



[4] *Lockia sonii*. a. flowering plant; b. inflorescence; c. flower; d. flower with removed lateral sepal and petal, side view; e. flattened sepals and petals; f. lip sagittal section, side view; g. flattened lip, with dissected basal part; h. lip, front view; i. column, lateral, frontal and dorsal views; j. anther cap, view from above and from below; k. pollinarium, ventral, dorsal and side views; m. leaf; n. leaf section in basal and apical portions. All drawn from the type (CPC 1140) by L. Averyanov and T. Maisak.

***Lockia* Aver., gen. nov.** (Subfam. Vandoideae, Trib. Vandae Lindl., Subtrib. Aeridinae Pfitz.).

TYPE *Lockia sonii* Aver.

Caulis erectus, simplex, ad 50 cm altus, usque ad apicem foliosus. Folia disticha, subulata, canaliculata, 15–20 cm longa. Inflorescentia axillaris, 6–10 cm longa, floribus in numero 6–12 dissitis, 1–1.2 cm in diametro, pallide roseis. Sepalum medium petalaeque obovata, 12–15 mm longa, apice rotunda. Sepala lateralia rhomboidea,

14–16 mm longa, obtusa. Labium carnosum, trilobatum, centro saccatum, lobo medio ovato, 6–7 mm longo, lobis lateralibus triangularibus, erectis, 3 mm longis. Columna cylindrica, 2 mm alta lataque. Pollinia solida, sphaerica, integra.

DESCRIPTION Monopodial epiphyte with stout, erect, unbranched, woody stem to 50 cm tall, 4–8 mm in diameter. Roots few, at the base of stem, rigid, wiry and flexuose. Stem at lower two thirds covered with densely appressed, overlapping,



[5–6] *Lockia sonii*. Flowering plant in its habitat (CPC 1140).

[7–8] Inflorescence of *L. sonii* (CPC 1140).

[9] Flowers of *L. sonii* (CPC 1140).



distichous, partially disintegrated, gray leaf sheaths, leafy and slightly twisted toward apical portion. Leaves distichous restricted to apical third of stem, very rigid, subulate, canaliculate, almost terete toward the apex, acute, straight or slightly recurved, 15–20 cm long, 5–8 mm wide, broadening at the base into a closed sheath enveloping the stem. Inflorescence a raceme; peduncle arising from leaf axil, erect, rigid, 3–4 cm long, bearing 1–2 short, broadly-triangular, obtuse sterile bracts; rachis rigid, 4–5 cm long, with 6–12 distant flowers. Floral bracts small, broadly triangular to broadly ovate, obtuse, 1–2 mm long and wide. Pedicel and ovary ridged or keeled, 1.2–1.6 cm long, strongly curved toward the apex. Flowers odorless, resupinate, shallowly campanulate, 1–1.2 cm across; sepals and petals light pink, free. Dorsal sepal and petals subsimilar, concave, obovate, 12–15 mm long, 7–9 mm wide, round at apex. Lateral sepals obliquely rhombic, concave, 14–16 mm long, 8–10 mm wide, obtuse. Lip not mobile, firmly attached to the column-foot, purple, fleshy, 3-lobed, deeply concave or saccate at the center; midlobe slightly convex, recurved, fleshy, rugose, ovate, 6–7 mm long, 5–6 mm wide, round or slightly emarginate at apex; side lobes rigid, triangular, erect, obtuse, about 3 mm tall and wide. Column light violet, shortly cylindric, about 2 mm tall and broad, truncate, with almost flat clinandrium and small 2-lobed rostellum, at front with round concave stigma. Column-foot short, less than 1 mm long. Operculum yellow, hemispheric, 1.8 mm in diam., 2-chambered inside, finely verrucose outside, frontally with a short, triangular, recurved beak rounded at apex. Pollinarium consisting of 2 pollinia, caudicles, stipe and viscidium. Pollinia solid, spherical, yellow, finely verrucose, entire but distinctly notched abaxially. Caudicles light yellow, very short. Stipe a simple elongate, slightly conduplicate lamina bent at the middle and broadening to the base. Viscidium a thin, flat, round disk, sometimes slightly emarginate in front. Fruit not seen.

ETYMOLOGY This monospecific genus is named in honor of the distinguished Vietnamese botanist and outstanding science manager Professor Phan Ke Loc.

