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Peliosanthes yunnanensis and *Trichosma yanshanensis* - New Additions to the Flora of Vietnam

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ABSTRACT: Two rare, poorly known species – *Peliosanthes yunnanensis* (Convallariaceae) and *Trichosma yanshanensis* (Orchidaceae) were recently discovered in Vietnam representing new additions to the flora of the country. Detailed information on taxonomy, types, morphology, ecology, distribution and studied voucher specimens, as well as illustrations are provided here for both species. Two necessary nomenclature combinations are also proposed, namely - *Trichosma chlorantha* (Aver. & Averyanova) Aver. and *T. yanshanensis* (S.-C. Chen) Aver.

KEY WORDS: Convallariacae, Flora of Vietnam, Orchidaceae, *Peliosanthes*, plant geography, taxonomy, *Trichosma*.

INTRODUCTION

Two rare, poorly known species – *Peliosanthes yunnanensis* (Convallariaceae) and *Trichosma yanshanensis* (Orchidaceae) were recently discovered in Vietnam. A number of specimens of both species were found among herbarium materials collected during last years in course of a number of field exploration programs and housed now at HN and LE Herbaria. These studied collections give important data on two significant additions new to the flora of Vietnam. Below follow short data on taxonomy, types, morphology, ecology and distribution of mentioned species accompanied with their illustrations.

TAXONOMIC TREATMENTS

Peliosanthes Andrews**,** 1808, Bot. Repos. 10, tab. 605. – *Bulbospermum* Blume, 1827, Enum. Pl. Javae 1: 15. – *Lourya* Baill., 1888, Bull. Mens. Soc. Linn. Paris 1: 743. – *Neolourya* L.Rodrig., 1934, Bull. Mus. Nat. Hist. Nat., ser.2, 6: 96.

Type species: *P. teta* Andrews.

The genus *Peliosanthes* along with closely related genera *Ophiopogon* Ker Gawl. and *Liriope* Herb. classified in the past as a members of Haemodoraceae, Liliaceae s.str., or Ophiopogonaceae now is placed into subfamily Ophiopogonoideae, tribe Ophiopogoneae of Convallariaceae family (Takhtajan, 2009). This family has certainly very important center of diversity in mainland southeastern Asia. About 16 species of *Peliosanthes* s.str. spread in southeast Asia from Nepal, NE. India, Bangladesh and S. China through Myanmar, Indochina and Malacca Peninsula to Indonesia with maximal concentration species in southern China and Indochina.

Only three species of the genus were surprisingly reported till now from Vietnam (Tanaka, 2004; Nguyen, 2005). These species are *Peliosanthes humilis* Andrews, *P. teta* Andrews and recently described *P. divaricatanthera* N. Tanaka. At the same time in neighbor countries, such as China and Laos are presently known seven and six species of the genus respectively (Chen and Tamura, 2000; Tanaka, 2004; Newman, et al., 2007). It is obvious that flora of Vietnam should certainly include more *Peliosanthes* species that was reported before. Our recent field explorations completely confirm this supposition resulting in discovery on the territory of Vietnam of *P. yunnanensis*, new species for the flora of the country. Short data on this species are presented below as follow.

Peliosanthes yannanensis F.-T.Wang & Tang**,** 1978, Fl. Sin. 15: 254; Chen Xinqi, Tamura, 2000, Fl. China, 24: 262. 雲南球子草 Figs. 1 & 2.

Described from southern China ("Yunnan: Ma-li-po ..."). Type ("*K.M. Feng … 12962*") – PE.

Perennial terrestrial herbs with short plagiotropic or inclined rhizomes to 4-8cm long, about 0.5 cm in diam., with numerous rigid semi-woody wiry roots. Stem erect, 1.5-3 cm tall, covered with loose broad papyraceous bracts. Leaves erect, petiolate; petiole rigid, 25-30 cm long, elliptic, 15-25 cm long, 3.5-6 cm wide, glabrous, apex distinctly attenuate, secondary transverse veins subperpendicular to numerous longitudinal nerves. Inflorescence a raceme, 5-15 cm tall; scape erect or ascending, rigid, 3-6 cm long, 2-3 mm in diam., naked or with 1 greenish scarious, cuneate, sterile bract, 6-12 mm long, 2-4 mm wide; rachis 3-9 cm long bearing 5-15 flowers. Floral bracts green to light greenish, scarious, cuneate or narrowly triangular, 5-8 mm long, 2-3 mm wide. Flowers solitary, articulated with short green

