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Cover photo : *Calocedrus rupestris* in NorthernVietnam, Phong Nha - Ke Bang National Park, 26 January 2005. © Pr. Leonid Averyanov.

Découverte d'une nouvelle aire de *Calocedrus rupestris* en Chine

Décrit pour la première fois en 2004 au Vietnam, *Calocedrus rupestris* Aver., T.H. Nguyên & P.K. Lôc avait longtemps été confondu avec *Calocedrus macrolepis* Kurz qui occupe en partie la même aire géographique, mais une niche écologique différente (Averyanov *et al.* 2005, 2008). Tout récemment de nouvelles stations de *Calocedrus rupestris* avaient été trouvées au nord de la province du Guangxi en Chine (Nong *et al*. 2011).

En septembre 2016, en travaillant sur les localités des *Calocedrus macrolepis* (Hoch en préparation), j'ai eu la bonne surprise de découvrir deux spécimens de *Calocedrus rupestris* à l'herbarium de Paris qui proviennent du Guizhou en Chine (P01637501, P01637502). Cette espèce était jusque-là inconnue dans cette province. Ces spécimens furent récoltés par un missionnaire français, Julien Cavalerie en poste au Guizhou entre 1896 et 1919. Le premier spécimen (*Cavalerie 3983*) date de 1911 : Guizhou, rochers sud de « Kouy-Houa ». Cet endroit actualisé (Bousquet 19..) est le sud du chef-lieu du district de Ziyun Xian (**B** sur la carte 1 – fig. 2). Le second spécimen (*Cavalerie 4247*), date de 1914 : Guizhou, « sud de Gan-chouen » qui est aujourd'hui (Bagge & Aïtoff 1921) la ville préfecture d'Anshun et chef-lieu du district Xixiu Qu (**A** sur la carte 1 – fig. 1). Ces deux endroits sont situés respectivement à environ 50 et 90 km plus au nord de la station la plus proche au Guangxi, (préfecture de Baise, district de Leye Xian, canton de Yachangxiang). Cette station au Guangxi, également nouvelle, est représentée par le spécimen *Qin Haining* et al. *607011* (**M** sur la carte 1). Grâce à l'identification des spécimens de Cavalerie, il était permis d'espérer découvrir encore d'autres preuves de la présence de *Calocedrus rupestris* dans les montagnes calcaires du Guizhou. De plus amples investigations ont révélé que l'herbier de Kew détenait également un *Calocedrus* identifié *Calocedrus macrolepis* (K000087902) qui provient du Sud Guizhou (Qiannan Prefecture, Libo Xian – fig. 3). L'examen de ce spécimen (*Song X.H. 439*, 12.04.1983) révèle qu'il s'agit là encore d'un *Calocedrus rupestris* (**G** sur la carte 1). Deux récoltes de *Calocedrus rupestris* supplémentaires ont pu être trouvées sur le site du Chinese Virtual herbarium et une à Edimbourg (**J**, **K** & **L** – carte 1). D'autre part, une feuille d'herbier (SYS00001347), sans photo, déterminée *Calocedrus macrolepis* du Guizhou est listée à Zhongshan (Sun Yatsen) University, Guangzhou, Guangdong, China. C'est un spécimen *Y. Tsiang 8562* qui date de 1930 : Guizhou, « Jiu-lung-shan, Tinfan » ce qui correspond au (mont) Jiu Long Shan, situé environ 1 km à l'ouest du chef-lieu du Huishui Xian, (**D** sur la carte 1). Une recherche de doublons dans l'ensemble des herbiers a permis de trouver 5 feuilles *Y. Tsiang 8562* supplémentaires, avec photos. Ces 5 feuilles-là (PE00014411, PE00014421, NAS00163748, NAS00163746, P01636772* – fig. 4) avaient été déterminées *Fokienia* [1] , mais ce sont bien des spécimens de *Calocedrus rupestris*.

Ainsi, *Calocedrus rupestris* pouvait aussi avoir été déterminé comme *Fokienia* (Cheng 1931). La recherche a donc été étendue à l'ensemble des feuilles en lignes avec photos de ce genre. Cela a permis d'identifier 14 feuilles de *Calocedrus rupestris* en plus au Guizhou (**E**, **F**, **H** & **I** – carte 1 & fig. 5-10) et 3 nouvelles au Guangxi (**M**, **N** & **O** – carte 1). (Liste n° 2: list of the new localities of *Calocedrus rupestris* in China.)

Le nombre de stations nouvelles ainsi localisées au Guizhou est de 12. La présence de cette espèce dans cette province ne fait aucun doute, et comme le montre la carte 1, son aire se répartit sur une grande superficie du sud Guizhou. On peut donc espérer localiser encore d'autres endroits. Sur le site du Chinese Virtual herbarium, 11 autres spécimens sont listés au Guizhou, tous indiqués *Calocedrus macrolepis* (voir liste n° 3). La plupart de ces spécimens sont récents ; ils datent de 1981 à 2002 et ils proviennent principalement de districts situés au Sud du Guizhou. Malheureusement le matériel photographique nécessaire pour les déterminer est à l'heure actuelle indisponible. Par cette note, je souhaite que les autorités botaniques respectives des institutions qui conservent les spécimens indiqués ci-dessous (voir liste n° 1) soient alertées et que de futures investigations soient rendues possibles.

Les spécimens P01637501, P01637502 & K000087902 ont été déterminés comme *Calocedrus rupestris* par Hoch, Frankis et Maerki, tous les autres spécimens ont été déterminés comme *Calocedrus rupestris* par Hoch.

[1] = *Chamaecyparis hodginsii* (Dunn) Rushforth (Rushforth 2007).

Remerciements

Nous adressons nos remerciements aux curateurs du Kew herbarium qui ont fourni les images à haute résolution ayant permis l'identification du spécimen K000087902. Nous voudrions aussi remercier les sites web du MNHN de Paris, Le Royal Botanic Garden Edinburgh et le Chinese Virtual Herbarium pour leurs spécimens disponibles en ligne, images qui ont permis de faire ces découvertes. Et un chaleureux remerciement est adressé au Prof. Averyanov pour les photos de *Calocedrus rupestris* au Vietnam.

Extended range area of *Calocedrus rupestris* in China

Described for the first time in 2004 in Vietnam, *Calocedrus rupestris* Aver., T.H. Nguyên & P.K. Lôc had long been confused with *Calocedrus macrolepis* Kurz occupying for part the same geographical area, but a different ecological niche (Averyanov *et al.* 2005, 2008). Recently new *Calocedrus rupestris* stations had been found north of Guangxi province in China (Nong *et al.* 2011).

In september 2016, working on the localities of *Calocedrus macrolepis* (Hoch in preparation), I was pleasantly surprised to discover two specimens of *Calocedrus rupestris* in Paris herbarium originating from Guizhou in China, (P01637501, P01637502). This species was hitherto unknown in this province. These specimens were collected by a French missionary, Julien Cavalerie stationed in Guizhou between 1896 and 1919. The first specimen (*Cavalerie 3983*) dates from 1911: Guizhou, 'rocks south of Kouy-Houa'. This updated place (Bousquet 19..) is South of the county town of Ziyun Xian (**B** on map 1 – fig. 2). The second specimen (*Cavalerie 4247*) date from 1914: Guizhou, 'south of Gan-chouen' which is today (Bagge & Aïtoff 1921) the prefecture city of Anshun and county town of Xixiu Qu (**A** on map 1 – fig. 1). These localities are situated respectively at some 50 and 90 km to the north of the nearest station in Guangxi (Baise prefecture, Leye Xian district, Yachangxiang canton). This Guangxi locality, also new, is represented by *Qin Haining* et al. *607011* (**M** on map 1). There is still some hope to discover new populations on limestone mountains in Guizhou. More thorough investigations allowed finding that the Kew herbarium also held one *Calocedrus* identified as *Calocedrus macrolepis* (K000087902) which comes from South Guizhou (Qiannan Prefecture, Libo Xian – fig. 3). The careful examination of this specimen (*Song X.H. 439*, 12.04.1983) reveals that it is a *Calocedrus rupestris* too (**G** on map 1). Two additional *Calocedrus rupestris* collects were found on the Chinese Virtual Herbarium site and one in Edinburgh (**J**, **K** & **L** on Map 1). On the other hand a herbarium sheet (SYS00001347), without photo, determinated as *Calocedrus macrolepis* from Guizhou is recorded at Zhongshan (Sun Yatsen) University, Guangzhou, Guangdong, China. It is a specimen *Y. Tsiang 8562* from 1930: Guizhou, "Jiu-lung-shan, Tinfan". It corresponds to (mount) Jiu Long Shan, situated ca. 1 km west of county town of Huishui Xian (**D** on map 1). A search to find duplicates in all herbaria revealed a further five sheets *Y. Tsiang 8562*, with photos. These five sheets (PE00014411, PE00014421, NAS00163748, NAS00163746, P01636772* – fig. 4) were labelled *Fokienia* [2], but they are specimens of *Calocedrus rupestris*.

