus shape	angular
Margin type	serrate	Tooth shape	flexuous/flexuous
Special margin features	revolute	Principal vein	present
Apex angle	obtuse	Principal vein termination	at the apex of tooth
Apex shape	acuminate	Course of major accessory vein	not visible
Base angle	reflex		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Viburnum opulus



Viburnum opulus

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	palmate basal actinodromous
<i>Deciduousness</i>	deciduous	Naked basal veins	absent
Leaf Arrangement	opposite	Number of basal veins	3
Leaf Organisation	simple	Agrophic veins	present compound
Leaflet Arrangement	x	Major secondary vein framework	craspedodromous
Leaflet Attachment	x	Interior secondaries	present
Petiole features		Minor secondary course	craspedodromous
Petiole base	x	Perimarginal veins	fimbrial vein
Glands	petiolar	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	inconsistent
<i>Petiolar trichoms</i>	absent	Major secondary attachment to midvein	decurrent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	present	Intersecondary length	absent
Features of the blade		Intersecondary distal course	absent
Position of lamina attachment	marginal	Intersecondary frequency	absent
<i>Laminar lenght [cm]</i>	7,79	Intercostal tertiary vein fabric	mixed percurrent obtuse
lm	7,79	Intercostal tertiary vein angle variability	increasing proximally
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	8,02	Distal course of percurrent epimedial tertiaries	parallel to intercostal tertiary, basiflexed
x	3,9	Exterior tertiary course	looped
y	4,12	Qurternary vein fabric	alternate percurrent
Width ratio (x/y)	0,95	Quinternary vein fabric	not visible
x'	3,6	Areolation	not visible
y'	3,2	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,89	Marginal ultimate venation	looped
Laminar L/W Ratio	0,97/1	III. Tooth characters	
Laminar size	mesophyll	Tooth spacing	irregular
Laminar shape	elliptic oblate	Number of order of teeth	two
Medial symmetry	symmetrical	Number of teeth per cm	2
Base symmetry	asymmetrical	Sinus shape	rounded
Lobation	palmately lobed	Tooth shape	straight/straight – convex/convex
Margin type	serrate	Principal vein	present
Special margin features	undulate	Principal vein termination	at the apex of tooth
Apex angle	obtuse	Course of major accessory vein	convex looped
Apex shape	acuminate		
Base angle	obtuse		
Base shape	cordate		
Terminal apex features	absent		
Surface texture	pubescent		
Surficial glands	absent		

Vinca minor



1 cm



1 cm

Vinca minor

I. Leaf characters		II. Vein characters	
Leaf Attachment	petiolate	Primary vein framework	pinnate
<i>Deciduousness</i>	evergreen	Naked basal veins	present
Leaf Arrangement	opposite	Number of basal veins	1
Leaf Organisation	simple	Agrophic veins	absent
Leaflet Arrangement	x	Major secondary vein framework	semicraspedodromous
Leaflet Attachment	x	Interior secondaries	absent
Petiole features		Minor secondary course	absent
Petiole base	x	Perimarginal veins	marginal secondary
Glands	absent	Major secondary spacing	irregular
Petiole-cross section	canaliculate	Variation of major secondary angle to midvein	uniform
<i>Petiole trichoms</i>	absent	Major secondary attachment to midvein	decurent
Phyllodes	absent	Intersecondary proximal course	parallel to major secondaries
<i>Stipules</i>	absent	Intersecondary length	less than 50 % of subjacent secondary
Features of the blade		Intersecondary distal course	reticulating or ramifying
Position of lamina attachment	marginal	Intersecondary frequency	<1 per intercostal area
<i>Laminar length [cm]</i>	4,43	Intercostal tertiary vein fabric	not visible
lm	4,43	Intercostal tertiary vein angle variability	absent
la	0	Epimedial tertiary fabric	alternate percurrent
lb	0	Proximal course of percurrent epimedial tertiaries	acute to the midvein
<i>Laminar width [cm]</i>	2,17	Distal course of percurrent epimedial tertiaries	basiflexed
x	1,1	Exterior tertiary course	not visible
y	1,07	Quaternary vein fabric	not visible
Width ratio (x/y)	0,97	Quinternary vein fabric	not visible
x'	0,85	Areolation	not visible
y'	0,74	Freely ending veinlets	not visible
Basal width ratio (x'/y')	0,87	Marginal ultimate venation	not visible
Laminar L/W Ratio	2,04/1	III. Tooth characters	
Laminar size	microphyll	Tooth spacing	x
Laminar shape	elliptic	Number of order of teeth	x
Medial symmetry	symmetrical	Number of teeth per cm	x
Base symmetry	asymmetrical	Sinus shape	x
Lobation	unlobed (entire)	Tooth shape	x
Margin type	untoothed (entire)	Principal vein	x
Special margin features	undulate	Principal vein termination	x
Apex angle	acute	Course of major accessory vein	x
Apex shape	straight		
Base angle	obtuse		
Base shape	convex		
Terminal apex features	absent		
Surface texture	smooth		
Surficial glands	absent		

