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NOTE

Notes on *Adiantum juxtapositum* (Adiantaceae) and *Abrodictyum pluma* (Hymenophyllaceae) for the Fern Flora of Vietnam

Pham Van The[1*], Leonid Averyanov[2] and Phan Ke Loc[3]

1. Department of Plant Resources , Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, No. 18 Hoang Quoc Viet Road, Cau Giay, Hanoi, Vietnam.
2. Komarov Botanical Institute, Russian Academy of Science, St. Petersburg. Prof. Papov Srt. 2, Russia, 197376. Email: av_leonid@mail.ru; av_leonid@yahoo.com
3. Department of Botany, Faculty of Biology, Hanoi University of Science, No. 334 Nguyen Trai Road, Thanh Xuan, Hanoi, Vietnam. Email: pkeloc@yahoo.com
** Corresponding author. Email: phamvthe@gmail.com*

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ABSTRACT: New original data on ecology and distribution of two rare ferns - *Adiantum juxtapositum* (Adiantaceae) and *Abrodictyum pluma* (Hymenophyllaceae) in Vietnam are provided. Detailed descriptions, illustrations and relevant taxonomic notes are also presented for both studied taxa.

KEY WORDS: *Adiantum juxtapositum, Abrodictyum pluma*, ferns, flora of Vietnam.

INTRODUCTION

The first taxonomical treatment of Vietnamese ferns was published by M.L.Tardieu-Blot and C.Christensen during 1939–1951. It included 587 species, from 116 genera and 14 families. A half century later, Pham Hoang Ho (1991) enumerated and illustrated 633 species in 137 genera and 27 families. Most modern review of ferns in the flora of Vietnam published by Prof. Phan Ke Loc (2010) reported 717 species placed into 135 genera and 28 families according to Smith (2006) classification. Both species studied in this paper were not mentioned in the first and second accounts, but were included into last checklist (Phan, 2010). Meanwhile, any data about mentioned species localities, ecology, habitats, herbarium voucher material and morphological features were never been provided. Hence, we report here some factual data on these rare plants obtained from our personal field observations in Vietnam.

The genus *Adiantum* L. includes 150–200 species spreading all over the worls except cold and temperate polar areas (Mabberley, 2008). Modern fern taxonomists include Adiantum into family Pteridaceae (Smith, 2006) or segregate it into its "own" family - Adiantaceae (Lin, 1990). Fifteen species are reported presently in the flora of Vietnam by available publications (Pham, 1991; Phan, 2010).

Unusual samples of *Adiantum* were discovered during field trip in Huu Lien natural reserve of Lang Son province in northern Vietnam in 2009. We found no any similar herbarium specimens in largest available *Adiantum* collections stored in Vietnamese Herbaria (HN, HNU, VNM). Meanwhile, collected specimens were later identified as *A. juxtapositum* Ching (species, described from southeastern China) in the course of laboratory analysis and studies of relevant literature. *Adiantum juxtapositum* distinctly differs from its closes congener - *A. gingkoides* C.Chr., recorded in Indochina in longer stipe, in smaller blade and in smaller, more numerous pinnae having shorter stalk (see Table 1). These and other morphological characters fit well with description of *A. juxtapositum* regarded before as a local endermic found beside type habitat in Fujian in a few localities in Guangxi (X.C. Zhang, pers. comm.).

TAXONOMIC TREATMENT

Adiantum juxtapositum Ching, 1957, Acta Phytotax. Sin. 6, 4: 312.

Fig. 1A–D, 2A–F

Described from southeastern China ("Fukien: Shia-hsia-ling, on the border of southern Chekiang Province"). **Type (**Fujian, Shiaxialing, Aug. 1953, *P.S. Chiu 28*) - ?

