

CASE REPORT

Lindsay E. Sinn,¹ B.S. and John F. Porterfield,² M.D.

Fatal Taxine Poisoning from Yew Leaf Ingestion

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ABSTRACT: A case of fatal taxine poisoning from the ingestion of yew leaves by a young college man is reported. The toxicity of the plant is discussed, and the limited medical literature is reviewed.

KEYWORDS: toxicology, poisons, taxine, yew, *Taxus*

Just before daybreak on a winter morning, a passing motorist found a young man unresponsive, slumped against a duffel bag of freshly laundered clothes on a cement highway bridge riser. A cab driver had seen the man walking along the road a few minutes earlier. An emergency room physician pronounced the man dead after a trauma workup, which included a negative blood alcohol. The physician observed no evidence of trauma.

The deceased was a 22-year-old agriculture student in his fourth year at the local state university. He had recently become a suspect in a dormitory theft because his wallet had been found in the room where the theft occurred. Fellow students characterized him as a loner. They described him as being "depressed" or "spaced out" when seen in his dorm lounge the night before his death. His family denied any display of depression while he was home for the recently ended Christmas vacation. No psychiatric treatment was discovered. The deceased had had a hiatal hernia repaired two years before his death. He used marijuana, and a plastic bag of it was recovered from his pocket.

Autopsy and Laboratory Results

The deceased was tall, with long fingers and pectus excavatum. The only evidence of trauma found was a small scratch on the back of the left hand. An evergreen odor was noted during the dissection. On internal examination, the authors found an aggregate of fresh green blades of grasslike foliage in the jejunum.

An agronomist identified the material as the leaves of a yew plant (Fig. 1), a landscaping evergreen shrub common in the locale. The points of identification were that the leaves were linear, dark green, glossy, and pointed, with an average length of 2.5 cm, a prominent

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¹Forensic death investigator, Lancaster County Coroner's Office, Lincoln, NE, and pathologists' assistant, Pathology Medical Services, P.C., Lincoln, NE.

²Coroner's physician, Lancaster County, Lincoln, NE, and head, Anatomic Pathology Section, Pathology Medical Services, P.C., Lincoln, NE.

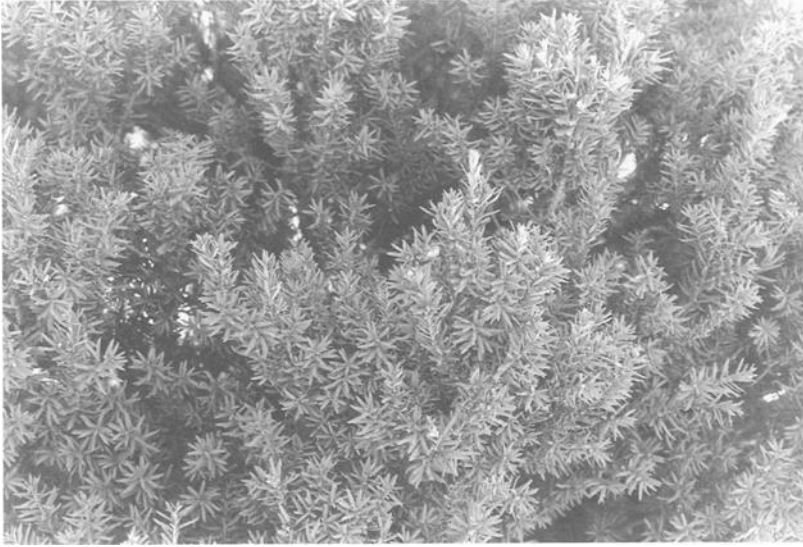


FIG. 1—*Taxus capitata*, a local landscaping shrub.

midrib, a more pale yellowish undersurface, and an obvious pedicel [1]. The characteristic odor of fresh yew leaves was the odor detected during the autopsy.

