Thunbergia kasajuana, a new species of Acanthaceae from Nepal

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Summary. A new species of *Thunbergia*, *T. kasajuana* Bh.Adhikari & J.R.I.Wood is described from central Nepal. It is most closely related to *T. grandiflora* Roxb., because of its reduced annular calyx and similar inflorescence structure but differs in the much smaller corolla, herbaceous habit and different ecology. A description, photographs and a key to the species of *Thunbergia* native to Nepal are provided.

Key Words. endemism, Himalaya, taxonomy.

Introduction

The genus *Thunbergia* Retz. comprises around 100 – 150 species (Borg *et al.* 2008; Vollesen 2008; Mabberley 2017) distributed through the tropical and subtropical regions of the Old World. It consists of erect or twining plants, although the native species of the Himalayas are all twiners. It is characterised by the presence of two large bracteoles enclosing the calyx and part of corolla tube, the reduced annular rim-like or shortly toothed calyx, and a woody capsule with a prominent beak. Several species are cultivated in tropical and temperate regions of the world because of their showy flowers, including *T. laurifolia* Lindl., which appears to be closely related to *T. grandiflora* Roxb. but is so far unrecorded from Nepal, *T. alata* Bojer ex Sims and *T. erecta* (Benth.) T. Anderson, both of which are known to be cultivated in Nepal. The only native species cultivated as an ornamental is *T. coccinea* Wall. ex D.Don.

The main centre of diversity of the genus is south and east Africa, 49 species being recorded in the *Flora of Tropical East Africa* (Vollesen 2008). It is less diverse in Asia with around 35 species recorded from SE Asia (Bremekamp 1955), 13 species (10 native) from India (Karthikeyan *et al.* 2009), six from China (Hu *et al.* 2011), five from Bhutan (Wood 2001) and 14 from Myanmar (Kress *et al.* 2003) of which 11 are native.

The five recognised native species from Nepal were described, discussed and illustrated by Adhikari *et al.* (2013). The commonest species is the very distinctive red-flowered *Thunbergia coccinea* (Fig. 1F) which is widely distributed in tropical and subtropical forest from 100 – 2100 m throughout Nepal. *Thunbergia fragrans* Roxb. (Fig. 1A, B), and *T. grandiflora* (Fig. 1D, E) are both commonly found in Tarai forest, and on the lower slopes of the Himalayas in central and

eastern Nepal. *Thunbergia lutea* T.Anderson is rare and known from only two localities in eastern Nepal but is easily distinguished from other species found in Nepal by its pinnately veined leaves. *Thunbergia nepalensis* Bh.Adhikari & J.R.I.Wood (Fig. 1C) is found at around 2100 m in two locations in western Nepal and is distinguished by its 5 – 7-toothed calyx, the teeth ovate-deltoid in shape. The discovery of *T. kasajuana* Bh.Adhikari & J.R.I.Wood by Saroj Kasaju in the Nagarkot region of central Nepal brings the total number of native *Thunbergia* species known from Nepal to six.

The most recent infrageneric classification of the genus by Bremekamp (1955) recognised seven subgenera to which one was added by Vollesen (2008). These subgenera are partially supported by molecular studies (Borg *et al.* 2008). The new species appears to belong to subgen. *Hexacentris* Benth. & Hook.f. emend. Bremek. to which *T. grandifolia* and *T. coccinea* also belong. It is a monophyletic, “rather well-defined group of woody climbers” (Borg *et al.* 2008) which can be recognised morphologically by its annular calyx and glandular corolla.

Materials and Methods

This paper is based on field studies by the first author in Nepal and by studies of specimens and literature by both authors. Specimens of *Thunbergia*, including the types, were examined at BM, E, K and KATH herbaria (herbarium codes follow Thiers, 2016 onwards). Published literature on the genus *Thunbergia* (Bremekamp 1955; Wood 2001; Vollesen 2008; Karthikeyan *et al.* 2009; Hu *et al.* 2011; Adhikari *et al.*

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Fig. 1. Selected species of *Thunbergia* found in Nepal. A, B *T. fragrans*; C *T. nepalensis*; D, E *T. grandiflora*; F *T. coccinea*. PHOTOS: A, B, D – F BHASKAR ADHIKARI; C H. IKEDA.

