

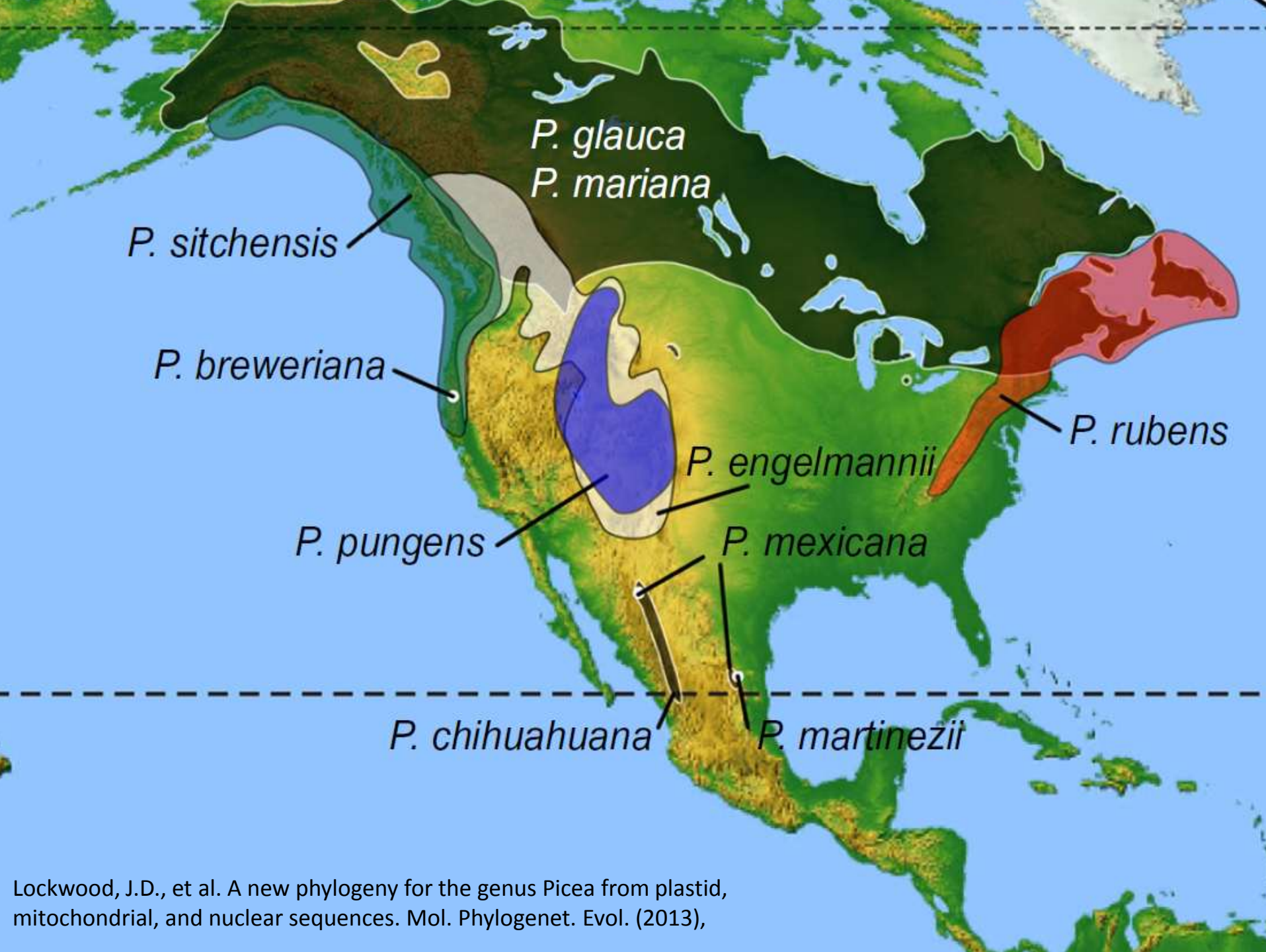
A Picture gallery of
Picea in the World and Arboreta

Philippe de Spoelberch
Belgian Dendrology Society Study day
Wespelaar, 7 September 2014

A	B	C	D	E	F
Picea Taxa and quantity of specimen in Belgian collections (BELTREES)					
OfINDEX	INDEXNAME	OfINDEX	INDEXNAME	OfINDEX	INDEXNAME
206	PICEA ABIES	4	PICEA SMITHIANA	1	PICEA ABIES CHLOROCARPA
103	PICEA ORIENTALIS	3	PICEA ABIES ACROCONA	1	PICEA ABIES CUPRESSINA
62	PICEA SITCHENSIS	3	PICEA ABIES FINEDONENSIS	1	PICEA ABIES INVERSA
44	PICEA PUNGENS GLAUCA GROUP	3	PICEA ABIES TUBERCULATA	1	PICEA ABIES NIDIFORMIS
41	PICEA OMORIKA	3	PICEA ABIES VIRGATA	1	PICEA ALCOQUIANA ACICULARIS
26	PICEA JEZOENSIS	3	PICEA GLEHNII	1	PICEA CRASSIFOLIA
23	PICEA PUNGENS	3	PICEA MEYERI	1	PICEA ENGELMANNII GLAUCA GROUP
18	PICEA ASPERATA	3	PICEA ORIENTALIS GRACILIS	1	PICEA ENGELMANNII MEXICANA
16	PICEA BREWERIANA	2	PICEA ABIES AUREA	1	PICEA GLAUCA ALBERTIANA CONICA
15	PICEA GLAUCA	2	PICEA ABIES ELEGANS	1	PICEA JEZOENSIS AUREA
14	PICEA RUBENS	2	PICEA ABIES ERYTHROCARPA	1	PICEA LIKIANGENSIS
14	PICEA TORANO	2	PICEA ABIES MICROPHYLLA	1	PICEA LIKIANGENSIS HIRTELLA
13	PICEA ALCOQUIANA	2	PICEA ABIES OHLENDORFFII	1	PICEA LIKIANGENSIS MONTIGENA
13	PICEA KOYAMAE	2	PICEA ABIES PENDULA	1	PICEA LUTZII
8	PICEA MARIANA	2	PICEA ABIES PYRAMIDATA	1	PICEA MARIANA DOUMETTI
8	PICEA SCHRENKIANA	2	PICEA ASPERATA HETEROLEPIS	1	PICEA MARTINEZII
6	PICEA JEZOENSIS HONDOENSIS	2	PICEA BRACHYTYLA	1	PICEA MORRISONICOLA
5	PICEA ABIES CRANSTONII	2	PICEA MAXIMOWICZII	1	PICEA ORIENTALIS ATROVIRENS
5	PICEA ABIES PENDULA MAJOR	2	PICEA OMORIKA NANA	1	PICEA ORIENTALIS AUREA
4	PICEA ENGELMANNII	2	PICEA PUNGENS ARGENTEA	1	PICEA ORIENTALIS AUREOSPICATA
4	PICEA LIKIANGENSIS RUBESCENS	2	PICEA PUNGENS GLAUCA GROUP COLUMNARIS	1	PICEA PURPUREA
4	PICEA OBOVATA	2	PICEA PUNGENS GLAUCA GROUP PENDULA	1	PICEA SPINULOSA
4	PICEA PUNGENS KOSTER	2	PICEA RETROFLEXA	1	PICEA WILSONII