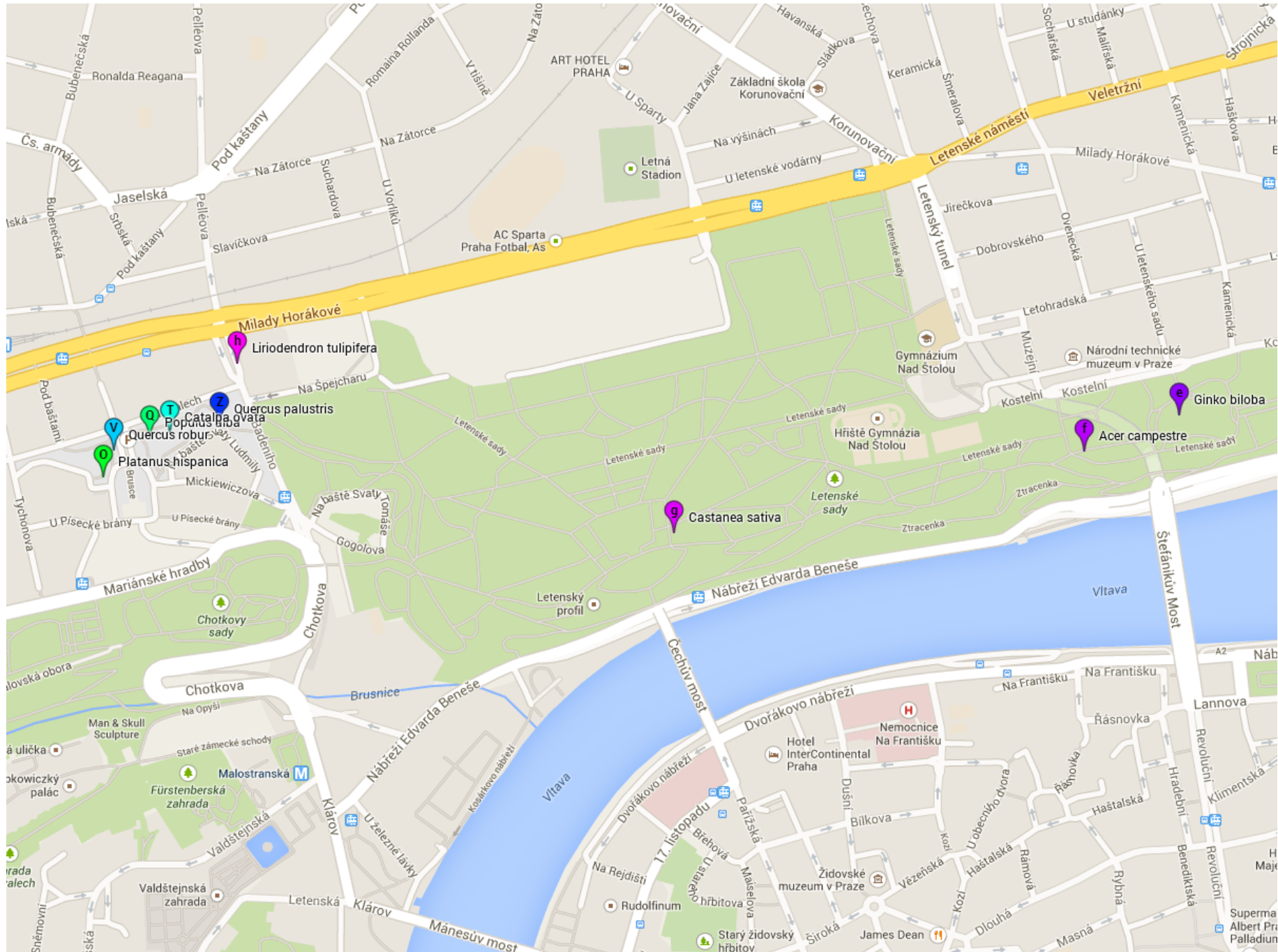
Příloha B

Mapy umístění vybraných stromů

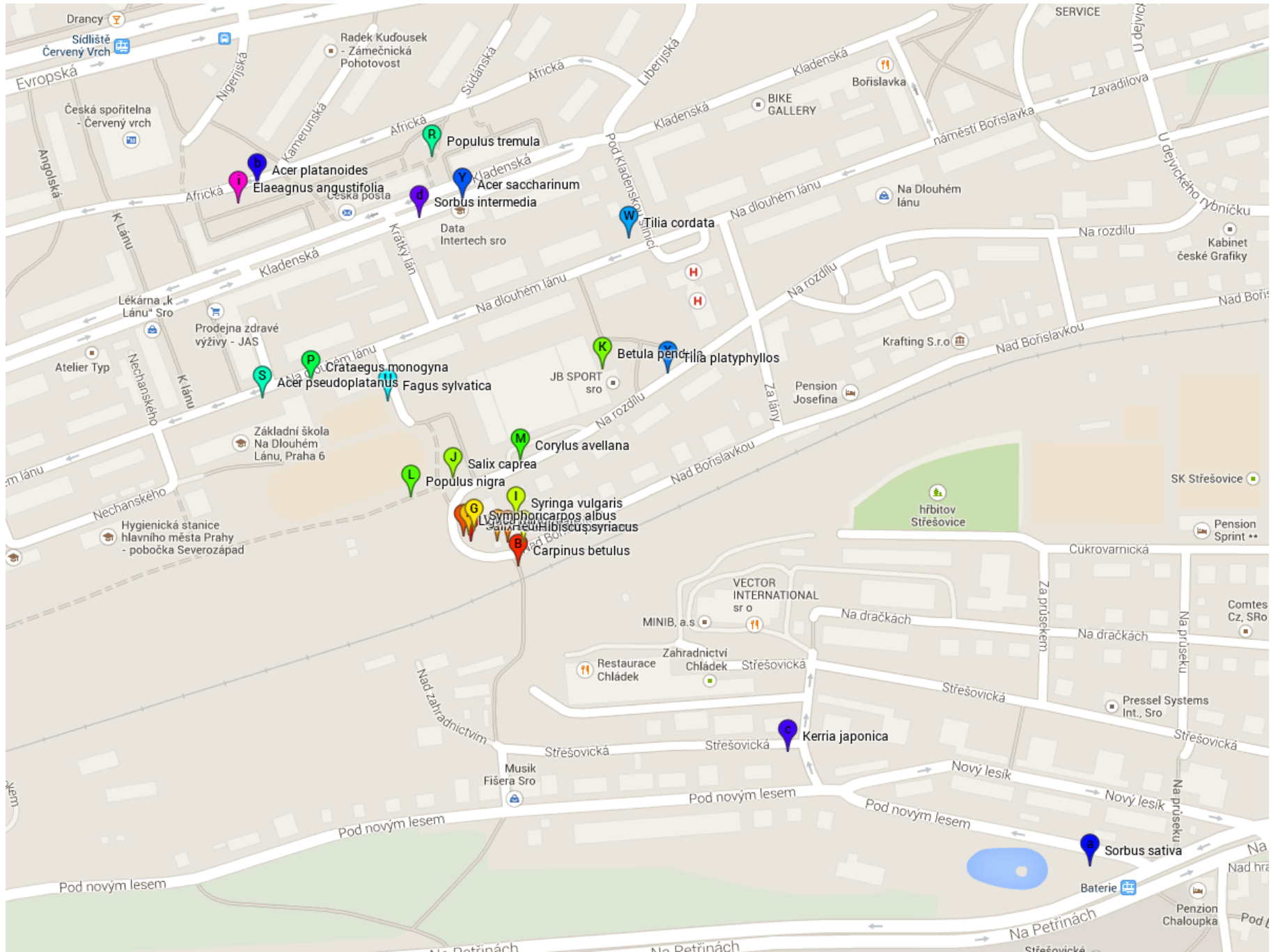
Kdyně



Praha - Letná



Praha - Vokovice



Příloha C

Fotografie vybraných stromů

Acer campestre



Acer platanoides



Acer pseudoplatanus



Acer saccharinum



Betula pendula



Buxus sempervirens



Carpinus betulus



Castanea sativa



Catalpa ovata



Corylus avellana



Crataegus sp.



