DOI: 10.1111/curt.12616

PLANT PORTRAIT

CURTIS'S
Botanical Magazine

1130. *Nothofagus dombeyi* (Mirb.) Oerst

Nothofagaceae

Jo Wenham[1] | **Christabel King**[2] | **John Grimshaw**[1]

[1]Royal Botanic Gardens, Kew

[2]Freelance botanical artist

Correspondence
Jo Wenham,
Email: j.wenham@kew.org

Summary

Nothofagus dombeyi, is described and illustrated. Its history, habitat and conservation status are described. Notes on collecting its seed in Chile and its cultivation in Europe are given. A short biography of the unfortunate Joseph Dombey is provided.

THE UNFORTUNATE JOSEPH DOMBEY

Joseph Dombey (1742–1794) was a French botanist and traveller, with a remarkable, if not altogether successful life story: in his native French the word *malchanceux* is apt. These biographical notes are derived from the accounts by Wilson & Fiske (1900) and Stafleu (1963).

Trained in medicine at Montpellier, he soon turned to botany, working for Bernard de Jussieu in Paris from 1772 and becoming botanist at the Jardin des Plantes in 1776. In 1777, however, he was sent on a mission to South America to collect 'useful' plants for cultivation in France. A series of unfortunate setbacks followed: in 1780 the ship bearing his first consignment of plants from Peru was captured by a British ship and his specimens were sent to London, where they remain in the collection of the Natural History Museum. He prepared a second collection, but on this occasion the Spanish authorities refused to permit the export of his illustrations of plants he had found, insisting they should only be published by the duo of Hipólito Ruiz and José Pavón, who had recently undertaken the Royal Botanical Expedition to the Viceroyalty of Peru, with the aim of describing the flora of those parts of the Spanish empire.

From 1782–85 Dombey botanised in Chile, though for a while he was appointed physician-in-charge of Concepción during a cholera outbreak, and he also became involved with the Chilean mercury-mining industry. Despite these diversions he sailed for Europe with another collection of plants in 1785, but was arrested on arrival at Cadiz, where half his collection was retained by the Spanish authorities. He was imprisoned until he agreed not to publish anything before Ruiz and Pavón. He eventually got himself to Paris via Le Havre and transferred his remaining collection to Charles Louis L'Héritier de Brutelle to be worked up.

L'Héritier was especially keen on publishing new species, and with other French botanists was not prepared to abide by the restrictions placed on Dombey's material in favour of Ruiz

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2025 The Author(s). *Curtis's Botanical Magazine* published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

and Pavón. The Spanish government objected to this and persuaded the French authorities to agree to their terms. Learning of this decision while attending the court at Versailles, L'Héritier dashed home, packed up the specimens and fled to England with them, pretending that he had gone to his country residence. Arriving at Dover in September 1786, he invoked Sir Joseph Banks's name to get the herbarium through customs, incurring displeasure at having done so without authorisation, but he became a welcome guest at Banks's Soho Square residence and epicentre of research. He remained in London for fifteen months, preparing a series of new plant descriptions for what would become his *Sertum Anglicum* (1788), and hoping that the fuss over what became known as the Dombey affair would die down. In the end L'Héritier published few of Dombey's plants: Ruiz and Pavón got most of them, incorporating Dombey's associated information into their texts without acknowledgement. In many ways the Dombey affair is an early illustration of the importance of the principle tenets of the Nagoya Protocol (Anon., 2011), prior informed consent and equitable access and benefit sharing.

Joseph Dombey was compensated by a pension from the (royalist) French government: whether this continued after the revolution is unknown, but in 1793 the revolutionary government sent him on a mission to the United States to introduce metrication. One wonders what might have happened if he had succeeded in this, but on the voyage the ship was blown south into the Caribbean, where it was captured by privateers and Dombey died in their captivity in Monserrat in 1794. The kilogram weight he took to show Thomas Jefferson survives in the museum of the (United States) National Institute for Science and Technology (Palca 2017).

