

Melanochyla (Anacardiaceae): a new generic record for Flora of Vietnam

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Abstract: *Melanochyla angustifolia* Hook.f., collected from Kon Chu Rang Nature Reserve, Gia Lai province, is reported here for the first time, marking the first record of the genus *Melanochyla* in Vietnam. Detailed photographic illustrations of the species and a key to the genera of Anacardiaceae in Vietnam are provided here.

Keywords: Central highlands, Kon Chu Rang Nature Reserve, Taxonomy, Phytodiversity, New record

Introduction

The family Anacardiaceae R.Br. comprises approximately 81 genera and about 600 species. It is primarily distributed across the tropics and subtropics, particularly in primary rainforests (Tardieu, 1962; Kochummen, 1996; Heywood, 1996; Ming, 2008; Takhtajan, 2009; Chayamarit, 2010; Pell, 2011; POWO, 2024). The recent checklists of Anacardiaceae in Vietnam have documented 22 genera and 66 species in the country (Nguyen *et al.* 2017; Pham, 2003; Nguyen, 2003).

During 2023 and 2024, floristic surveys were conducted in the Kon Chu Rang Nature Reserve and an interesting specimen of the family Anacardiaceae was collected. After carefully examining the taxonomic literature and type specimens in multiple herbaria (HN, HNU, K,

P, NY, L), we identified the collected species as *Melanochyla angustifolia* Hook.f.

Melanochyla Hook.f., a genus of about thirty species (Chayamarit, 2010; Pell, 2011), is found in several Southeast Asian countries: one species in Thailand (Chayamarit, 2010), four in Brunei (Hassler, 2024), seventeen in Malaysia (Ding, 1978a, b; Kochummen, 1996), and eight in Indonesia (DFI, 2024). Here, we report the first record of this genus and species in Vietnam. Detailed illustrations of our collections and a key to the genera of Anacardiaceae in Vietnam for facilitating the identification of this species are provided.

Materials and Methods

The newly recorded species was collected from the Kon Chu Rang Nature Reserve in Vietnam during September 2023 and January 2024. The herbarium specimens were deposited in the herbarium of the Institute of Ecology & Biological Resources (HN), Vietnam. Morphological characters were studied by consulting the relevant literature (Hooker, 1876; King, 1896; Ding, 1978a, b; Kochummen, 1996).

Taxonomic Treatment

Melanochyla Hook.f., Fl. Brit. India 2(4): 38. 1876. *Lectotype* (designated by Ding Hou, 1978b: 29): *Melanochyla auriculata* Hook.f.

Trees with buttresses or stilt roots. Leaves spirally arranged, simple, entire, and petiolate, with minute papillae on the lower surface. Inflorescences with axillary or terminal panicles, accompanied by bracts and bracteoles, with articulated pedicels. Flowers typically unisexual, with a cup-shaped hypanthium, puberulous outside and accrescent in fruit. Calyx 4–5-lobed; petals 4–5, puberulous outside, woolly on the inner surface. Stamens 4–5, with subulate, densely hairy filaments and oblong, dorsifixed anthers. Disc 4–5-lobed, glabrous. Ovary globose, 1-locular, usually densely hairy, with a short style and 3 stigmas. Drupes globose, fleshy with black resin, and surrounded at the base by the hypanthium. Endocarp hard and thick.

Melanochyla angustifolia Hook.f., Fl. Brit. India 2(4): 39. 1876. *Type*: MALAYSIA, *s.d.*, A.C. Maingay 492 (holo K [K000695567 digital image!]; iso L [L0015798 digital image!]). **Figs. 1 & 2**

