

# A Taxonomic Study of the Genus *Blastus* Lour. (Melastomataceae) in Vietnam

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Received 06 August 2016

Revised 26 August 2016; Accepted 09 September 2016

**Abstract:** The genus *Blastus* Lour. belongs to the family Melastomataceae with 12 species over the World [1], among which five are found in Vietnam [2, 3]. Previously, there have been some studies on this genus in Vietnam. The first study documented the genus *Blastus* was the “Flora Cochinchinensis” by Loureiro (1790) [4]. To date, there have been data of five species and one variety of *Blastus* in Vietnam, among them one species and one variety may be endemic to Vietnam, which are *Blastus eglandulosus* and *B. boneensis* var. *eberhardtii*. In this article, we provided the diagnostic characteristics of the *Blastus* species found in Vietnam, provided some information about distribution, ecology, biology and the identification key to these five species and one variety.

**Keywords:** *Blastus*, Melastomataceae, taxonomy, Vietnam.

## 1. Introduction

*Blastus* is a small genus of the family Melastomataceae with twelve species that distributed in South Asia and South America [1]. Five species and one variety of this genus are found in Vietnam [2, 3]. Loureiro (1790) [4] described this genus and designated *B. cochinchinensis* as the type species. Subsequently, most of scientists who studied the taxonomy of *Blastus* agreed with the placement of this genus in the family Melastomataceae, such as Chun Cheng Yih

(1979) [5], Chen Cheih (1984) [6], Chie Jie (2005) [7], S. S. Renner and Chen Jie (2007) [8], Wen Xiang-ying (2008) [9]. In Vietnam, A. Guillaumin (1908) [10] studied the characteristics of four species, and later Nguyen Tien Ban (1997) [2] and P. H. Ho (1992, reprinted 2000) [3] provided short descriptions of all five species and one variety of *Blastus* known from the country. However, there is still the lack of information about the morphological characteristics, distribution, ecology and typus of this genus in Vietnam. Therefore, this study aims to provide such information and in turn contribute to the advancement of the Flora of Vietnam project.

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## 2. Material and methods

### a. Material

The study was based on herbarium specimens deposited in Hanoi Herbarium of Institute of Ecology and Biological Resources (HN), Herbarium of VNU University of Science (HNU), Herbarium of Institute of Tropical Biology (VNM), Herbarium of National Institute of Medicinal Materials (HNPM), and the fresh samples collected in recent field trips. The published documents, especially the monograph about genus *Blastus* Lour. in the world and Vietnam [1].

### b. Methods

To study the classification of the genus *Blastus*, we used the comparative morphological methods. It was the classic method and based on the morphological characteristics of the external organs, especially the reproductive organs, because the reproductive characteristics are closely related to the genetic code and little altered by the impact of the environment.

## 3. Result and discussion

### 3.1. The classification characteristic of the genus *Blastus* Lour. in Vietnam

Most of species in *Blastus* are shrubs with 1 to 6m tall. Stem glabrous or puberulent (*B. borneensis* var. *eberhardtii*).

Leaves along stem, opposite, petiole 5-35 mm long or absent (*B. auriculatus*), equal in pair (*B. auriculatus*, *B. cochinchinensis*) or unequal in pair (*B. borneensis*, *B. englandulosus*, *B. multiflorus*); leaf shape: elliptic to lanceolate (*B. auriculatus*, *B. cochinchinensis*, *B. borneensis*, *B. englandulosus*), ovate (*B. borneensis*, *B. multiflorus*); almost species in this genus have under surface of leaf glabrous, base auriculate (*B. auriculatus*, *B. multiflorus*) or cuneate (*B. cochinchinensis*, *B. borneensis*, *B. englandulosus*); almost apex acuminate; mostly

margin entire or small dentate; under surface of leaves was covered with shield - shape (peltate) glands or absent (*B. englandulosus*); 3 or 5 nerves from base.

Inflorescences axillary cymose (*B. auriculatus*, *B. cochinchinensis*) or terminal cymose (*B. multiflorus*) or both two (*B. borneensis*, *B. englandulosus*); compound cymose (*B. borneensis*, *B. englandulosus*, *B. multiflorus*) or umbellate cymose (*B. cochinchinensis*); bract 2 or absent, small, triangular, apex curve or not, caducous.

