Turczaninowia 27, 3: 159–176 (2024)
DOI: 10.14258/turczaninowia.27.3.15
http://turczaninowia.asu.ru

ISSN 1560–7259 (print edition)
TURCZANINOWIA
ISSN 1560–7267 (online edition)

УДК 582.725:581.96(597)

New genus and species, *Quangnamia syncarpa* (Hamamelidaceae), from central Vietnam

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Keywords: Altingiaceae, central Truong Son Range, endemism, plant diversity, plant taxonomy, Quang Nam Province.

Summary. A new monotypic genus, *Quangnamia* (Hamamelidaceae), and its species, *Q. syncarpa*, discovered in central Vietnam are described and illustrated. *Quangnamia syncarpa* is evergreen treelet or tree with non-stellate indumentum on vegetative and floral parts, glabrous twigs and leaves, axillary inflorescences in form of spadix-like many-flowered heads, hermaphrodite, 5(6)-merous flowers, petals straight in bud, in open flowers greenish yellow, linear-lorate to linear, ribbonlike with straight and entire margins, lacking staminodes, 1-sporangiate anther thecae dehisced by a longitudinal slit, gynoecium syncarpous of two completely fused carpels, with inferior 2-locular ovary, each locule with 2 ovules placed on axial placenta, irregularly globular syncarpous infructescence consisting of few- to many 2-carpellate capsules, dorsoventrally flattened, broadly obovoid, entire or slightly retuse at apex, opening septicidally like bivalve shell, with two seed per carpel, and wingless seed. Morphological comparison of *Quangnamia* with related genera, and notes on the habitat, phenology, and conservation status of the new plant are provided and discussed.

Поступило в редакцию 06.09.2024
Принято к публикации 25.10.2024

Submitted 06.09.2024
Accepted 25.10.2024

Quangnamia syncarpa (Hamamelidaceae) – новый род и вид из центрального Вьетнама

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Ключевые слова: провинция Куангнам, разнообразие растений, таксономия растений, центр хребта Труонг Шон, эндемизм, Altingiaceae.

Аннотация. В статье приводится иллюстрированное описание нового монотипного рода *Quangnamia* (Hamamelidaceae) и его вида *Q. syncarpa*, обнаруженного в центральном Вьетнаме. *Quangnamia syncarpa* – вечнозелёное деревце или дерево с не звёздчатым опушением вегетативных и генеративных органов, голыми ветвями и листьями, пазушными соцветиями в виде початковидных многоцветковых головок, обоеполыми 5(6)-членными цветками, лепестками в бутоне прямыми, в раскрытых цветках зеленовато-жёлтыми, линейно-лопатчатыми до линейных, лентовидными с прямыми и цельными краями, без стаминодиев, пыльниками 1-спорангиатными, вскрывающимися продольной щелью, гинецеем синкарпным, состоящим из двух полностью сросшихся плодолистиков, с нижней 2-гнёздной завязью, каждое гнездо с 2-мя семяпочками, расположенными на осевой плаценте, синкарпным бугристо-шаровидным соплодием, состоящим из нескольких или многих коробочек, составленных двумя плодолистиками, дорсовентрально уплощёнными, широко-обратнояйцевидными, цельными или слегка выемчатыми на верхушке, открывающимися септицидно, как раковина двустворчатого моллюска, с двумя семенами на плодолистике и бескрылыми семенами. Приводятся заметки о среде обитания, фенологии и охранном статусе открытого растения, а также обсуждается его морфологическое сходство с родственными родами.

Hamamelidaceae R. Br. (Brown, 1818) consists of 26 accepted genera and 114 species, widely distributed in temperate, tropical, and subtropical regions of North, Central and South America, E and S Africa, E, W and SE Asia, NE Australia, and Pacific Islands (POWO, 2024). In the past, it included the family Altingiaceae Horan. (Horaninow, 1841) and was divided into several subfamilies (Harms, 1930; Chang, 1973; Li, 1997; Endress, 1989, 1993). Four subfamilies, *Hamamelidoideae* Reinsch (Reinsch, 1890), *Rhodoleioideae* Harms (Harms, 1930), *Exbucklandioideae* (as *Bucklandioideae*) Reinsch (Reinsch, 1890), and *Altingioideae* Reinsch (Reinsch, 1890) were recognized by Endress (1989, 1993). Li (1997) in addition to taxonomic treatment of Endress (1989, 1993) accepted two more subfamilies, *Disanthoideae* Harms (Harms, 1930) including monotypic genus of *Disanthus* Maxim. (Maximowicz, 1866), and the *Mytilarioideae* H. H. Chang (Chang, 1973) consisting of *Mytilaria* Lecomte (Lecomte, 1924) and *Chunia* H. T. Chang (Chang, 1948). Both were included earlier by Endress (1989, 1993) into the subfamily *Exbucklandioideae*.

Three genera, *Liquidambar* L. (Linnaeus, 1753), *Altingia* Noronha (Noronha, 1790), and *Semiliquidambar* H. T. Chang (Chang, 1962),

having superficial resemblance with our plant, were placed under the *Altingioideae*, which shares 5 key characters, namely caducous small stipules, unisexual flowers aggregated in dense head (or rarely spike), carpels with many ovules (> 20), ripe carpel with 2 or more seeds, and ripe seeds not ejected out of capsule at maturity (Endress, 1989). Modern molecular and morphological data supported to raise the *Altingioideae* as a separated family namely Altingiaceae and expanded the genus *Liquidambar* including the *Altingia* and *Semiliquidambar* (Ickert-Bond, Wen, 2013; Jia et al., 2024; POWO, 2024). The Altingiaceae is strikingly differentiated from Hamamelidaceae by its capitate woody infructescences with many bicarpellate fruits, and male inflorescences in heads aggregating into racemes (Ickert-Bond, Wen, 2013), unisexual flowers, and absence of stellate indumentum, sepals and petals (Endress, 1989; Takhtajan, 2009).

While identification of several specimens of Hamamelidaceae (CPC 3452, CPC 3599, CPC 3624, HH-QN 15, HH-QN 30 and HH-QN 45) collected from Quang Nam Province deposited in HN (Vietnam) and LE (Russia) herbaria, and their photographs, we found that these collections and images belong to undescribed plant. These plants are evergreen, small to medium size trees, which have non-stellate indumentum, alternate, simple leaves with pinnate venation and entire margin, caducous, small, linear stipules, inflorescence in form of axillary spadix-like many-flowered head with bisexual, 5(6)-merous flowers, petals straight (not circinate) in bud, lacking staminodes, anther with two 1-sporangiate thecae, each theca opened by longitudinal slit, gynoecium syncarpous of 2 entirely fused carpels, inferior 2-locular ovary, each locule with 2 ovules placed on axial placenta, each capsule dehiscing at apex septicidally by two valves, each fruiting fertile capsule usually containing 2 seeds. It is clear that discovered plant with mentioned characters belongs to the Hamamelidaceae family (Endress, 1989, 1993; Takhtajan, 2009).

