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Two new additions to the flora of Vietnam

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Abstract

Among the studied specimens collected from Son Tra Nature Reserve, Vietnam, two new taxa: *Oxalis barrelieri* L. (Oxalidaceae) and *Glochidion acuminatum* var. *siamense* Airy Shaw (Phyllanthaceae) which forms new records to the flora of Vietnam. Taxonomic description, habitat, distribution and uses, and color photographs of both taxa are provided.

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Introduction

The genus *Oxalis* L. belonging to family Oxalidaceae consisting of over 800 species and is distributed in tropical and cold regions (1). Until now, three species and one variety of *Oxalis* have been recorded from Vietnam include *O. corniculata* L., *O. deppei* Lodd. ex Sweet, *O. acetosella* L. and *O. debilis* var. *corymbosa* (DC.) Lourteig (2).

Glochidion J. R. Forster & G. Forster is one of the large genera in the family Phyllanthaceae and is represented by more than 300 species in the Indo-Pacific, east to southeast Polynesia and south into Australia (3, 4). Currently, about 22 species of *Glochidion* are known to occur in Vietnam (2, 5).

During a floristic exploration trip to Son Tra Nature Reserve, Da Nang City of Vietnam, we

collected two unrecorded species of *Oxalis* and *Glochidion* in evergreen forest. After a detailed scrutiny of the literature and comparison of some species of genus *Oxalis* and *Glochidion*, they were identified as *Oxalis barrelieri* L. and *Glochidion acuminatum* var. *siamense* Airy Shaw. Hence, we report them as new records for the flora of Vietnam. A detailed description along with photographs, habitat, distribution and uses are provided.

Materials and Methods

The specimens collected from the field trip were preserved in the Herbarium of Institute of Tropical Biology (VNM) and the Herbarium of Son Tra Nature Reserve. We identified species by using the