2013) was also checked. The specimens and photographs of the new species were compared with all known species of *Thunbergia* from adjacent regions. Particular attention was paid to species recorded from north east India and Myanmar, those from South

India pertaining to a different phytogeographical region. Of those listed by Karthikeyan *et al.* 2009, only two from northern India were unknown in Nepal and both of these, *T. leavis* Nees and *T. maculata* Lace were clearly related to *T. fragrans* and thus belonged to a

different subgenus of *Thunbergia*. Search through the Myanmar checklist (Kress *et al.* 2003) revealed two possible species said by their authors (Gamble 1913; W. W. Smith 2014) to belong to subgen. *Hexacentris*, although both were recorded far to the east of Nepal. Both are represented in the Kew herbarium; *T. lacei* Gamble has a dentate calyx so can be excluded from

consideration; *T. papilionacea* W.W.Sm. appears to be correctly placed in subgen. *Hexacentris* but differs from *T. kasajuana* in its subtomentose indumentum, densely hirsute ovary and presumed purple flowers.

The following key is a modified version of that provided by Adhikari *et al.* (2013) with the addition of the new species.

Key to native species of *Thunbergia* found in Nepal

1. Leaves pinnately-veined *T. lutea*
 Leaves palmately-veined 2
2. Corolla red or orange-red, flowers in many-flowered, long-pendulous, axillary or terminal racemes up to 45 cm in length *T. coccinea*
 Corolla white, bluish-white or yellowish white, flowers solitary or paired in the leaf axils and sometimes also in terminal racemes, but racemes < 20 cm long and at most weakly pendulous 3
3. Calyx annular, untoothed 4
 Calyx 5 – 17-toothed 5
4. Woody climber; corolla lobes 2.5 – 4 × 2 – 2.5 cm *T. grandiflora*
 Herbaceous climber, corolla lobes 0.5 – 0.8 × 0.5 – 1 cm *T. kasajuana*
5. Anthers muticous, corolla tube cylindrical *T. fragrans*
 Anthers spurred, corolla tube gradually widened from base *T. nepalensis*

Taxonomic Treatment

Thunbergia kasajuana Bh.Adhikari & J.R.I.Wood, sp. nov. Type: Nepal, Bhaktapur, Nagarkot, 2020 m, 6 Sept. 2018, S. Kasaju 133 (holotype KATH; isotype E).

<http://www.ipni.org/urn:lsid:ipni.org:names:77206325-1>

Herbaceous climber to 4 m. *Stem* angular, sulcate, hirsute, more densely so towards the nodes. *Leaves* petiolate, ovate or ovate-triangular, 5 – 9 × 3.5 – 6.5 cm, base cordate to hastate, apex acuminate, margin irregularly and shallowly dentate, palmately 5 – 7-veined, both surfaces sparsely strigose, more densely so towards the margin and veins; petioles 2 – 5 cm long. *Flowers* solitary in the leaf axils or in the axils of bracts, often aggregated into terminal racemes, racemes 3 – 12 cm long, pedicels 1 – 1.5 cm; bracts small, ovate, 5 – 10 × 2 – 4 mm, minutely pubescent; bracteoles green, ovate, 1.5 – 2 × 1 – 1.5 cm, apex mucronate, minutely pubescent, the pubescence denser at the margins; calyx annular, unlobed, 1.5 – 2 mm long in flower, accrescent to 3 mm in fruit; corolla white, the throat yellowish with pinkish veins, glabrous internally and externally, tube 2.5 – 3.5 cm, constricted at base for c. 0.5 cm then gradually widened to 1 cm at mouth, lobes obovate to rounded, 0.5 – 0.8 × 0.5 – 1 cm; filaments slightly unequal, shorter 8 – 10 mm, longer 9 – 12 mm, anthers bearded, spurred, the spur 2 – 3 mm, finely acuminate; ovary glabrous, style 2.5 – 3 cm, stigma bilobed, lobes subequal, upper folded inwards, lower spreading. *Capsule* glabrous or minutely pubescent, basal part 1 – 1.5 cm wide, beak 2 – 2.5 cm long; seeds 5 – 7 mm. Fig. 2.