Dombey's legacy is the great herbarium collected in South America, now distributed between Madrid, Paris and London, and the various plants named in his honour. Prime among them is the genus *Dombeya* Cav. (1786) (Malvaceae). It is not clear why a genus whose distribution is centred on Africa and Madagascar should bear his name, but as popular tropical ornamentals they ensure that he is remembered. *Dombeya* L'Hér. (1786) is a synonym of *Tourrettia* Foug. (1787), while *Dombeya* Lam. (1786) is an illegitimate name for *Araucaria*: *Dombeya chilensis* Lam. is none other than the Monkey-puzzle, *Araucaria araucana* (RBG Kew, 2024b). That three eminent botanists rushed to commemorate Dombey with genera in 1786 must indicate how highly regarded he was in the botanical community of Paris at that time (Figure 1).

Curiously, the plant with which we are concerned here, *Nothofagus dombeyi*, was not named (as *Fagus dombeyi* Mirb.) until 1827, in a lengthy paper discussing early biogeographical theories by Charles-François Brisseau de Mirbel (1776–1854), also considered to be a father of cytology (Mirbel, 1827). In the paper he described several species of *Alnus*, *Myrica* and *Salix* as well as *Nothofagus* (as *Fagus*) *obliqua*, *N. betuloides, N. dubia* (now considered a synonym of *N. betuloides*) and *N. dombeyi*. Unfortunately he did not (it was not then required) denote a type specimen, but makes it clear that he used Dombey's specimens and notes in describing this and *N. obliqua* and that they had been found together near Concepción.

Mirbel followed Dombey in recording the Chilean vernacular name *coigüe* for this species. It is still in use there and has been co-opted as the English vernacular name for the species (e.g. Johnson & More 2004, Johnson 2020). C*oigüe* is derived from the Mapuche word for *Nothofagus dombeyi*, *koywe* or *koiwe* meaning a place of water (Echeverria, 2024). It has also been rendered as *koihue*, meaning 'a place of plenty of water' (Gardner et al., 2015).

NOTHOFAGUS DOMBEYI IN THE WILD AND IN CULTIVATION

Although frequently occurring in wet forest, *Nothofagus dombeyi* is characteristic of the southern landscape (Hoffman, 1991) occurring in a wide range of habitats, often being an important component of them. It is tolerant of a diversity of soil types from thin soil to, deep volcanic soils and those that are intermittently waterlogged. It is an integral part of the mixed *Nothofagus*



PLATE 1130 *Nothofagus dombeyi* CHRISTABEL KING



FIGURE 1 *Nothofagus dombeyi* growing with *Araucaria araucana*, named *Dombeya chilensis* by Lamarck in 1786. Photograph Jo Wenham.

obliqua, *N. dombeyi* and *N. alpina* second-growth forest type, but is also a key component of the evergreen Valdivian forests. It often associates with *Laurelia sempervirens, Aextoxicon punctatum Saxogothaea conspicua and Drimys winteri* (Veblen et al., 1996) (Plate 1130, Figure 2).



FIGURE 2 *Nothofagus dombeyi* emerging above *Nothofagus obliqua* in Conguillio National Park, Chile, 2009. Photograph Dan Luscombe.

It is quite surprising that, despite its wide distribution and evident familiarity in Chile and to European botanists, *Nothofagus dombeyi* was not introduced to European cultivation until 1916. In that year Frederick Robert Stephen Balfour (1873–1945) of Dawyck, Scotland presented a large quantity of seeds to Sir David Prain (Director of Kew 1905–1922) (Bean, 1976) and some living plants (Balfour *in litt*., 2016) for which shipping could still be found despite the raging conflict of World War I.

F.R.S. Balfour spent his early years travelling the Pacific coast of North America and developed a great knowledge the trees of eastern Canada and the north-eastern States and forests of south Chile. He became, therefore, a recognized authority in Great Britain on American trees, especially conifers. On returning to Scotland, he developed the collection of North American trees at Dawyck, introducing several species for the first time, his favourite being the rare *Picea breweriana*. He also expanded the collection of Asian plants there, mostly with species introduced by E. H. Wilson, whose second expedition to China he helped to finance (Anon., 1945).