Thus, *Calocedrus rupestris* could also have been determined as *Fokienia* (Cheng 1931). The search was therefore extended to all online sheets with photos of this genus name. This led to the identification of 14 more sheets of *Calocedrus rupestris* in Guizhou (**E**, **F**, **H** & **I** on Map 1 & fig. 5-10) and 3 in Guangxi (**M**, **N** & **O** on Map 1). (List #2: *Calocedrus rupestris* in China.) The number of new stations thus located in Guizhou is 12. The presence of this species in this province is beyond doubt and, as shown on Map 1, its area is spread over a large part of southern Guizhou. Hence, it is hoped to locate even more places. The Chinese Virtual Herbarium website lists 11 more specimens from Guizhou labeled *Calocedrus macrolepis* (cf. list #3). Most of these specimens are recent; they date from 1981 to 2002 and come from South Guizhou districts. Unfortunately, photographic material of these herbarium sheets – necessary to identify them – is currently

[2] = *Chamaecyparis hodginsii* (Dunn) Rushforth (Rushforth 2007).

unavailable. With this note I wish that the respective authorities of the botanical institutions holding the specimens listed below (cf. list #1) will be alerted and that future investigations will be possible.

The specimens P01637501, P01637502 & K000087902 were all determined as *Calocedrus rupestris* by Hoch, Frankis and Maerki, while all the other specimens were determined as *Calocedrus rupestris* by Hoch.

Acknowledgments

We address our thanks to the curators of the Kew herbarium who provided the high resolution image allowing the identification of the K000087902 specimen. We would also thank the websites of the Museum of Paris, the Royal Botanic Garden Edinburgh and the Chinese Virtual Herbarium for their on line specimen photos which allowed us to make these discoveries. And my deep thanks are addressed to Prof. Averyanov for the photos of *Calocedrus rupestris* in Vietnam.

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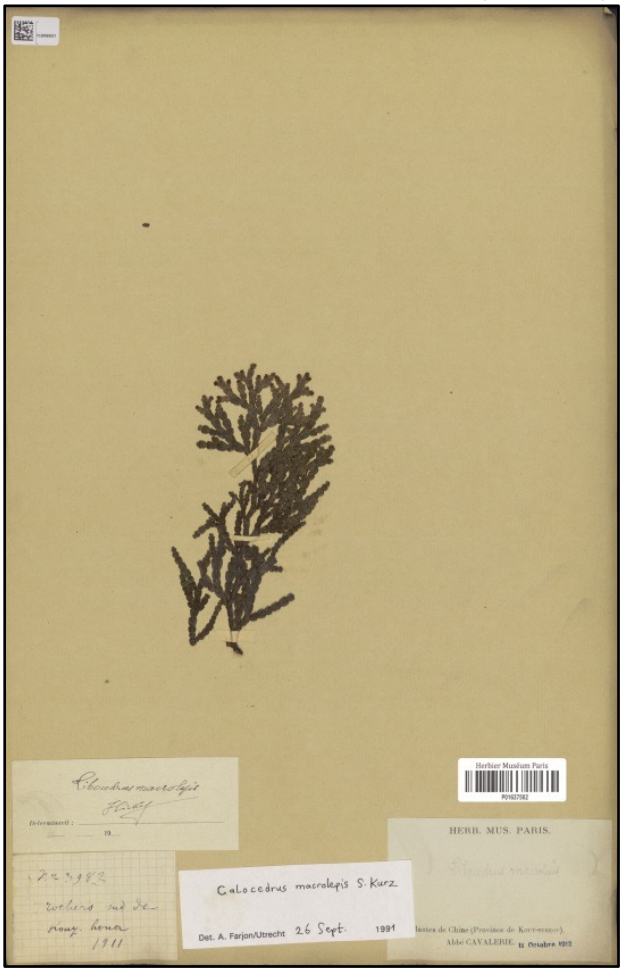
Rushforth, K. (2007). Notes on the Cupressaceae in Vietnam. *TC Sinh hoc* 29(3): 32-39.

Fig. 1: *Calocedrus rupestris*, *Cavalerie 4247*.

Fig. 2: *Calocedrus rupestris*, *Cavalerie 3983*.



List #1: Herbaria:

HGAS: Guizhou Academy of Sciences, Guiyang, Guizhou, China.
IBSC: South China Botanical Garden, Guangzhou, Guangdong, China.
SYS: Zhongshan (Sun Yatsen) University, Guangzhou, Guangdong, China (SYS00001347).

List #2: list of the new localities of *Calocedrus rupestris* in China.

Cf. map 1, letters A-O.

Guizhou:

A - *Cavalerie 4247*: (1914), South of Anshun city, Xixiu Qu, Anshun pref., P01637501, E00747148.
B - *Cavalerie 3983*: (1911), rocks, South of Ziyun city, Ziyun Xian, Anshun pref., P01637502.
C - *Libo team 1357*: (24.07.1959), Maolan National Nature Reserve, Libo Xian, Qiannan pref., PE00014415, PE00014407.
D - *Tsiang 8562*: (18.07.1930), Jiu Long Shan, ca. 1 km W. of Huishui city, Huishui Xian, Qiannan pref., SYS00001347* (no photo), PE00014411, PE00014421, NAS00163748, NAS00163746, P01636772.
E - *Anonymous 1987*: (15.02.1943), Tongzilin, Dushan Xian, Qiannan pref., PE01601135, PE01601136.
F - *Cavalerie 7663:* (1900-1920), Ziyun city, Ziyun Xian, Anshun pref., E00747149, P01636776.
G - *Song 439*: (12.04.1983), Libo Xian, Qiannan pref., K000087902.
H - *Tsiang 7135*: (15.10.1930), “Nian-hoa-shan”, Pingtang Xian, Qiannan pref., PE00014418, LBG00059888, NAS00163747, NAS00163751, IBSC0016123, E00747150.
I - *Chinese plant office 22*: (00.04.1935), Luodian Xian, Qiannan pref., PE00014406, PE00014417.
J - *Lan Kaimin sn.*: (4.1984), Guizhou, Libo Xian, Qiannan pref., GZAC0022245, GZAC0022244, GZAC0022251, GZAC0022215.
K - *Zhang Huahai 024*: (17.9.2009), Wangmo Xian, Qianxinan Pref., GZAC0032356.
L - *Esquirol 2091*: (08.05.1910), “Tien Sen Kiao”, south of Huishui Xian, Qiannan pref. E00747154.

Guangxi:

M - *Qin Haining et al. 607011*: (07.06.2006), Yachangxiang (canton), Leye Xian, Baise pref., alt. 1104 m, PE01980124.
N - *Li Zhong-Ti 603313*: (29.06.1959), Sihecun, Gantian Zhen, Leye Xian, Baise, IBSC0016047.
O - *Li Zhi-Ji 3492*: (03.12.1956), Pingmengzhen, Napo Xian, Baise, IBK00040232, IBSC0016056.

List #3: list of 11 *Calocedrus* specimens to be confirmed and their localisations.

Cf. map 1, numbers 1-4.

1: Guizhou, Qiannan Pref., Libo Xian; 贵州省 黔南布依族苗族自治州 荔波县: IBSC0096216, HGAS496, HGAS502, HGAS508, HGAS510, HGAS514.
2: Guizhou, Qiannan Pref., Pingtang Xian; 贵州省 黔南布依族苗族自治州 平塘县: HGAS504.
3: Guizhou, Qiandongnan Pref., Congjiang Xian; 贵州省 黔东南苗族侗族自治州 从江县: HGAS507, HGAS511, HGAS615.
4: Guizhou, Qiandongnan Pref., Danzhai Xian; 贵州省 黔东南苗族侗族自治州 丹寨县: IBSC0096217.

