Rhododendron Update - 3

INTRODUCTION

This is the third part of our Rhododendron species update and contains 13 species. We have departed from our usual alphabetic ordering of species and have chosen for this update to concentrate on the threatened Rhododendrons (according to Gibbs et al. 2011) that were not covered in the previous two newsletters – one Critically Endangered species, one Endangered and ten Vulnerable.

Our methods are described in the July 2014 newsletter and are summarized in Appendix 1.

For these threatened species we have searched on line to determine whether it is in cultivation and where. Our major sources were the Global Survey of ex situ Rhododendron Collections (BGCI 2011), the Multisite Search page of the Royal Botanic Garden Edinburgh (MSEBG 2014) and the Database of Asian Plants in Cultivation (DAPC 2014).

RATING CONSERVATION STATUS

The conservation rating system is that developed by the International Union for the Conservation of Nature (IUCN) and forms the basis for their Red List. Species are rated as being in one of nine potential categories, depending upon the data available and formal criteria of conservation assessment (Figure 1)[1].

Extinction risk increases from Least Concern to Critically Endangered and the three categories Critically Endangered, Endangered and Vulnerable are called the "Threatened Categories".

Classification into a category is based on five criteria[2]:

A. Population Size Reduction
B. Geographic Occurrence - This red list criterion uses two terms to reflect distribution – "area of occupancy" is the actual area known to be occupied by the species and "extent of occurrence" is the area of the smallest single polygon that encompasses all these sites (Figure 2).
C. Small Population size and decline
D. Very small or restricted population
E. Quantitative analysis (of probability of extinction)

The following summary of the categories is taken from Gibbs et al. (2011).

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1 Guidelines can be found on http://jr.iucnredlist.org/documents/redlist_cats_crit_en.pdf).

2 http://www.iucnredlist.org/documents/2001CatsCrit_Summary_EN.pdf presents a summary of the criteria.

Extinct (EX): there is no reasonable doubt that the last individual has died. Exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.

Extinct In The Wild (EW): known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range.

Critically Endangered (CR): meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered (EN): meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable (VU) meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

Near Threatened (NT): has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC): has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

Data Deficient (DD): appropriate data on abundance and/or distribution are inadequate to make a direct, or indirect, assessment of its risk of extinction. Data Deficient is therefore not a category of threat. Listing in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. If the range of a taxon is suspected to be relatively small and restricted, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Formally each species is given a category and the criteria under which it has been classified. For example the Critically Endangered *Rhododendron liboense* Z.R. Chen & K.M. Lan is formally categorized as “CR D” which means it is CR based on criterion D.

Rhododendron vellereum Hutch. ex Tagg presents a more complex case It is categorized as is “EN B1b(i,iii)” which means Endangered based on Criterion “B” (geographic Range). The “1b” refers to the extent of occurrence being estimated to be less than 5,000 km^2 and a continuing decline is observed, inferred or projected. Further, the 1b classification is based on knowledge of the species extent of occurrence (i) and area, extent and/or quality of habitat (iii).