BD_NuStat	Rg	NAME	Circ	HT	DATE_M	CITY	PARKCODE	DATA_FRENC
2182	5 **	Picea abies	570	35	2003	Bouillon	AMERO	Is,Cp.3Br, 69:530,87:551
6990	4 -	Picea abies	540	35	1990	Hamoir	LASSU	Is,mes/0.50m,candélabre
28257	4 *	Picea abies	492	45	1999	Nandrin	BAUGN	Gr.5
2723	0	Picea abies	480	30	1988	Ciney	BARSE	Gr.3,prairie,mes/0.50m,Br.lat./340,02:mort
28750	4 *	Picea abies	473	40	1997	Ciney (Leignon)	VARIA	Château de Barcenale,prairie,Gr.3(+ 332+278),très
16961	4 *	Picea abies	454	41	2003	Bouillon	AMERO	ma,bord du verger,gauche chemin dir.allée Navy
21721	4 -	Picea orientalis	440	16	2001	Hamoir (Comblain-Fairon)	VARIA	mes/base
25340	4 **	Picea sitchensis	427	36	2001	Neufchâteau	VARIA	Ave de la Gare 16,mes/1.50m,le +gros région wall
21726	3 °	Picea abies	420	28	2001	Hamoir (Filot)	VARIA	dans enclos
2180	3 *	Picea sitchensis	417	39	2003	Bouillon	AMERO	Is,69:345,91:397
1631	0	Picea abies	414		1986	Schoten	VORDE	04:pas trouvé
22860	4 °	Picea abies	413		2006	Saint-Hubert	ISOLE	Fond de Palogne,Tr.,sain
11065	5 °	Picea abies	412	38	1997	Arlon (Guirsch)	GUIRS	beau, Br.latérale énorme,91:418
2183	5 °	Picea abies	398	50	1987	Bouillon	AMERO	Ma, au pied du château,
2829	5 °	Picea abies	395	34	1988	Beauraing (Voneche)	VONEC	TB,près de l'étang,
5226	4 °	Picea abies	391	44	1989	Libin (Ochamps)	ROUMO	137ans,Li,étang,
2252	4 *	Picea sitchensis	384	46	2007	La-Roche-en-Ardenne	SJEAN	double,87:325
4624	4 .	Picea abies	381	28	2010	Houyet	ARDEN	Is,89:340,01:353
11084	4 .	Picea abies	380	33	1997	Arlon (Guirsch)	GUIRS	Is,c/la volière(reflet bleu),91:365
16960	4 .	Picea abies	376		2003	Bouillon	AMERO	gauche/chemin dir. allée de Navy,ma,bord verger
23314	4 *	Picea sitchensis	370		2006	Tervuren	ARTER	bois Capucins
25384	4 .	Picea abies	367	31	2000	Sainte-Ode (Lavacherie)	ISOLE	Lejardin
2357	4 .	Picea abies	366	36	2010	Assesse (Sart-Bernard)	RONCH	Gr,60:208,87:320,07:358(Struelens)
4655	4 .	Picea abies	365	35	1989	Houyet	ARDEN	Ma,
21844	4 .	Picea abies	365	25	2002	Jalhay (Sart-lez-Spa)	ISOLE	Cockaifaigne,TB
11082	4 .	Picea abies	363	37	1997	Arlon (Guirsch)	GUIRS	Ma,côté/Sequoia,91:365
21402	4 .	Picea abies	361	34	1997	Clavier	PONTH	pas mal de bois mort
6991	4	Picea abies	360	40	1990	Hamoir	LASSU	Is,en prairie
4811	0	Picea orientalis	360	35	1969	Yvoir	YVOIR	Rue Gayolle 1,tombé en 1986/tempête,
2657	4 .	Picea abies	360	43	1988	Ciney (Conneux)	CONJO	Li,de 700m,sujets de 3à4m,
5224	4	Picea abies	360	45	1989	Libin (Ochamps)	ROUMO	137ans,Li,étang,

	Summary Distribution & Classification of Picea species									
	Western America	Eastern America	Europe	Caucasus	Himalaya	SW China	C & E China (Taiwan)	Siberia	Korea, Manshuria	Japan
Clade 1			abies				obovata	obovata	obovata	koyamae
						asperata	meyeri		jezoensis	jezoensis
						retroflexa	crassifolia		koraiensis	glehnii
										torano
			omorika	orientalis						alcoquiana
										maximowiczii
Clade 2	glauca	glauca								
	mariana	mariana								
	engelmannii									
	sitchensis									
	pungens									
	mexicana									
	chihuahuana	rubens								
	martinezii									
Clade 3					likiangensis	likiangensis				
						brachytyla	brachytyla			
					spinulosa	neoveitchii	purpurea			
					farreri	farreri	wilsonii			
							schrenkiana	schrenkiana		
	breweriana				smithiana		morrisonicola			

