



Acer and *Dipteronia*

vegetative key to species in cultivation

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Acer and Dipteronia 122 species in this key:

ACER

- A. acuminatum* (Arguta)
A. albopurpurascens (Oblonga)
A. amamiense (Lithocarpa)
A. amoenum (Palmata)
- var. *amoenum*
- var. *matsumurae*
A. amplum (Platanoidea)
A. argutum (Arguta)
A. barbinerve (Arguta)
A. buergerianum (Oblonga)
A. caesium (Acer)
- subsp. *caesium*
- subsp. *giraldii*
A. calcaratum (Palmata)
A. campbellii (Palmata)
A. aff. campbellii (Palmata)
A. campestre (Platanoidea)
A. capillipes (Macrantha)
A. cappadocicum (Platanoidea)
- subsp. *cappadocicum*
- subsp. *sinicum*
A. carpinifolium (Indivisa)
A. catalpifolium (Platanoidea)
A. caudatifolium (Macrantha)
A. caudatum (Spicata)
A. chapaense (Platanoidea)
A. chienii (Macrantha)
A. circinatum (Palmata)
A. cissifolium (Negundo)
A. cordatum (Oblonga)
A. coriaceifolium (Oblonga)
A. crataegifolium (Macrantha)
A. davidii (Macrantha)
- subsp. *davidii*
- subsp. *grosseri*
A. diabolicum (Lithocarpa)
A. distylum (Parviflora)
A. divergens (Platanoidea)
A. duplicatoserratum (Palmata)
A. elegantulum (Palmata)
A. erianthum (Palmata)
A. fabri (Palmata)
A. fenzelianum (Macrantha)
A. flabellatum (Palmata)
A. floridanum (Acer)
A. forrestii (Macrantha)
A. fulvescens (Platanoidea)
A. glabrum (Glabra)
- subsp. *douglasii*
- subsp. *glabrum*
A. granatense (Acer)
A. grandidentatum (Acer)
A. griseum (Trifoliata)
A. heldreichii (Acer)
- subsp. *heldreichii*
- subsp. *macropterum*
- subsp. *trautvetteri*
A. henryi (Negundo)
A. hyrcanum (Acer)
- subsp. *hyrcanum*
- subsp. *intermedium*
- subsp. *keckianum*
- subsp. *tauricolum*
A. HWJ 569 (Macrantha)
A. japonicum (Palmata)
A. laevigatum (Palmata)
- var. *laevigatum*
- var. *salweenense*
A. laurinum (Hyptiocarpa)
A. laxiflorum (Macrantha)
A. leucoderme (Acer)
A. lobelii (Platanoidea)
A. longipes (Platanoidea)
A. macrophyllum (Macrophylla)
A. mandshuricum (Trifoliata)
A. maximowiczianum (Trifoliata)
A. maximowiczii (Macrantha)
A. metcalfei (Macrantha)
A. miaotaiense (Platanoidea)
A. micranthum (Macrantha)
A. miyabei (Platanoidea)
A. monspessulanum (Acer)
A. morifolium (Macrantha)
A. negundo (Negundo)
- subsp. *californicum*
- subsp. *mexicanum*
- subsp. *nexundo*
- subsp. *texanum*
A. nigrum (Acer)
A. nipponicum (Parviflora)
A. oblongum (Oblonga)
A. obtusifolium (Acer)
A. okamotoanum (Platanoidea)
A. oliverianum (Palmata)
A. opalus (Acer)
- subsp. *obtusatum*
- subsp. *opalus*
A. palmatum (Palmata)
A. paxii (Oblonga)
A. pectinatum (Macrantha)
- subsp. *pectinatum*
- subsp. *taronense*
A. aff. pectinatum (BSWJ 8270/KR 3012) (Macrantha)
A. pennsylvanicum (Macrantha)
A. pentaphyllum (Pentaphylla)
A. pictum (Platanoidea)
- subsp. *dissectum*
- subsp. *dissectum* f. *connivens*
- subsp. *macropterum*
- subsp. *mono*
- subsp. *savateri*
- subsp. *pictum*
A. pilosum (Pubescentia)
A. pinnatinervium (Hyptiocarpa)
A. platanoides (Platanoidea)
A. pseudoplatanus (Acer)
A. pseudosieboldianum (Palmata)
- subsp. *pseudosieboldianum*
- subsp. *takesimense*
A. pubipalmatum (Palmata)
A. pycnanthum (Rubra)
A. robustum (Palmata)
A. rubescens (Macrantha)
A. rubrum (Rubra)
A. rufinerve (Macrantha)
A. saccharinum (Rubra)
A. saccharum (Acer)
A. sempervirens (Acer)
A. serrulatum (Palmata)
A. shenkanense (Platanoidea)
A. shirasawanum (Palmata)
A. sieboldianum (Palmata)
A. sikkimense (Macrantha)
A. sinense (Palmata)
A. sinopurpurascens (Lithocarpa)
A. skutchii (Acer)
A. spicatum (Spicata)
A. stachyophyllum (Arguta)
- subsp. *betulifolium*
- subsp. *stachyophyllum*
A. sterculiaceum (Lithocarpa)
- subsp. *franchetii*
- subsp. *sterculiaceum*
A. tataricum (Ginnala)
- subsp. *ginnala*
- subsp. *semenovii*
- subsp. *tataricum*
A. tegmentosum (Macrantha)
A. tenellum (Platanoidea)
A. tenuifolium (Palmata)
A. tibetense (Platanoidea)
A. triflorum (Trifoliata)
A. truncatum (Platanoidea)
A. tschonoskii (Macrantha)
- subsp. *koreanum*
- subsp. *tschonoskii*
A. tsinglingense (Lithocarpa)
A. turkestanicum (Platanoidea)
A. tutcheri (Palmata)
A. ukurunduense (Spicata)
A. velutinum (Acer)
A. wardii (Wardiana)
A. wilsonii (Palmata)
A. yui (Oblonga)

DIPTERONIA

- D. dyeriana*
D. sinensis

To improve accuracy:



Use a 10× LENS.

Look at the entire plant.

Beware of hybridisation.

key to genera



Dipteronia

Acer

Acer

Leaves:

simple OR IF compound:
with **3-7(-9)** leaflets.



Dipteronia

Leaves:

pinnately compound
with **7-13(-15)** leaflets.



Acer

Leaves:

simple OR IF compound:
with **3-7(-9)** leaflets.



Dipteronia

Leaves:

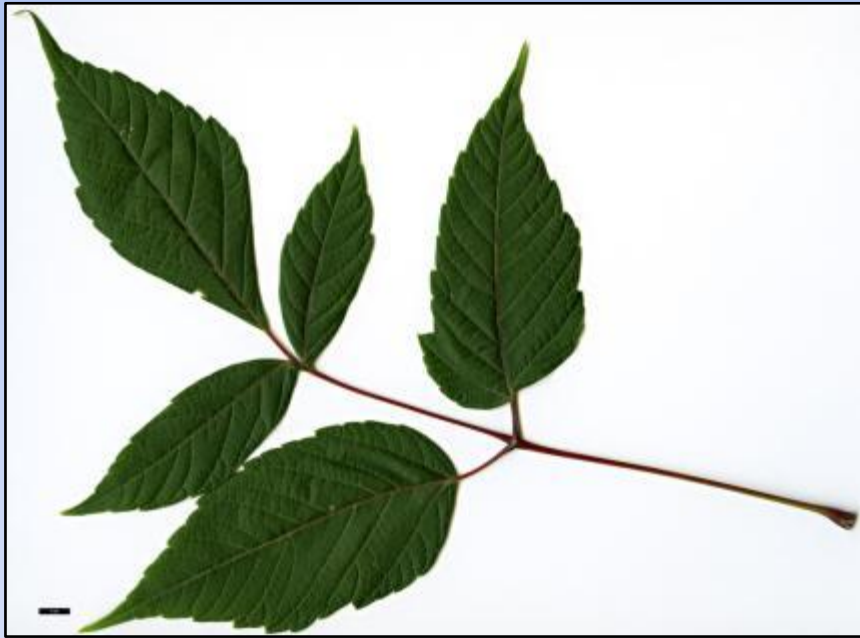
pinnately compound
with **7-13(-15)** leaflets.



Acer

Leaves:

simple OR IF compound:
with **3-7(-9)** leaflets.



Dipteronia

Leaves:

pinnately compound
with **7-13(-15)** leaflets.



Acer

Shoot at base:

with obvious bud scale scars
in 2-many pairs.



Dipteronia

Shoot at base:

with scars
scarcely apparent.



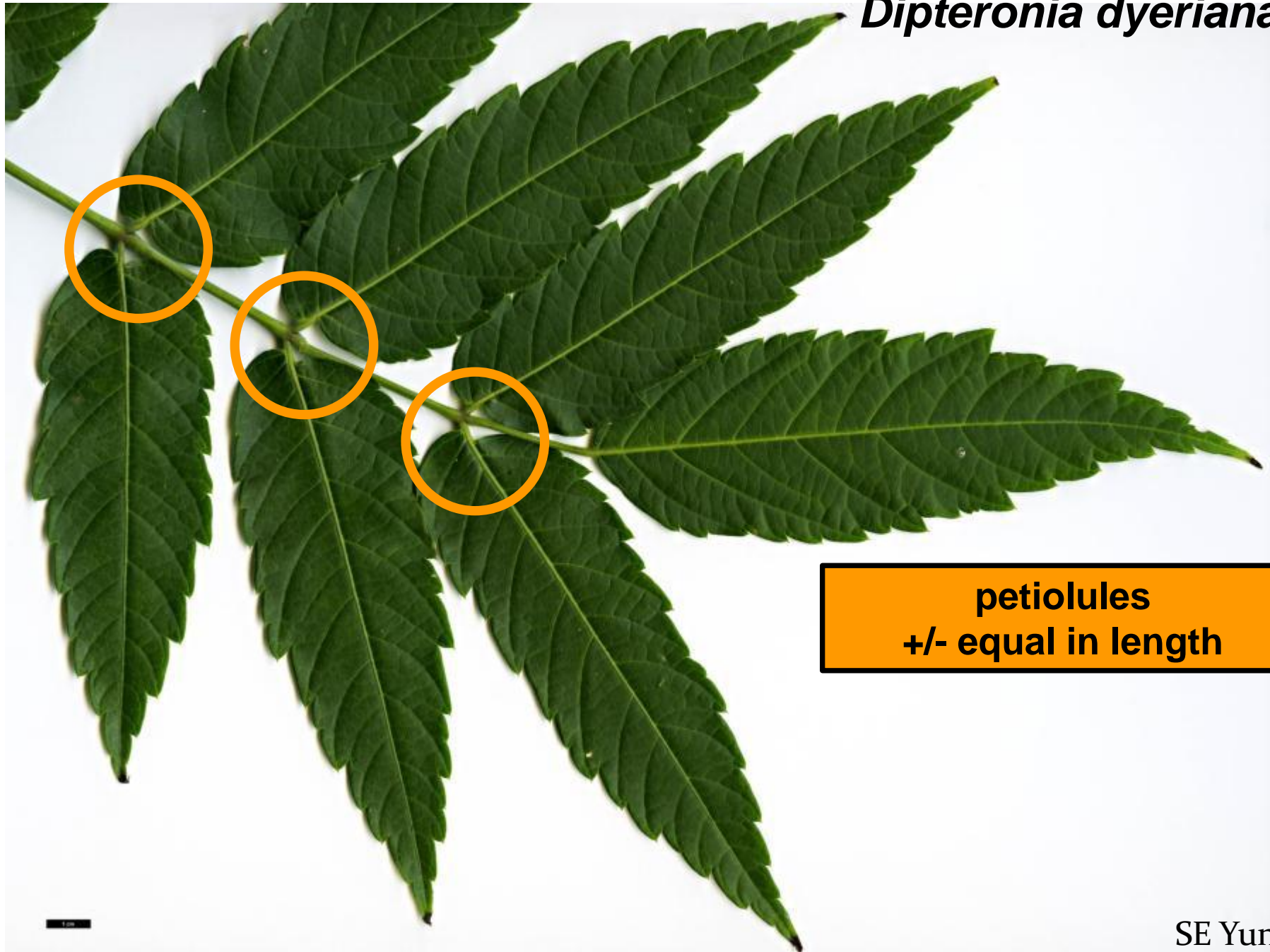
Dipteronia

two species:

D. dyeriana

D. sinensis

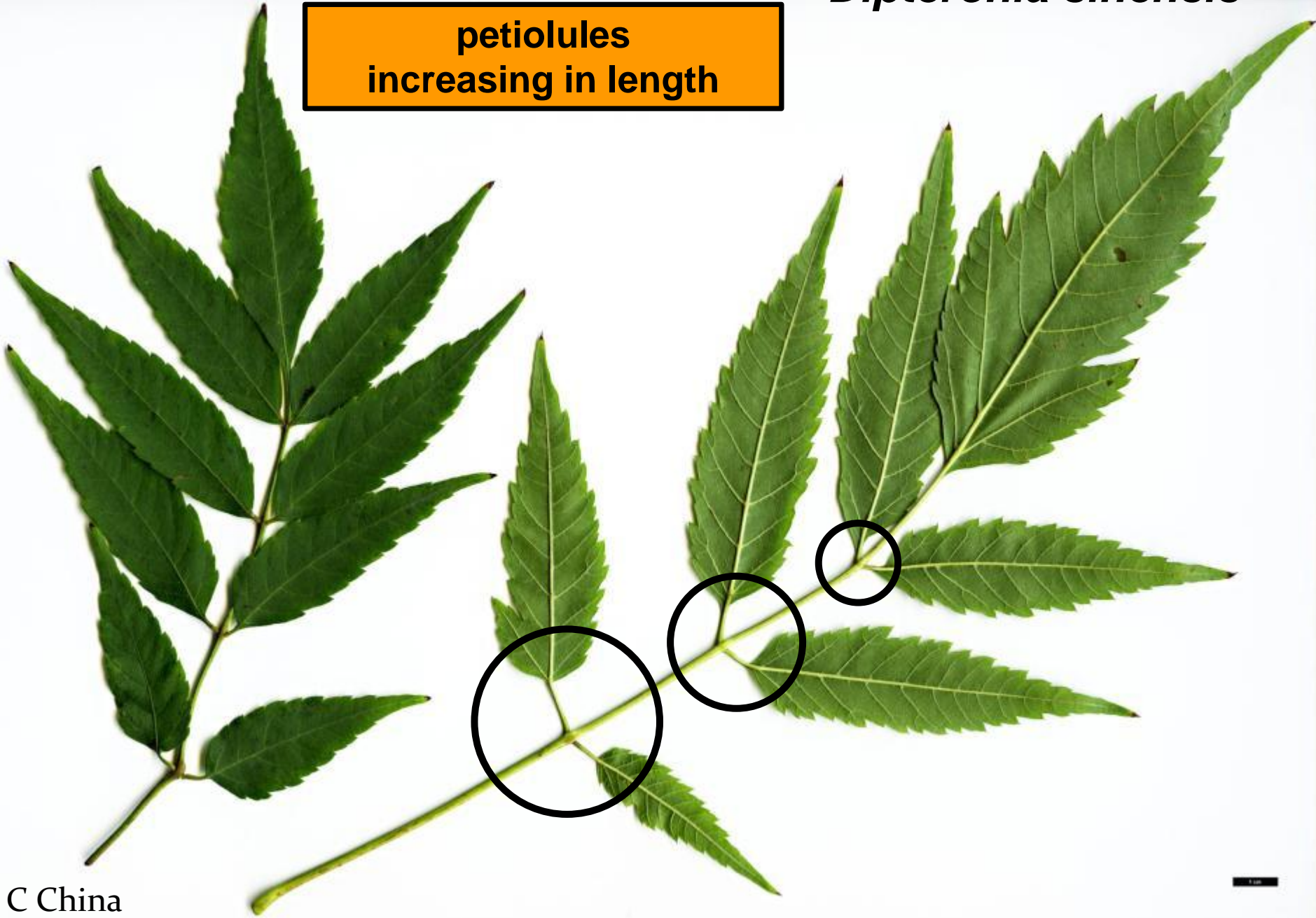
Dipteronia dyeriana



**petiolules
+/- equal in length**

Dipteronia sinensis

petiolules
increasing in length



C China

***Acer*: key to groups**



16 groups

with the following

diagnostic characters:

GROUP A

Plant wintergreen AND lamina unlobed or 0-3-lobed,
with LS distinctly glaucous.



A. paxii (*Oblonga*)

Group A



unlobed
to
3-lobed



C and N Guangxi, Guizhou, SW Sichuan, NW Yunnan

***A. coriaceifolium* (Oblonga)**

Group A



unlobed



SE Gansu, N Sichuan

A. coriaceifolium (*Oblonga*)

Group A



unlobed

lamina LS
pubescent



A. pinnatinervium (*Hyptiocarpa*)

Group A

short
petiole



unlobed



SW Xizang, Yunnan, N India, Thailand

A. laurinum (*Hyptiocarpa*)

Group A



unlobed

5-6
veins
per
side

Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Philippines

A. oblongum (*Oblonga*)

largest width
below middle

Group A



unlobed

6-8(+)
veins
per
side



Himalaya, W and S China

A. albopurpurascens (*Oblonga*)

Group A

largest width
in the middle



unlobed

6-8(+)
veins
per
side

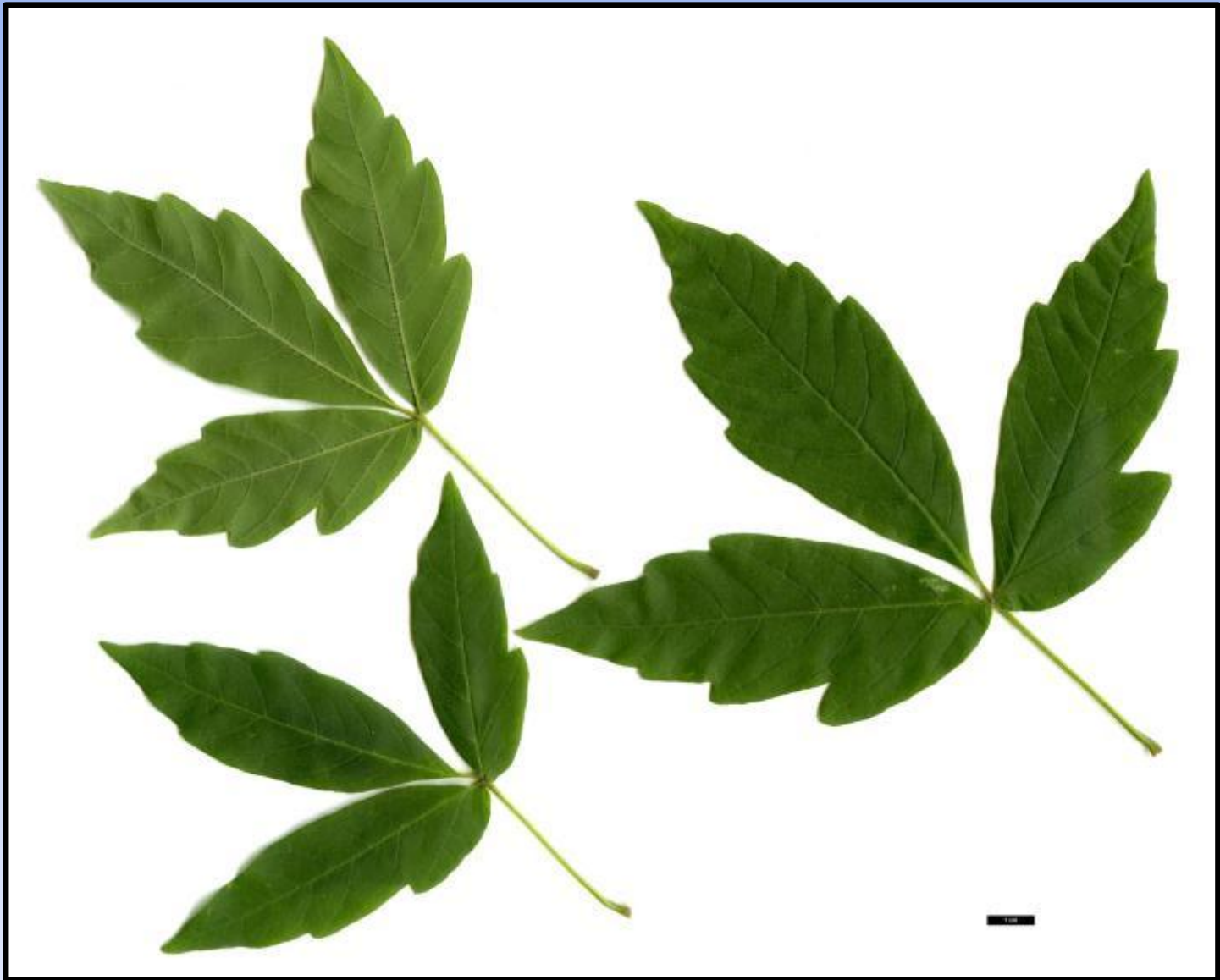


1 cm

Taiwan

GROUP B

Leaves predominantly compound.



A. pentaphyllum (*Pentaphylla*)

Group B



palmately
5-7-
foliolate



SW Sichuan

A. cissifolium (Negundo)

Group B



3-

foliolate



1 cm

Japan

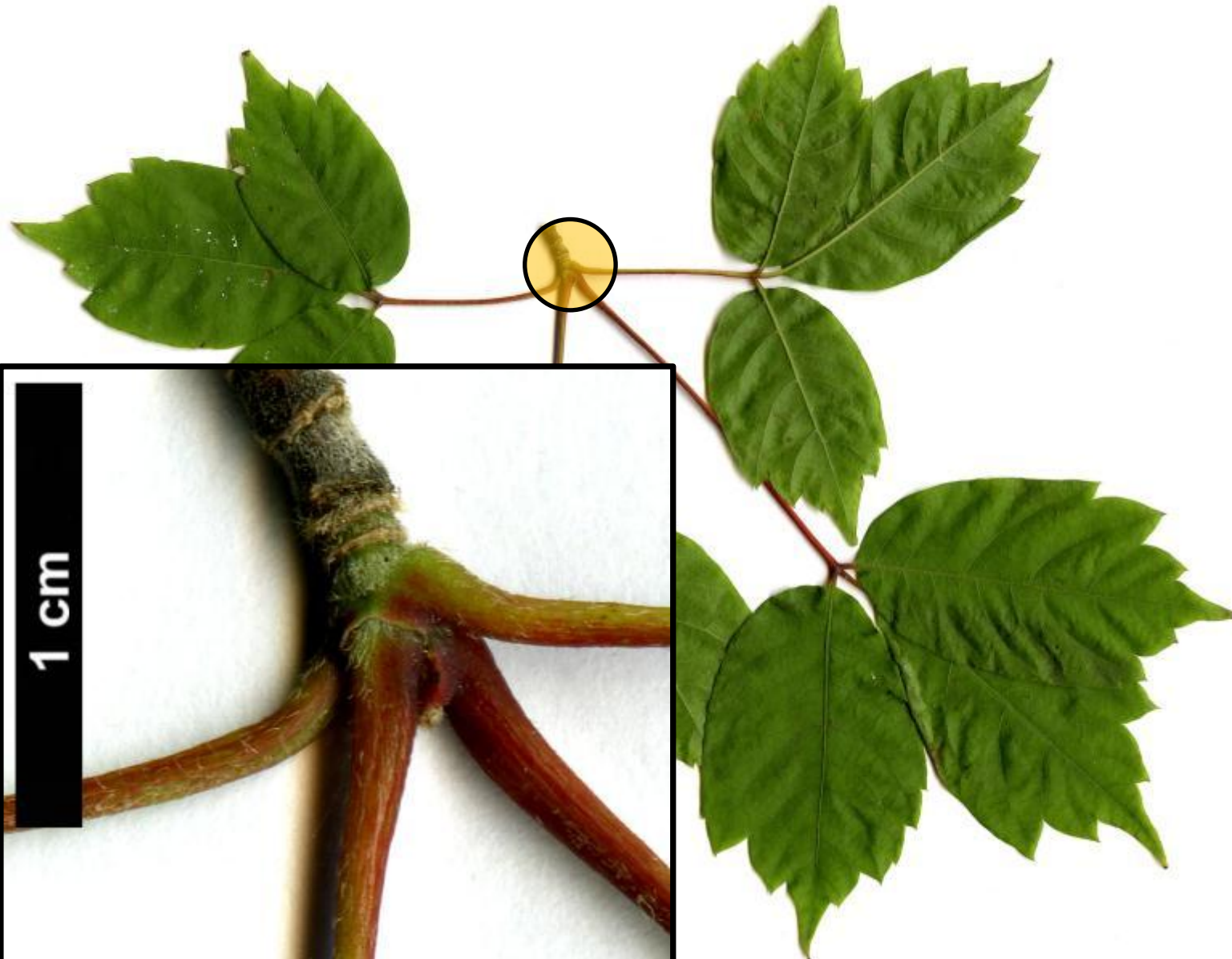
A. cissifolium (Negundo)

