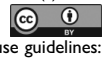
Check for updates

Case report

Drug Science

Drug Science, Policy and Law
Volume 12: 1–7
© The Author(s) 2026

Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/20503245261488435
journals.sagepub.com/home/dsp


Fatal self-poisoning with *Cerbera manghas* purchased through a U.K. homeware supply chain: A case report highlighting a novel consumer safety hazard

Irma Gasparini-Andre[1], Hayley C Gorton[2,3], Georgia C Richards[1,4] and Caroline S Copeland[1,3]

Abstract

Background and aims: *Cerbera manghas* is a highly cardiotoxic plant. Whilst fatal and non-fatal poisonings have been reported in South and Southeast Asia, cases in Western countries are rare. Here we describe a fatal self-poisoning involving *C. manghas* in England and examine the subsequent public health and regulatory response.

Methods: A case report identified through the National Programme on Substance Use Mortality was reviewed. Coroner records, post-mortem findings, botanical investigations and a Prevention of Future Deaths (PFD) report were examined. The Preventable Deaths Tracker was used to identify concerns raised by the coroner and actions taken by relevant agencies.

Results: A 50-year-old woman was found deceased at home. A letter detailing her actions and 10 fruit kernels missing their seeds were recovered at the scene. Severe decomposition precluded meaningful post-mortem examination and toxicological analysis. Investigation identified that the kernels had been advertised as a decorative homeware product and sold through a U.K. retail supply chain. Botanical assessment identified the material as *C. manghas*. The coroner concluded that death resulted from fatal *C. manghas* toxicity. A PFD report prompted regulatory action, including product withdrawal, retailer notifications, importer warnings and engagement with online marketplaces and trading standards authorities.

Conclusions: This case demonstrates an unusual route by which a highly toxic plant product entered the U.K. consumer market, and highlights the importance of integrating coronial, botanical and surveillance data when toxicological confirmation is unavailable. It also illustrates how individual death investigations can identify previously unrecognised public health hazards and trigger preventive regulatory action.

Keywords

Cerbera manghas, cardiac glycosides, suicide, prevention of future deaths, forensic toxicology

Introduction

Cerbera is a genus of highly toxic shrubs in the dogbane (*Apocynaceae*) family (Saxena et al., 2023). They contain potent cardiac glycoside compounds which inhibit myocardial Na^+/K^+-ATPase, a membrane-bound enzyme in cardiac muscle cells responsible for maintaining intracellular sodium and potassium gradients essential for normal electrical conduction and contraction (Carlier et al., 2014; Gaillard et al., 2004; Tsai et al., 2008). Inhibition of this enzyme can therefore cause hyperkalaemia, conduction abnormalities, malignant dysrhythmias and cardiovascular collapse (Gaillard et al., 2004; Menon et al., 2016). *Cerbera odollam* (the 'sea mango tree', 'suicide tree' or 'pong-pong tree') has been the most extensively studied and reported *Cerbera* species in medical and toxicological literature, largely due to its longstanding use in deliberate

[1]Department of Toxicology and Forensic Sciences, Faculty of Life Sciences and Medicine, King's College London, London, UK
[2]Aston Centre of Excellence in Pharmacotherapy Optimisation and Pharmacoepidemiology Research, Aston University, Birmingham, UK
[3]National Programme on Substance Use Mortality, London, UK
[4]The Dickson Poon School of Law, King's College London, London, UK

Corresponding author:
Caroline Copeland, Department of Toxicology and Forensic Sciences, Faculty of Life Sciences and Medicine, King's College London, London, UK; National Programme on Substance Use Mortality, London, UK.
Email: Caroline.copeland@kcl.ac.uk

self-poisoning in southern India and other parts of South and Southeast Asia (Gaillard et al., 2004; Menezes et al., 2018; Renymol et al., 2018; Saxena et al., 2023). The closely related species *Cerbera manghas* has likewise been implicated in deliberate self-poisoning and fatal intoxications (Eddleston and Haggalla, 2008; Severson et al., 2015; Tsai et al., 2008), although such poisoning reports are considerably less frequent.