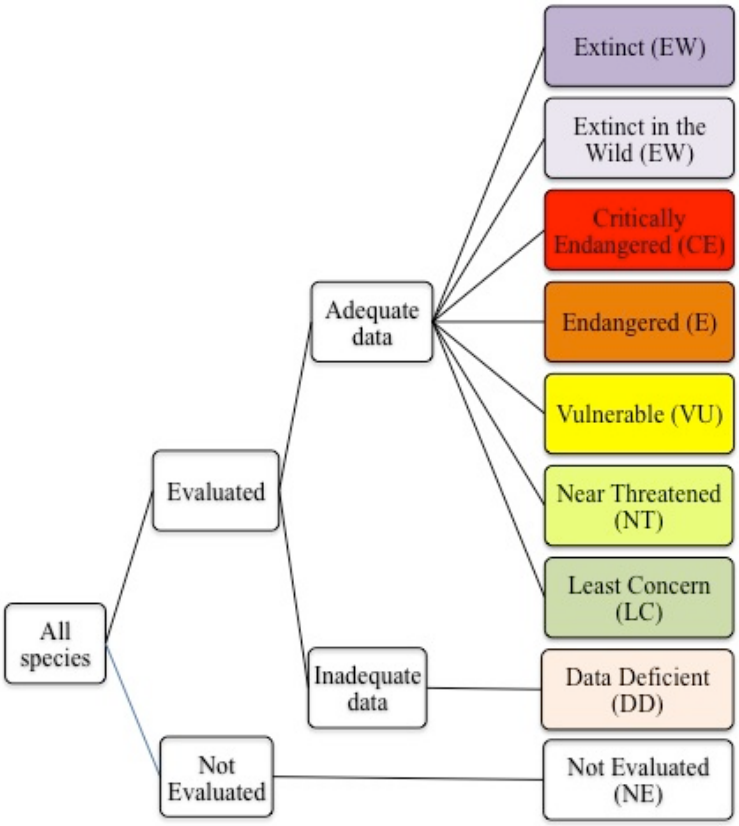

Figure 1 The Red List categorisation scheme.

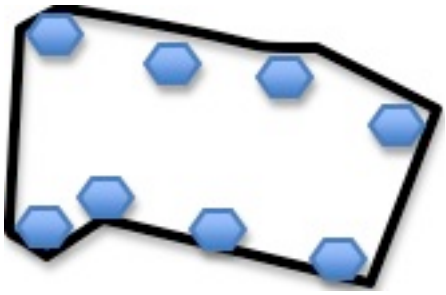

Figure 2 Geographic range. The sum of the areas of the blue polygons is “area of occupancy”. The area of the black polygon is “extent of occurrence”.

SPECIES ACCOUNTS

In the following accounts the species name and author is given followed by the journal reference for the original description. Then follows a short account of the species. More detailed descriptions can be found in the references with each account.

Rhododendron liboense Z.R. Chen & K.M. Lan

2003. Acta Phytotax. Sin. 41(6): 563-565 pl. 1

Subgenus Hymenanthes, Section Ponticum, Subsection Fortunea

This recently described species is known only from a single population of 35 individuals at 600-700 m on a limestone mountain in Libo County, Guizhou (Figure 3). It is classified as Critically Endangered (CR D) on the basis that the presumed population size is less than 50 individuals. It is not in cultivation.

It is a small tree, 2-5 m tall with smooth branchlets. The leaf is leathery, elliptic-lanceolate, 10-15 × 1.6-2.8 cm with smooth upper and lower surfaces. The smooth pink flowers are broadly campanulate, 3.7-5.5 × 8 cm, and borne on 7-9-flowered terminal inflorescences. There are 15 unequal stamens and the ovary has dense white woolly glands.

It is similar to *R. huanum*, but has narrower leaves, a shorter calyx, and larger corolla.

Rhododendron vellereum Hutch. ex Tagg

1931. Notes Roy. Bot. Gard. Edinburgh 16(79): 209-210

Subgenus Hymenanthes, Section Ponticum, Subsection Taliensia

This species is widespread but rare in coniferous forests and rhododendron thickets at 3000-4500 m. in southern Xizang and southeast Qinghai (Figure 3). It is categorised as Endangered (EN B1b(i,iii)) on the basis that the extent of occurrence is less than 5,000 km^2 and there is continuing decline in extent of occurrence and area, extent and/or quality of habitat.

The Flora of China describes it as a small tree 2-5 m tall with thick leathery oblong-elliptic to oblong-lanceolate leaves, 6-12 × 2-4.5 cm, with a rounded or heart-shaped base, the underside having a thickish silvery-white to gray-yellow, soft and spongy indumentum. The flowers are funnel shaped to campanulate, white, sometimes flushed rose, with purple spots inside, 3.5-4 cm in 10-20-flowered inflorescences. There are ten stamens and the ovary is mostly smooth.

