



Original Article  
*Prosaptia Contigua* C. Presl (Grammitidaceae),  
a New Record for Vietnam

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**Abstract:** The specimens of genus *Prosaptia* C. Presl (family Grammitidaceae) stored in the Herbarium of the University of Science under Vietnam National University were studied with the traditional morphological methods. The study provides descriptions, illustrations and comparisons of 6 species of genus *Prosaptia*, namely *P. alata*, *P. barathrophylla*, *P. intermedia*, *P. pectinata*, *P. obliquata* and *P. contigua*. *Prosaptia contigua* (G.Forst.) C.Presl has been identified as a new record for the flora of Vietnam.

**Keywords:** Genus *Prosaptia*, *Prosaptia contigua*, Grammitidaceae, new record for the flora of Vietnam.

## 1. Introduction

Grammitidaceae is a family of ferns that distributed mainly in Southeast Asia, including Vietnam. In 1941, Tardieu-Blot M.L. and Christensen C. showed that Vietnam has 4 species belonging to the genus *Prosaptia*, with namely as: *P. stenobasis* Baker, *P. obliquatum* Mett., *P. urceolare* (Hayata) Copel. and *P. khasyana* (Hook.) C.Chr. & Tardieu [1]. In 1991, Phạm Hoàng Hộ pointed out that Vietnam has only 2 species: *P. stenobasis* Baker and *P. urceolare* (Hayata) Copel. [2]. In 2010 Phan K.L. showed that Vietnam has only one species,

*P. urceolare* (Hayata) Copel. [3]. Until recently, the taxonomic concepts of grammitid ferns have been changing considerably under the light of molecular phylogeny. *Ctenopteris* Blume ex Kunze, *Grammitis* Sw. s.l. and *Xiphopteris* Kaulf. formerly widely used names for grammitid ferns, but are now considered to be unsatisfactory artificial genera based on frond dissection. Recent developments in Old World grammitid taxonomy have centred on describing new genera based upon additional morphological characters and two of the three old genera are no longer recognized. The type species of *Ctenopteris* has been transferred to *Prosaptia*

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C.Presl [4]. In the genus *Prosaptia* of Vietnam have five-species that were registrated now as *Prosaptia alata* (Blume) H.Christ (syn. *Ctenopteris alata* (Blume) Holttum), *Prosaptia barathrophylla* (Baker) M.G.Price (syn. *Ctenopteris barathrophylla* (Baker) Parris, *P. khasyana* auct. non (Hook.) C.Chr. & Tardieu: Tardieu & Christensen, *Prosaptia intermedia* (Ching) Tagawa (syn. *P. urceolaris* auct. non (Hayata) Copel.: Tardieu & Christensen, Phan,

*Prosaptia obliquata* (Blume) Mett. (syn. *Ctenopteris obliquata* (Blume) Copel.), *Prosaptia pectinata* T.Moore (syn. *P. stenobasis* Baker, *Ctenopteris leysii* (Baker) Holttum) [4]. Specimen *HLF5267b* stored in the Herbarium HNU of VNU University of Science differs from all of cited species. It is identified by us as *Prosaptia contigua* (G.Forst.) C. Presl. Thus this is a new record for the fern flora of Vietnam.

Table 1. Comparison of the basic characteristics of the species in the genus *Prosaptia* encountered in Vietnam