Published reports of *Cerbera* poisonings in Europe and North America remain uncommon, with only a small number of fatal and non-fatal intentional ingestions described in individuals who obtained seeds through internet vendors (Bernshteyn et al., 2020; Fok et al., 2018; Kassop et al., 2014; Misek et al., 2018; Severson et al., 2015; Wermuth et al., 2018). These cases illustrate how online marketplaces have increased access to these highly toxic plants beyond their native geographic range. Online access to information on uncommon suicide methods and associated materials has raised wider concerns regarding the role of e-commerce in facilitating access to lethal means (Bojanić et al., 2024).

Here we report a fatal case of *C. manghas* toxicity in a 50-year-old woman in England. The case was identified through the National Programme on Substance Use Mortality (NPSUM). The report highlights an unusual route by which a highly toxic plant product entered the U.K. consumer market, the importance of scene and botanical investigations when toxicological confirmation is unavailable, and the value of coronial Prevention of Future Deaths (PFD) reports in mitigating emerging public health risks.

Methods

The National Programme on Substance Use Mortality

The NPSUM has received information on deaths following psychoactive drug use in England, Wales, the Channel Islands and the Isle of Man from coroners since 1997, and from the General Register Office for Northern Ireland since 2004. Additional reports were received from the Scottish Crime and Drug Enforcement Agency between 2004 and 2011. Over 60,000 deaths have been reported to the NPSUM since its inception.

Deaths are voluntarily submitted to the NPSUM if psychoactive substance(s) are directly implicated in death, if controlled drugs are identified at post-mortem and/or an individual has a history of drug use. At the time of writing, 85% of coronial jurisdictions in England, Wales and Northern Ireland report to the NPSUM.

Preventable deaths tracker

The Preventable deaths tracker (PDT), which launched in 2020, automates the collection of PFD reports and contains over 6000 PFDs written by coroners in England and Wales since implementation of The Coroners (Investigations) Regulations 2013 (https://preventabledeathstracker.net/). Coroners send PFDs to organisations who they deem able to take action to prevent similar future deaths. By law, these organisations must respond within 56 days outlining actions taken to prevent future deaths.

Ethical considerations

The King's College London (KCL) Biomedical and Health Sciences, Dentistry, Medicine and Natural and Mathematical Sciences Research Ethics Sub-Committee has confirmed that research using NPSUM and PDT data does not require ethics review as all subjects are deceased. Data in the PDT is also collected from publicly available sources shared by coroners via the Chief Coroner's Office.

Case identification

As new substances require additions to the NPSUM codebook, the case-entry process acts as an internal mechanism for identifying novel detections. During data entry, it was noted that this substance had not previously been recorded within the NPSUM database. The PDT was searched to identify whether a PFD was written by the coroner who presided over the case, concerns raised by the coroner, who they were addressed to, and subsequent responses of actions proposed or taken.

As the NPSUM methodology has been described in previous publications, limited text recycling has been used for parts of the Methods section to ensure consistency with those descriptions, in accordance with guidance from the text recycling project (https://textrecycling.org/).

Results

Circumstances of death

The deceased was a 50-year-old female, who was found in a decomposed state at her home address in August 2024 with no suspicious circumstances or third-party involvement. A letter written by the deceased was located, which detailed the actions she had taken, alongside evidence of 10 fruit kernels which were missing their seed pods. Her past medical history included depression, a previous suicide attempt, diazepam overdose, post-traumatic disorder and cerebral-venous sinus thrombosis.

Post-mortem and toxicology investigations

A pathologist was instructed to conduct a post-mortem, but the severity of decomposition limited macroscopic examination of any whole organs. A fragment of psoas muscle was retained and sent for toxicology, but the volume of

submitted muscle tissue was insufficient to allow for any testing to be carried out.

Botanical analysis

On the box in which the fruit kernels were in, there were details of the interior homeware shop from which they had been purchased. Coroner's correspondence with the shop owners enabled confirmation that the deceased had purchased the fruit kernels from their online store, which were advertised as a decorative home accessory. The homeware shop was unaware of the toxic nature of the seed pods. They had purchased them from a United Kingdom-based wholesale flower importer who had sourced them from the Netherlands.