Elaeagnus angustifolia



Fagus sylvatica



Ginkgo biloba



Hedera helix



Hibiscus syriacus



Kerria japonica



Ligustrum vulgare



Liriodendron tulipifera



Platanus hispanica



Populus alba



Populus nigra



Populus tremula



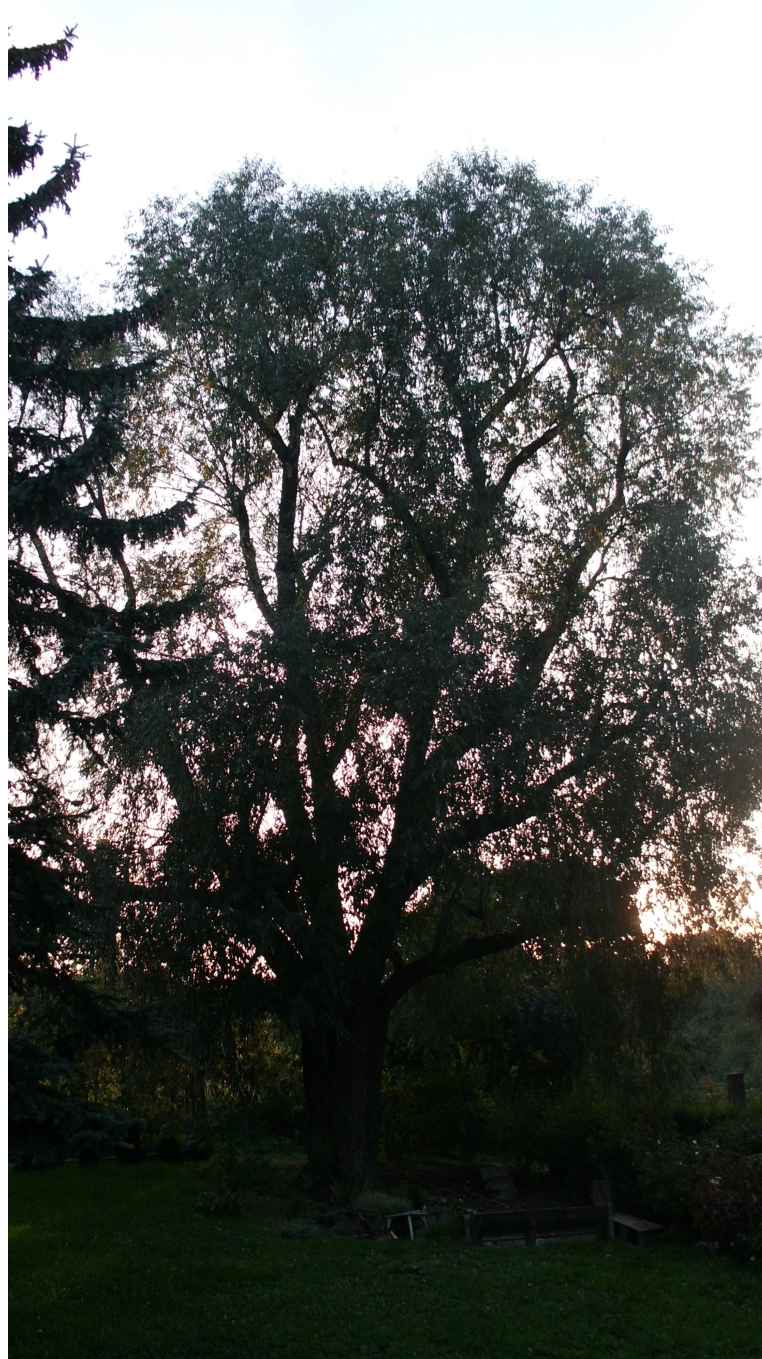
Quercus palustris



Quercus robur



Salix alba



Salix caprea



Sorbus aria



Sorbus intermedia



Symphori carposalbus



Syringa vulgaris



Tilia cordata



Tilia platyphyllos



Viburnum opulus



Vinca minor