Group B



3-
foliolate

bud
scale
scars
<5 pairs



A. cissifolium (Negundo)

Group B

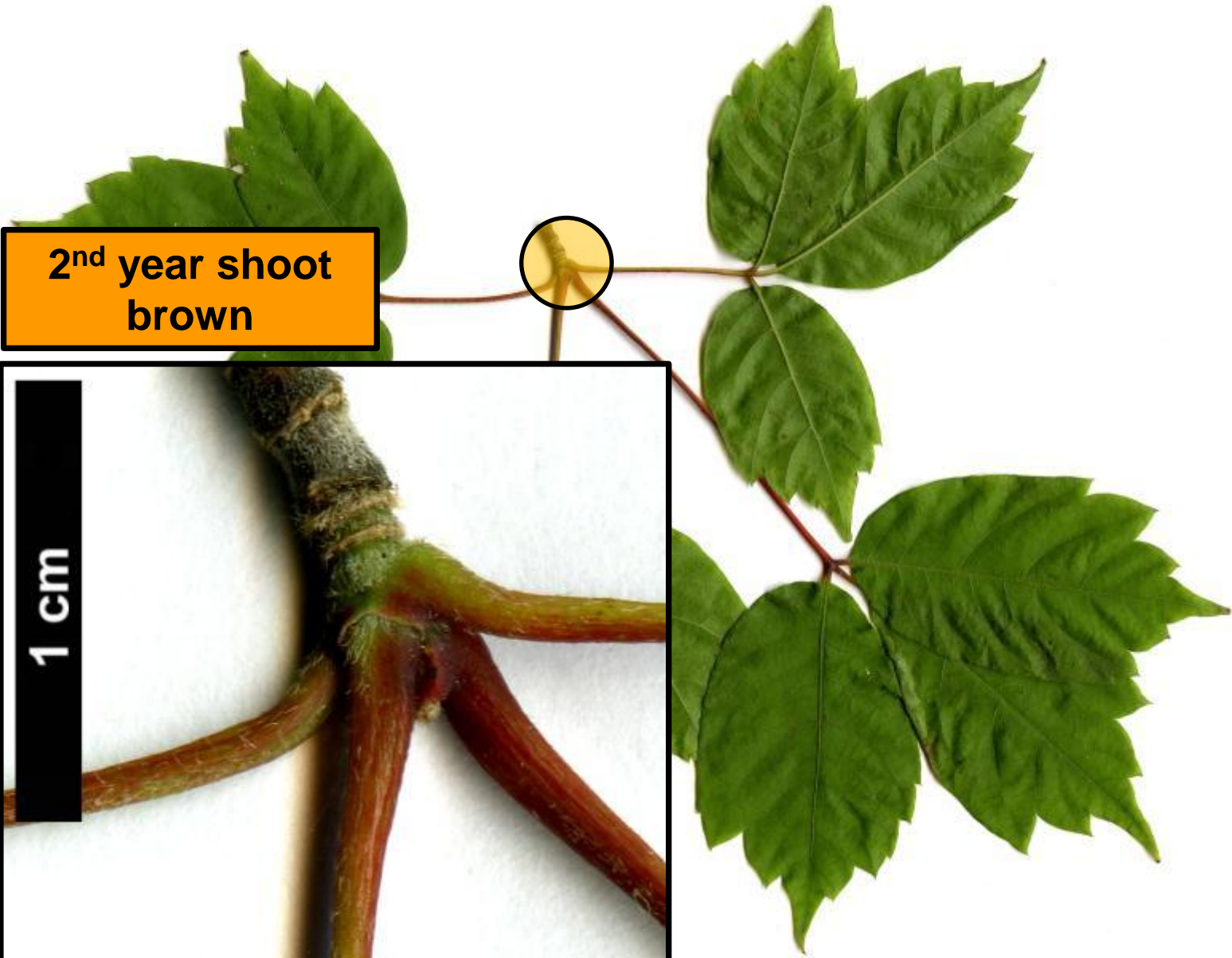
2nd year shoot
brown



3-
foliolate

bud
scale
scars
<5 pairs

1 cm



A. henryi (Negundo)

Group B



3-
foliolate

bud
scale
scars
<5 pairs



C China

A. henryi (Negundo)

Group B



second year
shoot green

3-
foliolate

bud
scale
scars
<5 pairs



1 cm



A. negundo (*Negundo*)

Group B



3-5(-9)-
foliolate

bud
scale
scars
<5 pairs



Canada, USA

A. negundo subsp. *mexicanum* (*Negundo*)

Group B



3-5(-9)-
foliolate

bud
scale
scars
<5 pairs



Guatemala, Mexico

A. negundo subsp. *mexicanum* (*Negundo*)

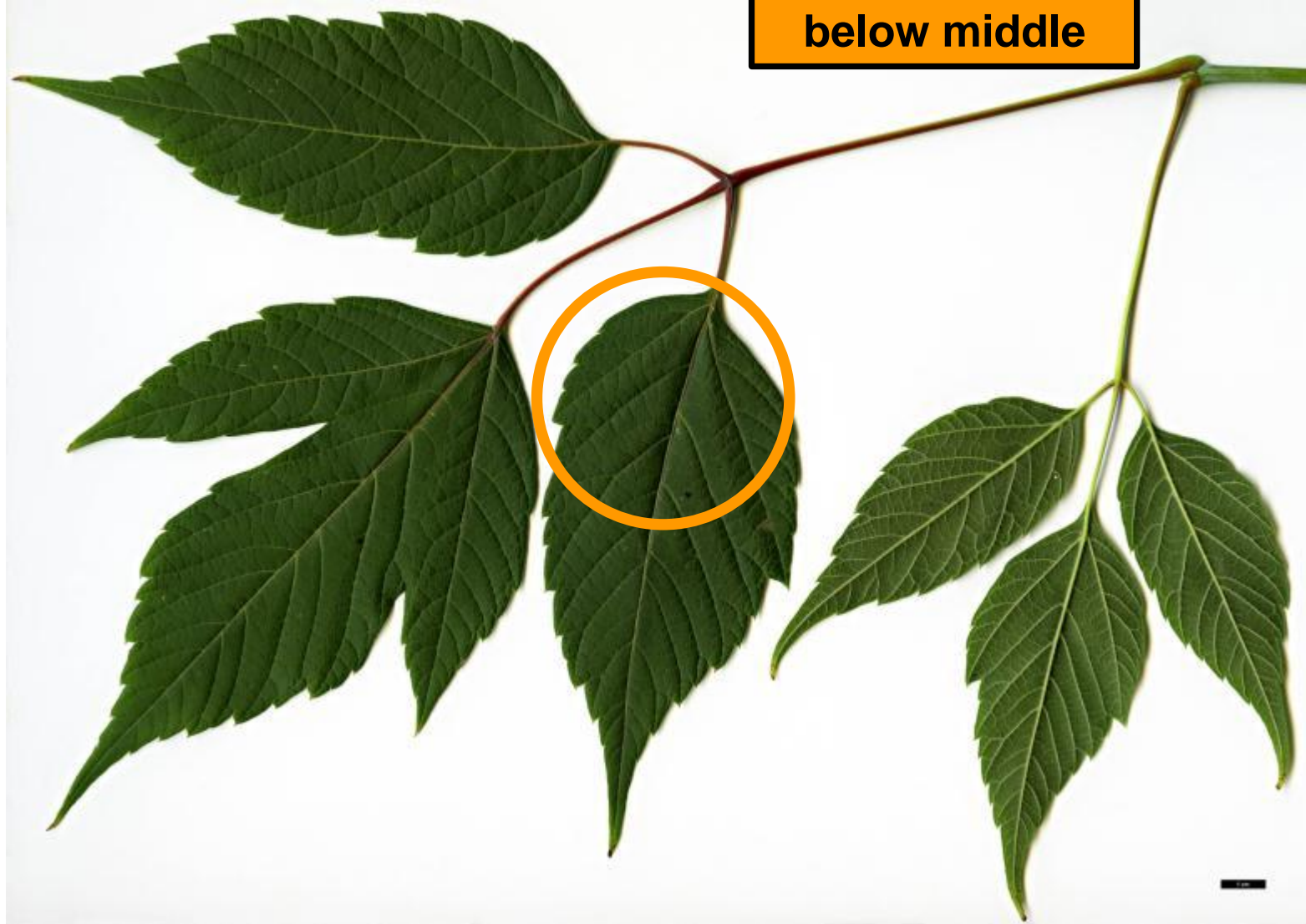
Group B

IF 3-foliolate:
serrate from
below middle



3-5(-9)-
foliolate

bud
scale
scars
<5 pairs



Guatemala, Mexico

A. mandshuricum (*Trifoliata*)

Group B



3-

foliolate



E Siberia, Manchuria

A. mandshuricum (*Trifoliata*)

Group B

petiole glabrous
≥10 teeth/side



3-
foliolate

bud
scale
scars
>5 pairs



1 cm

E Siberia, Manchuria

A. mandshuricum (*Trifoliata*)

Group B

petiole glabrous
 ≥ 10 teeth/side



3-
foliolate

bud
scale
scars
>5 pairs



1 cm

E Siberia, Manchuria

A. triflorum (*Trifoliata*)

Group B

petiole pubescent
 ≤ 8 teeth/lobes



3-
foliolate

bud
scale
scars
>5 pairs

NE China (Heilongjiang, Jilin, Liaoning), Korea

1 cm

A. triflorum (*Trifoliata*)

Group B

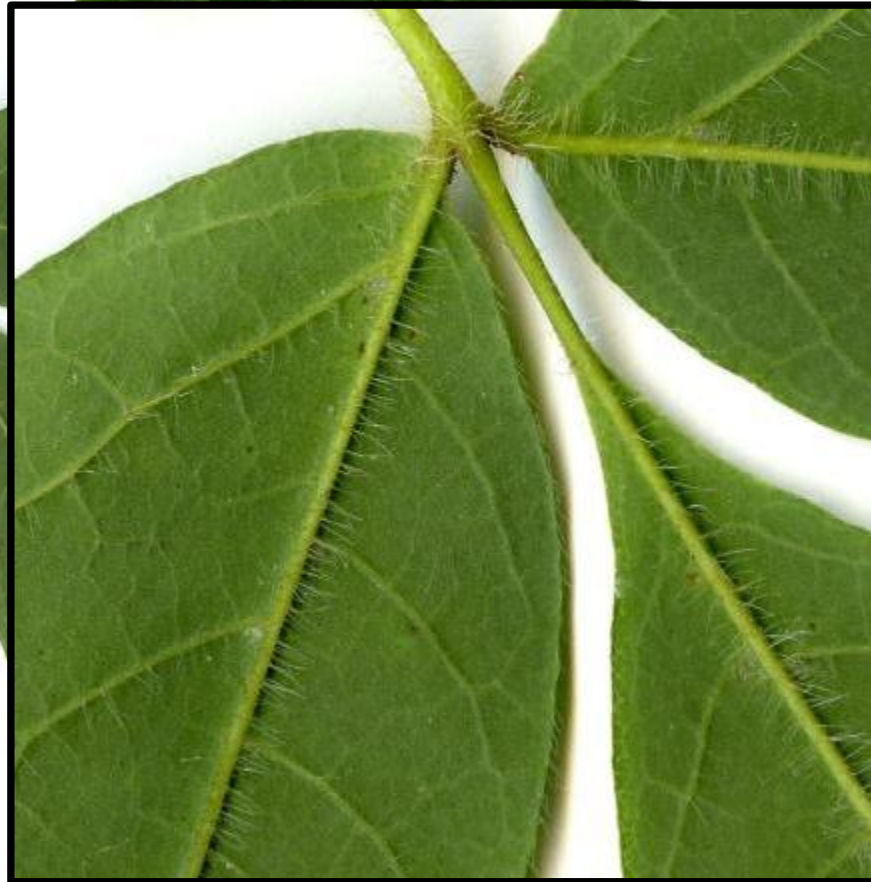
petiole pubescent
 ≤ 8 teeth/lobes

leaflet LS
pubescent on veins



3-
foliolate

bud
scale
scars
>5 pairs



NE China (Heilongjiang, Jilin, Liaoning), Korea

A. maximowiczianum (*Trifoliata*)

Group B



3-
foliolate

bud
scale
scars
>5 pairs



E Siberia, Manchuria

A. maximowiczianum (*Trifoliata*)

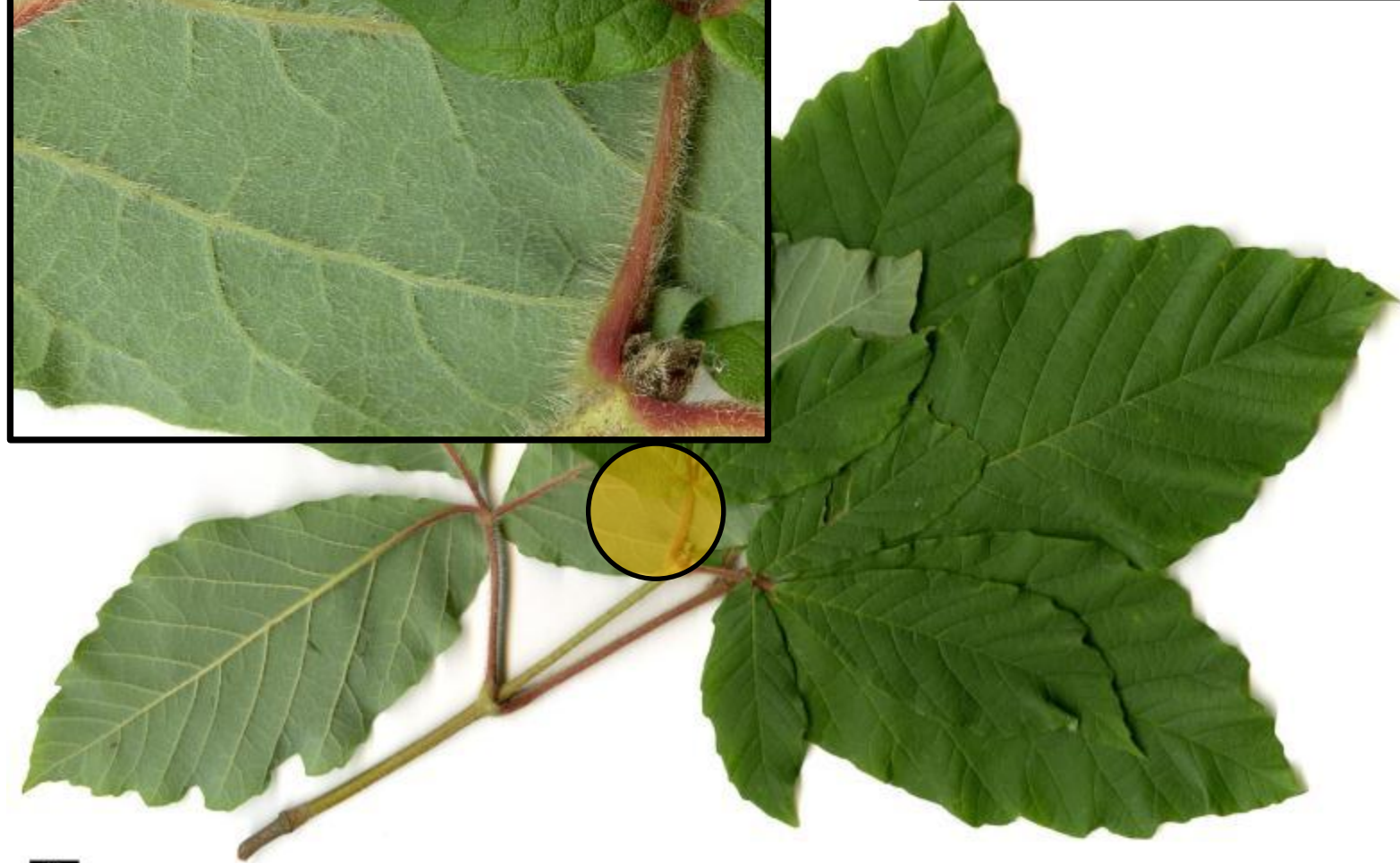
Group B

leaflet LS
pubescent
3-8 teeth/side



3-
foliolate

bud
scale
scars
>5 pairs



E Siberia, Manchuria

A. griseum (*Trifoliata*)

Group B

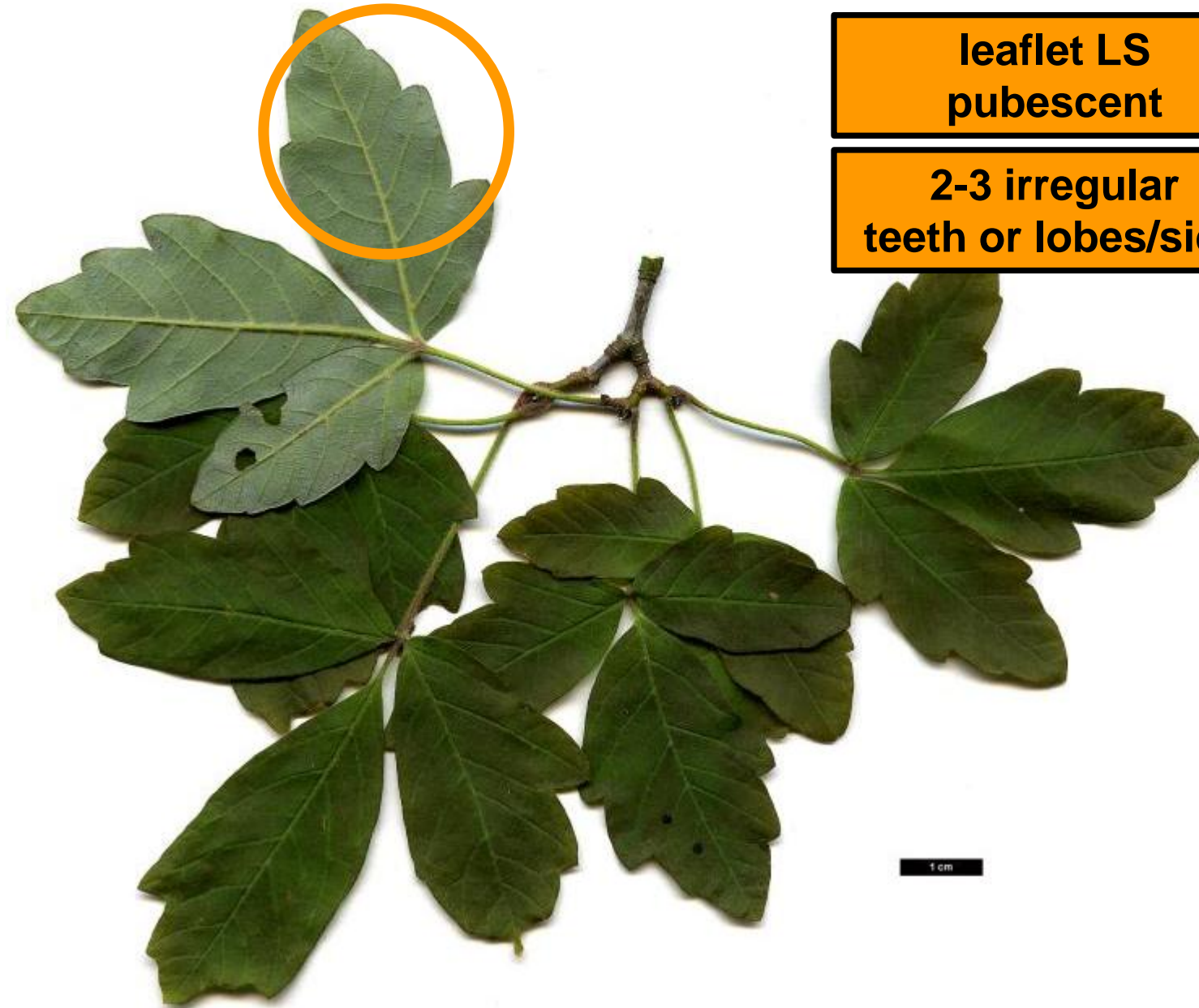
leaflet LS
pubescent

2-3 irregular
teeth or lobes/side



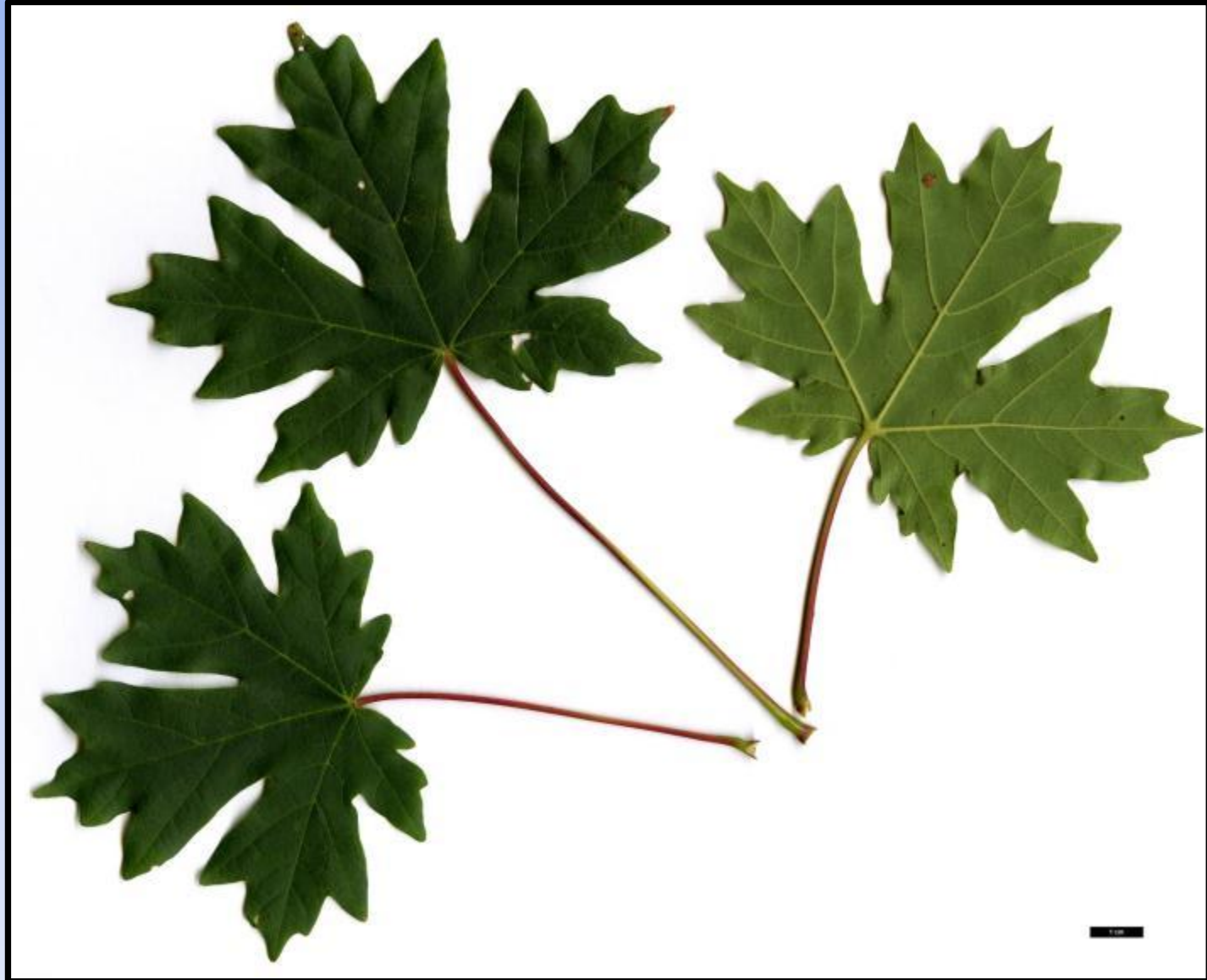
3-
foliolate

bud
scale
scars
>5 pairs



1 cm

Leaves always simple.



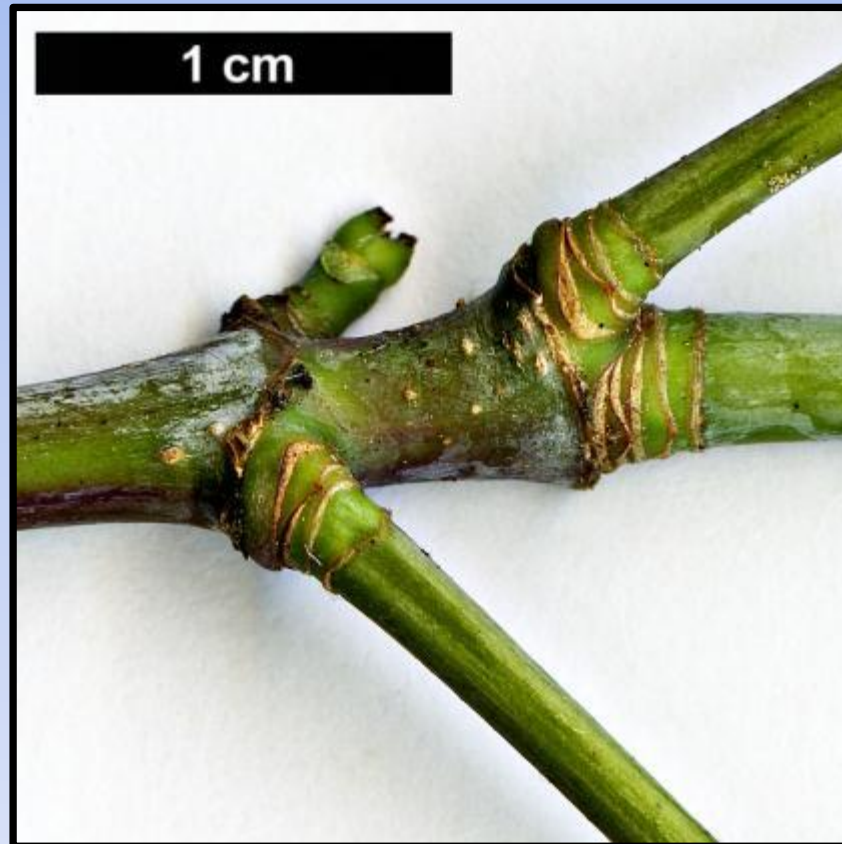
Petiole lactiferous

shoots, buds and larger veins may be lactiferous too.



GROUP C

Second year and older branches green, not woody.



A. macrophyllum (*Macrophylla*)

Group C



lobes
deeply
dentate
to lobed



W N America

A. catalpifolium (Platanoidea)

Group C



unlobed
to
3-lobed



Guangxi, Guizhou, Sichuan

A. longipes (*Platanoidea*)

Group C



(0-)3-5-
lobed



N Guangxi, S Henan, Hunan, W Hubei, Jiangxi, S Shaanxi, Sichuan

A. longipes (Platanoidea)

Group C



**(0-)3-5-
lobed**

**LS pubescent
throughout**



A. chapaense (*Platanoidea*)

Group C



(0-)3-5-
lobed

Vietnam

A. chapaense (*Platanoides*)

Group C

**LS pubescent
in vein axils**

**basal lobes
obtuse to acute**



**(0-)3-5-
lobed**



Vietnam

A. shenkanense (*Platanoides*)

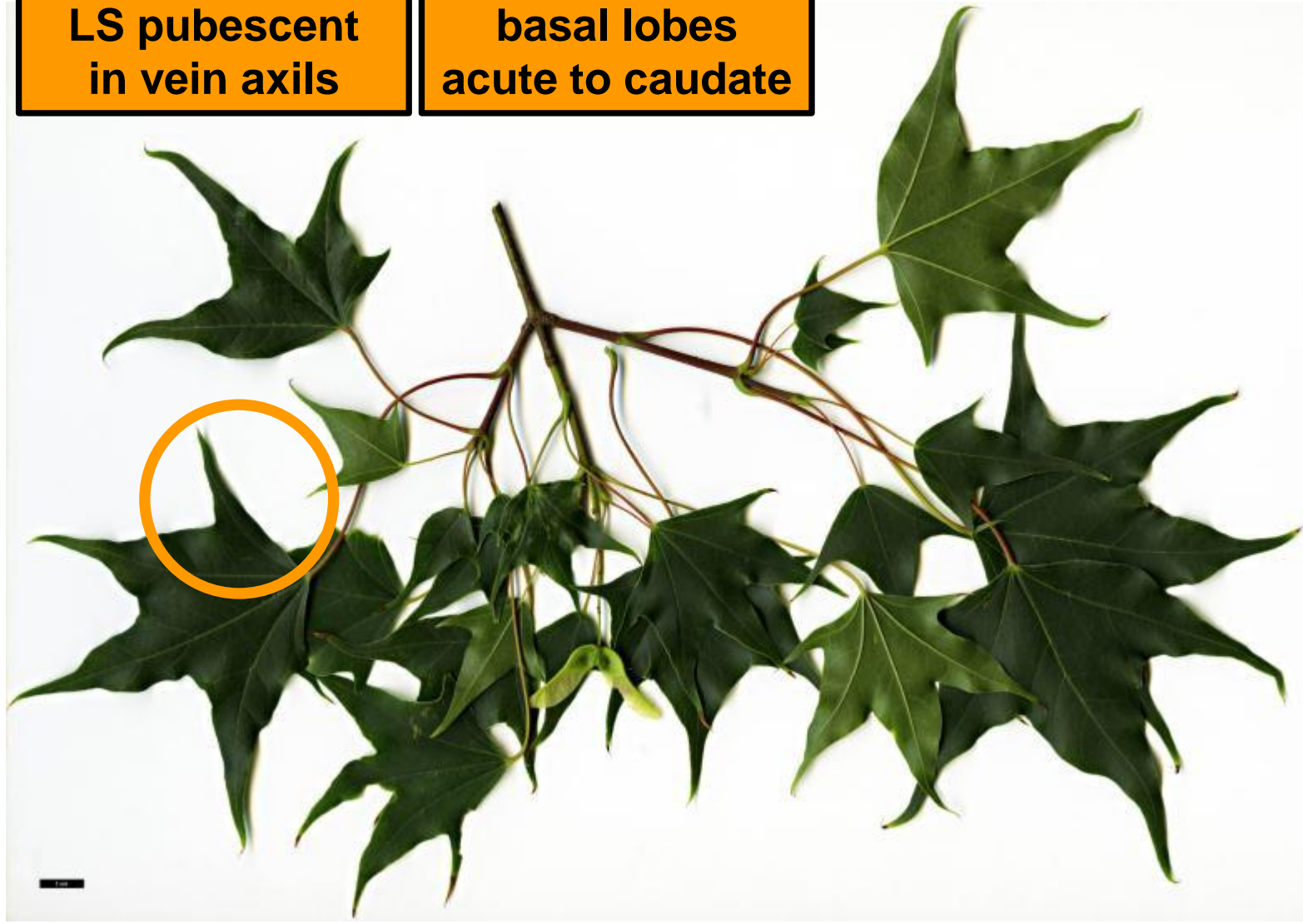
Group C

**LS pubescent
in vein axils**

**basal lobes
acute to caudate**



**(0-)3-5-
lobed**



SE Gansu, W Hubei, S Shaanxi, NW Sichuan

A. tibetense (*Platanoides*)

Group C



**5-lobed
or
5-7-lobed**



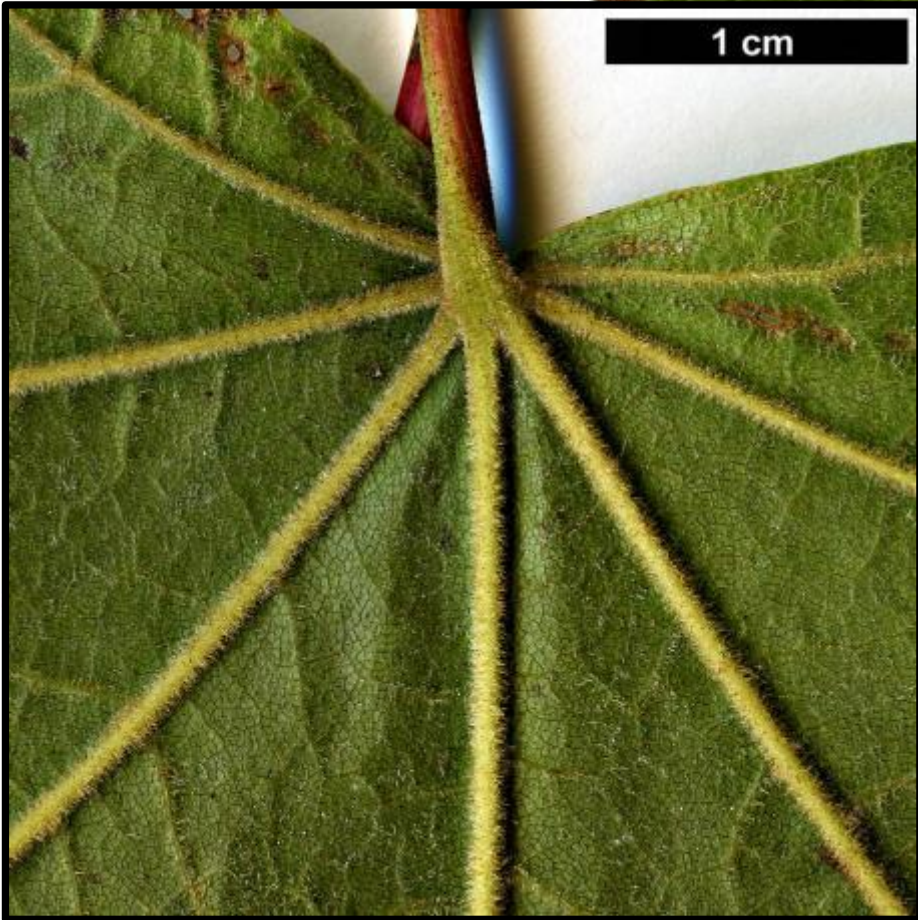
SE Xizang

A. tibetense (*Platanoidea*)

Group C



**5-lobed
or
5-7-lobed**



**LS pubescent
throughout**



A. amplum (*Platanoidea*)

Group C



**5-lobed
or
5-7-lobed**



SW China

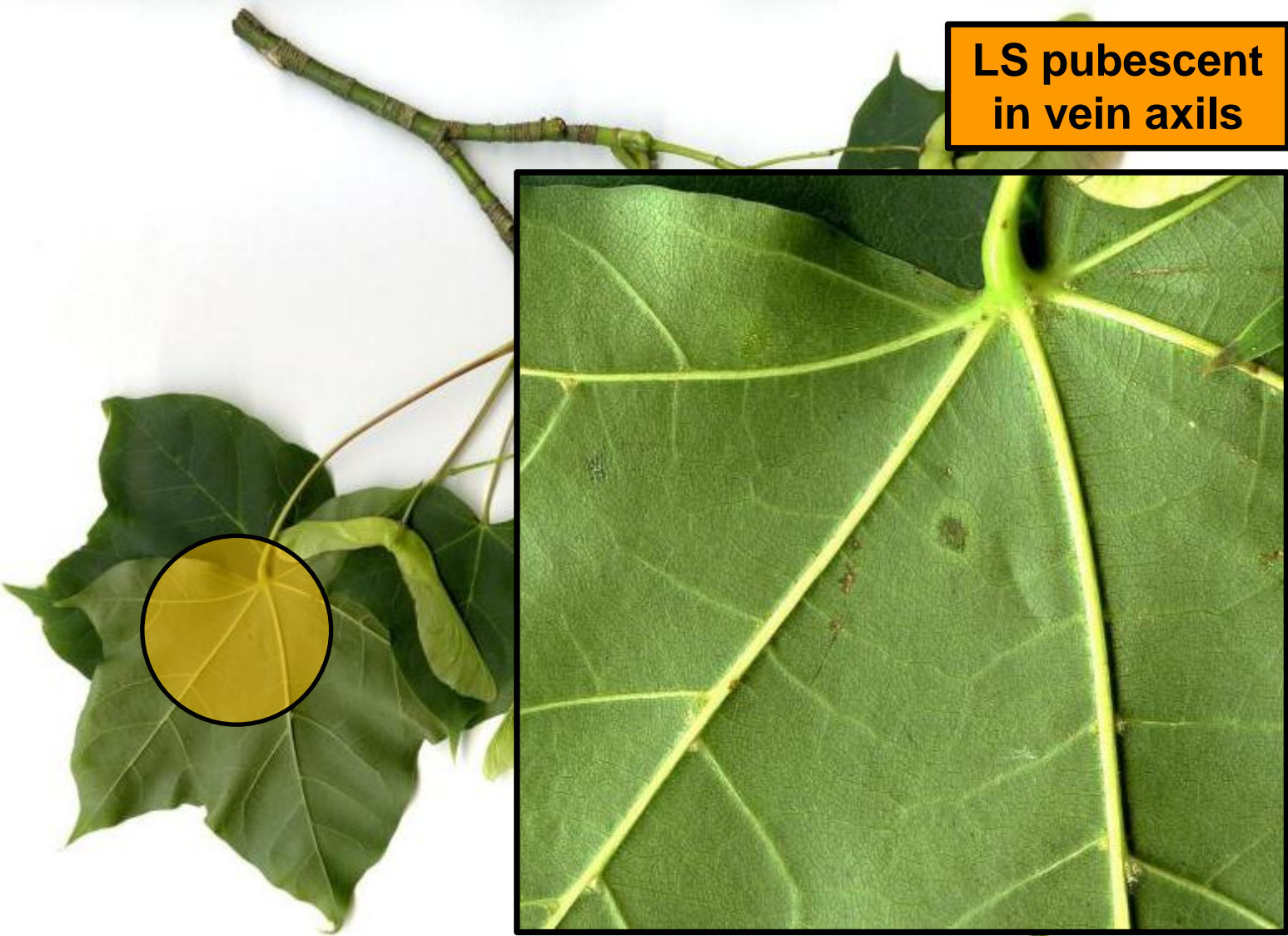
A. amplum (Platanoidea)

Group C

**LS pubescent
in vein axils**



**5-lobed
or
5-7-lobed**



A. amplum (*Platanoidea*)

Group C

**terminal lobe
wider than long**



**5-lobed
or
5-7-lobed**



SW China

A. cappadocicum subsp. ***cappadocicum***
(*Platanoidea*)

terminal lobe
longer than wide

Group C



5-lobed
or
5-7-lobed



Yunnan, Xizang, Bhutan, N India, Kashmir, Nepal, Pakistan, SW Asia and S Europe

A. lobelii (Platanoidea)

Group C



**5-lobed
or
5-7-lobed**



S Italy

A. lobelii (Platanoidea)



columnar



Group C



lactiferous



green

**5-lobed
or
5-7-lobed**

Second year and older branches grey to brown and woody, often striate.



GROUP D

Well developed shoot at base with 8-12 pairs of bud scale scars AND lamina predominantly 3-5-lobed.



A. sinopurpurascens (*Lithocarpa*)

Group D



3-5-lobed
8-12 pairs
of
BSS



S Anhui, NE Hubei, N Jiangxi, NW Zhejiang

A. sinopurpurascens (*Lithocarpa*)

Group D

very lactiferous
shoot + petiole
glabrescent
T-lobe caudate



3-5-lobed
8-12 pairs
of
BSS



S Anhui, NE Hubei, N Jiangxi, NW Zhejiang

A. tsinglingense (*Lithocarpa*)

Group D



**3-5-lobed
8-12 pairs
of
BSS**

SE Gansu, SW Henan, Shaanxi

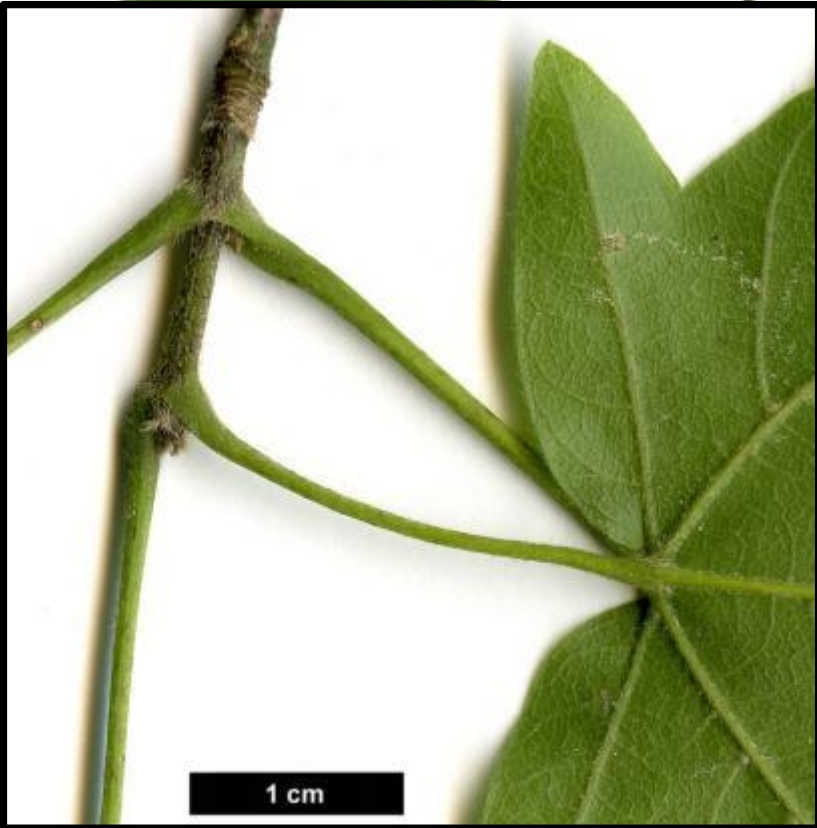
A. tsinglingense (*Lithocarpa*)

Group D

very lactiferous
shoot + petiole
pubescent
T-lobe acuminate

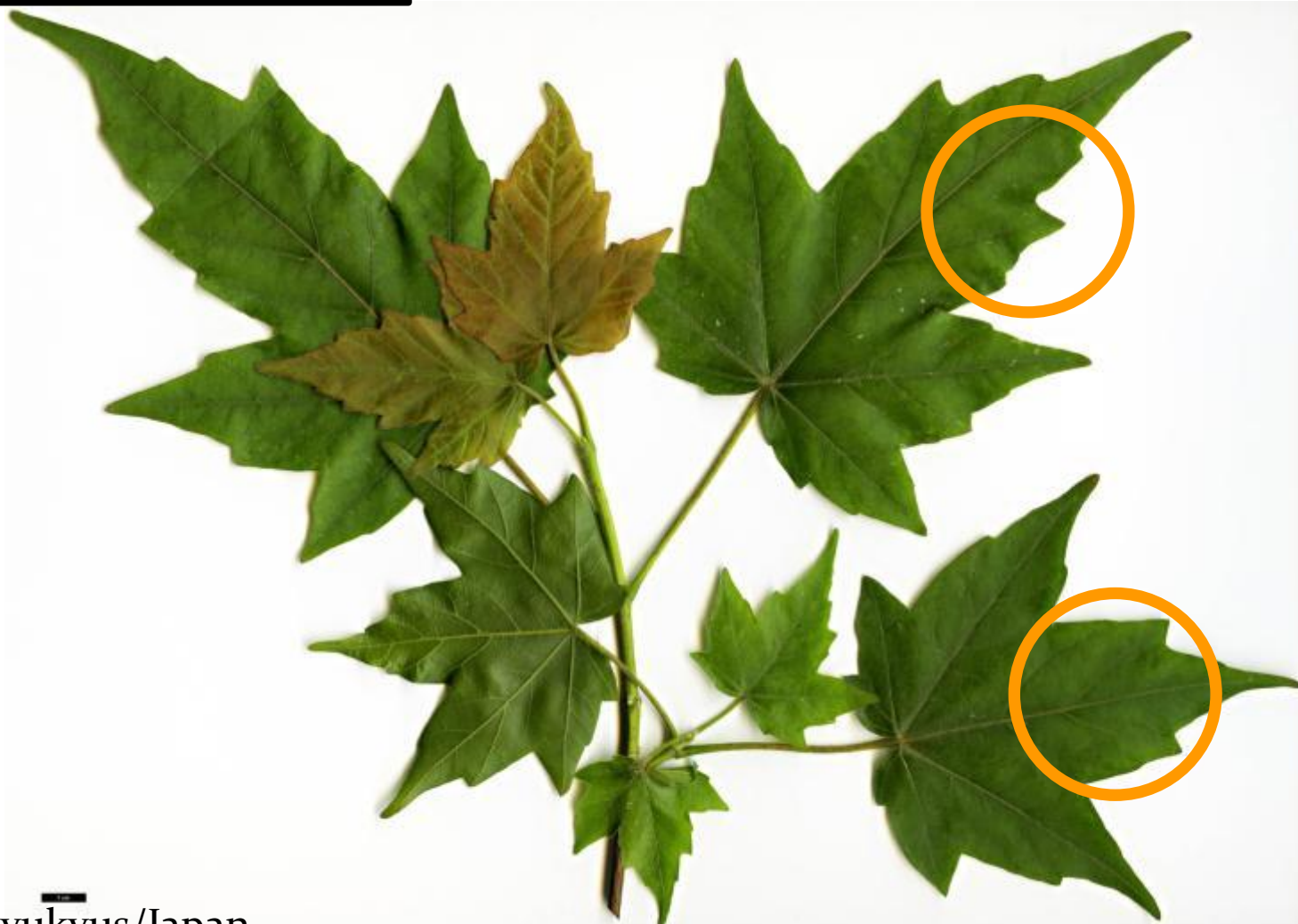


3-5-lobed
8-12 pairs
of
BSS



A. amamiense (*Lithocarpa*)

+/- lactiferous
T-lobe with
1-3 teeth/side



Group D



3-5-lobed
8-12 pairs
of
BSS

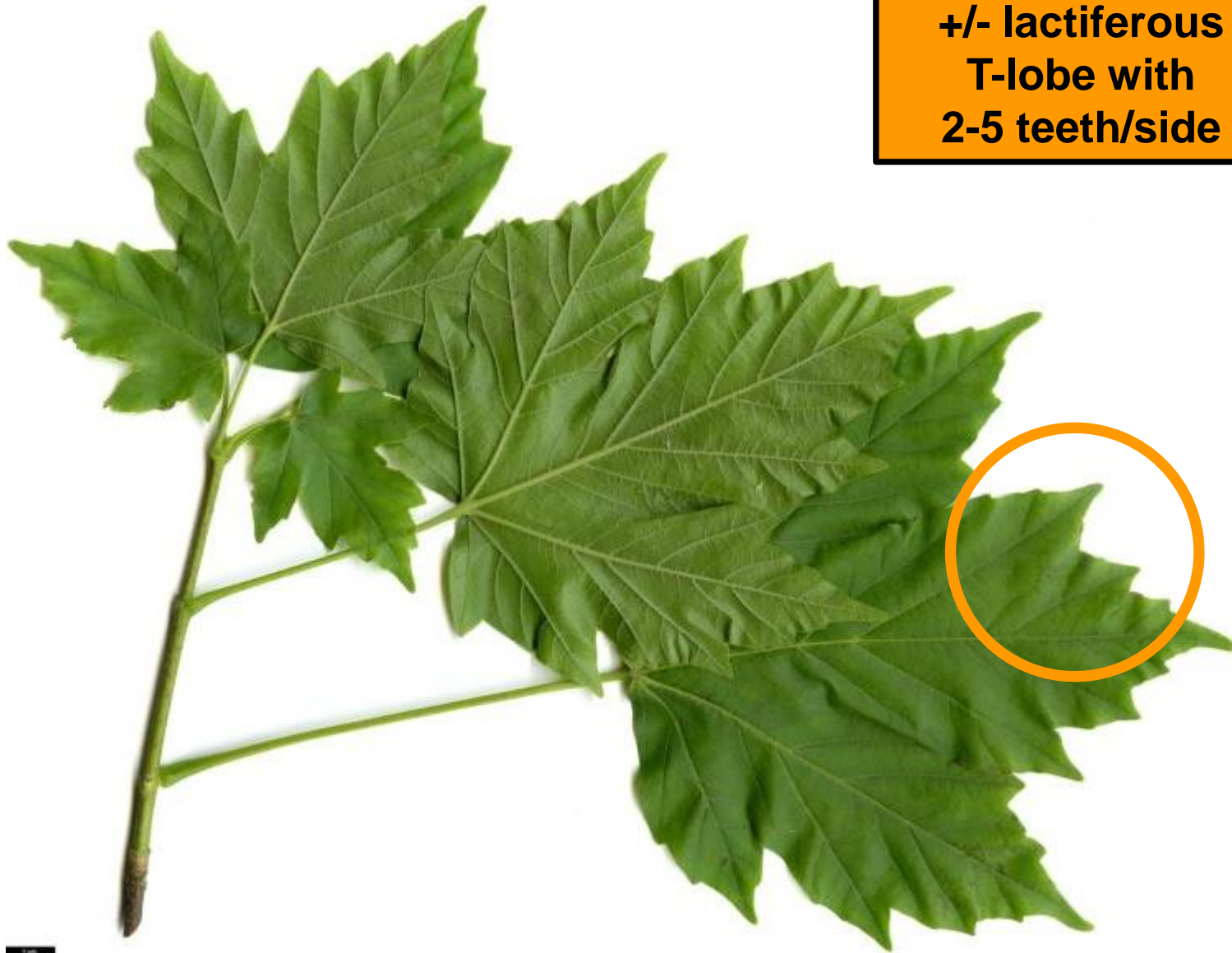
A. diabolicum (*Lithocarpa*)