A botanist was then instructed to examine the plant material. The botanist was informed that the seeds were recovered from beside a deceased woman and that they were suspected to be 'Cerebra Odollam' (sic). Plant identification usually requires in-person examination; however, due to the availability of high-quality photographs with scale bars (Figure 1(A) and (B)) and the distinctive shape of the fruit kernels, the consulting botanist did not deem this necessary. Morphologically comparable fruits were searched for using supplementary online data resources (e.g. http://plantillustrations.org/) and the algorithm-based plant identification tool, Pl@ntNet (https://identify.plantnet.org/). Based on morphology (Figure 1(A) and (B)), the fruit kernels were identified as belonging to the *Apocynaceae* (Dogbane family), specifically the *Cerbera* genus. Distinctive features of the fruit kernels include a split (dehisce) along a suture line (in the manner of a pea pod splitting), which is only found in two of the *Apocynaceae* species: *C. odollam* and *C. manghas*. Whilst *C. odollam* and *C. manghas* dried fruit kernel anatomy is very similar, the plant material was deemed to closely resemble *C. manghas* as the drupe valves are oblong rather than circular (Figure 2).

Cause of death and inquest conclusion

At the inquest, the coroner deemed the medical cause to be:

1a. Fatal *Cerbera manghas* toxicity

and concluded that the manner of death was suicide.

Prevention of future deaths report

The presiding coroner issued a PFD report, which raised concerns regarding the fruit kernels being imported and sold nationally with no safety warnings regarding risk to life (Judiciary CaT, 2025). The PFD was sent to the Office for Product Safety and Standards (OPSS) and the UK's Department for Environment, Food and Rural Affairs (DEFRA).

Prevention of future deaths response

Following discussions with the Department of Health and Social Care (DHSC) suicide prevention team, the OPSS carried out several actions as a result of the PFD including:

I. advising businesses in the supply chain relating to the fatality, as well as those in wider supply chain, of the risks associated with the product and that they should remove it from sale;
II. advising a major national retailer on implementing a recall of the product;
III. notifying online marketplaces of the risks associated with the product, with all of the online marketplaces contacted where the product was not already prohibited by their internal controls from being listed for sale, immediately withdrawing the product from sale;
IV. issuance of a warning letter to the importer of the product involved in the fatality, setting out their legal obligations and warning them that as the importer that they should refrain from importing and placing the product on the market;
sharing of information with relevant trade associations to ensure that member businesses have been made aware of the risks associated with the product;
VI. issuance of information to Local Authority Trading Standards (LATS) regarding their investigation into the product and recommending that LATS are aware of this when carrying out their own regulatory activities (*personal communication with OPSS*).

DEFRA replied stating that they do not have legislative power over plants imported into the United Kingdom but have been in discussion with the Department for Business and Trade (Judiciary CaT, 2025).

Discussion

This report describes a fatal self-poisoning involving *C. manghas* in a 50-year-old woman in England. Whilst fatal intoxications involving *Cerbera* species have been described previously (Bernshteyn et al., 2020; Eddleston and Haggalla, 2008; Gaillard et al., 2004; Kassop et al., 2014; Menezes et al., 2018; Misek et al., 2018; Renymol et al., 2018; Saxena et al., 2023; Severson et al., 2015; Wermuth et al., 2018Fok et al., 2018), this is the first case describing fatal self-poisoning with *C. manghas* seeds in Europe.

