

***Nervilia kasiensis* (Orchidaceae), A NEW RECORD
FOR THE FLORA OF VIETNAM**

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ABSTRACT

Nervilia kasiensis is reported here as a new record for the flora of Vietnam. It is illustrated with detailed photographs made in the field. A key for the identification of all species of *Nervilia* genus known in Vietnam is presented.

Keywords: Lam Dong province, orchids, plant diversity, southern Vietnam.

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INTRODUCTION

The genus *Nervilia* Commerson ex Gaudichaud (1829: 42) is characterized by having a prominent fan-shaped venation of leaves and hysteroanthous annual flowering (Pridgeon et al., 2005). This genus comprised approximately 80 species (www.plantsoftheworldonline.org), distributed from tropical, subtropical and warm temperate regions of Africa, Asia, Australia, to the southwest Pacific islands (Govaert et al., 2017). Of these, eleven species are known from Thailand (Gale & Watthana, 2014; Gale & Phaxaysombath, 2017), nine from China (Chen et al., 2009), and five from Laos (Schuiteman et al., 2008; Gale et al., 2016).

Due to the fugacious leafless flowering, species of the genus are often overlooked in the field surveys, and not well presented in herbaria. The genus *Nervilia* continues to grow with the addition of at least one new species every year during the last decade (Averyanov, 2011a, b; Gale et al., 2016; Gale & Phaxaysombath, 2017; Tang et al., 2018; Hsu, 2020; Averyanov et al., 2020). The recent discoveries of new species of *Nervilia* genus in Indochina show that this area has certain potentials for the finding here of other novelties belonging to this genus.

During our field surveys in the Da Lat Town area in southern Vietnam, we came across an unusual specimen of *Nervilia*, which after critical studies of the relevant literature and herbarium specimens, was identified as *Nervilia kasiensis* S.W.Gale & Phaxays., a taxon never reported from Vietnam. Before this report, only ten species of *Nervilia* genus were recorded from Vietnam (Pham Hoang, 1999; Averyanov, 2011a, b; Chen et al., 2009; Hsu,

2020; Averyanov et al., 2020). The present report brings the total number of the species of *Nervilia* genus in Vietnam to eleven.

MATERIALS AND METHODS

Samples of the newly recorded species were collected in the Da Lat Town area of the Lam Dong province in Vietnam during 2013. Specimens were processed using the methods of Jain & Rao (1977) and deposited in the Herbarium of Tay Nguyen Institute for Scientific Research. Photographs of the taxonomically important plant organs were taken from the fresh materials in the field. Species identification was based on morphological characters reported by Pham Hoang (1999), Chen (2009), Averyanov (2011), and Gale et al. (2016, 2017). The morphological features of discovered samples were compared with herbarium specimens stored in herbaria of the Institute of Ecology and Biological Resources, the Institute of Tropical Biology, as well as with digital images available in databases of the Muséum National d'Histoire Naturelle (<https://science.mnhn.fr/>), the Chinese Virtual Herbarium (<http://www.cvh.ac.cn/>), Royal Botanic Gardens Kew (<http://apps.kew.org/>), JSTOR Global Plants (<https://plants.jstor.org/>), and the Herbarium of Vascular Plants of the Komarov Botanical Institute of the Russian Academy of Sciences (<http://en.herbariumle.ru/>).

RESULTS

Key to the species of *Nervilia* genus in Vietnam

(Based on Pham Hoang, 1999; Chen, 2009; Averyanov, 2011a, b; Gale et al., 2016, 2017; Hsu, 2020; Averyanov et al., 2020 and the authors' field observations).

- 1a. Flowering plant has fully developed leaves*N. marutana*
- 1b. Flowering plant has no leaves, plant forms leaves after flowering (leaves completely die before the next flower formation)2
- 2a. Leaf blade pubescent3
- 2b. Leaf blade glabrous4

- 3a. Inflorescence 1-flowered; flowers erect; leaf blade cordate or polygonal ...*N. crociformis*
3b. Inflorescence normally 2-flowered; flowers nodding; leaf blade orbicular-cordate
.....*N. plicata*
4a. Inflorescence 1-flowered5
4b. Inflorescence with 2 or more flowers7
5a. Leaves broadly cordate-reniform, with 9 veins*N. mekongensis*
5b. Leaves broadly cordate-ovate, with more than 10 veins6
6a. Petals pale green with purplish venation; floral bracts linear; disk densely villous
especially toward apex*N. fordii*
6b. Petals yellowish green; floral bracts narrowly lanceolate; disk villous mainly along veins
.....*N. concolor*
7a. Flowers erect8
7b. Flowers nodding10
8a. Flowers widely opening*N. infundibulifolia*
8b. Flowers not widely opening9
9a. Sepals and petals similar, lanceolate, yellowish-brown to greenish-brown, with purple-
brown streaks and flecks*N. gracilis*
9b. Sepals and petals subsimilar, broadly lanceolate or narrowly elliptic, uniformly pale
olive greenish*N. appressifolia*
10a. Flowers widely opening; sepals and petals subsimilar, uniformly yellowish green
.....*N. pubilabia*
10b. Flowers not widely opening; sepals and petals similar, outer surfaces cream-beige with
irregular pink-violet flecks, glossy white inside*N. kasiensis*