Flower small, hypanthium campanulate funnellform to urceolate, usually subquadrangular in cross section. Calyx connate very short tube at the lower, divided into 4 lobes; lobes broadly triangular (*B. auricularis*, *B. borneensis*, *B. englandulosus*) or ovate (*B. cochinchinensis*) or round (*B. multiflorus*), apex acuminate, pointed dorsally, covered in scales and with peltate gland (*B. auriculatus*, *B. borneensis*, *B. cochinchinensis*, *B. multiflorus*), or not (*B. englandulosus*). **Petal** 4 petals, free, white, pink or yellow; ovate; apex acuminate; glabrous or rarely with a few peltate glands on the outside (*B. borneensis*). Stamens 4, free; equal in size and same shape (isomorphic); glabrous (*B. auriculatus*, *B. cochinchinensis*, *B. englandulosus*) or with a few peltate glands on basal half (*B. borneensis*) or with peltate glands at transition to filament (*B. multiflorus*); anthers slightly S-shape or curve in lateral view, broad at base, base cordate or bituberculate, tapering into a beak; anther sac connective distinct (*B. auriculatus*, *B. englandulosus*, *B. multiflorus*) to indistinct (*B. borneensis*, *B. cochinchinensis*), present dorsally on free basal part, dorsally inappendiculate. The length of ovary usually about 2/3 of the length of hypanthium; partially adnate to hypanthium for about 2/5 (*B. auriculatus*) its half (*B. multiflorus*) or its whole length (*B. borneensis*, *B. cochinchinensis*, *B. englandulosus*); urceolate; apically usually slightly to deeply depress about base of style with an indumentum of peltate glands or rarely small gland- tipped hair; ovoid

not protruding into ovary cell, but forming together to make column square in cross section; style glabrous or rarely with some peltate glands on basal half (*B. borneensis*), deciduous after flowering; stigma small, usually slightly narrower than style.

Capsule is as long as and include in the long persistent hypanthium, and often breaking it when dehiscing; elliptic, cup-shaped, ovoid, urceolate to fusiform, rarely with 4 low ribs, base rounded, acute to attenuate; covered in scale on the outside; the placental column usually break.

Seeds cunrate (*B. borneensis*, *B. eglandulosus*, *B. multiflorus*), obovate or elliptic (*B. cochinchinensis*), sometime slightly angular, rarely extensions at both ends, usually break at chalaza; seed coat is bullate or in place tuberculate, brown; raphe (a ridge on the seed formed by the portion of the funiculus fused to the seed coat) is a narrow and shallow furrow, rarely broad, sometime a rounded angle or low ridge; strophiole is restricted to hilum area.

### 3.2. Key to species of genus *Blastus* Lour. in Vietnam

- 1A. Leaves sessile 1. *B. auriculatus*
- 1B. Leaves petiolate
- 2A. Anther sac connective indistinct
- 3A. Leave unequal in pair; stamen with a few peltate glands on basal half; style peltate gland.
- 4A. Branches without stellate 2. *B. borneensis*
- 4B. Branches with brownish or yellow stellate 2a. *B. borneensis* var. *eberhardtii*.
- 3B. Leaves equal in pair; stamen glabrous; style without peltate gland. 3. *B. cochinchinensis*
- 2B. Anther sac connective distinct.
- 5A. Calyx lobes ovate; stamen with a few peltate glands at transition to fillament; anthers much curved 5. *B. multiflorus*
- 5B. Calyx lobes broadly triangular; stamen glabrous; anther slightly curved 4. *B. eglandulosus*

### 3.3. The classification characteristic of species of genus *Blastus* Lour. in Vietnam

#### **Species 1. *Blastus auriculatus* Y. C. Huang ex C. Chen - *Bo rung co tai***

Y. C. Huang ex C. Chen, 1979. Fl. Yunnan. 2: 103, f.26; C. Chen, 1984. Fl. Reip. Pop. Sin. 53(1): 180, f.39; C. Hansen, 1982. Bul. Mus. Natl. Hist. Nat. 4: 72, pl.12, f.13; N. K. Dao, 2003. Checklist. Plant. Vietn. 2: 912.

Shrubs, stems terete; branches densely yellow glandular, glabrous when older. Leaves: sessile; equal in pair, leaf blade elliptic, 13-24 x 4.5-8 cm, papery, young leaves covered on both side peltate glands, undersurface glabrescent when older, have 3 nerves from petiole; base auriculate; margin entire and ciliate; apex acuminate. Inflorescences axillary, cymose, 5-9-flowered; bracts 2, about 1mm length, small triangular, curve, caducous. Pedicel ca. 2mm, densely peltate glands. Hypanthium long funnellform, ca. 3.5mm, 4-sided, glandular. Calyx lobes 4, ca. 0.5 mm, broadly triangular, margin sinuous, apex apiculate, covered with peltate glands. Petals 4, white, ovate, ca. 2.2mm long, apex acuminate, glabrous. Stamens 4, free, equal in size and same shape; filaments ca. 2 mm; anthers narrowly lanceolate, ca. 3.5mm, reddish, slightly curved; anther sac connective distinct. Ovary inferior, urceolate, 4-celled, glandular, adherent to the calyx tube for about 2/5 of its length, 4 little tubercles at apex. Capsule elliptic, with calyx persistent, 3.5 x 2mm, densely covered with peltate glands. Seeds cunrate.