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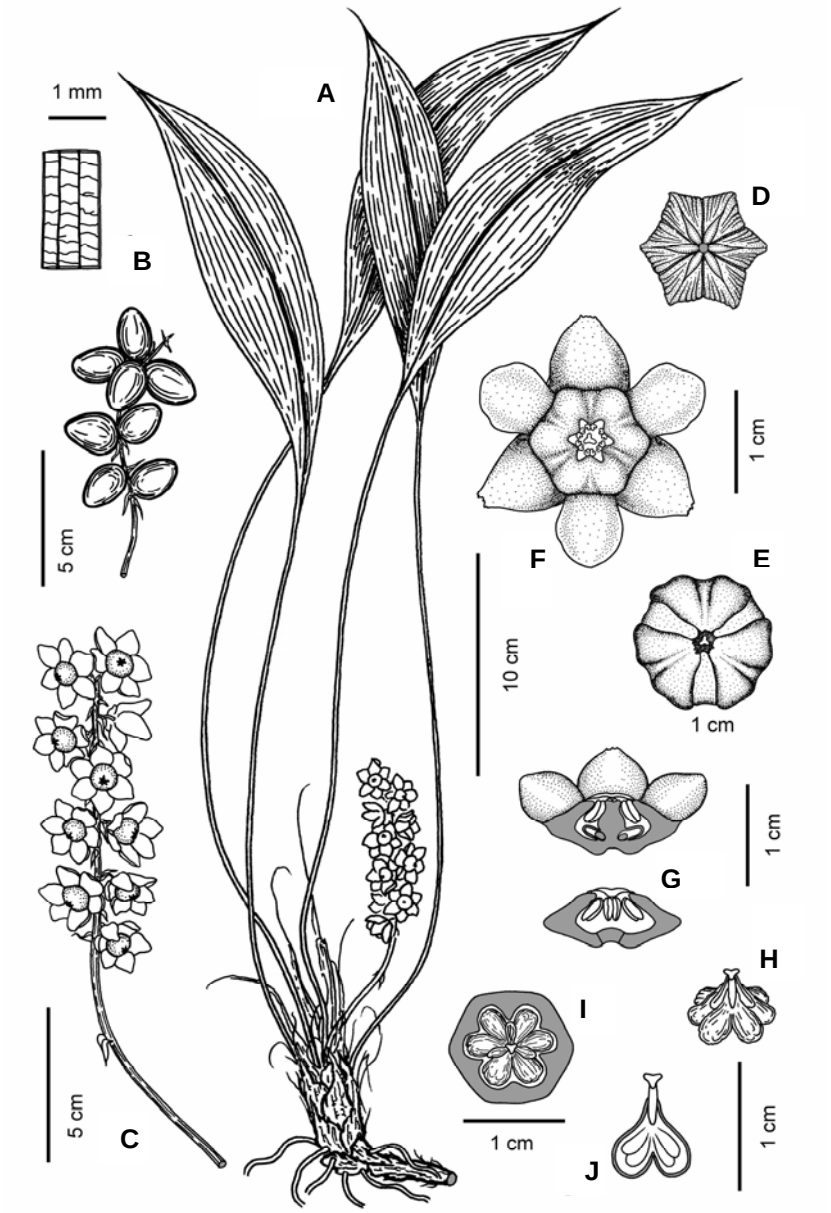


Fig. 1. *Peliosanthes yunnanensis*. A: Flowering plant. B: Marginal portion of leaf with transverse secondary veins. C: Inflorescence. D, E: Mature flower bud from bottom and from the top. F: Open flower. G: Sagittal section of the flower, with and without ovary, H: Ovary, side view. I, J: Ovary, transversal and sagittal sections (all drawn from specimen *HAL 10767*).

pedicel 2-3 mm long, dull pale yellow, widely opening or slightly campanulate, 2-2.5 cm across. Sepals almost triangular, 5-6 mm long, 6-7 mm wide at the base, finely irregularly denticulate at obtuse apex. Petals triangular-orbiculare, as long as sepals, 5-6 mm wide, almost rounded at the apex. Corona compressed, lens-shaped, 3-4 mm tall, 11-13 mm in diam., apical opening 6-dentate, 3-4 mm in diam. Anthers 6, introrse, oblong, about 3 mm long, subsessile, with filaments less than 0.5 mm long. Ovary superior, broadly conical, 3-4 m tall, 6-7 mm across at the base, 3-partite, with 1 locule in each part, each locule with 2 chambers, each containing 2 ovules; style short, conical, less than 2 mm tall, stigma 3-lobed, with small lobes. Seeds ovoid, drupe-like, 1.4-1.8 cm long, glossy, seed coat blue, juicy. (Figs. 1 & 2.).