The description of the newly recorded species

Nervilia kasiensis S. W. Gale & Phaxays., 2017, *Blumea* 62: 1–5 (Fig. 1).

Type: LAOS, herbarium specimen prepared from cultivated plant in 11 March 2016 by Gale & Phaxaysombath, HNL-KFBG 537b (holotype HNL).

Paratype: LAOS, Vientiane Province, Kasi District, Khoun Lang Cave, 29 November 2015, Gale & Phaxaysombath, HNL-KFBG 537a (HNL).

Description: Terrestrial herbs, inflorescence 5–12 cm long. Tubers light yellowish to white, ovoid to globose, 1–1.5 mm in diam., 3–4-noded. Leaf blade cordate-polygonal, 11–12.5 cm long, 10–11 cm wide, deeply cordate, acute, 7-veined, glabrous. Inflorescence 5–12 cm long, 1-

flowered; peduncle greenish brown with pink-violet flecks, with 2–3 tubular sheaths; sheaths 1.5–2 cm long, brown, acute; floral bract elliptic, 4.5–5 mm long, greenish brown, acute. Flower, nodding, not widely opening, 15–20 mm in diam.; pedicel and ovary brown to greenish brown with pink-violet flecks, 3–5 mm long. Sepals and petals similar, elliptic-lanceolate, 15–20 mm long, 2.5–4 mm wide, brown to greenish brown with purple flecks, attenuate; lip narrowly obovate-spatulate, 15–20 mm long, white with pink-violet flecks and blotches; hypochile oblong, 10–12 mm long; epichile narrowly ovate, 8–9 mm long. Column white, slender, 0.8–1 cm long; pollinia enclosed behind the stigma, 2.4–2.6 mm long; stigma shield-shaped. Flowers in March.



Figure 1. The species *Nervilia kasinensis*. A. Habitat; B. Leaf in natural habitat; C. Flattened flowering plant; D. Flower, view from above; E. Flower with recurved median sepal; F. Dorsal sepal and petals; G. Lateral sepals; H. Side view of the ovary, column and labellum; I. Frontal view of labellum; J. Pollinarium [Photos by Nong Van Duy]

Distribution and ecology: *N. kasiensis* grows in the understory with deep soils rich in humus, along streams under the canopy of the evergreen broad-leaved forest, at an elevation of about 1315 m a.s.l. In Vietnam, it is recorded only from the Da Lat Town area of Lam Dong province in southern Vietnam. However, its occurrence in similar habitats elsewhere in Vietnam is not unlikely.

Specimens examined: VIETNAM, Lam Dong province, Da Lat Town area, around point 12°55'59" N 108°23'01" E, 1315 m a.s.l., 22 April 2020, *Nong Van Duy* (VTN 1445); *Vu Kim Cong*, VTN 1700. LAOS, Luang Prabang province, Pon Xay District, Nam Bo Village, around point 19°57'23.5"N, 102°26'16.4"E, 650–750 m a.s.l., 6 April 2017, L. Averyanov et al, *LA-VN 2173* (LE01074047 <http://en.herbariumle.ru/?t=occ&id=44406>, LE 01074051 <http://en.herbariumle.ru/?t=occ&id=44410>, LE 01074052 <http://en.herbariumle.ru/?t=occ&id=44411>, LE 01090147 <http://en.herbariumle.ru/?t=occ&id=75941>).

Conservation status: A small population with less than 200 mature individuals was found. It is expected that more populations may be found in similar forests. However, the ongoing destruction of primary moist broad-leaved forest in southern Vietnam posing a considerable threat due to habitat loss. This species is also reported from two locations in Laos. The current conservation status of this species in IUCN terms and categories may be estimated provisionally as Data Deficient (IUCN, 2019).

Note: *Nervilia kasiensis* is similar to *Nervilia muratana* by its leaf shape, deeply cordate base, acute apex, and 1-flowered inflorescence. However, *N. kasiensis* is distinguished from *N. muratana* by elliptic-lanceolate, brown to greenish brown sepals (vs. sepals linear-lanceolate, white), lip obovate-spatulate, 15–20 mm long (vs. lip ovate-triangular, ca. 12 mm long).