According to the Flora of China the types of *R. vellereum* and *R. principis* are very similar, differing only in the indumentum on the ovary. Cox and Cox (1997) have sunk it under *R. principis*, but McQuire and Robinson (2009 p. 344) treat it as a separate species. It has been treated as a subspecies of *R. principis* (*Rhododendron principis var. vellereum* (Hutch. ex Tagg) T.L. Ming) but IPNI, Tropicos and the Plant List treat *R. vellereum* as a species and *R. principis var. vellereum* (Hutch. ex Tagg) T.L. Ming as a synonym.

BGCI (2011) records one collection in cultivation but does not specify where. The Royal Botanic Gardens Edinburgh (MSEBG 2014) have several plants of *R.*

principis wild collected by Keith Rushforth in Xizang; some may be this species.

Rhododendron leptocladon Dop

1930. Fl. Indo-Chine 3: 745

Subgenus Rhododendron, Section Rhododendron, Subsection Maddenia

This is an epiphytic species with a very limited distribution in forests at 2000-2300 m. in southern Yunnan and northern Vietnam (Figure 4), although it is locally common where it does occur. Cox and Cox (1997) include *R. leptocladon* in the supplement to their second edition along with a photo and there are several photos on line.

It is categorised as Vulnerable (VU B1ab(iii)) because the extent of occurrence is less than 20,000 km^2, its range is severely fragmented, it occurs in few populations, and there is continuing decline in extent of occurrence and extent and/or quality of habitat.

The species is an epiphytic shrub 0.5 -1 m tall. The young shoots have dense brown scales but become smooth with age. It has leathery, elliptic, oblong-elliptic or ovate leaves, 4-6× 2-3.5 cm with wedge-shaped to rounded bases and somewhat pointed apices. The lower surface is gray green with brown scales. It bears broadly funnel-form yellow flowers in terminal, 3-4 flowered inflorescences. The flowers are lobed to the middle, 3.5 x 4.3 cm, with a gray-white pubescent tube. There are ten unequal stamens, shorter than the corolla.

According to the Flora of China, Holland (1997) has shown that *R. nemorosum* is synonymous with R. *leptocladon.*

We can find no evidence of this species being in cultivation.

Rhododendron liaoxigense S.L. Tung & Z. Lu

1988. Bull. Bot. Res. Harbin 8(2): 155

Subgenus Rhododendron, Section Rhododendron, Subsection Micrantha

This species is found in one small locality at ca. 500 m in western Liaoning in far northern China (Figure 3). This restricted area of occupancy (less than 20 km²) produces a categorisation of Vulnerable (VU D2) and it may warrant a higher categorisation.
It is a shrub, up to 2 m tall with densely pubescent branchlets. The leaves are thick, almost leathery, obovate-elliptic, 2.5-5.5 × 1.1-1.8 cm, with wedge-shaped bases. The under surface is yellowish white with dense, yellowish brown scales and the upper surface is sparsely scaly. The flowers are yellow in inflorescences of more than 13 flowers. There are ten stamens, slightly longer than the corolla.

We can find no evidence of this species being in cultivation.

Rhododendron mackenzianum Forrest

1920. Notes Roy. Bot. Gard. Edinburgh 12(57-58): 132-135

Subgenus Azaleastrum, Section Choniastrum

This species is known from less than five locations in southeast Xizang, western Yunnan and northeast Myanmar (Figure 4), where it occurs in thickets at 2000-2800 m. It is categorised as Vulnerable (VU D1+2) based on there being less than 1,000 mature individuals, its restricted area of occupancy (less than 20 km²) and because it is known from few locations.

This is a shrub or small trees, 3-12 m tall, with peeling purplish tinged bark. The leaves are leathery, oblong or oblong-lanceolate, 8-14 × 2.5-4 cm, with a wedge-shaped base, pointed apex and slightly recurved margins. Both leaf surfaces are smooth. The flowers are mostly borne singly and are narrowly funnel-campanulate, pink or white, with yellowish orange markings on the inner surface of the upper lobes, 5-5.7 × ca. 5 cm. There are nine or ten unequal stamens.