The state criminalistics laboratory reported that extracts of the contents of the stomach and small intestine produced a gas chromatographic tracing resembling that of an extract from a yew plant. In addition, the analysis showed that cannabinoids were present in the urine at a level greater than 75 ng/mL.

The crime laboratory evaluated the extracts from the stomach and small intestine contents with the knowledge that there was preliminary evidence of yew poisoning. No prior referenced procedures for detecting yew alkaloids could be found, so the laboratory performed the following procedure.

Yew leaves native to the area and resembling those found in the subject's small intestine were macerated in 6 mL of dichloromethane and centrifuged, and the organic phase was decanted into another tube. The organic extract was evaporated to a volume of approximately 100 μ L, and 3 μ L of this volume was injected into a gas chromatograph (GC). Two millilitres of the contents of the stomach and small intestine were extracted in the same manner and also injected into the GC.

The instrument used contained the following features: a Spectra Physics Model 7100 GC equipped with a flame ionization detector (FID), a Sulpelco 30-m DB-5 column (with a 0.32-mm inside diameter and 1- μ m film thickness), and nitrogen carrier gas. The temperatures were as follows: the injector temperature was 250°C; the detector temperature was 300°C; and the oven was programed at 100°C for 1 min, ramped 15°C/min to 260°C, and held at this temperature for 10 min.

There were five peaks from the extracted yew with retention times of 0.82, 1.07, 1.82, 7.80, and 11.80 min. The contents of both the stomach and small intestine produced peaks at 1.80, 7.14, and 11.73 min. The 1.80 and 11.73 peaks were considered evidence of yew ingestion.

Discussion and Review of Literature

The yew family includes three genera and approximately 15 species that are found in both hemispheres. Eight species are distributed throughout the northern hemisphere and

are planted as ornamental shrubs and trees for landscaping or as low ground cover. The most common of the *Taxus* species include the *Taxus baccata* (English yew), the *Taxus cuspidata* (Japanese yew), *Taxus canadensis* (ground hemlock), and *Taxus brevifolia* (Western yew) [1]. The ripened red berries may cause poisoning in children and birds, who are attracted by their color [2].

All parts of the plant are toxic at all times of the year. In England, it is considered a serious danger to livestock [2]. Human fatalities are rarely reported, and we have found only three reported cases [3–5].

The alkaloid taxine is a cardiac depressant. Bradycardia, nervousness, trembling, dyspnea, and incoordination appear a few hours after ingestion. Death closely follows the onset of symptoms. There is no known antidote [4].

Taxine A and Taxine B have been recovered from the yew plant. The exact mechanism of action of the toxin is unknown, but death apparently results from cardiac failure due to the depressant effects of the toxin. Electrocardiographic changes observed in a human poisoning suggest that the primary action is the production of a block in the distal portion of the conduction system of the heart, resulting in fatal rhythm disturbances [5]. When the toxin is absorbed from the intestine, death is relatively sudden, and survival after poisoning is uncommon [2].

Of the three reported fatal taxine poisonings which we located, only one involved the deliberate ingestion of a yew plant by an adult to commit suicide [4]. The case reported was of a 70-year-old woman who had earlier attempted suicide with diazepam. She was transferred to a psychiatric institution and allowed to walk about the grounds, where she ate the bark of the *Taxus baccata*. She developed severe bradycardia and died 2 h after ingestion of the yew.

Conclusions

The manner of death in the present case was regarded as undetermined. Although his "loner" status, recent suspicion by the police in a theft, and agronomy knowledge would suggest suicide by taxine poisoning, there was no documentation of such. It is also possible that his agronomy studies merely sparked a curiosity regarding the effects of the yew leaves. That he experimented with mind-altering drugs was manifested by his marijuana use.

Acknowledgement

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Address requests for reprints or additional information to
Lindsay E. Sinn
Pathology Medical Services, P.C.
1919 South 40th Street, Suite 333
Lincoln, NE 68506