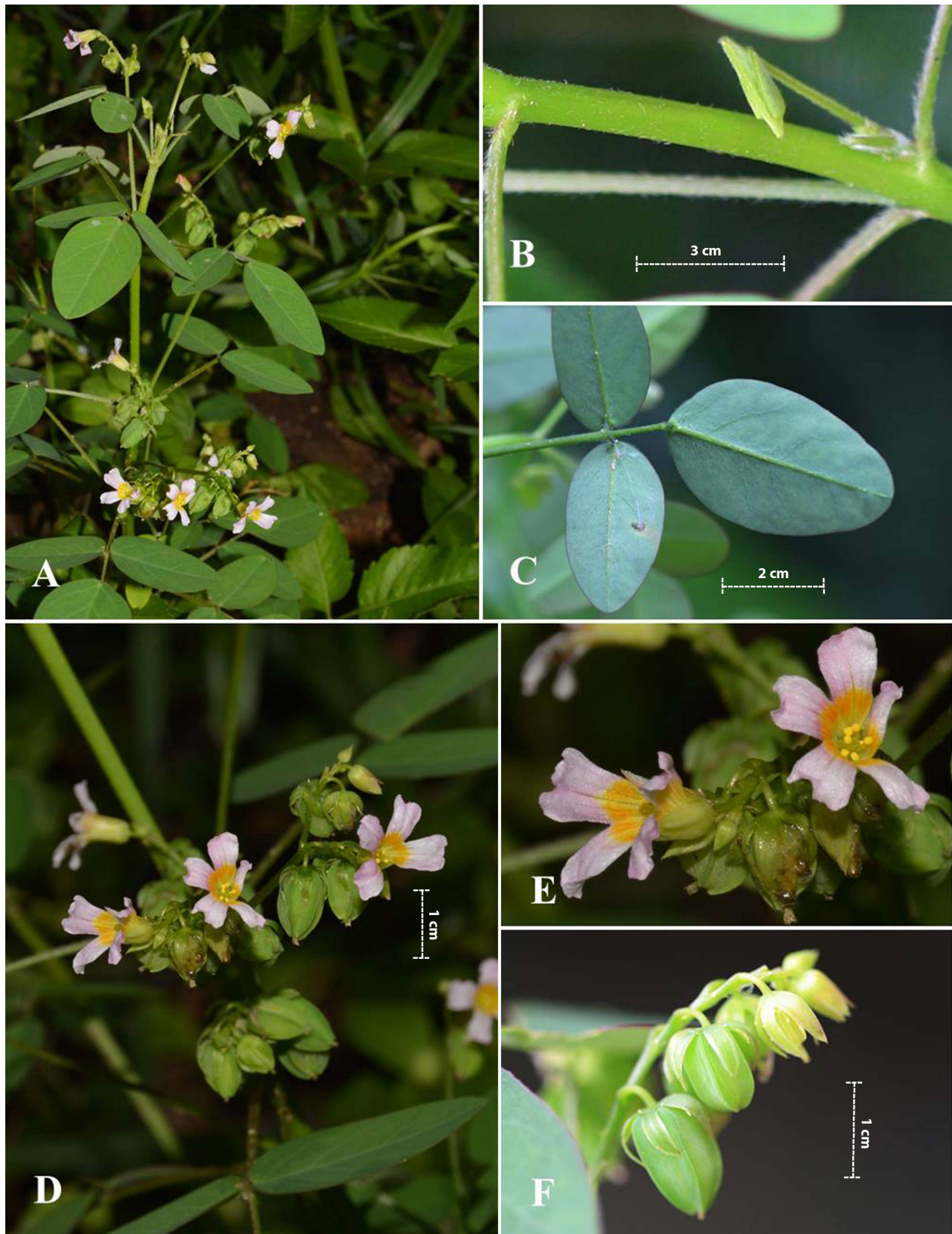


Fig. 1. *Oxalis barrelieri* L. (Ton et al. Q089): A. Habit, B. Internodes, C. Leaves pinnately 3-foliolate, D. Flowers and fruits, E. Flowers with the sepals and petals, F. Immature fruits.

following literature viz. Flora of Panama of *Oxalis* (1) and Flora of Thailand of *Glochidion* (6). The measurements and descriptions of floral characters were made from living plants and herbarium specimens. A Canon 1000D digital camera was used to take photographs of the material in the field.

Taxonomic treatments

1. *Oxalis barrelieri* L., Sp. Pl. ed. 2. 624. 1762 – *Acetosella barrelieri* (L.) Kuntze, Rev. Gen. Pl. 1: 90. 1891. – *Lotoxalis barrelieri* (L.) Small, N. Amer. Fl. 25(1): 49. 1907.

