

FIRST RECORD OF A PECAN NUT *CARYA ILLINOINENSIS* (VON WANGENHEIM) K. KOCH (JUNGLANDACEAE: HICORIEAE: APOCARYA) DRIFT ENDOCARP FROM IRISH WATERS AND A REVIEW OF NW EUROPEAN RECORDS OF *CARYA ENDOCARPS*

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Abstract

On 8 December 1988, DM discovered an endocarp of a Pecan Nut *Carya illinoensis* measuring 42mm in length and 24mm in diameter stranded on the Long Strand (W330340; 51.5630°N, 8.9826°W), near Castlefreke, County Cork, on the SW coast of Ireland. The specimen, which represents the first record of a *C. illinoensis* drift endocarp from Irish waters and the sixth from NW Europe, was donated to the National Herbarium, Dublin (DBN 2019). The occurrence of *C. illinoensis* and other *Carya* drift endocarps from NW European waters is reviewed.

Key words: Pecan Nut, *Carya illinoensis*, drift endocarps, Irish and NW European waters.

Introduction

The Hickory genus *Carya*, one of eight genera within the Walnut family (Juglandaceae), exhibits an intercontinentally disjunct distribution between subtropical and tropical regions of eastern Asia (5 species) and temperate to subtropical regions of eastern North America (12 species) (Manning, 1978; Zhang *et al.*, 2013).

Twelve endemic species of *Carya* are known to occur within hydrographic catchments draining into the North Western Atlantic Ocean and Gulf of Mexico (Manning, 1978), including Pecan Nut *C. illinoensis* (von Wangenheim) K. Koch (Iowa to N Mexico), Water Hickory *C. aquatica* (Michaux) Nuttall (SE Virginia to E Texas), Bitternut *C. cordiformis* (von Wangenheim) K. Koch (Quebec to E Texas), Black Hickory *C. texana* Buckley (1861) (southern Great Plains to lower Mississippi Valley), Sand Hickory *C. pallida* (Ashe) Engelmann & Graebn. (SE U.S.A.), Scrub Hickory *C. floridana* Sargent (Florida), Nutmeg Hickory *C. myristiciformis* (Michaux.) Elliott (1824) (SE U.S.A. to N Mexico), Mockernut *C. tomentosa* Sargent (Ontario to Texas), Red Hickory *C. ovalis* (Wangenheim) Sargent (Ontario to E Texas), Shagback Hickory *C. ovata* (Miller) K. Koch (SE Canada and E U.S.A.), Big Shellbark Hickory *C. laciniosa* (Miller) K. Koch (New York to Oklahoma) and Pignut *C. glabra* Miller (Ontario to E Texas).

At least eight North American species of *Carya* have been introduced and are currently cultivated in NW Europe, including *C. illinoensis*, *C. aquatica*, *C. cordiformis*, *C. tomentosa*, *C. ovalis*, *C. ovata*, *C. laciniosa*, and *C. glabra* (Johnson and More, 2006). Five of these species are well established under ambient conditions in the National Botanic Gardens in Dublin (DBN), including *C. cordiformis* (as *C. minima*), *C. tormentosa* (as *C. alba*), *C. ovata*, *C. laciniosa*, and *C. glabra* (Anon., 2015).

Pecan trees are relatively large, reaching up to 52m in height within its native North American range (Iowa to N Mexico), but European specimens rarely produce fruit (Johnson and More, 2006). The pale to dark brown smooth endocarps, shaped like rugby balls, measure up to 30mm in length and 20mm in diameter, and depending on the amount of erosion, may have either pointed or rounded ends (Nelson, 2000). The kernels within the endocarp are a popular food worldwide.

Pecan Nut *Carya illinoensis* drift endocarps from Irish and NW European waters

On 8 December 1988, DM discovered an endocarp of *Carya illinoensis* measuring 42mm in length and 24mm in diameter stranded on the Long Strand (W330340; 51.5630°N, 8.9826°W), near Castlefreke, County Cork, on the SW coast of Ireland (Plate 1). The specimen, which represents the first record of a *C. illinoensis* drift endocarp from Irish waters and the sixth from NW Europe, was donated to the National Herbarium, Dublin (DBN 2019).

Details of all known NW European records of stranded *C. illinoensis* drift endocarps are summarized in Table 1. A total of six drift endocarps have been recorded since 1894, including three from the U.K., two from the Netherlands and one from Ireland.

Discussion

Although twelve endemic species of *Carya* are known to occur within hydrographic catchments draining into the North Western Atlantic Ocean and Gulf of Mexico, and eight of these are known to be cultivated in NW Europe (Johnson and More, 2006), only stranded endocarps belonging to four species (Plate 2) have been recorded from the Western Atlantic (*C. illinoensis*, *C. aquatic*, *C. glabra* and *C. tomentosa*) (Gunn, 1968; Burkhalter and Wright, 1989; Zies, 1997; Gunn and Dennis, 1973, 1999; Sullivan, 2003; Perry and Dennis, 2010), and only two of these from the Eastern Atlantic (*C. illinoensis* and *C. aquatica*).

While some of the NW European endocarps of *C. illinoensis* may have been locally discarded, others probably represent true peregrine trans-Atlantic drifters. According to Nelson (2000), pecan endocarps can remain afloat in salt water for a year and are capable of drifting from the eastern U.S.A. to NW Europe. However, endocarps stranded on NW European beaches are unlikely to be viable.

There are only two confirmed records of stranded endocarps of *C. aquatica* from NW Europe, both from Cornwall, U.K. (Dennis, 2000; Gainey, 2014). However, Nelson (2000) noted that there was one unconfirmed report from Connemara, County Galway, on the west coast of Ireland.

