



Azelia africana Sm. ex Pers.

Protologue

Syn. pl. 1: 455 (1805).

[show more data \(3\)](#) [comments \(0\)](#)

Family

Caesalpiniaceae (Leguminosae - Caesalpinioideae)

[show more data \(16\)](#) [comments \(0\)](#)

Chromosome number

$2n = 24$

[show more data \(2\)](#) [comments \(0\)](#)

Synonyms

[show more data \(5\)](#) [comments \(0\)](#)

Vernacular names

Azelia, lucky-bean tree, African oak (En). Doussié, lingué (Fr). Chanfuta, uvala, mussacossa (Po).

[show more data \(23\)](#) [comments \(0\)](#)

Origin and geographic distribution

Azelia africana is widespread, occurring from Senegal east to Uganda, and south to DR Congo.

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Uses

Like other *Azelia* spp., the wood of *Azelia africana* is characterized by an excellent stability with little susceptibility to variations in humidity, small shrinkage and preservatives are unnecessary, even for usage in permanent humid conditions or in localities where wood-attacking insects are abundant. This makes it an excellent wood for interior fittings. For such uses it is sometimes as much in demand as teak. The wood is also valued for joinery and panelling, both interior and exterior, particularly for canoes. It is commonly used for domestic articles such as boxes, bowls, spoons, mortars and masks, and is locally popular for making drums. Its dimensional stability, its great dimensional stability, it is often preferred to materials like metals and synthetics for vats and precision equipment in industrial applications. The objects such as antiques and old books in libraries. However, it should not be used in contact with textiles under more humid conditions because of the presence of tannins and for charcoal production.

The foliage is commonly used as forage and the tree is particularly important as a source of fodder for livestock in the dry season. In many regions, *Azelia africana* is cooked as a vegetable; young leaves are mixed with grounded cereals before cooking. The flowers are used as condiment in sauces. The tree is valued in agroforestry systems. The seed aril is edible and reportedly sweet; precaution is needed because the seed has been reported to be toxic, although it is used as soup condiment in Nigeria and for necklaces and for other ornamental and ritual purposes. *Azelia africana* is considered a fetish tree in many regions.

Roots, bark, leaves and fruits are used in traditional medicine. Root decoctions or macerations are used to treat stomach complaints, convulsions, trypanosomiasis and malaria. Roots have also been used in mixtures to prepare arrow poison. Bark decoctions and macerations are administered in the treatment of constipation, fever, vomiting, pregnancy, and as anodyne, diuretic, galactagogue and aphrodisiac. Bark ash is applied externally to treat lumbago and bark powder to wounds and swellings. The externally against dysmenorrhoea, epilepsy, oedema, migraine, stomach-ache, asthenia, trypanosomiasis and as anodyne. Fruit preparations are taken to treat lung disease. Twigs are used as chewing sticks.

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Production and international trade

Azelia africana is not the most important *Azelia* species for the international timber market. Its wood is often mixed with that of more commonly traded species such as *Khaya* for which Cameroon is the main exporting country. In 2003 Cameroon exported 9900 m³ of sawn doussié wood and 47,750 m³ in 2005. Exports from Côte d'Ivoire were 7200–8000 m³ in importing countries. In 2005 Ghana exported 9000 m³ of sawn *Azelia* wood (as 'papao'), and 7000 m³ in 2006 at an average price of US\$ 780 per m³.

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Properties

The heartwood is orange-brown to golden brown, becoming red-brown upon prolonged exposure, sometimes with darker streaks. It is distinctly demarcated from the sapwood, occasionally interlocked, texture medium to coarse but even. The wood is slightly glossy and dried wood has a leather-like smell upon planing.

The wood is medium-weight to moderately heavy, with a density of 720–850 kg/m³ at 12% moisture content. Drying usually does not cause problems, without delamination. Preliminary air drying under cover is recommended before kiln drying. The shrinkage rates are low, from green to oven dry 2.5–3.5% radial and 3.5–5.0% tangential. At 12% moisture content, the modulus of rupture is 105–145(–200) N/mm², modulus of elasticity (9100–)14,000–17,000 N/mm², compression parallel to grain 57–7200–8000 N and Chalais-Meudon side hardness 5.7–8.2.