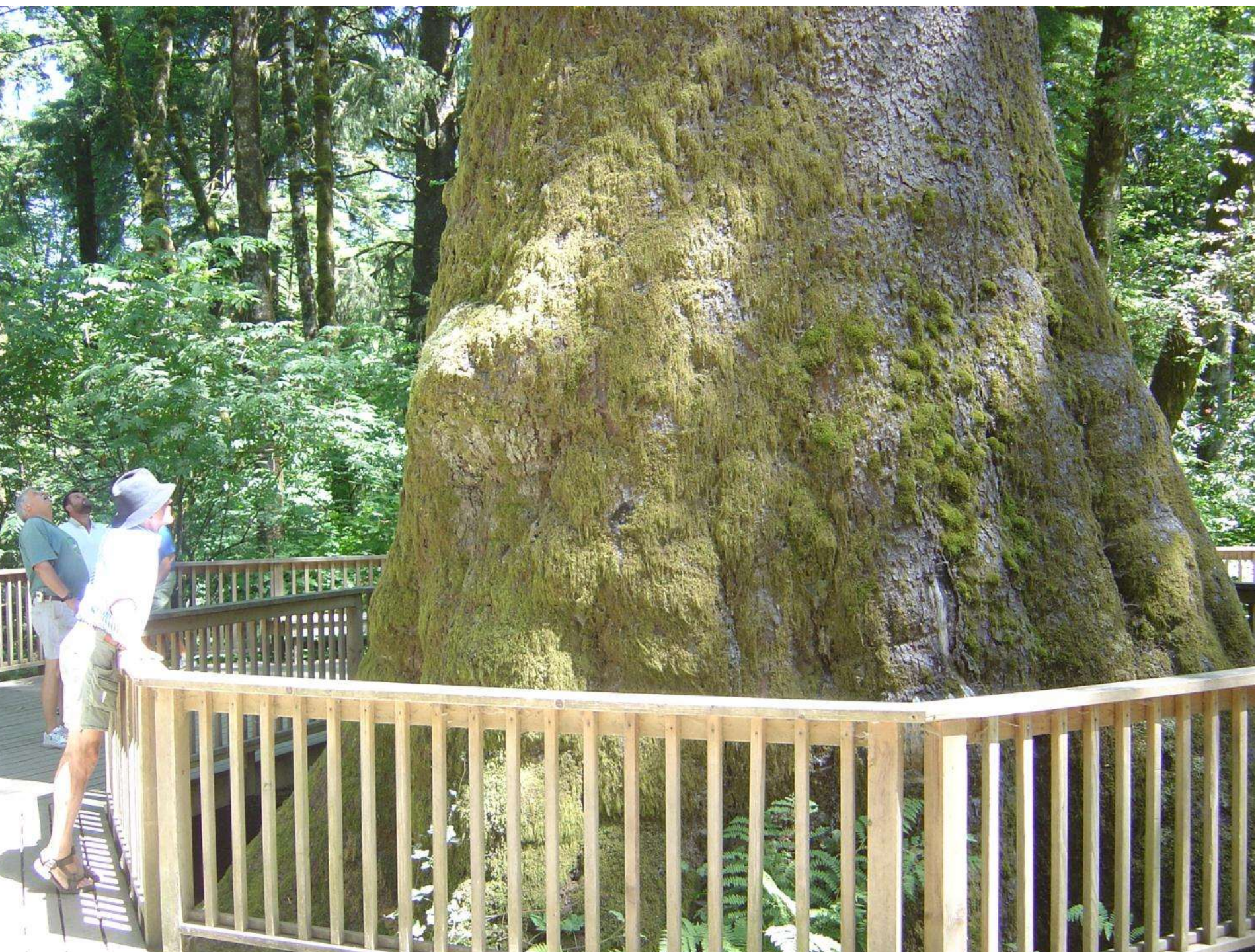


Lockwood, J.D., et al. A new phylogeny for the genus *Picea* from plastid, mitochondrial, and nuclear sequences. *Mol. Phylogenet. Evol.* (2013),

Picea sitchensis

A photograph of a massive Picea sitchensis tree in a forest. The tree is the central focus, with a very thick, textured trunk. Sunlight filters through the dense green canopy, creating a dappled light effect. At the base of the tree, a wooden walkway with railings leads towards it. Several people are standing on the walkway, providing a sense of scale to the enormous tree.

Picea sitchensis
(Klootchey Creek Giant)
Oregon, 15 m x 60 in 2004,





Picea sitchensis (Queets Spruce, 337m³) –
Queets Valley, Olympic National Park, Wa. – July 2004



Picea sitchensis - Quinault Lake,
Olympic National Park. August 2004





WORLD'S
LARGEST
SPRUCE
TREE
191' TALL
96' SPREAD
58' AROUND
ABOUT 1000
YEARS OLD

Picea sitchensis - Quinault Lake, Olympic
Nat.Park, 17 m x 60m -2004 -



Picea sitchensis -Beach 1,
Pacific shore, Olympic National Park -









Picea sitchensis - Culzean, 544cm,
BDB in Wales - 1995.05





Picea sitchensis, 463cm – Tregrehan, Cornwall - 2014.0327



Picea sitchensis, 326cm, BD.9382 - en H17 - MEMBA, Baelen – 2010



Picea sitchensis, 326cm, BD.9382 - en H17 - MEMBA, Baelen – 2010



Picea sitchensis —
Les Amerois , BD.2180, 417 cm x 39 m







Picea sitchensis (Valdez, Alaska) - Horsholm Arboretum.1982.0051 - 2012.0518



Picea sitchensis (Valdez, Alaska) - Horsholm Arboretum.1982.0051 - 2012.0518



Picea breweriana





Picea breweriana –
Siskiyou Mts. 1000m / -2010.0708



Picea breweriana –
Siskiyou Mts. 1000m -2010.0708



















Picea breweriana - Dawyck - 2008.0430 -



Picea breweriana - Arboretum provincial de Ghlin - 2006.1021



Picea breweriana BD.9712 – Parc de Mariemont, Morlanwez - 2 May 2005

Picea pungens





Picea pungens - Poma Ranch, Nr Pagosa Springs, Colorado – (*Frasera speciosa*, Gentianaceae) - 2003.07 -



Picea pungens - Poma Ranch, Nr Pagosa Springs, Colorado – (*Frasera speciosa*, Gentianaceae) - 2003.07 -



Picea pungens - Poma Ranch, Nr Pagosa Springs, Colorado – (*Frasera speciosa*, Gentianaceae) - 2003.07 -



Picea pungens, *Pseudotsuga menziesii* (right) - Wolf Creek, Colorado. - IDS - 2003.0702 -



Picea pungens (variable color) - Mountain Man Tree Farm, - San Juan Mts, USA - 2003.0628



Picea pungens – Closerie du Rond Chêne, Esneux - 1991.08 -



Picea pungens - Arnold Arb. - 2014.0824



Picea pungens – Royal Golf Ravenstein - RAVEN, 7g - Q - 2012.0912



Cones of *Picea pungens* versus cones of *Picea glauca* (right) - Meise Botanical Garden-



Picea engelmannii

Picea engelmannii - Gothic, 2900m, Crested Butte, Colorado – 2003.0703 - IDS in Rocky Mountains



Picea engelmannii - Poma Ranch 2000m , Pagosa Springs, Colorado. - 2003.0701





Picea engelmannii – (krumholtz, tree below) - Cumberland pass, 3656m - 2003.0705 - Rocky Mts