**Loc. class:** Chinan: Yunan. **Typus:** Hekou 43 (Holotype: KUN)

**Distribution:** Vietnam: Phu Tho, Truong Son area. Other country: China[China].

**Habitat & Ecology:** Flowering in May-June and fruiting in July. Bamboo forests, below 200 m above sea level.

**Examined specimens:** PHU THO, Y. C. Huang ex Chen Phuong 0442 (HN).

**Species 2. *Blastus borneensis* Cogn. ex Boerl - *Bo rung borneo, Mua rung diem tuyen.***

A. Cogniaux in DC, 1891. Monogr. Phan. 7: 477; Boerlage ex J. Gijsbert, 1890. Handl. Fl. Ned. Ind, 1(2): 512, 531; C. Chen, 1984. Fl. Reip. Pop. Sin. 53(1): 184; C. Hansen, 1986. Bul. Mus. Natl. Hist. Nat. 4: 55, pl.1, 2, 3, 5, 6, f.8; P. H. Ho, 2000. Illustr. Fl. Vietn. 2: 82; S. S. Renner, 2001. Fl. Thailand. 7: 416, f.26; N. K. Dao, 2003. Checklist. Plant. Vietn. 2: 912; S.S. Renner ex C. Jie, 2007. Fl. China. 13: 371.

- *Blastus cogniauxii* Stapf. 1894. Hooker's Icon, Pl. 24: tab. 2311.

- *Blastus caudatus* Sphare. 1929. Bull. Misc. Inform. Kew. 10: 319.

- *Blastus cogniauxii* Stapf var. *caudatus* (Spare). Nayar, 1968. Cur. Sci. 37: 413

- *Blastus sumatranus* Merr. 1939. Pap. Michigan Acad. Sci. 24: 84.

- *Blastus borneensis* Boerl. 1890. Handl. Fl. Ned. Ind, 1(2): 512, 531, nom. nud.

Shrubs, 1.3- 4.5 (-6) m. Stems terete; branches with densely peltate glands and often also brownish glands when young, glabrous when older. Leaf unequal in pair; petiole ca. 0.7-2.7 (3.5) cm long; leaf blade lanceolate to ovate, 11-21 × 3-6.5 cm, upper surface with dense stellate to hair when young, and also of minute brownish glands, glabrous or with hair at least along nerves when older; under surface curved peltate glandular and sometime also minute brownish glandular; 3 (-5) nerves from base; base cuneate; margin entire or rarely small dentate; apex long acuminate. Inflorescences axillary or terminal compound cymose, ca. 2 - 3.5cm; bracts 1-2mm long, triangular, caducous. Pedicel ca. 0.5-2 (-4.4) cm. Hypanthium campanulate to urceolate, 1.1-2.7 (-3.5) × 0.8-1.5 (-2.3) mm, 4-sided, always with yellow or rarely red peltate glandular. Calyx very short, connect to low rim, lobes broadly triangular, with a dorsal conical thickening bluntly pointed close to apex. Petals white or yellow, rarely pink, broadly ovate, ca. 2.5×1.3 mm, a few peltate glands on the outside, margin minutely dentate. Stamens 4, with a few peltate glands on basal half; filaments thick, 1-1.8 mm; anthers slightly S-shape, curved, base cordate or rarely

bituberculate; anther sac connective indistinct. Ovary inferior, adnate to hypanthium for about its whole length, ovoid-elliptic, 4-celled, apically deeply depressed around base of style, densely covered peltate glandular. Style 2-7mm long, peltate gland on basal half. Capsule urceolate or more often cup-shaped, base broadly rounded, 1.5-2.3 × 1.2-2.6 mm, crowned by hypanthium lobes. Seed 0.5mm long, cunnate or sometime slightly angular with a short beak at chalaza, brown.

**Loc. class:** Malaysia: Borneo. **Typus:** Teysimann *sine num.* (Holotype: BR)

**Distribution:** Vietnam: Phu Tho, Vinh Phuc (Tam Dao), Ha Noi (Ba Vi), Nghe An, Quang Binh, Quang Tri, Thua Thien Hue, Da Nang, Lam Dong. Other countries: China, Indonesia, Malaysia, Thailand.

**Habitat & Ecology:** Flowering in Junly-November; fruiting in September-December. Dense mixed forests, valleys, mountain slope, stream banks, moist places; at 100- 1300m.