The wood saws easily when good equipment is used; it contains little silica (less than 0.015%) and stellite-tipped saw teeth are not needed for sawing fresh wood. Tungsten-carbide-tipped cutting tools are recommended in planing and moulding operations. It is recommended to reduce the cutting angle to 15° to avoid riving and to obtain smooth surfaces. The nailing and screwing properties are satisfactory, but pre-boring is recommended to avoid splitting. Gluing usually does not cause problems. The wood may contain anti-oxidant substances that slow down drying of varnish and may cause problems in painting. Sliced veneer of good quality can be produced, but the wood contains acids and alkalines.

The heartwood is durable, with an excellent resistance to fungal, termite and borer attacks, but it is liable to marine borers. The sapwood is susceptible to *Lyctus* and *Cryptorhynchus* attacks, allergic reactions, irritation of mucous membranes and asthma in wood workers.

Investigations of the fibre and vessel characteristics indicate that the wood is not suitable for the production of good-quality pulp and paper. Logs may have crevice resin. The substance consists of kaempferol and derivatives. Kaempferol and its glycosides have antibacterial, antifungal and anti-inflammatory activities. Several other flavonoids are present. The lignin content is 31%. The solubility is 14–17% in a 1% NaOH solution.

The foliage has an excellent digestibility, in vitro about 51% of the dry matter and in vivo in sheep 64% of the dry matter, and is rich in proteins. The energy value is 14.4 MJ/kg DM and 8.6% ash. The crude protein content of the foliage decreases significantly from the late dry season to the cool season. Tests with goats did not show any effect. The seeds contain about 27% protein, 33% carbohydrate and 32% lipid. They contain 18–37% of oil. The oil is semi-drying, needs little purification and has a long shelf life. The predominant fatty acid is palmitic. Toxicological studies of the oil showed no detectable toxins. The presence of a cyanogenic compound may explain the reputed toxicity made from the seeds. Supplementing wheat flour with up to 30% seed flour of *Azelia africana* improved the protein quality. Experiments with chickens showed that the seeds before feeding because they may contain phytates and alkaloids.

In a study with type II diabetic patients in Nigeria, it was shown that the incorporation of *Azelia africana* seeds in the diet had hypolipidemic effects. The twigs contain tannins.

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Adulterations and substitutes

The wood of three other *Afzelia* species is similar to that of *Afzelia africana* and also traded as 'doussié': *Afzelia bella* Harms, mainly exported from West Africa, Central Africa. The excellent properties of *Afzelia africana* wood concerning dimensional stability and high natural durability are comparable to some well-known makore (*Tieghemella heckelii* (A.Chev.) Robery) and douka (*Tieghemella africana* Pierre).

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Description

Evergreen, small to fairly large tree up to 40 m tall; bole branchless for up to 20 m, usually straight and cylindrical, up to 150(–200) cm in diameter, often with unroundish scales, inner bark pale brown to pinkish brown, with yellowish brown exudate, very aromatic; crown elongate to rounded or flattened depending on age. Leaves alternate, paripinnately compound with 2–5(–6) pairs of leaflets; stipules with basal parts fused and persistent, upper parts free, linear and caducous; petiol slightly twisted; leaflets opposite, elliptical to ovate-elliptical, 5–15 cm × 3–8.5 cm, obtuse to acute or short-acuminate at apex, glabrous, pinnately veined with 6–brown short-hairy. Flowers bisexual, zygomorphic, sweet-scented; pedicel 1–1.5 cm long, jointed at base; bracteoles c. 0.5 cm × 0.5 cm, caducous; hypanthium c. cm × 1 cm, with long claw, 2-lobed, greenish white with red-purple marking in the centre, 4 others minute; fertile stamens 7 and 1.5–2 cm long, rudimentary stam hairy, style c. 2 cm long, curved. Fruit an oblong, flattened pod 10–20 cm × 5–8 cm, dark brown to black, dehiscing with 2 woody valves, c. 10-seeded. Seeds ellip. Seedling with epigeal germination; hypocotyl 7–16 cm long, epicotyl 8–20 cm long, glabrous; cotyledons fleshy, oblong, c. 2 cm long, erect; first 2 leaves opposit