Trees, evergreen, 12–20 m tall, trunk 35–40 cm in diam., with greenish grey bark, smooth or slightly cracked surface, yielding black resin. Branchlets light brown, pubescent. Leaves simple, petiole 2.5–4 cm long, thickened towards the base 1–1.5 cm; lamina oblanceolate, elliptic to narrowly elliptic, 23–31 × 6–10 cm, adaxial surface green, abaxial surface white-green, glabrous on both surfaces, with cuneate to attenuate base, margins entire, shortly acuminate to acuminate at apex, secondary veins 12–21 on each side, reticular tertiary veins, distinct below and faint above. Inflorescences terminal panicles, 14–22 cm long, puberulous. Flowers unisexual, subsessile; calyx lobes triangular; petals oblong, elliptic, lanceolate, or oblanceolate, white to yellow, flat. Staminal filaments brown, free; anthers imperfect or abortive stamens present. Disk 5–(or 4-) lobed. Ovary globose; abortive pistils absent in most flowers but present in some, replaced by a tuft of hairs; stigma capitellate. Drupes ellipsoid or ovoid, (2)3–4.5 × 1.5–2 cm, shortly hairy with apex rounded. Seeds dark brown, *c.* 2 × *c.* 1 cm.

Flowering & fruiting: Flowering from May to November; fruiting from April to December.

Habitat & ecology: *Melanochyla angustifolia* was found in mixed evergreen forests with coniferous trees, such as *Dacrycarpus imbricatus* (Blume) de Laub., typically near roadside forest edges at elevations between 950 and 1,100 meters above sea level. This species is currently known from a single locality in the Kon Chu Rang Nature Reserve, Gia Lai Province, Vietnam. It grows along the forest margins, in association with *Brachytome wallichii* Hook.f. (Rubiaceae), *Callicarpa rubella* Lindl. (Lamiaceae), *Litsea* sp. (Lauraceae), *Desmos cochinchinensis* Lour. (Annonaceae), and *Dacrycarpus imbricatus* (Blume) de Laub. (Podocarpaceae).

Distribution: Brunei (Temburong), Indonesia (Kalimantan), Malaysia (Sabah, Sarawak), Thailand (Trang), and now in Vietnam [Gia Lai province, K'Bang district, Son Lang commune (Kon Chu Rang Nature Reserve)].

Specimens examined: BRUNEI, **Temburong district**, Ulu Temburong National Park, Kuala Belalong Field Studies Centre; Ashton Trail, 29.06.2012, D.C. Daly, J.D. Mitchell, M. Saleh, H.M. Shamira & H.Y. Nisah 14434 (NY [NY01415083 digital image!]). MALAYSIA, **Negeri Sembilan**, Jelebu, Pasoh Forest Reserve (FRIM), Nature Trail, 13.06.2012, D.C. Daly, J.D. Mitchell, S. Kamarudin & A. Angan 14304 (NY [NY10415084 digital image!]); **Sabah**, Nabawan district, Labou Forest Reserve, 28.05.1992, *Fidilis Krispinus* SAN130043 (L [L2266837 digital image!]); Beluran district, Sungai (Sg. "Sungai" River), Sapi Forest Reserve Camp, 24.07.1963, *Sayu Elleh* 37447 (L [L2266840 digital image!]); Sandakan district, Jalan Hujung Tanjong, Sepilok Forest Reserve, 01.06.1960, W. Meijer SAN21715 (L [L2266842 digital image!]); **Sarawak**, Sungai Sebuloh, Lundu, First Division, 01.10.1985, O. Ismawi S49908 (L [L2266844, L2266845 digital image!]); 7th Division, Ulu Belaga, Sepakau logging camp, 06.11.1981, Hansen C973 (L [L2266835 digital image!]); Ulu Medamit, Limbang, 5th Division, 11.10.1972, A.E. Wright & O. Ismawi 32304 (L [L2266843

digital image!]); Sungai, Mengiong, Balleh, Kapit, Third Division., 22.01.1970, *O. Ismawi* S.29689 (L [L2266839 digital image!]); Malaya, road to Bukit Tinggi, 12.05.1983, *K.M. Kochummen* FRI 26253

(L [L2266863 digital image!]); Malaya, Johore, Rengam Virgin Jungle Reserve, 13.04.1971, *K.M. Kochummen* FRI16374 (L [L2266872 digital image!]); Malaya, Selangor, Sungai Buloh Forest



Fig. 1. *Melanochyla angustifolia* Hook.f.: **a.** habit; **b.** fruiting branch-lateral view; **c.** fruiting branch-front view; **d.** fruits; **e.** stem showing black resin exudate (Photos by T.D. Binh).