**Examined specimens:** PHU THO, 10781, Phuong 6307 (HN), P.7071 (HN) - VINH PHUC, N.V.Trai 6791A and 6791B (HNPM) - NGHE AN, N. N. Thin 14813 (HNU). - QUANG BINH, L. V. Averyanov, P. K. Loc, N. T. Hiep VH 4779 (HN), P. 4265 (HNU). - THUA THIEN HUE, 30 (HN), Nhan 927 and 86 (HN), Ha Tue 600, 651 and 670 (HN), Le Kim Bien 345 (HN), 2796 (VNM). - DA DANG, Poilane 7400 (VNM) - LAM DONG, L. V. Averyanov, P. K. Loc, N. Q. Binh VH2917 (HN).

**Species 2a. *Blastus borneensis* var. *eberhardtii* (Guillaum.) C. Hansen - *Borung eberhardtii*.**

C. Hansen, 1986. Bul. Mus. Natl. Hist. Nat. 4:59, pl.7, f.8; P.H.Ho, 2000. Illustr. Fl. Vietn. 2: 92; N. K. Dao, 2003. Checklist. Plant. Vietn. 2:912.

- *Blastus eberhardtii* Guillaum. 1921. Bull. Soc. Bot. France. 68:3.

It's quite difficulty define *B. bornensis* var. *bornensis* and *B. bornensis* var. *eberhardtii*. The main difference of *B. bornensis* var. *eberhardtii* from *B. bornensis* var. *bornensis*

that it has broadly and largely leaves. Moreover, a part of branches usually covered with brownish or yellow stellate to plumose hair, densely peltate glands. Leaves covered narrowly peltate glands and plumose hair. Capsules are longer in var. *eberhardtii* than var. *borneensis*. The anther sacs seem to be reduced, the ventral fissure are shallow and sometime indistinct. The connective is always shortly connate ventrally of the insertion of the filament.

**Loc. class:** Vietnam, Vinh Phuc, Tam Dao;  
**Syntypii:** Eberhardt 4955 (P, iso.: VNM!); Eberhardt 5031 (P).

**Distribution:** Bac Kan, Lang Son, Vinh Phuc (Tam Dao), Nghe An, Quang Binh, Quang Tri (Lao Bao), Thua Thien Hue (Bach Ma). This variety only was recorded in Vietnam so it may be endemic.

**Habitat & Ecology:** Flowering in April-August; fruiting June to September. Dense mixed forests, valleys, mountain slope, stream banks, moist places; at 100-1.300 m above sea level.

**Examined specimens:** BAC KAN, B. D. Binh 07489 (HNU) - LANG SON, B. D. Binh, 7491 (HNU) - VINH PHUC, T. D. Nghia T.026 (HN), B. D. Binh 7485, 7486, 7492, 7493, 7494, 7495, T033(HNU), Eberhardt 4955 (VNM) - NGHE AN, VN511 (HN) - HA TINH, L. V. Averyanov, P. K. Loc, N. T. Hiep 361 (HN) - QUANG BINH, B. D. Binh, 07489 (HNU) - QUANG TRI, B. D. Binh 7489 (HNU) - THUA THIEN HUE, Thai Thuan 557 (HN), Doi dieu tra thuc vat 2591 (HN), Poilane 16/4/39 (VNM).

**Uses:** Ripe fruits and roots used as an antipyretic drug.

**Species 3. *Blastus cochinchinensis* Lour. - *Mua rung trang*, *Mua rung Nam Bo*.**

Lour. 1790. Fl. Cochinch. 2: 517; C. B. Clarke, 1879. Fl. Brit. Ind. 2: 528; A. Guillaumin, 1908. Fl. Indo-Chine. 2: 898; M. H. Kamboku, 1965. Fl. Japan: 652; Y. C. Huang ex C. Chen, 1979. Fl. Yunnan. 2: 101. f. 26; C. Chen, 1984. Fl. Reip. Pop. Sin. 53(1): 180. f. 39; C. Hansen, 1982. Bul. Mus. Natl. Hist. Nat. 4: 72, pl.1,2,3,5, f.4; Huang et al.,

1996. Fl. Taiwan. 3: 909, f. 453; P. H. Ho, 2000. Illustr. Fl. Vietn. 2: 83; N. K. Dao, 2003. Checklist. Plant. Vietn. 2: 912; Chen Jie, 2005. Fl. Guang Xi. 2: 10, f.4; S. S. Renner et C. Jie, 2007. Fl. China.13: 372; Wen Xiang Ying, 2008. Fl. Hongk. 2:154.

- *Anplectrum paviflorum* Benth. 1861. Fl. Hongk. 116.

- *Blastus marchandii* H. Lév. 1913. Repert. Spec. Nov. Regni Veg. 11: 494.

- *Blastus parviflorum* (Benth.) Triana. 1871. Trans. Linn. Soc. London 28(1): 116.