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Other botanical information

Afzelia comprises about 11 species, 7 of which occur in tropical Africa and 4 in South-East Asia. It is closely related to *Intsia*.

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Anatomy

Wood-anatomical description (IAWA hardwood codes):

Growth rings: 1: growth ring boundaries distinct. Vessels: 5: wood diffuse-porous; 13: simple perforation plates; 22: intervessel pits alternate; 23: shape of alternat µm; 29: vested pits; 30: vessel-ray pits with distinct borders; similar to intervessel pits in size and shape throughout the ray cell; 42: mean tangential diameter of 46: ≤ 5 vessels per square millimetre; (47: 5–20 vessels per square millimetre); 58: gums and other deposits in heartwood vessels. Tracheids and fibres: 61: fibres, thick-walled; 70: fibres very thick-walled. Axial parenchyma: 80: axial parenchyma aliform; 81: axial parenchyma lozenge-aliform; 83: axial parenchyma conflue parenchyma strand; 92: four (3–4) cells per parenchyma strand. Rays: 97: ray width 1–3 cells; 104: all ray cells procumbent; 115: 4–12 rays per mm; 116: ≥ 12 ray chambered axial parenchyma cells; 143: prismatic crystals in fibres.

(N.P. Mollel, P. Baas & P.E. Gasson)

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Growth and development

Seedlings are very sensitive to fire, browsing and drought. In Côte d'Ivoire it has been reported that young trees of *Afzelia africana* often develop poorly because of damage terminal buds. Low branching is often the result. For proper development, trees have to grow fast enough in the rainy season to have their terminal buds or passed, young trees may grow up to 1 m per year in height. Based on studies of growth rings, the mean annual diameter growth of the bole is up to 1 cm on termit d'Ivoire, mean annual diameter growth has been estimated at 11 mm up to an age of 40 years, and in dense forest at 6–8 mm up to 50 years old. In experimental pl diameter of 15 cm 10 years after planting in evergreen forest, a survival rate of 100% with an average tree height of 11 m and bole diameter of 11.5 cm in transitio of 12 cm in semi-deciduous forest. In 17-year-old plantations, trees attained an average height of 16 m and a mean annual diameter growth of 0.7 cm in semi-dec long in evergreen forest. In savanna areas the bole of trees is usually short, rarely reaching 12 m, but in the forest it may reach large dimensions.

Trees usually flower in the rainy season. The flowers are sometimes eaten by bats. Fruits take about 6 months to ripen after flowering. They may remain on the tre the arils. The roots are associated with ectomycorrhizal fungi; more than 30 species of fungi have been recorded.

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Ecology

Afzelia africana is characteristic for the transition zone between wooded savanna and dense dry forest, and for dense semi-deciduous forest in more humid regions large parts of the region from southern Senegal to Guinea. *Afzelia africana* shows a wide adaptation to climatological conditions, but is most common in areas wit deep, well-drained but moist soils and to termite mounds. It occurs up to 1400 m altitude.

Afzelia africana is found on a wide variety of soil types, often on hardpans of calcareous, sandy or ferrallitic soils, on steep slopes, as well as in depressions and in the driest sites, *Afzelia africana* has a reputation of being fairly fire resistant, but in dense forest it appears to be susceptible even to occasional fires. *Afzelia affi*, commonly burned.