Ecology: Primary and secondary evergreen broadleaved humid shady forest (sometimes with bamboo) on silicate soils at elevation 500-2,200 m a.s.l. Flowering November – December, fruiting December – January. Not common (LR).

Distribution: Vietnam (provinces: Lai Chau, Lao

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Fig. 2. *Peliosanthes yunnanensis*. Digital herbarium sheet of specimen *HAL 10767.*

Cai, Vinh Phuc). S. China (SE. Yunnan).

Examined specimens: Lai Chau, Phong Tho, *N.T. Hiep, L. Averyanov, P.K. Loc, P.V .The, N.T. Vinh, HAL 10767* (HN, LE), d-EXSICCATES OF VIETNAMESE FLORA *0089/HAL10767*; Lao Cai, *s. leg. 8483*, 21 January 1975 (LE); Vinh Phu, Tam Dao, *L.Averyanov et al., LX-VN 3967* (HN, LE).

Notes: This species probably are much more common in north and northwestern Vietnam than in southern China were it was reported till now only from two localities (Hekou and Malipo). Sometimes it was observed in Vietnam as significant component of herbaceous cover of forest floor. Species often forms large and dense populations, but individual plants in such populations develop flowers rarely hence plant is rather poorly presented in herbarium collections. In southeastern Yunnan this species was reported beginning from elevations as low as 200 m a.s.l. that was newer observed in Vietnam. Relatively large, long lasting flowers of *P. yunnanensis* are quite attractive, why plants may be used as easily cultivated, shade-tolerant ornamental plant.

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Trichosma Lindl.**,** 1842, Bot. Reg. 28, tab. 21. –*Eria* Lindl. sect. *Trichosma* Lindley, 1859, Journ. Linn. Soc. London (Bot.) 3: 52.

Type species: *Trichosma suavis*, nom. illeg. (=*T. coronaria* (Lindl.) Kuntze).

The genus *Trichosma* Lindl., s.str. includes four species distributed in mainland SE. Asia. One species – *T. coronaria* (Lindl.) Kuntze (=*Coelogyne coronaria* Lindl., *Trichosma suavis*, *Eria cylindropoda* Griffith, *E. medogensis* S.C. Chen & Z.H. Tsi) is widespread taxon occurring in Bhutan, Nepal, India, S. China, Thailand and Vietnam. Other two species – *T. simondii* Gagnep. (*Eria gagnepainii* Hawkes & Heller, *E. rubropunctata* Seidenf.) and *T. yanshanensis* (S.C. Chen) Aver. (*Eria yanshanensis* S.C. Chen) have much smaller areas spreading only in southern China and northern Vietnam. Whereas *T. simondii* is relatively common species of wet mountain forests on acidic silicate rocks, *T. yanshanensis* remains very rare and poorly known species of rather low rocky remnant limestone mountains and hills. Last species – ***Trichosma chlorantha*** (Aver. et Averyanova) Aver., *comb.nov.* (*Eria chlorantha* Aver. et Averyanova, 2006, Komarovia 4: 12, fig. 6) is local endemic of southern Vietnam (Ngoc Linh Mountains).

It is curiously to note that all mentioned *Trichosma* species were recently included into type section of the genus *Eria* (Pridgeon et al., 2005; Chen et al., 2009), with which they hardly have any close relation. In prevalent presently concept of newly splitting of *Eria* s.l. into a number of "old/new" genera, four mentioned species represent distinctly separate isolated clade much more desirable generic status than many others groups of the complex. Concept of generic rank for this group under *Trichosma* Lindl. name is accepted here following to bright obvious morphological specificity of these plants.

Trichosma yanshanensis listed below is very rare taxon actually known only by type specimens collected in 1939 in Yan Shan Mountains in southeastern Yunnan. In 1995 some plants of this species were also found in northern Vietnam in limestone areas of Cao Bang province allied to Chinese border. Since 15 years later, in 2010 few collected plants developed flowers under cultivation hence their undoubted verifiable identification become possible. Short taxonomic data, description and illustration for this rare species follow below.