Shrubs ca. 0.6-3 m high. Branches subquadrangular, densely small brownish scales when young, glabrous when older. Leaf equal in pair; petiole 0.7-2.6 (-3.7) cm long, glandular; leaf blade lanceolate, narrowly elliptic, or elliptic to lanceolate, 6.2-11.5 (-18) × 2.5-3.6 (-6.4) cm; under surface covered glands, upper surface sparsely glandular but glabrescent, 3 nerves form base; base to cuneate; margin entire or very inconspicuously denticulate; apex acuminate. Inflorescences axillary, umbellate cymose; peduncles 1-2 in an axil, 0.5-2 mm long or absent. Pedicel ca. 3 mm, densely glandular. Hypanthium urceolate to campanulate funnelform, thick wall, 4-sided, ca. 2.5-3.6 × 1.4-2.4 mm, densely peltate glands. Calyx lobes 4, ovate, ca. 1 mm, with peltate gland, connate into low rim. Petals 4, white or pink, ovate, ca. 4 mm, glabrous, apex acuminate. Stamens 4, equal in size, glabrous, filaments ca. 4 mm; anthers pink, S-shape, base cordate, connective slightly inflated and indistinct. Ovary inferior, urceolate, slightly glandular, as long as hypanthium; style glabrous. Capsule elliptic, ca. 3-4 × 2-3 mm, 4-sided, glandular, base attenuate, breaking the hypanthium when it dehiscing, placental column long-beaked. Seed obovate or elliptic, rarely extensions at both ends; seed coat bullate, or some places tuberculate, light brown.

**Loc class:** Vietnam. **Lectotypus:** Loureiro 171 (picture: BM)

**Distribution:** Vietnam: Lao Cai, Ha Giang, Bac Kan, Hoa Binh, Lang Son, Vinh Phuc, Ha Noi (Ba Vi), Quang Ninh, Ninh Binh (Cuc

Phuong), Nghe An, Thua Thien Hue (Hue). Other countries: China, Cambodia, India, Laos, Myanmar.

**Habitat & Ecology:** Flowering in February to July. Mixed forests, under the shadow, stony soil, at 200-1300 m above sea level.

**Examined specimens:** LAO CAI, P. K. Loc, N. T. Hiep, L. V. Averyanov, G. E. Shatz, S. Bodine DKH 6845 (HN) - HA GIANG, N. T. Le 388 (HN); N. H. Hien 049 (HN); V. V. Chi 1034A and 1034B (HNPM) - BAC KAN, Daniel E. Atha, N. T. Hiep, P. V. The DA4763 (HN); D. D. Sojearto; T. N. Ninh, N. Q. Binh 9753 (HN) - LANG SON, P.1854 (HN); Phuong 2670, 3431, 3889, 4100 and 4306 (HN); N. K. Dao 5479 (HN); 05414 B (HNU); 0033 (HNU); TTH 71 D2 02 (HNU) -HOA BINH, Nguyen Ba 1014 (HN) - VINH PHUC, Phuong 2670 (HNU); P. 7066 (HN); N. T. Thin 7483 (HN) - QUANG NINH, Ba Nhan LX - 514 (HN) - NGHE AN, V. Q. N. 15746 (HNU) - THUA THIEN HUE, Duong Tuyen 75 (HN).

**Uses:** Used as cordial for anemia patients.

**Species 4. *Blastus eglandulosus* Spare - *Bo rung khong tuyen*.**

G. H. Spare, 1929. Bull. Misc. Inform. Kew. 10: 318; C. Hansen, 1982. Bul. Mus. Natl. Hist. Nat. 4: 61, pl.9; P. H. Ho, 2000. Illustr. Fl. Vietn.2: 83; N. K. Dao, 2003. Checklist. Plant. Vietn. 2: 912.

Shurbs 2-6m high. Branches with subquadrangular, brown glandular or sometime covered with a glossy layer when young, terete and glabrous when older. Leave unequal in pair; petioles 1-2cm; leaf blade elliptic to lanceolate, 4-12 x 2-4cm, both surface when young with brown glands or sometime glossy, when old usually glabrous, 3 nerves form base, papery; base attenuate; margin entire; apex acuminate to long acuminate. Inflorescences compound cymose terminal or axillary, small, rarely more than 5cm long, 5-7 flowers; bracts triangular, curved, 2-3 x 0.9 cm. Pedicel ca. 2mm, glandular. Hypanthium campanulate, ca. 3 x 1.5 mm, glabrous. Calyx 4 lobes, broadly triangular, glabrous, connect into low rim, ca. 0.7-1mm. Petals 4, pink or white, ovate, ca. 3x2

mm, apex acuminate. Stament 4; filament thick, 2-3 mm long, glabrous; anthers slightly covered, about 3mm long, base cordate, connective distinct. Ovary inferior, ovoid, 4-celled, particularly adnate to hypanthium for its whole length, apically slightly depressed around of base style and clothed with small gland-tipped hairs; style ca.7.5-8mm long, glabrous rare small gland-tipped hairs as top of ovary. Capsule fusiform, ovoid, base rounded, ca. 3 x 2mm. Seed cunuate, slightly angular with a short blunt beak at chalaza, about 6mm long. Seed coat bullate or tuberculate along angles, brown.