***Lockia sonii* Aver., sp. nov.**

TYPE Son La Prov., Son La City, Chieng Co Municipality, around point 21°18'24"N 103°52'53"E. 20 Dec. 2010, *L. Averyanov, P.K. Loc, P.V. The, N.T. Vinh, CPC 1140* (Center for Plant Conservation Herbarium). Epitype: d-Exsiccates of Vietnamese Flora 0172/CPC 1140.

ECOLOGY Primary evergreen, dry, broad leaved forests on rocky, crystalline

limestone at elevations of approximately 2,600–3,000 feet above sea level (800–900 m). Epiphyte on old trees, on tops of ridges.

FLOWERING December–January. Very rare (EN=endangered plants in International Union for Conservation of Nature [IUCN] classification).

ETYMOLOGY The species is named after its discoverer and skilled orchid lover Mr. Nguyen Thanh Son.

DISTRIBUTION Northwestern Vietnam (Son La). Probably locally endemic with very restricted distribution.

NOTES Floral morphology taken by itself resembles a representative of the obscure genus *Penkimia* Phukan et Odyuo with its lone species *Penkimia nagalandensis* Phukan et Odyuo distributed in northeastern India and southwestern China (Phukan and Odyuo 2006; Chen Xinqi and Wood 2009). At the same time, our taxon's plant habit, form of the lip and particularly column structure differ strikingly. While *Penkimia* may be related to *Ascocentrum* Schltr. and *Holcoglossum* Schltr. (Phukan and Odyuo 2006; Chen Xinqi and Wood 2009), our novelty seems closer to such genera as *Luisia* Gaudich. and *Vanda* R.Br. As the described plant is not clearly accommodated in any known genus, we treat it now as a new-to-science distinct genus.

Meanwhile, vegetative and floral morphology of our plant in some aspects exhibit features that may be treated as transitional between *Luisia* and *Vanda*. This affords some speculative support to hybrid origin. At least seven species of *Vanda* (*V. alpina* [Lindl.] Lindl., *V. brunnea* Rchb. f., *V. concolor* Blume, *V. cristata* Lindl., *V. fuscoviridis* Lindl., *V. liouvillei* Finet, *V. pumila* Hook.f.) and six species of *Luisia* (*L. appressifolia* Aver., *L. antennifera* Blume, *L. morsei* Rolfe, *L. psyche* Rchb.f., *L. thailandica* Seidenf., *L. zollingeri* Rchb. f.) are known to occur in the area in which this new taxon was discovered. However all of these species are themselves fairly rare and only *V. brunnea*, *Luisia psyche* and *Luisia zollingeri* are relatively common in similar habitats. These three species (or their ancestors) may be theoretically regarded as parental taxa of our discovery however the formation of such natural hybrids is highly unlikely due to the disparate flowering seasons of potential parents. Should this hybrid-origin hypothesis be confirmed with further additional studies, our plant would then belong to the genus *Luisanda*; the name registered for the first artificial hybrid between *Luisia* and *Vanda* in 1952 (*Luisanda* hort. ex C.H. Curtis, 1952, *Orchid Review*, 60:180. It should



be noted that at the time, *Papilionanthe* species were considered *Vanda* species. The first *Luisanda* hybrid involving a true *Vanda* species did not appear until 1967.). At least 12 *Luisanda* hybrids (excluding hybrids with *Papilionanthe* species) (see Table 1 on page 366) and a great number of bigeneric hybrids with other genera of the Tribe Vandae have now been registered. Some hybrid forms among this diversity have some resemblance to our discovery. This is particularly true of hybrids between “pure” native species of *Luisia* and *Vanda*, like *Luisanda* Swissthai Vichai (*V. coerulea* Griff. × *L. psyche* Rchb.f.). This hybrid, for example, has flowers with a lip fairly similar to a *Lockia*. The same is

[10] Digital herbarium sheet: d-Exsiccates of Vietnamese Flora 0172/CPC 1140, epitype of *L. sonii*. (CPC 1140). Photograph and design by L. Averyanov.

true with regard to this hybrid's plant habit (<http://www.orchideen.ch/Bewertung/Archiv/v03-0305.htm#nr2324>) and further studies will be necessary to fully understand the nature of our very rare, unusual and surprising discovery.