While The Plant List, Tropicos and IPNI regard this as an accepted name, Cox and Cox (1997) and McQuire and Robinson (2006) consider this synonymous with *R. moulmainense*, a species of Least Concern, and The Red List notes this debate. Should *R. mackenzianum* be found to be the same as *R. moulmainense* then it would no longer warrant Vulnerable status. However, the stakes are high for a plant with such a restricted distribution and such a decision would need to be based on good research including genetic analysis and not rely on opinion based on gross morphology alone.

The Royal Botanic Gardens Edinburgh (MSEBG 2014) have one plant catalogued under *R. moulmainense* wild collected by Kingdon Ward in Kachin State in Burma that may be from the range of this species.

Rhododendron platyphyllum (Franch. ex Diels) Balf. f. & W.W. Sm.

1916. Notes Roy. Bot. Gard. Edinburgh 9(44-45): 259-261

Subgenus Rhododendron, Section Pogonanthum

This species occurs in bamboo brakes, among rocks in open alpine pastures, cliffs and ledges at 3000-4500 m in central and northwest Yunnan (Figure 3). It is categorised as Vulnerable (VU D2) based on the restricted area of occupancy (less than 20 km²) and it being only known from a few locations. It is rare in cultivation.

It is an erect or semiprostrate shrub, 0.15-1.5 m tall with short scaly branchlets short. The leaf is aromatic, broadly elliptic, oblong-ovate or ovate, 0.3-0.5 × 0.2-

0.3 cm with a rounded or wedge shaped base and rounded apex. The under side is dark brown and scaly, the upper surface dark green, smooth and shiny. The flowers, born in 6-10 flowered inflorescences, are tubular to funnel-form, white, creamy white or pink, rarely yellowish or rose, 1.8-2 cm, and the tube 1.3-1.4 cm, the flowers are smooth outside and densely woolly inside. There are 5 -8 stamens. This taxon is treated as a subspecies of *R. cephalanthum* by some authors including Cox and Cox (1997) who indicate it was reintroduced into cultivation in 1992 after being lost. It is available from various growers in the UK[3].

Rhododendron roseatum Hutch.

1919. Notes Roy. Bot. Gard. Edinburgh 12(56): 57-58

Subgenus Rhododendron, Section Rhododendron, Subsection Maddenia

This tree or shrub has a very limited and scattered distribution in Yunnan and NE Myanmar in evergreen broad-leaved forests, on hilltops and on open slopes at 3000 m (Figure 4). It is categorised as Vulnerable (VU D2) based on the restricted area of occupancy (less than 20 km²) and it being only known from a few locations.

The species is in cultivation and is figured in Cox and Cox (1997) but it is not on the ICON list nor has a case been prepared for its inclusion.

It grows to 4 m tall and has pale brown young shoots. The leaf is ovate, 6-10 × 2-4.5 cm; with a generally rounded base and a triangular to pointed tip. The Flora of China describes the upper surface as pink green and scaly and the lower surface densely brown scaly. The inflorescence is terminal and bears two to four flowers that are fragrant, broadly funnel-form, 5-lobed to the middle, pinkish in the bud and white tinged with pale red on opening. Flowers are 5.5-7 cm, and the lobes are densely scaly. There are ten stamens. Photographs can be found in Feng Guomei (1988 p. 125).

This description from the Flora of China differs from that in Cox and Cox (1997) who describe the flower colour as white flushed pink with a yellow blotch. The Flora of China also includes northeast Myanmar in this species' distribution whereas Cox and Cox (loc.cit) and the Red List only include Yunnan. However the distribution map in the Red List includes a collection in Myanmar on or near the Chudu Razi (Range). This is not shown on Figure 4. Cox and Cox (1997) suggest *R. roseatum* is conspecific with *R. pachypodum*, which in turn they suggest is the same as *R. ciliicalyx*.