**Loc. class:** Vietnam, Ha Noi, Ba Vi;

**Lectotype:** Balansa 3509 design by Hansen, 1982 (Isolectotype: G, K, picture: GH, NY, US).

**Distribution:** Vinh Phuc (Tam Dao), Ha Noi (Ba Vi), Thanh Hoa, Nghe An. This species only was recorded in Vietnam so it may be endemic species.

**Habitat & Ecology:** Flowering in May - July; Fruiting in June - September. Mixed forests, up to 1000 m above sea level.

**Examined specimens:** VINH PHUC, TTH D2 75 018 (HN); T033 (HN); LXVN 1352 (HN); Phuong 2879 (HN); N.V.Trai 6790A and 6790B (HNPM) - THANH HOA, 4575 and 4584 (HN) - NGHE AN, N. N. Thin 14814 (HNU).

**Species 5. *Blastus multiflorus* (Cogn.) *Guillaum.- Bo rung nhieu hoa***

Guillaumin, 1913. Bull. Soc. Bot. France. 60: 89; C. Hansen, 1986. Bul. Mus. Natl. Hist. Nat. 4: 63-65, pl.10; P.H.Ho, 2000. Illustr. Fl. Vietn.2: 92; N. K. Dao, 2003. Checklist. Plant. Vietn. 2: 912.

- *Allomorpha multiflora* Cogn. 1891. DC. Monogr. Phan. 7: 1183.

Shurbs, 2m tall. Branches with subquadrangular, peltate glands when young, terete and glabrous when older. Leaves unequal in pair; petiole ca. 1.5-5cm; leaf blade ovate, 7 (-16) x 4 (-9)cm; both surface with an indumentum of peltate glands when young, upper surface become glabrous, 5 nerves form base; base auriculate; papery; margin entire;

apex acuminate. Inflorescences a terminal compound cymose, ca. 5.5-11cm. Bracts 2, triangular, 1.0 (-1.3) x 0.3 (-0.4)cm, caducous. Pedicel ca. 0.5-1.3mm long, glandular. Hypanthium campanulate, ca. 1.8 x 1.5, peltate glandular. Calyx very short connate, lobes round, with a conical pointed thickening dorsally, ca. 0.4mm long, peltate gland. Petals 4, pink or white, ovate, apex acuminate, glandular. Stamens 4; filaments thick, ca. 1.3mm long, with a few peltate glands at transition to filament; anther very curved, about 4 mm long, base cordate; connective distinct. Ovary inferior, particularly adnate to hypanthium for about half of its whole length, free part rounded and slightly depressed, densely covered peltate glands around base of style; style ca. 5.8mm long, glabrous. Capsule urceolate, base rounded, ca. 1.8mm long and wide, breaking the hypanthium when dehiscent, placental column shortly beaked. Seeds cuneate, apically tapering to one side into a more or less curved beak, 0.5-0.7mm long. Seed coat is bullate or in places tuberculate, brownish.

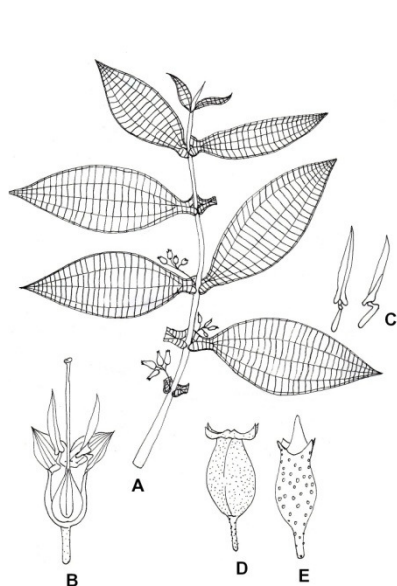


Fig. 2. *Blastus auriculatus* Y. C. Huang ex C. Chen. A. flowering branch; B. cross section of flower; C. stamens; D. fruit; E. bud; painter: N. T. Hien

**Loc. class:** Vietnam, Tonkin. **Lectotype:** Balansa 3509, design by C. Hansen, 1982 (Isolectotype: BR, K; picture: GH, NY, US).

**Distribution:** Vietnam: Lao Cai, Ha Giang, Thai Nguyen, Phu Tho, Vinh Phuc (Tam Dao), Ninh Binh, Thua Thien Hue, Quang Nam. Other country: China.

**Habitat & Ecology:** Fruiting in October to December. Mixed forests, valleys, stream banks, moist places, at about 250 m above sea level.