Erect herb, up to 1 m; stem green, pubescent. Leaves pinnately 3-foliolate,

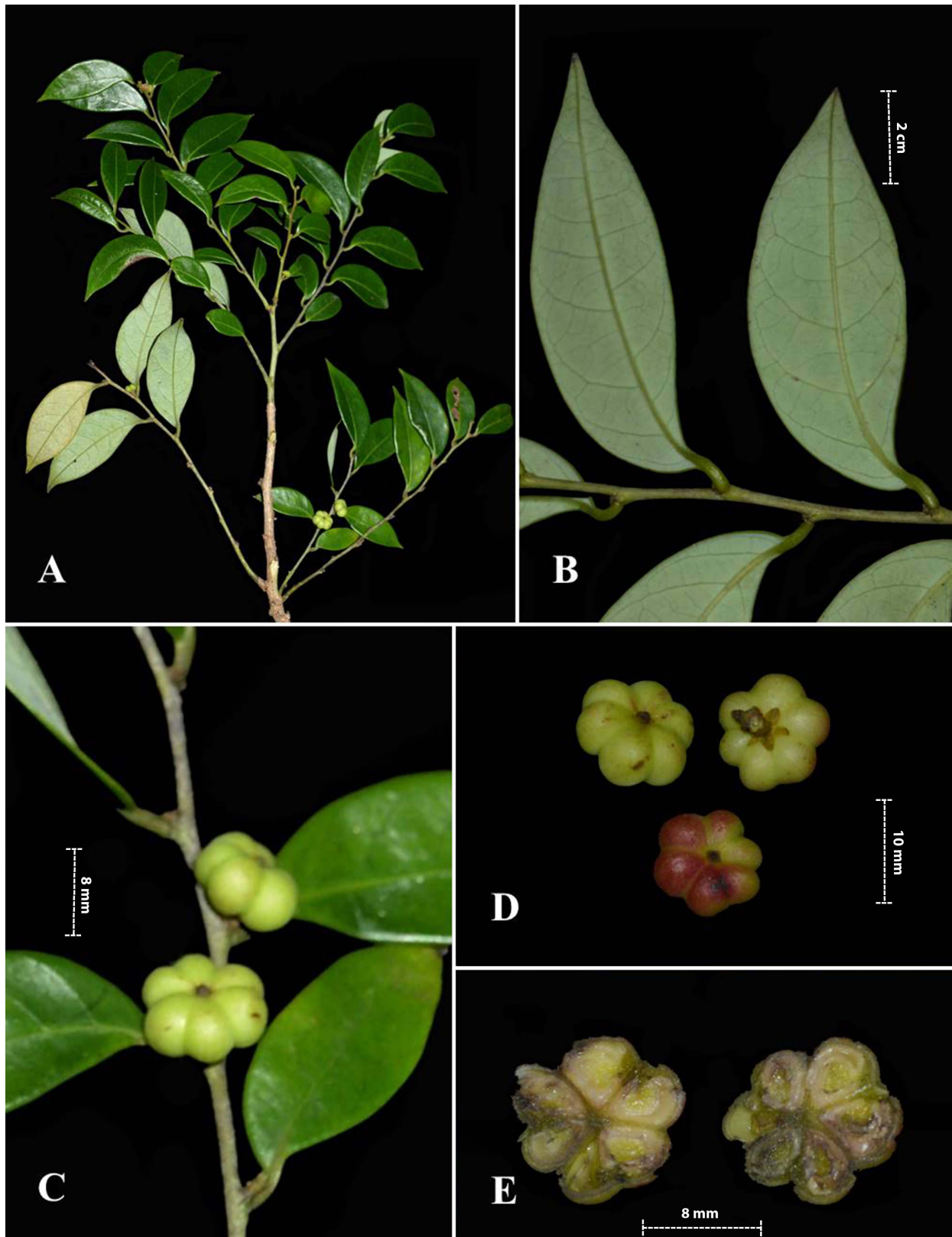


Fig. 2. *Glochidion acuminatum* var. *siamense* Airy Shaw (Ton *et al.* Q168): A. Branch, B. Abaxial surface of leaf, C. Branch with immature fruits, D. Immature fruits and ripe fruits. E. Transverse section of fruits.

exstipulate; leaflets sub-orbicular, oblong, ovate to elliptic, $0.8\text{--}5.5 \times 0.6\text{--}2.5$ cm, pubescent, base acute, roundish or subpeltate, margin entire, apex obtuse, seldom acute. Petioles 12–15 cm long; lateral petiolule 0.5–1 mm long, terminal petiolule 10–15 mm long. Inflorescence cymes, 4–10-flowered; peduncles 6–6.5 cm long, pubescent; bracts lanceolate or triangular, 1.5–2 mm long,

reddish, pilose; bracteoles smaller, appressed to the pedicel. Flowers with the sepals light green, $2\text{--}3.5 \times 1\text{--}1.5$ mm, ovate-lanceolate, acute, mucronate, pubescent, 3-nerved; petals white or yellowish at the throat and base, limb pink, obovate-lanceolate, apex rounded, $6\text{--}9 \times 2\text{--}3.5$ mm, glabrous; stamens 2–3 mm long, pubescent or glabrous; pistil 3–4 mm long, ovary ovoid,

glabrous. Capsule slightly ovoid, 4–10 × 3–3.5 mm, apex and base 5-lobed, glabrous. Seeds brownish, ovoid-compressed, 1–2 mm long (Fig. 1).