Group D

+/- lactiferous
T-lobe with
2-5 teeth/side



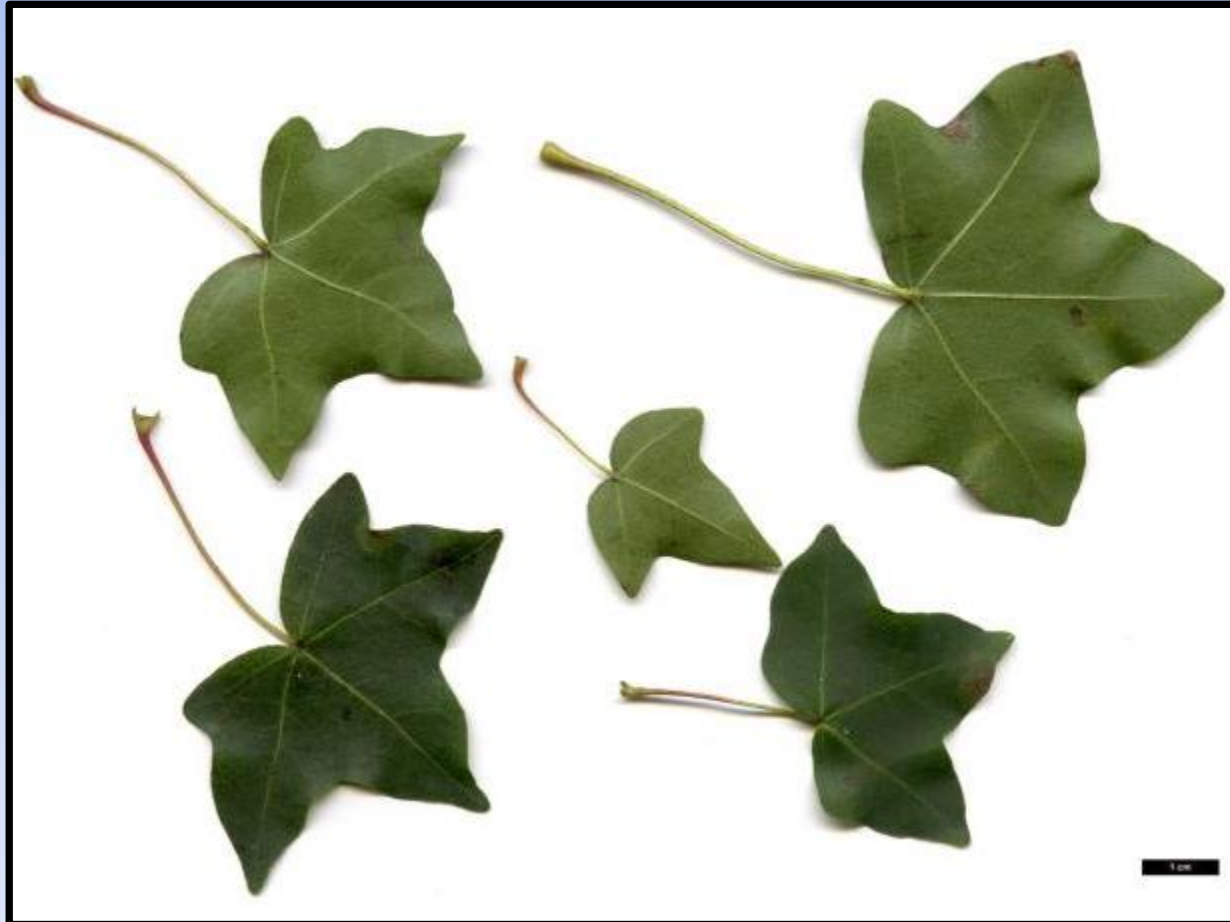
3-5-lobed
8-12 pairs
of
BSS



Japan

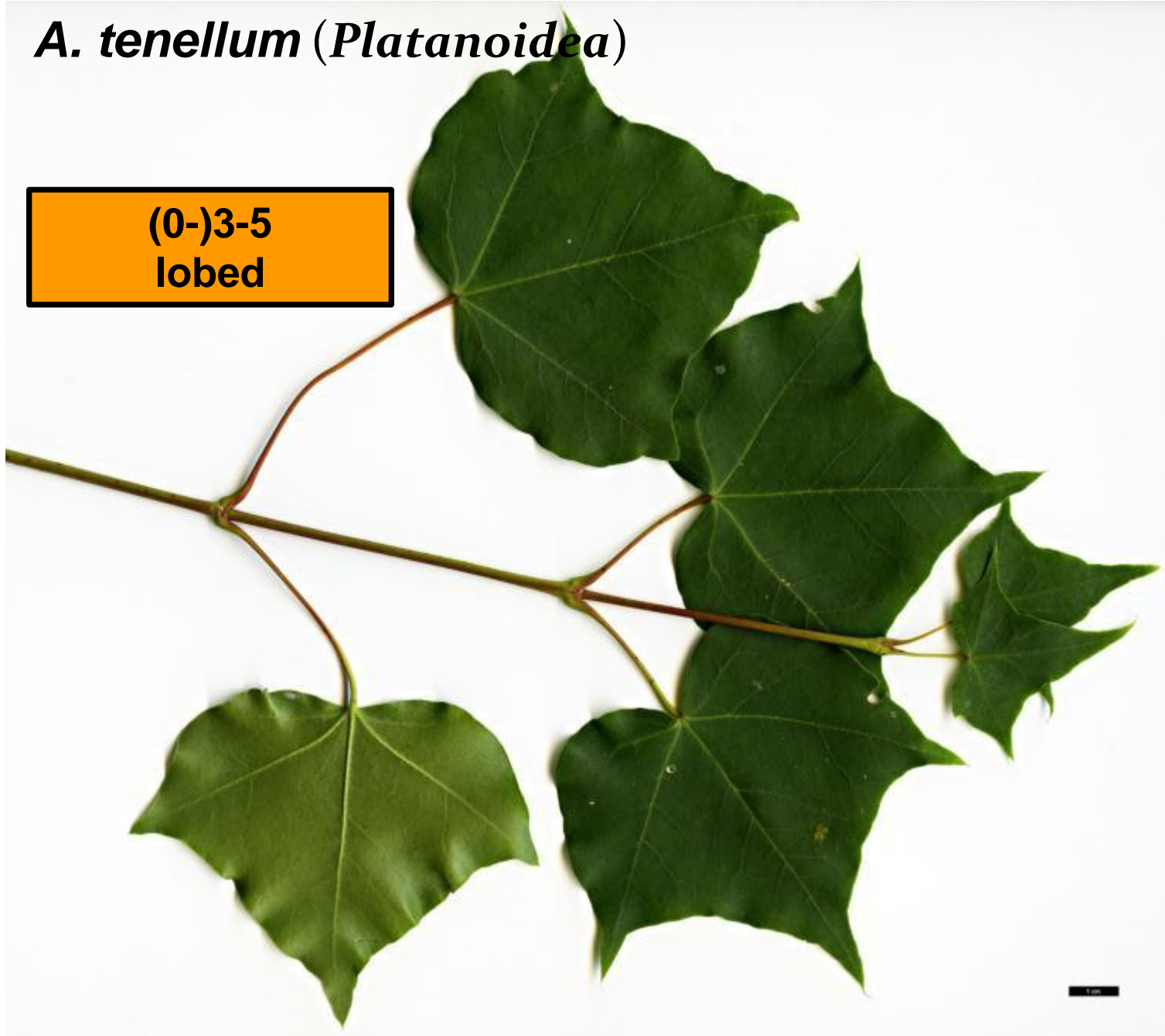
GROUP E

Well developed shoot at base with 5-8 pairs of bud scale scars AND lamina predominantly 3-5-lobed or 5-lobed.



A. tenellum (*Platanoidea*)

(0-)3-5
lobed



Group E



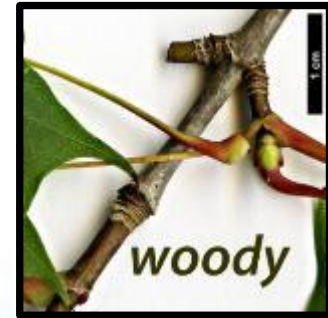
3-5-lobed
5-8 pairs
of
BSS

W Hubei, E and SE Sichuan

A. divergens (*Platanoides*)

Group E

midvein length
 ≤ 6 cm



3-5-lobed
5-8 pairs
of
BSS



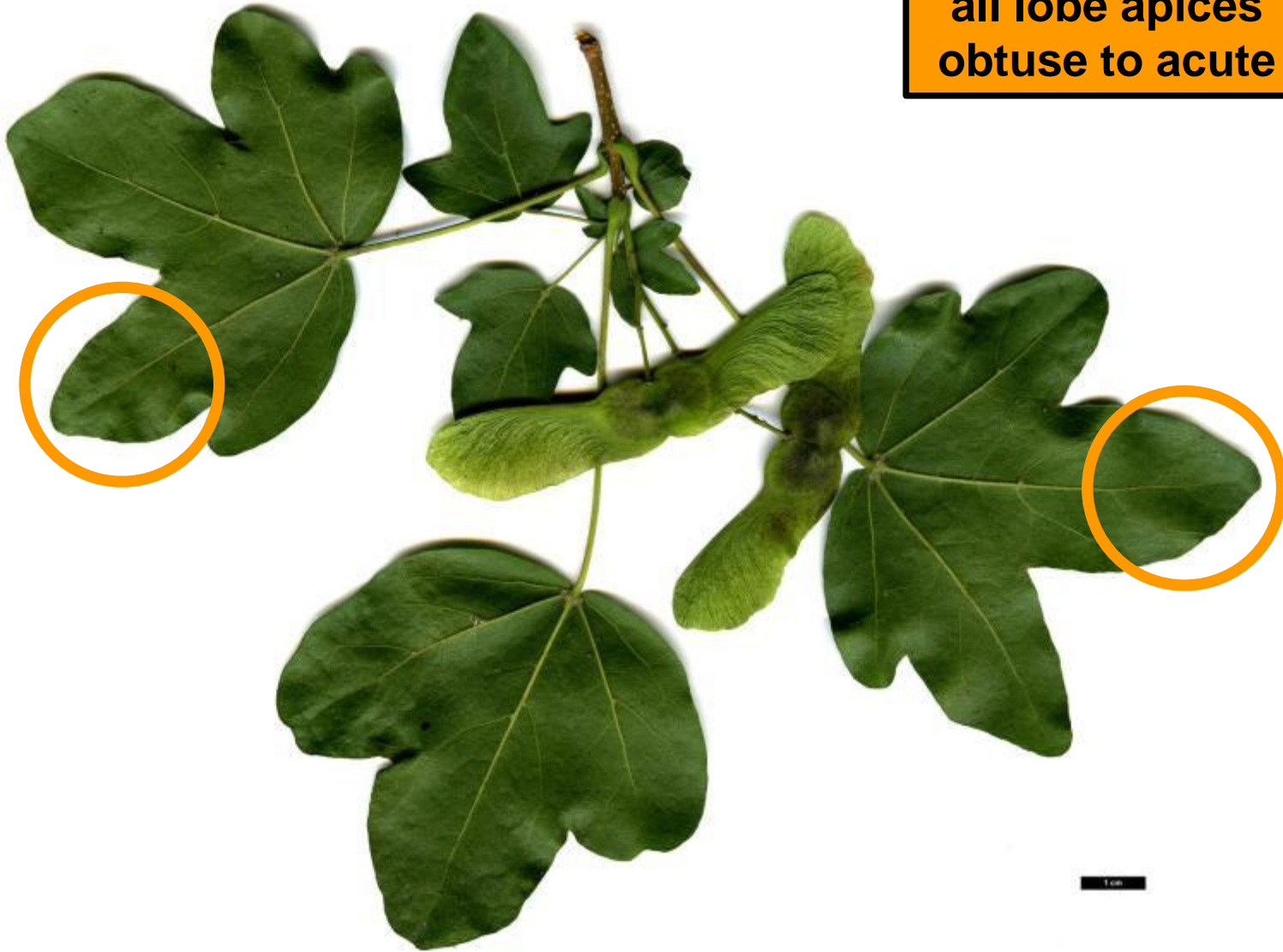
A. campestre (Platanoidea)

Group E

all lobe apices
obtuse to acute



3-5-lobed
5-8 pairs
of
BSS



Europe, Near East, N Africa

A. fulvescens (*Platanoides*)

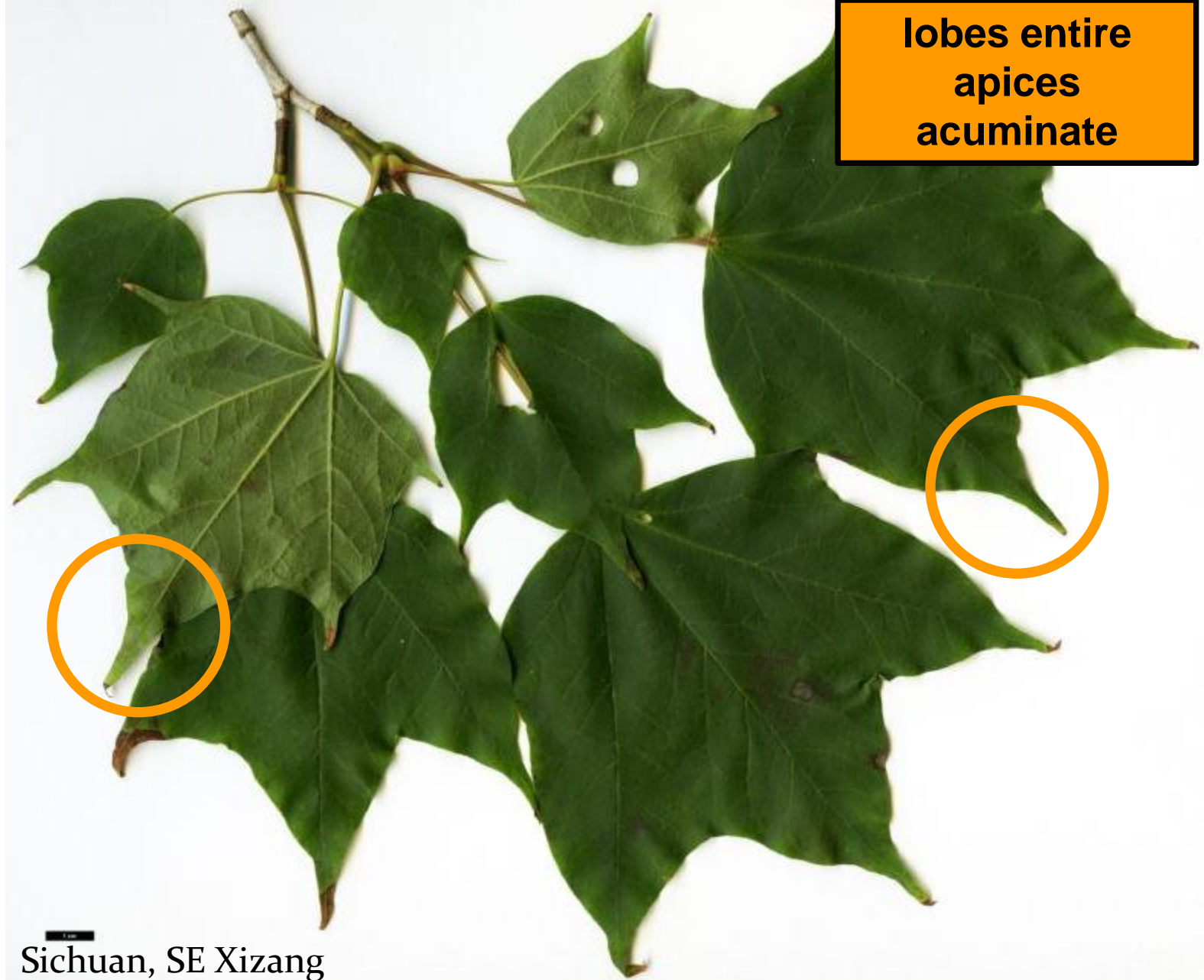
Group E

lobes entire
apices
acuminate



3-5-lobed
5-8 pairs
of
BSS

Sichuan, SE Xizang



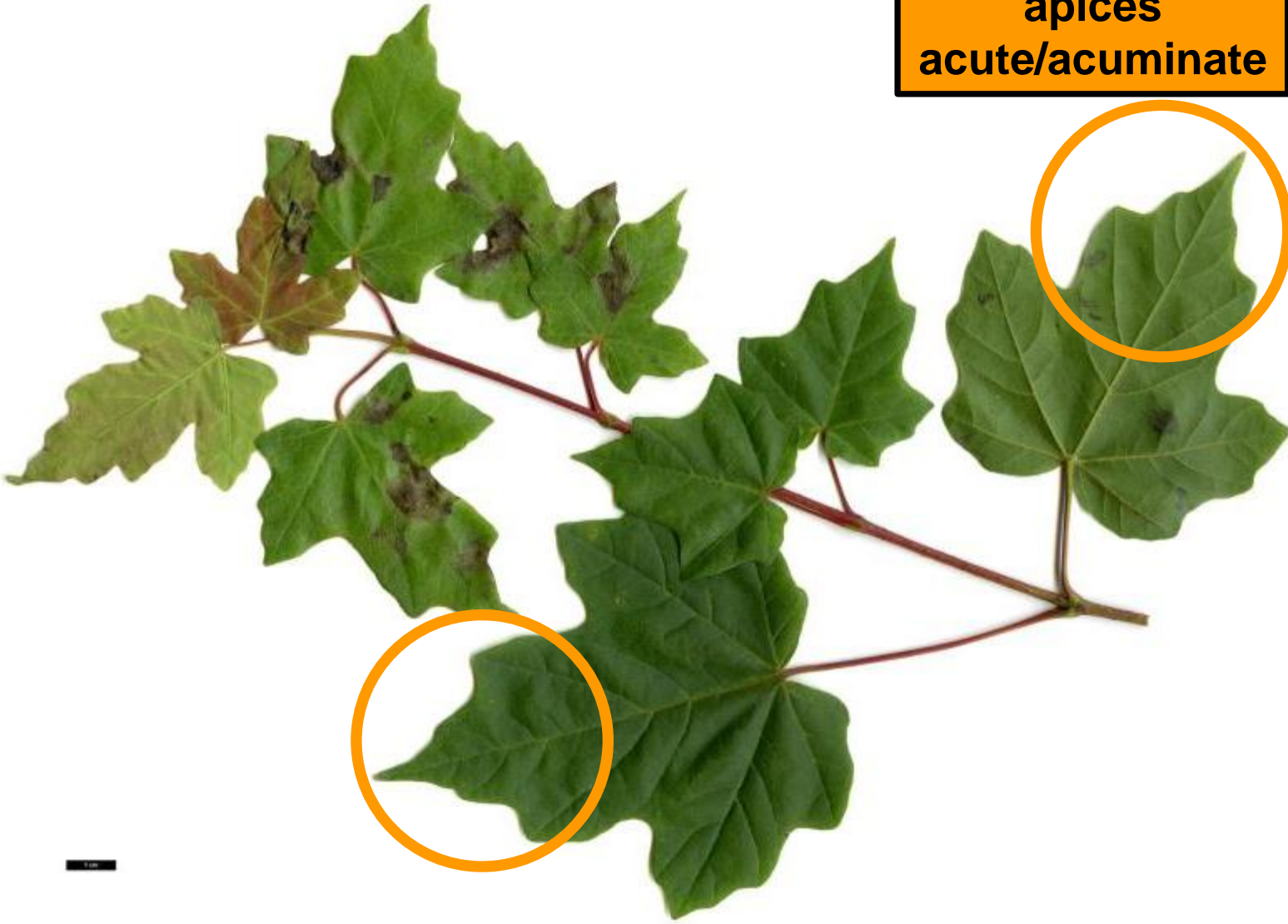
A. miaotaiense (Platanoidea)

Group E

lobes +/- dentate
apices
acute/acuminate



3-5-lobed
5-8 pairs
of
BSS



C China

A. miaotaiense (Platanoidea)

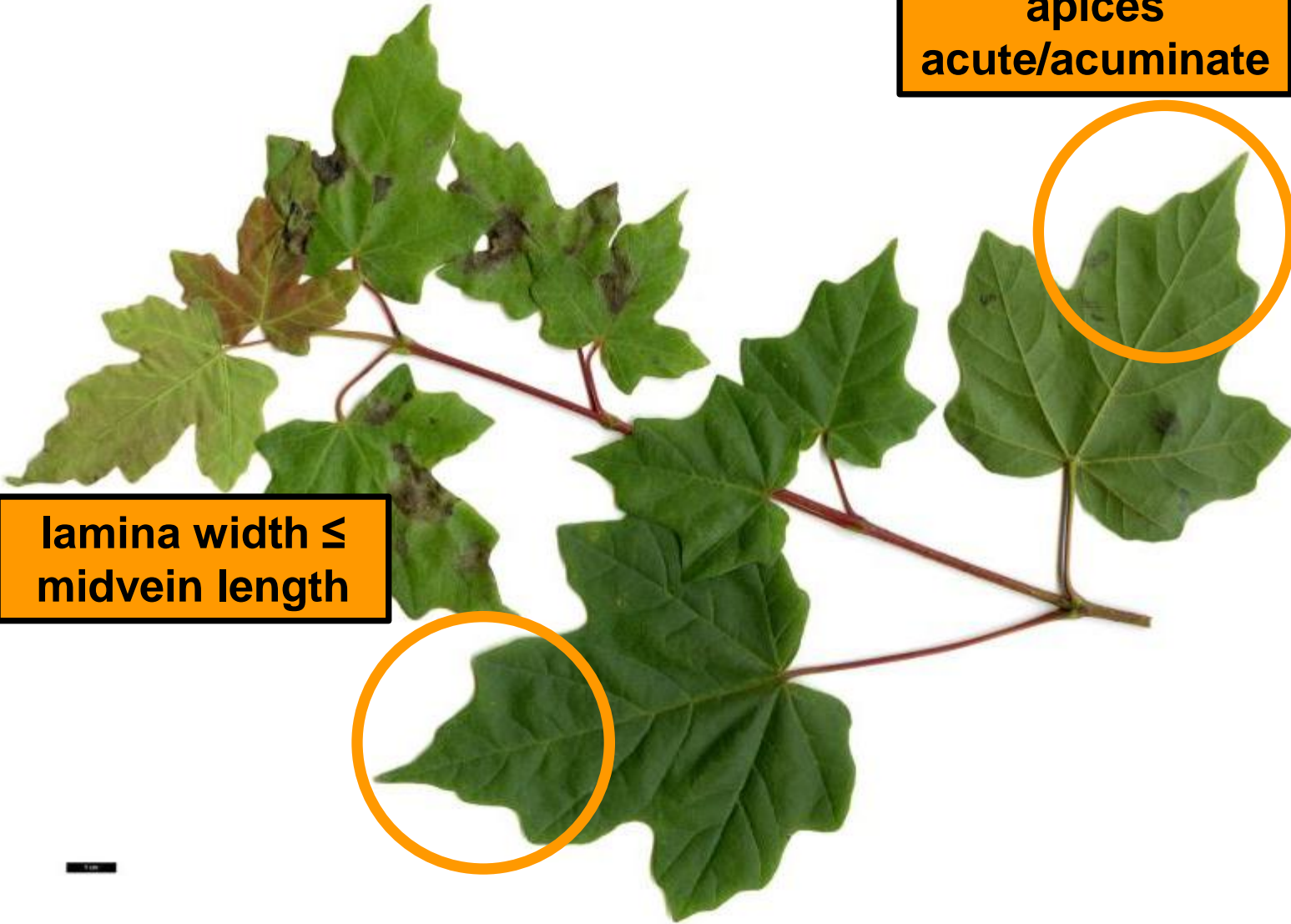
Group E

lobes +/- dentate
apices
acute/acuminate



3-5-lobed
5-8 pairs
of
BSS

lamina width \leq
midvein length



1 cm

C China

A. miyabei (Platanoides)

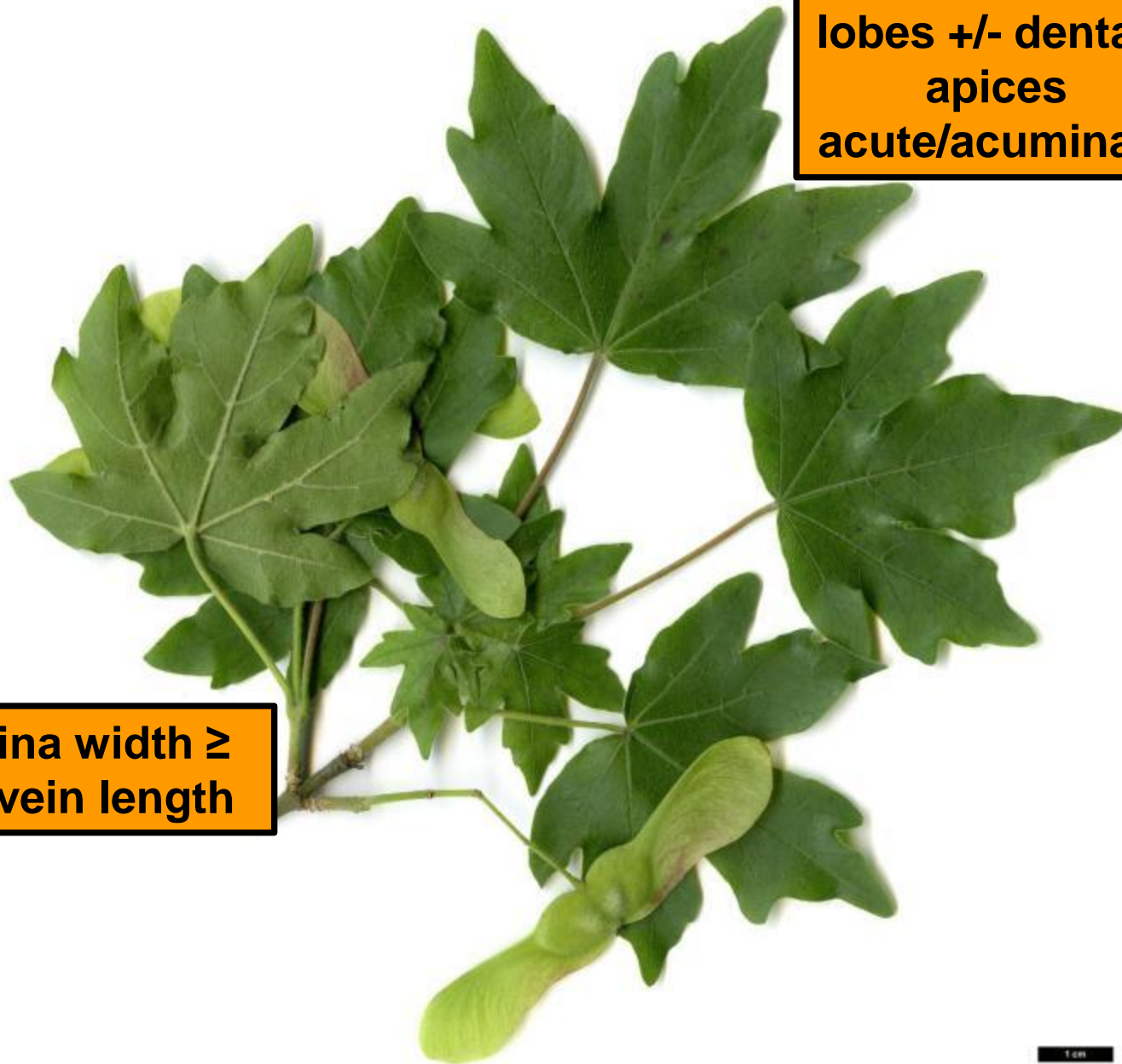
Group E

lobes +/- dentate
apices
acute/acuminate



3-5-lobed
5-8 pairs
of
BSS

lamina width \geq
midvein length



1cm

GROUP F
Lamina 5-9-lobed.