The absence of stranded endocarps of *C. glabra*, and *C. tomentosa* from NW European waters may be related to either poorer buoyancy or a lack of recording effort. Gunn and Dennis (1999) noted that the endocarps of *C. glabra* and *C. tomentosa* usually have open sutures which may limit their long-term buoyancy and ability to float from North America to Europe.

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References

- Anon. (2015) National Botanic Gardens, Glasnevin. Far Grounds – *Aesculus*, *Betula* etc. (A4) Loc. 5. Last updated: April 2015.
- Burkhalter, J.R. and Wright, J.C. (1989) Fourteen additions to the known stranded seeds and fruits of northwest Florida beaches. *Sida* **13**: 345-349.
- Dennis, J. V. (2000) The Lucky Bean. *The Drifting Seed* **6**: 8-9.
- Gainey, P. A. (2014) Drift seeds on Cornish strandlines. *The Drifting Seed* **20**: 9-11.
- Gunn, C. R. (1968) Stranded seeds and fruits from the southeastern shore of Florida. *Garden Journal* **18**: 43-54.
- Gunn, C. R. and Dennis, J. V. (1973) Tropical and temperate stranded seeds and fruits from the Gulf of Mexico. *Contributions in Marine Science* **17**: 111-121.
- Gunn, C. R. and Dennis, J. V. (1999) *World guide to tropical drift seeds and fruits*. Malabar, Florida: Krieger Publishing Company. 240pp.
- Johnson, O. and More, D. (2006) *Collins Tree Guide*. HarperCollins, London. 464pp.
- Manning, W. E. (1978) The classification within the Juglandaceae. *Annals of the Missouri Botanical Garden* **65**: 1058-1087.

- Morgan, I. (1991) Drift-seeds in Carmarthenshire. *Llanelli Naturalists' Newsletter* (**Winter 1991-1992**): 13-15.
- Nelson, E. C. (1990) Exotic drift fruits and seeds from the coasts of Britain and adjacent islands. *Journal of the Royal Institution of Cornwall* (New Series) **10**: 147-177.
- Nelson, E. C. (2000) *Sea Beans and Nickar Nuts. A handbook of exotic seeds and fruits stranded on beaches in north-western Europe*. BSBI Handbook **No. 10**. Botanical Society of the British Isles, London. 156pp.
- Perry, E. and Dennis, J. V. (2010) *Sea-beans from the tropics: a collector's guide to sea-beans and other tropical drift on Atlantic shores*. Krieger Publishing Company, Malabar, Florida. 217pp.
- Sullivan, G. (2003) Sea-Bean Collection at University of Texas at Austin Marine Science Institute. *The Drifting Seed* **9**: 7-9.
- Van der Ham, R., Cadée, G. C. and Kruiswijk, W. (2013) Walnoten, pecannoten en een vieugelnoot van de Nederlandse kust. *Het Zeepaard* **73**: 96-103.
- Zhang, J.-B., Li, R.-Q., Xiang, X.-G., Manchester, S. R., Lin, L., Wang, W., Wen, J. And Chen, Z.-D. (2013) Integrated fossil and molecular data reveal the biogeographic diversification of the Eastern Asian-Eastern North American disjunct Hickory Genus (*Carya* Nutt.). *PlosOne* **8**: 13pp.
- Zies, P. (1997) Florida Drift Seeds. *The Drifting Seed* **3**: 6-7.

TABLE 1. NW European records of stranded Pecan Nut *Carya illinoensis* endocarps.

- 1.** *Date*: 1894. *Location*: Carmarthenshire, Wales, UK. *Latitude °N & Longitude*: 51.6670 & 4.5000. *Reference*: Morgan (1991).
- 2.** *Date*: 1908-1919. *Location*: north shore, Stornway, Isle of Lewis, Outer Hebrides, Scotland, U.K. *Latitude °N & Longitude*: 58.2094 & 6.3849. *TL (mm)*: 35. *Diameter (mm)*: 17. *Collector*: William L. MacGillivray. *Voucher Details*: King's Museum, Aberdeen (ABDUZ:50086.22). *Reference*: Nelson (1990).
- 3.** *Date*: 1930. *Location*: Mullion, Lizard Peninsula, Cornwall, U.K. *Latitude °N & Longitude*: 50.0280 & 5.2405. *Reference*: Nelson (1990).
- 4.** *Date*: 1970s. *Location*: between Bergen aan Zee and Schoorl, The Netherlands. *Latitude °N & Longitude*: 52.6610 & -4.6318. *TL (mm)*: 33. *Collector*: Jan Sterringa/Gerhard Cadee. *Reference*: Van der Ham *et al.* (2013).
- 5.** *Date*: 1970s. *Location*: Zandvoort, The Netherlands. *Latitude °N & Longitude*: 52.3711 & -4.5334. *Collector*: Wim Kuijper. *Reference*: Van der Ham *et al.* (2013).
- 6.** *Date*: 8 December 1988. *Location*: Long Strand, Castlefreke, County Cork, Ireland. *Latitude °N & Longitude*: 51.5630 & 8.9826. *TL (mm)*: 42. *Diameter (mm)*: 24. *Collector*: Dan Minchin. *Voucher Details*: National Herbarium, Dublin (DBN). *Reference*: This paper.



PLATE 1. Pecan Nut (*Carya illinoensis*) endocarp stranded on Long Strand, Castlefreke, County Cork (8 December 1998).



PLATE 2. *Carya* drift endocarps collected from the east coast of Florida, U.S.A. (Courtesy of Ed Perry).