

Rediscovery of *Jasminum parkeri* Dunn, an endemic and endangered taxon from the western Himalaya, India

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Abstract: The present article deals with the rediscovery of *Jasminum parkeri* Dunn (Oleaceae) collected from its type locality after a lapse of about 100 years. *J. parkeri* is a highly endangered and narrowly endemic taxon restricted to a small pocket in the remote mountain area of Chamba district, Himachal Pradesh in the western Himalaya, India. In order to facilitate identification of this species, the plant description along with a brief history of its discovery, affinity with the other taxa of *Jasminum*, ecological notes, and pictures are provided. Subsequently, possibility of cultivation of this species in *ex-situ* conditions is also discussed.

Key words: *Jasminum parkeri*, Chamba district, endemic, western Himalaya

1. Introduction

The Indian Himalaya is characterized by varied climatic conditions, topography, ecology, and altitudinal variations ranging from 300 m to c8000 m a.s.l. The high mountain ranges and deep valleys act as a barrier and support enormous plant diversity including rich endemic flora. This is why the Indian Himalaya has been recognized as one of 34 global biodiversity hotspots in the world (Myers *et al.* 2000; Mittermeier *et al.* 2004). It supports nearly 8000 species of flowering plants, of which about 40% are endemic (Singh & Hajra 1996; Dhar 2002). The western Himalaya is also considered a center of endemism and recognized as one of 25 micro-centers of endemic plants (Nayar 1996). *Jasminum parkeri* Dunn (Oleaceae) is one of such endemic species, which was recently re-collected from its type locality after a lapse of about 100 years. The genus *Jasminum* currently comprises ca 300 species distributed mainly in the tropical and warm temperate regions of the world (Grohmann 1974). Of the total of 47 species reported from the Indian subcontinent (Green 2003), 17 species are rare and threatened (Srivastava & Kapoor 1987). In the Indian Himalaya, the genus is represented by 16 species, of which 6 taxa are rare and endemic to this region (Srivastava 1987). Among these, *Jasminum*

parkeri Dunn is a narrowly endemic and highly endangered taxon confined to the sub-temperate zone of the Indian western Himalaya.

Jasminum parkeri was collected for the first time by J.H. Lace from the Rupani forest (2100 m a.s.l.) of the Chamba district (previously Chamba State) in the western Himalaya in 1899, however, it remained inconspicuous for nearly 20 years. Later, this species was collected in 1919 by R.N. Parker from Tiari (1800 m), the Holi area of Bharmour subdivision, Chamba district (Srivastava 1985). Consequently, the plant was described first by S.T. Dunn based on Parker's collections deposited in the Herbarium of the Royal Botanical Gardens, Kew (Dunn 1920). Subsequently, Parker also reported *J. parkeri* in his floristic publication about Punjab and its adjoining areas (Parker 1924). Until recently, the species has not been collected after the initial Parker's collection. Despite the revisions of Indian Oleaceae by Gupta & Chandra (1957), Srivastava (1987), Srivastava & Kapoor (1987), and Jain *et al.* (2011) and floristic studies carried out by various researchers (Chowdhery & Wadhwa 1984; Polunin & Stainton 1984; Singh & Sharma 2006) in the western Himalaya in general and in Chamba district in particular during the last century, *J. parkeri* has never been additionally collected until our research conducted in May 2012. During a field study



Fig. 1. *Jasminum parkeri* Dunn: the type locality and different stages of phenology

Explanations: A – plant growing in the type locality, B – general habit, C – *Jasminum parkeri* in full bloom, D – fruit-bearing plant

in the remote tribal areas of Bharmour subdivision in the Chamba district, Himachal Pradesh in the western Himalaya, the authors succeeded in finding this interesting plant almost 100 years after the previous collections. Following our critical examination of the plant with the

help of available relevant literature (Dunn 1920; Parker 1924; Srivastava 1985) and voucher specimens (isotypes) deposited in the herbarium of the Forest Research Institute, Dehradun (DD), the newly collected plant has been identified as *J. parkeri* (Fig. 1), one of the narrowly