The current champion tree in Britain and Ireland can be found at Mount Usher, Co. Wicklow, Ireland, measured at 35 m in height with a girth of 531 cm in 2014. The record reference "1922 seed via Kew? Planted in 1928" (Tree Register 2024) suggests that this is likely from the first introductions by Balfour to the UK (Johnson 2020), as is another giant at Mount Usher, ranking second largest at 32.4 m with 498 cm girth, also in 2014 (Tree Register 2024). The third is in Lilybank Wood at Muncaster Castle, Cumbria, which was measured for the Tree Register in 2024 at 33 m, 495 cm girth, but other sources cite it as 36 m (Monumental Trees 2024). These are just the top few of many found across Britain and Ireland exceeding 20 m in height: it can be a very magnificent tree indeed. The source of post-Balfour plantings remains unclear, though it has been consistently offered by British nurseries for decades, indicating a regular supply of seed from Chile

(e.g. Marchant 1937). None of the Balfour originals remain in Kew's collections, but wild source material was gathered in the 1980s, 1990s and 2000s, and three specimens are currently growing there (Figure 3).



FIGURE 3 The largest *Nothofagus* in Britain and Ireland is this *N. dombeyi* growing at Mount Usher, Co. Wicklow, Ireland, seen here in 2021. Photograph Ian Brown, via the Tree Register.

In 2009 staff from Wakehurst, Bedgebury Pinetum and Westonbirt Arboretum (Jo Wenham, Chris Stubbings, Dan Luscombe and Ben Jones) travelled in southern Chile as the CHIX Expedition (CHIX meaning Chile and IX - the 9th region of Chile named Araucanía). We collected *Araucaria* from its coastal populations but also gathered seed from *N. dombeyi* in three locations in Chile at Nahuelbuta, Conguillio National Parks and Park Pumalin at altitudes from 127 m to 1395 m, between the latitudes of 42.7 to 37.8°S. In Nahuelbuta *N. dombeyi* was jostling for position with *Araucaria araucana*. Here we collected seed from an individual which was 14 m high with a spread of 10 m. The species was abundant in open areas, growing on shallow slopes (1–5%) with an eastern aspect, conspicuous with its stems of silvery dark grey with black patches. It was growing in association with *Araucaria araucana*, *Chusquea culeou*, *Berberis microphylla*, *Berberis serratodentata, Desfontainia fulgens, Gaultheria* sp. and *Ribes* sp. (Royal Botanic Gardens, Kew 2024a) (Figure 4).

Offspring from these trees are now planted in Coates Wood as part of a mixed Chilean planting scheme, with some reaching around 5–6 m by 2024. At Wakehurst the *Nothofagus* National Plant Collection holds 12 trees in total. The accession painted for this article is growing at Wakehurst in Coates Wood (1995–139*1, *KWSA 56*). It was collected in 1993 by Andy Jackson (former Director of Wakehurst) in Nahuel Huapi National Park, Argentina, at an altitude of 850 m. It was growing in association with *Saxegothaea*, *Chusquea*, *Desfontainia* and *Campsidium*, growing on glacial sediments with an overlying organic layer up to 1 m deep.

According to BGCI Plant Search there are nearly 48 occurrences of *N. dombeyi in* botanic gardens across the globe with a high concentration in Europe including many plants in Scotland, Ireland, England, and Belgium. There are some specimens in China, New Zealand, Australia and the USA amongst others (BGCI 2024). The Tree Register of Britain and Ireland



FIGURE 4 Collecting seed of *Nothofagus dombeyi* in Chile, 2009. Photograph Jo Wenham.

holds 100 entries covering the finest specimens (Tree Register, 2024) of this widely grown tree. The species has been trialled in UK and Europe as an experimental forestry tree but with limited success due to its failures in trials at higher altitudes and because the trunk growth was not straight enough (Johnson 2020). It may also grow too fast, causing the wood to be brittle. A specimen planted in 1974 in Ray Wood at Castle Howard, North Yorkshire, reached 24.5 m (312 cm girth) by 2019, significantly exceeding the surrounding oaks (*Quercus robur*) planted in 1947, but lost the top 8 m in the northerly Storm Arwen in November 2021 (J. Grimshaw, pers. comm. 2024). At Wakehurst, Arboretum Manager Russell Croft has observed that when grown in open ground for display *N. dombeyi* has shown lack of apical dominance and a tendency to have co-dominant stems and tight unions. He also notes that they are a favourite of the grey squirrel *Sciurus carolinensis* and have suffered extensively from bark stripping, consequently they seem prone to limb failure.