Characteristics	<i>Prosaptia alata</i> [5, 6]	<i>Prosaptia barathrophylla</i> [6, 7]	<i>Prosaptia intermedia</i> [8]	<i>Prosaptia obliquata</i> [6, 9]	<i>Prosaptia pectinata</i> [6]	<i>Prosaptia contigua</i>
Stipe	Short, 5-18 mm long	Very short	Very short, 2 mm long	Short, 14-30 mm long	Winged to base or 1-10 mm long	Short, 10-25 mm long
Lamina	Linear-lanceolate, 144-270 × 14-25 mm, pinnately divided to wing 4.4-8 mm wide along rachis	Lanceolate, 120-530 (or more) × 16-30 mm, simply pinnatifid, wing 2.5-3 mm wide.	Narrowly elliptic, 110-180 × 15-21 mm, deeply pinnately divided to wing 0.5-1.3 mm wide along rachis	Narrowly elliptic in outline, pinnate or deeply pinnately divided to wing 0.1-0.2 mm wide along rachis	Narrowly elliptic in outline, 142-380 (or more) × 31-65 mm, deeply pinnately divided to wing 0.2-1 mm wide along rachis.	Linear-elliptic, 140-200 × 18-27 mm, pinnate or deeply pinnately divided to narrow wing less than 0.8 mm wide along rachis.
Pinnae	25-48 (or more) pairs, narrowly triangular to narrowly oblong in outline, obtuse to acute at apex.	36-74 (or more) pairs, very narrowly oblong to very narrowly triangular, entire, obtuse to acute at apex.	14-24 (or more) pairs, narrowly triangular to narrowly oblong, entire, bluntly acute to acute at apex.	40-84 pairs, linear to linear-lanceolate, acute or obtuse at apex.	26-46 pairs, very narrowly triangular to very narrowly oblong, entire in sterile pinnae, crenate-undulate toward apex on margin in fertile ones, obtuse or rounded at apex.	38-52 (or more) pairs, very narrowly oblong to very narrowly triangular-oblong in outline obtuse at apex.

Sori	Deeply sunken oblique or parallel to plane of lamina, opening at margin, lamina margin forming part of pits mouth.	Sunk in very distinct round pits, which do not show as papillae on the upper surface of the frond, perpendicular to plane of lamina.	Deeply sunken in cavities perpendicular to lamina surface with rim higher on side nearest costa, entirely on abaxial surface of lamina.	Sunken perpendicular to plane of lamina in steep-sided pits, mouth entirely on abaxial surface of lamina, rim of even height.	Sunken oblique or parallel to plane of lamina in semicircular to semi-elliptic pouches, opening at margin, lamina margin forming part of pits mouth.	Sunken in marginal urceolate cavities opening outward, parallel to plane of lamina, lamina margin forming of pits mouth.
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### Key to the species of *Prosaptia* in Vietnam

- 1a Sori perpendicular to plane of lamina ..... 2  
 2a Sori without a raised rim ..... *P. barathrophylla*  
 2b Sori with a rim ..... 3  
 3a Rim higher on side nearest costa ..... *P. intermedia*  
 3b Rim of even height ..... *P. obliquata*  
 1b Sori oblique or parallel to plane of lamina ..... 4  
 4a Rachis wing wide, more than 1 mm, up to 8 mm ..... *P. alata*  
 4b Rachis wing narrow, less than 1 mm ..... 5  
 5a Lamina margin forming part of pit mouth ..... *P. pectinata*  
 5b Lamina margin forming all of pit mouth ..... *P. contigua*



Figure 1. Sori image of species belonging to genus *Prosaptia* in Vietnam. A. *P. intermedia* (Blume) Christ; B. *P. barathrophylla* (Baker) M.G. Price.; C-D. *P. contigua* (G. Forst.) C. Presl; E. *P. intermedia* (Ching) Tagawa; F. *P. obliquata* (Blume) Mett.; G. *P. pectinata* T. Moore (Photos: A. by Phutthai, T.[10]; B, F. by Nationaal Herbarium Nederland [11]; C. by Toan N.C.; D. by Natural History Museum [12]; E. by Herbarium Universitatis Mosquensis [13]; G. by Pi F.L [14].

Note: It is note worthy that *Prosaptia contigua*'s hairs on the stipe in Vietnam is less than lectotype (BM 000036058!), sometimes lamina sudden decrease at apex.



Figure 2. *Prosaptia contigua* (G.Forst.) C.Presl: A. & B. L.Averyanov, P.K.Loc, J.Regalado, T.T.T.Trang, T.V.Thao, N.V.Duy and N.T.Vinh. 5267b; M.Kato, C. B.Sunarno and H.Akiyama 3578 (Isotype L 0700179!), retrieved from [http://bioportal.naturalis.nl/multimedia/L++0700179\\_0101692314/term=prosaptia+contigua&from=119](http://bioportal.naturalis.nl/multimedia/L++0700179_0101692314/term=prosaptia+contigua&from=119); D. David Nelson s.n. 023019 (Lectotype BM 000036058!), retrieved from [http://data.nhm.ac.uk/dataset/collection-specimens/resource/05ff2255-c38a-40c9-b657-4ccb55ab2feb?\\_\\_no\\_cache\\_\\_=True&view\\_id=6ba121d1-da26-4ee1-81fa-7da11e68f68e&filters=higherGeography%3AOceania%3B%20French%20Polynesia&page=14](http://data.nhm.ac.uk/dataset/collection-specimens/resource/05ff2255-c38a-40c9-b657-4ccb55ab2feb?__no_cache__=True&view_id=6ba121d1-da26-4ee1-81fa-7da11e68f68e&filters=higherGeography%3AOceania%3B%20French%20Polynesia&page=14).