Map 1: Distribution range of *Calocedrus rupestris* in China and in N.E. Vietnam.
For explanations, see text, and list #2 & #3 for the references to the herbarium sheets.

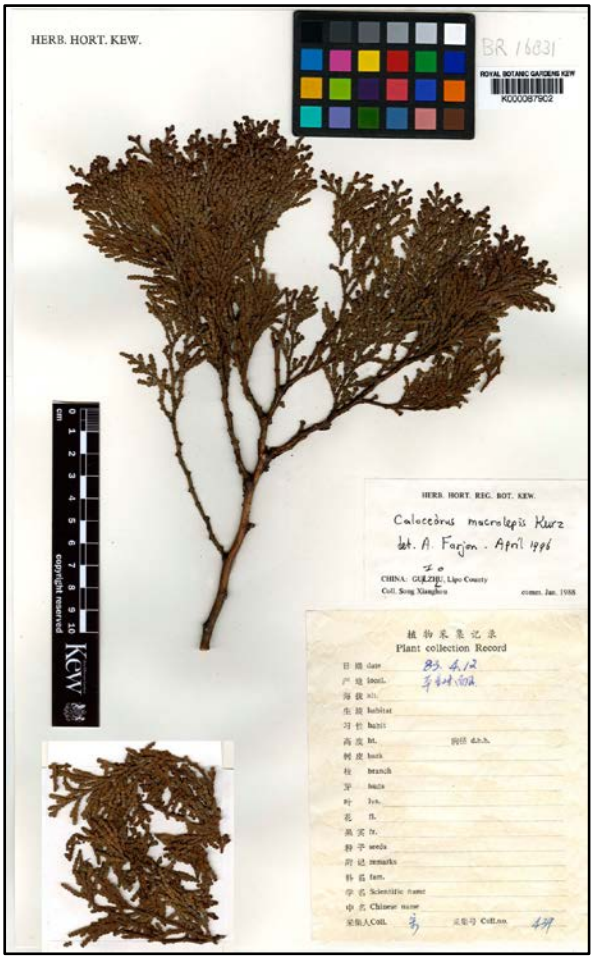


Fig. 3: *Calocedrus rupestris*, *Song 439*.
© Kew Herbarium, Royal Botanic Gardens, UK (K000087902).

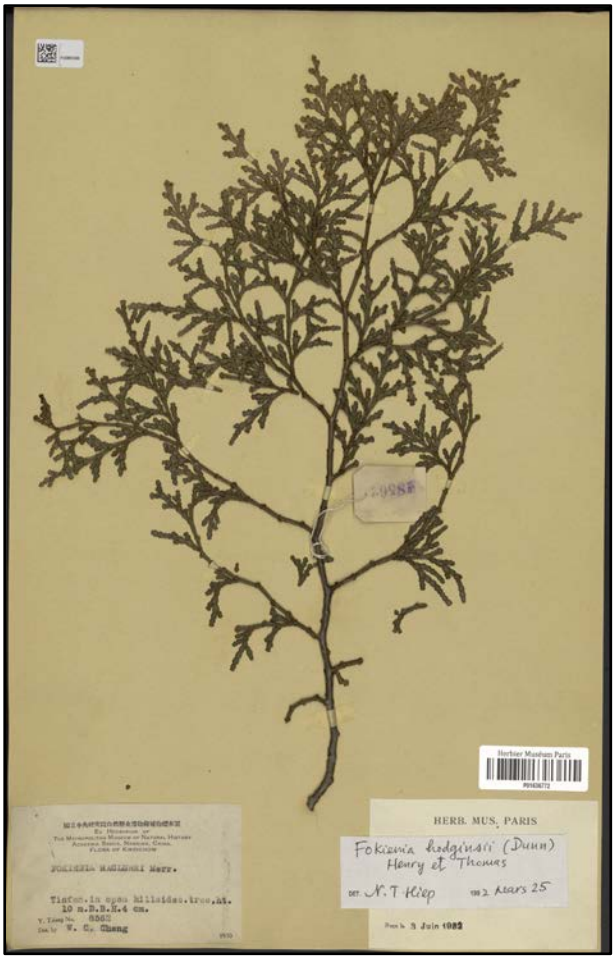


Fig. 4: *Calocedrus rupestris*, *Tsiang 8562*.
© Musée National d'Histoire Naturelle, Paris (P01636772).

Fig. 5: *Calocedrus rupestris*, *Cavalerie 7663*.
© RBG Edinburgh Herbarium, UK (E00747149).

Fig. 6: *Calocedrus rupestris*, *Esquirol 2091*.
© RBG Edinburgh Herbarium, UK (E00747154).

Fig. 7: *Calocedrus rupestris*, *Tsiang 7135*.
© RBG Edinburgh Herbarium, UK (E00747150).

Fig. 8: *Calocedrus rupestris*, *Libo team 1357*.
© Beijing Herbarium, Beijing (PE00014415).

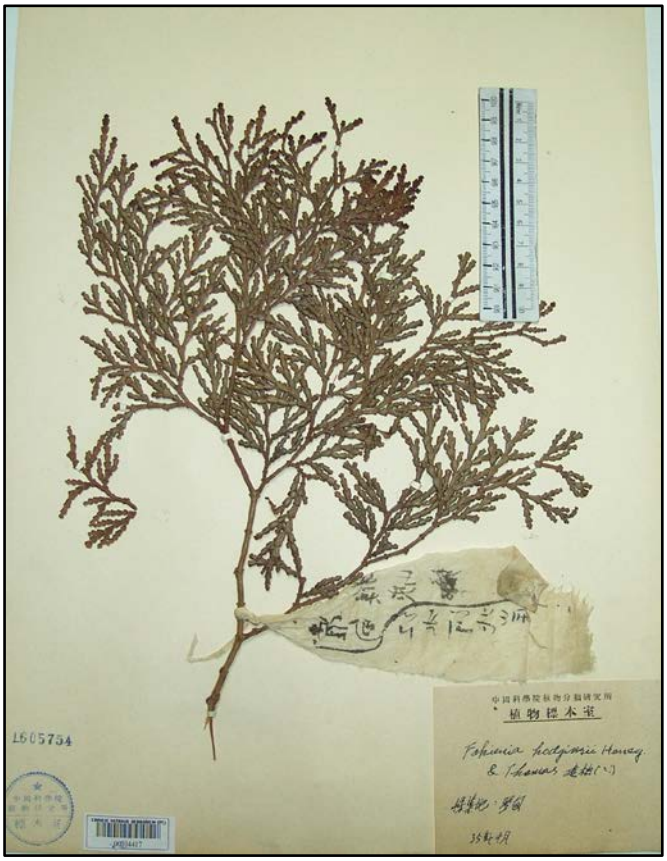


Fig. 9: *Calocedrus rupestris*, *Chinese plant office 22*.
© Beijing Herbarium, Beijing (PE00014417).

Fig. 10: *Calocedrus rupestris*, *Anonymous 1987*.
© Beijing Herbarium, Beijing (PE01601135).

Fig. 11-13: *Calocedrus rupestris*, cultivated, USA. Photos © Robert Lovett, 2007.
Fig. 14, p. 59: *Calocedrus rupestris*, N.Vietnam, Phong Nha-Ke Bang National Park, *HAL 6109/9222*. 26.1.2005. © Prof. L. Averynov.
Fig. 15-16, p. 60-61: *Calocedrus rupestris*, N.Vietnam, Ha Giang, *HAL 8548/13925*. 12.12.2005. © Prof. L. Averynov.

Cooke's Peak (New Mexico) Arizona Cypress grove
Trip report 2015

I visited this Arizona Cypress grove for the second time[1] on November 2015 to obtain more seeds for the *Cupressus* Conservation Project. It is located on the ridge running north from Cooke's Peak[2] on a spur which runs to the east. The cypresses here are found between elevations 2070-2255 m (6,800'-7,400') and are *Cupressus arizonica* Greene with rough bark and grayish-green foliage. This is the only location where Arizona Cypress grows wild in New Mexico. Most of the trees are extremely squat. Typically trees with diameters of 30-45 cm (12-18") will be only 3.50-5.50 m (12-18') tall. Roger Peterson and John Hubbard originally visited the site in 1977 and were very helpful with notes and maps as I prepared to make the trip.