[3] e.g. http://sound-garden-designs.co.uk/rhododendrons/

The Royal Botanic Gardens Edinburgh (MSEBG 2014) has a plant in cultivation but with no details of provenance available on line.

Rhododendron setiferum Balf. f. & Forrest

1919. Notes Roy. Bot. Gard. Edinburgh 11(52-53): 137-139

Subgenus Hymenanthes, Section Ponticum, Subsection Selensia

The species occurs in fir forests and thickets in south-east Xizang and north-west Yunnan at 3300-3700 m (Figure 4). It is categorised as Vulnerable (VU B2ab(i,iii)) based on the restricted area of occupancy (less than 2,000 km²), its range being fragmented and/or occurring in few 10 populations, and there is continuing decline extent of occurrence and extent and/or quality of habitat.

It is a shrub two to three m tall with usually smooth flaking older branches, the young branchlets are stout and glandular. The leaf is leathery, oblong-elliptic or elliptic, 5.5-10 × 1.8-4 cm with a rounded base and blunt or pointed apex. The upper side is smooth and the lower has a thin indumentum. The flowers are unequal, funnel-form, white or pink, with deep red lines at the base, 3.5-4 × ca. 3.5 cm born in 6 to 10 flowered inflorescences. There are ten stamens.

It is described in Cox and Cox (1997) under *R. selense* subsp. *setiferum* (Balf. f. & Forrest) D.F. Chamb. Sound Garden Design offers it for sale also under the name of *R. selense* subsp. *setiferum*[4].

Rhododendron taronense Hutch.

1931. Notes Roy. Bot. Gard. Edinburgh 16(79): 178

Subgenus Rhododendron, Section Rhododendron, Subsection Maddenia

This species has a very restricted distribution in broad-leaved forests at 1200-1600 m in the Dulong (Taron) Valley, Yunnan (Figure 4) and possibly neighbouring Myanmar. It supposedly grows near rivers. It is categorised as Vulnerable (VU D2) based on a restricted area of occupancy (less than 20 km²) and few locations.

It is a shrub, sometimes epiphytic on trees, 1.2-3 m tall with dark purple, peeling bark on old branches. The leaf is leathery, narrowly elliptic or oblong-lanceolate, 7-12 × 2.3-4.3 cm, acute at both ends. The underside has brown or yellowish brown, mostly concave scales, the upper side is also sparsely scaly. The inflorescence is terminal and bears four to five broadly funnel form, white flowers with yellow markings inside. The flowers are fragrant with rounded,

[4] This is a commercial Rhododendron garden run by Timothy Atkinson that asserts their plants are from field-collected seed. (http://sound-garden-designs.co.uk)

spreading lobes 4-5 cm in size. There are ten stamens. Photographs can be found in Feng Guomei (1988 p. 126).

Cullen (1980) reduced this species to a synonym of *R. dendricola* and it is treated as such in Cox and Cox (1997). *R. dendricola* (*sens. lat*.) has a broad distribution from Arunachal Pradesh (India) to Zizang, China. Several websites present photographs purporting to be R. *taronense*, and R. *taronense* is included, incorrectly, as one of the endemic plants of Northern Myanmar[5]. We follow The Plant List and retain it as a species.

DAPC (2014) record plants of unspecified origin growing in the San Francisco Botanical Garden at Strybing Arboretum and the Edinburgh Botanic Garden (MSEBG 2014) has a living plant catalogued under *R. dendricola* collected by Forrest.