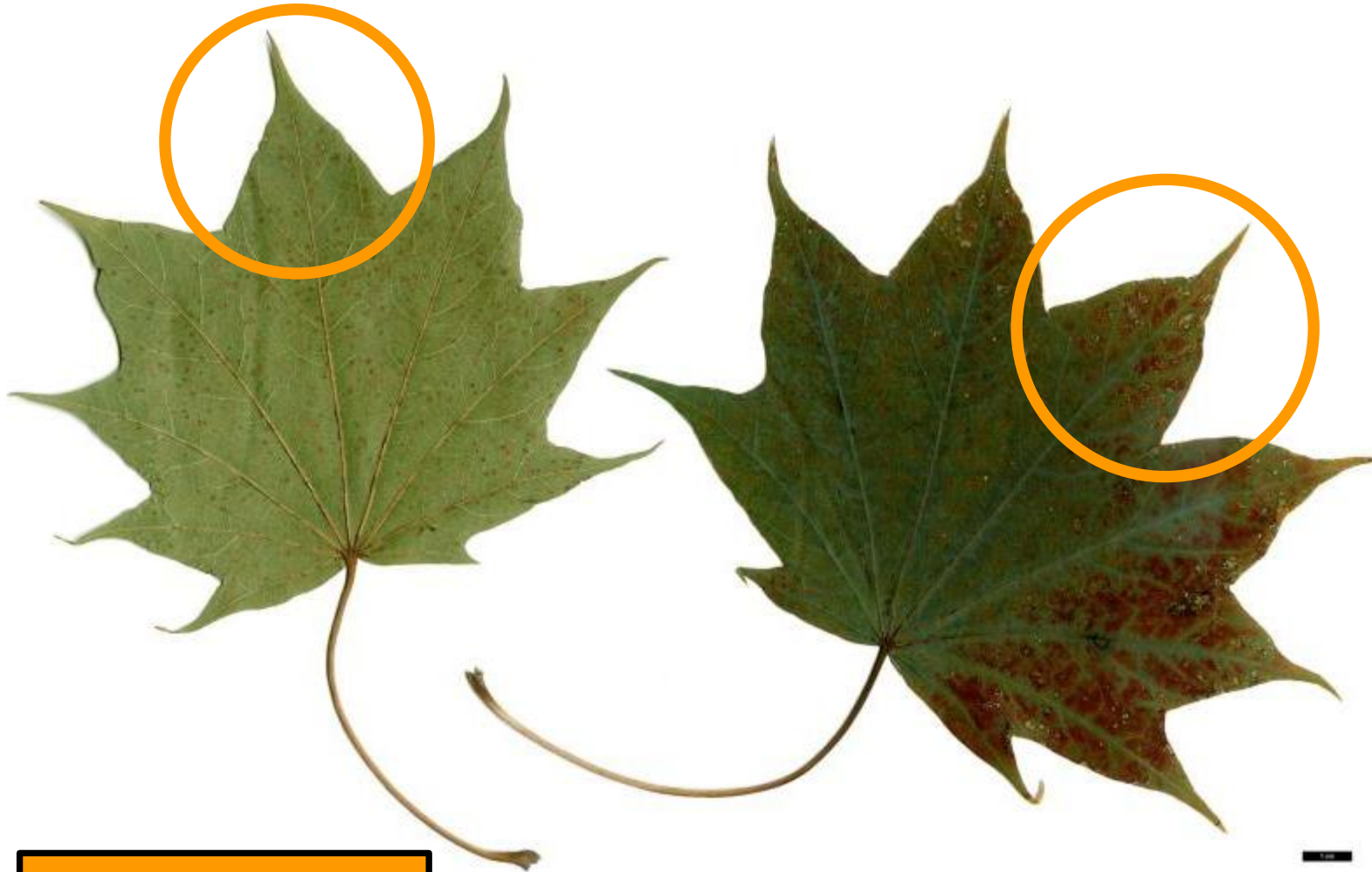


A. okamotoanum (*Platanioidea*)

Group F



7-9
lobed



lobe margin
entire

Ulleung-do (S Korea)

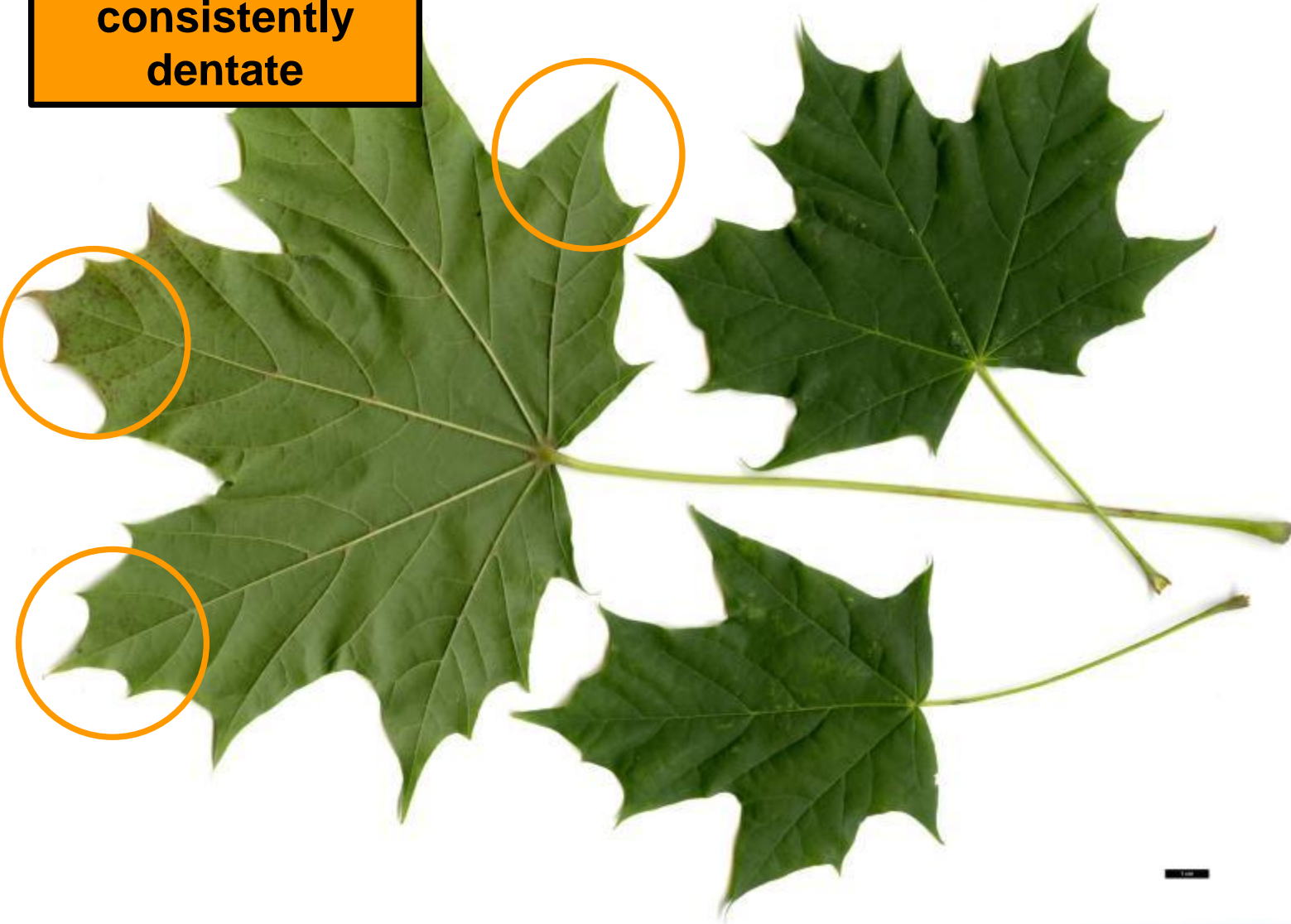
A. platanoides (*Platanioidea*)

lobe margin
consistently
dentate

Group F



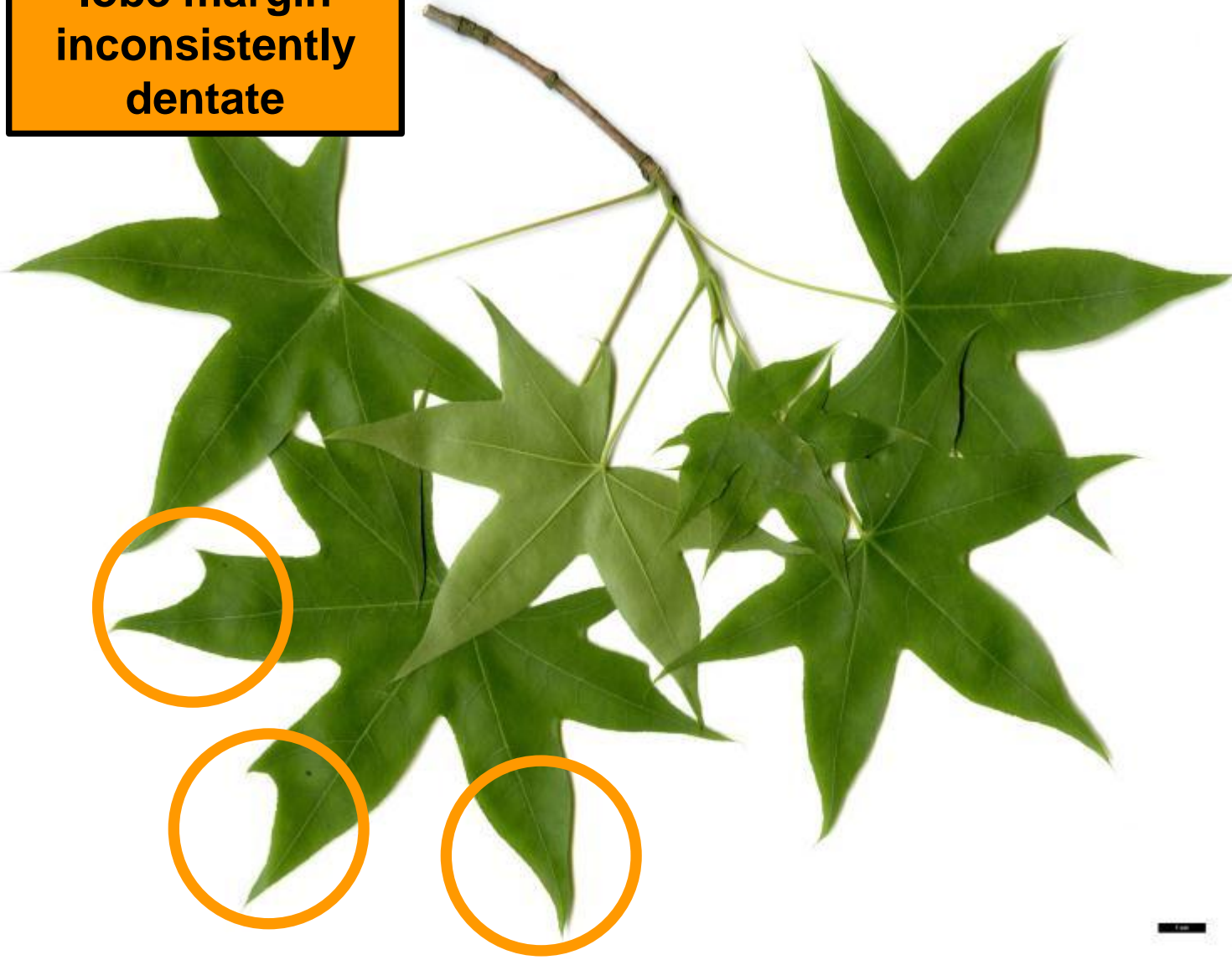
5-7
lobed



continental Europe

A. truncatum (*Platanoidea*)

lobe margin
inconsistently
dentate



Group F



lactiferous



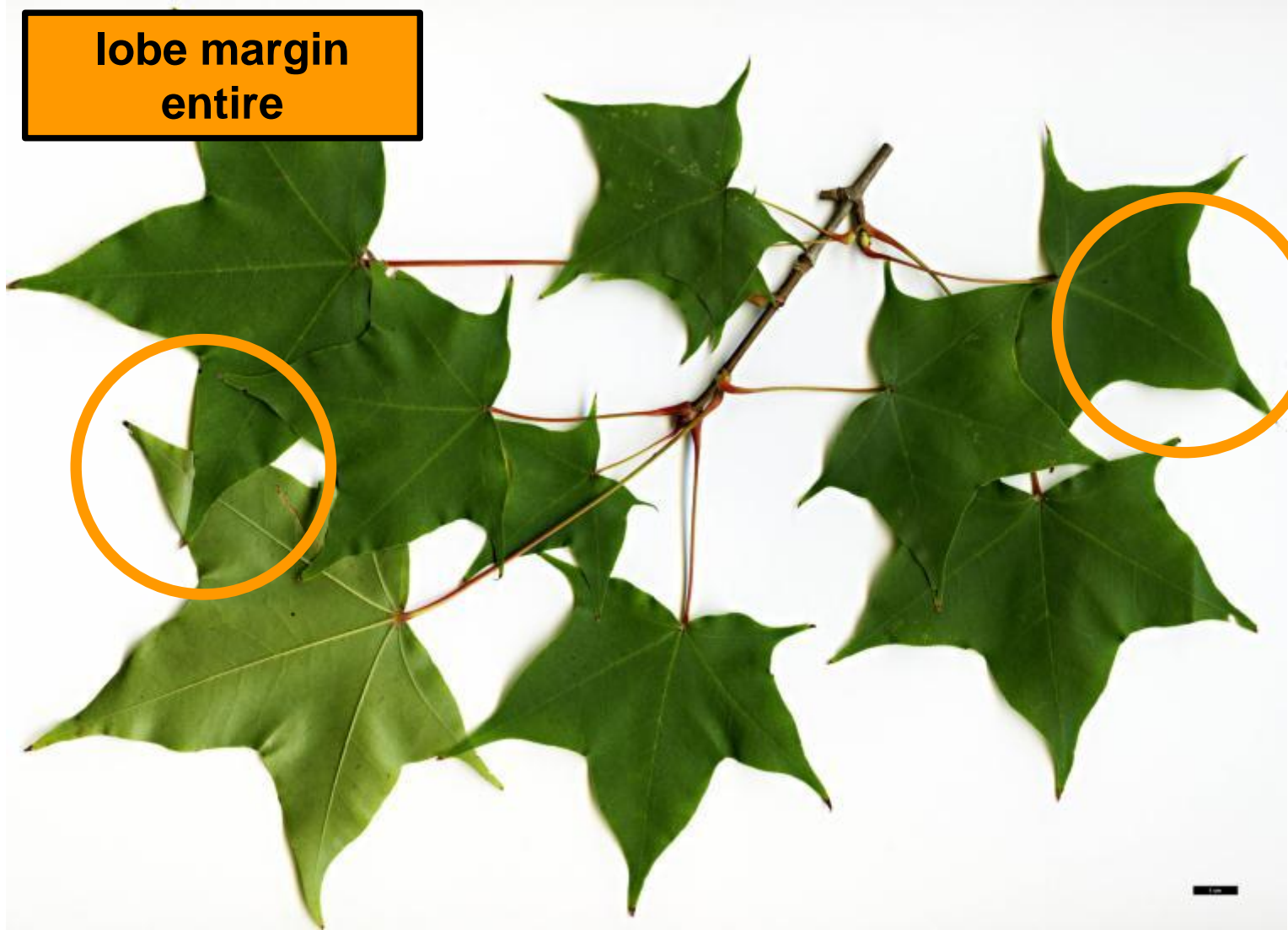
woody

5-7
lobed

A. pictum (*Platanoides*)

Group F

lobe margin
entire



5-7
lobed

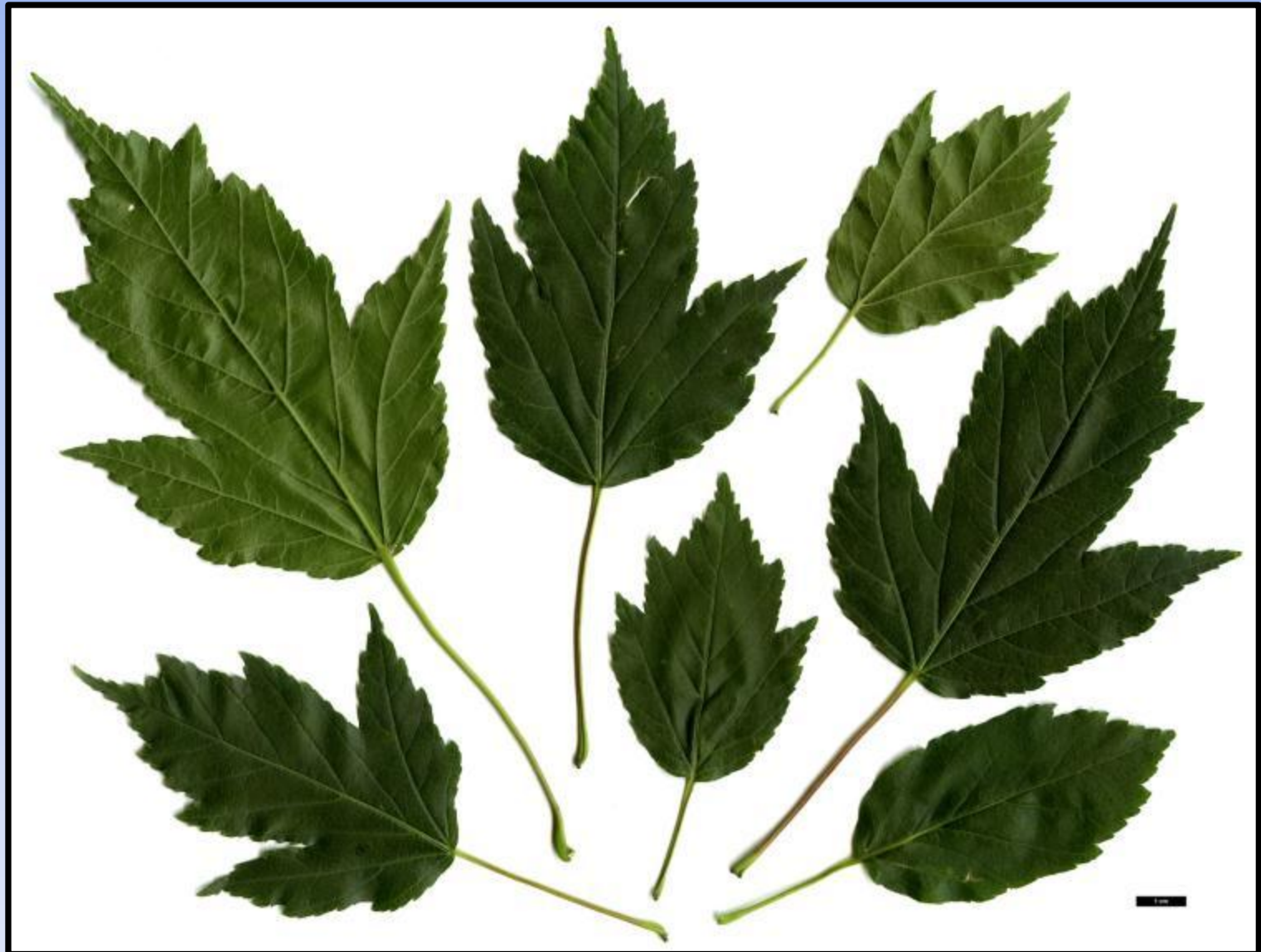
China, Japan, Korea, Mongolia, E Russia

Shoot at base with >4 pairs of bud scale scars ($10\times$ LENS).



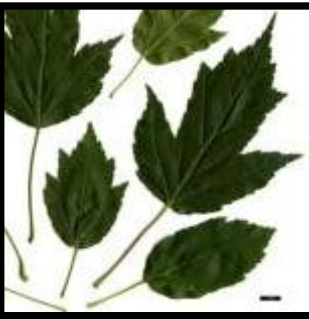
GROUP G

Lamina unlobed or 0-3-lobed, 5-lobed laminas absent.



A. carpinifolium (*Indivisa*)

Group G



secondary veins
15-25/side

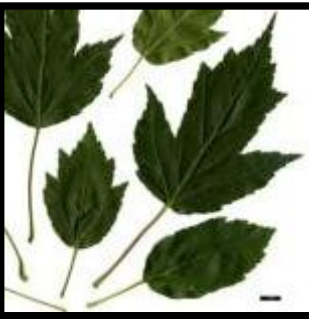
not
lobed

1cm

A. monspessulanum (Acer)

Group G

apex obtuse to acute
very long petiole



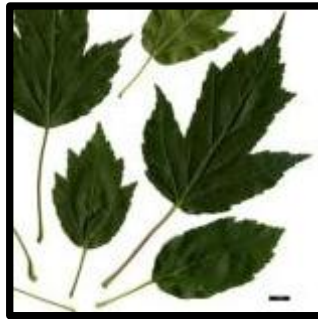
3-lobed

S and C Europe, N Africa Near East

A. yui (*Oblonga*)

Group G

apex obtuse to acute
very long petiole



3-lobed



S Gansu, NW Sichuan

A. yui (*Oblonga*)

Group G

apex obtuse to acute
very long petiole

petiole
pubescent



3-
lobed



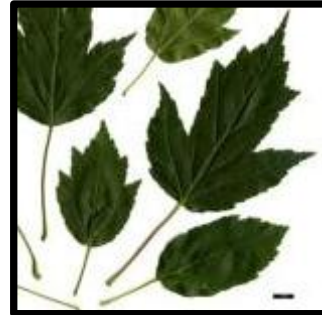
S Gansu, NW Sichuan

A. sempervirens (Acer)

apex obtuse to acute
short petiole
midvein length <4 cm



Group G



(0-)3-
lobed

E Mediterranean

A. obtusifolium (Acer)

apex obtuse to acute
short petiole
midvein length 4-6+ cm



Group G



(0-)3-
lobed

Turkey, Syria, Lebanon, Cyprus, Israël

A. pilosum (*Pubescentia*)

apex acute to acuminate
3-lobed
terminal lobe narrow



Group G



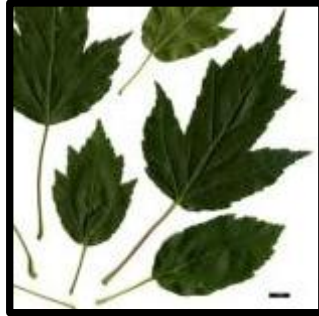
3-
lobed

Gansu, SW Nei Mongol, SE Ningxia, Shaanxi, Shanxi

A. tataricum (Ginnala)

apex acute to acuminate
0-3-lobed
terminal lobe wide

Group G



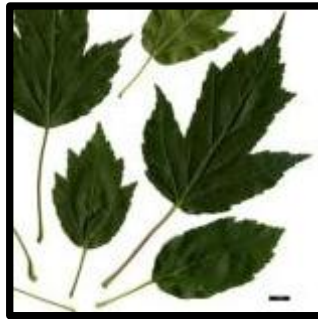
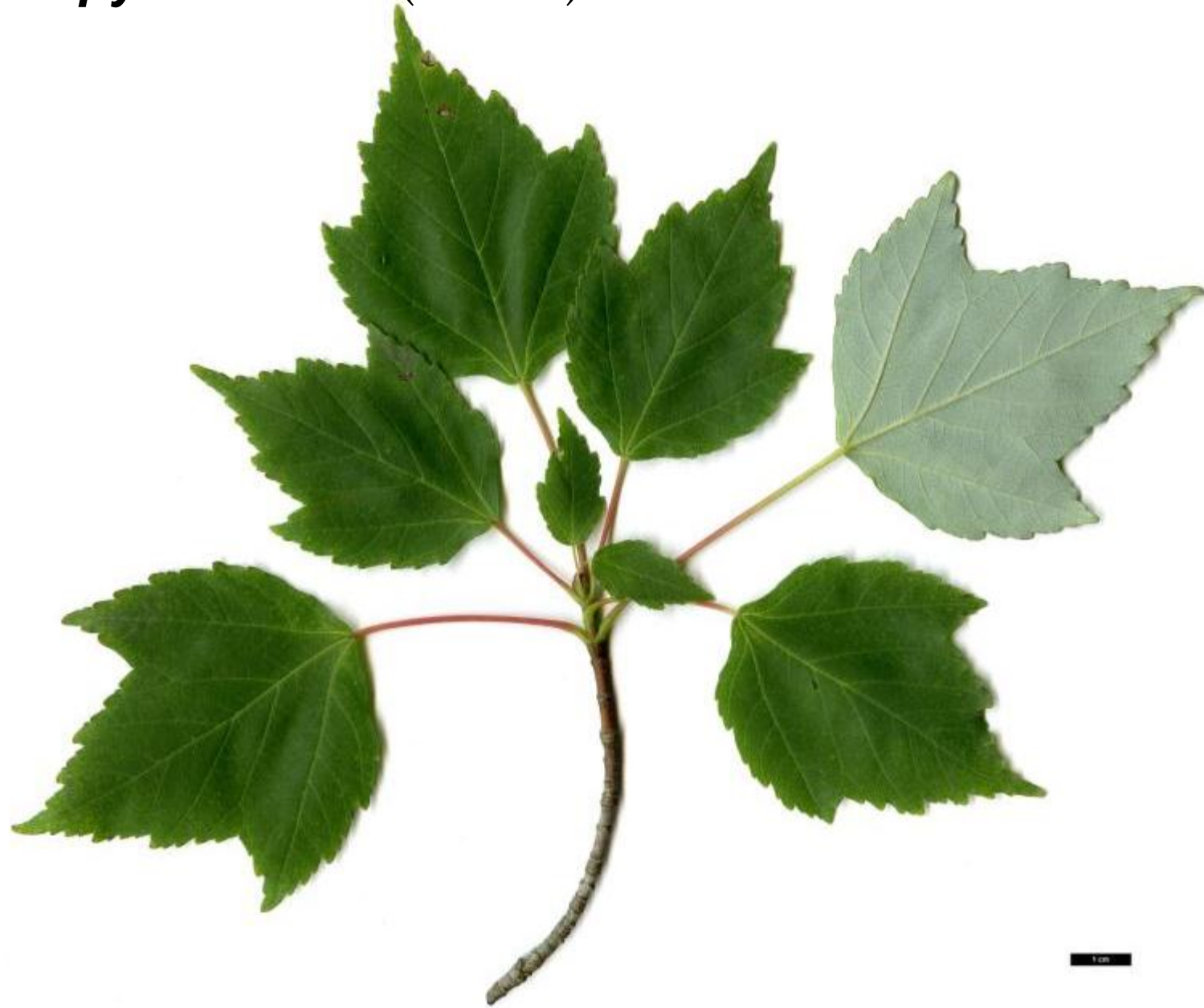
(0-)3-
lobed



China, Afghanistan, Japan, Korea, Mongolia, Russia, SW Asia, C and SE Europe

A. pycnanthum (Rubra)

Group G



3-
lobed

Japan

A. pycnanthum (*Rubra*)

lamina LS greyish green
margin coarsely serrate
>5 teeth >1 mm

Group G



3-lobed



1 cm

A. buergerianum (*Oblonga*)

Group G



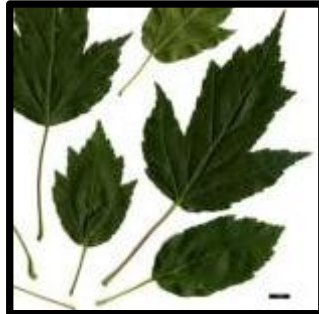
3-lobed

SW China, Japan, Taiwan

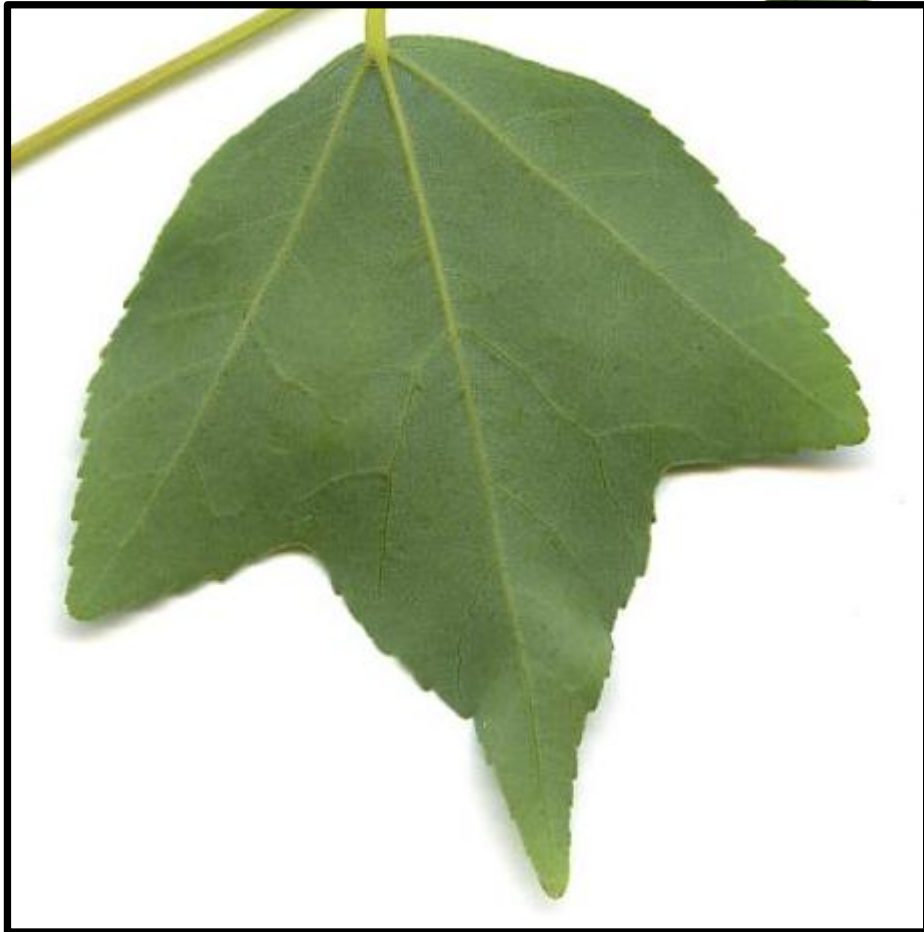
A. buergerianum (*Oblonga*)

lamina LS bluish green
margin finely serrate
teeth <1 mm

Group G



3-
lobed



GROUP H

Lamina 3-5- OR 5-7-lobed.

Terminal lobe predominantly with 6-numerous teeth/side.



A. pseudoplatanus (*Acer*)

Group H



terminal
lobe
 ≥ 6 teeth
per side

1 cm

Europe

A. pseudoplatanus (*Acer*)

Group H



terminal lobe ≥ 6 teeth per side

terminal bud green

Europe

A. saccharinum (*Rubra*)

Group H



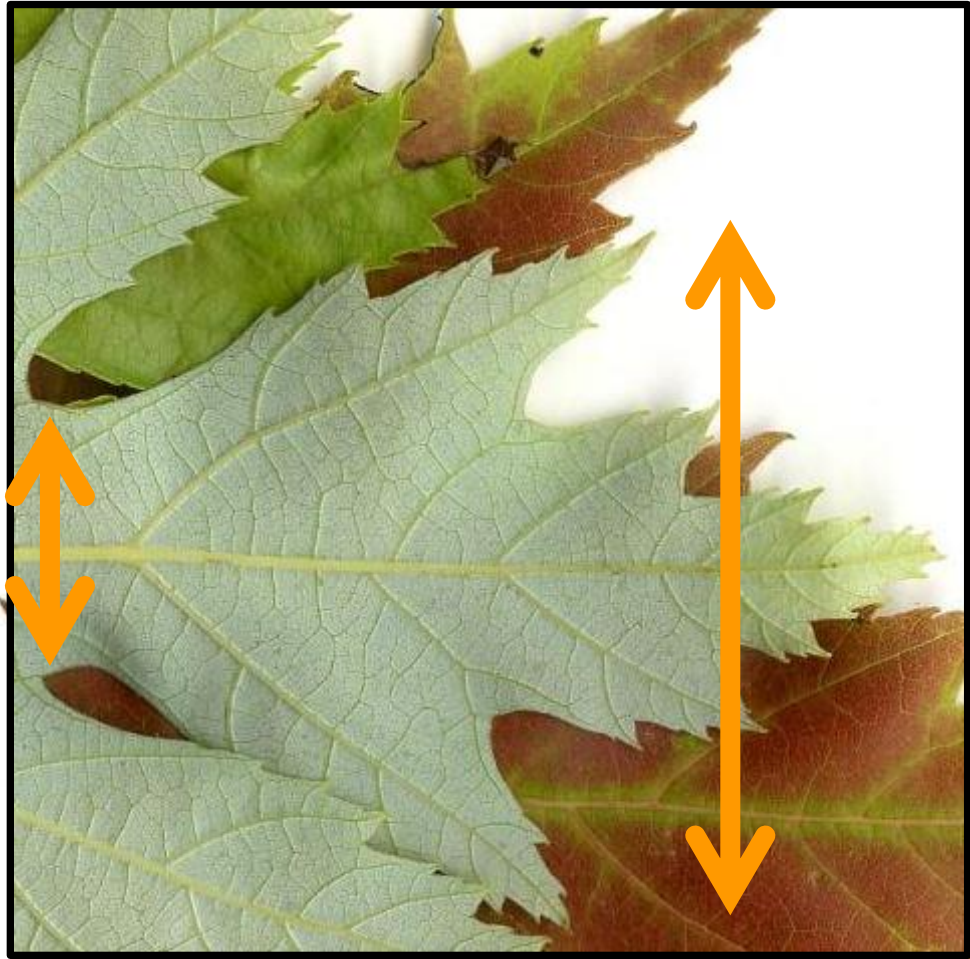
terminal lobe ≥ 6 teeth per side



eastern N America

A. saccharinum (*Rubra*)

Group H



**terminal lobe
largest width
above base**



**terminal
lobe
≥6 teeth
per side**



eastern N America

A. saccharinum (*Rubra*)

Group H

terminal lobe
largest width
above base



terminal
lobe
≥6 teeth
per side

U-shaped sinus
terminal/lateral lobe

A. heldreichii subsp. *macropterum* (Acer)

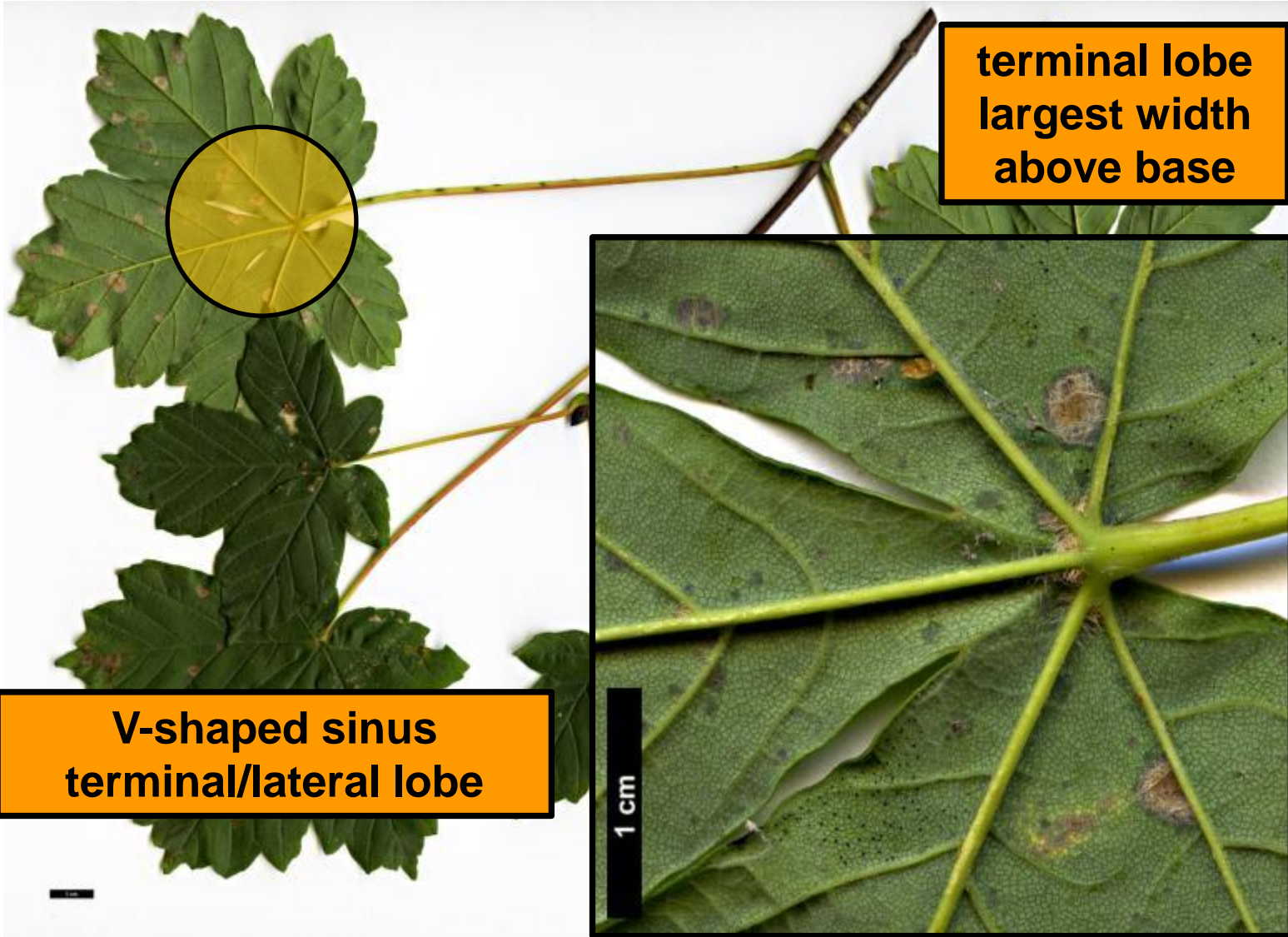
Group H



terminal
lobe
 ≥ 6 teeth
per side

A. heldreichii subsp. *macropterum* (*Acer*)

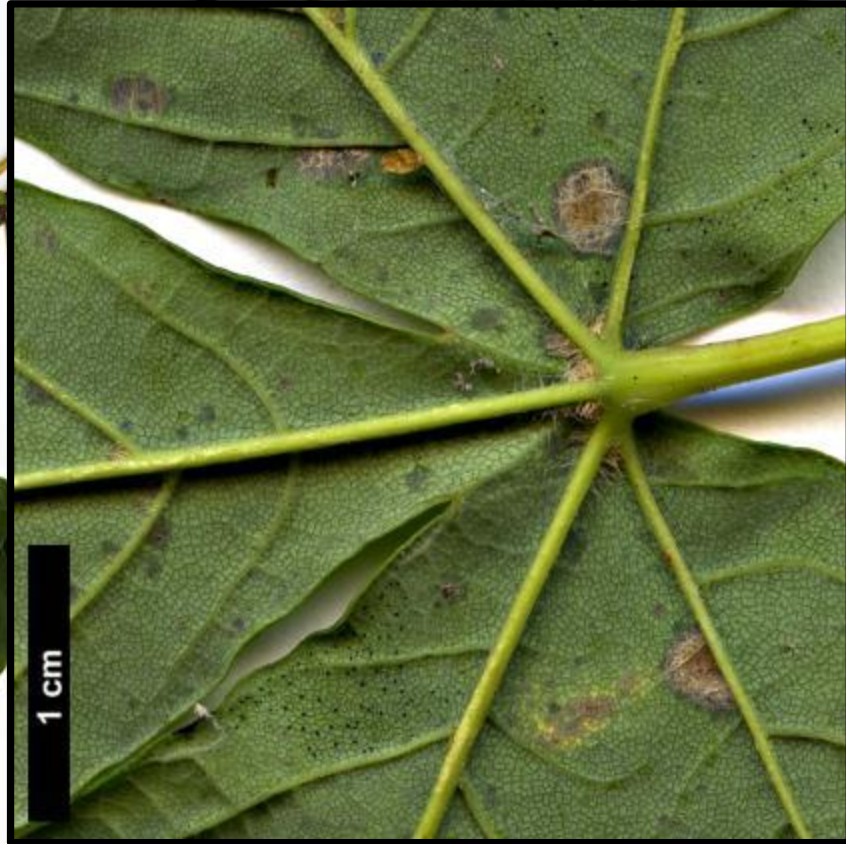
Group H



terminal lobe
largest width
above base

terminal
lobe
≥6 teeth
per side

V-shaped sinus
terminal/lateral lobe



A. sterculiaceum (*Lithocarpa*)

Group H



terminal
lobe
 ≥ 6 teeth
per side



S Xizang, NW Yunnan, Bhutan, N India

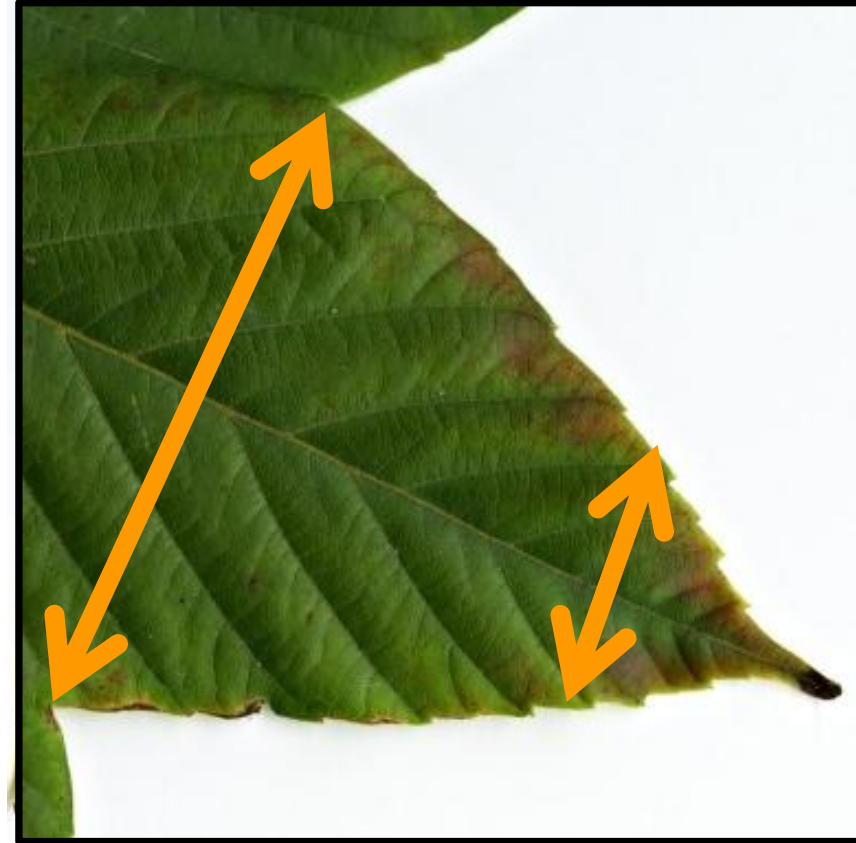
A. sterculiaceum (*Lithocarpa*)