Newly sequenced plastomes (Jia et al., 2024) clearly showed the phylogenetic position of each genus within each subfamily of Hamamelidaceae and proved that the *Exbucklandia* R. W. Br. (Brown, 1946) is sister to *Rhodoleia* Champ. ex Hook. (Hooker, 1850), these two genera are sister to the clade of (*Chunia* + *Mytilaria*) and (*Disanthus* + all other genera studied of *Hamamelidoideae*). These modern molecular data raise disputation of placing *Rhodoleia* into subfamily, separate from *Exbucklandioideae*; or placing *Exbucklandia, Chunia, Mytilaria*, and *Disanthus* into the subfamily *Exbucklandioideae*, and *Rhodoleia* into *Rhodoleidoideae* as this is accepted in taxonomic reviews of Endress (1989, 1993) and Takhtajan (2009). Meanwhile, the mentioned data stand in discord with the systematic treatment based on both morphology and molecular data (*matK* and ITS sequences) of Li (1997). Morphological data (Table 1) clearly show that our plant cannot be placed into any subfamilies of the Hamamelidaceae treated by Endress (1989, 1993), Li (1997), and Takhtajan (2009) due to several characters that are perhaps intermediate between currently accepted subfamilies.

After careful investigation of relevant literature and examining of available specimens of known taxa stored in numerous herbaria (E, K, P, PE, KUN, HN) and available digitalized specimens (https://en.herbariumle.ru/, https://plants.jstor.org/, https://sweetgum.nybg.org/science/vh/, https://worldfloraonline.org/, https://www.cvh.ac.cn/, https://www.gbif.org/, etc.), we found that our species represent an undescribed genus of Hamamelidaceae. It is morphologically most similar to *Disanthus* distributed in China, Japan, and Vietnam (Zhang et al., 2003; Averyanov et al., 2017), *Mytilaria* recorded from China, Laos, and Vietnam (Zhang et al., 2003), of the subfamily *Exbucklandioideae* (Endress, 1989, 1993; Takhtajan, 2009), or *Disanthoideae* (Harms, 1930; Chang, 1973; Li, 1997) by its evergreen habit, vegetative organs without stellate hairs, 5-merous flowers aggregated in dense spike, drupe or fruits in form of syncarpous carpels, having more than one seed. It also resembles *Trichocladus* Persoon (Persoon, 1807) from Africa, of the subfamily *Hamamelidoideae* (Harms, 1930; Chang, 1973; Endress, 1989, 1993; Li, 1997; Takhtajan, 2009) having inflorescence in form of axillary spadix-like many-flowered head, 5-merous flowers, anther consisting of two 1-sporangiate thecae opening by a single longitudinal slit, pinnate leaf venation, and evergreen habit. The morphological comparison of the expectedly new genus, named *Quangnamia*, with its morphologically closest relatives is presented in Table 2.

Table 1

Morphological comparison of *Quangnamia* with genera of Hamamelidaceae subfamilies (Endress, 1989, 1993)

Characters	***Quangnamia***	***Altingioideae* (*Liquidambar, Altingia, Semiliquidambar*)**	***Rhodoleioideae* (*Rhodoleia*)**	***Exbucklandioideae* (*Disanthus, Mytilaria, Chunia, Exbucklandia*)**	***Hamamelidoideae* (*Hamamelis, Loropetalum*, etc., genus 1 to 22 in Endress, 1993)**
Habit	small to medium-size tree, evergreen	medium-size to big tree, evergreen or deciduous	small to big tree, evergreen	small to medium-size tree, evergreen or deciduous	small to medium-size tree, evergreen, semi-deciduous, or deciduous
Stellate hairs	absent	absent	absent or present	absent	mostly present
Leaf shape	elliptic	ovate, tricuspidate, or palmately lobed	ovate, rarely cordate	mostly cordate, ovate, often tricuspidate	mostly ovate, sometimes cordate
Leaf vein	pinnate	pinnate or palmate	pinnate	pinnate, actinodromous, palmate	pinnate, actinodromous
Leaf margin	entire	entire or toothed	entire	entire	entire or toothed
Stipule	present	present	mostly absent	present	present
Inflorescence	axillary, aggregated spadix-like many-flowered head	aggregated in dense heads (or spikes)	a pseudanthium of strongly zygomorphic flowers	2 to numerous flowers, aggregated in dense spikes	spikes or heads (rarely dense panicles)
Flower sex	bisexual	unisexual	bisexual	bisexual	bisexual, rarely unisexual
Sepal number	5(6)	0	rudimentary, number not distinguishable	0 or 5	4–6
Petal number	5(6)	0	0 or 1–4	0 or 5	0 or 4–6
Petal development in bud	straight		straight	circinate, or straight	circinate, or rarely straight
Staminode	absent	absent or present	present	absent or present	absent or present
Stamen number	5–6	4 to many	6–11	5, 10–15	4–6
Anther	with 1-sporangiate thecae, each theca opened by 1 valve	with 2-sporangiate thecae, each theca opened by 1 valve	with 2-sporangiate thecae, each theca opened by 2 valves	with 1, or 2-sporangiate thecae, each theca opened by 1–2 valves	with 1, or 2-sporangiate thecae, each theca opened by 1–2 valves
Ovary	inferior	inferior	semi-inferior	almost superior, semi-inferior, inferior	superior to semi-inferior, or inferior
Ovule per carpel	2	20–47	10–20	5–8	1, or rarely 1 + 2 abortive
Seed wing	absent	absent, or present	present	absent, or present	absent
Seed ejection	ejected at maturity	not ejected at maturity	not ejected at maturity	not ejected at maturity	ejected at maturity
Chromosome base number (*x*)	?	8	12	8, 13	12

Table 2

Morphological comparison of *Quangnamia* with most similar genera

Characters	***Quangnamia***	***Rhodoleia*** **(1, 2)**	***Mytilaria*** **(1, 2, 3, 4)**	***Disanthus*** **(1, 2, 5, 6)**	***Trichocladus*** **(1, 7, 8)**	***Loropetalum*** **(1, 2, 9)**	***Hamamelis*** **(1, 2, 10)**
Habit	small to medium-sized tree 1.5–25 m tall, evergreen	small to medium-size tree to 20 m tall, evergreen (1, 2)	tree to 30 m tall, evergreen (1, 2, 3, 4)	small tree to 5 m tall, evergreen or deciduous (1, 2, 6)	small tree, evergreen (1, 7, 8)	small tree, evergreen or semi-deciduous (1, 2, 9)	small tree, deciduous (1, 2, 10)
Stellate hairs	absent	absent (1, 2)	absent (1, 2, 3, 4)	absent (2, 5, 6)	present (1, 7, 8)	present (2, 9)	present (2, 10)
Leaves	alternate, simple, margin entire	alternate, simple, margin entire (1, 2)	alternate, tricuspidate or simple, margin entire (1, 2, 3, 4)	alternate, simple, margin entire (1, 2, 5, 6)	alternate or opposite, simple, margin entire or dentate (1, 7)	alternate, simple, margin entire (1, 2, 9) or sparsely serrulate (2)	alternate, simple, margin entire, undulate-dentate, or dentate (2, 10)
Venation	pinnate	pinnate (1, 2)	actinodromous (1), palmate (2–4)	Pinnate (6), actinodromous(1) or palmate(2, 5)	pinnate or actinodromous (1, 7)	pinnate (1, 2, 9)	pinnate (2, 10)
Stipule	linear, rudimentary, to 2 mm long	almost absent (1, 2)	narrowly ovate (2), enclosing apical bud (2, 3, 4)	linear (2, 5), lanceolate, or narrowly ovate, 6.5–13.5 × 1.5–4 mm (6), not enclosing the apical bud (1, 2, 5, 6)	subulate(7), or linear (8), not enclosing the apical bud (1, 7, 8)	triangular-lanceolate, or obovate, 3–5 × 1.5–2 mm in L. *chinense* (2), or narrowly lanceolate, 3–5 × 0.8–1.2 mm in *L. flavum* (9)	stipules insignificant, caducous, leaving small scar (2)
Inflorescence	axillary, spadix-like many-flowered head	axillary, 5–8 flowered (2), pseudanthial head (1)	terminal or leaf-opposed, densely spicate, many-flowered, narrowly ellipsoid or cylindrical, 3–4 cm long (2, 3, 4)	axillary, capitate, 1–3 flowered (1, 2, 5, 6)	axillary or terminal, capitate or spicate, many-flowered (7, 8)	axillary or terminal, capitate, shortly spicate, or racemose, 3–25-flowered (2, 9)	axillary, capitate, or shortly spicate, 3–4-flowered (1, 2, 10)
Flower sex	bisexual	bisexual (1, 2)	bisexual (1, 2, 4)	bisexual (1, 2, 5, 6)	bisexual (1, 7, 8), or unisexual (7, 8)	bisexual (1, 2, 9)	bisexual (1, 2, 10)
Sepals number	5(6)	absent (2) or rudimentary, number uncertain (1, 2)	5 (1, 2), or 5–6 (4)	5 (1, 2, 5, 6)	5 (1)	4–6 (1, 2, 9)	4 (1, 2, 10)