Clustering lithophyte. Rhizome rigid, short, creeping to erect, covered with brown-black lanceolate scales toward apex. Fronds numerous, suberect to pendulous, rather leathery, glabrous, adaxially grassy-green, abaxially glaucous; stipes and rachis glossy, dark brown to almost black, (2) 4–13 cm long, about 1 mm in diam.; blade lanceolate, 2–11 cm long, 1–2.5 cm wide, imparipinnate; pinnae in (2) 4–7 (8)

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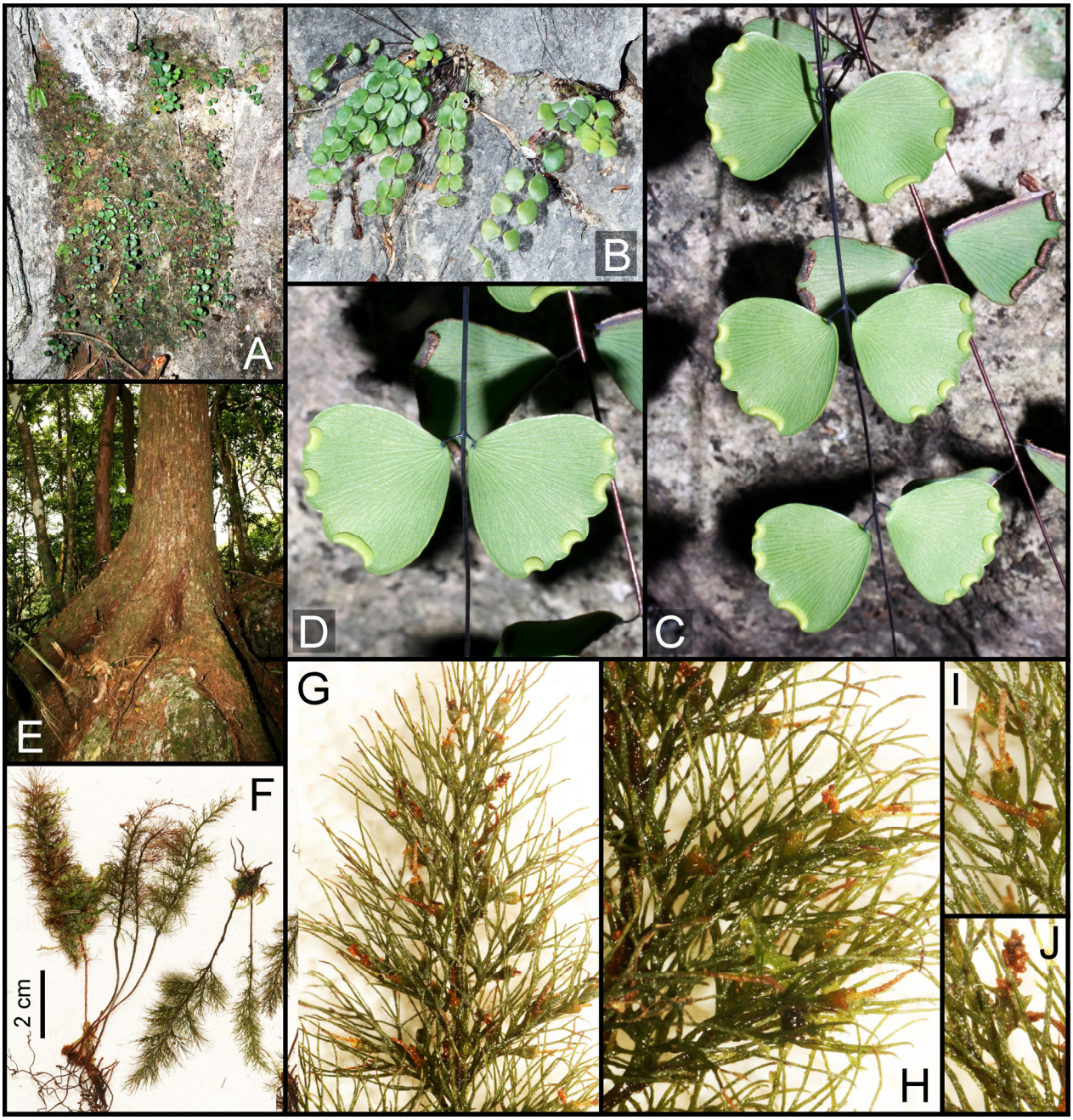


Fig. 1. *Adiantum juxtapositum*. A & B: Plants in natural habitat. C & D: Portion of frond and pinnae (*PVT 452*). *Abrodictyum pluma*. E: Species habitat. F: Whole plants. G & H: Portion of frond and pinnae. I & J: Sori (*HAL 11724*). Photos and design by L.Averyanov and Pham Van The.