Group H

terminal lobe
largest width
at base



terminal
lobe
 ≥ 6 teeth
per side



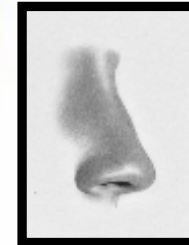
A. sterculiaceum (*Lithocarpa*)

Group H

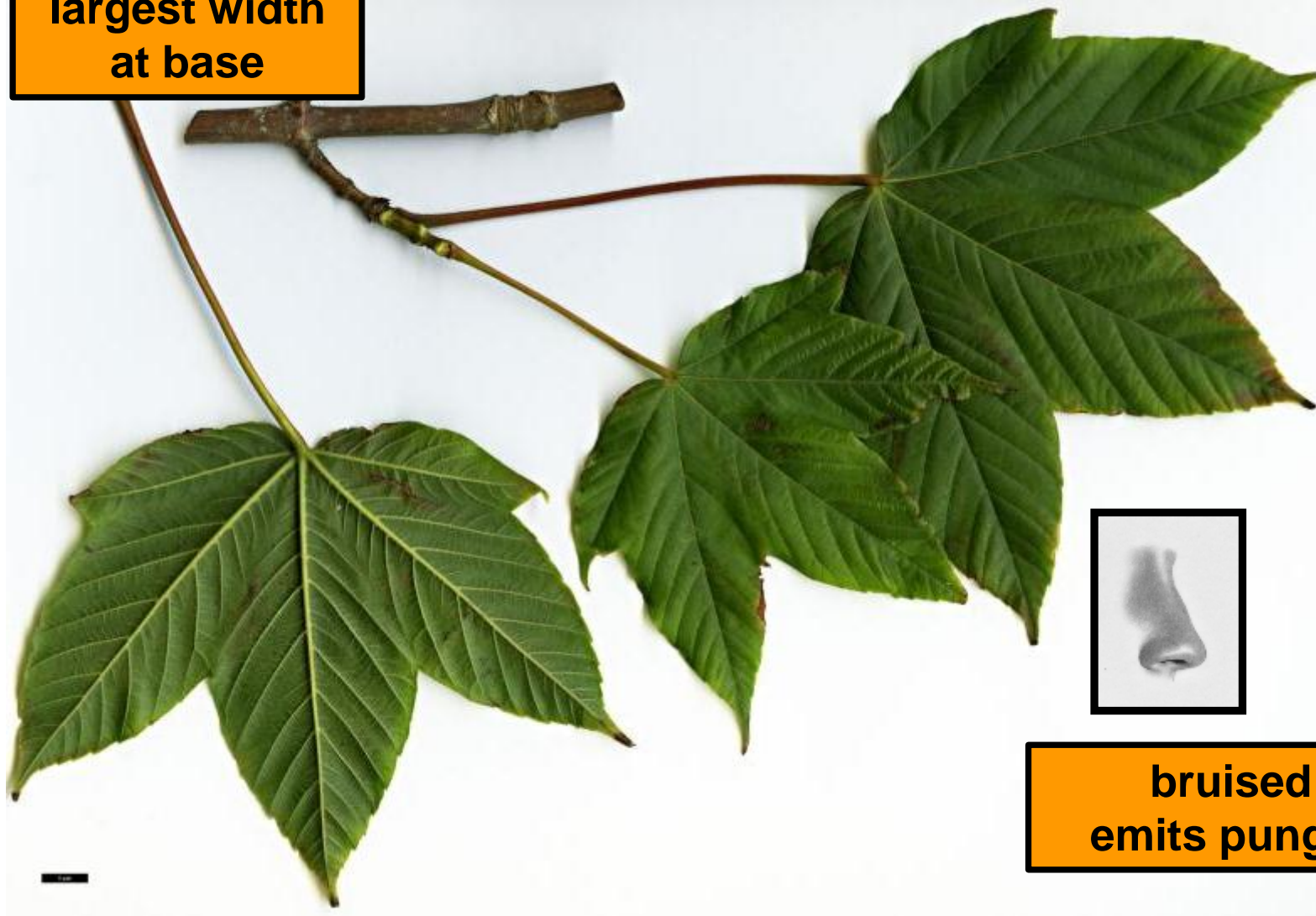
terminal lobe
largest width
at base



terminal
lobe
 ≥ 6 teeth
per side



bruised lamina
emits pungent scent



1 cm

S Xizang, NW Yunnan, Bhutan, N India

A. caesium subsp. *giraldii* (*Acer*)

terminal lobe
largest width
at base

Group H



terminal
lobe
 ≥ 6 teeth
per side



China, N India, Nepal, Pakistan

A. caesium subsp. *giraldii* (Acer)

Group H

terminal lobe
largest width
at base

lobe apices +/- caudate
shoot bloomed



terminal
lobe
≥6 teeth
per side



China, N India, Nepal, Pakistan

A. velutinum (Acer)

Group H



terminal
lobe
 ≥ 6 teeth
per side

1 cm

Caucasus, Iran

A. velutinum (Acer)

Group H

terminal lobe
largest width
+/- at base

bud brownish
lamina Ø 15-30 cm



terminal
lobe
≥6 teeth
per side

A. rubrum (*Rubra*)

terminal lobe
largest width
+/- at base

bud green/red
lamina <15 cm

Group H



terminal
lobe
 ≥ 6 teeth
per side



eastern N America

GROUP I

Lamina 3-5- OR 5-7-lobed.

Terminal lobe predominantly with few: 0-6 teeth/side.



A. heldreichii subsp. *heldreichii* (Acer)

terminal lobe slender

Group I



terminal
lobe
0-6 teeth
per side



Balkan, Greece

A. saccharum (*Acer*)

Group I

lobe apices acuminate
midvein length >10 cm



terminal
lobe
0-6 teeth
per side



Canada, Mexico, USA

A. nigrum (Acer)

Group I

lobe apices acuminate
midvein length >10 cm



terminal
lobe
0-6 teeth
per side



Canada, USA

A. nigrum (Acer)

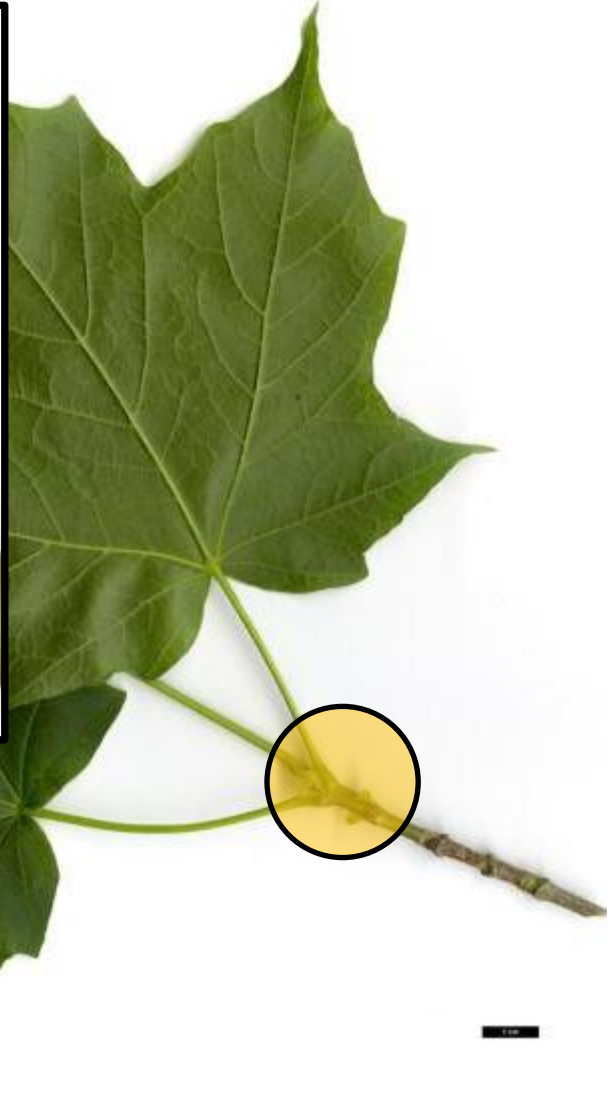
Group I

**petiole base
stipulate**

**lobe apices acuminate
midvein length >10 cm**



**terminal
lobe
0-6 teeth
per side**



A. skutchii (Acer)

Group I

lobe apices acuminate
midvein length >10 cm



terminal
lobe
0-6 teeth
per side

1 cm

Guatemala, Mexico

A. skutchii (Acer)

Group I

lobe apices acuminate
midvein length >10 cm

petiole thick
+ pubescent



terminal
lobe
0-6 teeth
per side

1 cm



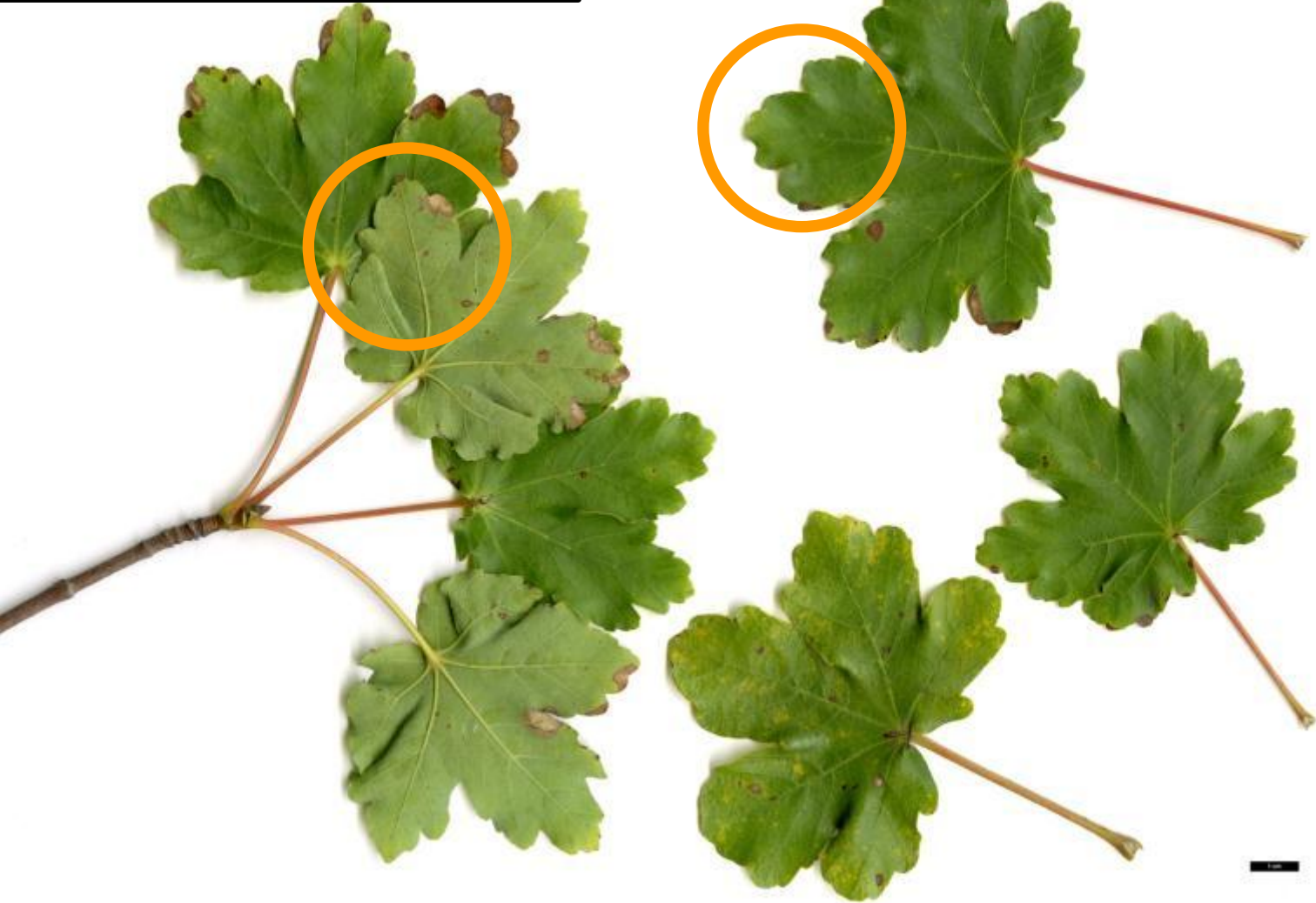
A. granatense (Acer)

lobe apices
obtuse to acute

Group I



terminal
lobe
0-6 teeth
per side



N Africa SE Iberica

A. granatense (Acer)

Group I

**lobe apices
obtuse to acute**

**petiole \geq midvein length
T-lobe $\geq 1/2$ midvein length**



**terminal
lobe
0-6 teeth
per side**



N Africa SE Iberica

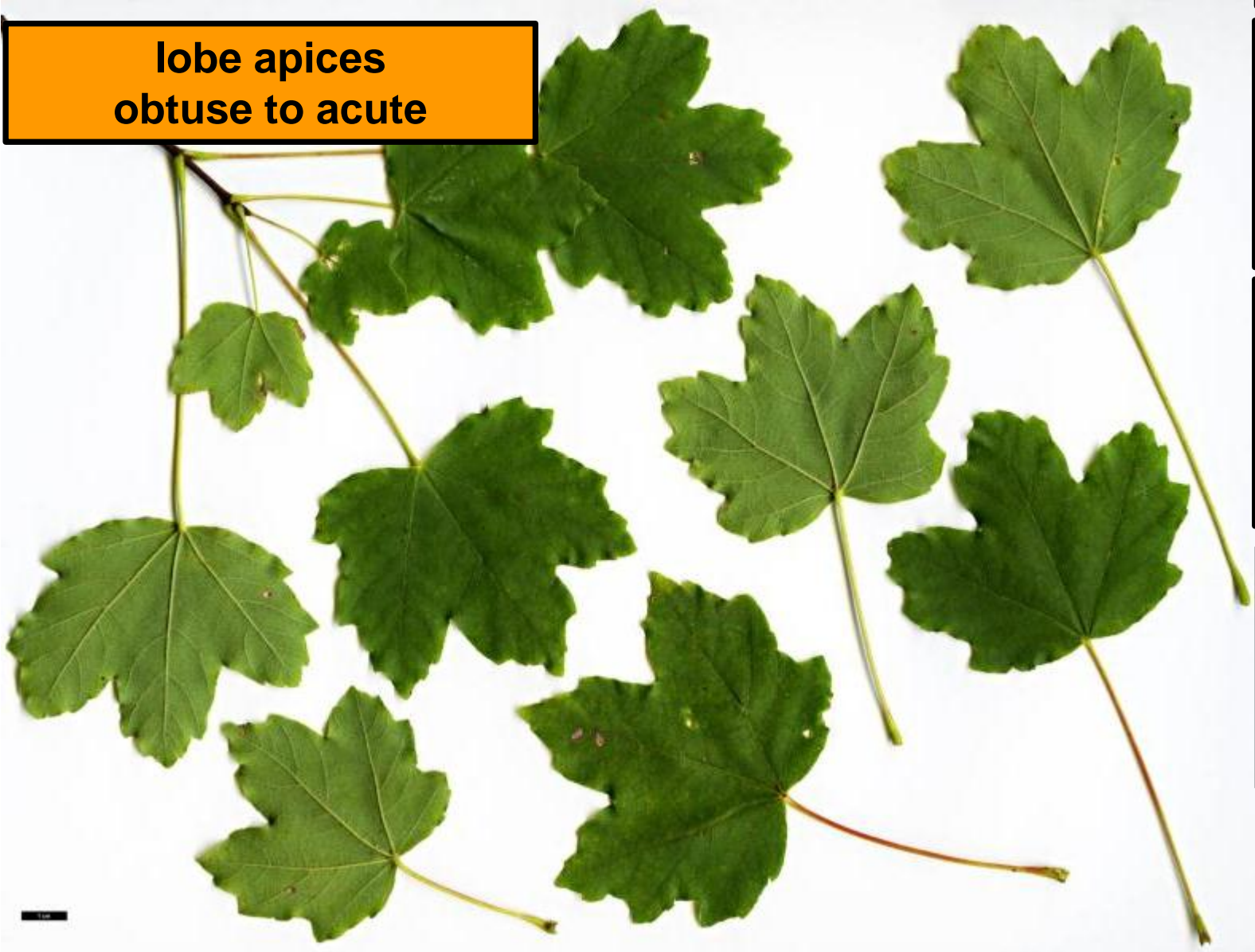
A. hyrcanum (*Acer*)

Group I

lobe apices
obtuse to acute



terminal
lobe
0-6 teeth
per side



SE Europe

A. hyrcanum (*Acer*)

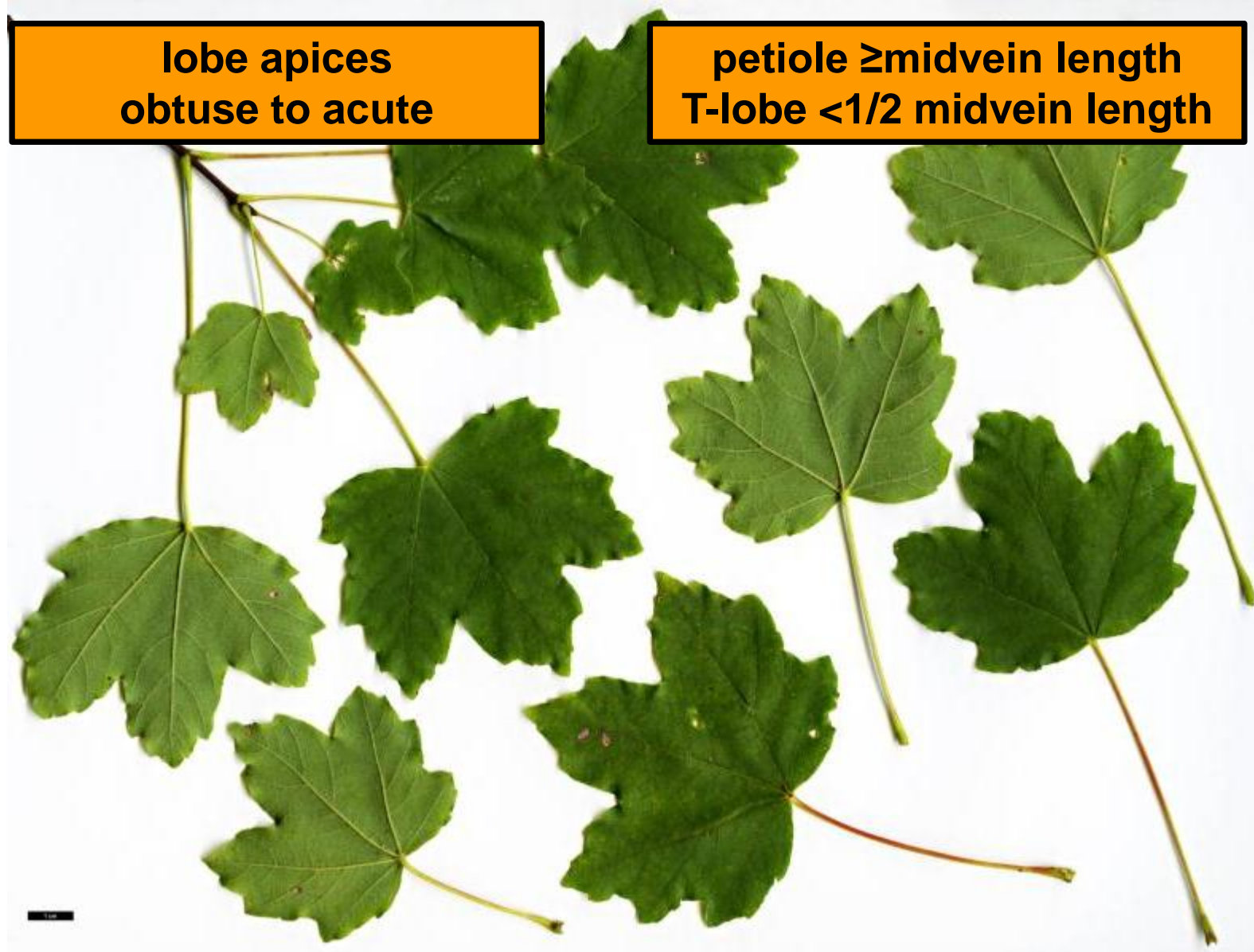
Group I

lobe apices
obtuse to acute

petiole \geq midvein length
T-lobe $< 1/2$ midvein length



terminal
lobe
0-6 teeth
per side



SE Europe

A. opalus subsp. *obtusatum* (*Acer*)

Group I

lobe apices
obtuse to acute

petiole < midvein length
T-lobe < 1/2 midvein length



terminal
lobe
0-6 teeth
per side



C and E Europe

A. grandidentatum (*Acer*)

Group I

lobe apices +/- acute
lamina LS greyish

petiole predominantly
< midvein length



terminal
lobe
0-6 teeth
per side

USA (Oklahoma, Texas, Arizona, Montana)

A. leucoderme (*Acer*)

Group I

T-lobe acuminate/caudate
lamina LS green

petiole predominantly
< midvein length



terminal
lobe
0-6 teeth
per side



USA (Alabama, Arkansas, Florida, Georgia, Louisiana, N and S Carolina)

Shoot at base with 2-4 pairs of bud scale scars (10× LENS).

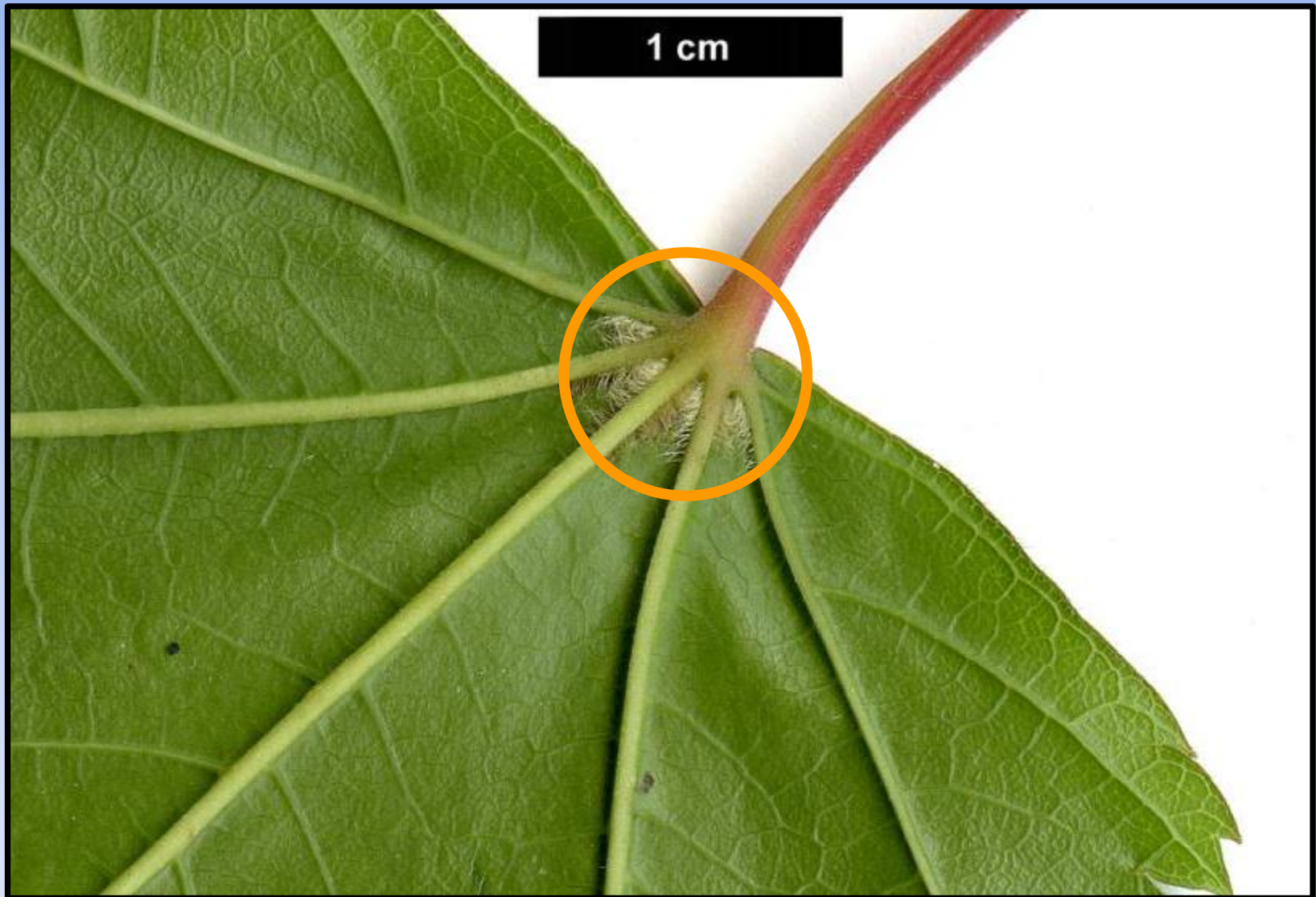


Bud stipitate (10× LENS).



GROUP J

Lamina LS basal vein axils without membranous pockets.



