

## One Hundred Miles of Natural *Rhododendron* Communities

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**Significance to Industry:** Natural plant resources are important to potential ornamental plant exploration, which ultimately leads to breeding and introduction of better ornamental plants for the nursery and greenhouse industries. One hundred miles of natural *Rhododendron* communities (Baili *Rhododendron* communities) are located in western Guizhou Province of China. The communities consist of broad-leaf evergreen *Rhododendron*. A total of 19 species and one natural, double-flower form have been identified. Among them, 11 species have been introduced to US and European countries while 8 species are new to our US gardens. Detailed exploration with focus on potential ornamental *Rhododendron* species and new hybrids should be conducted in Baili *Rhododendron* areas. Future collaboration on plant exploration, introduction, breeding, and better management of this ornamental treasure is desperately needed.

**Nature of Work:** *Rhododendron* are popular ornamental plants in today's market. The genus *Rhododendron* has 854 to 1,000 natural taxa [1, 6, 7]. With the ability of the species to freely hybridize, more than 5,000 cultivars have been introduced to the market [5]. Dirr [3] recorded 1558 taxa and cultivars in his manual. The genus is widely distributed through Asia, Europe, and North America. Two species are recorded in Australia, but none are native in South America or Africa. China is a center of diversity with a total of 571 species. Among them, 409 species are endemic in China [6].

Guizhou is one of the provinces in China with rich *Rhododendron* species. A total of 86 species, 3 varieties, and 1 form were collected in Guizhou [2, 4]. Hundred miles of *Rhododendron* communities are in western Guizhou with latitude 27°17' to 27°20'N, longitude 105°50' to 106°00'E, and elevation from 1,500 to 1,800 meters [4]. After thousands of years of natural selections, Baili *Rhododendron* communities reached today's pure stands. The climate is a subtropical type with

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dry and chilly spring and wet and warm summer. The annual mean temperature is 11.8<sup>0</sup>C (53.3<sup>0</sup>F). The highest average temperature is 20.7<sup>0</sup>C (69.3<sup>0</sup>F) in July and the lowest month 1.6<sup>0</sup>C (33.6<sup>0</sup>F) in January. The annual precipitation is 1180.8 mm (46.5"). The raining days reach 221 days per year and the raining months are from May to October. The annual relative humidity is 84%. The full sunny days are only 21.4 days per year. Others are raining and cloudy days. Several types of soils have been described in Hundred Miles of Rhododendron areas. Generally, these soil types are acidic, with pH range of 4.5-6.3. Obviously, this chilly and lower light environment with acid soil is the best for some of Rhododendron species.

In the past four years, we have investigated Baili Rhododendron communities. The purpose of this paper is to share the preliminary results of their natural species and communities. Further studies should focus on their species with better ornamental potentials and natural hybrids.

**Results and Discussion:** Hundred Miles of Rhododendron communities are bush vegetation. They are not typical Rhododendron communities as that in high mountains (more than 3,000 m (11,800 ft) above the sea level). Also, they are not zonal climax vegetations. The zonal vegetations for Baili Rhododendron areas are evergreen broadleaf forests, especially under the elevation of 2,000 m (7,870 ft). Baili Rhododendron plants are dominant species under tree layer of the communities. With human intervention in the last century, all trees in the communities were removed for various commercial purposes. The understory plants (*Rhododendron* spp.) became dominant species.

Three distinguished communities in Baili Rhododendron are *Rhododendron irroratum* Community, *Rhododendron simsii* community, and *Quercus-Castanea-Rhododendron* community. The dominant species for the first two communities are *R. irroratum* and *R. simsii*, while the dominant *Rhododendron* species for third one are *R. arboretum* and *R. delavayi*. Other *Rhododendron* species are mixed with these four species or deciduous oak species. Preliminary investigation concluded that both *R. irroratum* and *R. simsii* communities have some pure stands. Although *Quercus-Castanea-Rhododendron* community has some mixed species, the number of *R. delavayi* is stable with very strong natural succession. Some populations had 59% of *R. delavayi* with basal diameters more than 14 cm (5 in) (aged plants). Others showed that number of plants decreased as the plant basal diameters increased and 60% or more plants had less than 8cm (3 in) basal diameter. In a 15 m<sup>2</sup> (160 ft<sup>2</sup>) plot, 319 natural seedlings from age 3-5 years were counted. With proper protection and management, *Quercus-Castanea-Rhododendron* community will be in succession to *Rhododendron delavayi* communities.

It is a magnificent experience to visit One Hundred Miles of Rhododendron (Baili Rhododendron). After a moment of thrill, authors had been able to collect and identify 19 taxa (18 species and one variety). Although the following species

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have been mentioned in Hortus Third [1] and The Royal Horticultural Society Dictionary of Gardening [7], the phenotypes of some species and hybrids may have great potential for *Rhododendron* breeding.

*Rhododendron ambiguum* Hemsley, not in RHS.  
*Rhododendron arboreum* Smith  
*Rhododendron argyrophyllum* Franchet  
*Rhododendron calophytum* Franchet  
*Rhododendron decorum* Franchet  
*Rhododendron delavayi* Franchet (*Rh. arboretum* ssp. *delavayi* in RHS)  
*Rhododendron irroratum* Franchet  
*Rhododendron* × *pulchrum* Sweet = *Rh. indicum* × *Rh. mucronatum* in RHS.  
*Rhododendron siderophyllum* Franchet  
*Rhododendron simsii* Planchon  
*Rhododendron wiltonii* Hemsley & E. H. Wilson

Variations in *Rhododendron* habit, foliage, flower color and quality, and fruit are phenomenal. The preliminary survey indicated that the following species were new to our ornamental market. Although it takes time and a lot research to determine their performance in our gardens, these natural taxa will enhance our breeding work and enrich the new plant list for our nursery industry.

*Rhododendron agastum* I. B. Balfour & W. W. Smith  
*Rhododendron anthosphaerum* Diels  
*Rhododendron atrovirens* Franchet  
*Rhododendron bachii* H. Léveillé (= *Rh. ovatum* in RHS)  
*Rhododendron cavaleriei* H. Léveillé  
*Rhododendron fuchsiiflorum* H. Léveillé  
*Rhododendron peramoenum* I. B. Balfour & Forrest  
*Rhododendron simsii* var. *bailii* (a new variety will be published)

Generally, Baili *Rhododendrons* bloomed from late March to early June, with peak season from end of March to middle May. The diversity of flower colors, sizes, and floral structures are phenomena. It is possible that natural hybridizations among the species produced some new plants. Further plant exploration and collection should be conducted.

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**Supporting Online Material:**

<http://www.umaine.edu/maineplants/PubDZ/SNA07Rhodo.pdf>  
Slide presentation for the 52nd SNA Research Conference.

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