## 2. Description

*Prosaptia contigua* (G.Forst.) C.Presl, Tent. Pterid. 166. 1836. **Basionym:** *Trichomanes contiguum* G.Forst., Fl. Ins. Austr. 84. 1786. Type: French Polynesia, Oceania, Tahiti, Society Islands - Windward, 11 June 1996, *David Nelson s.n.* (Lectotype **BM** 000036058!). **Synonym:** *Ctenopteris contigua* (G.Forst.) Holttum, Rev. Fl. Malaysia 2: 230, fig. 130. 1954. Type: C. Seram, Manusela National Park, along a trail between Wae (River) Ansela and Wae Huhu, Kecamatan (District) Seram Utara, Indonesia, 03 Jan. 1985, *M.Kato, B.Sunarno* and *H.Akiyama* (Isotype **L** 0700179!).

Stipe short, 1-2.5 cm long with occasional to scattered hairs, simple and tufted 2, sometimes 3, medium to dark reddish brown, less than 0.7 mm long.

**Lamina** linear-elliptic, gradually narrowing towards both ends sometimes sudden decrease at apex, 14-20 × 1.8-2.7 cm, acuminate at apex, gradually shortened downward to form small deltoid or semicircular pinnae; lamina pinnate or deeply pinnately divided to narrow wing less than 0.8 mm wide along rachis, 38-52 (or more) pairs, very narrowly oblong to very narrowly triangular oblong in outline, pinnae ascending, middle pinnae largest, 0.8-1.5 × 0.1-0.2 cm, dilated at base, obtuse at apex; margins of pinnae entire when sterile, lobed to wing less than 1 mm wide along pinna midvein when fertile, 1/3 to the apex of the pinnae; rachis prominent on both surfaces of lamina, medium brown or darker, concolorous to darker on both surfaces, terete at base; costae slightly prominent on both surfaces; veins slightly superficial and short, simple; hairs simple, solitary or sometimes tufted 2-3, medium to dark reddish brown, 0.2-0.7 mm, dense and short hairs on abaxial side of rachis, scattered on adaxial side, occasional to scattered on both sides of costae and margin, sparse on both sides of lamina. Sorus 1 per tooth and/or 1 at apex of pinna, 1-4 on each pinna, sunken in marginal urceolate cavities opening outward, parallel to plane of lamina, lamina margin forming of pit

mouth, rim of cavity slightly with some short simple hairs on both sides.

Vietnam: Lam Dong Prov., Lac Duong Distr., Da Chais Comm., around point 12°05'27"N, 108°39'43"E, at elevation 2100-2300 m a.s.l., along main ridge of Bi Doup mountain, 15 Oct. 2005, *L.Averyanov, P.K.Loc, J.Regalado, T.T.T.Trang, T.V.Thao, N.V.Duy* and *N.T.Vinh* 5267b.

Distribution- Outside Vietnam: S India, Sri Lanka, Thailand, S China, Taiwan, Sumatra, Peninsular Malaysia, Borneo (Sabah and Sarawak), Java, Lesser Sunda Islands, the Philippines, Sulawesi, Maluku, New Guinea, NE Australia and the Pacific Island [6];- In Vietnam: Lam Dong Province, Lac Duong District, Da Chais Community, only one specimen was collected.

Ecology- Outside Vietnam: Uncommon epiphyte 0-3 m up on trees 10-30 cm diameter and on rotten logs, sometimes by streams, or lithophyte on granite, in ridge crest and valley lower montane forest and ridge crest upper montane forest from 760 to 1700 m [6];- In Vietnam: It is occasional an epiphyte on mossy trees in primary mossy wet coniferous forest with the dominance of *Fokienia hodginsii* along main ridge, 2100-2300 m.

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