A. distylum (*Parviflora*)

Group J

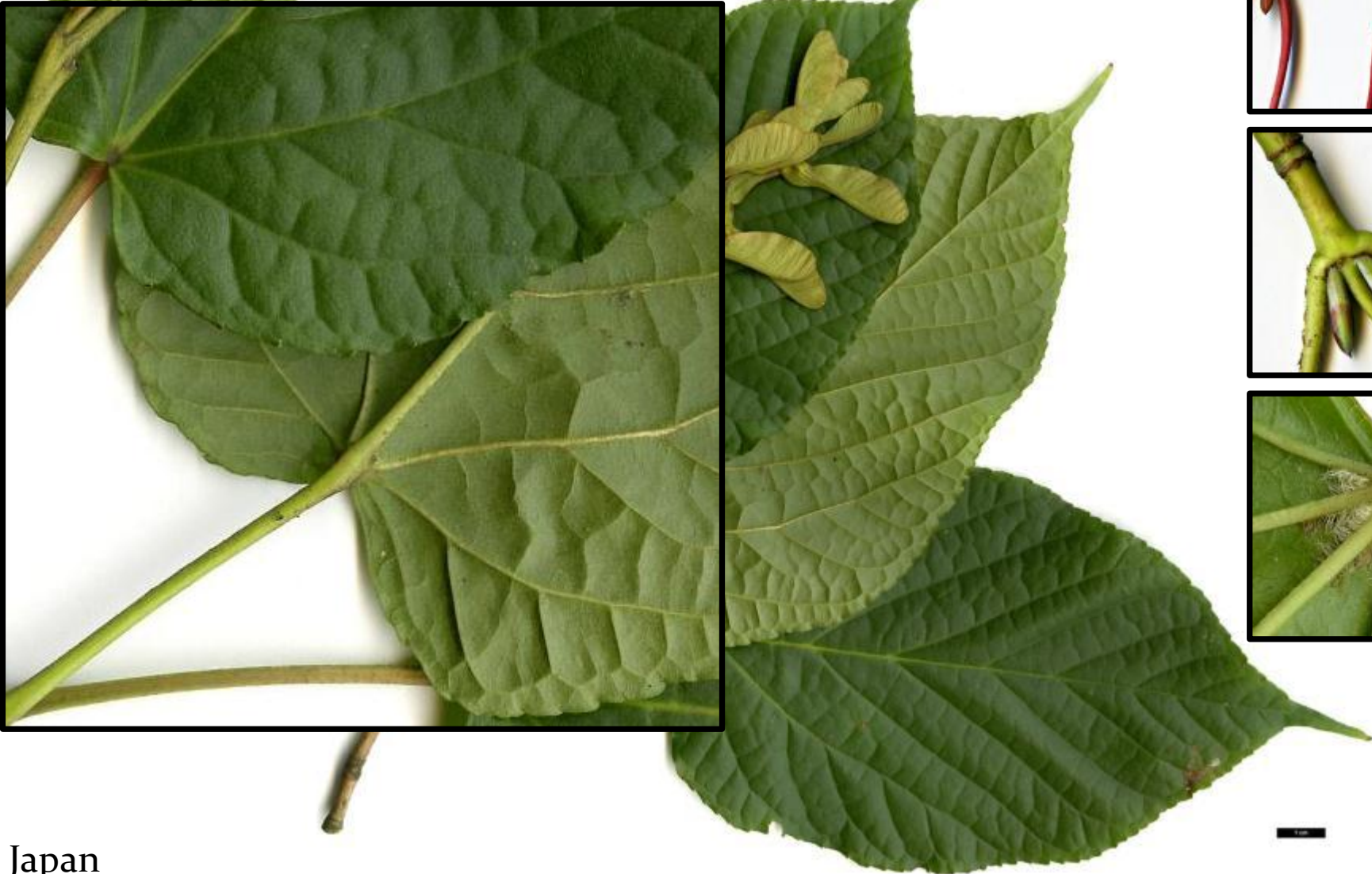


Japan

A. distylum (*Parviflora*)

Group J

lamina unlobed
base cordate



Japan

A. stachyophyllum (*Arguta*)

lamina shallowly lobed
base truncate/rounded

Group J



W Hubei, Sichuan, S and SE Xizang, NW Yunnan, Bhutan, N India, Myanmar, Nepal

A. glabrum (*Glabra*)

Group J



western N America

A. glabrum (*Glabra*)

lamina
LS glabrous

Group J



A. spicatum (*Spicata*)

terminal lobe
coarsely serrate/dentate

Group J



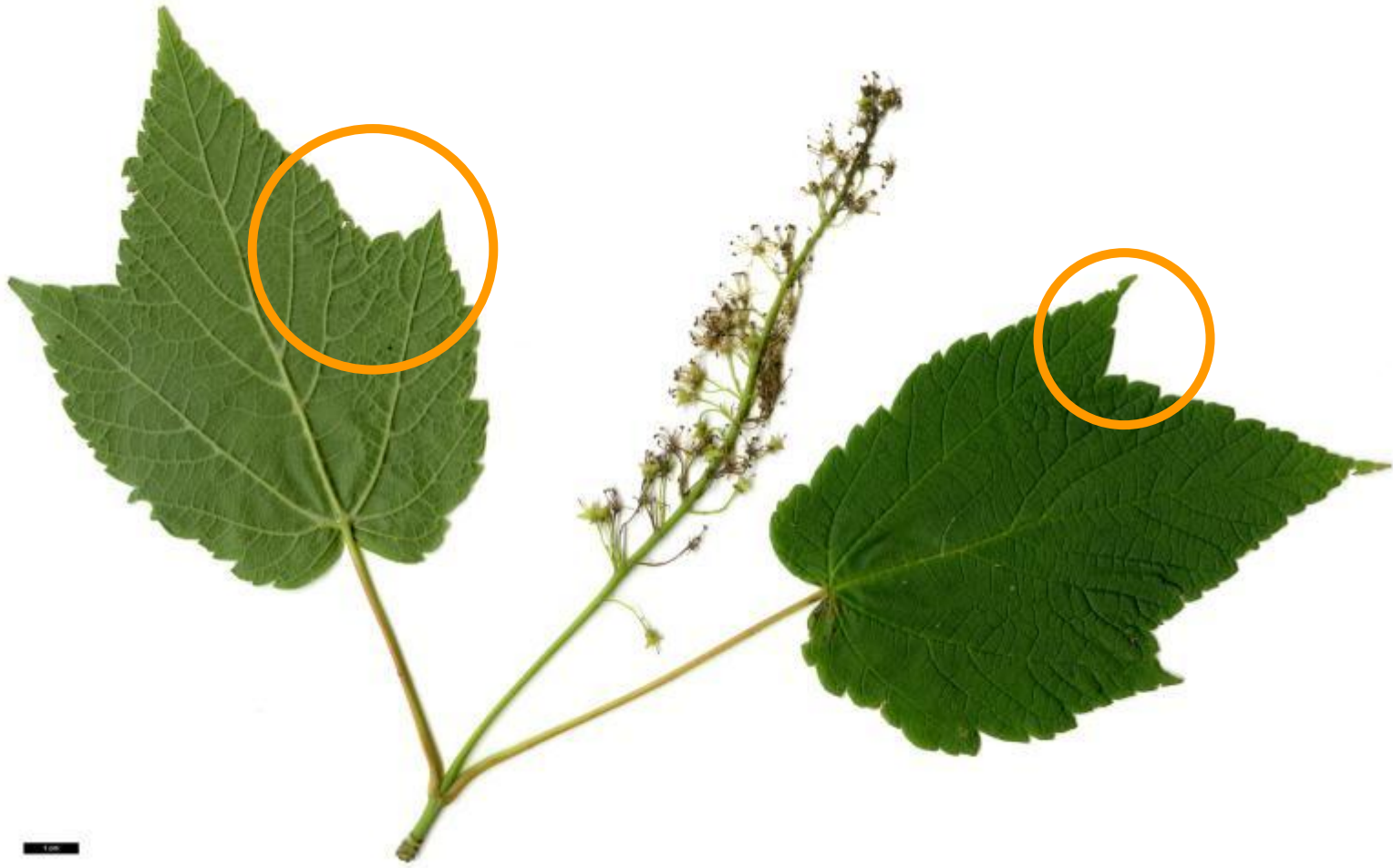
eastern USA, Canada

A. spicatum (*Spicata*)

Group J

terminal lobe
coarsely serrate/dentate

T-lobe base wide
sinus wide



eastern USA, Canada

A. ukurunduense (*Spicata*)

Group J

terminal lobe
coarsely serrate/dentate



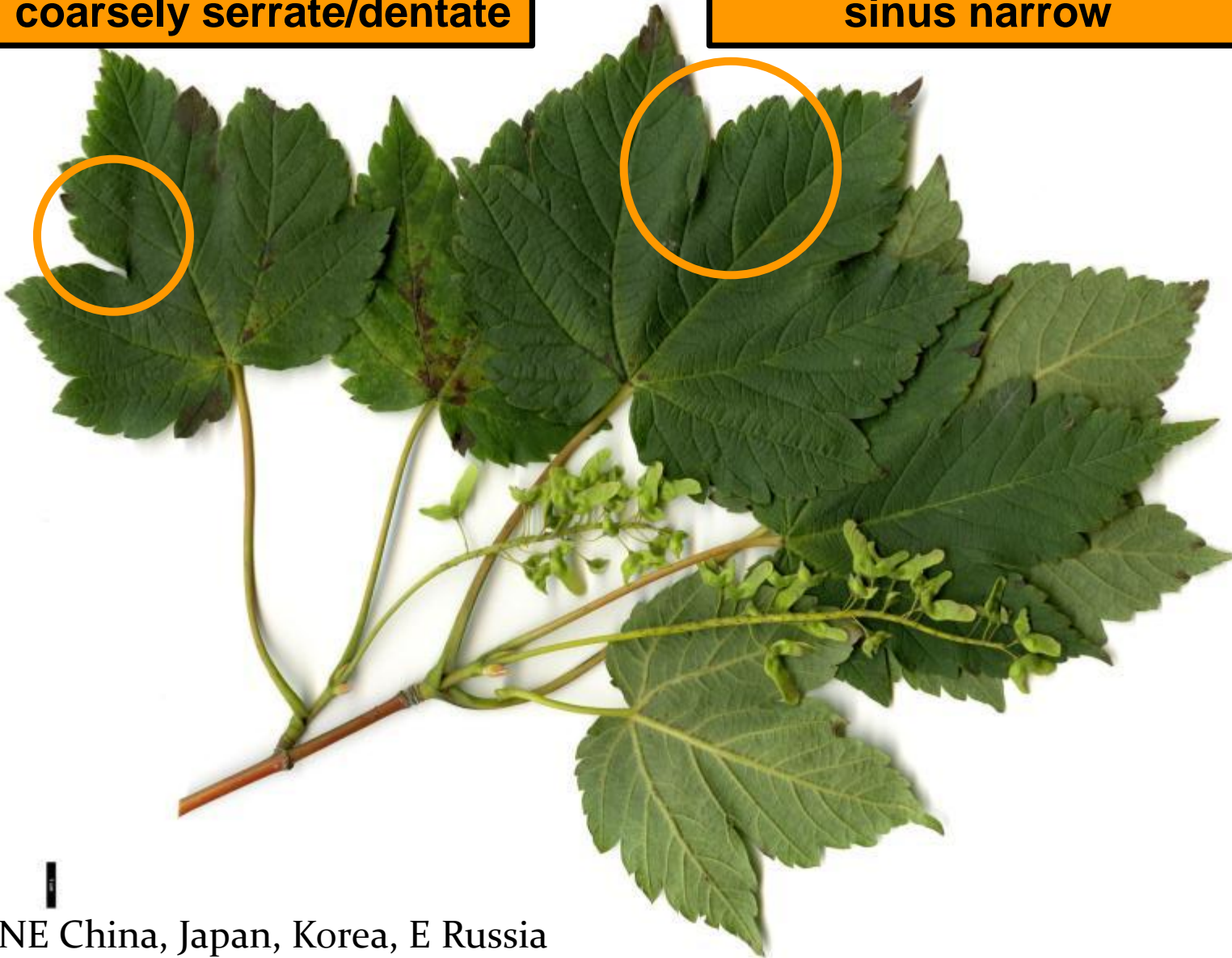
NE China, Japan, Korea, E Russia

A. ukurunduense (*Spicata*)

Group J

terminal lobe
coarsely serrate/dentate

T-lobe base narrow
sinus narrow



NE China, Japan, Korea, E Russia

A. barbinerve (*Arguta*)

Group J

terminal lobe
coarsely serrate/dentate

+/- similar but
midvein length <10 cm



NE China, N Korea, E Russia

A. nipponicum (*Parviflora*)

Group J



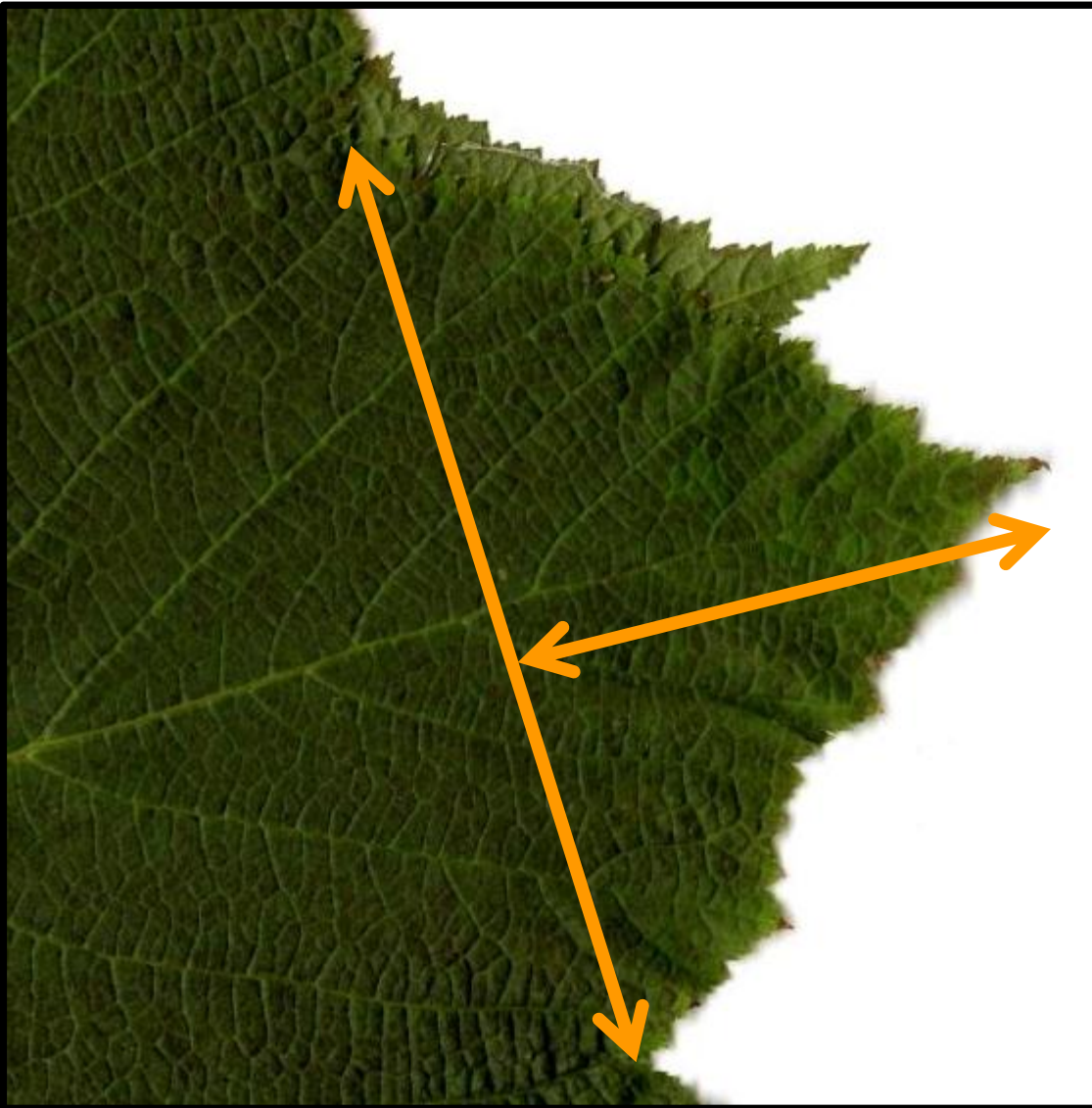
Japan

A. nipponicum (*Parviflora*)

Group J

terminal lobe
finely serrate/dentate

terminal lobe
wider than long



A. wardii (*Wardiana*)

Group J



E Xizang, NW Yunnan, NE India, NE Nyanmar

A. wardii (Wardiana)

Group J

terminal lobe
finely serrate/dentate

terminal lobe
longer than wide

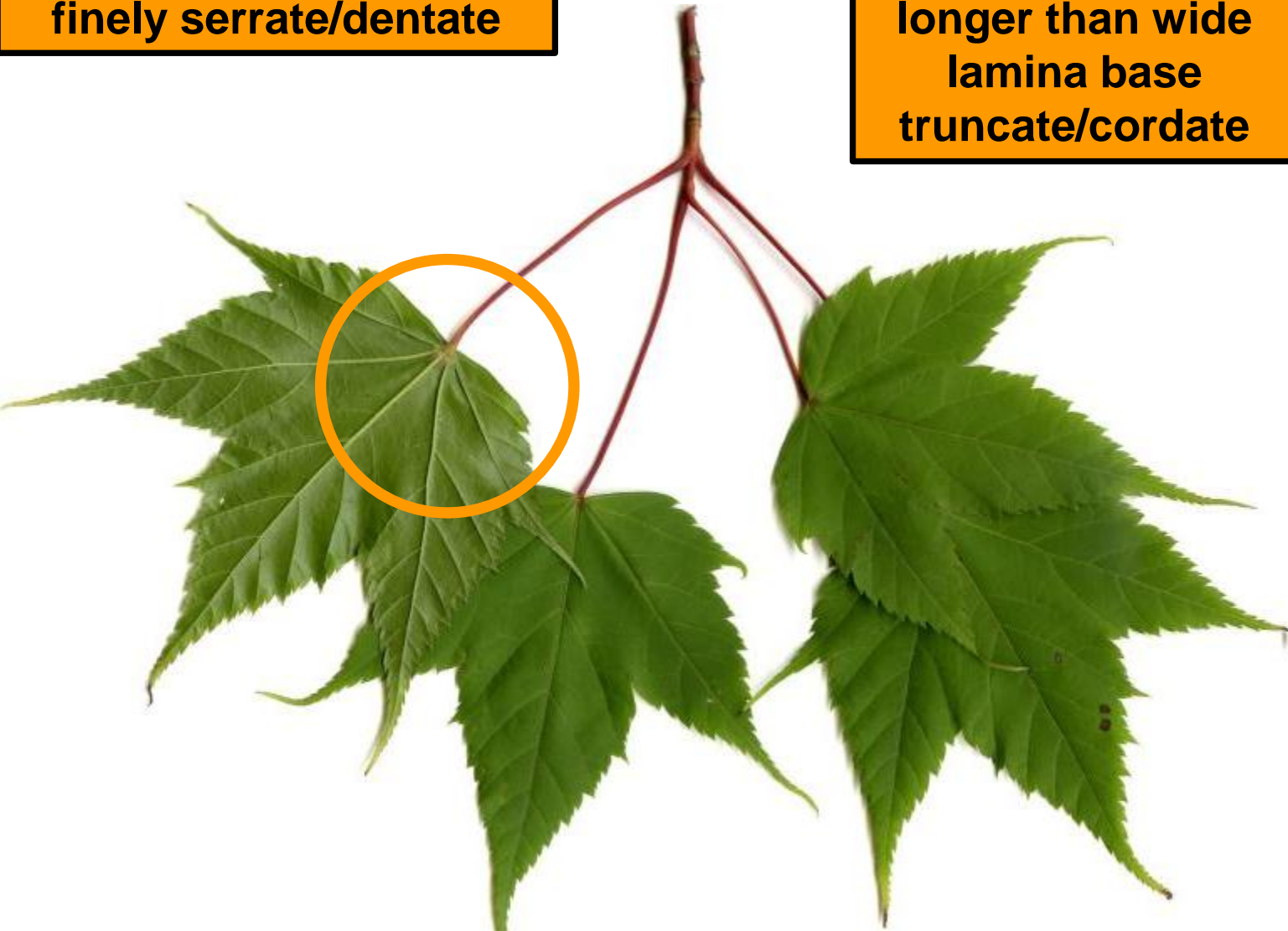


A. acuminatum (*Arguta*)

Group J

terminal lobe
finely serrate/dentate

terminal lobe
longer than wide
lamina base
truncate/cordate



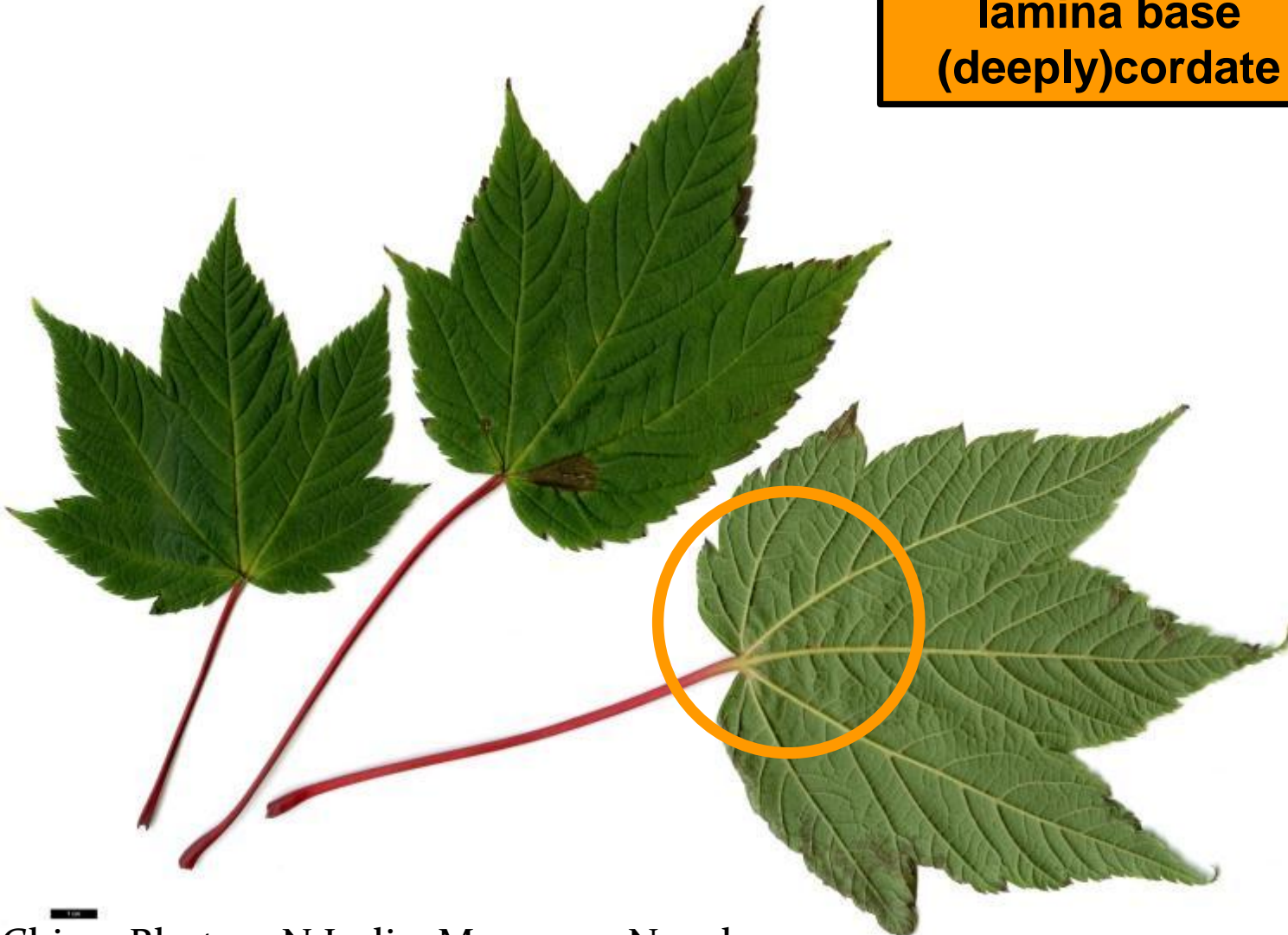
Xizang, India, Kashmir, Nepal, Pakistan

A. caudatum (*Spicata*)

Group J

terminal lobe
finely serrate/dentate

terminal lobe
longer than wide
lamina base
(deeply)cordate



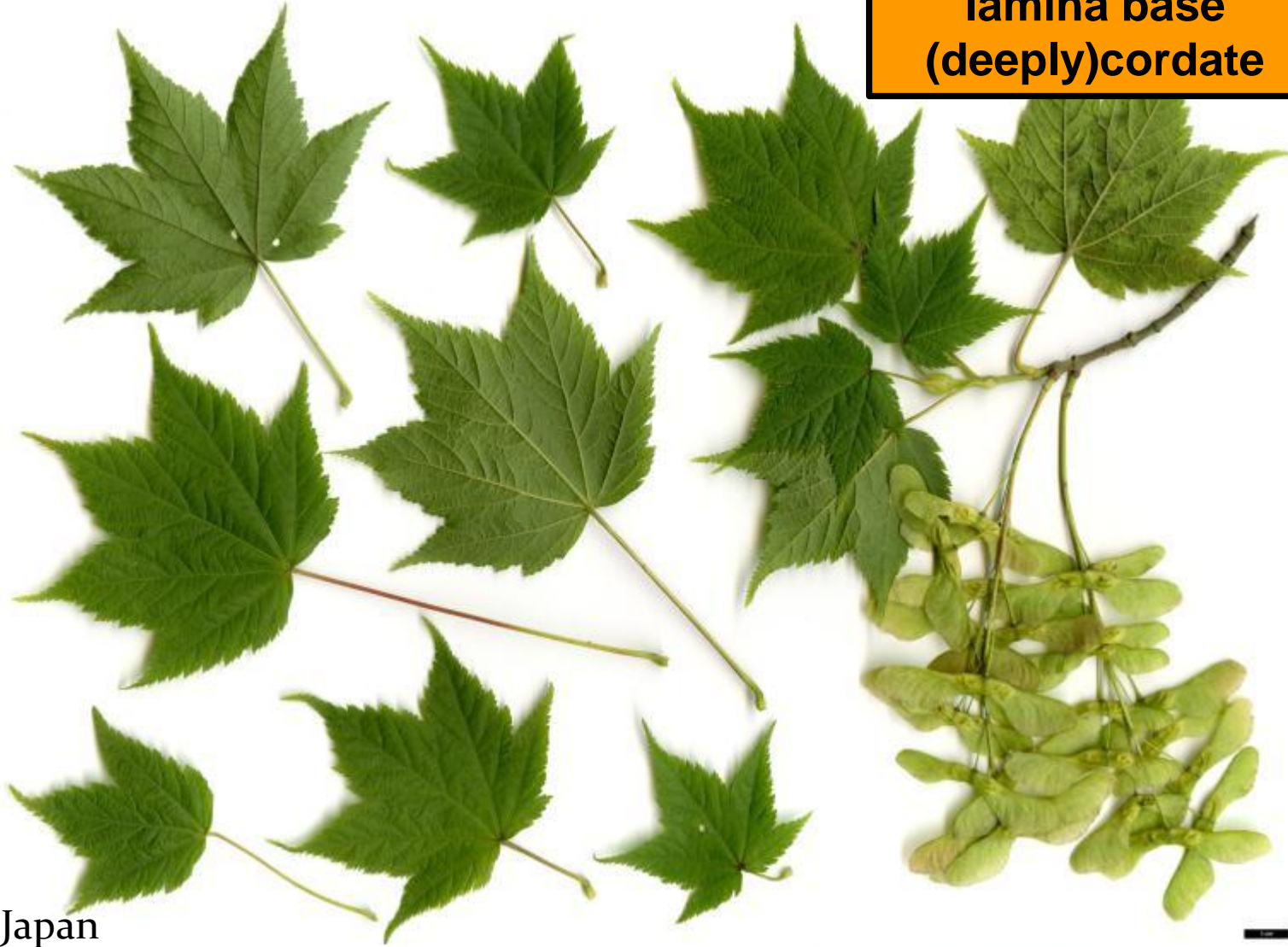
China, Bhutan, N India, Myanmar, Nepal

A. argutum (*Arguta*)

terminal lobe
finely serrate/dentate

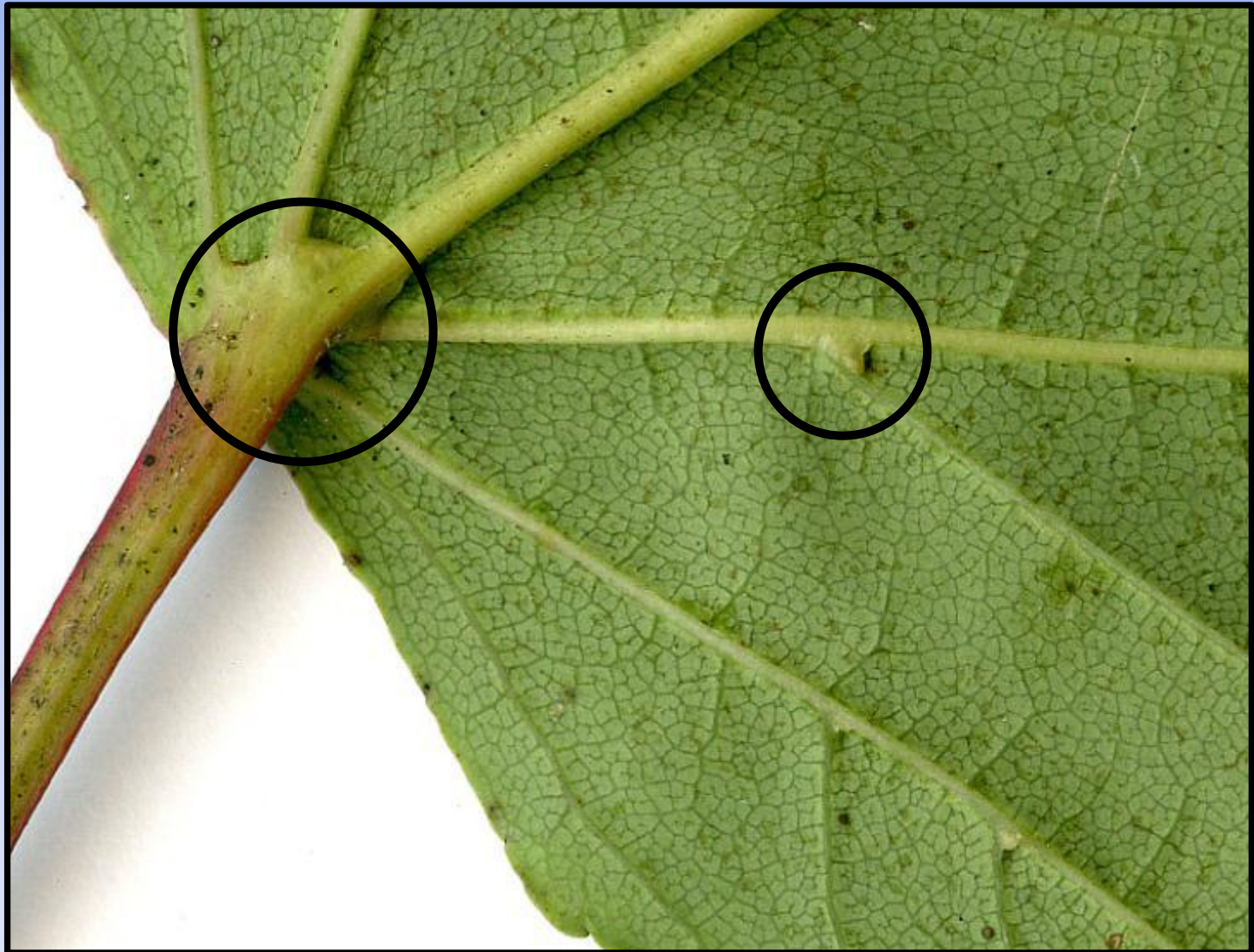
terminal lobe
longer than wide
lamina base
(deeply)cordate

Group J



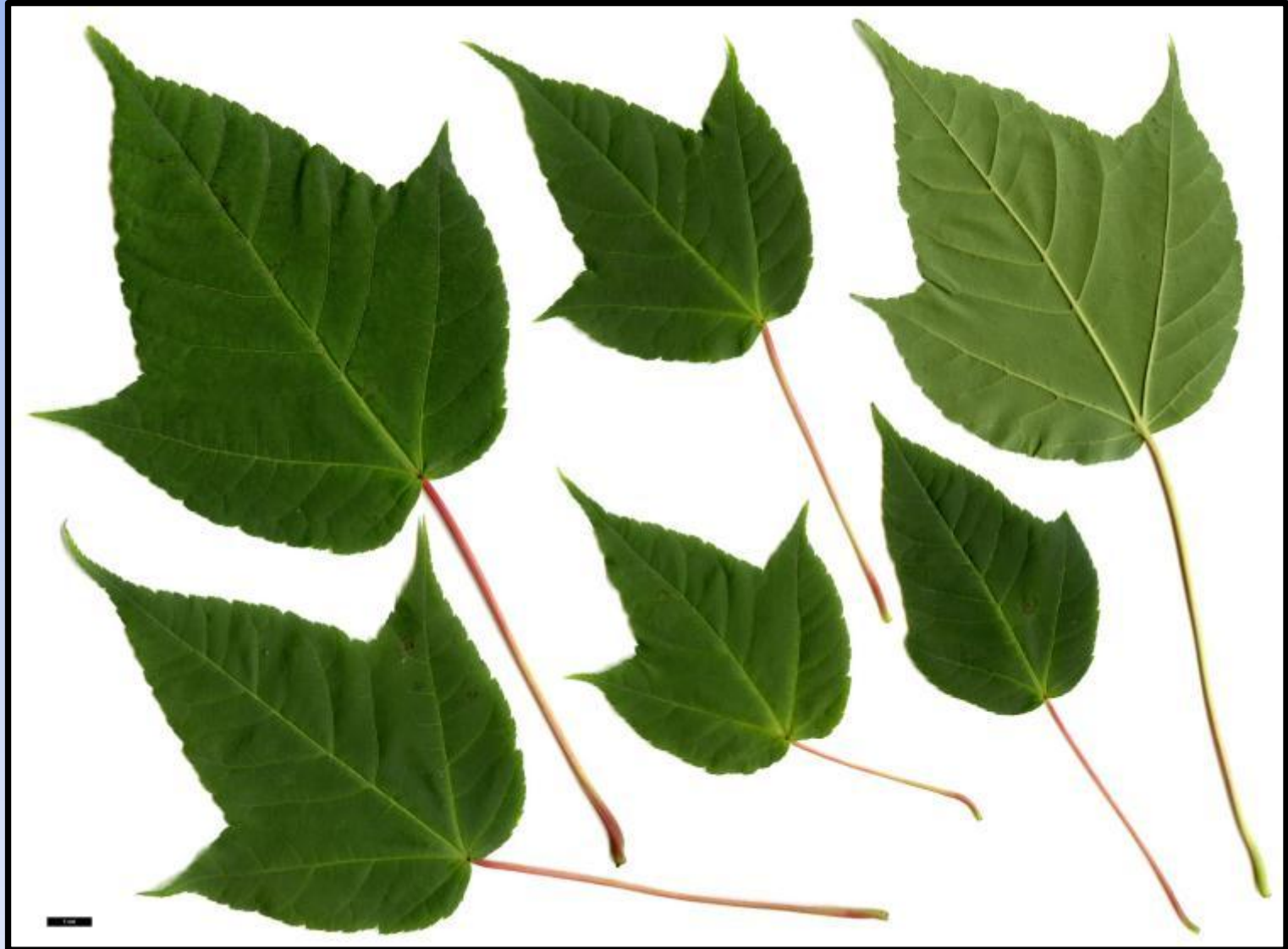
Japan

Lamina LS vein axils with membranous pockets.



GROUP K

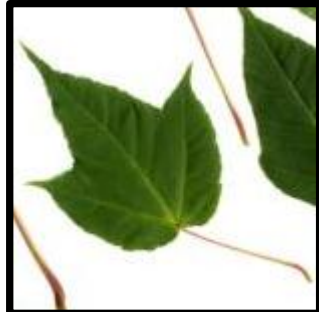
Lamina LS vein axils with membranous pockets.
Lamina predominantly unlobed or unlobed to 3-lobed.



A. chienii (*Macrantha*)

lamina 3-lobed
+/- from apical half

Group K



NW Yunnan

A. sikkimense (*Macrantha*)

Group K

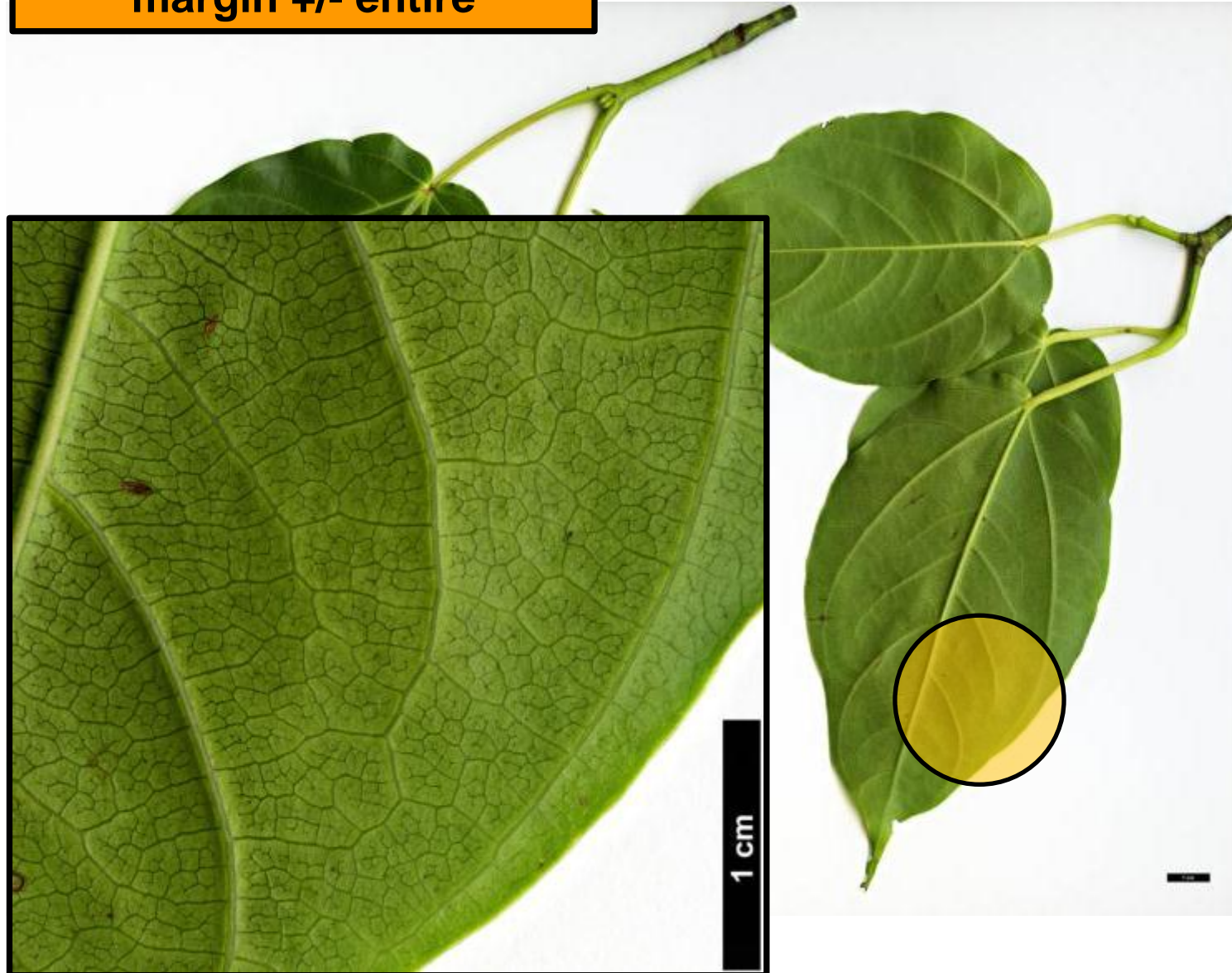
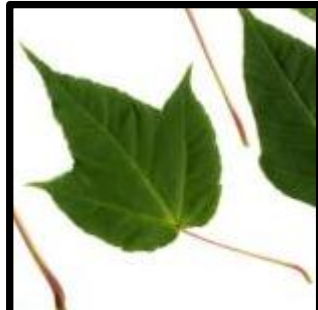


SE Xizang, Yunnan, Bhutan, N India, N Myanmar, Nepal

A. sikkimense (*Macrantha*)

lamina unlobed
margin +/- entire

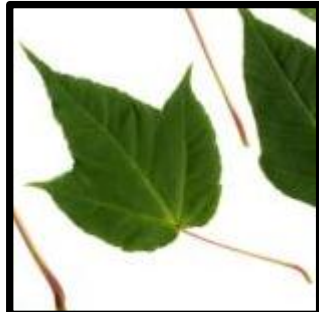
Group K



A. laxiflorum (*Macrantha*)

lamina L/W ratio +/- 2/1
unlobed to +/- 3-lobed

Group K



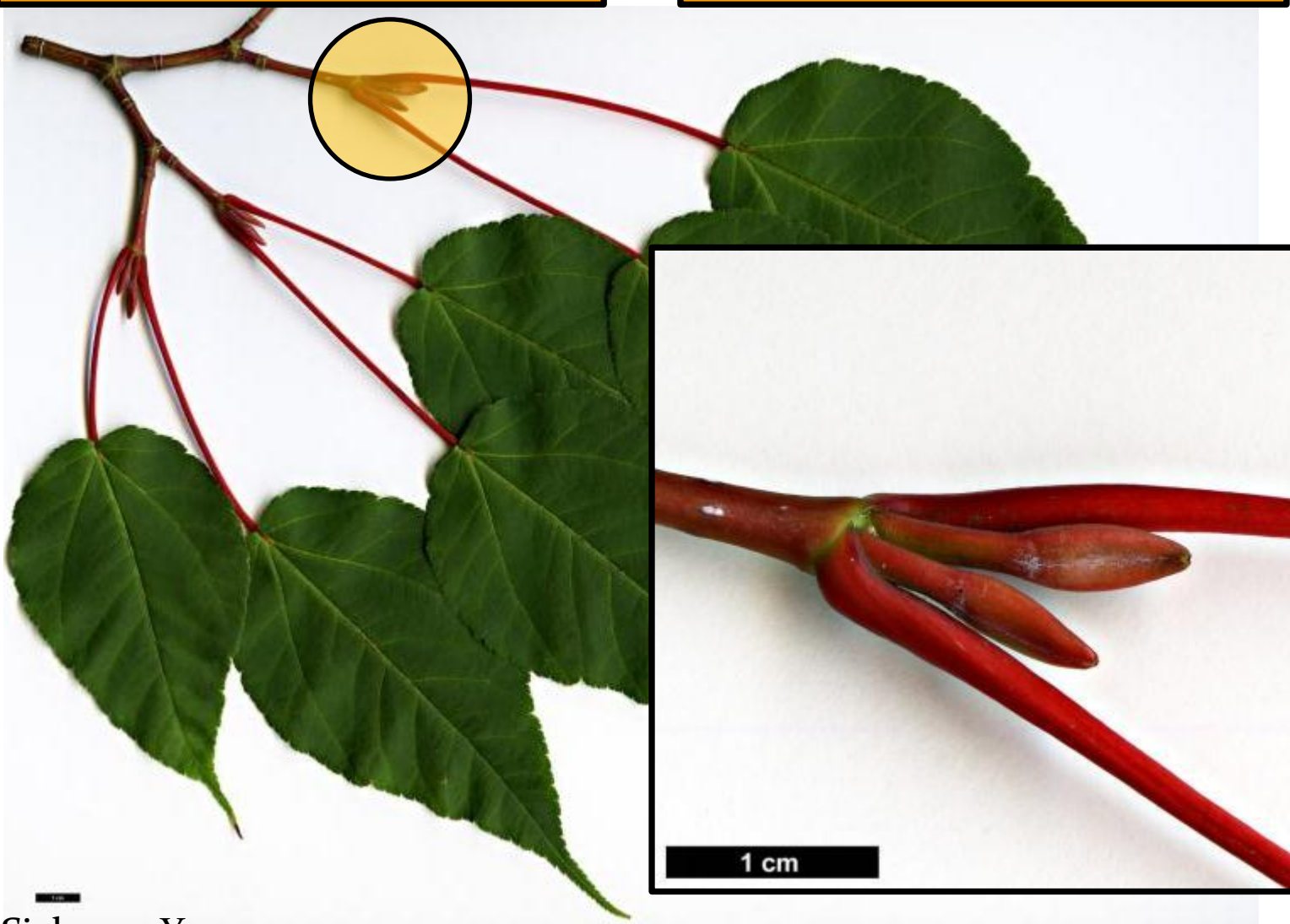
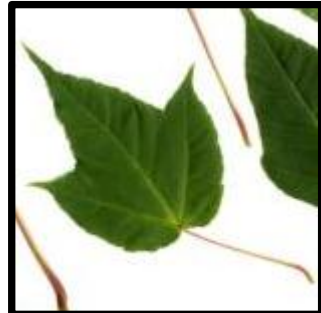
Sichuan, Yunnan