**Examined specimens:** LAO CAI, HAL 2763 (HN) - HA GIANG, V.V. Chi 1035A and 1305B - THAI NGUYEN, B. D. Binh 7463, 7464, 7465 and 7466 (HNU); N. N. Thin 7467 and 7469 (HNU); N. Thuy Nga 7468 (HNU) - NINH BINH, N. T. Hiep 8752A (HN); Ha Phuong 1814 (HN); C. Chen 1486, La D. Moi 2138 (HN) - THUA THIEN HUE, L. K. Bien 1345 (HN) - QUANG NAM, LXVN 3034 (HN); N. Q. Duc (HN); 5403 (HN), 121CP (HN); *sine num.* ĐC (HNU).

**Uses:** Used as cordial for anemia patients.

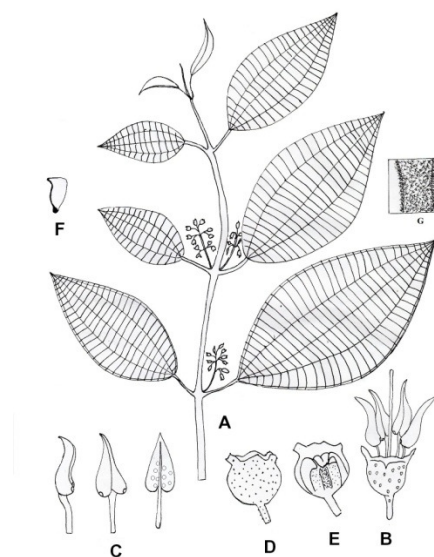


Fig. 3. *Blastus borneensis* var. *eberhardtii* (Guillaum.) C. Hansen. A. flowering branch; B. flower without petal; C. stamens; D. fruit; E. cross section of fruit; F. seed; G. stellate hair in stem; painter: N. T. Hien



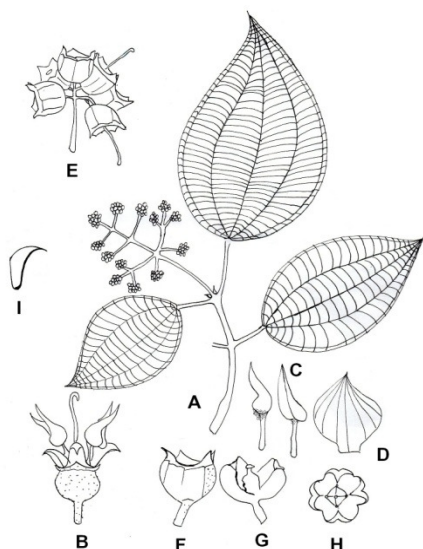


Fig. 4. *Blastus multiflorus* (Cogn.) Guillaum.  
A. flowering branch; B. flower; C. stamens; D. bud; E. Inflorescence; F. capsule; G. opened capsule; H. cross section of fruit; I. seed; painter: N. T. Hien

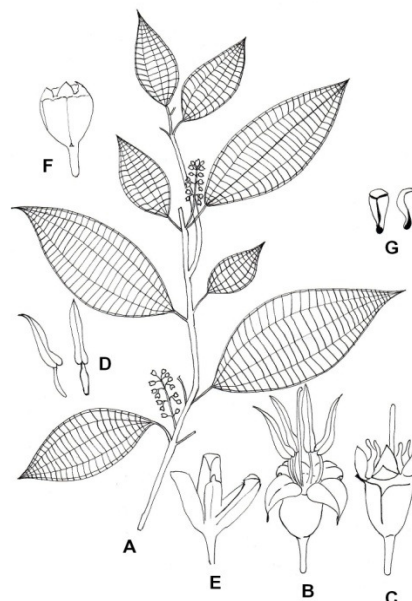


Fig. 5. *Blastus eglandulosus* Stapf ex Spare.  
A. flowering branch; B. flower; C. flower without petal; D. stamens; E. capsule opened; F. bud; G. seed; painter: N. T. Hien

#### 4. Conclusion

The main morphological characteristics to identify species of *Blastus* Lour. in Vietnam include: shrubs; leaves glabrous, 3 or 5 nerves from base; inflorescence cymes; calyx lobes triangular or quadangular; petals 4; stamens 4, equal in size and shape, indistinctly to distinctly connective; capsule dehiscens apically; seed oblong, distinct break at chalaza and distinct furrow along raphe.

We have constructed the key to species for five species and one variety of *Blastus* Lour. based on characteristics of the petioles, leaf equal or unequal in size, peltate glands in adaxially, inflorescences, calyx lobes, anther curve or not.

We have described morphological characteristics of five species and one variety of *Blastus* Lour. in Vietnam and provided more information about their typus, distribution,

biology and ecology, examined specimens and application values (if possible) of each species. More noticeable, *Blastus eglandulosus* Spare and *B. borneensis* var. *eberhardtii* were only recorded in Vietnam so they may be considered endemic to the country.