Reserve, 27.05.1970, K.M. Kochummen FRI16046 (L2266859, L2266860 digital image!); Malaya, Selangor, Ampang Forest Reserve, Catchment area, 06.06.1970, T.C. Whitmore FRI15161 (L

[L2266858 digital image!]); Malaya, NE Johore, Lenggong forest reserve, 10.05.1968, T.C. Whitmore FRI8645 (L [L2266867 digital image!]); Malaya, Trengganu, Ulu S. Trengan, NW of Batu

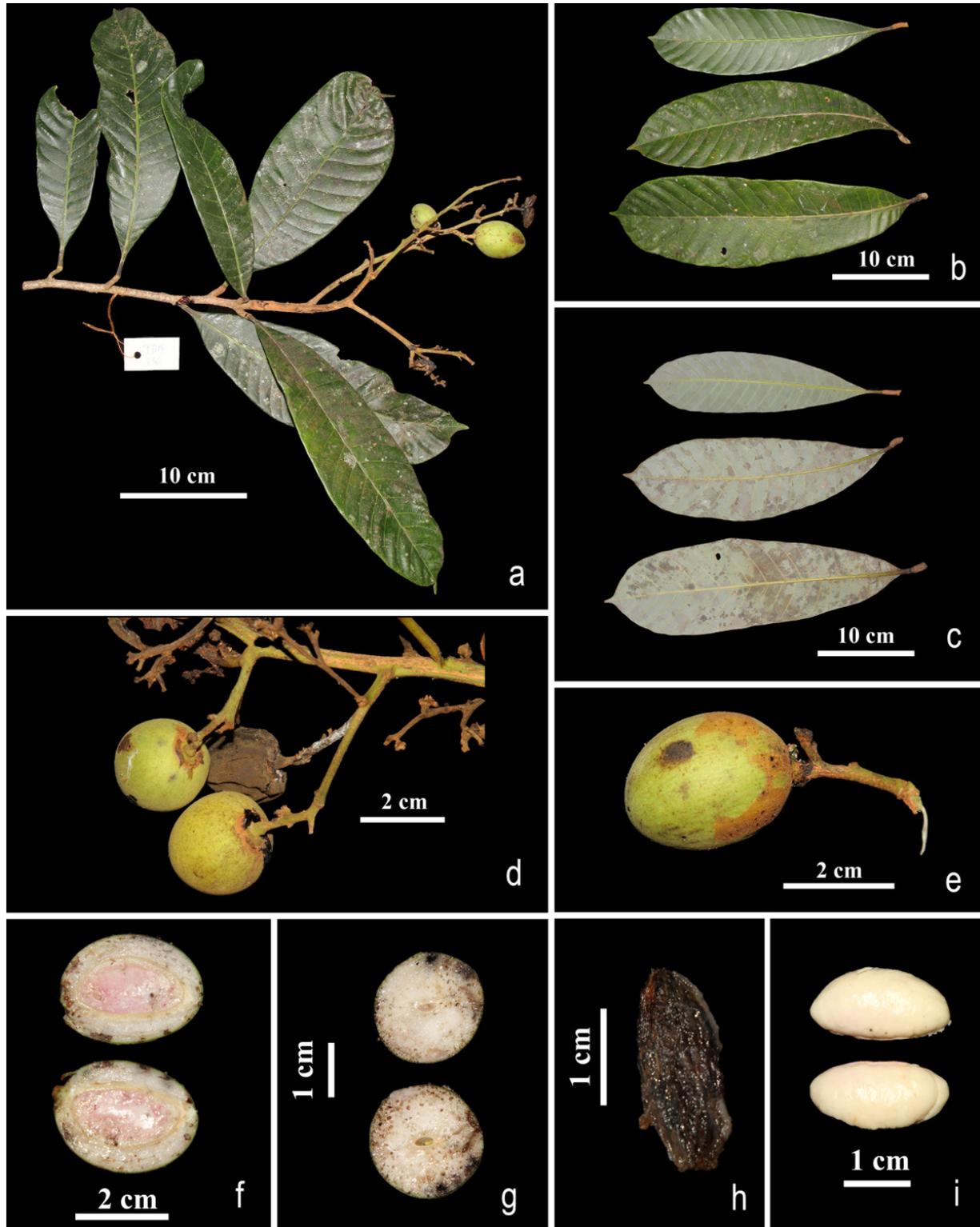


Fig. 2. *Melanochyla angustifolia* Hook.f.: a. twig with fruit; b. leaf-adaxial side; c. leaf-abaxial side; d, e. fruits; f. longitudinal-section of fruit; g. cross-section of fruit; h. mature seed; i. endosperm (Photos by T.D. Binh).

Bidan, 11.06.1968, *P.F. Cockburn* FRI10587 (L [L2266861 digital image!]), Malaya, N. Kelantan, Kemahang, 27.06.1968, *T.C. Whitmore* FRI8879 (L [L2266865, L2266866 digital images!]): Malaya, Ulu Trengganu, Ulu S. Trenggan, near K. Petang, 03.06.1968, *P.F. Cockburn* FRI8433 (L [L2266868 digital image!]); Malaya, Trengganu, Ulu S. Trenggan, Kg. Melaka, 07.06.1968, *P.F. Cockburn*, FRI10534 (L [L2266871 digital image!]); Malaya, North Kelantan, Kemahang, 01.07.1968, *Y.C. Chan* FRI6686 (L [L2266856, L2266857 digital images!]); Malaya, 10th mile Dungu, Bukit Besi Road, compt. 