I would break down the Arizona Cypress stand here into 4 segments or environments: the western saddle peaks, the east-west ridge top, the steep northern slope, and the headwater drainages for the Hadley Draw (creek).

Western Saddle Peaks

I climbed up the small most northern peak of a small saddle where the ridge runs south to Cooke's Peak. There were several very scattered Arizona Cypresses there. There also appeared to be several Arizona Cypresses on next saddle peak to the south. I had not checked these areas before for cypresses. The very scattered population here appears to be in good shape. The elevation range for these trees is between 2195-2280 m (7,200'-7,480').

Steep North Slope

I then walked the ridge top running east-west. Cypresses were observed growing on the steep north side with few or no dead trees noticeable. This segment of the population appeared to be the healthiest. The cypresses in this segment were noted from the ridge change of direction to as far east as I could see. The limits of these trees appear to follow the limits of the cypress on top of the ridge. Estimate the elevation of these trees to run from 2070-2225 m (6,800' to 7,300'). These were the tallest of the Arizona Cypress here with trees 12 m (40') or more in height visible.

East-West Ridge

The cypresses along the ridge top area were little changed from last year. This area ranges from fairly flat on top with a south-facing slope that steepens the further south one goes. I walked along the rim from west to east. I estimate that 60% of the cypress deaths here have occurred in last 10 years. Bark was still evident on dead trees but was falling off the trunks. Some regeneration of the population was noted – estimated about 20% of dead trees have young seedlings/saplings growing underneath the dead snags. The young trees appeared to be in good shape. I walked eastward along the ridge edge far enough to be able to observe the eastern most limits of the ridge population, perhaps 600 m (2,000') away. I noted that the line of trees extended along this ridge much farther to east than I had previously realized. Sadly on the last 600 m (2,000') of the ridge all the cypresses appeared to be dead and no regeneration was noted from a distance. However one would have to walk the area to be certain that regeneration was not occurring. I then travelled back to the west approximately 180 m (200 yards) from the rim and observed about the same cypress mortality. Regeneration here was about the same or less as noted previously. There were cypresses still alive and with some regeneration occurring from the eastern high point down to lower elevations. The soil here is layered sloping downhill to the south, and appears to have an impervious layer

[1] My first visit was on late September 2014. The last recorded visit prior to that date was in 1977.

[2] 32° 32' 9.52" N, 107° 43' 53.14" W – History of Cooke's Peak, origin of the name, geology, etc.

(probably rock) within a meter or two (a few feet) of the surface. This produces oozing water at the lower elevations for several days after a rain and probably accounts for the scattered cypress survival here. Elevation range here was from 2135-2225 m (7,000' to 7,400').

Hadley Draw Headwaters

I next observed cypress growing down the eastern headwater drainage of Hadley Draw. The population looked ok from a distance. No cypresses were observed growing down the western headwaters of Hadley Draw. They had never established there from what I could tell. The exception to this is the one large cypress and several smaller ones by the big rock close to the water tank (elevation 2100 m [~6,900']). These appear to be an anomaly and may have been planted. They do seem to be a match to the existing wild population. The elevation range here would be from 2100-2195 m (6,900' to 7,200'). There is another drainage area for Hadley Draw to the east that may have Arizona Cypress growing on it, but I did not have time to look at it.

Overall status

Those trees that are alive appear to be in good shape. But regeneration of the stand so far has not replaced those lost in the last 10 years. The north slope area appears to be an exception to this.

Viable cone production was very poor. Very few cones are produced per tree. This is particularly evident when compared to the *Cupressus arizonica* population at Big Bend which has a much more prolific cone production. I collected several gray-colored cones that I hoped were mature but had not dried out yet due to above average rainfall and any dried cones with some seeds that I could find.

I measured the circumference of one of the larger living *Cupressus arizonica* and found it to be 2.13 m (7'). That would yield a measurement of 67 cm (2.2') dbh for a 5.50 m (18') high tree with a broken top leader. This tree was in the East-west ridge-top area.

In addition, I brought back samples of the green foliage in a ziplock bag and kept it on ice or refrigerated. When I conducted a smell test 30 days later, I was able to compare foliage from Chisos Mts. Cypress with Chiricahua Mts. Cypress and Cooke's Peak Cypress. All 3 were identifiable as *Cupressus arizonica* based on smell alone. *Cupressus arizonica* has a distinctive smell, described as a coniferous version of wet-dog or skunkish, compared to *Cupressus glabra* which has a brighter, more conifer smell/citrus smell.

Summary

The original range of the Arizona Cypress at Cooke's Peak was slightly more extensive than I had initially realized in 2014. The total population of these cypress has shrunk by perhaps 30–40% over the last few years. The cypresses alive now are mostly in good health and the small amount of regeneration that is occurring also appears to be in good health. Little or no change appeared in the segment on the steep north slope. This segment appears to be doing very well but is not expanding that I could tell from the top of the ridge/cliff.

More young pinyons (*Pinus edulis* and/or *Pinus discolor* [3]) were observed growing under the dead cypress snags than young *Cupressus arizonica*.

I do not believe this population is in danger of immediate extinction, but would say that it has retreated in the last 10 years and is not expanding its range. It is a population that is very small and in a very limited and harsh area, and climate change resulting in increased drought could result in its further reduction or even extinction.

Tom R. Hamilton
30.12.2015

[3] These pinyons would be worth further investigation, as this mountain is not mapped for any pinyon. They could be either of these two species.

Legends of the photos, p. 64-70, figures 1-15 (all © by the author)**.**

Page 64: fig. 1: on the saddle, many dead trees.

Page 65: figs 2-4: typical cypresses of the Cooke's Peak population showing dry branches or a very sparse foliage; note the fibrous bark.

Page 66: fig. 5: there are many dead trees among this population and here is one of the biggest.

Page 67: fig. 6: another typical rather young cypress.

———— fig. 7: example of a cypress on the North slope edge.

Page 68: fig. 8: the walking stick measuring 1.5 m (5 ft) gives an indication of the height of the cypress.

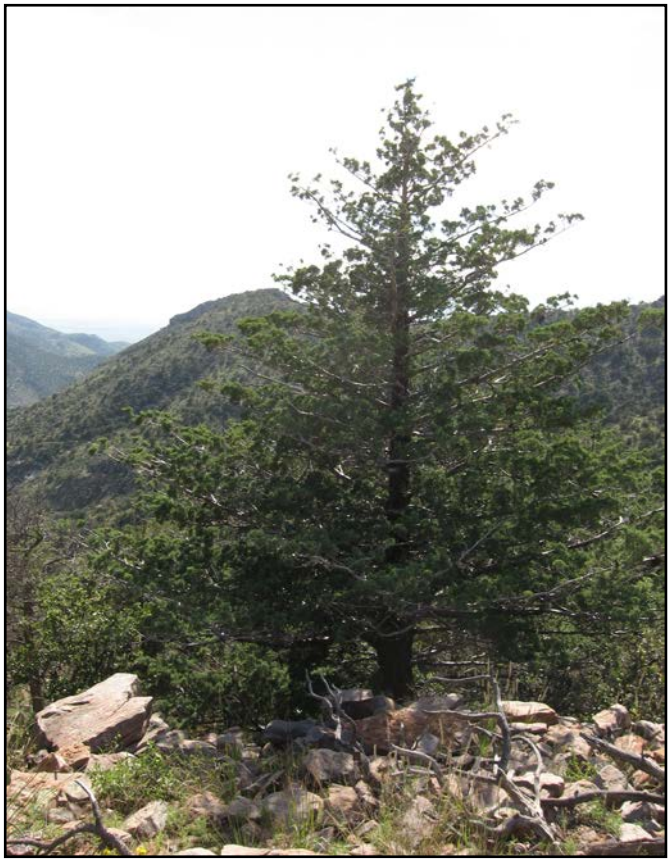
———— figs 9 & 10: two of the biggest trees.