Table 2 (continued)

Characters	*Quangnamia*	*Rhodoleia* (1, 2)	*Mytilaria* (1, 2, 3, 4)	*Disanthus* (1, 2, 5, 6)	*Trichocladus* (1, 7, 8)	*Loropetalum* (1, 2, 9)	*Hamamelis* (1, 2, 10)
Petals number	5(6)	(0), or 1–5 (1, 2)	5 (1, 2, 4)	5 (1, 2, 5, 6)	5 (1,8), or often absent in female flower (8)	4–6 (1, 2, 9), rarely 3, or 7 (9)	4 (1, 2, 10)
Petal shape in bud	straight	straight (1, 2)	straight (1, 2, 4)	circinate (1, 2, 5, 6)	circinate (1, 8) or straight(1)	circinate (1, 2, 9)	circinate (1, 2, 10)
Staminodes	absent	present (1, 2)	present(1, 2)	absent(4)	absent(1, 7, 8)	present(2, 9)	present(1, 2, 10)
Stamens	5(6)	6–11 (1, 2)	5 (1, 2), or 10–13 (4)	5 (1, 2, 5, 6)	5(1, 7, 8)	4–6 (1, 2, 9), rarely 3 or 7 (9)	4 (1, 2, 10)
Anther	with 1-sporangiate thecae, each opening by a longitudinal slit	with 2-sporangiate thecae, each opening by 2 valves (1, 2)	with 2-sporangiate thecae, each opening by 2 valves (1, 2, 4)	with 2-sporangiate thecae, each opening by a longitudinal slit (1, 2, 6)	with 2-sporangiate thecae, each opening by 1 valve (1)	with 2-sporangiate thecae, each opening by 2 valves (1, 2, 6)	with 1-sporangiate thecae, each opening by 1 valve (1, 2, 10)
Ovary	inferior	semi-inferior (1, 2)	semi-inferior (1, 2, 3, 4)	almost superior (1, 2, 5) to semi-inferior (6)	almost superior to inferior (1, 8)	Inferior (1, 2, 9), or semi-inferior (2)	semi-inferior (1, 2) to almost inferior (10)
Ovule per locule	2	10–20 (1, 2)	2 (3), or 6 (1, 2, 4)	5 (5), 4–5 (6), or 5–6 (1, 2)	1 (1, 8)	1 (1, 2, 9)	1 (1, 2)
Infructescence	spadix-like head, formed by few to many capsules completely sunken into and enclosed by the woody globose accrete torus, or capsules completely fused into the woody globose axis	semi-head, formed by few to several capsules distally free, proximally connate to each other, and adnate to a woody obconoid axis or floral cup (2, 11)	distortedly ellipsoid or cylindrical spike, formed by many capsules distally free, proximally connate to each other, and partly fused into the cylindrical axis (2, 3, 11)	single or compact of 2–3 capsules totally free or proximally shallowly connate to each other, basally adnate to a woody obconoid axis 1–3 mm height (2, 6, 11)	semi-head formed by several capsules totally free or proximally connate to each other, basally adnate to a woody obconoid axis or floral cup (11)	semi-head or umbel-like formed by several capsules totally free or proximally connate to each other, basally adnate to a woody obconoid axis or floral cup (2, 11)	head-like aggregate formed by 2–4 capsules, distally free, proximally connate to each other, basally adnate to a woody obconoid axis or floral cup (2, 11)
Capsule shape	dorsoventrally flattened, broadly obovoid, bivalve shell-like	not flattened, obovoid (11)	not flattened, ovoid (3, 4, 11)	not obovoid (6, 11)	not flattened, ovoid (8,11)	not flattened, ovoid, or globose (2, 11)	not flattened, ovoid (2, 11)

Table 2 (continued)

Characters	*Quangnamia*	*Rhodoleia* (1, 2)	*Mytilaria* (1, 2, 3, 4)	*Disanthus* (1, 2, 5, 6)	*Trichocladus* (1, 7, 8)	*Loropetalum* (1, 2, 9)	*Hamamelis* (1, 2, 10)
Capsule apex	apically round, entire or slightly retuse, without persistent style base	apically 2-lobed, with persistent style base (11)	apically obtuse or retuse, without persistent style base (3, 4, 11)	apically shallowly 2-lobed (2) or 2-horned (6), with persistent style base (6, 11)	apically 2-horned, with persistent style base (8, 11)	apically almost entire, or shallowly 2-lobed, with inconspicuous style base (2, 11)	apically 2-horned, with persistent style base (2, 11)
Capsule dehiscence	by two entire valves	by four valves (2)	by four valves (3), or two 2-lobed valves (2)	by two valves (2), or two 2-lobed valves (6,11)	by two bifid valves (8)	by two 2-lobed valves (2)	by two 2-lobed valves (2)
Seed ornamentation	wingless	winged (1, 2)	wingless (1, 3)	wingless (1, 2, 5, 6)	wingless (1, 8)	wingless (1, 2)	wingless (1, 2, 10)
Distribution	Vietnam	Mainland SE Asia, Sumatra (1, 2)	China, Laos, Vietnam (1, 2, 3, 4)	China, Japan, Vietnam (1, 2, 5, 6)	eastern & southern Africa (1, 7, 8)	India, China, Japan and Vietnam (1, 2, 9)	China, Japan, eastern North America (1, 2, 10)

Note. Characters and reference sources: Endress, 1993 (1); Zhang et al., 2003 (2); Lecomte, 1924 (3); Chang, 1948 (4); Maximowicz, 1866 (5); Averyanov et al., 2017 (6); Hutchinson, 1933 (7); Bamps, 1951 (8); Averyanov et al., 2018 (9); Prain, 1914 (10); observation (11) based on specimens of herbaria listed in our text and photos available from Plant Science Data Center, Chinese Academy of Sciences (https://www.plantplus.cn/en), Plant Photo Bank of China (https://ppbc.iplant.cn/), Global Biodiversity Information Facility (https://www.gbif.org/), African Plants – A Photo Guide (http://www.africanplants.senckenberg.de/root/index.php).