Picea engelmannii - krumholtz - downwind, Cumberland pass, 3656m , Colorado - 2003.070



Picea engelmannii - krumholtz - downwind, Cumberland pass, 3656m, Colorado - 2003.0705 - 1







Cones of *Picea pungens* (left) & *Picea engelmannii* (right) –
San Juan Mts, Santa Fe, New Mexico - 2003.0628 - IDS in Rocky Mountains



Picea chihuahuana

Picea chihuahuana - 734-78 - Arnold Arboretum, Boston Mass. - 2014.0824





Picea chihuahuana – Pinetum Anthoine Jamioulx - 2001.0408 -



Picea chihuahuana - J.B. Strasbourg – 28 May 2006 - BDB -



Picea mexicana

Picea mexicana (Cerro Mohinara, Mexico) - 95357-wld-112 - with Abies lasiocarpa - 2013.1113



Picea mexicana KR 526 (Coahuila 2650m,Mexico) - 94061-wld-112 - 14 May 2005 -



Picea mexicana KR 526 (Coahuila 2650m, Mexico) - 94061-wld-112 - 14 May 2005 -



Picea mexicana (Cerro Mohinara, Mexico) - 95356-wld-112 - 2006.0517 -



Picea mexicana (Cerro Mohinara, Mexico) - 95356-wld-112 - 2006.0517 -



Picea mexicana (Cerro Mohinara, Mexico) - 95356-wld-112 - 2006.0517 -



Picea martinezii



Picea martinezii (El Butano, Nuevo Leon, Mexico) - 96021 - wld - 121 -



Picea martinezii (El Butano, Nv Leon, Mexico, 2150m) - 96021-wld-121 - 2011.1211





Picea glauca



P. mariana

P. glauca

P. glauca



Picea glauca - 70047-wld-530 – Wespelaar - 2012.0809 – a difficult plant in our maritime climate



Picea glauca - Mt Washington State Forest, eastern Mass. USA
IDS in New England - 12 Oct 1989



Picea glauca - 70047-wld-530 – Wespelaar - 2004.0830 -



Picea glauca - 70047-wld-530 – Wespelaar - 2004.0830 -



Picea mariana

Picea mariana aff. - Wilhelmshohe – BDB - 2010.1007



Picea mariana - 1336-78 - Arnold Arb. - 2014.0824



Picea mariana - at Maurice Foster's – White House Farm, Kent, UK - 2004

A photograph of a forest landscape. In the foreground and middle ground, there are numerous trees with vibrant autumn foliage in shades of orange, yellow, and red. Interspersed among these are several tall, dark green coniferous trees, identified as Picea rubens. The background shows a dense forest of similar trees under a clear blue sky. The text "Picea rubens" is overlaid in the center in a large, white, sans-serif font.

Picea rubens

Picea rubens – BDB in the Great Smoky Mountains - 2013.1018



Picea rubens, *Tsuga canadensis* - Great Smoky Mts - 2013.1018



Picea rubens - Great Smoky Mts - 2013.1018



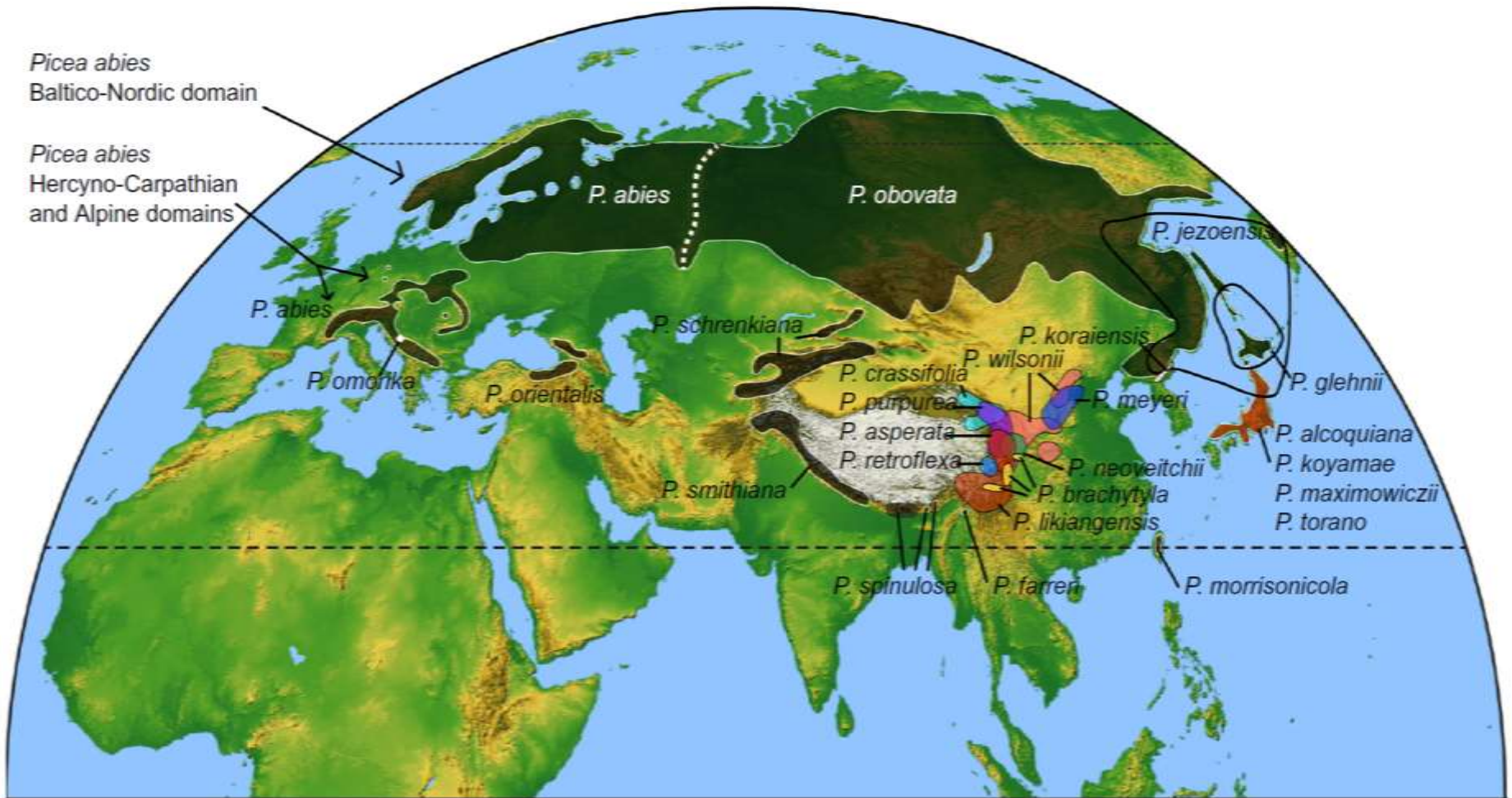
Picea rubens (Rice Sanctuary, Peru, Mass) - 01046-wld-282 - 2006.0616 -