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Propagation and planting

On sandy-loamy soils in Burkina Faso, seedlings are often found abundantly beneath parent trees, with 10–100 seedlings per 100 m². However, they rarely develo of regular burning of the vegetation and high predation of seedlings by animals. The seedlings are also susceptible to drought. In Côte d'Ivoire it has been demons There are 200–500(–800) seeds per kg. In southern Mali seeds can be collected from mid-November to mid-January and in northern Côte d'Ivoire in October–Nov dried in the shade in a well-ventilated locality and open spontaneously after some days. For storage of the seeds, arils should be removed, but it has also been repo good germination rate. Seeds are dried for 2–3 weeks in the shade and then stored in jute bags in a well ventilated room. Seeds with arils stored in this way had a g stored for at least 3 years in air-tied containers at room temperature, without significant reduction of the germination rate. It is advised to add ash to the containers In Benin it is recommended to sow only seeds with a weight of more than 2 g, resulting in more vigorous seedlings. The mean height of seedlings developed from seeds of less than 2 g reached on average only 37 cm. To obtain a rapid and homogenous germination, pre-treatment of the seeds is needed. In Mali and Burkina F d'Ivoire they are treated with concentrated sulphuric acid for 30 minutes, followed by soaking in water for 3 hours, or they are soaked in water for 3 days. Germin germination is 25–30°C.

The depth of sowing is important for germination. Seeds buried for 2 cm with the hilum facing downward showed the best results, whereas seeds buried for 6 cm may reach the bottom of the pot in 3–4 weeks. In nursery tests, inoculation with ectomycorrhizae did not result in increased growth; possibly endomycorrhizae pla months. A test in Senegal showed good results for planting seedlings of more than 180 cm tall raised for 3 years in the nursery, with a survival rate of 60–100% af bare rooted plants of 6 and 15 months old showed a survival rate in the field of 75% and 95%, respectively, after the first rainy season. Propagation by grafting is j

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Management

No special soil preparation is needed before planting. For seedlings raised in the nursery, holes of 40 cm in diameter and 40 cm deep are usually made. After plant against fire. Regular weeding is needed in young plantations. In plantations in southern Côte d'Ivoire the number of stems had been reduced by 2 thinnings to 360 cm over a period of 17 years.

Enrichment planting has been practised in transition and deciduous forest, with spacing of about 15 m between lines and 2–3 m between plants in the line. In sava Sm. and *Harungana madagascariensis* Lam. ex Poir., which may serve as nurse trees.

Afzelia africana usually occurs scattered, rarely in small groups. In wooded savanna in northern Côte d'Ivoire, the density of trees with a bole diameter of more th trees/ha can be found. Trees can be coppiced and pollarded.

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Diseases and pests

Seedlings are susceptible to fungal and grasshopper attacks and should be protected against browsing by numerous mammals.

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Yield

In dense forest in Côte d'Ivoire, a bole branchless for 12 m and with a diameter of 70 cm yielded 4.5 m³ of wood, and one of the same length but with a diameter c usually not longer than 4 m and yield 1.2–2.3 m³ of wood.

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Handling after harvest

Prolonged stocking of logs after harvesting does not cause problems except occasional black holes in the sapwood caused by borer attacks. Logs of *Azelia africana*
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Genetic resources and breeding

Azelia africana does not seem to be in immediate danger because it occurs widespread in a wide range of habitats. However, in many countries where high pressure Faso, Benin, Nigeria and Cameroon. Exploitation for timber is locally severe, e.g. in Ghana, and conservation measures have been recommended. *Azelia africana* intensive exploitation.

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Prospects

Azelia africana has good prospects as a commercial plantation timber, although it does not grow rapidly and needs rather rigorous management. The high value of interesting. It deserves more research, especially on its genetic diversity and breeding for superior characteristics. As a true multipurpose tree, it is of great interest. The seeds may be a useful nutrient source for humans and animals, but further toxicological studies are needed. The nutritive value of the foliage seems to justify of sustainable management should be investigated. Although various plant parts of *Azelia africana* are widely used in traditional medicine, few studies on phytoc show interesting leads for the development of new drugs, and additional research is strongly recommended.