Material and Methods

Observations and measurements of morphological features were made on fresh, dry, and liquid fixed materials collected in 2011 and 2024. The general terminology for the morphological descriptions follows Beentje (2016). In the descriptions, for the quantitative characters, infrequent extreme values (i. e., rarely occurring minimal and maximal values) of a variation range are indicated in parentheses before and after the normal variation range. The detailed analytical photos of plants were made from the living and dry materials. The IUCN Red List Guidelines (IUCN, 2024) was employed to assess the conservation status. Institutions where the cited specimens are housed are indicated by their internationally accepted herbarium acronyms (Theirs, 2024).

Taxonomic treatment

Quangnamia K. S. Nguyen et Aver., **gen. nov.**

Diagnosis. *Quangnamia* is most similar to *Liquidambar, Mytilaria*, and *Trichocladus* but distinct from them and all other known genera of Hamamelidaceae in capitate infructescence with capsules completely sunken into woody, globose torus, capsules dorsoventrally flattened, broadly obovoid, entire or slightly retuse at apex, without persistent style base, and the combination of the following features: evergreen, hermaphroditic tree; absence of stellate indumentums and staminodes; perulate vegetative buds; glabrous, simple, pinnate-nerved leaves; early caducous minute linear stipules; inflorescence in form of axillary spadix-like many-flowered head; bisexual 5(6)-merous flowers; petals straight in bud, ribbonlike in opened flowers; 1-sporangiate anther thecae dehisced by a longitudinal slit; syncarpous gynoecium of 2 completely fused carpels; inferior 2-locular ovary, and 2 ovules per locule.

Type: *Quangnamia syncarpa* K. S. Nguyen, Aver., C. W. Lin, G. Q. Liu et H. H. Truong.

Monotype genus.

Etymology. Refers to the name of Quang Nam Province, where the type species was discovered.

Description. Tree up to 25 m tall, rarely generative treelet about 1.5 m tall, evergreen, hermaphroditic, with glabrous trunk and branches. **Buds** perulate, obtuse to acute, composed of 4–5 coriaceous scales; scales cymbiform, glabrous, but ciliate along the margin. **Stipules** early caducous, linear. **Leaves** alternate, petiolate, indistinctly distichous, glabrous; leaf blade simple, leathery or coriaceous, margin entire, venation pinnate, tertiary veins well distinct on both surfaces, almost perpendicular to main veins, forming abaxially prominent reticulum. **Inflorescence** axillary pedunculate spadix-like many-flowered head, 2–3 cm in diameter; peduncle erect, stout, densely hairy with soft brown orange hairs, bracteate; sterile bracts 2–3(4), distant, spirally arranged, minute, insignificant, triangular, pubescent; rachis almost globular, fleshy. **Flowers** ebracteate, widely opening, bisexual, actinomorphic, epigynous, sessile, densely adpressed to each other, with ovary completely sunk into fleshy rachis, 5(6)-merous, with 2-whorled perianth and flat, round, densely hairy floral disc, forming no floral cup. **Sepals** 5(6), brownish orange, slightly imbricate, straight, ovate to broadly ovate, slightly concave, round at apex, densely hairy with soft white hairs on both sides. **Petals** 5(6), straight in bud, yellow, linear-lorate to linear, ribbonlike, glabrous, spreading, straight, tapering to the base, margins straight and entire, apex obtuse to roundish. **Androecium** of 5(6) stamens, alternate with petals, without staminodia; stamens free, glabrous, arranged in one whorl; filaments dorsoventrally flattened, recurved; anthers basifixed, introrse, laterally with 2 narrowly ovoid 1-sporongiate thecae, each dehiscing by 1 longitudinal slit; connective protrusion conoid, erect, obtuse to round. **Gynoecium** syncarpous of 2 completely fused carpels (except styles); ovary inferior, and completely sunk and fused with fleshy rachis, 2-locular, each locule with 2 ovules placed on axial placenta; floral disc almost flat, densely hairy with soft white hairs; styles 2, free, conoid, erect, straight to slightly recurved, glabrous, each with capitate, irregularly verruculose pale brownish stigma. **Aggregated fruit** (infructescence) is semiwoody, solid, gray brownish, irregularly globular syncarp, formed by few to many 2-carpellate capsules completely sunken into enlarged and lignified rachis; each capsule is placed in its individual subspherical hole with round or elliptic opening, dehiscing at apex septicidally by longitudinal slit forming two entire valves; each capsule contains 2(4) seeds, (0)2 seeds per carpels (ovules in one carpel of individual capsule usually abortive). **Drupe** narrowly ovoid or ellipsoid, surface brown; seeds ovoid or ellipsoid, slightly flattened, with endosperm, seed coat bony, thick and hard, wingless.

Quangnamia syncarpa K. S. Nguyen, Aver., C. W. Lin, G. Q. Liu et H. H. Truong**, sp. nov.** (Figs. 1–5).

Type: "Vietnam, Quang Nam Province: Dai Loc District, Dai Hong Commune, Ngoc Thach Village, Huu Nien Mountain, evergreen broad-leaved forest on sandstone, around point 15.823°N, 107.966°E, at elevation of 400–600 m a. s. l., tree 10–25 m tall, 10–20(25) cm in DBH, usually growing on rocky places nearby stream, not common. 9 VII 2024. Truong Hoang Hap, HH-QN 30" (holotype: HN0000076833; isotypes: HN0000076831, HN0000076832; authentic photos LE01255157, https://en.herbariumle.ru/?t=occ&id=228667).

Etymology. The specific epithet refers to syncarpous fruit forming entire lignified body.