Picea rubens (Rice Sanctuary, Peru, Mass) - 01046-wld-282 - 2006.0616 -



Picea rubens –
Arboretum de Saint
Michel
Saint Hubert,
BD 9526
Champion tree: 190 cm
23 April 2005 -

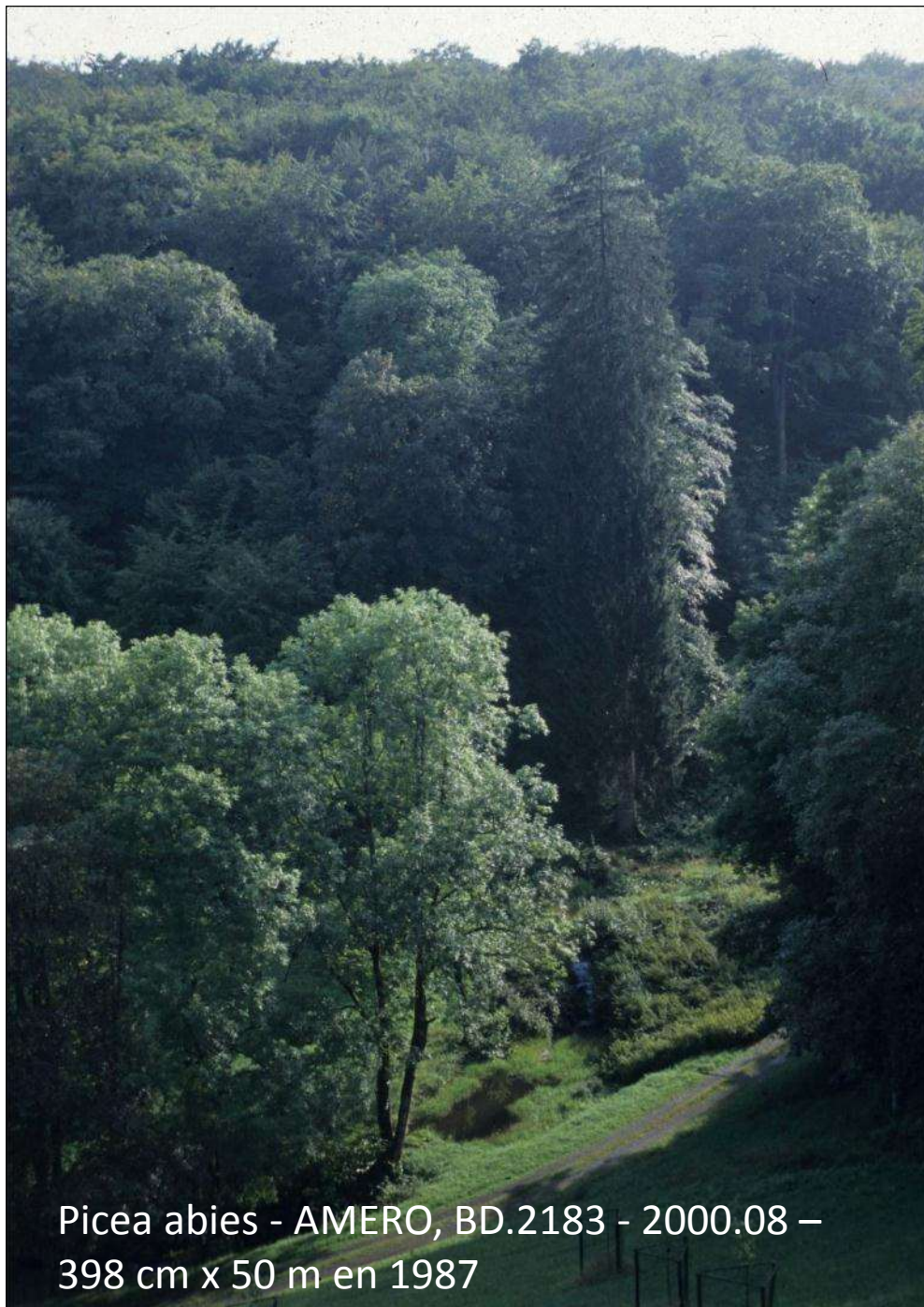


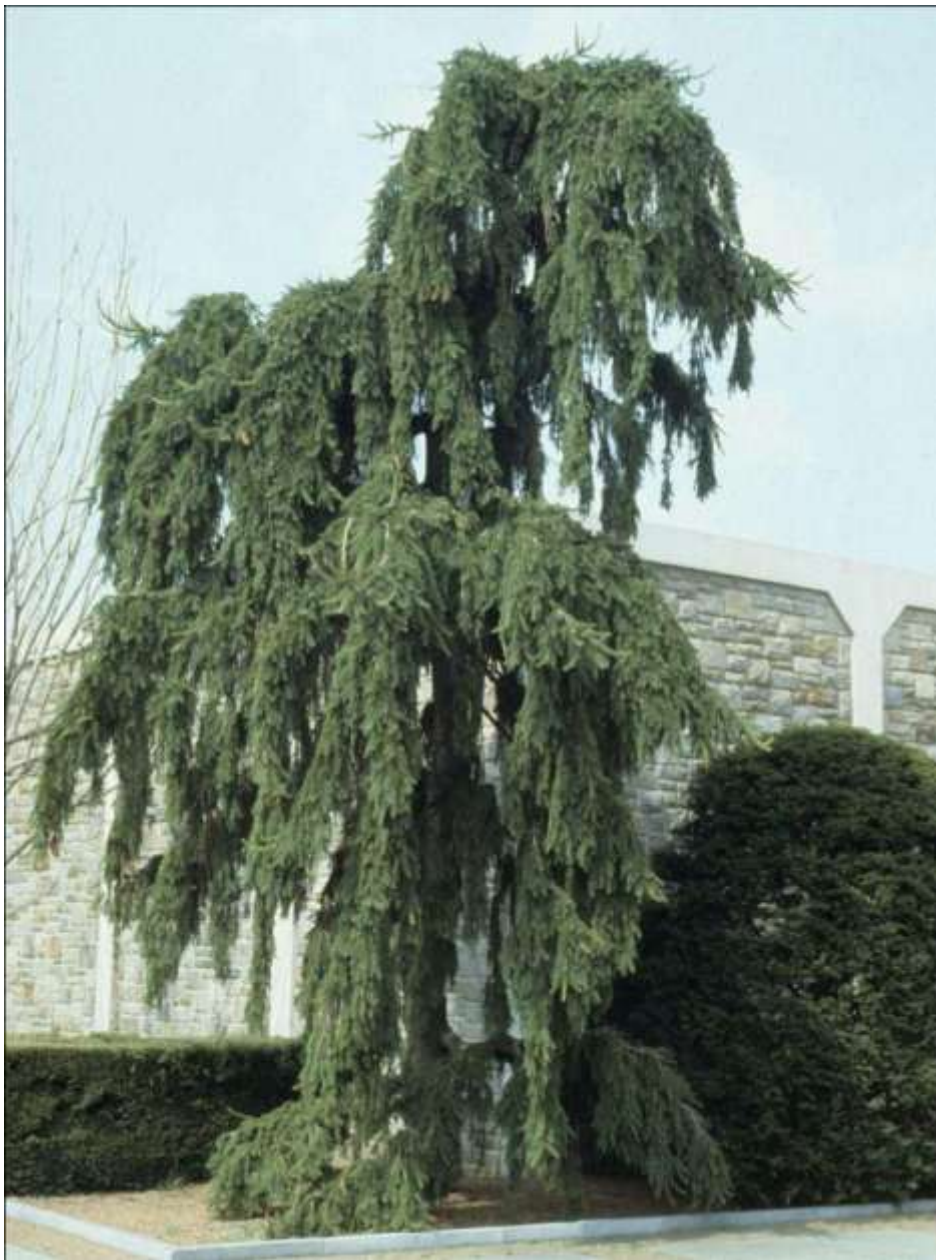
1. Map of the Northern Hemisphere in equal-area projection (Mollweide) showing the distribution of *Picea* based on Farjón (1990) and eFloras (2008). Black dashed line indicates the equator. From Lockwood, J.D. et Al - (2013) - A new phylogeny for the genus *Picea*, in Molecular Phylogenetics and Evolution 2013, Vol.69/3, p. 717-727



Picea abies

Picea abies – Royal Golf d'Ardenne, BD.4624 - 353cm x 28 m - 2010.1107





Picea abies 'Pendula' - Longwood - 1991.04