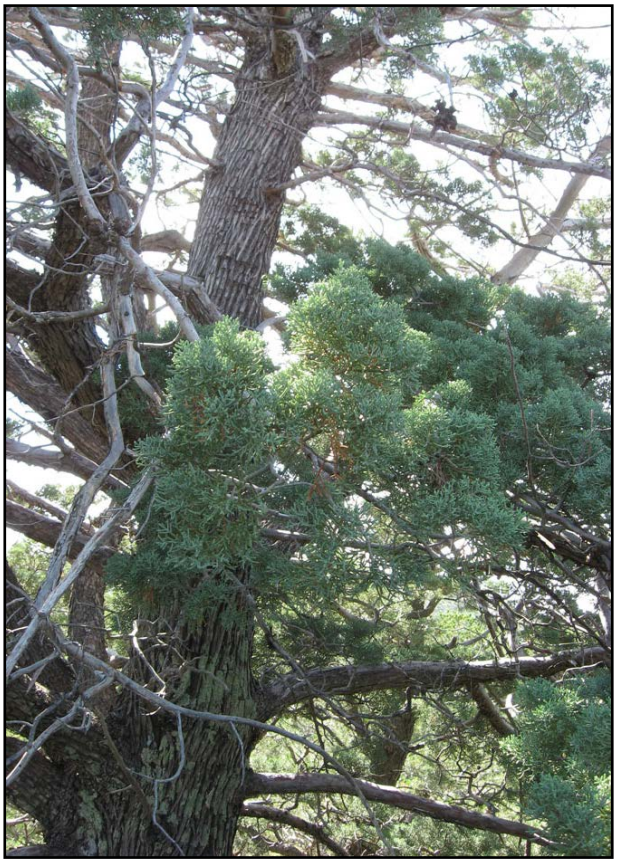
———— fig. 11: regeneration is very scarce; here are two saplings on the southern slope.

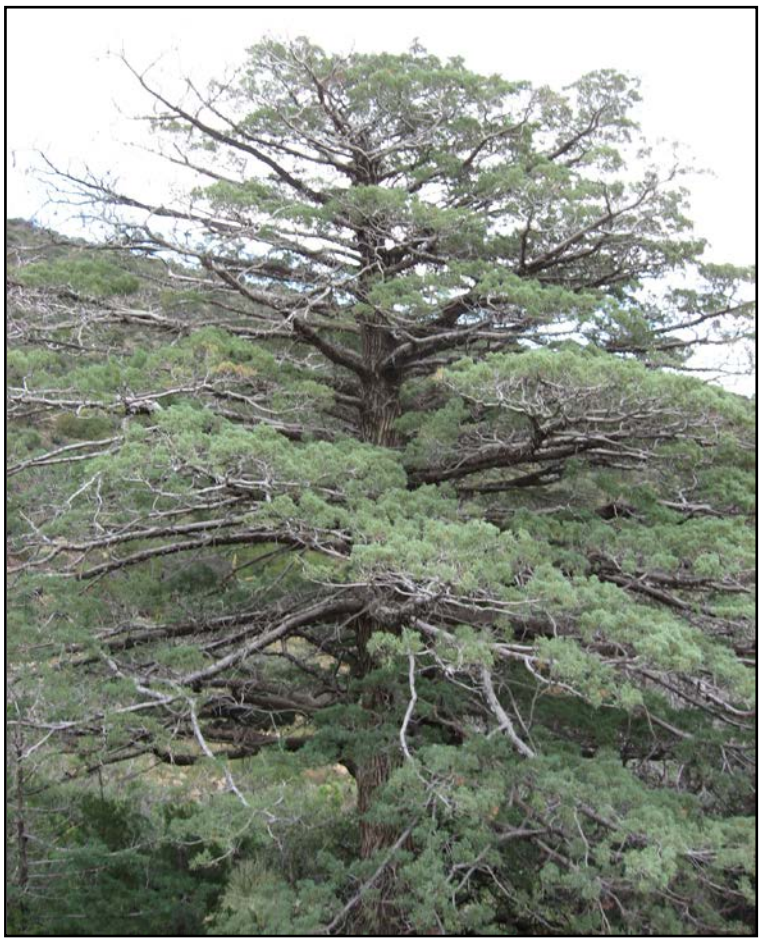
Page 69: figs 12 & 13: North slope drop-off. Note the trees live only where shade protects them from western sun. Pinyon pines are visible on the left of fig. 11.

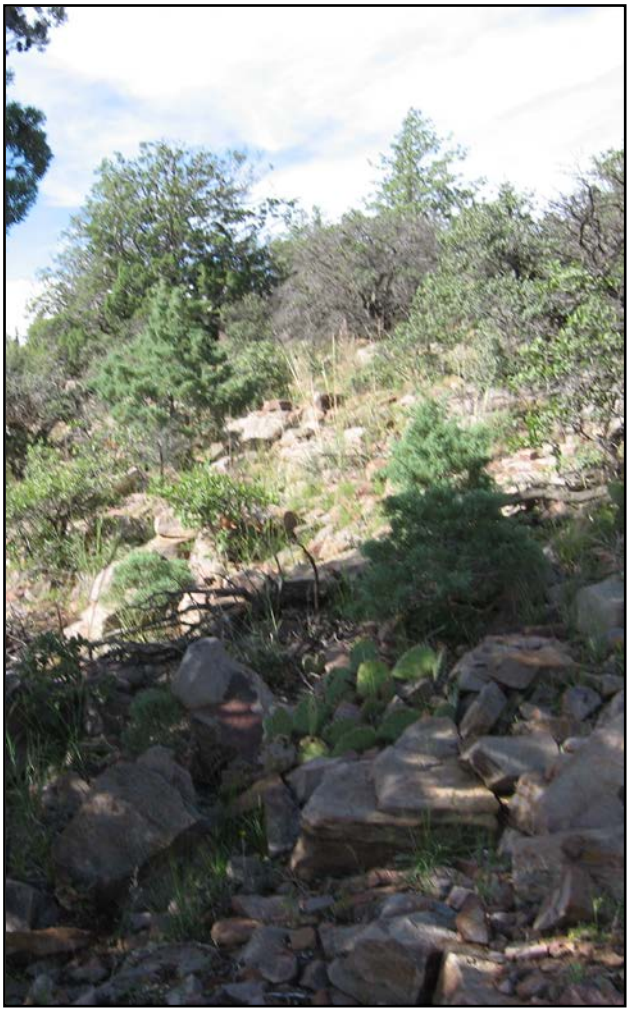
Page 70: fig. 14: close to the top of the ridge, most trees show dry branches.

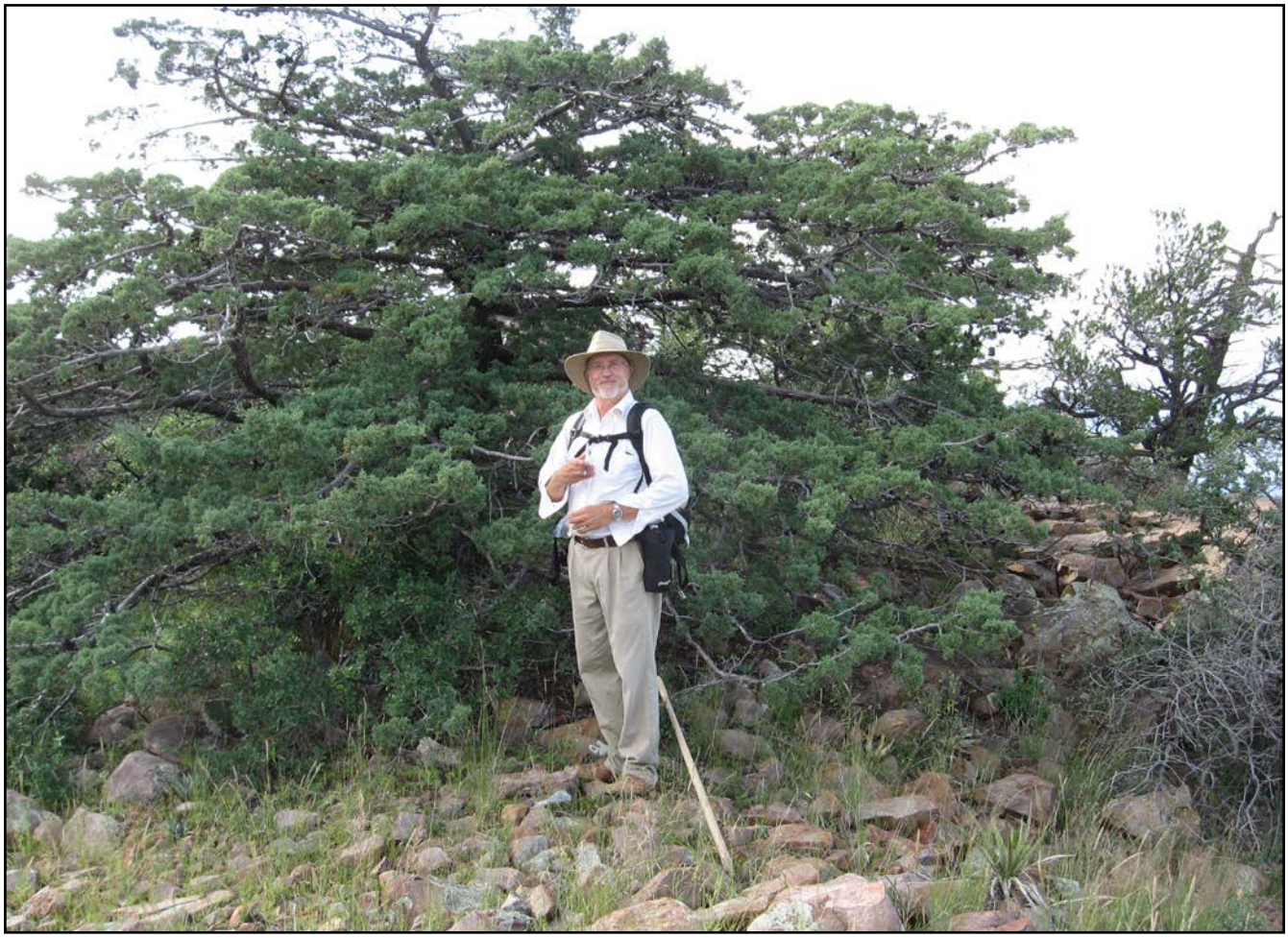
———— fig. 15: another typical cypress with the author.