Description. Treelet or tree 1.5–25 m tall, to 10–25 cm DBH, evergreen, hermaphroditic, with diffuse irregular ovoid crown. **Trunk and branches** dull brownish gray to dirty gray, annual shoots light green, glaucous, glabrous. **Buds** perulate, obtuse to acute, consisting 4–5 coriaceous scales, early caducous; vegetative buds pale olive green to pale reddish purple, ovoid to broadly ovoid, (4)5–6(7) mm long; floral buds light green, narrowly ovoid to ovoid (4.5)5–7(8.5) mm long; scales ovoid to broadly ovoid, obtuse to acute, cymbiform, glabrous, but ciliate along the margin, 2.5–4(5.5) mm long (1.5)2–3(3.5) mm wide (when flatten). **Stipules** early caducous, brownish, glabrous, rudimentary, very small, linear, to 2 mm long, 0.2 mm wide. **Leaves** petiolate, alternate, indistinctly distichous; petiole rigid, subterete, pale green, glaucous, (6.5)8–12(14) mm long, (1.2)1.4–1.8(2) mm in diameter, straight, slightly recurved, or little twisted; leaf blade simple, leathery or coriaceous, elliptic, (5.5)6.5–9.5(10) cm long, (1.6)2–4(4.5) cm wide, margin entire, at base and apex cuneate, obtuse, dark glossy green above, pale light glaucous-green to whitish below; venation pinnate, with prominent median vein and (4)5–8(9) pairs of rather indistinct lateral arcuate veins; tertiary veins well distinct on both surfaces, almost perpendicular to main veins, forming abaxially prominent reticulum. **Inflorescence** axillary pedunculate spadix-like many-flowered head, (1.8)2–2.5(3) cm in diameter; peduncle erect, stout, dull greenish, (6)10–18(20) mm long, 2–4 mm in diameter, densely hairy with soft brown orange hairs, bracteate; sterile bracts 2–3(4), distant, spirally arranged, minute, insignificant, triangular, pubescent, 0.3–0.5 mm long and broad, acute, early caducous; rachis almost globular, fleshy, (5)5.5–7(8) mm in diameter. **Flowers** ebracteate, widely opening, bisexual, actinomorphic, epigynous, sessile, densely adpressed to each other, with ovary completely sunk and fused with fleshy rachis, 5(6)-merous, with 2-whorled perianth and flat, round, densely hairy floral disc, forming no floral cup. **Sepals** 5(6), brownish orange, slightly imbricate, ovate to broadly ovate, (0.9)1-1.2(1.3) mm long and wide, slightly concave, round at apex, densely hairy with soft white hairs on both sides. **Petals** 5(6), green and straight in bud; when fully open yellow, linear-lorate to linear, ribbonlike, glabrous, (7)8–12(14) mm long, (0.4) 0.6–1.2(1.3) mm wide, spreading, straight, tapering to the base, margins straight and entire, apex obtuse to roundish. **Androecium** of 5(6) stamens, alternate with petals, without staminodia; stamens free, glabrous, arranged in one whorl; filaments dorsoventrally flattened, recurved, (0.55)0.6–0.7(0.75) mm long, (0.45)0.5–0.6(0.65) mm wide; anthers basifixed, introrse, (0.65)0.7–0.8(0.85) mm long, (0.55)0.6–0.7(0.75) mm wide, laterally with 2 narrowly ovoid 1-sporangiate thecae, each dehiscing by 1 longitudinal slit; connective protrusion conoid, erect, 0.25–0.3 mm long, obtuse to round. **Gynoecium** syncarpous of 2 completely fused carpels (except styles); ovary inferior, sunk and completely fused with fleshy rachis, 2-locular, each locule with 2 ovules placed on axial placenta; floral disc almost flat, densely hairy with soft white hairs; styles 2, free, light green, conoid, erect, straight to slightly recurved, glabrous, 0.25–0.3 mm long, each with capitate, irregularly verruculose pale brownish stigma. **Aggregated fruit** (infructescence) is semiwoody, solid, gray brownish, irregularly globular syncarp (1.2)1.5–2(2.4) cm in diameter, formed by few- to many 2-carpellate capsules completely sunken into enlarged and lignified rachis; each capsule in syncarp is placed in its individual subspherical hole (5.5)6–7(10) mm in diameter, with round or elliptic opening; capsule dorsoventrally flattened, broadly ovoid, entire or slightly retuse at apex, dehiscing at apex septicidally by longitudinal slit, like bivalve shell, forming 2 entire valves; each capsule usually contains 2(rarely 4) fertile seeds (two ovules in one carpel normally abortive). **Drupe** narrowly ovoid or ellipsoid, (4.5)5-6(6.5) mm long, 2.8–3.2 mm wide, surface brown; seeds erected and ejected out in maturity, ellipsoid to ovoid, slightly flattened, 3.2–3.6 mm long, 2.8–3 mm wide, with endosperm; seed coat bony, thick and hard, wingless, chestnut brown, longitudinally minutely wrinkled, glossy and very slippery.

Ecology and phenology. Primary and secondary broad-leaved evergreen lowland forest on sandstone, at elevation of 400–650 m a. s. l., usually along small rocky streams and on eroded sandstone cliffs. Locally not rare. Flowers and fruits were observed in January and in May.

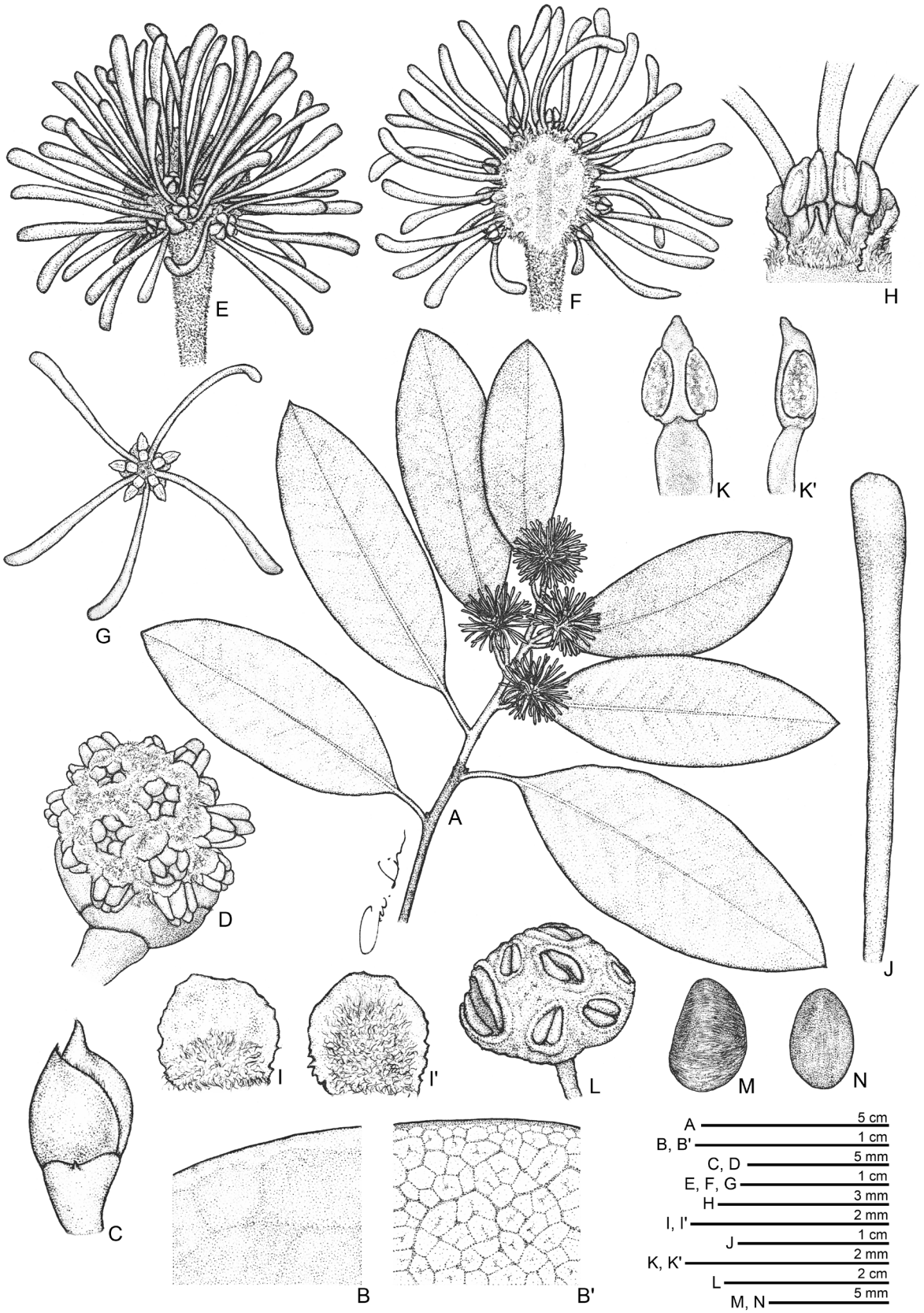

Fig. 1. *Quangnamia syncarpa*; A – branch bearing full flowering inflorescences; B, B' – adaxial and abaxial surface of leaf piece; C – vegetative bud; D – young inflorescences; E – full flowering inflorescence; F – sagittal section of full flowering inflorescence; G – full-open flower, in front view; H – part of open flower, lateral view; I, I' – abaxial and adaxial surface of sepal; J – petal; K, K' – stamen, ventral and lateral view; L – intact syncarp; M – seed coat outside; N – seed. Drawing by C. W. Lin from the type specimen Truong Hoang Hap, HH-QN 30.