Flowering and fruiting: July–November.

Habitat: *Oxalis barrelieri* was found growing in evergreen forest on rocky slopes and roadsides in association with *Croton*, *Desmodium*, *Helicteres*, *Phyllanthus*, *Hedyotis* at elevations about 400–500 m.

Distribution: This species was found in tropical and subtropical America, cultivated and established in many places of the Old World. In Vietnam, it only occurs in Son Tra Nature Reserve, Da Nang City, Central Vietnam.

Uses: Leaves edible and the whole plant for the treatment of many diarrhoeal diseases.

Notes: *Oxalis barrelieri* can be distinguished from the other four species (*O. corniculata*, *O. deppei*, *O. acetosella* and *O. debilis* var. *corymbosa*) in Vietnam by leaf pinnately 3-foliolate, petals white or yellowish at the throat and base with the pink limb.

Specimens examined: Vietnam. Da Nang City, Son Tra Nature Reserve, on rocky slopes and roadsides in evergreen forest, 16°07'00"N, 108°16'49"E, ±450 m, 10 August 2017, Ton Nu Thi Nhu Quynh, Nguyen Nguyen, Dang Van Son, Q089 (VNM, and the herbarium of Son Tra Nature Reserve).

2. *Glochidion acuminatum* var. *siamense* Airy Shaw, Kew Bull. 26: 273. 1972; Welzen in Welzen *et al.*, Thai For. Bull. (Bot.) 28: 83. 2000; Welzen in Welzen & Chayam., Fl. Thailand 8, 2: 310. 2007; Phytotaxa 236(1): 5. 2015. – *Glochidion triandrum* var. *siamense* (Airy Shaw) P. T. Li, Acta Phytotax. Sin. 26: 62. 1988; P. T. Li & M. G. Gilbert, Fl. China 11: 197. 2008.

Shrubs or small trees, up to 6 m. Leaves alternate, thickly papery, ovate to elliptic, usually falcate, 4–13 × 1.5–4.5 cm, coriaceous, base asymmetric, oblique to cuneate, margin entire, apex acute to gradually cuspidate, densely pubescent abaxially. Petioles 3–5 mm long. Stipules triangular, 1.5–3 mm long, caducous. Inflorescences axillary, bracteate fascicles. Sepals greenish to light yellow, outer ones 2–3 × 1–1.5 mm, inner ones 1.5–2 × 0.5–1 mm, plicate, obovate, acute; stamens 3, 0.8–1.2 mm long, yellow, anthers 0.5–0.9 mm long; ovary 4 or 5-locular; stigmas 0.6–1 mm long, yellow. Capsules round, apically and basally flattened, depressed above, ca. 10 mm in diam., pedicels robust, very short. Seeds triangular, ca. 3–3.2 × 2–2.5 mm, reddish brown (Fig. 2).

Flowering and fruiting: May–October.

Habitat: The small population was found along the margin of evergreen forest, at ca. 400 m, in an area dominated by Fabaceae, Rubiaceae, Euphorbiaceae and Rutaceae.

Distribution: This variety is distributed in China, Thailand and Vietnam (new record).

Uses: Young shoots edible.

Notes: *Glochidion acuminatum* var. *siamense* is similar to *Glochidion acuminatum* var. *acuminatum*, but distinguished by thickly papery leaves which is densely pubescent abaxially, capsules up to 10 mm in diam. and robust and very short pedicels.

Specimens examined: Vietnam, Da Nang City, Son Tra Nature Reserve, along margin in evergreen forest, 16°05'01"N, 108°14'39"E, ± 400 m, 16 August 2017, Ton Nu Thi Nhu Quynh, Nguyen Nguyen, Dang Van Son, Q168 (VNM, and the herbarium of Son Tra Nature Reserve).

Competing interest

The authors declare that they have no competing interests.

Authors' contributions

All authors contributed equally to the work presented in this paper.

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