DISTRIBUTION AND HABITAT

Nothofagus dombeyi is found in Chile from 34° 40′ -48° S between Colchagua and the Aysén region; in Argentina it occurs in the southern Andes near the Chilean border regions from 38° 30′ - 44° S. Across the majority of its range it grows alongside *N. alpina* and *N. obliqua* (Nothofagus, 2007–2008) but no hybrids between them have been recorded. It can occur in a wide range of habitats and soil types from near sea level to around 2,500 m, with varied growth habit. On glacially derived sediments it often occurs in dense thickets, while in the Valdivian rain forest it is often an emergent tree associating with *Eucryphia cordifolia*, *Laurelia sempervirens, Weinmannia trichosperma, Drimys winteri* and *Aextoxicon punctatum*. Where the Valdivian rain forest extends across the Andes *N. dombeyi* can be found with *Fitzroya cupressoides* and other codominants such as *Saxegothaea conspicua* and *Podocarpus nubigenus* amongst others; in places *N. dombeyi* can also be found with *Austrocedrus chilensis*. To the east of the Valdivian forest *N. dombeyi* forms pure stands where the understory is dominated by *Chusquea culeou*. (Hoffman et al., 1996) (Figures 5, 6, 7).

CONSERVATION

In its most recent Red List assessment in 2018 *N. dombeyi* was assessed as Least Concern (LC) with the most significant threats identified as agriculture and aquaculture, logging and wood-harvesting. While there is significant habitat loss due to conversion of land to pine plantations, this species has a large population and is a dominant component of the Patagonian forests (Baldwin et al., 2018).

CULTIVATION

The germination requirements of *N. dombeyi have* been thoroughly investigated. Research has shown that seed from lower latitude populations tend to have the best germination rates when exposed to the same stratification techniques as those from higher latitudes, which is similar to both *N. alpina* and *N. obliqua*. Seed germinated from the Andean Cordillera at 36° 52′ and 37°35'S achieved 61% and 71% respectively when stratified for 90 days. Whereas seed from the Andean Cordillera and Coastal Range from a latitude between 39° and 40°S, again stratified for 90 days,ranged between 10–23% success. (Veblen et al., 1996).

In recent germination tests carried out at the Millennium Seed Bank, seeds were stratified for 56 days at 5°C and then sown on agar at a day/night temperature of 25°C/10°C which resulted 51 of the 60 seeds sown germinating successfully. In most cases seed shows no decline in seed viability over 10 years of storage of *N. dombeyi* seed held in the Millenium Seed



FIGURE 5 *Nothofagus dombeyi* can form huge trees. Photograph Cristian Echeverria.

Bank, indicating they are of orthodox storage behaviour (R. Davies, Germination Specialist Millenium Seedbank, pers. comms, 2024).

The tree in Ray Wood mentioned above has produced many seedlings growing within and just outside the area of its own canopy, where ground vegetation is suppressed by its shade.



FIGURE 6 Chilean forest dominated by *Nothofagus dombeyi*. Photograph Cristian Echeverria.

Seedlings have not been observed away from the immediate vicinity of this parent, nor near another large specimen in the wood. At Wakehurst some self-seeding is present but establishment is limited due to mowing regimes, as is the case in Windsor Great Park (J. Anderson pers. comm. 2024, and see Steed-Mundin (2024, this part) (Figure 8).

NOMENCLATURE AND DESCRIPTION

Nothofagus dombeyi (Mirb.) Oerst., Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd. Ser. V, ix. 354 (1871).

Fagus dombeyi Mirb. in Mém. Mus. Hist. Nat. 14: 467 (1827) Lectotype: [designated by Heenan & Smissen, Phytotaxa 146: (2013:1–31)] Chile, without locality, no date, *J. Dombey 931*, P (P744730).

Fagus dombeyi var. *microphylla* Phil. in Anales Univ. Chile 91: 516 (1895).