Fig. 2. *Quangnamia syncarpa*. Plant in natural habitat: A – flowering tree in the forest stands; B, C – flowering tree and treelet free standing in open place; D – flowering branches; E – flowering and fruiting branchlets; F – branch with young inflorescences; G – branch with full flowering inflorescences; H, I – close up full flowering inflorescences and individual inflorescence. Photos by H. H. Truong (A, C, photos from HH-QN 15 and 45) and L. Averyanov (B, D–I, photos from specimen CPC 3599), photo correction and design by L. Averyanov and T. Maisak.

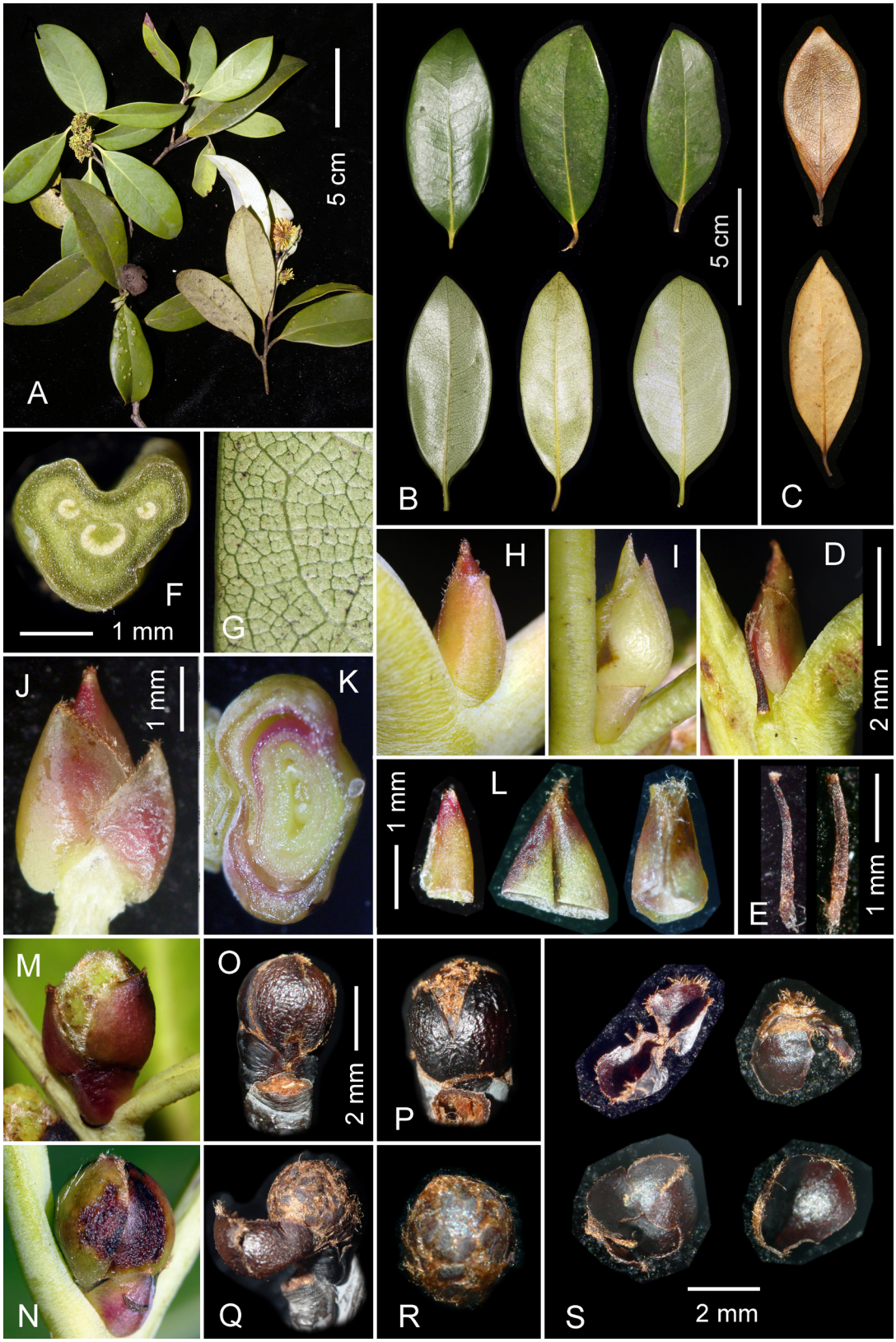

Fig. 3. *Quangnamia syncarpa*. Structure of leaves, vegetative and floral buds: A – flattened flowering and fruiting branches prior herbarization of the type specimens; B, C – fresh and dry leaves, adaxial and abaxial side; D – base of petiole with stipule; E – separated stipules; F – petiole cross section; G – venation on abaxial side of fresh leaf; H, I – intact vegetative buds, side view; J – separated vegetative bud, side view; K – cross section of the vegetative bud base; L – separated bracts of fresh vegetative bud; M, N – close and opening fresh floral bud, side view; O – intact dry floral bud, side view; P, Q – opening dry floral buds, side view; R – dry young inflorescence from floral bud; S – separated bracts of dry vegetative bud. All photos by K. S. Nguyen from the type specimen, photo correction and design by L. Averyanov and T. Maisak.