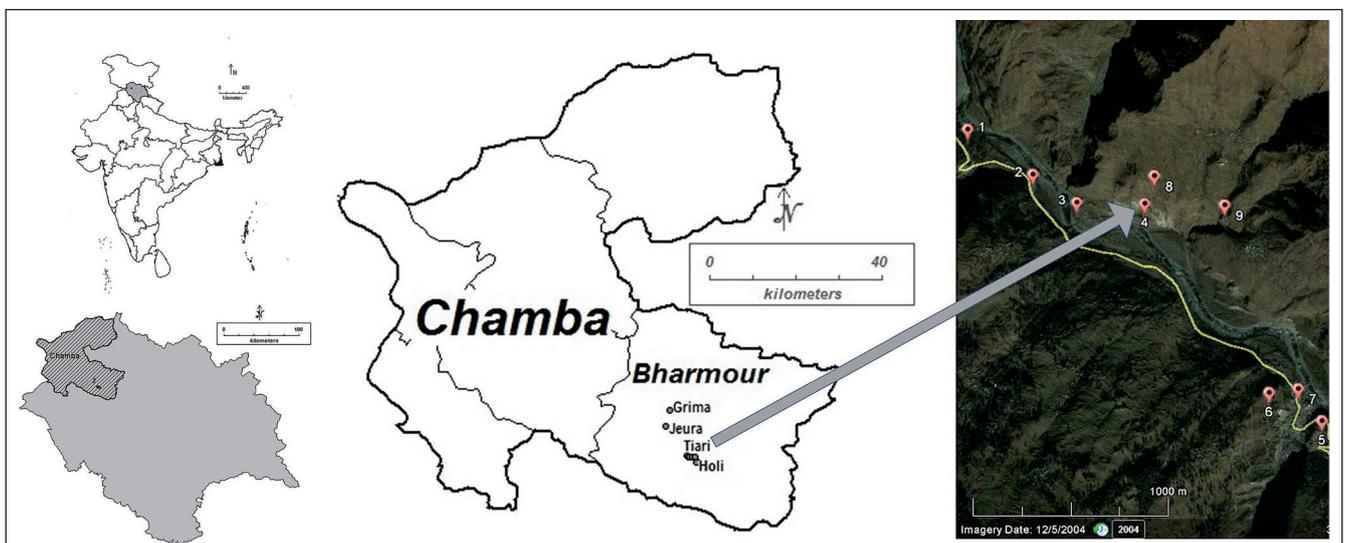


Fig. 2. Map showing the locations of *Jasminum parkeri* Dunn in western Himalayas

endemic plants of the western Himalayan region. Thus, this species was collected for the second time, after R. N. Parker, from its type locality, Tiari, and also from other nearby localities in the Bharmour subdivision of Chamba district (Fig. 2).

The taxa with narrow distribution are first to experience the adverse effect of habitat destruction and, therefore, they require immediate attention to protect them from extinction. Thus, the present study is an attempt to document the distribution, habitat, plant description, phenology and phytosociology of *J. parkeri* and to explore possibility of its cultivation and *in-situ* conservation.

2. Materials and methods

While searching information on some rare and threatened plants of western Himalaya, an article on *J. parkeri* by Srivastava (1985) has revealed that until now, this species after its discovery has not been re-collected even from its type locality. In order to track down this plant, the voucher specimens housed in DD, collected by J. H. Lace (1899) and R. N. Parker (1919, 1920), were studied first and all field details like localities, season of flowering-fruiting and other relevant information were noted. Subsequently, several plant collection trips were conducted to different localities