Picea abies 'Inversa' Pinetum J. ICKX. -2013.03



Picea abies 'Nidiformis' – Closerie du Rond Chêne (André Charlier) - 1991.08 -



Picea abies 'Cranstonii' - KALMT.0001905a - 2



Picea abies 'Cranstonii' - KALMT.0001905a - 2



Picea abies 'Cranstonii' - KALMT.0001905a - 2

Picea omorika



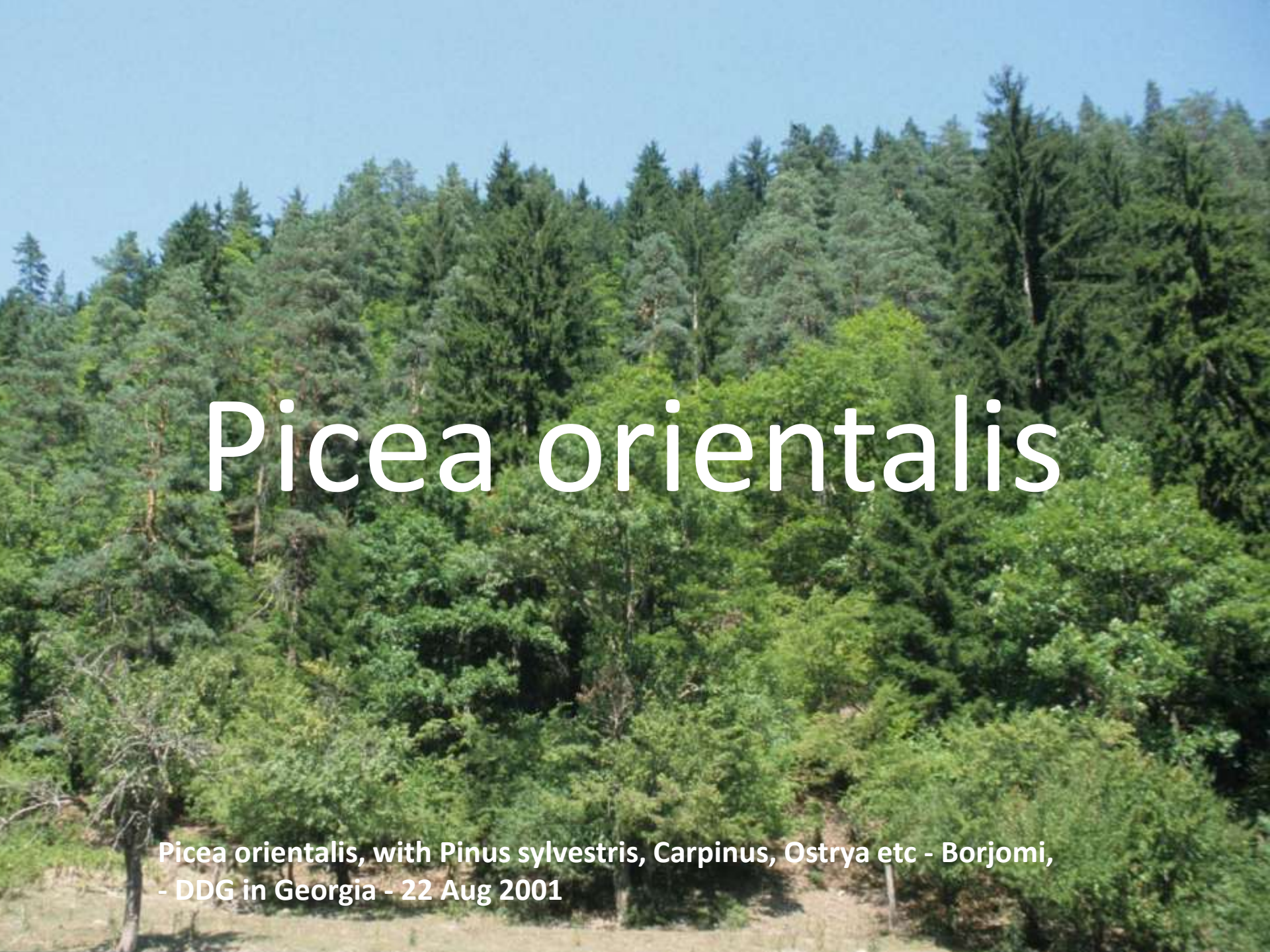
Picea omorika – Royal Golf Club Ravenstein - 2010.1011



Picea omorika - MEZEN, BD.6455 - Arb der MEZEN - 2011.0328



Picea omorika (left) , and *Picea orientalis* (right) - Pinetum, VORDENSTEIN - 2010.0820

A photograph of a dense forest of Picea orientalis trees on a hillside. The trees are green and conical, with some showing signs of age or damage. The sky is clear and blue.