Rhododendron tianlinense P.C. Tam

1983. Guihaia 3(3): 181

Subgenus Azaleastrum, Section Azaleastrum

R. tianlinense occurs in dense montane forests, usually with pines and bamboos, at around 1200m in north-west Guangxi and possibly also in south-east Guizhou (Figure 3). It is categorised as Vulnerable (VU D2) based on a restricted area of occupancy and the few localities at which it occurs.
It is a shrub or small tree up to 4 m tall. The leaf is papery, lanceolate or elliptic-lanceolate, 5.5-9.5 × 1.5-3 cm, with a narrow wedge-shaped base and a pointed apex. The margin is slightly recurved and both surfaces are pubescent along the midrib. The flower is not known but the structure of the fruits and flower stalks indicate they are born singly and subapically and the style is persistent and about 2 cm long.

We can find no evidence of this species being in cultivation.

Rhododendron tingwuense P.C. Tam

1978. Med. Mat. Guangdong 4: 36 f. 6

Subgenus Tsutsusi, Section Tsutsusi

This occurs on mountain ridges at 800-900 m. in Dinghushan and Jilangshan, Gayao, Guangdong (Figure 3). It is categorised as Vulnerable (VU D2) based on a restricted area of occupancy and few localities at which it occurs.

[5] http://www.terrestrial-biozones.net/endemic%20floras/Northern%20Myanmar%20Endemics.html

It is a shrub 1.5-2 m tall with young shoots covered in short stiff hairs. The leaves are somewhat dimorphic, thick and leathery, elliptic or obovate-elliptic, 1-2.5 × 0.5-1.3 cm, with broad wedge-shaped or rounded bases, short pointed apices and recurved margins.

The flowers are born in inflorescences of 6 to 10, and the flower stalks like the shoots are covered in short stiff hairs. The corolla is narrowly funnel form, purplish, 1-1.6 cm, with a tube ca. 8 mm. There are five stamens with pubescent filaments. The ovary is silky tomentose and has short stiff hairs. Photographs can be found in Feng Guomei (1999 p. 149).

We can find no evidence of this species being in cultivation.

Rhododendron wolongense W.K. Hu

1988. Acta Phytotax. Sin. 26: 303

Subgenus Hymenanthes, Section Ponticum, Subsection Fortunea

This occurs in a limited number of small populations, in broad-leaved forests at ca. 1700 m in western Sichuan (Figure 3). It is categorised as Vulnerable (VU D2) based on a restricted area of occupancy and the few localities at which it occurs.
The species is a small tree, 4-6 m tall. The leaf is leathery, narrowly oblong, rarely oblong-oblanceolate, 14-17.5 × 3-4.5 cm with a rounded or slightly heart shaped base, a blunt apex and recurved edges. The underside is glaucous and the upper side glabrous. The inflorescence consists of 5 or 6 funnel shaped to campanulate, pink to white flowers 9.5-10.5 cm with seven lobes. There are 15 stamens and the ovary is densely pink glandular-hairy.

We can find no evidence of this species being in cultivation.

Rhododendron yaoshanense L.M. Gao & S.D. Zhang

2008. Ann. Bot. Fenn. 45: 204-206 f.
Subgenus Hymenanthes, Section Ponticum, Subsection Taliensia

VU D2
This is an evergreen dwarf creeping shrub, 0.2–0.5 m tall with smooth, yellow brown branches.
Leaves occur in clusters of four to six at the end of branches. The leaf blade is thickly leathery, oblong to obovate, 3–6 x 1.5–3 cm; with a recurved margin and blunt to slightly pointed apex. The underside has a thin pale woolly indumentum, and the upper surface is smooth, deep green and slightly shiny. The inflorescence is compact consisting of 4–7 campanulate white flowers with

crimson spots on the inner upper lobes. The corolla is 3–3.5 cm diameter and five lobed. There are ten stamens.

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Multisite Search page of the Royal Botanic Garden Edinburgh (MSEBG). Accessed July 2014. www.rbgweb2. rbge.org.uk/multisite/multisite3.php

APPENDIX 1

Basically we had a six-step process.