pairs, opposite or sub opposite in basal half, alternate upward, more or less flatly spreading or down nutant. Pinnae orbicular, broadly orbicular-flabellate, obtriangular or obovate, 0.5–1.2 (1.4) cm long, 0.4–1.6 (2) cm wide, apical margin rounded, slightly crenulate-undulate, base roundish-cuneate to cuneate, stalks persistent, 1.5–2.5 mm long, articulate at apex when dry pinnae easily fallen. Pinnae veins multi-dichotomous branching and reached to cartilaginous margins, better visible on lower surface. Sori (1) 2–4 (6) per pinna; indusia graish-black, orbicular, orbicular-reniform or elongated, leathery, upper margins flat and straight or slightly revolute, entire or slightly undulate, persistent. Perines of spores with indistinct granulate ornamentation.

Distribution: Vietnam (Lang Son province), SE China (Fujian, Guangxi).

Ecology: Perennial herb, growing in small bundles

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in crevices on vertical limestone cliffs near ridges, in evergreen, rather open, broad-leaved limestone forest (presently logged and replaced by secondary scrub). Not common.

Specimens examined: VIETNAM. Lang Son Prov., Huu Lien Nature Reserve, 21°40'32''N, 106°23'45''E, alt. 400 m, *P.V. The 452* (HN, HNU, LE); ibid., *P.K.Loc et al. CPC 050, CPC 076, CPC 100* (HN, HNU).

Notes: *Adiantum gingkoides* closely allied to *A. juxtapositum* reported from Laos may be also found in Vietnam (Pham, 1991). Detailed morphological comparison of both species is given in Table 1.

The genus *Abrodictyum* C.Presl (Hymenophyllaceae) contains 25 species spreading throughout world tropics (Ebihara et al., 2006). There are three species of the genus known in Vietnam (Phan, 2010). Among them *A. pluma* was collected in Quang Binh province of center of Vietnam in 2008. It is similar to *A. idoneum* (C.V.Morton) Ebihara et K.Iwats., - the species also recorded from Vietnam. However, *A. pluma* clearly differs from last related species in shorter and narrower frond, ascending pinnae and in shorter sori (see Table 2).

Abrodictyum pluma (Hook.) Ebihara et K.Iwats., 2006, Blumea 51, 2: 243.– *Trichomanes pluma* Hook., 1854, Icon. Pl. 6: pl. 997.

Figs. 1E–J, 2G–K.

Lithophyte. Rhizomes thin, rigid, short, creeping, sparsely covered with brownish setose hairs. Stipes densely clustering, stiff, very narrowly winged or not, dark brown, hairy at base when young, 0.5–1 mm in diam., to 5 cm long. Fronds oblong-ovate to broadly lanceolate in outline, 5–12 cm long, 1.5–4 cm wide, with sparse, short, glandular-setose hairs, finely quadripinnate dissected, into terete subulate rigid lobes, second and third branching all faced in different planes;rachis very narrowly winged or not; the wings with a single row of cells; pinnae ascending, broadly oblong inoutline, round at apex, cuneate to subtruncate at base, (0.5) 1–1.5 (2) cm long, about 1 cm wide, shortly stalked; ultimate segments rigid, subulate, needle-like. Sori at apices of short segments usually near pinnae rachis; involucre goblet-shaped, 1–1.2 mm long, 0.5–0.7 mm in diam., the mouth truncate; receptacles extruded, slender, 2–3 time longer than ivolucre.

Distribution: Vietnam (Quang Binh province). Thailand, Malaysia, Samoa, New-Caledonia.

Ecology: Perennial lithophytic herb growing on shady mossy rocks in primary intact coniferous forests with of *Dacrydium elatum* (Roxb.) Wall. ex Hook., *Fokienia hodginsii* (Dunn) A.Henry et H.H.Thomas and *Pinus dalatensis* Ferré along ridge edge composed with brown shale. Not common.

Table 1. Main morphological differences between *Adiantum juxtapositum* and *A. gingkoides*

Characters	*A. juxtapositum*	*A. gingkoides*
Stipes	1–13 cm long	1.3–4 cm long
Blades	2–11 × 1–2.5 cm	3–10 × 3–5 cm
Pinnae	(2) 4–7 (8) pairs, 0.5–1.4 × 0.4–2 cm	1–4 pairs; 1.1–3 × 3.5–4.4 cm
Shape	Orbicular or broadly orbicular-flabellate (rarely obtriangular)	Flabellate
Pinna stalks	1.5–2.5 mm long	5 mm long

Specimen examined: **VIETNAM**. Quang Binh Prov., Giang Man Range, 17º41'09''N, 105º45'54''E, alt. 1100 m, *L.Averyanov et al. HAL 11724* (HN, HNU, LE).