A large monoecious evergreen *tree* to 50 m with a trunk diameter of up to 2 m, though often smaller, often with an irregular habit with widespreading branches. *Bark* dark grey with horizontal lenticels, cracking in younger specimens. Young *branches* are red with pale lenticels which become white as the stem matures. *Leaves* alternate, 2–4 × 1–2 cm, simple, ovate or ovate-lanceolate to narrowly triangular and tapering steadily towards a shortly pointed tip, lamina thicker towards the irregularly toothed margins, dark glossy above and bright green below with blackish glands often visible on both surfaces. *Male flowers* narrowly campanulate with 8–15 bright red stamens, mostly borne in groups of three; *female flowers* in groups of three. *Cupule* four-valved, not glandular, containing three small winged nutlets, two triangular and one flat.



FIGURE 7 *Nothofagus dombeyi* foliage. Photograph Jo Wenham.

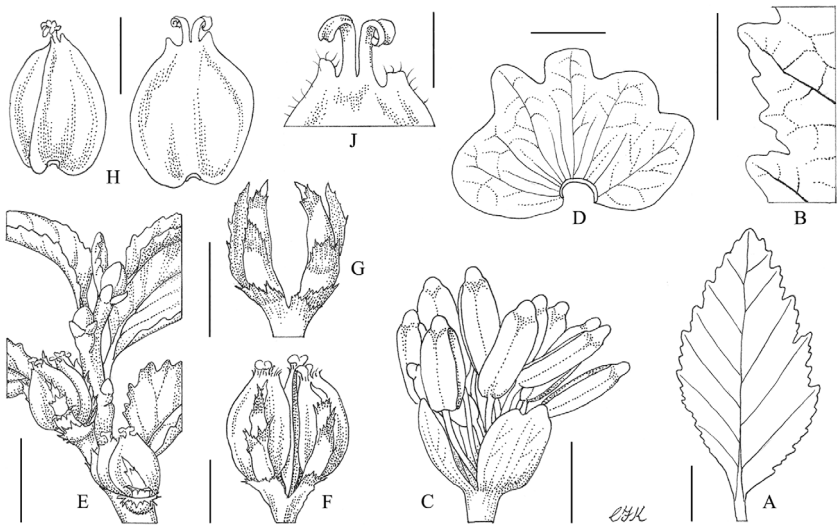


FIGURE 8 *Nothofagus dombeyi*. Scale bar represents size in mm. A, leaf outline, 5 mm; B, detail of leaf margin, 3 mm; C, male flower, 2 mm; D, corolla of male flower, 2 mm; E, shoot with cupules, 5 mm; F, cupule including seeds, 5 mm; G, dehisced cupule, 3 mm; H, nutlets; lateral nutlet (left) and central nutlet (right), 2 mm; J, apex of lateral seed (highly magnified). Drawn by Christabel King from Wakehurst accession 1995–139, *KWSA 56*, 2024.

Distribution. Argentina: southern Andes near the Chilean border Chile: O'Higgins, Maule, Bío Bío, Ñuble, La Araucanía, Los Ríos, Los Lagos and Aysén regions.

Phenology. Flowering in spring, varying from September to October in Chile; flowering observed in April 2024 at Wakehurst.

Conservation status. Least concern.

ACKNOWLEDGEMENTS

Thanks to Rachael Davis, Germination Specialist for the Millennium Seed Bank, for germination data on *Nothofagus*, Joseph Couper, Wakehurst apprentice, for his amazing *Nothofagus* images taken in Chile in 2024, John Anderson, Windsor Great Park, for information on regeneration, and Russell Croft, Arboretum Manager at Wakehurst, for tree management information.

ORCID

Jo Wenham https://orcid.org/0000-0003-0664-3691
John Grimshaw https://orcid.org/0009-0007-6010-7642

REFERENCES

Anon. (1945). Mr. F. R. S. Balfour. C.V.O. *Nature* 3934, March 24, 1945: 357–8.

Anon. (2011). Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the convention on biological diversity. *Text and annex. Montreal*: Secretariat of the Convention on Biological Diversity.

Baldwin, H., Barstow, M. & Rivers, M. (2018). *The Red List of Nothofagus*. Richmond, UK: Botanic Gardens Conservation International.

Balfour, F.R.S. (2016). Letter to Sir D. Prain 25 June 1916. Director's Correspondence, RBG Kew. Available at Letter from F.R.S.[Frederick Robert Stephen] Balfour to Sir David Prain; from 39 Phillimore Gardens, [London]; 25 June 1916; one page letter comprising one image; folio 232 on JSTOR (accessed 17 November 2024).