1. We extracted all "accepted" names of Rhododendron that were not synonyms from "The Plant List", an online working list of all known plant species, produced by the Royal Botanic Gardens, Kew and the Missouri Botanical Garden.[6]
2. We then removed species that were on the ICON[7] list of Rhododendrons whose seed can be legally imported into Australia.
3. We then removed species that Simon Begg had already determined were not on the ICON list and that await submissions to be prepared for their inclusion on the ICON list. These species are mostly from Argent (2006) and Cox and Cox (1997).
4. This left approximately 70 'missed' Rhododendrons i.e. species not yet permitted for import and not on Simon's list of species awaiting submissions to ICON, mostly species described since 1997.
5. These missed species were then cross-checked in two other on-line databases – The International Plant Names Index (IPNI)[8] and Tropicos[9].
6. We then consulted the Red List of Rhododendrons (Gibbs et al. 2011) for their conservation status and checked other databases, Rhododendron society websites and primary scientific literature to discover more about each species.

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[6] http://www.theplantlist.org. The List combines multiple checklist data sets held by these institutions and others and provides the accepted Latin name for most species, and synonyms by which that species has been known. "Around 20% of names are Unresolved indicating that the data sources included provided no evidence or view as to whether the name should be treated as accepted or not, or there were conflicting opinions that could not be readily resolved."

[7] ICON is the Commonwealth Department of Agriculture's import conditions database

[8] IPNI is a database of the names and associated basic bibliographical details of plants developed by the Royal Botanic Gardens Kew, the Harvard University Herbaria, and THE Australian National Herbarium.

[9] Tropicos® contains all the nomenclatural, bibliographic, and specimen data in the Missouri Botanic Garden's databases - there are over 1.2 million scientific names and 4.0 million specimen records. It is a common source for other databases.