BOOK REVIEW

– '**Handbook of the World's Conifers**', 2nd edition, by **A. Farjon**.

The second edition of this work was published in April 2017 (the first edition was issued in 2010). In the foreword of this edition, the author writes (30 November 2016):

> Since the publication of this Handbook in 2010 rapid and substantial developments in conifer research and publication occurred. Those that have caused many necessary corrections and amendments to the first edition are connected with two projects led by the author; the compilation of an *Atlas of the World's Conifers* published by Brill in 2013 and the reassessment for the IUCN Red List of all conifers in 2010-2013, As a consequence, new and often more detailed information on distribution and conservation status of species became available and has to be incorporated in the new edition. Proposed taxonomic changes have been treated cautiously but those considered 'unavoidable' have been presented in an Appendix so as not to disrupt the alphabetical sequence adopted in the Handbook.

It is a fact that from 2010 to the present days many articles devoted to conifers have been published, with for instance a near-continuous flow of research using molecular analyses, new field observations and morphological studies. Looking at the bibliography section of this new *Handbook* however, only three documents are cited which were published after 2009:

- Adams' *Junipers of the World*, 3rd edition, 2011. A fourth edition was published in 2014.
- Mill & Whiting's article (2012) with a new rank for *Podocarpus spathoides* var. *solomonensis* Silba; this existing taxon is a acknowledged in the new edition as a species, as *Podocarpus orarius* Mill (p. 1071).
- Thomas & Le Page's interesting article (2011), *The end of an era?* evaluating the conservation status of the disappearing Taxodiaceae.

And that is all for new references: one already outdated and two articles.

Here is a small list – far from exhaustive – of contributions published since 2010 which are important for the taxonomy or the conservation of the conifers, yet not cited (additionally, articles published in the *Bulletin of the* Cupressus *Conservation Project* are skipped here, although several have important conservation or taxonomic issues):

- Mao, K. *et al.* (2010). Diversification and biogeography of *Juniperus* (Cupressaceae): variable diversification rates and multiple intercontinental dispersals. *New Phytol.* 188: 254–272.
- Bouillé, M. *et al.* (2011). Discordant mtDNA and cpDNA phylogenies indicate geographic speciation and reticulation as driving factors for the diversification of the genus *Picea*. *Tree Genet. Genomes* 7: 469–484.
- Businský, R. (2011). *Pinus fenzeliana* Hand.-Mazz. (Pinaceae) still misinterpreted? *Phyton* 51: 77-87.
- Christenhusz, M.J.M. *et al.* (Farjon as co-author) (2011). A new classification and linear sequence of extant gymnosperms. *Phytotaxa* 19: 55–70.
- Debreczy, Z. & I. Rácz (2011). *Conifers around the world*. 2 vol. Budapest: DendroPress Ltd.
- Adams, R.P. *et al.* (2012). Analysis of putative hybrids of *Hesperocyparis glabra* × *H. pygmaea* by leaf essential oils. *Phytologia* 94: 174–192.
- Mao K. *et al.* (2012). Distribution of living Cupressaceae reflects the breakup of Pangea. *PNAS* 109: 7793–7798.
- Yang, Z.-Y *et al.* (2012). Three genome-based phylogeny of Cupressaceae s.l.: further evidence for the evolution of gymnosperms and Southern Hemisphere biogeography. *Molec. Phylogen. Evol.* 64: 452–470.
- Lang, X.-D. (2013). A taxonomic revision of the genus *Cephalotaxus* (Taxaceae). *Phytotaxa* 84: 1–24.
- Boratynski, A. *et al.* (2013). Morphological differentiation supports the genetic pattern of the geographic structure of *Juniperus thurifera* (Cupressaceae). *Plant. Syst. Evol.* 299: 773–784.
- Businský, R. (2013). Taxonomic revision and conspectus of *Pinus* in Vietnam. *Phyton* 53: 241–264.
- Flores-Rentería, L. *et al.* (2013). Genetic, morphological, geographical and ecological approaches reveal phylogenetic relationships in complex groups, an example of recently diverged pinyon pine species (Subsection *Cembroides*). *Molec. Phylogen. Evol.* 69: 940–949.
- Adams, R.P. (2014). *Junipers of the World – The genus* Juniperus. 4th edition.
- Adams, R.P. *et al.* (2014). Taxonomy of *Hesperocyparis montana*, *H. revealiana* and *H. stephensonii*: evidence from leaf essential oils analyses and DNA sequences. *Phytologia* 96: 71–83.
- Averyanov, L. *et al.* (2014). Gymnosperms of Laos. *Nordic J. Bot.* 32: 765–805.
- Businský, R. (2014). The *Pinus merkusii* agg. (Pinaceae): literature review, taxa delimitation and typifications. *Phyton* 54: 1–26.
- Boratynski, A. *et al.* (2014). The biogeography and genetic relationships of *Juniperus oxycedrus* and related taxa from the Mediterranean and Macaronesian region. *Bot. J. Linn. Soc.* 174: 637–653.
- Sękiewicz, K. *et al.* (2014). Chorological and conservation status of the endemic cypress, *Cupressus atlantica* Gaussen, in the High Atlas (Morocco). *Dendrobiology* 71: 3–13.
- Mill, R.R. (2014-2106). A monographic revision of the genus *Podocarpus* (Podocarpaceae). 1 to 3. *Edinburgh J. Bot.*
- Averyanov, L. *et al.* (2015). Preliminary assessment for conservation of *Pinus cernua* (Pinaceae) with a brief synopsis of related taxa in eastern Indochina. *Turczaninowia* 18: 05–17
- Fragnière, Y. *et al.* (2015). Fighting their last stand? A global analysis of the distribution and conservation status of gymnosperms. *J. Biogeogr.* 42: 809–820.
- Kozlowski, G. *et al.* (2015). Hydrophobia of gymnosperms: myth or reality? A global analysis. *Ecohydrol.* 8: 105–112.
- Terry, R.G. & R.P. Adams (2015). A molecular re-examination of phylogenetic relationships among *Juniperus*, *Cupressus*, and the *Hesperocyparis-Callitropsis-Xanthocyparis* clades of Cupressaceae. *Phytologia* 97: 67–75.
- Gao, L.M. (2016). DNA barcoding of East Asian *Amentotaxus* (Taxaceae): potential new species and implications for conservation. *J. Syst. Evol.*, doi: 10.1111/jse.12207.
- Ortiz-Medrano, A. *et al.* (2016). Morphological and niche divergence of pinyon pines. *Ecol. Evol.* 6: 2886–2896.
- Sobierajska, K. *et al.* (2016). Effect of the Aegean Sea barrier between Europe and Asia on differentiation in *Juniperus drupacea* (Cupressaceae). *Bot. J. Linn. Soc.* 180: 365–385.
- Terry, R.G. *et al.* (2016). A molecular biogeography of the New World cypresses (*Callitropsis*, *Hesperocyparis*; Cupressaceae). *Plant Syst. Evol.* 302: 1–22.