A. laxiflorum (*Macrantha*)

Group K

lamina L/W ratio +/- 2/1
unlobed (to +/- 3-lobed)

lamina 7-14 × 4-8 cm
petiole red

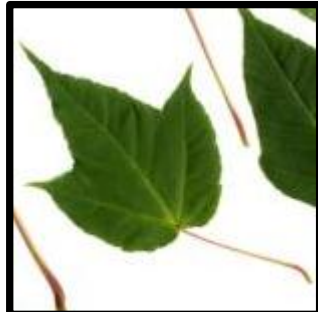


Sichuan, Yunnan

A. caudatifolium (*Macrantha*)

lamina L/W ratio +/- 2/1
unlobed (to +/- 3-lobed)

Group K



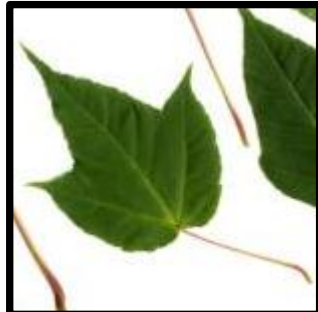
Taiwan

A. caudatifolium (*Macrantha*)

Group K

lamina L/W ratio +/- 2/1
unlobed (to +/- 3-lobed)

lamina 10 × 4 cm
petiole green



A. forrestii (*Macrantha*)

Group K

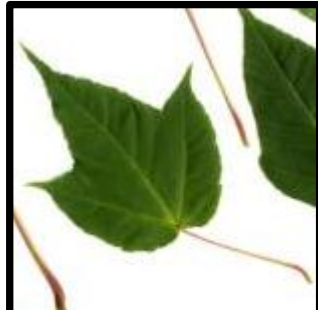


SW Sichuan, NW Yunnan

A. forrestii (*Macrantha*)

Group K

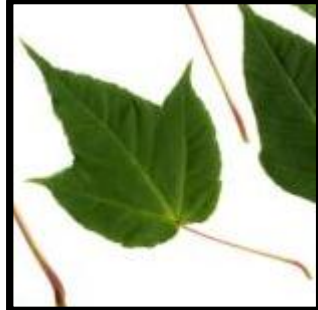
lamina 3-lobed
apices acuminate



SW Sichuan, NW Yunnan

A. crataegifolium (*Macrantha*)

Group K

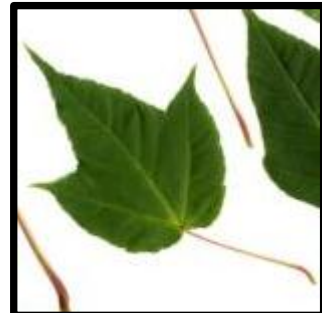
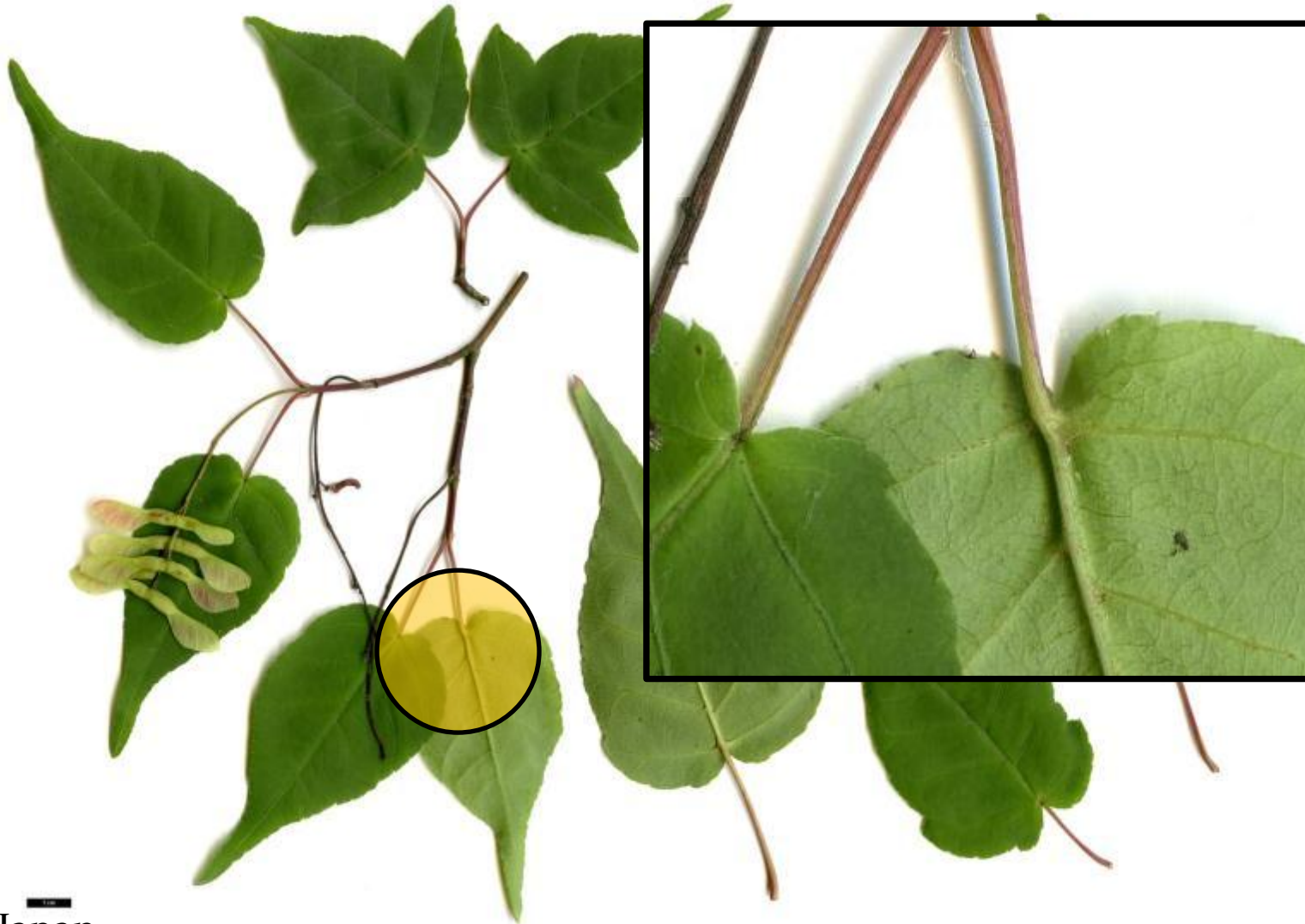


Japan

A. crataegifolium (*Macrantha*)

Group K

lamina 0-3-lobed ≤ 8 cm
tiny membranous pockets



A. davidii (*Macrantha*)

Group K



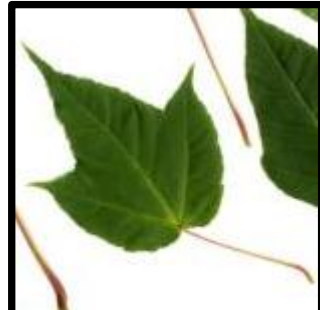
China

A. davidii (*Macrantha*)

Group K

lamina 0(-3)-lobed >8 cm
obvious membranous pockets

lateral lobe absent
or apices below middle



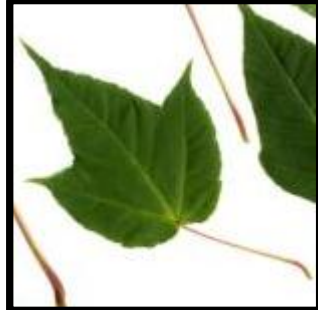
China

A. capillipes (*Macrantha*)

Group K

lamina (0-)3(-5)-lobed >8 cm
obvious membranous pockets

lateral lobe apices
at or above middle



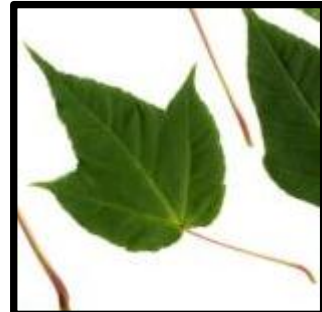
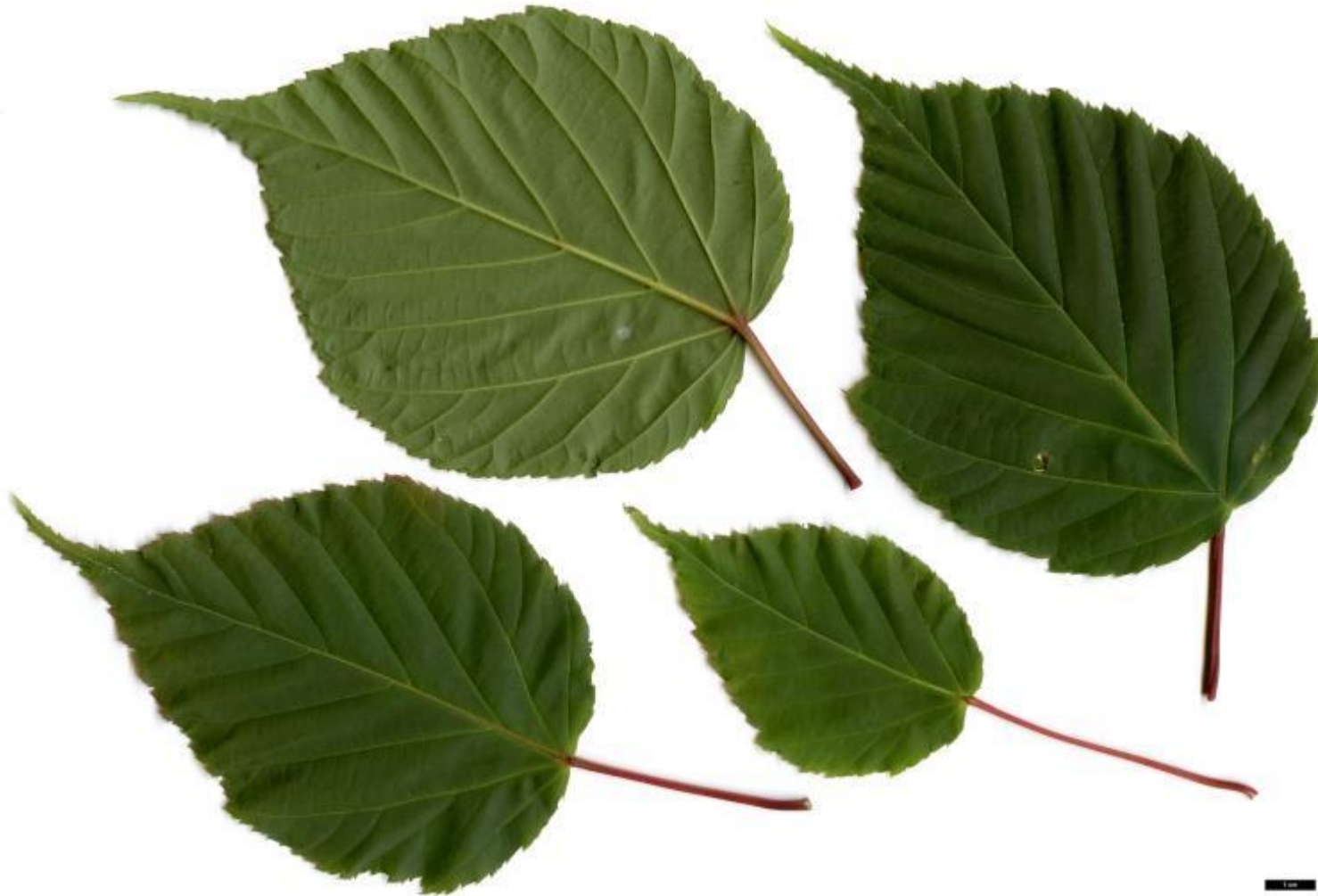
Japan

A. morifolium (*Macrantha*)

Group K

lamina (0-)3(-5)-lobed >8 cm
obvious membranous pockets

similar, less lobed,
less domatia



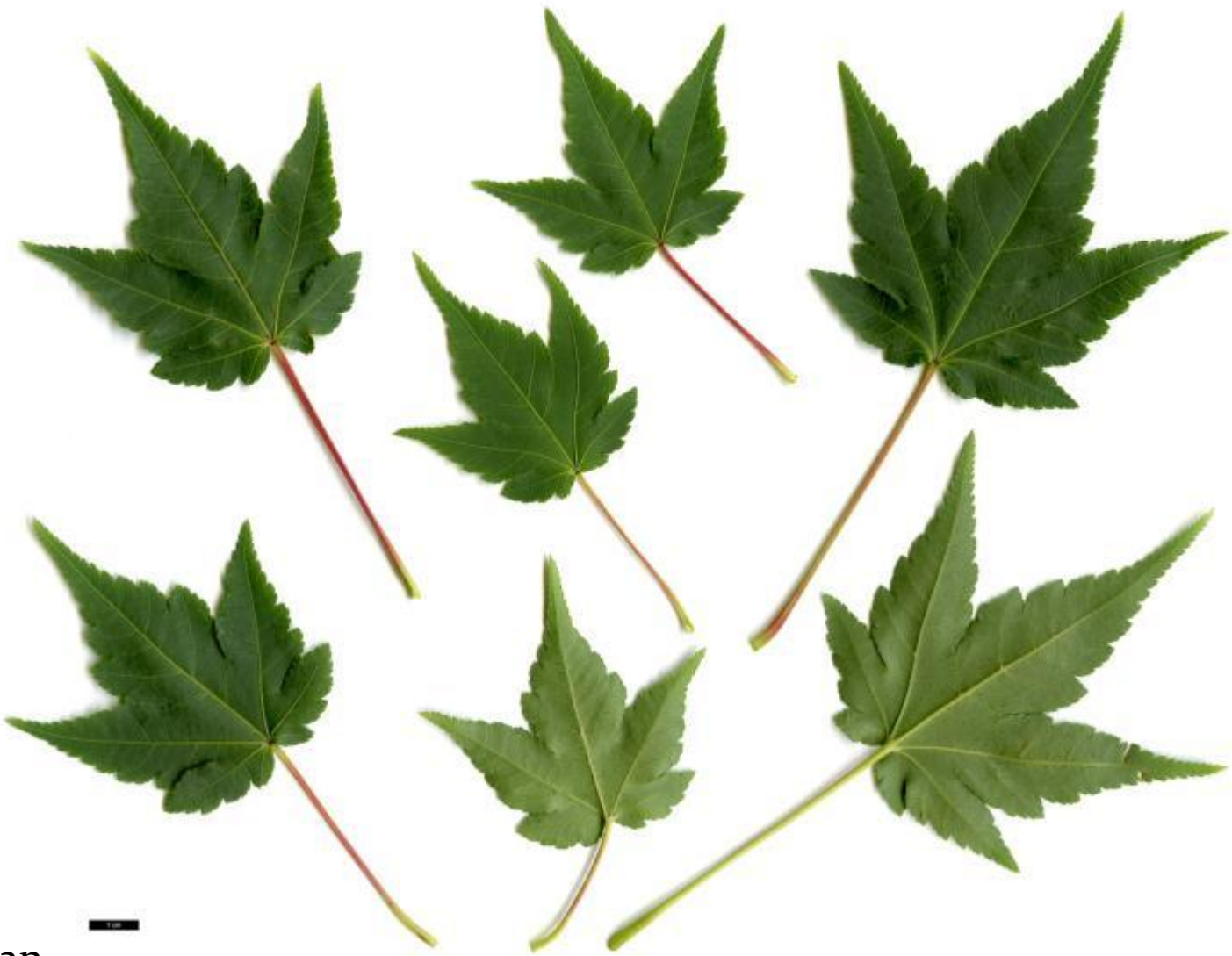
GROUP L

Lamina LS vein axils with membranous pockets.
Lamina predominantly 3-5-lobed or 5-lobed.



A. micranthum (*Macrantha*)

Group L



Japan

A. micranthum (*Macrantha*)

Group L

terminal/lateral lobe sinus
very narrow/overlapping

terminal lobe
L/W ratio $\geq 2/1$

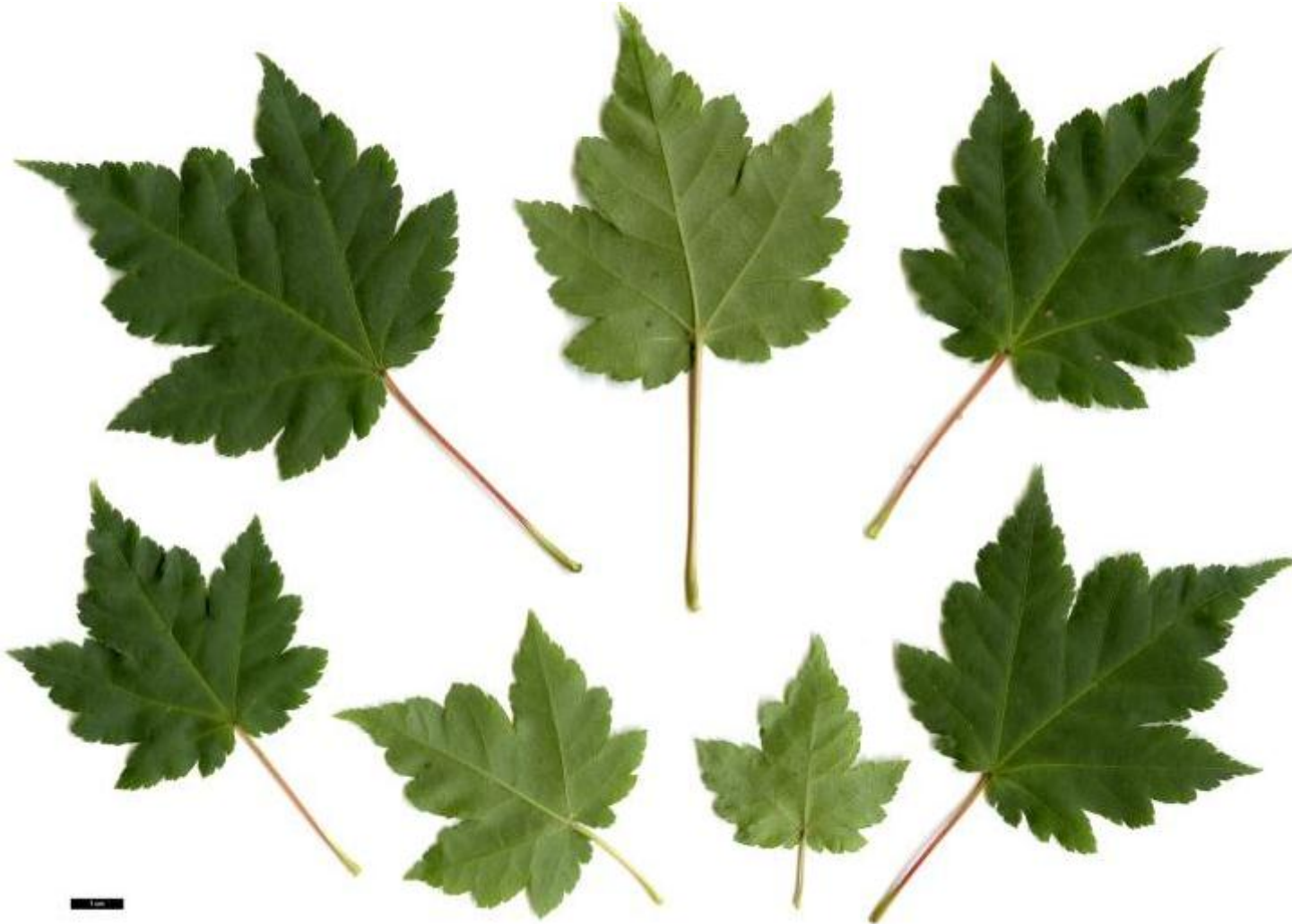


A. tschonoskii (*Macrantha*)

terminal/lateral lobe sinus
very narrow/overlapping

terminal lobe
L/W ratio $< 2/1$

Group L



Japan

A. rufinerve (*Macrantha*)

Group L

mature lamina
outline obovate



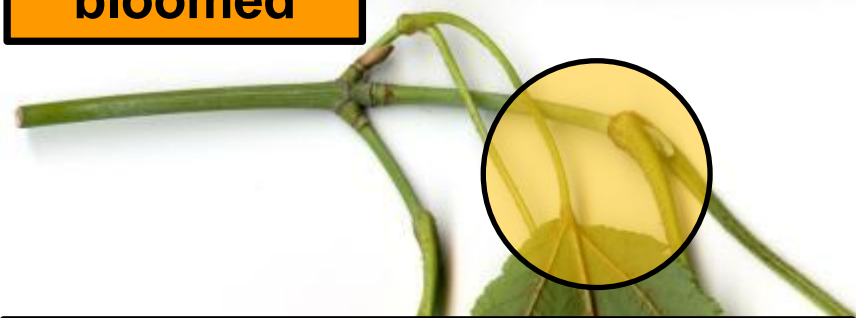
Japan

A. rufinerve (*Macrantha*)

Group L

shoot +/-
bloomed

lamina outline
obovate



A. pensylvanicum (*Macrantha*)

Group L

mature lamina
outline obovate



eastern N America

A. pensylvanicum (*Macrantha*)

Group L

shoot green

mature lamina outline obovate



eastern N America

A. tegmentosum (*Macrantha*)

Group L

mature lamina outline
pentagonal orbicular

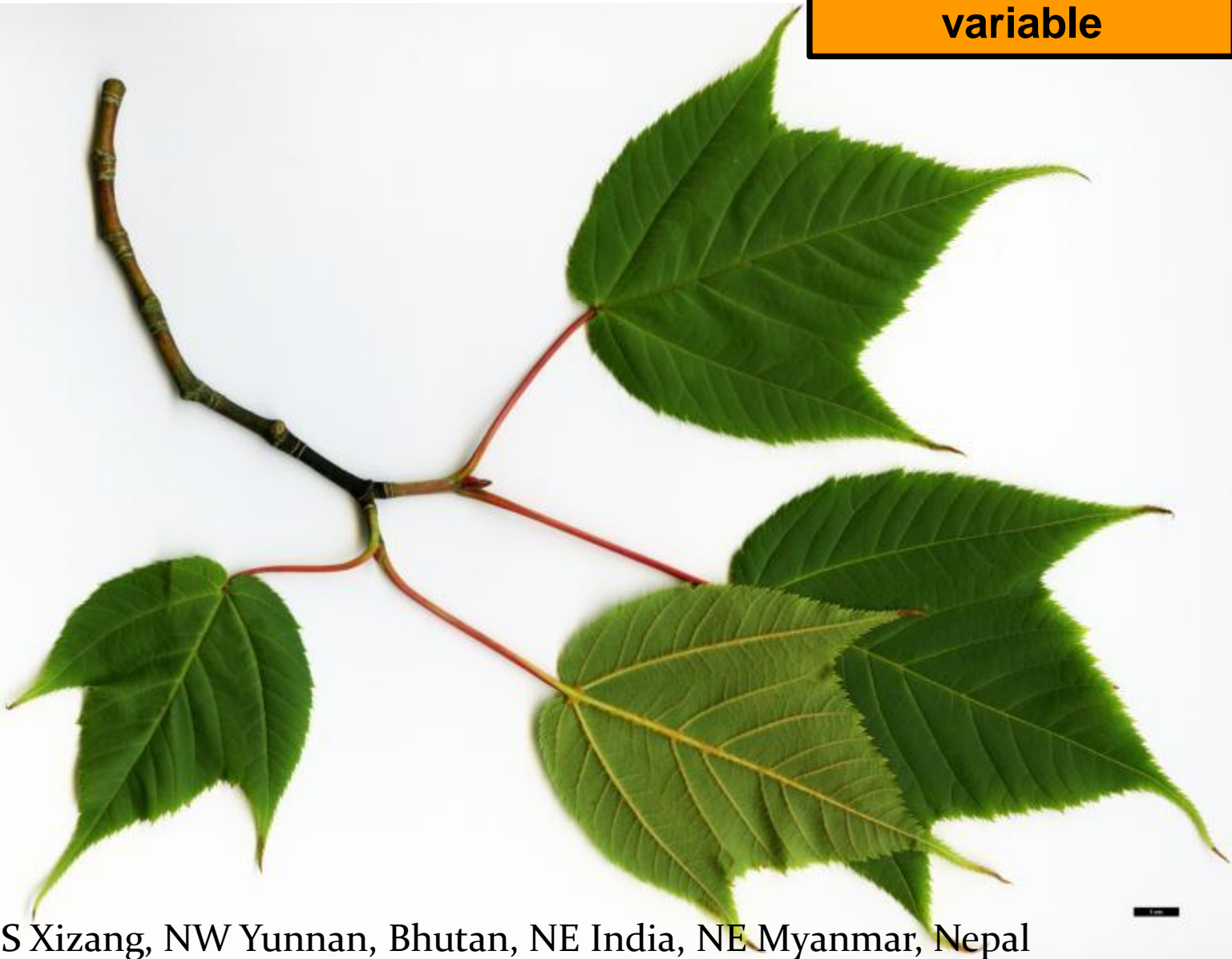


NE China, Korea, E Russia

A. pectinatum (*Macrantha*)

Group L

lamina outline variable



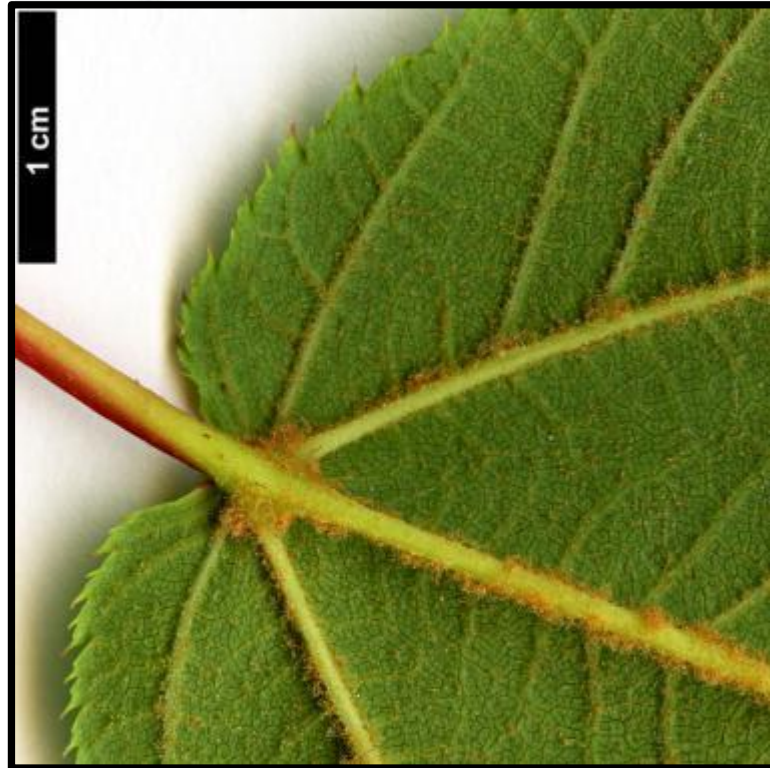
S Xizang, NW Yunnan, Bhutan, NE India, NE Myanmar, Nepal

A. pectinatum (*Macrantha*)

Group L

lamina LS
pubescent along veins

lamina outline
variable

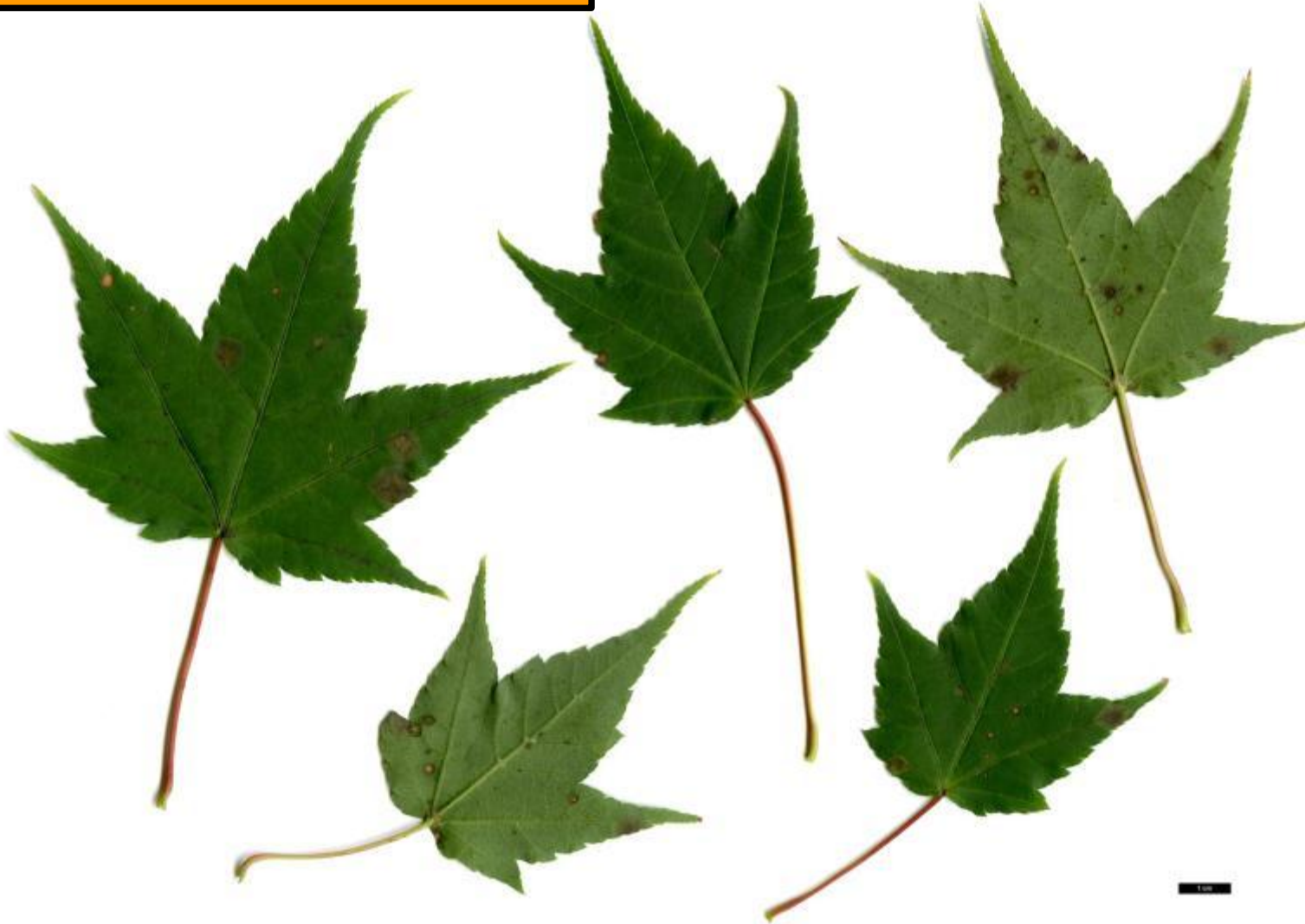


S Xizang, NW Yunnan, Bhutan, NE India, NE Myanmar, Nepal

A. maximowiczii (*Macrantha*)

terminal lobe relatively
narrow L/W ratio +/- 2/1

Group L



W China

A. metcalfii (*Macrantha*)

terminal lobe relatively
wide L/W ratio <2/1

petiole green

Group L



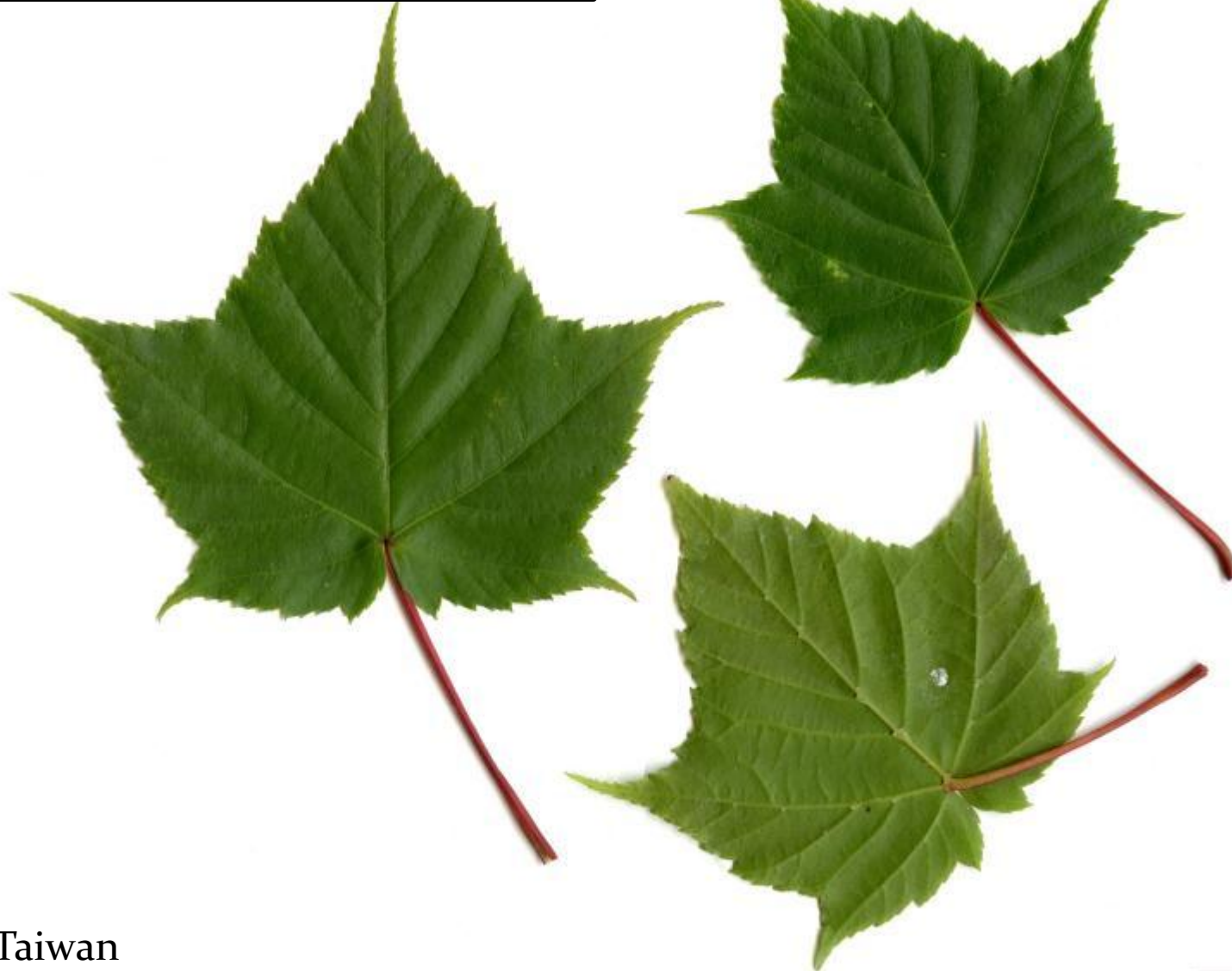
SE China

A. rubescens (*Macrantha*)

terminal lobe relatively
wide L/W ratio <2/1

petiole red

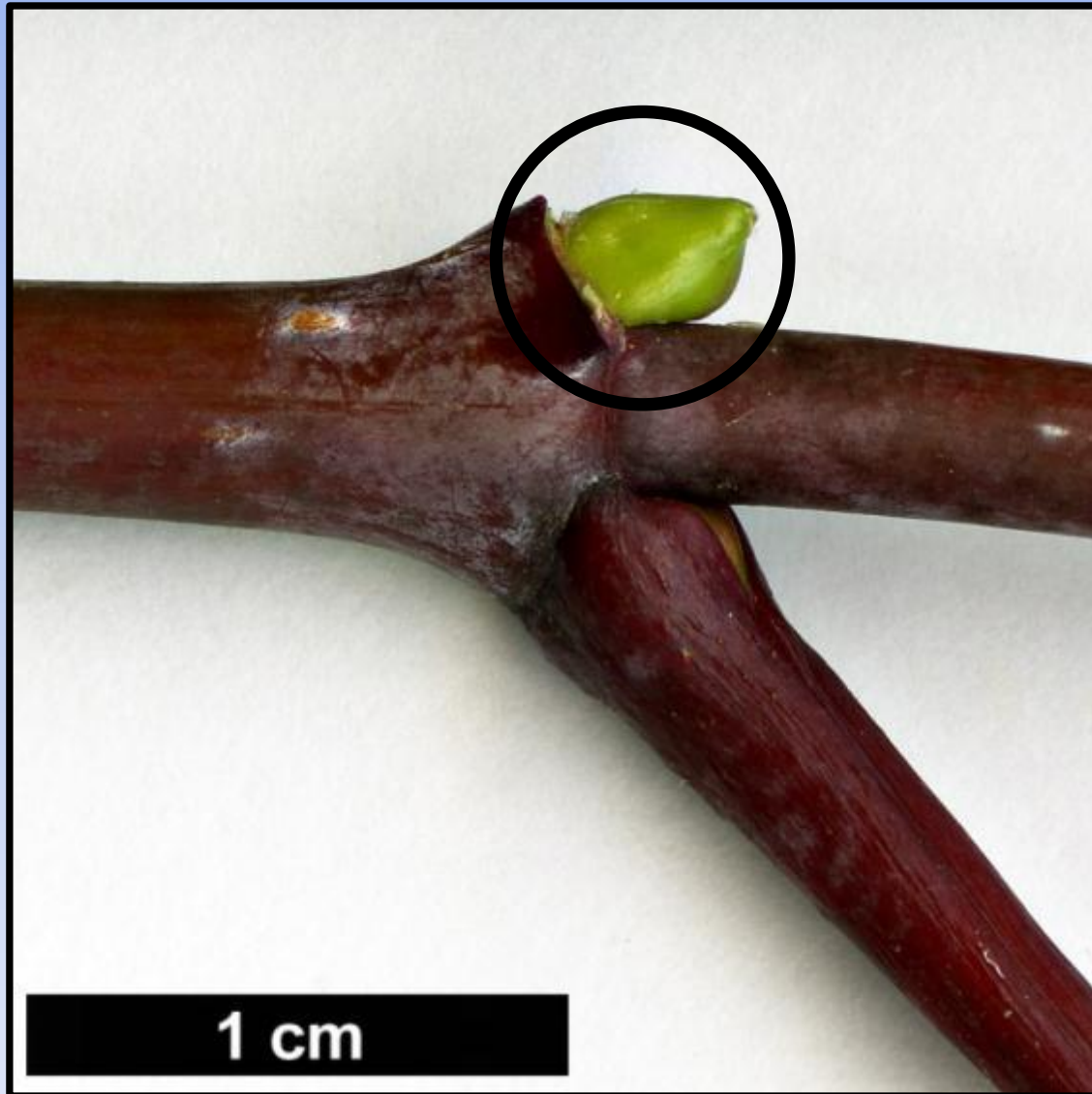
Group L



Shoot at base with 2-4 pairs of bud scale scars (10× LENS).