Trichosma yanshanensis (S.C. Chen) Aver., *comb.nov.* 硯山毛蘭 Figs. 3 & 4.

Eria yanshanensis S.C. Chen, 1988, Acta Phytotax. Sin. 26, 3: 239, fig. 1, 2.

Described from southern Yunnan ("Yunnan: Yan Shan, Bar-garh, alt. 1,100 m, in dense woods, fruit green…").

Type ("15 November 1939, *C.W. Wang 84974*") – PE.

Epiphytic and lithophytic herbs. Pseudobulbs sympodial, densely clustered, forming with their bases plagiotropic rhizome, bearing thin wiry flexuose hairy roots. Erect part of pseudobulbs ascending, green to yellowish-green, cylindric, 1.5-4 cm long, 2-4 mm in diam., covered from the base with black disintegrating sheath, apically with 2 leaves. Leaves sessile or shortly petiolate, broadly oblanceolate to oblong lanceolate, 5-15 cm long, 0.7-2(-3) cm wide, fleshy and rigid, with prominent median veins, obtuse. Inflorescence terminal, erect, (6-)10-22 cm tall, with (3-)8-12 lax flowers. Floral bracts green, cuneate, 3-5(-7) mm long, 0.5-1 mm wide. Flowers white, glabrous, not widely opening. Pedicel green, filiform, 2-6 mm long; ovary green, conical, 5-8 mm long, 2-4 mm across at the apex. Dorsal sepal narrowly ovate to broadly lanceolate, 7-9 mm long, 2-2.5 mm wide, obtuse. Lateral sepals oblique-triangular, 8-10 mm long, 8-9 mm wide at the base, obtuse. Petals broadly lanceolate to lanceolate, as long as sepals, 1.5 mm wide, acute. Lip obovate, white, speckled with purple, attenuate at the base, 8-10 mm long, 5–7 mm wide, 3-lobed, with strongly curved basal claw 4-4.5 mm long; lateral lobes small ovate to almost orbicular; median lobe orbicular, 1.5-2 mm long, 3-4.5 mm wide, margin finely irregularly crenate or denticulate, with long dense purple papills in 3-5 longitudinal rows; disk at center with 2 small suborbicular purple keels. Column white, erect, 1.5-2 mm tall, with prominent fat lateral auricles at the apex. Column foot 5-6 mm long, 1-1.5 mm wide, white speckled with purple. Anther cap white, hemispherical, 1 mm across. Capsule obovoid, 5-8 mm long, 2-5 mm across. (Figs. 3, 4.)

Ecology: Epiphyte and lithophyte in shady primary and secondary broadleaved and coniferous forests on rocky limestone, particularly on tops of remnant highly eroded ridges at elevations 600-900 m a.s.l. Flowering June - July (under cultivation - October), fruiting September - October. Rare (VU).

Distribution: Vietnam (Cao Bang Province). S. China (S. and SE. Yunnan).

Examined specimens: Vietnam: Cao Bang, Tra Linh, *L. Averyanov, N.T. Hiep, D.D .Huyen CB 24* (HN, LE), *CB 25* (HN, LE); Cao Bang, Thach An, *L. Averyanov, N.Q. Binh, P.K. Loc, N.X. Tam, CBL 831* (HN, LE).

Notes: The plant in Vietnam usually was observed as epiphyte on old mossy trees, mostly on species of *Quercus* and *Lithocarpus*. Occasionally it was also found as lithophytic herbs on shady mossy rocky outcrops and on cliffs, usually of N exposition. In southern China the species was reported from elevations