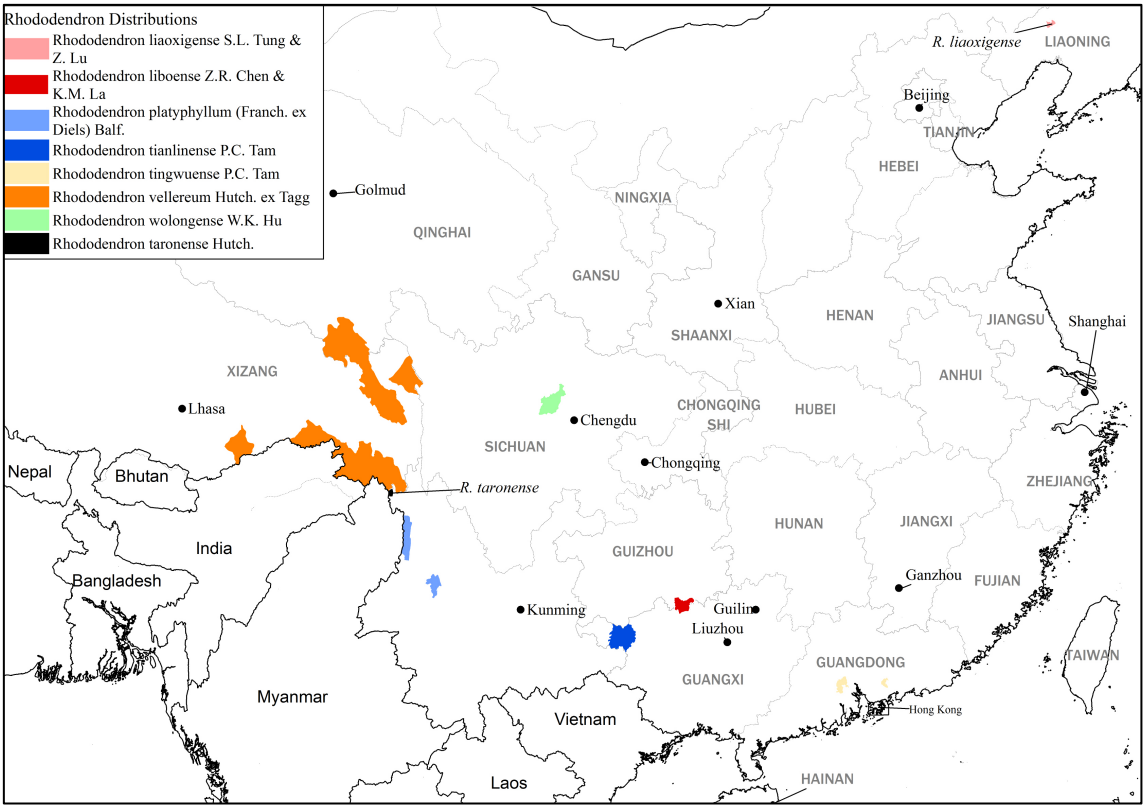

Figure 3 Distribution of species I (from Fang et al. 2011). The distributions are mapped as counties within which the species has been collected.

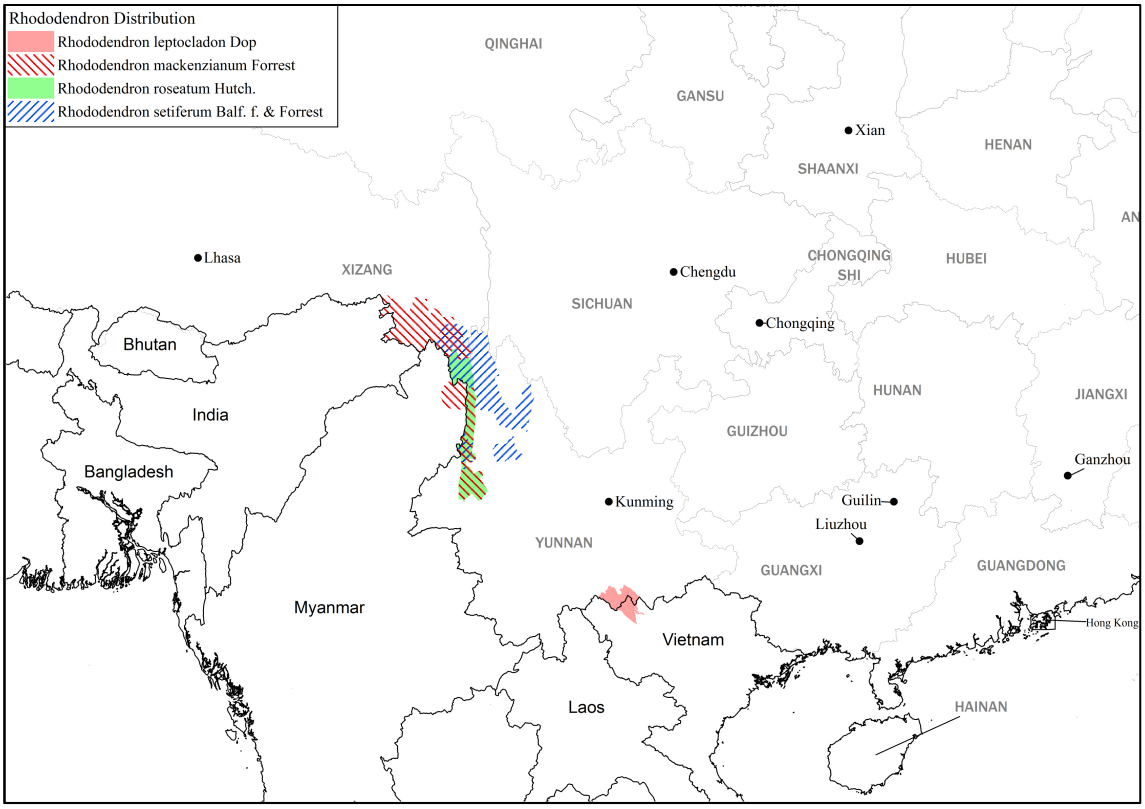

Figure 4 Distribution of species II (from Fang et al. 2011). The distributions are mapped as counties within which the species has been collected.