Notes: *Abrodictyum pluma* is similar to *A. idoneum*, the species reported from Vietnam in earlier survey (Pham, 1991). Main differences of *A. pluma* from last species consist of shorter and narrower frond, ascending pinnae and shorter sori. Detailed comparison of morphological features of both species is presented in Table 2.

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LITERATURE CITED

Ching, R. C. 1957. On the genus *Adiantum* L. of China with notes on some related species from neighbouring regions. Acta Phytotax. Sin**. 6**: 301–359

Ebihara, A., J. Y. Dubuisson, K. Iwatsuki, S. Hennequin and M. Ito. 2006. A taxonomic revision of Hymenophyllaceae. Blumea **51**: 242–244

Hooker, W. J. 1854. Icones Plantarum or Figures, with Brief Descriptive Characters and Remarks, of New or Rare Plants, selected from the Author's Herbarium **6**: Pl. 997. London: William Pamplin, 45, Frith Street, Soho Square, UK.

IUCN Standards and Petitions Subcommittee. 2011. Guidelines for Using the IUCN Red List Categories and Criteria. Version 9.0. Prepared by the Standards and Petitions Subcommittee. Downloadable from http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

Lin Y.-X. 1990. Adiantaceae. *In* R.C.Ching & K.S.Shing (eds.). Fl. Reip. Popularis Sin. **3**: 182.

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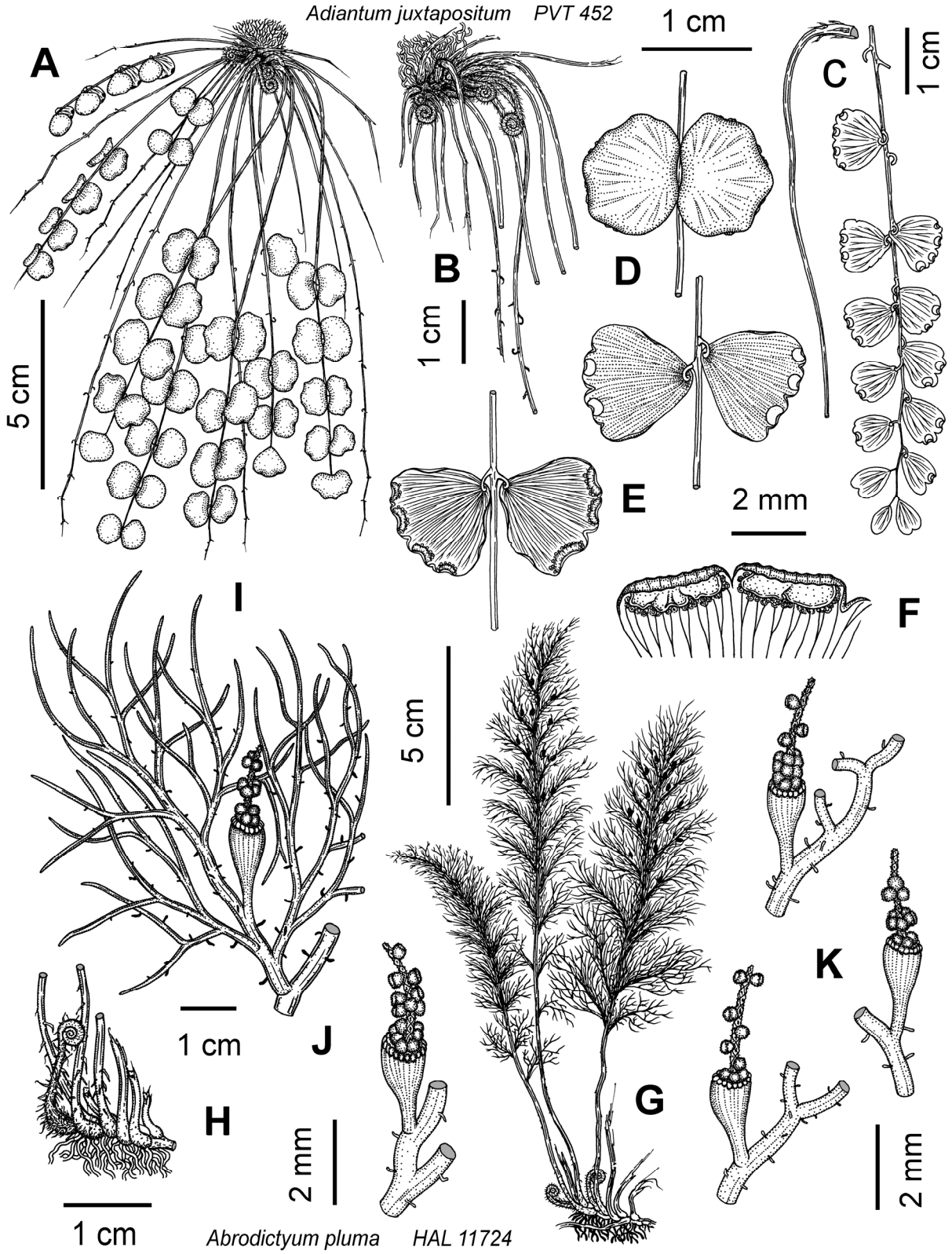