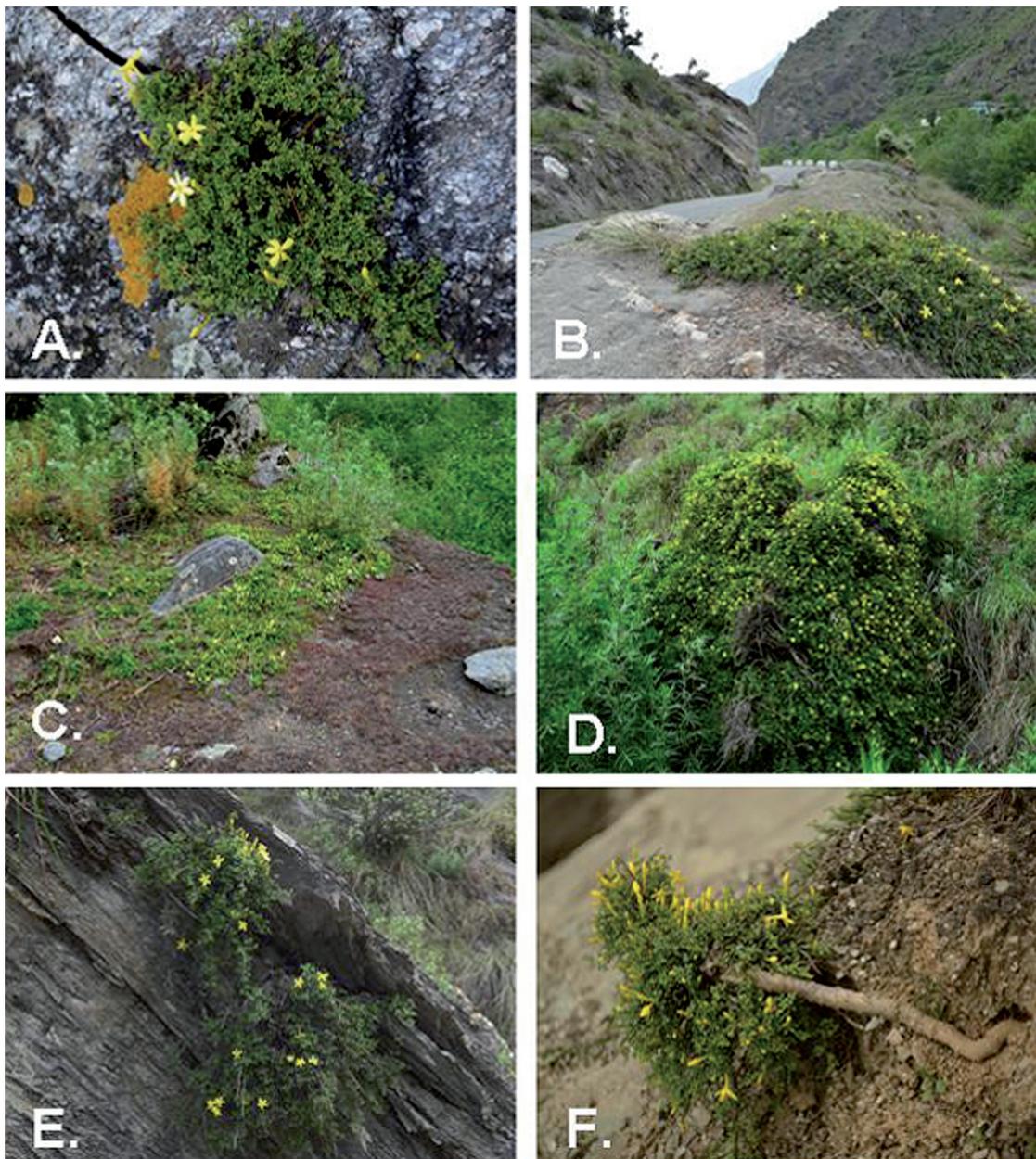


Fig. 3. Habitat diversity of *Jasminum parkeri* Dunn

Explanations: A – *Jasminum parkeri* emerging from rock crevices, B – dome-shaped habit of *Jasminum parkeri* growing along the roadside, C – plant growing on the open, dry, flat ground among rocky stones, D – *Jasminum parkeri* sheathing the boulder on a slope, E – plant sagging in sediment rocks, F – plant growing on roadside cutting shows a woody stem and strong root system

(including the type locality) in the Chamba district. The sites other than the type locality, like Rupani, Holi, Batola, Deol, Bantuh, Jaura, Seur, Raitan and Grima were also visited (Fig. 2).

Jasminum parkeri was re-found during a plant collection trip to the Holi area of Bharmour subdivision in the Chamba district in May, 2012. Besides recording field details like habit, habitats, phenology and associated flora, the voucher specimens were collected for identification and herbarium records. Based on the perusal of relevant literature (Dunn 1920; Parker 1924; Srivastava 1985) and study of voucher specimens, including the type specimens (isotype) lodged in DD, the plant has been identified as *Jasminum parkeri* (Fig. 1). The specimens collected were pressed and dried (Jain & Rao 1977; Rao & Sharma 1990) and preserved in the herbarium of the Institute of Himalayan Bioresource Technology, Palampur (PLP) as reference material. In addition, the pictures of this plant taken in different habitats were also provided (Fig. 3).