Farjon did not even include his own recent contributions in the bibliography, neither the Curtis's article on *Cupressus torulosa* (Farjon 2013 – featuring a *Cupressus lusitanica* as the illustration for the Himalayan species) nor the "*Atlas*" (Farjon & Filer 2013).

The type locality of *Cupressus chengiana* is updated, but the author of this discovery is not credited. Jean Hoch thoroughly searched through Cheng collections in Sichuan to understand the contradiction between the two localities found on the different herbarium sheets of the isotypes (*Cheng 2066*) and wrote to Farjon that the locality of Kangding (1st edition) was an error. Any reader comparing the two editions will come to the conclusion that Farjon is to be credited for the correction.

The type of *Cupressus nootkatensis* is still cited as "not located", when it was found at Oxford already four years ago (Maerki & Frankis 2013).

The most important invoked update is about the conservation status of the different conifer taxa. For this *Bulletin*'s interest (see Maerki 2017, table 1 for the genus *Cupressus*), a notable case is *Cupressus montana*. The first edition of the *Handbook* gives its conservation status as Vulnerable (VU). The IUCN 2013 assessment (under the rank of variety) changed it to Critically Endangered (CR; viewed on 2017-06-26), and this new status is reported in the 2nd edition, but the paragraph commenting on this change is word for word the same as in the 2010 edition; there is no explanation for the change accepted. Moreover, the information given is erroneous as explained in details in an article published in this Bulletin re-evaluating the distribution range and conservation threats to that taxon (conservation status assessed as Endangered – Maerki 2015). Following that article, Edinburgh began work on a reassessment and expects to change it back from CR to Vulnerable (P. Thomas, pers. comm.), making this *Handbook* 2nd edition soon outdated on that point.

The case of the *Cupressus guadalupensis* conservation status is also surprising: the evaluation changes from CR to Endangered, but no explanation is given for this status update, although the new assessment is correct. The text remains unchanged: "the most important threat to regeneration being goat overgrazing." In fact, goats were already completely removed from the island more than 12 years ago, and regeneration occurred by the thousands, not only of the cypresses, but also of the endemic *Pinus radiata* var. *binata*. Farjon mentions **fires** destroying trees, yet in fact there was only one fire (which was inadvertently started by people stationed there to study the consequences of removing the goats), but forgot to mention that this fire triggered an even greater, mass regeneration process. This species is adapted to fires and the threat would consist of a second fire happening before a new seed load could be established.

Apart from the *Podocarpus* taxonomic change given above, there is only one other "'unavoidable'" one, surreptitiously stated in an "end note" (p. 1153): *Pinus fragilissima* Businský is reduced to a variety of *Pinus taiwanensis* by Farjon. Other new species such as *Pinus anemophila* Businský or *Pinus cernua* P.K.Lôc for instance are ignored, as are other new combinations or status. *Cupressus tonkinensis* (recognised now by Edinburgh – the most endangered *Cupressus* species, closest to extinction in the wild) is still synonymised with *Cupressus torulosa*. *Cupressus tortulosa* is still listed as *Cupressus cashmeriana* and *Cupressus pygmaea* is still confused with *Cupressus goveniana*. *Cupressus revealiana* continues to be declared a synonym of *Cupressus stephensonii* despite its completely different phenology (article in prep.) and molecular analysis results (Adams *et al.* 2014 – see reference in the list above). Nothing is impossible taxonomically when *Cupressus lusitanica* specimens are identified as *Cupressus torulosa* and even as *Cupressus cashmeriana* (see following note). Further evidence (after Farjon 2013) comes from the colour photo #99 of both editions (no date, no locality) labelled *Cupressus torulosa* var. *torulosa*, when the correct identification is *Cupressus lusitanica*. For the sake of cypress taxonomy and cypress conservation, it is urgent that taxonomy and conservation assessments are handed over to people competent at identification.

The assessment updates of the IUCN are or will be available for free online. According to the foreword, the second source of information justifying this new edition is the *Atlas of the World's Conifers*. This "atlas" is rigged with wrong information, mistakes and unusable, faulty maps (Maerki 2016). Using them in this new edition will not enhance its quality.

The *Handbook* is one of the few documents covering almost all the extant conifer taxa. This 2nd edition does not bring what it promises in its foreword. For a review of the first edition of the *Handbook*, see Businský (2013).

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Maerki, D. (2017). Editorial: Recent developments in the taxonomy of the genus *Cupressus* and consequences for their conservation. *Bull. Cupressus Conservation Proj.* 6: 3-24.

Rushforth, K., R.P. Adams, M. Zhong, X.-qiang Ma & R.N. Pandey (2003). Variation among *Cupressus* species from the eastern hemisphere based on Random Amplified Polymorphic DNAs (RAPDs). *Biochem. Syst. Ecol.* 31: 17-24.

Bull. Cupressus Conservation Proj. 6 (3): 72-73. (9.2017) **D. Maerki**

Mislabelled *Cupressus* specimens at Kew

At Kew Gardens at least three cultivated specimens of *Cupressus lusitanica* were investigated and found to be wrongly labelled; one as *Cupressus cashmeriana* (2014-236/SILB 19847), the other two as *Cupressus torulosa* (1997-4900/SILB 19847 & 1996-519/DECH) (cf. figs 1-7, p. 73). SILB 19847 appears in the article by Rushforth *et al.* (2003 – see bibliography above) under *Cupressus darjeelingiensis* Silba, and clusters with *Cupressus lusitanica* Miller, away from any Eurasian cypress species. If necessary this is the nail on the coffin of these trees labelled as *Cupressus torulosa* (see p. 74 of this issue).

Figs 1-3: *Cupressus lusitanica* labelled as *Cupressus cashmeriana* in Kew Gardens (21.4.2017).

Geo-coordinates: 51°28'23.94"N, 0°17'59.26"W.

Figs 4-7 (below): *Cupressus lusitanica* labelled as *Cupressus torulosa* in Kew Garden (21.4.2017). Both labels give the common name "Bhutan Cypress" when *Cupressus torulosa* is not growing in this country. Also the first label here has the same reference as the "*Cupressus cashmeriana*" of figs 1-3: "SILB 19847", same origin, same taxon and different Latin names.

Geo-coordinates: 51°28'23.96"N, 0°17'59.70"W.

Note on *Cupressus assamica* Silba

In 1994, Silba described a cypress species under *Cupressus assamica* (p. 19):

> 4. *Cupressus assamica* Silba, Species Nova.
>
> *Arboris ad 50 m. altis. Ramulis longeis pendulis, planeis distichis. Foliis obscuris viridis, 1.5 mm. longis, subacutis vel obtusis, non-glandulosis. Strobilis femineus globosi.s, 7-12 mm. longis, squamis 8-10. Cotyledonibus semperis conspicuis 3-5.*
>
> India: Arunachal Pradesh, Balipara Tract, near Rupa, 1500-1800 m. in dry country, near a Shergoan Stream, *Kingdon-Ward 12449* (holotype-BM). Arunachal Pradesh, near Hapoli (Ziro), *K. Haridisan 0193* (paratypes-NY, K, E).
>
> A tree to 50 m. tall. Bark ash-grey, deeply furrowed. Branchlets pendulous, in flattened chain-like segments. Foliage bluntly acute, not sharply acute as in *Cupressus lindleyi* Klotzsch, dark green in color. Female cones globular, 7 mm. long to 12 mm. long, with 6-10 scales, each scale with a prominent umbo, cones often glaucous brown. Cotyledons always 3-5.
>
> Apparently once widespread in Arunachal Pradesh and widely cultivated in Assam. This species was recorded from Mount Piri La, on the northern side in Western Arunachal Pradesh by N.L. Bor (1938) on steep limestone at 2000 m. or more and also in the Lunbe and Tenga Valleys under the name *C. torulosa*.