Fig. 2. A–F, *Adiantum juxtapositum*. A: Whole plant. B: Rhizome with young fronds. C: frond. D: pinnules, from adaxial and abaxial side. E: pinnules with ripe sori. F: Ripe sori (*PVT 452*). G–K: *Abrodictyum pluma*. G: Whole plant. H: Rhizome with young frond. I: pinna with sorus. K, J: Ripe sori (*HAL 11724*). All drawn by L. Averyanov.

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Mabberley, D. J. 2008. Mabberley's Plant-Book: A Portable Dictionary of Plants, their Classification and Uses, 3rd ed.: 15. Cambridge Univ. Press, Cambridge, UK.

Pham, H. H. 1991. An Illustrated Flora of Vietnam **1(1)**: 42–261. Mekong Printing, Montréal, Canada.

Phan, K. L. 2010. The updated checklist of the Fern Flora of Vietnam following the classification scheme of A. Smith et al. (2006). J. Fairylake Bot. Gard. **9(3)**: 1–13

Smith, A. R., K. M. Pryer, E. Schuettpelz, P. Korall, H. Schneider and P.G. Wolf. 2006. A classification of extant ferns. Taxon **55**: 705–731.

Tardieu-Blot, M. L. and C. Christensen. 1939–1951. Fl. Gén. Indo-Chine. T. 7. Pt. 2 Fasc. 7–10. Cryptogames. P. 1–545. Masson et Cie, ParisFrance.

Table 2. Main morphological differences between *Abrodictyum pluma* and *A. idoneum*

Characters	*A. pluma*	*A. idoneum*
Fronds	2–5 cm long, 1.5–3 cm wide	18 cm long, 7 cm wide
Pinnae	Ascending	Overlapping but placed almost in one plane
Sori	Less than 1 mm long	1.5 mm long

越南植物誌新增之兩蕨類：*Adiantum juxtapositum*（膜蕨科）and *Abrodictyum pluma*（鐵線蕨科）

Pham Van The[(1*)], Leonid Averyanov[(2)] and Phan Ke Loc[(3)]

1. Department of Plant Resources , Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, No. 18 Hoang Quoc Viet Road, Cau Giay, Hanoi, Vietnam.

2. Komarov Botanical Institute, Russian Academy of Science, St. Petersburg. Prof. Papov Srt. 2, Russia, 197376. Email: av_leonid@mail.ru; av_leonid@yahoo.com.

3. Department of Botany, Faculty of Biology, Hanoi University of Science, No. 334 Nguyen Trai Road, Thanh Xuan, Hanoi, Vietnam. Email: pkeloc@yahoo.com

* 通信作者。*Email: phamvthe@gmail.com*

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摘要：本文提供新增至越南植物誌的兩個蕨類新紀錄*Adiantum juxtapositum*（膜蕨科）and *Abrodictyum pluma* （鐵線蕨科），同時提供特徵描述，相關紀要及手繪圖。

關鍵詞：*Adiantum juxtapositum*、*Abrodictyum pluma*、蕨類、越南植物誌。

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