12B, Bukit Bauk FR, 18.06.1967, *K.M. Kochummen* FRI 2399 (L2266864 digital image!), Malaya, Sungai Buloh Forest Reserve, 08.06.1963, *K.M. Kochummen* 94988 (L2266869 digital image!); Malaya, Bukit Lagong Forest Reserve, Kuala Lumpur, 06.08.1960, *Ahmad* 85227 (L [L2266862 digital image!]); Malaya, Selangor, Sungai Buloh, Rubber Research Institute Experimental Estate, forest clearing lately Forest Reserve, 23.11.1956, *H.M. Burkill & M. Shah*, HMB.1037 (L [L2266870 digital image!]). INDONESIA, **East Kalimantan**, Sepaku area, PT, ITCI, Kenangan, Balikpapan., 08.03.1991, *Ambri & Arifin* AA117 (L [L2266846 digital image!]); West Kalimantan Province, Gunong Bentuang area, 5-10 km North of Masa village, 150 km North East of Pontianak, Ridge system West of Semawang River, 13.06.1989, *J.S. Burley, Tukirin* 2570 (L [L2266847, L2266848 digital images !]); Borneo, Bukit Raya, Tumbang Sah, 03.02.1983, *H. Wiriadinata* 3502 (L [L2266841 digital image!]); Borneo, *W. Kalimantan*, NSF 312 (L [L2266836 digital image!]). THAILAND, **Trang**, Khao Chong, 12.03.1974, *K. Larsen & S.S. Larsen* 33254 (L [L2266854 digital image!]); *ibid.*, 05.04.1971, *S. Phusomsaeng* 413 (L [L2266855 digital image!]); P [P06633071 digital image!]. VIETNAM, **Gia Lai province**, K'Bang district, Son Lang commune, roadside forest margins, near the office area, N 14°29'33.42", E 108°32'37.01", 1050 m, Kon Chu Rang Nature Reserve, 27.11.2023, in fruiting, *Bui Hong Quang & Tran Duc Binh* TDB 336 (HN [HN000080490!]); *ibid.*, N

14°28'53.00" E 108°32'55.07", 980 m, 23.01.2024, in fruiting, *Bui Hong Quang & Tran Duc Binh* TDB 369 (HN [HN000080490!]).