Previous reports of fatal *Cerbera* poisonings in Western countries have involved seeds purchased directly from internet vendors specifically advertising the plant or its seeds (Bernshteyn et al., 2020; Fok et al., 2018; Kassop et al., 2014; Misek et al., 2018; Severson et al., 2015; Wermuth et al., 2018). In contrast, the material in this



Figure 1. (A) The 20 fruit kernel halves recovered from the scene. Each of these is half of a whole fruit (drupe); within each drupe, there would have been a single seed. Therefore, there would have been 10 seeds within these fruits. No seeds were recovered from the scene. (B) The inner (left) and outer (right) surfaces of fruit kernel; number 9; in the centre of the left-hand image, the darker central space is where the seed would have been located prior to removal.

case was marketed and sold as a decorative home accessory, with no indication that it contained biologically active cardiac glycosides or posed a risk to human life. Indeed, the retailer was not aware of the toxic nature of the product. This case therefore demonstrates an unusual route by which a highly toxic plant product entered the U.K. consumer market, and how e-commerce platforms may inadvertently facilitate access to potentially lethal toxic materials beyond their native geographic range and advertised sale purpose. Similar regulatory challenges have previously been encountered with synthetic cannabinoid products marketed as 'herbal incense' or 'potpourri', whereby hazardous substances were sold as consumer products labelled as not intended for human consumption (Antoniou and Juurlink, 2014; United States Drug Enforcement Administration, 2024), complicating regulatory oversight. These examples illustrate the difficulties of identifying and controlling hazardous products that fall outside traditional regulatory categories.

Advanced decomposition prevented meaningful post-mortem examination and precluded toxicological confirmation of any substances present. Although, whilst toxicological confirmation would ordinarily be desirable, previous reports have highlighted the challenges associated with the detection and identification of *Cerbera*-derived cardiac glycosides, which typically require targeted analytical methods and are unlikely to be identified during routine toxicological investigation (Carlier et al., 2014; Gaillard et al., 2004; Menezes et al., 2018; Wermuth et al., 2018). Consequently, determination of the cause of death relied upon the integration of circumstantial evidence: the letter written by the deceased detailing the actions she had taken, recovery of the empty fruit kernels, tracing of the purchased product, and subsequent botanical identification. This approach is consistent with many poisoning deaths, in which specific macroscopic pathological findings are absent, and the cause of death is determined from the integration of pathological, toxicological and circumstantial evidence. The present case therefore highlights the importance of retaining unusual plant material recovered at the scene and considering specialist botanical consultation when conventional forensic investigations are limited.

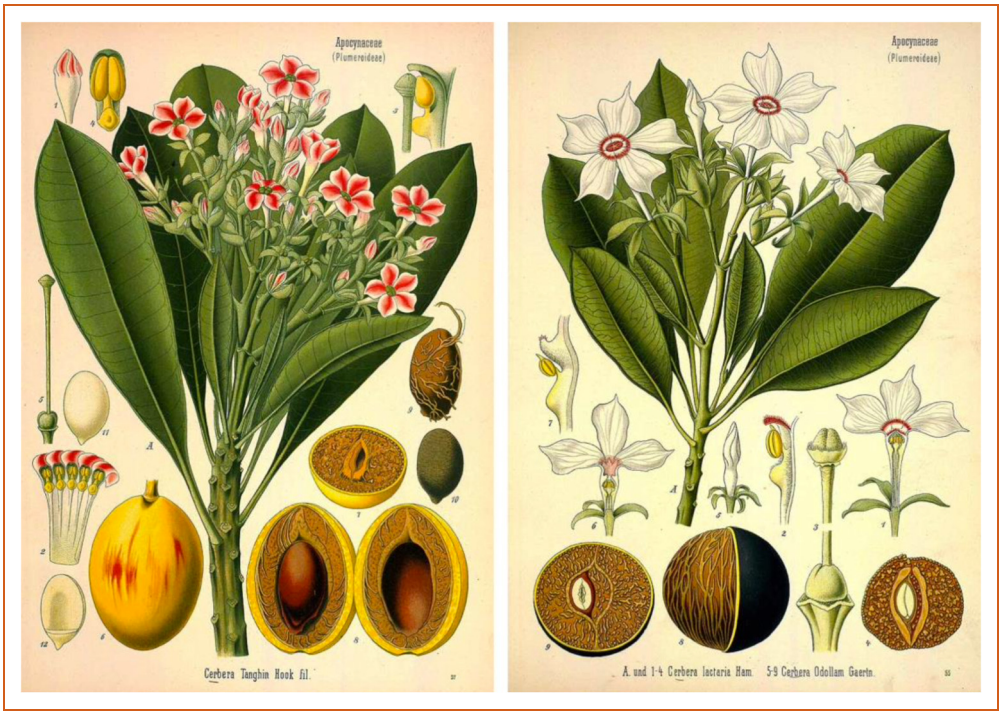


Figure 2. Illustrations of *C. manghas* (left), and *C. odollam* (right). Note the similarity of the sectioned fruit kernel outlines in (A) and (B) with the *C. manghas* illustration. *Note:* the names on these plates are synonyms of *C. manghas* and *C. odollam* (Köhler, 1883-1914).