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Major references

- ATIBT (Association Technique Internationale des Bois Tropicaux), 1986. Tropical timber atlas: Part 1 – Africa. ATIBT, Paris, France. 208 pp.
- Bationo, B.A., Ouedraogo, S.J. & Guinko, S., 2001. Longévité des graines et contraintes à la survie des plantules d'*Azelia africana* Sm. dans une savane boisée
- Bolza, E. & Keating, W.G., 1972. African timbers: the properties, uses and characteristics of 700 species. Division of Building Research, CSIRO, Melbourne, AI
- CIRAD Forestry Department, 2009. Doussie. [Internet] Tropix 6.0. <http://tropix.cirad.fr/africa/doussie.pdf>. Accessed January 2011.
- CTFT (Centre Technique Forestier Tropical), 1980. Doussie. Bois et Forêts des Tropiques 189: 37–54.
- Fouarge, J., Quoilin, J. & Roosen, P., 1970. Essais physiques, mécaniques et de durabilité de bois de la République Démocratique du Congo. Série technique No 40 pp.
- Gérard, J., Edi Kouassi, A., Daigremont, C., Détienné, P., Fouquet, D. & Vernay, M., 1998. Synthèse sur les caractéristiques technologiques des principaux bois
- Louppe, D., 2000. *Azelia africana*: une essence précieuse et plastique. Poster abstract. In: UFRO. Forests and Society: the role of research. Vienna, Austria.
- Oteng-Amoako, A.A. (Editor), 2006. 100 tropical African timber trees from Ghana: tree description and wood identification with notes on distribution, ecology,
- Sacande, M., 2007. *Azelia africana*. Seed leaflet No 118. Millennium Seed Bank Project. Forest & Landscape Denmark. 2 pp.

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Other references

- African Regional Workshop (Conservation & Sustainable Management of Trees, Zimbabwe), 1998. *Azelia africana*. In: IUCN. 2010 IUCN Red list of threatene
- Arbonnier, M., 2004. Trees, shrubs and lianas of West African dry zones. CIRAD, Margraf Publishers GmbH, MNHN, Paris, France. 573 pp.
- Aubréville, A., 1959. La flore forestière de la Côte d'Ivoire. Deuxième édition révisée. Tome premier. Publication No 15. Centre Technique Forestier Tropical, N
- Brenan, J.P.M., 1967. Leguminosae, subfamily Caesalpinioideae. In: Milne-Redhead, E. & Polhill, R.M. (Editors). Flora of Tropical East Africa. Crown Agents
- Burkill, H.M., 1995. The useful plants of West Tropical Africa. 2nd Edition. Volume 3, Families J–L. Royal Botanic Gardens, Kew, Richmond, United Kingdom
- CAB International, 2005. Forestry Compendium. *Azelia africana*. [Internet] http://www.cabicompendium.org/fc/datasheet.asp?CCODE=AFZ_AF. Accessed Jan
- Chudnoff, M., 1980. Tropical timbers of the world. USDA Forest Service, Agricultural Handbook No 607, Washington D.C., United States. 826 pp.
- de la Mensbrughe, G., 1966. La germination et les plantules des essences arborées de la forêt dense humide de la Côte d'Ivoire. Centre Technique Forestier Tropic
- Hausen, B.M., 1981. Woods injurious to human health: a manual. Walter de Gruyter & Co., Berlin, Germany. 189 pp.
- Hawthorne, W. & Jongkind, C., 2006. Woody plants of western African forests: a guide to the forest trees, shrubs and lianes from Senegal to Ghana. Kew Publis
- Katende, A.B., Birmie, A. & Tengnäs, B., 1995. Useful trees and shrubs for Uganda: identification, propagation and management for agricultural and pastoral coi
- Koch, G., Richter, H.G. & Schmitt, U., 2006. Topochemical investigation on phenolic deposits in the vessels of *afzelia* (*Azelia* spp.) and *merbau* (*Intsia* spp.) he
- Neuwinger, H.D., 1996. African ethnobotany: poisons and drugs. Chapman & Hall, London, United Kingdom. 941 pp.
- Neuwinger, H.D., 2000. African traditional medicine: a dictionary of plant use and applications. Medpharm Scientific, Stuttgart, Germany. 589 pp.
- Normand, D. & Paquis, J., 1976. Manuel d'identification des bois commerciaux. Tome 2. Afrique guinéo-congolaise. Centre Technique Forestier Tropical, Noge
- Orwa, C., Mutua, A., Kindt, R., Jamnadass, R. & Simons, A., 2009. Agroforestry database: a tree reference and selection guide. Version 4.0. [Internet] World A [resources/databases/ agroforestry](http://www.worldagroforestrycentre.org/centres/info/databases/agroforestry/). Accessed January 2011.
- Sanon, K.B., Bâ, A.M. & Dexheimer, J., 1997. Mycorrhizal status of some fungi fruiting beneath indigenous trees in Burkina Faso. Forest Ecology and Manager
- Takahashi, A., 1978. Compilation of data on the mechanical properties of foreign woods (part 3) Africa. Shimane University, Matsue, Japan. 248 pp.
- Vivien, J. & Faure, J.J., 1985. Arbres des forêts denses d'Afrique Centrale. Agence de Coopération Culturelle et Technique, Paris, France. 565 pp.
- Wilczek, R., Léonard, J., Hauman, L., Hoyle, A.C., Steyaert, R., Gilbert, G. & Boutique, R., 1952. Caesalpinaceae. In: Robyns, W., Staner, P., Demaret, F., Gerr & Boutique, R. (Editors). Flore du Congo belge et du Ruanda-Urundi. Spermatophytes. Volume 3. Institut National pour l'Étude Agronomique du Congo belge, B