Key to the genera of Anacardiaceae in Vietnam

1. Carpels free, sometimes 1-carpel developed (*Anacardiaceae*)..... 2
1. Carpels connate (*Spondieae*, *Rhoideae*, *Semecarpeae*)...8
2. Stamens 30–35, arranged in many whorls*Melanorrhoea*
2. Stamens 4–12, arranged in 1–2 whorls..... 3
3. Stamens twice the number of petals (8–12), arranged in 2 whorls..... 4
3. Stamens equal to the number of petals (4–5), arranged in 1 whorl 5
4. Flowers bisexual; stamens equal, without staminode; ovary enclosed by a disk; peduncle caducous *Buchanania*
4. Flowers bisexual or unisexual; stamens unequal with staminode, 1 stamen fertile; ovary without a disk; peduncle fleshy, *Anacardium*
5. Flowers bisexual without staminode..... 6
5. Flowers bisexual or unisexual with staminode...7
6. Leaves alternate; ovary without a disk*Gluta*
6. Leaves opposite or verticillate; ovary enclosed by a disk.....*Bouea*
7. Flowers without a disk; petal accrescent with fruit into wings; endocarp without crustaceous endocarp *Swintonia*
7. Flowers with a disk; petal not accrescent with fruit; endocarp crustaceous.....*Mangifera*
8. Gynoecium with 4–5 connate carpels, locules 4–5 (*Spondieae*) 9
8. Gynoecium with 1–3 connate carpels, locule 1 (*Rhoideae*, *Semecarpeae*)..... 15
9. Lianas.....*Pegia*
9. Trees..... 10

- 10. Perianth 4-merous*Lansea*
- 10. Perianth 5-merous 11
- 11. Perianth imbricate 12
- 11. Perianth valvate..... 14
- 12. Flowers bisexual.....*Dracontomelum*
- 12. Flowers unisexual (polygamo-dioecious or dioecious) 13
- 13. Female flowers axillary, solitary or 2–3 flowers; male flower paniced.....*Choerospondias*
- 13. Female and male flowers paniced... *Pleiogynium*
- 14. Endocarp crustaceous; lateral veins gradually extend to create intramarginal veins *Spondias*
- 14. Endocarp not crustaceous; lateral veins do not create intramarginal veins.....*Allospodias*
- 15. Leaves pinnately compound; ovary superior (*Rhoideae*)..... 16
- 15. Leaves simple; ovary superior or inferior (*Semecarpeae*) 20
- 16. Petal and sepals in 1 whorl..... 17
- 16. Petal completely reduced or left calyx in 1 whorl*Pistacia*
- 17. Stamens twice the number of petals (8–10) in 2 whorls..... 18
- 17. Stamens equal to petals (4–5) in a single whorl..19
- 18. Flowers bisexual; drupaceous, oblong ovoid *Pentaspadon*
- 18. Flowers unisexual; drupaceous globose..... *Schinus*
- 19. Inflorescences terminal; exocarp ciliate and glandular hair *Rhus*
- 19. Inflorescences axillary; exocarp smooth *Toxicodendron*
- 20. Ovary superior..... 21
- 20. Ovary inferior 22
- 21. Fruit with mesocarp and endocarp.....*Melanochyla*
- 21. Fruit with hypocarp.....*Semecarpus*

- 22. Flowers polygamous; perianth imbricate; stigma 1*Drimycarpus*
- 22. Flowers unisexual; perianth valvate; stigma 3 *Holigarna*

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