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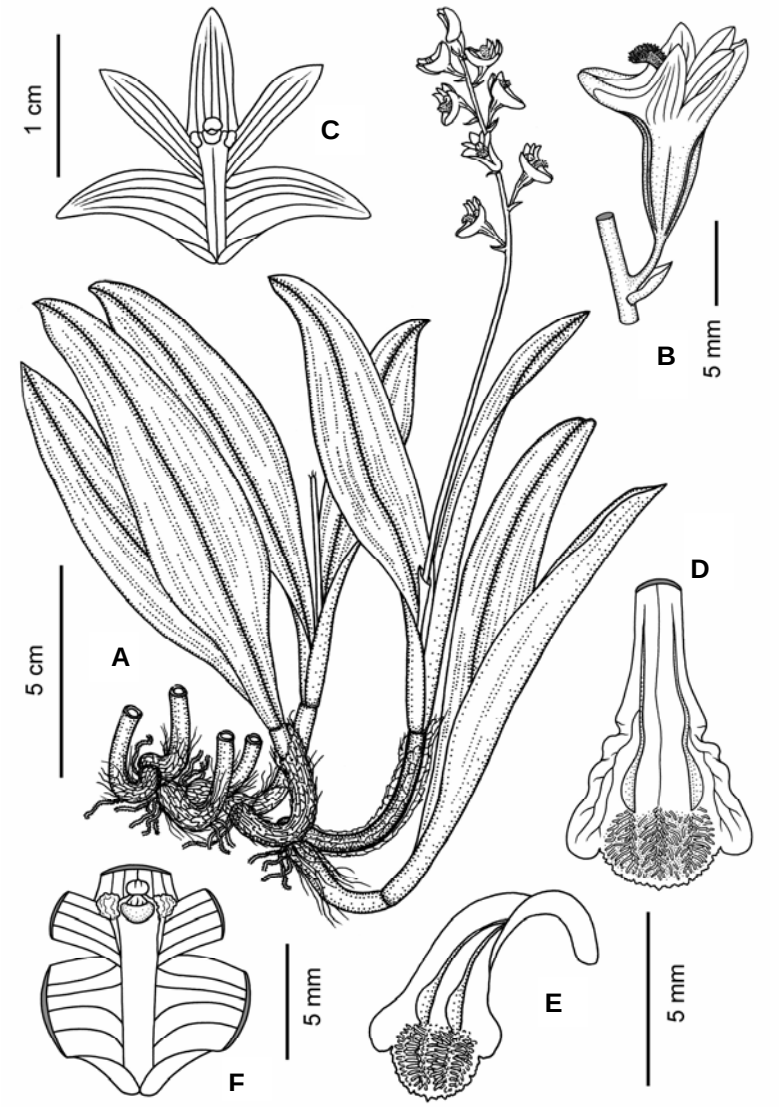


Fig. 3. *Trichosma yanshanensis*. A: Flowering plant. B: Flower. C: Flattened sepals and petals. D, E: Flattened lip and lip half-side view. F: Column, frontal view (all drawn from specimen *CB 25*).

about 1,100 m a.s.l. Plants of this and all other species of the genus always turning carbon-black when dried.

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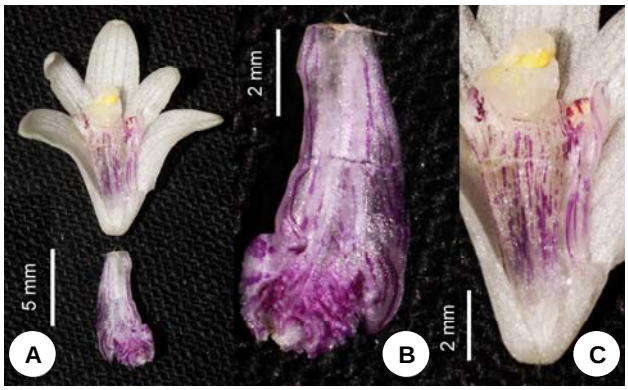


Fig. 4. *Trichosma yanshanensis*. Floral morphology: A: Flattened flower. B: Flattened lip. C: Column, anther and column foot.

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越南植物誌之新見 – 雲南球子草（*Peliosanthes yunnanensis*）及硯山毛蘭（*Trichosma yanshanensis*）

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摘要：兩種少有報導的稀有植物 – 雲南球子草（*Peliosanthes yunnanensis*）和硯山毛蘭（*Trichosma yanshanensis*）最近在越南被發現。本文除了報導此二種植物之分類、形態特徵、模式標本、生境、分布及繪圖外，亦特別說明此二物種：*Trichosma chlorantha* (Aver. & Averyanova) Aver. 及硯山毛蘭（*T. yanshanensis* (S.-C. Chen) Aver.）之新組合的命名。

關鍵詞：鈴蘭科（Convallariacae；百合科）、越南植物誌、蘭科、球子草屬、植物地理學、分類學、*Trichosma*。

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