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Sources of illustration

- Eggeling, W.J. & Dale, I.R., 1951. The indigenous trees of the Uganda Protectorate. Government Printer, Entebbe, Uganda. 491 pp.
- Hawthorne, W. & Jongkind, C., 2006. Woody plants of western African forests: a guide to the forest trees, shrubs and lianes from Senegal to Ghana. Kew Publis
- Vivien, J. & Faure, J.J., 1985. Arbres des forêts denses d'Afrique Centrale. Agence de Coopération Culturelle et Technique, Paris, France. 565 pp.

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Species	Information
<i>Afzelia africana</i>	Solution Properties of the Xyloglucan Polymer from <i>Afzelia africana</i> † Abbreviations: In this paper an unambiguous shorthand nomenclature for xyloglucan oligosaccharides is used. Each (1→ <i>Environmental Science & Technology - Environmental Science & Technology - Sep 11, 2004</i> {G-News}
<i>Afzelia africana</i>	Germinator: Britain's doomsday seedbank "There are just over 5000 in there," says processing manager Janet Terry, as I hold up a large jar of African pod mahogai <i>Daily Mail - May 3, 2007</i> {G-News}
<i>Afzelia africana</i>	EFFECT OF FINGER GEOMETRY AND END PRESSURE ON THE FLEXURAL PROPERTIES... The report further indicated that the cutoffs are available predominantly in the preferred primary species like Apa (<i>Afzeli</i> <i>Subscription - Forest Products Journal - HighBeam Research - Nov 1, 2000</i> {G-News}
<i>Afzelia africana</i>	EFFECT OF FINGER GEOMETRY AND END PRESSURE ON THE FLEXURAL PROPERTIES... The report further indicated that the cutoffs are available predominantly in the preferred primary species like Apa (<i>Afzeli</i> <i>Free with registration - Forest Products Journal - AccessMyLibrary.com - Nov 1, 2000</i> {G-News}
<i>Afzelia africana</i>	The relationship between herders and trees in space and time in... However, some herders value the ligneous fodder of particular trees, such as <i>Afzelia Africana</i> , so highly that they do not <i>Subscription - Geographical Journal - HighBeam Research - Dec 1, 2005</i> {G-News}

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