

SEEDS OF *ATTALEA FUNIFERA* MART. AND A REVIEW OF OTHER TROPICAL
SEEDS FROM THE DUTCH COAST

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ABSTRACT

Three seeds of the tropical palm *Attalea funifera* are reported from the Dutch coast. These seeds cannot drift; two were dredged. They are supposed to originate from shipwrecks. A survey of tropical (drift) seeds found on the Dutch coast reveals that most of them crossed the ocean by ship. They are imported for industrial purposes, or, particularly recently, for decorations. Real tropical drift seeds are rare on the Dutch coast and, moreover, hard to distinguish from those imported by man. This may also hold for other European coasts.

INTRODUCTION

Tropical drift seeds are relatively rare on European coasts but have attracted attention for a long time. In particular, the Irish coast is famous for its tropical drift seeds (see Lobelius & Pena, 1570, and other older literature cited in Colgan, 1919; also Guppy, 1917; Nelson, 1977; 1986).

A number of authors have investigated buoyancy of seeds and their viability after a prolonged time in seawater, in order to establish the role of seed transport by sea in plant dispersal (Darwin, 1857; Martins, 1857; Guppy, 1906; Praeger, 1913). Ridley gives an excellent summary of the subject.

Recently tropical (drift) seeds have also been discovered on the Dutch coast (Leenhouts, 1968; Kofman & van Tol, 1972; van Benthem Jutting, 1977; de Boer, 1980; Vader, 1980; Heerebout, 1981; de Graaf, 1984; Smit & Wagner, 1985; Cadée, 1983, 1986a, b, 1988). However, it has been repeatedly questioned whether these seeds have travelled all the way from the tropics to our coast by ocean currents. This paper summarizes these Dutch data and particularly stresses the importance of transport by man. It also presents the first record of seeds of the palm *Attalea funifera* Mart. from the Dutch coast. These heavy, non-buoyant seeds have certainly been transported by man.

ATTALEA FUNIFERA MART.

Some time ago the author received two interesting seeds for identification. They were found on the beach of the island of Texel, one in the early seventies by Mr C.G.J. van Empel, the other in 1985 by Mr J.P.G. Schraag. They bear some superficial resemblance to coconuts deprived of their vesiculous outer layer. However, they are smaller (lengths 8.2 and 7.4 cm), more oval, and the three germination holes are larger than in the coconut. They are heavier than water and cannot drift: their occurrence on the beach thus posed some problems. The one from 1985 was found in sand which had been dredged from the sea, from the inlet area between Texel and Vlieland; in recent years this sand has been used to supplement the beach on Texel because of the alarming erosion on the North Sea coast. For the earlier specimen, the finder could not recall the circumstances exactly, but it certainly dates from before this period of sand supplementation.

Identification as *Attalea funifera* proved easy, particularly as comparison with nuts in the carpological collections of the Rijksherbarium Leiden was possible. Moreover, the herbarium collection contained another specimen (carp. coll. 13285) from the Dutch coastal area. This nut was collected in 1938 during one of the attempts to recover the gold of the famous shipwreck of the frigate *Lutine*, wrecked in 1799 near Terschelling, the third of the Wadden Islands (van der Molen, 1970). Thus two of the *Attalea* nuts

were originally buried in coastal sediments, and only came to the surface owing to dredging activities.

How did these nuts arrive in the Dutch coastal area? It seems logical to assume that they were transported by ships. *A. funifera* nuts were used in the manufacture of buttons, doorknobs, etc. (Bondar, 1964; Menninger, 1977), the wood of the nut being very hard. Nuts of other *Attalea* species are used for the preparation of oil, and charcoal was made from the hard endocarp. As far as I know, *A. funifera* nowadays is only cultivated for the piaçaba (piassava) fibre from the leaves, from which hard brushes and brooms are manufactured (Kirby, 1963). *A. funifera* originates from tropical America, but it is now cultivated in Nigeria (Corner, 1966; Otedoh, 1973; Santos, 1979).

The *A. funifera* nuts collected from the Dutch coast most probably originate from ships that transported them from tropical areas (probably Brazil) to Europe. Many ships were wrecked on the coast off the Wadden Islands: I suppose the nuts to derive from such a shipwreck. A recent example of a shipwreck as a source of seeds on the coast is given by the *Compass I*, wrecked on the coast of Texel (12.1.1986), which delivered large quantities of soybeans to the beaches of Texel (pers. obs.).

OTHER TROPICAL SEEDS FROM THE DUTCH COAST

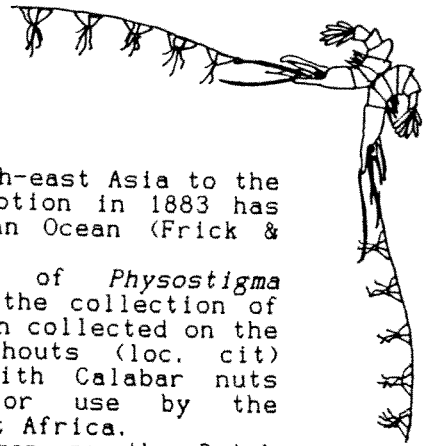
Undoubtedly, many of the tropical seeds on the Dutch coast have been transported by man. For seeds heavier than seawater this is evident: they cannot drift. This applies, for example, to ivory nuts (*Phytelphas macrocarpa* Ruiz & Pav.) reported for the Dutch coast (de Boer, 1980; Cadée, 1986a), and for *A. funifera*. Transport by ships over the ocean and subsequent short-distance transport by sea are most likely for a number of seeds introduced for human consumption, such as peanuts (*Arachis hypogaea* L.), Brazil nuts (*Bertholletia excelsa* Humb. & Bonpl.) and mango (*Mangifera indica* L.) (Guppy, 1917; Muir, 1937; Ridley, 1930; Gunn & Dennis, 1976).