3. Results and discussion

Taxonomic Treatment: *Jasminum parkeri* Dunn Bull. Misc. Inform. Kew, 6: 69, 1920; Parker For. Fl. Punjab, 322, 1921; Green Notes Roy. Bot. Gard. Edinb. 23: 371, 1961; Srivastava J. Econ. Taxon. Bot. 7: 709, 1985; Green Kew Bull. 58: 278, 2003.

Based on the leaf characters, the genus *Jasminum* has been divided into four sections, namely: *Jasminum* Linn., *Alternifolia* DC., *Trifoliata* DC., and *Unifoliata* DC. respectively (Green 2003). *Jasminum parkeri* has been placed under the section *Alternifolia*. It is closely

related to *Jasminum humile* L., but differs from it in many aspects (Table 1).

Description: Dwarf, prostrate, dome-shaped evergreen shrub, 20 to 30 cm tall, slender, sprawling or sagging on rocky-slopes or stone walls. Stems densely crowded, branched, crooked, verrucose and woody; twigs green, striate, scabrid. Leaves alternate, stipulate, petiolate, pinnately compound, 3-5 foliolate, imparipinnate, 7-15 mm long; rachis and petioles narrowly winged; petioles 2-4 mm long; leaflets subsessile, obovate, glabrous, thickly coriaceous; margin entire, base cuneate, apex mucronate; terminal leaflets longer than lateral ones, lateral leaflets 3-4x2-3 mm, terminal leaflets 3-6x2-3 mm, nerves indistinct. Flowers yellow in axillary and terminal cymes, 1.9-2.2 cm long, pedicellate; pedicels 1-3 mm long, glabrous. Calyx green, 5-lobed, 2-3 mm long, lobes linear, glabrous, green. Corolla bright yellow, tubular, 5-lobed, corolla tubes 13-14 mm long, lobes 8-9 mm long, oblong, ovate. Stamens 2, long, inserted the at middle of corolla tube. Ovary superior, bicarpellate, syncarpous, 2-loculed, one ovule in each locule, rounded; style 1.5 cm long, thread-like; stigma club-shaped. Fruit berry, ellipsoid, 3-4 mm in diameter, glabrous and shining.

Distribution: INDIA: western Himalaya, Himachal Pradesh, Chamba district, Bharmour subdivision, Endemic.

Flowering and fruiting: May-December

Specimens Examined: Himachal Pradesh, Chamba, Rupani forest (2135 m), 7.6.1899 J. H. Lace 1960, 4845 (DD); Chamba state, Tiari, Bharmour (1830 m), 2.7.1919, R.N. Parker s.n. (Isotype), 21688 (DD); Chamba state, between Grima and Siunr, Bhar-

Table 1. Differences between *Jasminum parkeri* Dunn and *Jasminum humile* L.

Attributes	<i>Jasminum parkeri</i>	<i>Jasminum humile</i>
Distribution	Narrowly distributed	Widely distributed
Habitat	Grows in crevices of rocks and on dry ground amongst boulders	Grows in moist shady places and at the forest edges
Habit	Dwarf, prostrate shrub	Erect or scandent shrub
Stem	Densely crowded, branched, up to 30 cm long	Glabrous, 1-1.5m long or more, branched, branchlets angular
Leaf	Leaves alternate, 3-5 foliolate, 1-1.5 cm long	Leaves alternate, imparipinnate, 6-14cm long
Leaflet	Leaflets 3-7 x 2-2.5 mm, mucronate, base cuneate or round, entire, thickly coriaceous	Leaflets 5-7, ovate or ovate-lanceolate, 2.5-7.5 x 1.5-2.8 cm, acute, entire
Inflorescence	Solitary, mostly axillary, or in clusters of 2-4 at the tips of branches, 1-3 flowers per inflorescence	Solitary or in short terminal compound corymbose cymes, 5-25 flowers per inflorescence
Flower	Flowers bright yellow; 0.9-2.2 cm long; bracts 2.5-3mm long, pedicels 2-3mm long	Flowers yellow, 1.5-2cm long, fragrant; bracts 3-4mm long; pedicels 0.1-3 cm long
Calyx	2.5-3.5mm long, glabrous; lobes 5, linear, subulate	2-3 mm long; teeth 5, triangular, half as long as the tube or less
Corolla	Corolla tube 1.0-1.2 cm long, lobes 6, lobes 8-9 mm long, oblong, ovate	Corolla tube 1-1.5 cm long; lobes 5, 3-7 mm, orbicular or ovate, often rounded at apex
Fruit	Berry 3mm in diameter, ellipsoid	Berries ellipsoid, 8-10 mm across

mour (7000 ft.), 15.8.1920, R.N. Parker 22304 (DD), Holi (1800 m) 25.4.2012, Arunava Datta 15301 (PLP); Tiari, (2000 m) 11.5.2012, Brij Lal and team 15336 (PLP); Grima (2250 m) and Jeura (1600 m), 29.8.2012; Brij Lal and team 12112 (PLP) all from Bharmour valley, Chamba district, Himachal Pradesh, India.