Beside *L. sonii*, primary evergreen, broadleaf forests on remnant mountains composed of rocky, highly eroded limestone support a remarkably high level of diversity of native Indochinese orchids. The main dominant trees of such hills and montane

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[11a–f] Hypothetical probable ancestors or parents of *L. sonii* relatively common in the area of its habitat. a. *Luisia psyche*; b. *Luisia zollingeri*; c–f. different color variants of *Vanda brunnea* flowers.

Table 1. Hybrids of *Luisanda* (*Luisia* Gaudich. × *Vanda* R.Br.) registered at the Royal Horticulture Society International Register arranged in chronological order.

***Luisia* (seed plant) × *Vanda* (pollen plant)**

- L. Rippa* (*L. jonesii* × *V. coerulea*), T.P. Tan 1967
- L. Dianne* (*L. jonesii* × *V. Small Boy Leong*), James Kingham 1968
- L. Ladda Bird* (*L. brachystachys* × *V. testacea*), Y. Pramwuet 1976
- L. Doty* (*L. javanica* × *V. tessellata*), F. Bangerter 1980
- L. Minikin* (*L. tristis* × *V. lamellata*), J. Rumrill 1980
- L. Soetomo Soerohaldoko* (*L. javanica* × *V. lindenii*), M. Imelda 1986
- L. Swissthai Alania* (*L. recurva* × *V. coerulescens*), W. Bürki-Anuson, 2002

***Vanda* (seed plant) × *Luisia* (pollen plant)**

- L. Rumrill* (*V. coerulescens* × *L. tristis*), J. Rumrill 1973
- L. Mojave* (*V. stangeana* × *L. teres*), J. Rumrill 1977
- L. Sai Nam Phung* (*V. denisoniana* × *L. tristis*), Sai Nam Phung 1979
- L. Golden Gem* (*V. cristata* × *L. tristis*), D. Cannon 1982
- L. Swissthai Vichai* (*V. coerulescens* × *L. psyche*), W. Bürki-Anuson 2001

slopes regularly reach 65–80 feet (20–25 m) tall with canopy coverage of 80–100 percent. The most commonly observed trees here are *Allospondias lakonensis*, *Choerospondias axillaris* (Anacardiaceae), *Chukrasia tabularis* (Meliaceae), *Pometia pinnata* (Sapindaceae), and species of such genera as *Aglaia* (Meliaceae), *Cinnamomum* (Lauraceae), *Ficus* (Moraceae) and *Lithocarpus* (Fagaceae). All these trees give support to numerous epiphytic orchid species. Many smaller tree and shrub species form an understory, among the most common being *Deutzianthus tonkinensis*, *Sapium rotundifolium* (Euphorbiaceae), *Streblus macrophyllus* (Moraceae), *Podocarpus neriifolius* (Podocarpaceae) and representatives of such genera as *Alniphyllum* (Styracaceae), *Baccaurea* (Euphorbiaceae), *Polyalthia*, *Xylopia* (Annonaceae) and *Schefflera* (Araliaceae). Palms with giant leaves that easily reach several meters in length (*Arenga pinnata* and *Caryota* sp.) are also common here and at the forest floor sedges (species of *Carex* and *Scleria*), herbs (*Alpinia*, *Aspidistra*, *Ophio-*

pogon) and undershrubs (*Strobilanthes*, *Psychotria*) are commonly encountered.

The forests encountered on the tops of rocky limestone hills and mountains are much shorter and include in their canopy stratum a number of specific tree species that are not regularly encountered on the slopes. Among them are such species as *Myrsine kwangsiensis* (Myrsinaceae), *Pistacia weinmannifolia* (Anacardiaceae), *Platycarya strobilacea* (Juglandaceae), *Schefflera pes-avis* (Araliaceae), *Ulmus lanceifolia* (Ulmaceae) and some species of *Campylotropis* (Fabaceae), *Ficus* (Moraceae), *Quercus* (Fagaceae) and *Sinosideroxylon* (Sapotaceae). Epiphytes in such forests reach their greatest abundance and diversity. They may be observed and studied here much easier as trees on tops of these ridges do not exceed a few meters in height. Thickets of *Dracaena cochinchinensis* often add a very characteristic appearance to the rocky outcrops that are the habitat of *Lockia sonii*. Such plant communities are not restricted to the tops of ridges and similar communities sometime occur on very steep rocky hillsides, bluffs and cliffs of limestone ridges as well as the middle parts of mountain slopes.