Coconuts (*Cocos nucifera* L.) are regularly found on our beaches, but are seldom reported because they are not thought to be of interest. In 1985 I found one on Texel and Mr L.F. Weijdt (Texel) told me that he had found two germinating coconuts in the warm summer of 1947 on Engelsmansplaat, a high tidal flat in the Wadden Sea. Coconuts are well known long drifters, so they could probably reach European coasts with the Gulf Stream; however, Ridley (1930: p.322) and later Gunn & Dennis (1976: p. 182) suppose Norwegian records to be jetsam from ships. Although they can drift for years, they do not remain viable for such a long time (e.g. Stopp, 1956), and the viable Engelsmansplaat specimens could not have been drifting for that long.

More than 30 seeds of the well-known tropical drift-seed *Entada gigas* L. have been found together on the coast of Zeeland, south Netherlands (Bentham Jutting, 1977; Heerebout, 1981). The suspiciously high number involved suggest transport by man in these cases also: a possible source relates to the use of this seed in pharmacology. I recently observed *Entada* seeds being sold in a flower market, and Nelson (in Cadée, 1983) reports them being sold as "lucky beans" in coastal resorts in England.

The five *Mucuna* sp. seeds recorded from the Dutch coast (Leenhouts, 1968; Kofman & van Tol, 1972; Vader, 1980) may be true tropical drift seeds. Vader (loc. cit.) suggests that the fact that 4 of the 5 seeds were found in the northern part of the Netherlands could support this hypothesis, as the northern coast may be more suitable for collecting Gulf Stream drift (coming from the north). However, Leenhouts (1968) mentions the use of *Mucuna* seeds in ornaments (necklaces), for which purpose they may be introduced to Europe.

Pangium edule Reinw. is another tropical drift seed reported from the Dutch coast (Cadée, 1986b), and it originates from a tree which grows only in Malaysia. The same is true of *Cerbera odollam* Gaertner seeds from the Dutch coast (de Graaf, 1984; Smit & Wagner, 1985). These must be the result of human transport as no ocean



current can be envisaged to bring seeds from south-east Asia to the Dutch coast: even pumice from the Krakatoa eruption in 1883 has only been found on beaches bordering the Indian Ocean (Frick & Kent, 1984).

Leenhouts (1968) mentions three seeds of *Physostigma cylindrosperma* (Bak.) from the Dutch coast. In the collection of Mr C.G.J. van Empel I identified a fourth specimen collected on the beach of Texel in the early seventies. Leenhouts (loc. cit) suggests transport by ship, probably mixed with Calabar nuts (*P. venenosum* Balf.), which are imported for use by the pharmaceutical industry. Both species grow in West Africa.

Ricinus communis L. seeds are not uncommon on the Dutch coast, and from a number of localities seedlings have been reported germinating in the strand zone (Cadée, 1983); such seedlings were also reported from the Rotterdam Harbour area. These seeds can drift for much longer than reported in the literature: while most drift for only 5 to 10 days (Guppy, 1917), three seeds collected on the beach of Texel four years ago are still floating in my experiment (unpubl.). *Ricinus* seeds are imported for industrial purposes, and their occurrence on our beaches is attributed to transshipment. They are unknown from the Irish coast, so famous for genuine tropical drift seeds; Nelson (1986) does report them from Cornwall.

The importance of man in the occurrence of smaller (non-tropical) seeds in drift on our coasts was mentioned by Kuijper (1982). He lists, for instance, *Anthriscus cerefolium* (L.), *Cannabis sativa* L., *Coriandrum sativum* L., *Ficus carica* L., *Fragaria chiloensis* (L.) X *F. virginiana* Duch., *Hordeum vulgare* L., *Panicum cf. mileaceum* L., *Papaver somniferum* L., *Rubus idaeus* L., *Vitis vinifera* L., all of which are from cultivated plants. To these I can add the larger seeds of *Cucumis melo* L., *Helianthus annuus* L., *Persica vulgaris* Batsch., *Prunus domestica* L. and *P. avium* L. all from the coast of Texel, and all of which stem from human consumption. Previously Stopp (1956), in discussing Beguinot's (1901) paper on the drift of the Italian river Tevere, stressed the importance of man as a contributor of fruit and seeds.

CONCLUSION

We must conclude that most of the tropical drift seeds found on the Dutch coast have been transported by man. It is therefore very difficult to discern genuine tropical drift seeds which have come all the way from the tropical West Indies with the Gulf Stream. While this holds for the Dutch coast, we must also be suspicious about other European coasts (see also Gunn & Dennis, 1976).

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