Picea orientalis

Picea orientalis, with Pinus sylvestris, Carpinus, Ostrya etc - Borjomi,
- DDG in Georgia - 22 Aug 2001



Picea orientalis – Bois Saint Jean, BD.2215, Belgian champion tree 307 cm x 25m in 2007



Picea orientalis –Arboretum Tervuren
BD.22943 - 2006.1027



Picea orientalis - BD.7443 - OV-
Berlare(Uitbergen) 2,06 x23 m- 1990.10 -



Picea orientalis n°31, – VORDENSTEIN - 2010.0820

A close-up photograph of a Picea orientalis branch. The branch is covered in dense, green, needle-like foliage. Several small, spherical, light green galls are visible, each with a distinct reddish-brown, grid-like pattern on its surface. The background is a soft, out-of-focus green, suggesting a forest setting.

Picea orientalis (sdlg #518-9) - Galls from *Dreyfusia nordmannianae*
Closerie du Rond Chêne , Esneux - 20 Jul 2005



Picea orientalis (sdlg #518-9) - Galls from *Dreyfusia nordmannianae*
Closerie du Rond Chêne , Esneux - 20 Jul 2005



Picea orientalis – ARTER, BD.22943 en 26 - 2006.1027 - Galls possibly -



Picea obovata

Picea obovata
Arboretum Robert Lenoir
n°.1965 –
2003.0602 - P





Picea schrenkiana

Picea schrenkiana - Göttingen BG. —
2010.1009 01

Picea schrenkiana - ANTHO - 2014.0303





Picea schrenkiana – Domaine du Rond Chêne Esneux - 2013.0821

Picea smithiana

A large group of people, mostly men, are walking along a grassy path in a forest. In the foreground, a large, mature Picea smithiana tree with dense, dark green needles and a thick trunk is prominent. The path leads into the distance, where more people are visible. The background is filled with various other trees, including some with lighter green foliage. The sky is overcast.

Picea smithiana – Killerton – IDS - 2011.1009 1



P. smithiana - 231cm, Villa Melzi, Lac de Come,



Picea smithiana 297cm - Tregrehan - 2014.0327





Picea smithiana – Arboretum Tervuren BD.25915 perk 34 - 2009.1031



Picea smithiana – Chateau de Scrawelle, Seneffe - 2013.0624



Picea smithiana – Chateau de Scrawelle, Seneffe - 2013.0624

Picea smithiana – Pinetum Anthoine, Jamioulx - 2014.0303



Picea smithiana – Pinetum Anthoine, Jamioulx - 2014.0303





Picea spinulosa

Picea spinulosa - Dombang valley, Lachung, Sikkim - 2010.0507





Picea spinulosa - Dombang valley, Lachung, Sikkim - 2010.0507











Picea crassifolia

Picea crassifolia – Arboretum Wespelaar - 91737-waa-289 - 2010.0911





Picea crassifolia - Arb. Wespelaar - 91737-waa-289 - 2012.0404



Picea crassifolia - Arb. Wespelaar - 91737-waa-289 - 2012.0404

Picea purpurea

Picea likiangensis var. *purpurea* –
Arboretum Robert Lenoir - LENOI.911 -
1999.0801 -



Picea asperata

A large, mature Picea asperata tree stands prominently in the center of the frame. The tree has a dense, conical shape with a bluish-green hue. To the left, a person wearing a blue cap, a green jacket, and a backpack is standing, looking at a small object in their hands, providing a sense of scale. The background is filled with other trees, including tall, slender evergreens and deciduous trees with green foliage. The ground is covered in dry, brownish leaves and pine needles. The overall scene is a natural, forested environment.