This case represents a tangible example of how individual death investigations can identify previously unrecognised public health hazards and lead directly to preventative action. The PFD report issued by the presiding coroner resulted in engagement with the OPSS, DEFRA, and the DHSC. Actions taken by the OPSS will have substantially reduced the future availability of the product, with the response from DEFRA highlighting a potentially important regulatory consideration: responsibility for potentially hazardous imported botanical products appears to span multiple regulatory bodies, thus highlighting the importance of clear interagency communication when responding to emerging risks associated with novel consumer products. These actions are particularly pertinent given the recent increase in public awareness of *Cerbera* poisoning following its portrayal in Season 3 of the television series *The White Lotus* (air date February–April 2025, after the death in this case report occurred [August 2024]), which may increase interest in the plant and reinforce the importance of restricting public access to highly toxic botanical products.

Surveillance systems such as the NPSUM and the PDT serve not only to identify novel substances and emerging causes of death, but also to demonstrate whether those findings lead to preventive action. In the present case, linkage between the two databases enabled the identification of a previously unrecognised consumer safety hazard and the subsequent regulatory response aimed at reducing future risk. More broadly, this case illustrates the potential value of mechanisms that systematically translate findings from individual death investigations into public health and regulatory action. Although coronial systems differ internationally, the underlying principles – structured reporting of preventable deaths, communication of concerns to organisations able to mitigate risk and transparent monitoring of subsequent responses – could be adopted or strengthened in other jurisdictions to improve surveillance of emerging hazards and facilitate timely interventions to prevent similar deaths.

Limitations

This report has several limitations. Not all deaths are referred to a coroner and, among those that are, not all undergo post-mortem examination or comprehensive toxicological investigation. Furthermore, as *Cerbera*-derived cardiac glycosides are not routinely included within standard forensic toxicology screening protocols, their contribution to mortality may be under-recognised. In the present case, advanced decomposition prevented toxicological analysis. Nevertheless, the conclusion of fatal *C. manghas* toxicity was supported by convergent circumstantial and forensic evidence.

Conclusion

This report describes a rare fatal self-poisoning involving *C. manghas* seeds obtained through a U.K. decorative homeware supply chain and highlights the value of integrating

coronial, botanical and surveillance data to identify previously unrecognised threats to public safety. The case also demonstrates how PFDs can translate findings from individual death investigations into regulatory action. Although *Cerbera* poisoning is well recognised in parts of Asia, awareness amongst coroners, pathologists, forensic toxicologists, public health agencies and frontline healthcare professionals in the United Kingdom is likely to be limited. As internet-based retail continues to expand, recognition of the toxic potential of *Cerbera* species may become increasingly important in both clinical and forensic settings.

Acknowledgements

The authors would like to thank the Manchester North Coroner's Office and the Office for Product Safety and Standards for their support.

ORCID iDs

Irma Gasparini-Andre https://orcid.org/0009-0001-8793-7802
Georgia C Richards https://orcid.org/0000-0003-0244-5620
Caroline S Copeland https://orcid.org/0000-0002-4462-1402

Ethical approval and declarations of competing interests

IGA has no competing interests. GCR is the Director of the Preventable Deaths Tracker. CSC is Director of the National Programme on Substance Use Mortality and HCG is a Scientific Advisory Board member.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the author(s) used ChatGPT for assistance with drafting and refining manuscript text. The author(s) reviewed and edited the output as needed and take full responsibility for the content of the published article.

Supplemental material

Supplemental material for this article is available online.