Ecological notes: *Jasminum parkeri* grows in diverse habitats from sunny and open, dry flat barren lands to partially shady places at the altitudes of 1600-2300 m a.s.l. in the upper Ravi basin of the Bharmour area of Chamba district in the western Himalaya. Generally, it grows in crevices of rocks, around or between boulders on flat grounds. Sometimes it is found profusely sprawling along the slopes of grazing lands, roadside edges, and stone walls, in association with the species of *Agrostis pilosula* Trin., *Ajuga parviflora* Benth., *Arabis* L., *Artemisia* L., *Arthraxon lancifolius* (Trin.) Hochst., *Asplenium trichomanes* L., *Astragalus amherstianus* Benth., *Astragalus oplites* Benth. ex R. Parker, *Carex* L., *Crepis japonica* (L.) Benth., *Daphne mucronata* Royle, *Equisetum arvense* L., *Erigeron* L., *Erodium cicutarium* (L.) L'Hér., *Herniaria hirsuta* L., *Launaea procumbens* (Roxb.) Ramayya & Rajagopal, *Lotus corniculatus* L., *Medicago falcata* L., *Micromeria biflora* (Buch.-Ham. ex D. Don) Benth., *Nepeta laevigata* (D. Don) Hand.-Mazz., *Origanum vulgare* L., *Oxalis corniculata* L., *Rabdosia rugosa* (Wall. ex Benth.) H. Hara, *Sageretia thea* (Osbeck) M.C. Johnst., *Salvia moorcroftiana* Wall. ex Benth., *Stipa sibirica* (L.) Lam., *Tagetes minuta* L., *Taraxacum officinale* Webb, *Themeda anathera* (Nees ex Steud.) Hack., *Tussilago farfara* L., *Veronica* L., and *Vincetoxicum* Medic.

In order to assess the IUCN status of various rare and threatened plants in India, sensible efforts were made by various workers (Jain & Sastry 1980; Nayar 1980; Jain & Rao 1983; Jain 1984; Nayar & Sastry 1987, 1988, 1990; Khoshoo 1996) during the last four decades, however, *J. parkeri* has not been assessed so far for any type of threat status (<http://eol.org/pages/5655303/overview>). Based on literature survey and scrutiny of herbaria, Srivastava (1985) placed this taxon under the endangered category, but field studies yet to be carried out to determine the actual threat status of this plant.

Jasminum parkeri is known by different vernacular names like Himalayan jasmine, Dwarf jasmine, or Parker jasmine. It is a beautiful natural bonsai-like shrub with bright-yellow attractive flowers, pleasantly scented. It looks very attractive when in full bloom (Fig. 1). This species has an immense horticultural potential as it is grown as an ornamental plant in some parts of the world (Bailey 1976, <http://www.forestfarm.com/product.php?id=2627>, <http://davesgarden.com/guides/pf/go/80116>) based on the original material collected from India about a century ago (http://plants.jstor.org/visual/kdcass_3663). Surprisingly, *J. parkeri* has not been used in any way in India, the country of its origin. It can be propagated easily through seeds and cuttings. Therefore, there is a great scope of harnessing the potential of *J. parkeri* in India as an ornamental plant.

4. Conclusion

Jasminum parkeri is a narrowly endemic and highly endangered taxon due to the small number of known individuals, which are vulnerable to human impact and natural disasters. The human interference and natural threats may lead to a severe reduction in population. Therefore, there is an urgent need to develop appropriate conservation strategies to protect this species in its native habitats, and, probably, also in cultivation. Appropriate conservation measures will not only protect this species from the population decline, but its cultivation would also benefit the tribal communities (*Gaddis*) inhabiting the Bharmour region of Himachal Pradesh in the Indian western Himalaya.

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