#### Acknowledgements

We are grateful to the directors, curators and staffs of Hanoi Herbarium of Institute of Ecology and Biological Resources, Hanoi, Vietnam (HN); Herbarium of VNU University of Science, Hanoi, Vietnam (HNU); Herbarium of National Institute of Medicinal Materials (HNPM); Herbarium of Institute of Tropical Biology, Ho Chi Minh city, Vietnam (VNM) for their facilities. This work has supported by Department of Botany, Faculty of Biology, VNU University of Science.



## References

- [1] Hansen C., Bulletin du Muséum National d'Histoire Naturelle Section B, Adansonia, botanique, phytochimie, Vol. 4, Muséum National D'Histoire Naturelle, Paris, pp. 43-78, 1982.
- [2] Nguyễn Kim Đào, Melastomataceae. In Nguyễn Tiến Bản (Ed), Checklist of plant species of Vietnam, Vol. 2, NXB Nông nghiệp, Hà Nội, pp. 912-913, 2003.
- [3] Phạm Hoàng Hộ, An illustrated flora of Vietnam, Vol. 2, NXB Trẻ, Tp Hồ Chí Minh, pp. 82-83, 2000.
- [4] Loureiro, Flora Cochinchinensis, Vol. 2 pp. 517, 526, 1790.
- [5] Chun Cheng Yih, Flora Yunnanica (Yunnan Zhi Wu Zhi), Vol. 2, ke xue chu ban she, pp. 101-104, 1970.
- [6] Chen Cheih, Flora republish popularis sinicae, 1, Vol. 53, China, pp. 180-192, 1984.
- [7] Chen Jie, Flora of Guang Xi (Guang Xi Zhi Wu Zhi Di Er Juan Zhong Zi Zhi Wu), Vol. 2, Guang Xi Ke Xue Ji Shu Chu Ban She, China, pp. 10-13, 2005.
- [8] Renner S. S. and Chen Jie, Flora of China, Vol. 13, Science Press & Missouri Botanical Garden China, pp. 371-373, 2007.
- [9] Wen Xiang-Ying, Flora of Hong Kong, Vol. 2, Hong Kong Herbarium and South China Botanical Garden, Hong Kong, pp. 154-155, 2008.
- [10] Guillaumin A., Flore générale de L'Indo-Chine, Vol. 2, Masson et C, Paris, (1908) 895.

## Nghiên cứu phân loại các loài thuộc chi Bo rừng (*Blastus* Lour.) ở Việt Nam

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**Tóm tắt:** Chi *Blastus* Lour. thuộc họ Mua (Melastomataceae) với 12 loài trên toàn thế giới và 5 loài được ghi nhận tại Việt Nam. Chi *Blastus* được công bố lần đầu tiên bởi Loureiro trong cuốn “*Flora Cochinchinensis*” vào năm 1790. Tuy nhiên, hiện nay chúng ta vẫn chưa có bất kỳ nghiên cứu đầy đủ nào về phân loại chi *Blastus* tại Việt Nam. Sau khi tiến hành nghiên cứu, phân tích, tổng hợp các tài liệu liên quan đến chi *Blastus* trên thế giới và ở Việt Nam kết hợp với phân tích đặc điểm hình thái của chi dựa trên những mẫu tiêu bản khô tại các bảo tàng thực vật ở Việt Nam cùng những mẫu tươi thu được ngoài thực địa. Chúng tôi đã thu được các kết quả sau: (1) Xác định được có 5 loài và 1 thứ loài thuộc chi *Blastus* trong họ Melastomataceae được ghi nhận có ở Việt Nam. (2) Xác định một số đặc điểm quan trọng nhận biết của chi *Blastus* ở Việt Nam chủ yếu dựa vào đặc điểm đài và cánh hoa đầu 4 cái, nhị 4 và bằng nhau. (3) Xây dựng khóa lưỡng phân cho 5 loài và một thứ loài thuộc chi *Blastus* ở Việt Nam dựa chủ yếu vào kích thước của cuống lá, kích thước lá, đặc điểm của của nhị, kiểu bao phấn. (4) Mô tả những đặc điểm hình thái nổi bật của 5 loài và một thứ loài thuộc chi *Blastus* ở Việt Nam, cung cấp thông tin về mẫu typus, đặc điểm sinh học, sinh thái, phân bố, mẫu nghiên cứu, giá trị (nếu có) của loài. (5) Loài *B. eglandulosus* và thứ *B. borneensis* var. *eberhardtii* chỉ được ghi nhận phân bố tại Việt Nam nên rất có thể là các taxon đặc hữu.

**Từ khoá:** Chi Bo rừng (*Blastus*), họ Mua (Melastomataceae), phân loại, Việt Nam.