Bud sessile (10× LENS).



GROUP M

Lamina always unlobed.



A. cordatum (*Palmata*)

Group M

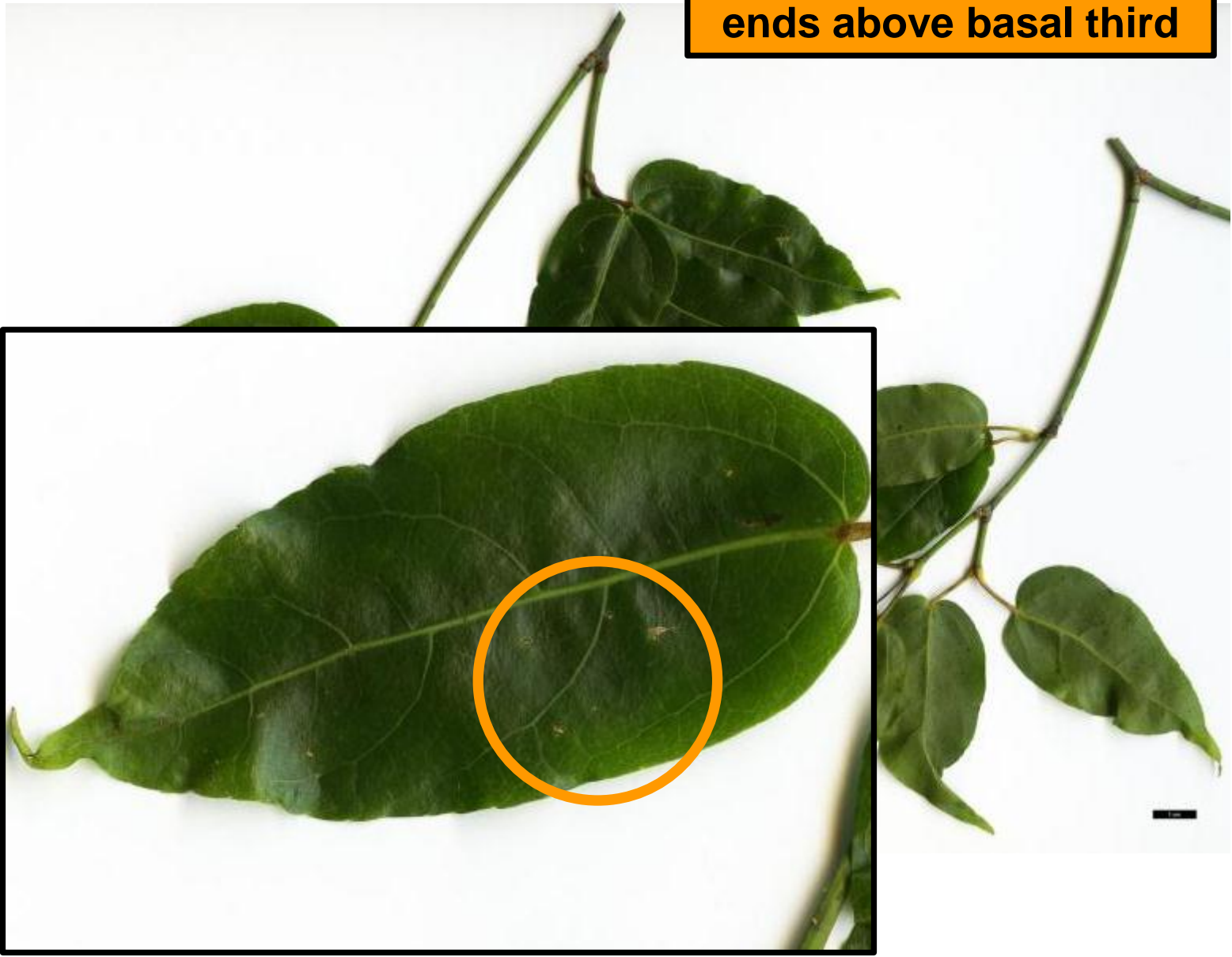


SW China

A. cordatum (*Palmata*)

Group M

basal secondary vein ends above basal third



A. fabri (*Palmata*)

Group M

basal secondary vein ends in basal third



SW China, Vietnam

A. fabri (*Palmata*)

Group M

secondary veins ≤ 6 /side

basal secondary vein ends in basal third



SW China, Vietnam

A. laevigatum (*Palmata*)

Group M

secondary veins
7-12/side

basal secondary vein
ends in basal third



E and C China

GROUP N

Lamina unlobed to 3-lobed, OR 3-lobed.



A. tutcheri (*Palmata*)

Group N

lobe sinus
in basal third



SE China, Taiwan

A. fenzelianum (*Palmata*)

Group N

lobe sinus
above basal third



S Yunnan, Vietnam

A. fenzelianum (*Palmata*)

Group N

current growth
petiole pubescent

lobe sinus
above basal third



S Yunnan, Vietnam

A. calcaratum (*Palmata*)

Group N

lobe sinus
above basal third



Yunnan, Myanmar, Thailand, Vietnam

A. calcaratum (*Palmata*)

Group N

current growth
petiole glabrous

lobe sinus
above basal third



Yunnan, Myanmar, Thailand, Vietnam

GROUP O

Lamina 3-5(-more)-lobed, 5-lobed lamina ALWAYS present.



A. wilsonii (*Palmata*)

Group O

lamina 3-5 lobed
base cuneate/rounded



China

A. sinense (*Palmata*)

Group O

lamina 5-lobed
petiole short



Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Sichuan

A. elegantulum (*Palmata*)

Group O

lamina 5-lobed
petiole long



SW China

A. elegantulum (*Palmata*)

Group O

lamina (3-)5-lobed
US venation impressed

lamina 5-lobed
petiole long



A. serrulatum (*Palmata*)

Group O

lamina (3-)5-lobed
petiole long



Taiwan

A. serrulatum (*Palmata*)

Group O

lamina (3-)5-lobed
US venation +/- elevated

lamina (3-)5-lobed
petiole long



1 cm

A. oliverianum (*Palmata*)

Group O

lamina (3-)5-lobed
petiole long



1 cm

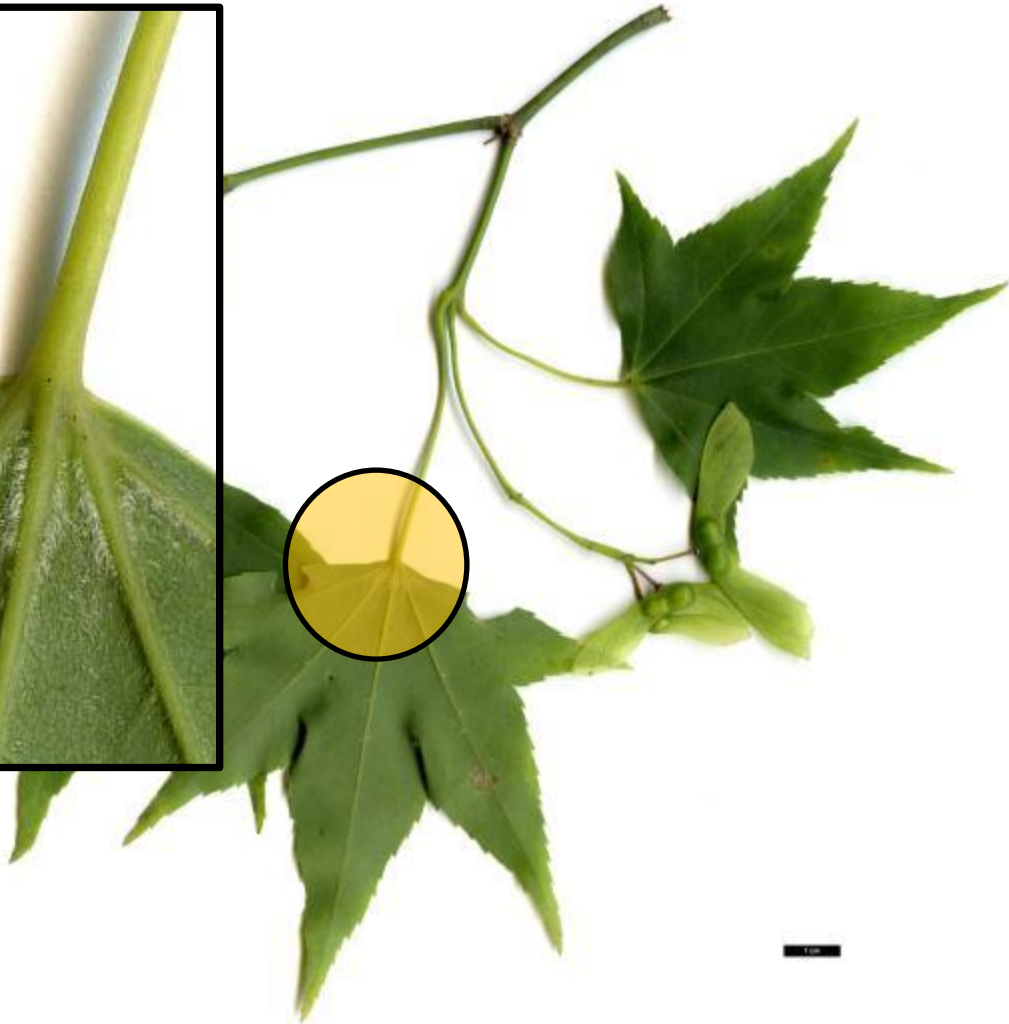
C China

A. oliverianum (*Palmata*)

Group O

similar, but lamina base pubescent

lamina (3-)5-lobed
petiole long



C China

A. pubipalmatum (*Palmata*)

Group O



S Anhui, Zhejiang

A. pubipalmatum (*Palmata*)

Group O

petiole
densely pubescent



S Anhui, Zhejiang

A. erianthum (*Palmata*)

Group O



Szechuan, Hupeh

A. erianthum (*Palmata*)

lamina LS veinlets
with remarkable tufts

Group O

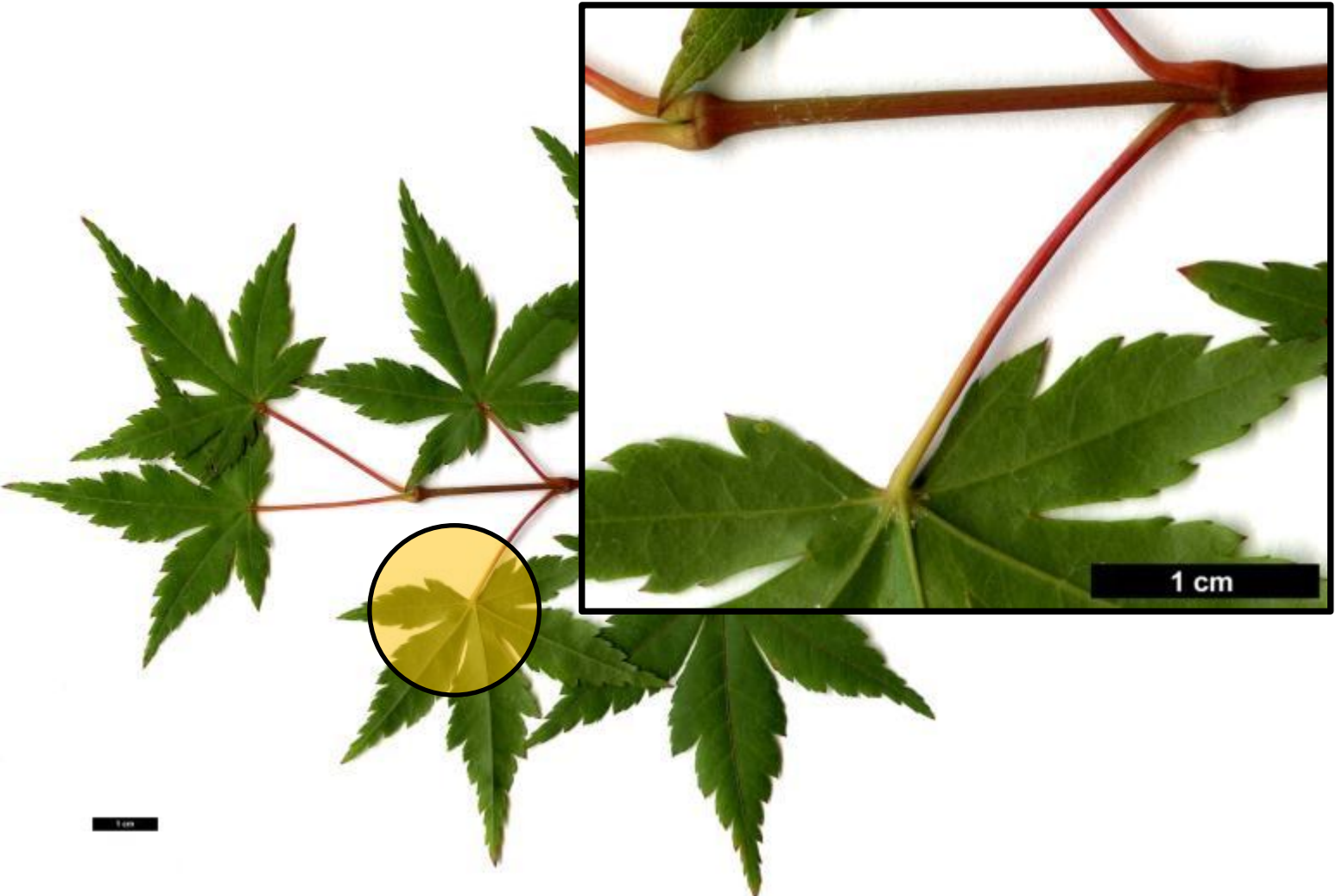


Szechuan, Hupeh

A. palmatum (*Palmata*)

Group O

5-7-lobed, midvein 3-9 cm
irregularly double serrate



Japan, Korea, Taiwan, SE China

A. amoenum (*Palmata*)

5-7-lobed, midvein 3-9 cm
regularly simple serrate



Group O



Japan, S Korea

A. amoenum (*Palmata*)

5-7-lobed, midvein 3-9 cm
regularly simple serrate

Group O



Japan, S Korea

A. campbellii (*Palmata*)

Group P

midvein length 8-15 cm
margin finely serrate

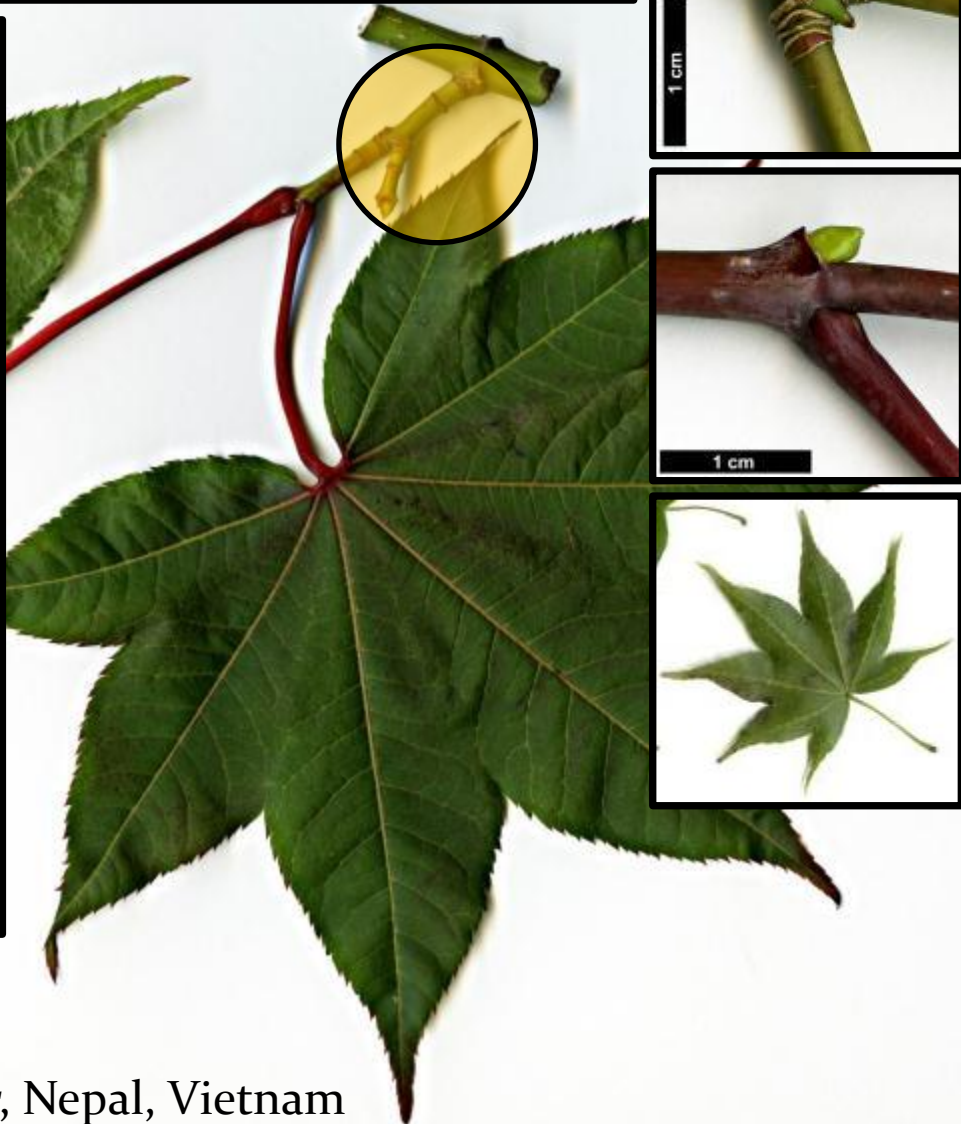


Xizang, Yunnan, Bhutan, N India, Myanmar, Nepal, Vietnam

A. campbellii (*Palmata*)

Group P

midvein length 8-15 cm
margin finely serrate



Xizang, Yunnan, Bhutan, N India, Myanmar, Nepal, Vietnam

A. flabellatum (*Palmata*)

Group P

midvein length 8-15 cm
margin coarsely serrate



SW China, Myanmar, Vietnam

A. flabellatum (*Palmata*)

Group P

midvein length 8-15 cm
margin coarsely serrate



SW China, Myanmar, Vietnam

GROUP P

Lamina 7(-more)-lobed AND 5-lobed lamina absent.



A. tenuifolium (*Palmata*)

Group P



Japan

A. tenuifolium (*Palmata*)

lamina base
+/- truncate to (sub)cordate

Group P



A. shirasawanum (*Palmata*)

Group P



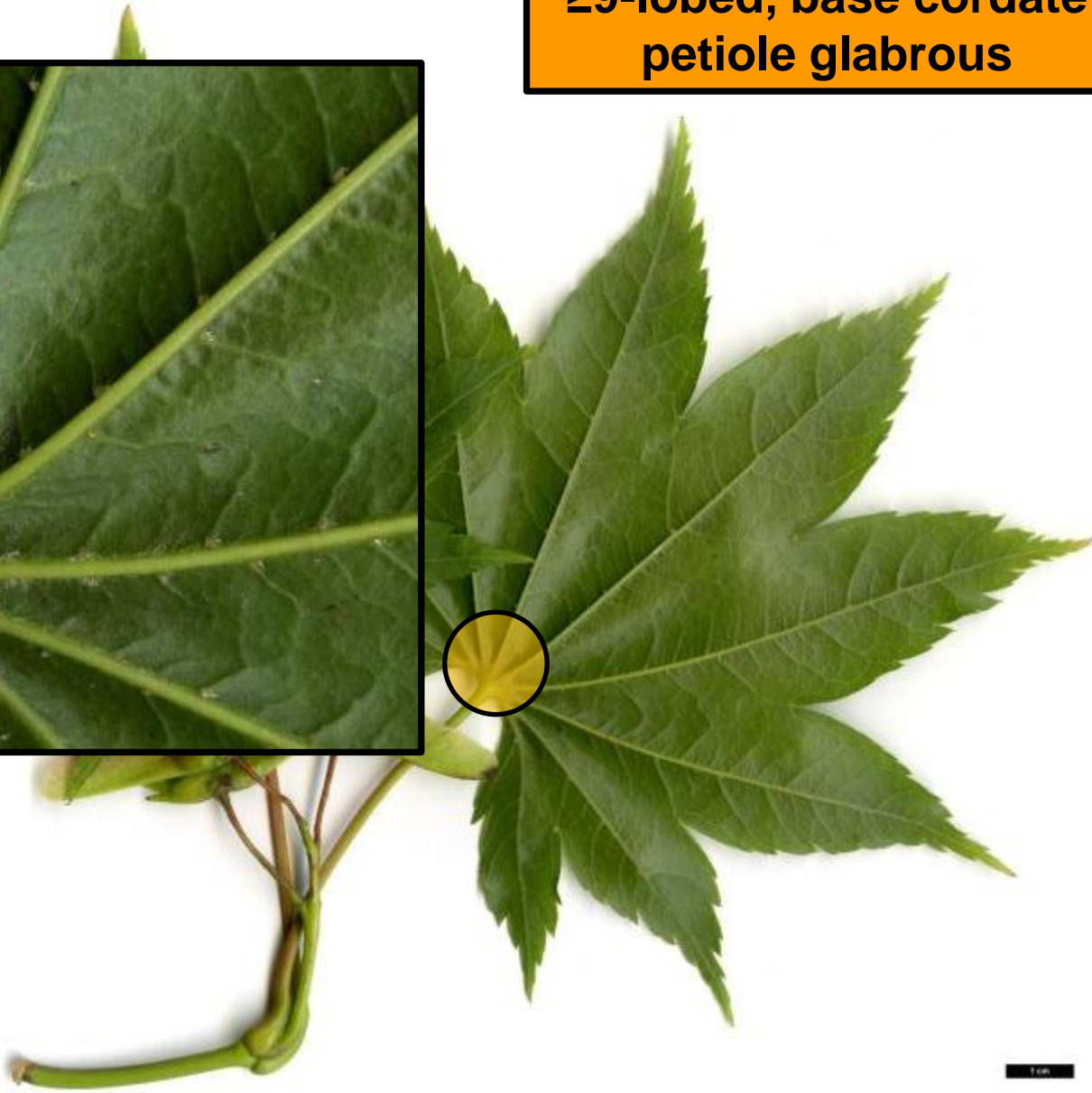
Japan

1 cm

A. shirasawanum (*Palmata*)

Group P

≥9-lobed, base cordate
petiole glabrous



Japan

A. japonicum (*Palmata*)

Group P

≥9-lobed, base cordate
petiole pubescent



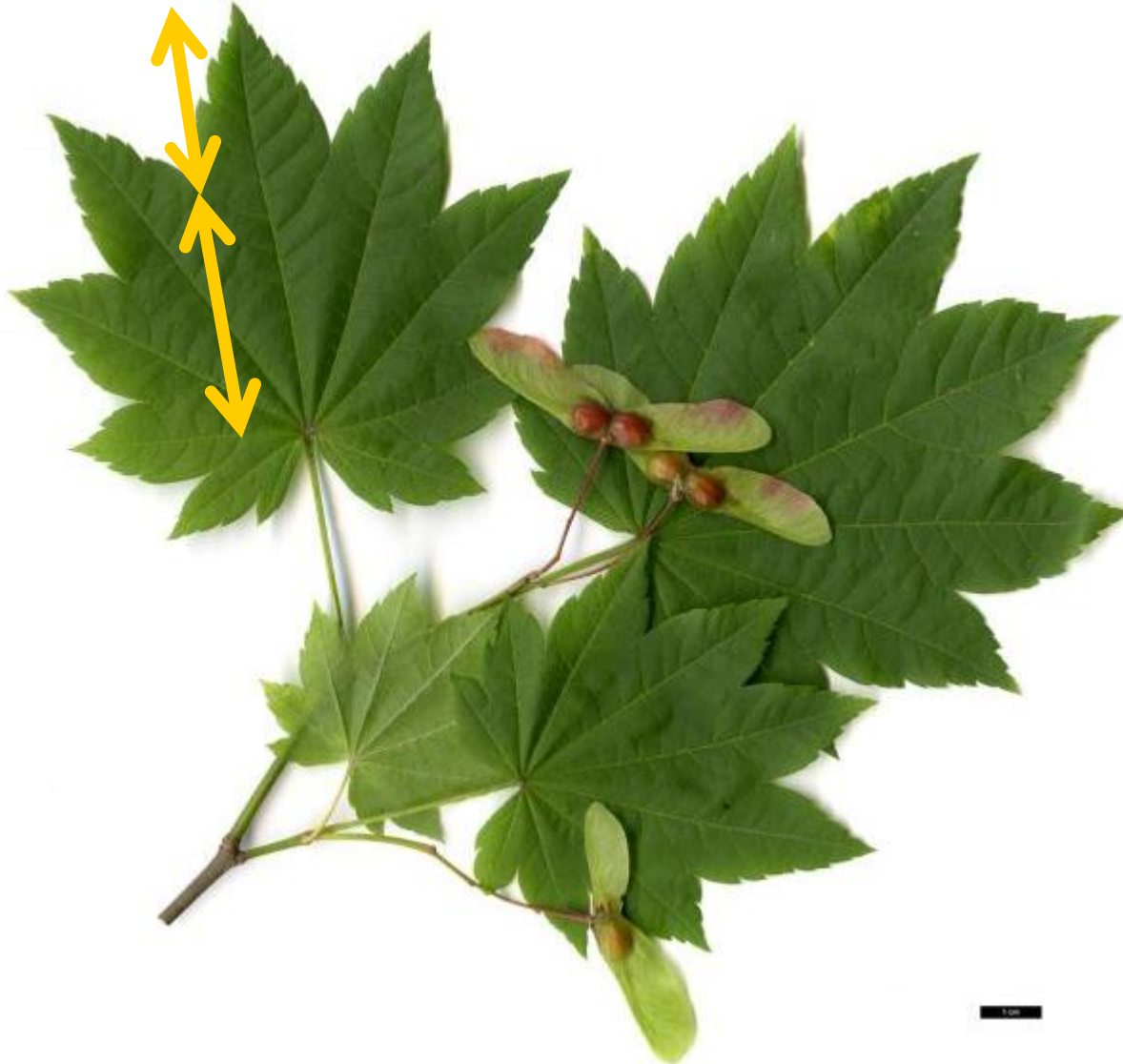
Japan

A. japonicum (*Palmata*)

Group P

terminal lobe
 $\leq 1/2$ midvein length

≥ 9 -lobed, base cordate
petiole pubescent



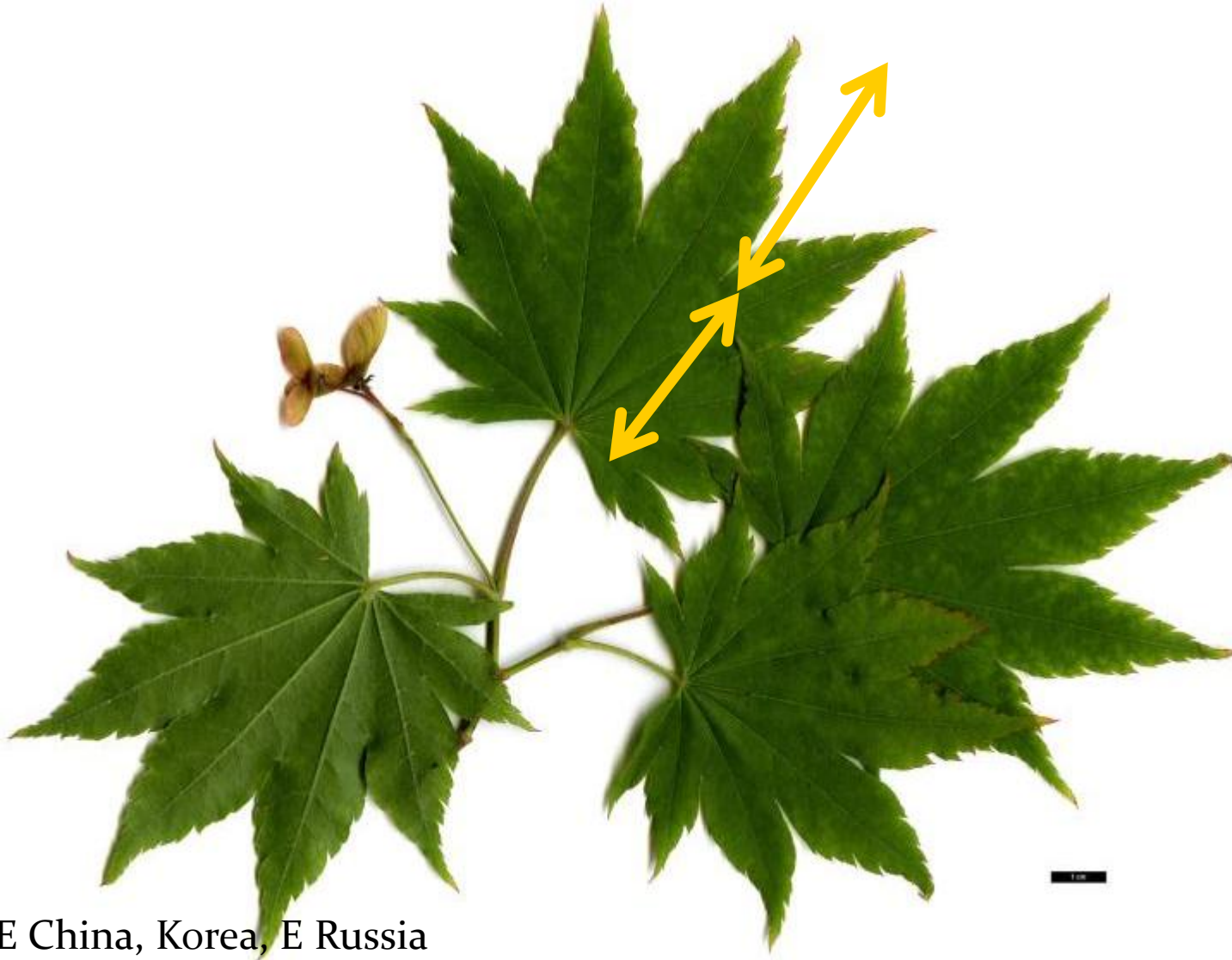
Japan

A. pseudosieboldianum (*Palmata*)

Group P

terminal lobe
>1/2 midvein length

≥9-lobed, base cordate
petiole pubescent



NE China, Korea, E Russia

A. duplicatoserratum (Palmata)

Group P



Taiwan

A. duplicatoserratum (*Palmata*)

7-9-lobed
lamina US pubescent

Group P



A. circinatum (*Palmata*)

7-9-lobed

T-lobe <1/2 midvein length



Group P



W N America

A. circinatum (*Palmata*)

Group P

7-9-lobed
T-lobe < 1/2 midvein length

petiole
glabrous



W N America

A. sieboldianum (*Palmata*)

Group P

7-9-lobed
T-lobe < 1/2 midvein length



Japan

A. sieboldianum (*Palmata*)

Group P

7-9-lobed
T-lobe < 1/2 midvein length

petiole
pubescent



A. robustum (*Palmata*)

7-lobed and terminal lobe
>1/2 midvein length

Group P



C China

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