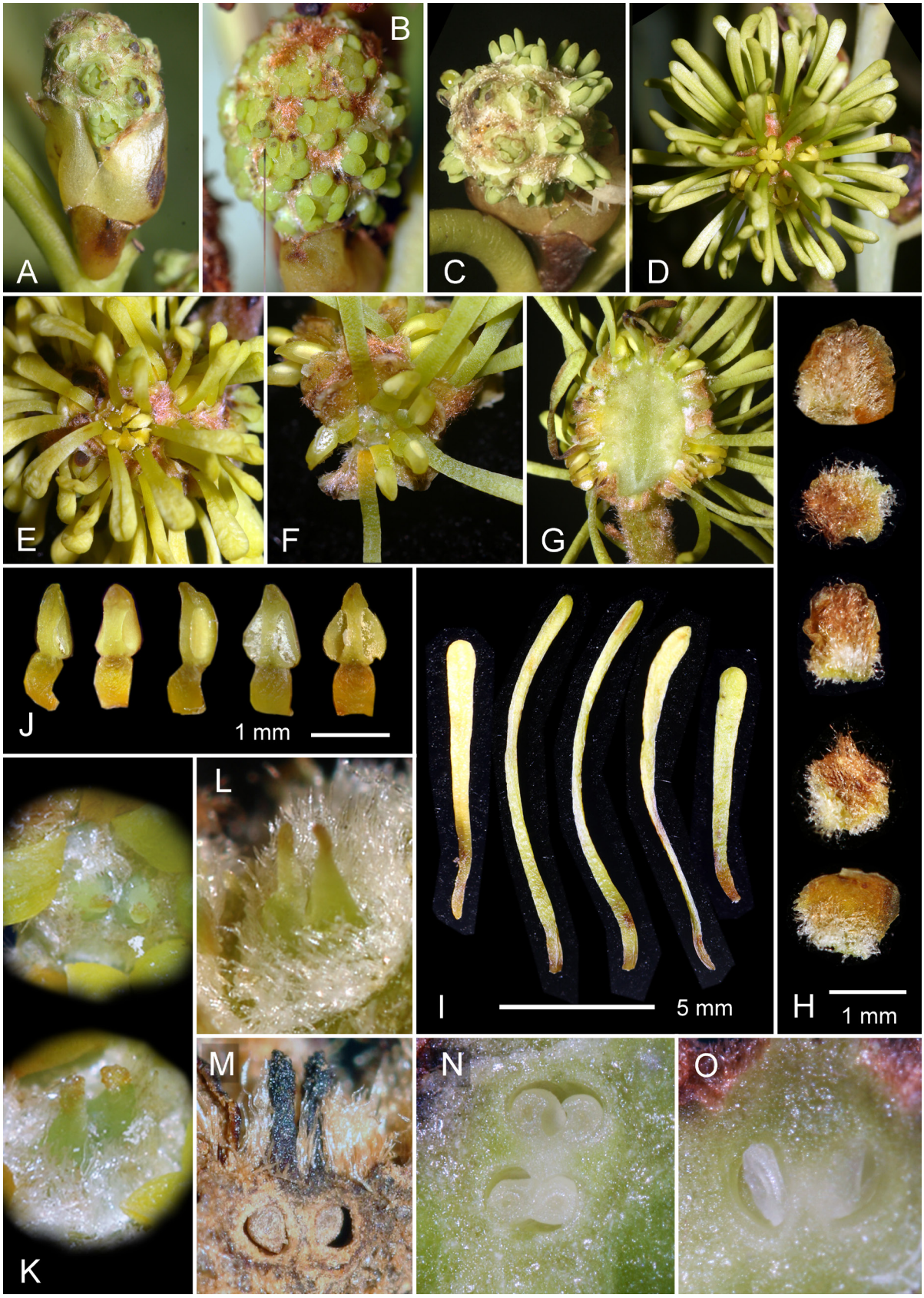

Fig. 4. *Quangnamia syncarpa*. Structure of flower: A–C – young inflorescences; D – inflorescence with full-open flowers; E – full-open flower in intact inflorescence, frontal view; F – central part of separated flower, half-side view; G – sagittal section of inflorescence, with full-open flowers; H – petals; I – sepals; J – anthers; K – floral disk with styles, view from above; L – floral disk with styles, side view; M – tangential section of carpels (in dry flower); N, O – cross and sagittal sections of carpels (in fresh flower). All photos by K. S. Nguyen from the type specimen, photo correction and design by L. Averyanov and T. Maisak.

Fig. 5. *Quangnamia syncarpa*. Structure of syncarp, fruits and seeds: A – intact fruiting branch; B, C – intact syncarps, view from above and side view; D, E – longitudinal syncarp section showing developing carpels; F – carpel with two developing seeds; G – transversal section of two-carpellate fruit showing semi-ripe seeds; H–J – opening two-carpellate individual fruits fusing into syncarp body; K–N – longitudinal section of the syncarp body, shoving fruit cavity, seed cavities and drupes; O, P – seed cavity in internal carpel surface; Q – seed coat outside and inside; R – seeds; S – hilum on seed coat rib; T – sagittal seed section showing endosperm. All photos by K. S. Nguyen from the type specimen, photo correction and design by L. Averyanov and T. Maisak.

Distribution. Stenoendemic to central Vietnam (Quang Nam Province, Dai Loc District).

Conservation status. The species presently is known only by few collections from a single location with the extent of occurrence (EOO) and area of occupancy (AOO) surely less than 100 km² and 10 km² respectively. This area has no official protection and is highly affected by various anthropogenic influence seriously decreasing the habitat quality. Being into consideration the wide deforestation in the species area, the conservation status of this plant should be preliminarily assessed according to the formal criteria of the IUCN Red List (2024) as Critically Endangered (CR) B1ab(iii)+2ab(iii), C1+2a(ii), D.

Additional specimens examined (paratypes). **Vietnam:** "Quang Nam Province, Dai Loc District, Dai Hong Commune, Ngoc Thach Village, Huu Nien Mountain, evergreen broad-leaved forest on sandstone, around point 15.823°N, 107.966°E, at elevation of 400–600 m a. s. l., tree 7–15 m tall, growing on rocky places, not common. 13 VI 2024. Truong Hoang Hap, HH-QN 15" (HN0000076834, HN0000076835); ibid., "treelet 1.5–10 m tall, 5 VIII 2024, Truong Hoang Hap, HH-QN 45" (HN0000076829, HN0000076830)**;** "Quang Nam Province, Dai Loc District, Dai Hong Municipality, environs of Dai Hong Town around point 15°49'1"N, 107°56'58"E, remnants of primary broad-leaved evergreen forest on rocky sandy uplifted plateau composed with eroded sandstone at elevation of about 500 m a. s. l., tree 6–8 m tall in rocky places along small rocky stream, not rare. 19 V 2011. L. Averyanov, P. K. Loc, N. Q. Hieu, P. V. The, N. T. Vinh, CPC 3452" (LE01276294, https://en.herbariumle.ru/?t=occ&id=229886, P00978978); "Quang Nam Province, Dai Loc District, Dai Hong Municipality, environs of Dai Hong Town around point 15°49'01"N, 107°56'31"E, remnants of primary and secondary dry broad-leaved evergreen forest on rocky sandy uplifted plateau composed with eroded sandstone at elevation of 600–650 m a. s. l., tree 8–10 m tall along rocky plateau cliff, flowers yellow-green, fruits dull light brown, common. 22 V 2011. L. Averyanov, P. K. Loc, N. Q. Hieu, P. V. The, N. T. Vinh, CPC 3599" (photos LE01255146, https://en.herbariumle.ru/?t=occ&id=228648).