Bean, W.J. (1976) Trees and Shrubs Hardy in the British Isles, *Vol*. 3, *N–Rh* 8th ed. (revised). London: John Murray
Botanic Gardens Conservation International (BGCI) (2024). Plant Search [database]. Available at https://plantsearch.bgci.org. Accessed on 14/10/2024.
Echeverria, C. (2024). *Nothofagus* species in South America. *Curtis's Botanical Magazine* 41(4): 467–474.
Gardner, M.F., Hechenleitner V., P. & Hepp, C. J. (2015). *Plants from the Woods and Forests of Chile*. Edinburgh: Royal Botanic Garden Edinburgh.
Hoffman, A.E. (1991). *Flora Silvestre De Chile: Zona Araucana: una guía ilustrada para la identificación de las especies de plantas leñosas del sur de Chile*. Santiago: Fundación Claudio Gay.
Johnson, O. (2020). *'Nothofagus dombeyi'* from the website *Trees and Shrubs Online* (treesandshrubsonline.org/articles/nothofagus/nothofagus-dombeyi/). (accessed 14/10/2024).
Johnson, O., & More, D. (2004). *Collins Tree Guide*. London: HarperCollins.
L'Héritier de Brutelle, C.L. (1788) *Sertum Anglicum*. Paris: P-F. Didot.
Marchant, W.J. (1937). *Choice Trees, Shrubs, Wall Plants and Climbers*. Wimborne, Dorset: W.J. Marchant.
Mason, B., Jinks, R., Savill, P. & Wilson, S. M. (2018). Southern beeches (*Nothofagus* species). *Quarterly Journal of Forestry* 112, 30–43.
Mirbel, C.F.B. de. (1827). Recherches sur la distribution géographiques de végétaux phanérogames dans l'Ancien Monde, depuis l'équateur jusqu'au pôle arctique. *Mémoires du Museum d'Histoire Naturelle. Paris* 14: 349–474
Monumental Trees (2024). *Coigüe in the garden of Muncaster Castle*, Muncaster, England, United Kingdom. https://monumentaltrees.org/en/gbr/england/cumbria/7538_muncastercastle/15211/ (accessed 06/12/2024).
Palca, J. (2017). *How Pirates of the Caribbean Hijacked America's Metric System*. Blog for NPR News. https://www.northcountrypublicradio.org/news/npr/574044232/how-pirates-of-the-caribbean-hijacked-america-s-metric-system (accessed 17/12/2024).
Royal Botanic Gardens, Kew. (2024a) Living Collections Database [dataset]. The Royal Botanic Gardens, Kew (accessed 11/08/2024).
Royal Botanic Gardens, Kew. (2024b) Plants of the World Online. powo.science.kew.org (accessed 11/08/2024).
Stafleu, F.A. (1963). L'Héritier de Brutelle: the man and his work. Pp. xiii- xliii In L'Héritier de Brutelle, C.L. (1963). *Sertum Anglicum Facsimile with critical studies and a translation*. Pittsburgh: The Hunt Botanical Library.
Steed-Mundin, O. (2024). The Southern Beeches: an introduction to the genus *Nothofagus* Blume. *Curtis's Botanical Magazine* 41(4): 439–456.
Tree Register, The. (2024). www.treeregister.org (accessed 11/08/2024).
Veblen, T., Donoso, C., Kitzberger, T. & Rebertus, A. (1996). Ecology of Southern Chilean and Argentinian *Nothofagus* Forests. In Veblen, T.T., Hill, R.S. & Read, J. *The Ecology and Biogeography of Nothofagus Forests* (pp. 293–353). New Haven: Yale University Press.
Wilson, J.G. & Fiske, J. (eds.) (1900). Dombey, Joseph. *Appleton's Cyclopaedia of American Biography*. NewYork: Appleton. Available at Appletons' Cyclopædia of American Biography/Dombey, Joseph - Wikisource, the free online library (accessed 15.12.2024).

How to cite this article: Wenham, J., King, C. & Grimshaw, J. (2024) 1130. *Nothofagus dombeyi* (Mirb.) Oerst. *Curtis's Botanical Magazine*, 41(4), 601–614. Available from: https://doi.org/10.1111/curt.12616