RECOGNITION. Among Nepal species *Thunbergia kasajuana* is most similar to *T. grandiflora* in its inflorescence and calyx. In both *T. grandiflora* and *T. kasajuana* the calyx is annular and untoothed but *T. grandiflora* is a woody climber and has much larger corolla lobes (2.5 – 4 cm long, not 0.5 – 0.8 cm long as in *T. kasajuana*). Moreover, *T. grandiflora* is a lowland species with pale blue or whitish flowers found below 1300 m while *T. kasajuana* has pink tinged flowers and is found at around 2000 m.

Thunbergia kasajuana bears a superficial resemblance to *T. nepalensis* but is readily distinguished by its annular, untoothed calyx (5 – 7-toothed in *T. nepalensis*). Table 1.

DISTRIBUTION. Endemic to central Nepal.

SPECIMENS EXAMINED. NEPAL. Bhaktapur Distr., Nagarkot, 2020 m, fr., 12 Dec 2017, S. Kasaju 1010 (KATH); Bhaktapur Distr., Nagarkot, 2020 m, fl., 21 Aug. 2018, S. Kasaju 120 (KATH); Bhaktapur Distr., Nagarkot, 2020 m, fr. 23 Sept. 2018, B. Adhikari & S. Kasaju 111 (E, KATH); Bhaktapur, Nagarkot, 2020 m, 6 Sept. 2018, S. Kasaju 133 (holotype KATH; isotype E).

HABITAT. Mixed forest on south-west facing slopes in association with *Clematis montana* D.Don (Ranunculaceae), *Eriobotrya japonica* (Thunb.) Lindl. (Rosaceae), *Lindera pulcherrima* (Nees) Benth. ex Hook.f. (Lauraceae), *Myrica esculenta* Buch.-Ham. ex D. Don (Myricaceae), *Prunus cerasoides* D.Don (Rosaceae), *Pyrus pashia* Buch.-Ham. ex D.Don (Rosaceae), *Rhododendron arboreum* Sm. (Ericaceae), *Rubus* sp. (Rosaceae), *Symplocos* sp. (Symplocaceae) etc.

CONSERVATION STATUS. *Thunbergia kasajuana* is known from only 3 – 4 individuals in one population in

Fig. 2. *Thunbergia kasajuana*. **A** flowering branch; **B** flowering branch showing young capsule and bracteoles; **C** corolla, front view; **D** branch with leaves and inset of stem; **E** corolla, side view; **F** corolla opened out to show stamens and style; **G** filament; **H** style showing stigma (side view); **J** stigma (front view); **K** young fruit. PHOTOS: **A – J** SAROJ KASAJU; **K** BHASKAR ADHIKARI.

Bhaktapur district of Central Nepal. More extensive collections from similar habitats from subtropical and temperate regions of Nepal will be needed to confirm its conservation status but the forest where it is found is

reported to be still in good condition. Saroj Kasaju also reports having seen it on Shivapuri Hill near Kathmandu, but no specimens have been seen. It is accordingly categorised as Data Deficient according to the IUCN

Table 1. Characters differentiating *Thunbergia kasajuana*, *T. nepalensis*, *T. grandiflora* and *T. fragrans*

Character	<i>T. kasajuana</i>	<i>T. nepalensis</i>	<i>T. grandiflora</i>	<i>T. fragrans</i>
Habit	herbaceous twiner	herbaceous twiner	vigorous woody climber	herbaceous twiner
Calyx	annular	irregularly 5 – 7 toothed	annular	finely 12 – 16 toothed
Corolla lobes (cm)	0.5 – 0.8 × 0.5 – 1	1 – 1.5 × 0.8 – 1	2.5 – 4 × 2 – 2.5	1 – 2 × 1.5 – 2
Anthers	spurred	spurred	spurred	muticous
Stigma	bilobed, upper folded, lower spreading	bilobed, lobes subequal	bilobed, lobes subequal	unlobed
Altitude range (m)	c. 2000	c. 2100	200 – 1300	200 – 2000

Red List of Threatened Species (IUCN 2012), until more information about its distribution and the status of its population becomes available.

PHENOLOGY. This species flowers in August and September at the end of the wet monsoon season and has been found in fruit in September and December.

ETYMOLOGY. The specific epithet *kasajuana* honours Mr Saroj Kumar Kasaju, who first discovered and photographed the species. Mr Kasaju is a citizen scientist contributing to our understanding of the flora of Nepal by taking photos of plant species from Nepal and India. He was actively involved in the identification of this species.

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