References

Antoniou T and Juurlink DN (2014) Synthetic cannabinoids. *Canadian Medical Association Journal* 186(3): 210.

Bernshteyn M, Adams SH and Gada K (2020) A case of attempted suicide by Cerbera odollam seed ingestion. *Case Reports in Critical Care* 2020: 7367191.

Bojanić L, Turnbull P, Ibrahim S, et al. (2024) Suicide-related internet use among mental health patients who died by suicide in the UK: A national clinical survey with case–control analysis. *The Lancet Regional Health - Europe* 44: 100991.

Carlier J, Guitton J, Bévalot F, et al. (2014) The principal toxic glycosidic steroids in Cerbera manghas L. seeds: Identification of cerberin, neriifolin, tanghinin and deacetyltanghinin by UHPLC-HRMS/MS, quantification by UHPLC-PDA-MS. *Journal of Chromatography. B. Analytical Technologies in the Biomedical and Life Sciences* 962: 1–8.

Eddleston M and Haggalla S (2008) Fatal injury in eastern Sri Lanka, with special reference to cardenolide self-poisoning with Cerbera manghas fruits. *Clinical Toxicology (Phila* 46(8): 745–748.

Fok H, Victor P, Bradberry S, et al. (2018) Novel methods of self-poisoning: Repeated cardenolide poisoning after accessing Cerbera odollam seeds via the internet. *Clinical Toxicology (Phila* 56(4): 304–306.

Gaillard Y, Krishnamoorthy A and Bevalot F (2004) Cerbera odollam: A 'suicide tree' and cause of death in the state of Kerala, India. *Journal of Ethnopharmacology* 95(2–3): 123–126.

Judiciary CaT (2025) Carla James: Prevention of Future Deaths Report 2025 [Available from: https://www.judiciary.uk/prevention-of-future-death-reports/carla-james-prevention-of-future-deaths-report/ (Accessed July 2026).

Kassop D, Donovan MS, Cohee BM, et al. (2014) An unusual case of cardiac glycoside toxicity. *International Journal of Cardiology* 170(3): 434–437.

Köhler FE (1883–1914) *Köhler's Medizinal-Pflanzen*. Fr. Eugen Köhler.

Menezes RG, Usman MS, Hussain SA, et al. (2018) Cerbera odollam toxicity: A review. *Journal Of Forensic And Legal Medicine* 58: 113–116.

Menon MS, Kumar P and Jayachandran CI (2016) Clinical profile and management of poisoning with suicide tree: An observational study. *Heart Views* 17(4): 136–139.

Misek R, Allen G, LeComte V, et al. (2018) Fatality following intentional ingestion of Cerbera odollam seeds. *Clinical Practice and Cases in Emergency Medicine* 2(3): 223–226.

Renymol B, Palappallil DS and Ambili NR (2018) Study on clinical profile and predictors of mortality in Cerbera odollam poisoning. *Indian Journal of Critical Care Medicine* 22(6): 431–434.

Saxena M, Jadhav EB, Sankhla MS, et al. (2023) Bintaro (Cerbera odollam and Cerbera manghas): An overview of its eco-friendly use, pharmacology, and toxicology. *Environmental Science and Pollution Research International* 30(28): 71970–71983.

Severson E, Jufer-Phipps R and Fowler DR (2015) Beyond the boundaries of forensic toxicology - the use of an atypical consultant in a rare case of cerberin poisoning. *Academic Forensic Pathology* 5(1): 140–144.

Tsai YC, Chen CY, Yang NI, et al. (2008) Cardiac glycoside poisoning following suicidal ingestion of Cerbera manghas. *Clinical Toxicology (Phila* 46(4): 340–341.

United States Drug Enforcement Administration (2024) Drug Fact Sheet: K2/Spice. 2024. Available at: https://www.dea.gov/sites/default/files/2025-01/K2-Spice-Drug-Fact-Sheet.pdf (Accessed July 2026)

Wermuth ME, Vohra R, Bowman N, et al. (2018) Cardiac toxicity from intentional ingestion of pong-pong seeds (Cerbera Odollam). *The Journal of Emergency Medicine* 55(4): 507–511.