Notes. Our plant is somewhat similar to *Rhodoleia* and *Disanthus* in having non-stellate hairs, alternate, simple leaves with an entire margin and pinnate venation, as well as bisexual flowers, but clearly differs from *Rhodoleia* by its inflorescence of spadix-like many-flowered head (vs. 5–8 flowered pseudanthial head), lacking (vs. present) staminodes, 5(6) (vs. 6–11) stamens, 1(vs. 2)-sporangiate anther theca, inferior (vs. semi-inferior) ovary with 2 (vs. 10–20) ovules per locule, fruiting capsules dorsoventrally flattened, broadly obovoid, completely sunken into a globose accrete torus, capsule apex of two entire or slightly retuse valves (vs. ovoid, basally adnate to a obconoid rachis, apex valves 2-lobed) and lacking (vs. having) persistent style base, and seeds wingless (vs. winged) at maturity (Champion, 1850; Endress 1993; Zhang et al., 2003). From *Disanthus* the new genus differs by its inflorescence of spadix-like many-flowered head (vs. 1–3-flowered capitula), petals straight (vs. circinate) in bud, inferior (vs. semi-inferior to almost superior) ovary with 2 (vs. 4–6) ovules per locule, capsules completely sunken into a globose accrete torus (vs. apically free, basally adnate to a obconoid rachis), apex valves entire or slightly retuse (vs. shallowly 2-lobed or 2-horned) and lacking (vs. having) persistent style base, and flattened ellipsoid (vs. irregularly angled ovoid) seeds with minutely finely wrinkled (vs. smooth) surface (Maximowicz, 1866; Endress, 1993; Zhang et al., 2003; Averyanov et al., 2017).

The new genus is also somewhat similar to *Loropetalum* R. Br. and *Hamamelis* L. on leaves, bisexual flowers, presence of sepals and petals, and wingless seeds but obviously differs from them by its evergreen habit (vs. usually semi-deciduous or deciduous), absence (vs. present) of stellate indumentum and staminodes, ovule per locule 2 (vs. 1), and capsules completely sunken into a globose accrete torus (vs. apically free, basally adnate to an obconoid rachis). In addition, the new genus is distinguished from *Loropetalum* by its anther with 1 (vs. 2)-sporangiate thecae, each theca dehisced by 1 valve (vs. 2) (Endress, 1993; Zhang et al., 2003; Averyanov et al., 2018). And from *Hamamelis*, *Quangnamia* differs in its inflorescence in form of spadix-like many-flowered head (vs. capitate, or shortly spicate, 3-4-flowered), 5(6) (vs. 4)-merous flowers, petals straight (vs. circinate) in bud, and capsules broadly obovoid, entire (vs. ovoid, 2-horned) at apex (Prain, 1914; Endress, 1993; Zhang et al., 2003). It is notable that *Quangnamia* shares more morphological characters with *Trichocladus,* a small genus of 4 species distributed in Africa (Hutchinson, 1933; Bamps, 1951; Endress, 1993; GBIF, 2023; POWO, 2024) than Asian genera of *Hamamelidoideae*. These characters are: evergreen habit, simple leaves, linear or subulate stipules, head-like many-flowered inflorescences, bisexual 5-merous flowers, the absence of staminodes, anther

theca dehisced by 1 valve, and wingless seeds (Table 2). However, our plant is strikingly differentiated from *Trichocladus* by its perulate vegetative buds (vs. naked), the absence of stellate indumentum (vs. present), inflorescence in form of axillary spadix-like head (vs. axillary or terminal capitate, or spicate), anthers with 1(vs. 2)-sporangiate thecae, ovule per locule 2 (vs. 1), infructescence cephalous or headed (vs. glomerate), and capsules completely sunken into a woody globose accrete torus (vs. apically free, basally adnate to a woody obconoid rachis), capsules dorsoventrally flattened, broadly obovoid, apically entire or slightly retuse, without persistent style base at apex (vs. ovoid, apically 2-horned, with persistent style base at apex).

It seems *Quangnamina* is most close morphologically to monotype Indochinese genus, *Mytilaria*, in the context of the absence of stellate indumentums, presence of dense head-like inflorescence, bisexual 5(6)-merous flowers with petals straight in bud, two ovules per locule, wingless seeds, and similar distribution in Indochina (Lecomte, 1924; Chang, 1948; Endress, 1993; Zhang et al., 2003). However, the new genus can be easily recognized by having short petiole, less than 2 cm long (vs. > 7 cm), simple, elliptic, pinnate-veined (vs. tricuspidate, broadly ovate, palmate-veined) leaves, linear (vs. narrowly lanceolate) rudimentary stipules not enclosing (vs. enclosing) the apical bud, the absence (vs. conspicuously present) of annular scar at each node, axillary (vs. terminal or leaf-opposed) inflorescence in form of spadix-like head, 1.8–3 cm in diameter (vs. spicate, narrowly cylindrical or ellipsoid, 2.5–4 × 1–1.5 cm), the absence (vs. present) of staminodes, anthers with 1 (vs. 2)-sporangiate thecae, irregular globular (vs. distortedly cylindrical) infructescences with capsules completely sunken into woody globose accrete torus (vs. apically free, basally adnate to a woody cylindrical un-accrete torus or cohered together with the next fertile capsule to form a clavate mass), and capsules dorsoventrally flattened obovoid (vs. ovoid).

In general, *Quangnamia* stands out from all other known extant genera of Hamamelidaceae due to its cephalous lignified infructescence, which are composed of numerous dense, entire obovoid bicarpellate valve shell like capsules that are completely sunken into a woody globose accrete torus, as well as broadly ovoid 2-ovulate carpels, and capsule apical valves entire or slightly retuse, at apex without remnants of style.

It is obviously that the new genus is quite similar to extant (Ickert-Bond, Wen, 2013) and extinct taxa of Altingiaceae s. str. (Zhou et al., 2001; Pigg et al., 2004; Maslova et al., 2015; Scharfstein et al., 2020; Xu et al., 2024) on infructescences and carpels, but it differs from the latter by its capsules completely sunken (vs. basally sunken and distally free) into a woody accrete torus, bisexual (vs. unisexual) flowers, present (vs. absent) petals. According to Ickert-Bond and Wen (2013) the Altingiaceae s. str. is recognized by the solitary capitate woody infructescences with many bicarpellate fruits, 30–50 ovules per locule, and male inflorescences in heads aggregating into racemes. However, the capitate male inflorescence of *Trichocladus dentatus* Hutch. (Hutchinson, 1933), a synonym of *T. goetzei* Engl. (Engler, 1913) as cited in POWO (2024), and inflorescences of compound heads in *Exbucklandia* and other genera of Hamamelidaceae are seemingly reduced forms from the Altingiaceae s. str. (Bogle, 1986). The high diversity of inflorescences in extant Hamamelidaceae s. l. is documented by Bogle (1970). In addition, the 1–2 mature seeds, up to 5–9 aborted seeds per carpel of *Liquidambar changii* Pigg, Ickert-Bond et Wen, a fossil from the Middle Miocene of Yakina Canyon, USA, were reported by Pigg et al. (2004). In combination with these data and our newly described plant, the infructescence of aggregated fruits apparently supports considering the Altingiaceae s. str. as a subfamily of Hamamelidaceae s. l. (Bogle, 1986; Endress, 1989, 1993; Li, 1997). It is certain that a comprehensive study, including palynology, anatomy, cytology, and molecular phylogeny, of *Quangnamia* in the near future will bring clues of its origin and natural relationships to other genera of Hamamelidaceae.

Acknowledgments

This study was supported by the institutional research project of the Komarov Botanical Institute of the Russian Academy of Sciences "Vascular plants of Eurasia: systematics, flora, and plant resources" (AAAA-A19-119031290052-1) and by the Ministry of Education and Science of the Russian Federation (contract no. 075-15-2021-1056).

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