Picea asperata – Arboretum de la Tessenire, Esneux - TESSE - 2013.0901



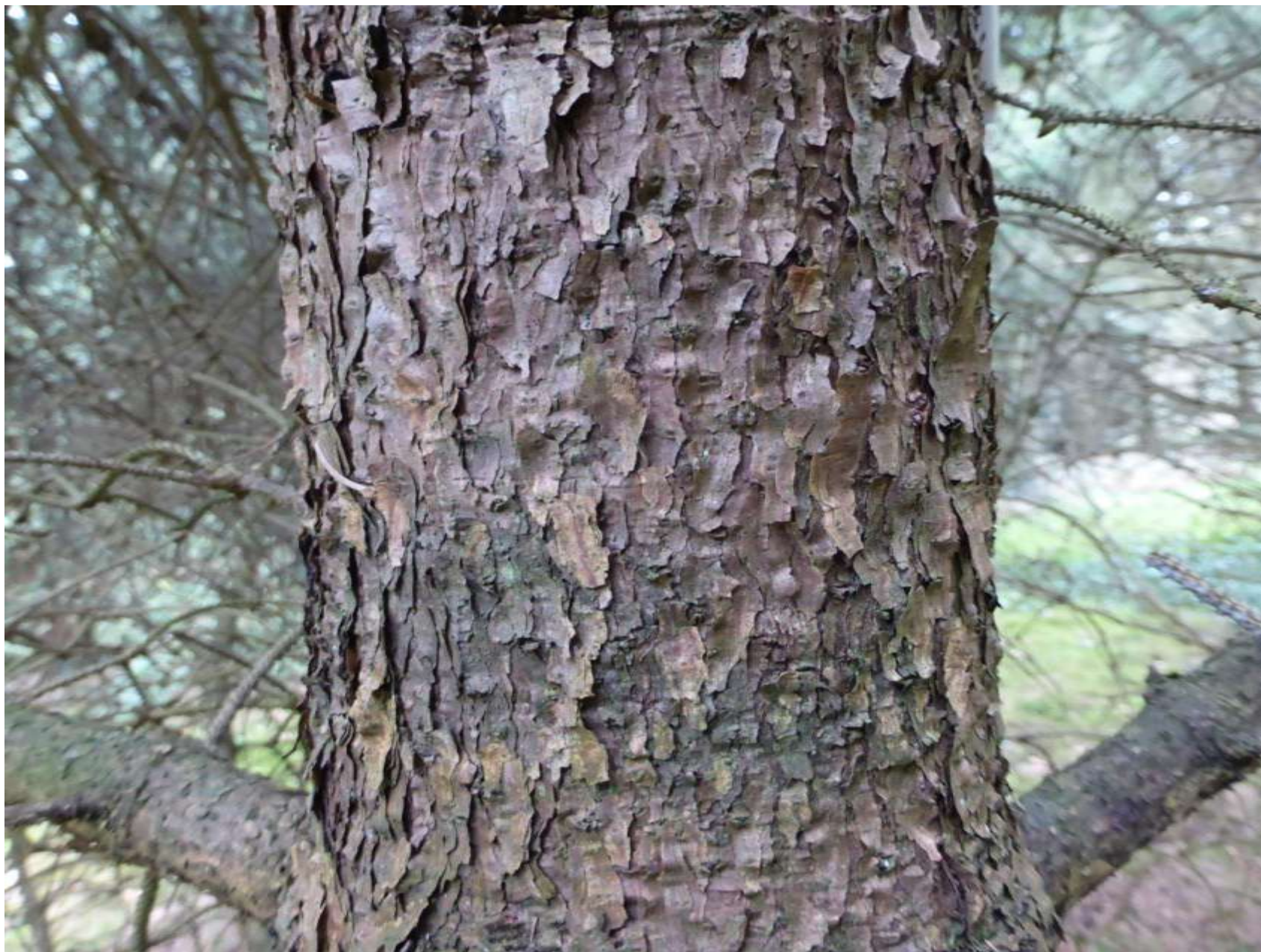




Picea asperata aff. - Jiuzhaigou, Sichuan - 2009.0705



Picea asperata - TESSE - 2013.0901



Picea asperata var. *notabilis* – Pinetum Anthoine, Jamioulx (NTHO)- 2014.0303



Picea wilsonii

Picea brachytyla (left) et wilsonii (right) –
Arb. R. LENOIR in loc. 17 - 2013.0817



Picea wilsonii - LENOI.n° 2553 en 17 - 2013.0817

Picea brachytyla

Picea brachytyla - Napahai top, Zhongdian, Yunnan – 2014.06



Somsang monastery , near Zhongdian, Yunnan - 2014.0618



Picea brachytyla - Napahai top, Zhongdian, Yunnan- 2014.0618







Picea brachytyla poss. (Galls on male catkins ?) - Tianchi lake, Zhongdian , Yunnan - 2014.0613







Picea brachytyla – Arboretum LENOIR- nr°2553 - 2010.0417

Picea likiangensis

A landscape photograph showing a lush green valley with several tall, conical evergreen trees in the foreground and middle ground. In the background, there are dark, forested mountains under a clear blue sky. The text 'Picea likiangensis' is overlaid in large white letters across the upper portion of the image.

Picea likiangensis – Lunang, 3430 m , down from the Sirkem La, the Rong chu, SE Tibet - 2013.0610







Picea likiangensis, with *Acer geraldii*, *Acer caudatum*, *Betula utilis* etc, Sirkem La, Tibet



Picea likiangensis (young cone) - Shika Mountain, 3500m, Zhongdian - 2014.0612



Picea likiangensis — Songtsam, ,Zongdian Yunnan- 2008.0627



Picea likiangensis - Songtsam, Zongdian Yunnan - 2008.0627



Picea likiangensis - North of Sangdai 4500m, Yunnan-Sichuan border - 2008.0702



Picea likiangensis - Yuhu, Lijiang, Yunnan - 2008.0624



Picea likiangensis – on G318 , East of Bomi (Pome), Tibet – Sichuan border -2013.0613



Pinus armandii



Pinus yunnanensis

CONES
COLLECTED
ABOVE
POME/BOWI
JUNE
2013



Picea brachytyla aff.



Picea likiangensis



**Larix
griffithii**

A photograph of a forest landscape. In the foreground, there are several tall, dark green coniferous trees (Picea jezoensis) and some deciduous trees with yellowing leaves. The background shows a dense forest covering a hillside, with more coniferous trees visible. The sky is clear and blue. The text "Picea jezoensis" is overlaid in the center of the image in a large, white, sans-serif font.

Picea jezoensis

Picea jezoensis - Takibue Bridge, to Shikotsu lake, Hokkaido, Japan - IDS- 23 Oct 1992









Picea jezoensis – Royal Golf club Ravenstein BD.22716 - 2008.0820







Picea alcoquiana

Picea alcoquiana var. reflexa - 651-67 - Arnold Arboretum- 2014.08 24. -



Picea alcoquiana var. *reflexa* * 65167 - Arnold Arboretum - 2014.08.24. -



Picea alcoquiana var. *reflexa* - 651-67 (cones) - Arnold Arb. - 2014.0824



Picea alcoquiana var. *reflexa* - 651-67 (cones) - Arnold Arb. - 2014.0824



Picea torano (syn. P. polita)



Picea torano – Arb. Du Sart Tilman, Liège - 2009.0517



Picea torano – Arb. Du Sart Tilman, Liège - 2009.0517







Picea torano (syn. polita) BD 26598 - en D4-5 MEMBA, Baelen - 2010.1029







A large, dark green coniferous tree, identified as Picea morrisonicola, stands prominently in the center of the frame. Its branches are heavily laden with bright green moss, particularly on the upper and outer parts. The tree is set against a backdrop of a mountainous landscape. To the left, a steep, rocky slope rises, partially covered in green vegetation. In the distance, more mountain ranges are visible under a sky filled with soft, white clouds. The overall scene is a natural, high-altitude environment.

Picea morrisonicola

Picea morrisonicola - before Dayuling, Taroko gorge, Taiwan - 2012.1112



Picea morrisonicola – young cones and old gall infected cone - Lishan to Hehuanshan Taiwan – 2012.1114



Picea morrisonicola – young cones and old gall infected cone - Lishan to Hehuanshan Taiwan – 2012.1114



Picea morrisonicola – young cones and old gall infected cone - Lishan to Hehuanshan Taiwan – 2012.1114

A large, mature Picea morrisonicola tree stands prominently in the foreground, its dark green needles and thick trunk clearly visible. The tree is set against a backdrop of a vast, mountainous landscape. In the distance, rolling hills and mountains are covered in dense green forests, with some peaks appearing hazy. The sky above is a clear, bright blue, dotted with a few wispy white clouds. The overall scene conveys a sense of a remote, natural environment.

The End

Picea morrisonicola - Lishan to Hehuanshan, Taiwan – 2012.1114