The specimen *Kingdon-Ward 12449* is composed of two herbarium sheets [BM000546884 and BM000546885]. The first one (see fig. 2) shows two open mature cones and an immature one. The mature cones measurements read: 1) 18mm x 16mm and 2) 18mm x 14.5mm, that is well outside the 7 to 12mm range given in Silba's description of *Cupressus assamica*. Both cones have 10 scales, not 6 or 8. The mature cone scales do not display a prominent umbo and the cones are not glaucous brown. No Eurasiatic cypress species has 3 to 5 cotyledons. In 2008 (7 December), Silba wrote (pers. comm.):

> [*Cupressus assamica*] does not have flattened branchlets like *Cupressus cashmeriana*, and occurs at lower elevations. *C. assamica* occurs in pure stands on Mount Piri La (Balipara Frontier) and has also been reported from the Shillong Plateau in Megahalaya.

This new description contradicts the one given in the diagnosis which corresponds effectively to the foliage of *Cupressus cashmeriana* (pendulous and flattened branchlets). Moreover material provided by Silba (specimens grown from *Silba 19848*, seeds – cf. *K.Haridasan 0193*) for a molecular analysis gave the following result where *Cupressus assamica* clusters with new world species:

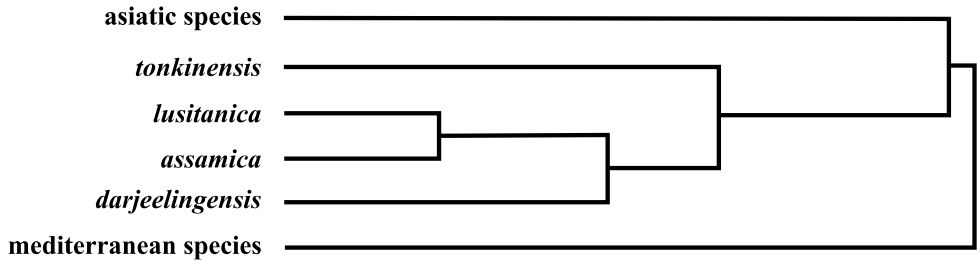

Fig. 1: Simplified cladogram after Rushforth *et al.* 2003: *Cupressus* species, molecular analyses based on 329 RAPD bands.

The paratype *K.Haridasan 0193* corresponds to the cone and the new foliage descriptions. The Kew specimen (K000088107 – see fig. 3) is easily identified as *Cupressus lusitanica*[1]. It follows that the type and the paratype of *Cupressus assamica* are two different cypress species easily distinguished.

In 2012, Silba became aware of the mistake and wrote (15 June – pers. comm.):

> Regarding *Cupressus assamica*, the first material introduced from Arunachal Pradesh was from cultivated material from J. Silba and a local contact in Arunachal Pradesh. Indeed, this early material turned out to be *Cupressus lusitanica*, and the early chemotaxonomic study done showed this first material was indeed *Cupressus lusitanica* or *Cupressus lindleyi*. However, just recently K. Rushforth collected authentic seed of *Cupressus assamica* from the type locality on Mount Piri in Arunachal Prahesh and the subsequent seedlings all had only two cotyledons, therefore this can not be the same as *Cupressus lusitanica* (as *Cupressus lusitanica* has 3 to 6 cotyledons, as do all New World species of *Cupressus*). If you will contact Keith Rushforth again I am sure he will tell you that *Cupressus assamica* from Mount Piri occurs in pure forest and is certaintly not the same as *Cupressus tortulosa* of Bhutan. K. Rushforth has pictures from Mount Piri in Arunachal Pradesh.

[1] The identification as *Cupressus torulosa* by Farjon is an error. In the Hillier arboretum exist three trees also with the label *Cupressus torulosa* which were grown from seeds of *Silba 19848*. It is worth noticing that two trees at Kew are *Silba 19847*, also *Cupressus lusitanica*, but with *Cupressus torulosa* and *Cupressus cashmeriana* labels (see photos p. 73).

Silba could have come to that conclusion earlier as he already noted in 1994:

> Zavarin [1967] had concluded the chemotaxonomic relationship of […] the Assam or Eastern Indian cypress described above contained similar tropolone heartwood constituent-percentage as that of *C. macrocarpa* Hartweg.

That is the same tropolone heatwood constituent-percentage as a new world *Cupressus* species.

One of Rushforth photos taken in the wild mentioned by Silba is reproduced in Maerki 2013: 64. fig. 16. The cones of *Kingdon-Ward 12449* can be easily compared with the cones of *Cupressus cashmeriana* (Maerki 2014: 111, figs 23 & 24; 114, fig. 39).

Rushforth collected material from two wild specimens (first new introductions into Europe since 1862 [Carrière 1867]):

KR 8688: India, Arunachal Pradesh, West Kameng district, between Shergoan and Rupa, 2060m: tree 25m by 0.5m, circa 70-80 years old, growing below road – (11/10/2006).

KR 9641: India, Arunachal Pradesh, West Kameng district, from Bomdila to Shergoan, 1990m: tree 15m by 0.4m, open crown, in fruit – (4/11/2008).

Several specimens from these two collections were planted in Cornwall where they proved hardy. Fig. 6 illustrates one specimen from *KR 8688*, already 4 m high in 2013.

From the above observations it is clear that the holotype and paratypes belong to different taxa. Furthermore, the holotype of *Cupressus assamica* agrees with *Cupressus cashmeriana*. As mentioned earlier (Maerki 2013: 46-49), Carrière (1867) indicated Tibet as the origin of this species. Until 1950, this region – south of the McMahon line (1913-1914) – was ruled by the Tibetans as part of South Tibet.

Cupressus cashmeriana Carrière 1867: 161.

Neotype: *Y.Pauthier s.n.*, 20.12.2011, designated by Maerki (2013: 54) – MNHN Paris: P02088769, P02088792 & P02088793.

= *Cupressus assamica* Silba emended Maerki & Rushforth.

Holotype: *Kingdon-Ward 12449* (holotype-BM) – see fig. 2.

The following description replaces part of the original one. **Altitude:** 1900-2200m[2]. **Seed cones** (sample size: 261)**:** 11.7 to 31.8 mm in length, 11.1 to 27.4 mm in width; number of scales: 10 (39.8%), 12 (58.6%) or 14 (1.5%). The *Kingdon-Ward 12449* cones fall inside these limits. **Number of seeds/cone** (sample size: 137)**:** 106 to 232. **Cotyledons:** 2 [wild origin]; 2 (85.7%), 3 (12.3%) and 4 (2.0%) [cultivated origin (France and Switzerland), sample size: 196]. **Mature cones** are never glaucous.

The paratypes *K.Haridasan 0193* are excluded as introduced *Cupressus lusitanica*.

Acknowledgment

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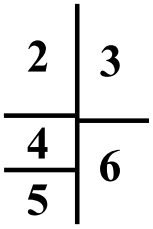
Legends of figures 2 to 6 (p. 76):

Fig. 2: *Cupressus cashmeriana*, *Kingdon-Ward 12449*, holotype of *Cupressus assamica*.
© British Museum Herbarium, UK (BM000546884).

Fig. 3: *Cupressus lusitanica*, *K.Hadirasan 0193*, excluded paratype of *Cupressus assamica*.
© Kew Herbarium, Royal Botanic Gardens, UK (K000088107).

Figs 4-5: *Cupressus lusitanica* planted as *Cupressus assamica* and showing a typical *lusitanica* habit (Lovett Pinetum, Texas, USA). © R.Lovett.

Figs 6: *Cupressus cashmeriana/assamica* from *KR 8688* (Cornwall, England, UK). © K.Rushforth.



[2] Cultivated trees may be as low as 1500m but on Mount Piri the wild trees are no lower than 1900m or so (KR).


SCANNED FOR GPI
FLORA OF ASSAM 1935
Capt. F. Kingdon-Ward
Cupressus torulosa D.Don
Hupa, Balipara Frontier Tract.


HERB. HORT. KEW.
Cupressus torulosa D. Don
(C. assamica not publ in Phytologia)
Det. A. Farjon (K) 23 April 1996
Gymnosperms Collection
Cupressaceae
Cupressus assamica Silba
India, north-east: Arunachal Pradesh: near
Hapoli (Ziro), lower Subansiri District,
near 27°36'N and 93°42'E.
Coll: K. Haridasan 0193
18th August 1993
Silba, in Phytologia. 1993.
Herbarium of John Silba
Kew
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