CONCLUSION

The occurrence of species *N. kasiensis* in Vietnam is not surprising as both Vietnam and

Laos have similar climates, vegetation and other natural conditions typical for the type location of this species.

This report brings the total number of known the species of *Nervilia* genus in Vietnam to 11.

REFERENCES

- Averyanov L. V., 2011a. *Nervilia gracilis* – A new orchid species from northern Vietnam. *Taiwania* 56(1): 50–53. [https://doi.org/10.6165/tai.2011.56\(1\).50](https://doi.org/10.6165/tai.2011.56(1).50)
- Averyanov L. V., 2011b. The orchids of Vietnam illustrated survey. Part 3. Subfamily Epidendroideae. *Turczaninowia* 14(2): 15–100.
- Averyanov L. V., Truong B. V., Nguyen V. C., Maisak T. V., Dinh Q. H., Nuraliev M. S., Nguyen K. S., Chu V. T., 2020. New Orchids in the Flora of Vietnam III (Collabieae, Malaxideae, Nervilieae and Orchideae). *Taiwania* 65(4): 478–492. <https://doi.org/10.6165/tai.2020.65.478>
- Chen S. C. & Gale S. W., 2009. *Nervilia Commerson ex Gaudichaud*. In: Wu, Z. Y., Raven, P. H. & Hong, D. Y. (Eds.) *Flora of China*. Vol. 25. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis: 197–201.
- Gale S. W., Schuiteman A., Watthana S., Sando T., Souvannakhommane K., Averyanov L. V & Suddee S., 2016. Studies in Asian *Nervilia* (Nervilieae, Epidendroideae, Orchidaceae) VI: *N. mekongensis*, a new species from Thailand, Cambodia, Laos and Vietnam. *Phytotaxa* 247 (4): 267–273. <https://doi.org/10.11646/phytotaxa.247.4.4>
- Gale S. W. & Phaxaysombath T., 2017. Studies in Asian *Nervilia* (Orchidaceae) VII: *Nervilia kasiensis*, a new Lao endemic. *Blumea* 62: 1–5. <https://doi.org/10.3767/000651917X694732>
- Gale S. W., Rueangruea S. & Suddee S., 2014. Studies in Asian *Nervilia* (Nervilieae, Epidendroideae, Orchidaceae) IV: *N. umphangensis*, a new species from the Thailand-Myanmar border. *Phytotaxa*

- 166: 139–144. <https://doi.org/10.11646/phytotaxa.166.2.5>
- Govaerts R., Campacci M. A., Baptista D. H., Cribb P. J., George A., Kreutz K. & Wood J. J., 2017. *World checklist of Orchidaceae*. The Board of Trustees of the Royal Botanic Gardens, Kew. <http://apps.kew.org/wcsp/Retrieved>
- Hsu T. C, Chen C. W, Hung H., Nguyen K. T. T, Truong Q. C, Luu H. T, Li. C. W, 2020. New and noteworthy orchids (Orchidaceae) discovered in Langbiang Plateau, southern Vietnam. *Taiwania*, 65(2): 237–248. <https://doi.org/10.6165/tai.2020.65.237>
- IUCN, 2019. *Guidelines for using the IUCN red list categories and criteria, version 14*. Retrieved January 6, 2021. <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>
- Jain S. K. & Rao R. R., 1977. *A Handbook of Field and Herbarium Methods*. Today and Tomorrow Printers and Publishers, New Delhi, pp. 150.
- Pham Hoang H., 1999. Orchidaceae. In: Pham-Hoang, H. (Ed.) *An Illustrated Flora of Vietnam*, vol. 3. Youth Publishing House, Ho Chi Minh City: 793-794 (in Vietnamese with English summary).
- Pridgeon A. M., Cribb P. J., Chase M. W. & Rasmussen F. N., 2005. *Nervilia*. In: *Genera orchidacearum, vol. 4, Epidendroideae (part one)*. Oxford University Press, Oxford, pp. 696.
- Schuiteman A., Bonnet P., Svengsuksa B., Barthélemy D., 2008. An annotated checklist of the Orchidaceae of Laos. *Nordic Journal of Botany* 26: 257–316. <https://doi.org/10.1111/j.1756-1051.2008.00265.x>
- Tang F. X., Li J. W., Pan B., Wu X. F., Luo Y. & Liu Q., 2018. New and Newly Record Orchids of *Nervilia* (Nervilieae, Epidendroideae, Orchidaceae) in China. *Phytotaxa* 379 (2): 162–168. <https://doi.org/10.11646/phytotaxa.379.2.4>