Nonstrata vegetation is well represented in primary limestone woods and includes numerous lithophytic, epiphytic, lianas, creeping and climbing plant species, as well as numerous mosses and lichens. Among epiphytic, creeping, climbing and genuine vines are most of the usual species of such genera as *Pyrrosia* (Polypodiaceae), *Hoya*, *Dischidia* (Asclepiadaceae), *Smilax* (Smilacaceae), *Stemona* (Stemonaceae), *Vanilla* (Orchidaceae), *Clematis* (Ranunculaceae) and even a few species of the pumpkin family (Cucurbitaceae). However, epiphytes and lithophytes are always most numerous and diverse in truly intact forests. As a rule this group includes great numbers of herbaceous species from such families as Begoniaceae, Gesneriaceae, Urticaceae, Araceae and Acanthaceae, but orchids and ferns absolutely dominate.

More than 500 orchid species can be commonly observed along the tops of these rocky limestone ridges. Orchid species observed to be the most commonly encountered companions in the area in which *L. sonii* was found are in Table 2.

Some very rare orchids previously known only on the basis of few or single collections were also found during our field exploration work. The discovery of some of them represents new additions to the flora of Vietnam and even some species new to science (see Table 3).

The most remarkable species in this

Table 2. *Lockia sonii* and its companion orchid species.

<i>Acampe rigida</i>	<i>Dendrobium amplum</i>	<i>Monomeria gymnopus</i>
<i>Bulbophyllum ambrosia</i>	<i>Dendrobium heterocarpum</i>	<i>Oberonia cavaleriei</i>
<i>Bulbophyllum apodum</i>	<i>Dendrobium loddigesii</i>	<i>Oberonia ensiformis</i>
<i>Bulbophyllum gymnopus</i>	<i>Eria carinata</i>	<i>Panisea tricallosa</i>
<i>Callostylis rigida</i>	<i>Eria coronaria</i>	<i>Paphiopedilum dianthum</i>
<i>Ceratostylis himalaica</i>	<i>Eria pannea</i>	<i>Pholidota leveilleana</i>
<i>Cleisostoma filiforme</i>	<i>Mycaranthes pannea</i>	<i>Pholidota pallida</i>
<i>Cleisostoma striatum</i>	<i>Liparis mannii</i>	<i>Sunipia scariosa</i>
<i>Coelogyne fimbriata</i>	<i>Liparis viridiflora</i>	<i>Thrixspermum calceolus</i>
<i>Coelogyne ovalis</i>	<i>Luisia zollingeri</i>	<i>Vanda brunnea</i>
<i>Dendrobium angustifolium</i>	<i>Monomeria barbata</i>	

Table 3. New additions to the flora of Vietnam, including some species new to science.

<i>Anoectochilus calcareous</i>	<i>Dendrobium longicornu</i>	<i>Paphiopedilum malipoense</i>
<i>Bulbophyllum gymnopus</i>	<i>Dendrobium moniliforme</i>	<i>Porpax elwesii</i>
<i>Bulbophyllum lockii</i>	<i>Dendrobium nobile</i>	<i>Schoenorchis fragrans</i>
<i>Callostylis bambusifolia</i>	<i>Dendrobium porphyrochilum</i>	<i>Schoenorchis scolopendria</i>
<i>Cheirostylis latilabris</i>	<i>Dendrobium senile</i>	<i>Sunipia andersonii</i>
<i>Coelogyne assamica</i>	<i>Eria bambusifolia</i>	<i>Taeniophyllum glandulosum</i>
<i>Coelogyne micrantha</i>	<i>Eriodes barbata</i>	<i>Vanda brunnea</i>
<i>Coelogyne ovalis</i>	<i>Monomeria gymnopus</i>	
<i>Cymbidium cyperifolium</i>	<i>Paphiopedilum barbigerum</i>	
<i>Cymbidium eburneum</i>	var. <i>coccineum</i> (= <i>barbig-</i> erum var. <i>barbigerum</i>)	

group of orchids belongs to the genus *Schoenorchis* Blume. This orchid certainly represents a new, as yet undescribed species, and we describe it here as *Schoenorchis scolopendria* Aver., sp. nov.