

THE TOX LAB

Podcast Transcript

Episode 8: Festive Poisons

This transcript was created by AI from audio and lightly edited for readability. Treat it with caution, and assume occasional transcription errors may remain.

TRANSCRIPT

Hi everyone, welcome back to The Tox Lab. I'm Rebecca.

I'm Rob. This week we've got a special Christmas episode, which I'm really excited about. We're going to be looking at some festive poisonings.

But before we jump into that, why did Rudolph have a red nose?

I don't know.

He had a dodgy boiler.

That is so bad.

It was quite bad. Shout out if you really enjoy the jokes on this podcast, or if you think we should stop doing them.

Anyway, we've made it to episode eight, which is really exciting, and we're still smiling, which is also good.

It's been fun. I hope everyone listening has enjoyed them as much as we've enjoyed making them.

Definitely. So this week we're going to be looking at some festive poisonings, and I don't mean the usual Christmas poisons like alcohol and sugar.

I do love a bit of sugar.

So do I.

We're going to look at some of the things we associate with Christmas that may or may not actually be poisonous.

So Rebecca: poinsettia. Bright red festive plant. Poisonous?

I don't know. Shall we find out?

Let's find out.

Poinsettias are that bright red decorative plant that, admittedly, I didn't really think of as especially Christmassy until much later than I should have done.

They're incredibly festive. How did you not?

They just weren't something we had in our house.

Poinsettias are commonly believed to be poisonous. If you buy them in supermarkets, they often come with warnings not to eat them, which is probably good advice for most plants. But there is actually an origin story behind the belief that they are dangerous.

The poinsettia was introduced into the United States from Mexico by Joel Roberts Poinsett, hence the name. In 1920, there was an unconfirmed report of a two-year-old Hawaiian child dying after ingesting a poinsettia leaf.

In 1944, a book on poisonous plants of Hawaii by a Dr Arnold repeated the story and described poinsettias as highly toxic. The author later acknowledged that the story was essentially hearsay, but by then the claim had already spread.

The press amplified it, activists later called for warning labels, poinsettias were banned from some hospitals and nursing homes, and even the FDA contributed to the hysteria by suggesting that one leaf could kill a child.

So we went digging in the archives and found a study from 1996 looking at poinsettia poisonings reported to poison control centres.

Why don't you take us through that?

The paper looked at calls to the American Association of Poison Control Centers between 1985 and 1992 involving poinsettia exposures.

They identified 2,793 poinsettia cases. About 49 percent involved males, 93 percent involved children, and around 70 percent involved children under two.

So in other words: toddlers chewing the leaves or flowers, people panicking, and calling poison control.

Exactly. Unsurprisingly, about 75 percent of cases occurred between December and February. Ninety-nine percent were accidental, ingestion was the main route of exposure in 95 percent of cases, and there were no fatalities.

Most importantly, 92 percent were classed as having no effect at all. Not mild symptoms, but literally no effect.

So lots of calls, but not much poisoning.

Yes. Interestingly, among the people who did have some symptoms, quite a few were from dermal exposure rather than ingestion. Poinsettias have a milky latex-like sap, so they may be more irritating to skin than they are dangerous to eat.

So that is one festive poison myth already largely debunked.

Yes. The practical advice is still not to eat it, and probably don't rub the sap in your eyes or on broken skin, but it is clearly not the deadly plant it was once made out to be.

Let's move on to another festive plant: holly.

Classic pointy green leaves, bright red berries. Very Christmassy.

Very Christmassy.

I remember being told as a child that holly berries were poisonous.

Same. Although after the poinsettia story, that warning suddenly feels a bit less certain.

So, are there any studies?

This was actually surprisingly hard. We couldn't find the same kind of poison-centre dataset for holly that we found for poinsettia.

What we do know is that holly contains methylxanthines such as caffeine and theobromine, which sounds almost delicious, but it also contains saponins, and those are the compounds more likely to cause harm.

Saponins can irritate the gastrointestinal tract and disrupt cell membranes, so if holly causes symptoms, they are likely to be nausea, vomiting, and stomach upset.

We did find references to a few case reports, including one involving twins who had eaten holly berries. One vomited around 40 times and became drowsy, while the other had several episodes of vomiting but was otherwise less affected.

So holly berries probably can cause GI distress, but we couldn't find convincing evidence of common severe poisoning or deaths from the kinds of accidental small exposures children might have.

So probably mildly poisonous, but not usually deadly.

That seems to be the best summary.

My earliest memory of holly was seeing birds eat the berries and being very confused after being told they were poisonous.

Which is a good reminder that what is harmless to birds is not always harmless to us.

Exactly.

So yes: holly berries, probably not a good idea, but not the unstoppable festive killer they are sometimes made out to be.

Let's move on to mistletoe.

Everyone loves a bit of mistletoe.

Do you have mistletoe at home?

No, but it does look pretty, especially the white berries.

The tradition of kissing under the mistletoe apparently comes from Norse ideas of love and peace, and then later Victorian traditions. Why it became particularly associated with Christmas is less clear, but if anyone knows, do let us know.

The key question for us is: is mistletoe poisonous?

I was definitely told growing up not to eat the berries.

Same. And unlike with holly, we did actually find some data for mistletoe.

The first paper was by the same group who looked at poinsettia exposures. Again they used poison centre data from the American Association of Poison Control Centers between 1985 and 1992.

Out of more than 700,000 plant exposures, mistletoe accounted for 1,754. Around 92 percent involved children, and ingestion was the main route of exposure in 96 percent of cases.

So once again: mostly children eating berries or bits of plant, then adults calling poison control.

Exactly. Most of the exposures were accidental, although there were some intentional exposures, including misuse and a few cases described as self-harm related.

But again, there were no fatalities reported in that dataset.

Most patients were asymptomatic, and most of the symptomatic cases were minor. Many received no treatment at all. Some were given what was then classed as gastrointestinal decontamination, including things like ipecac, which we would be much less enthusiastic about now.

The broad conclusion was that American mistletoe, in the sorts of small accidental exposures seen in children, did not appear especially dangerous.

There was also another small paper looking at children who had eaten one to three mistletoe berries, and again none of them developed serious symptoms.

So again, the data are surprisingly reassuring.

Yes, but with an important caveat. There have been isolated deaths reported from mistletoe exposure, usually involving tea or herbal preparations made from mistletoe rather than just a toddler eating a couple of berries.

So it may be a dose issue.

Exactly. And there are definitely toxic compounds in mistletoe. It contains phoratoxins and lectins, and also ribosome-inactivating proteins that work in broadly similar ways to some well-known plant toxins such as ricin.

So in theory there are some nasty compounds there, but the available poison-centre data suggest that small accidental exposures to American mistletoe rarely cause serious harm.

But we should point out that these studies are about American mistletoe.

Yes, and that matters. European mistletoe, which is the kind we are more likely to encounter naturally in the UK, is generally regarded as more toxic.

We couldn't find an equivalent UK or European dataset, but European mistletoe seems to contain higher concentrations of some of the toxic compounds.

And there is another twist: mistletoe is a parasitic plant, which means it grows on other host plants, and the compounds present may vary somewhat depending on the host.

Which is really interesting.

So the safest summary is probably: mistletoe is plausibly poisonous, especially depending on species, amount, and preparation, so don't eat it.

And definitely keep pets and children away from it.

Now for the final thing we wanted to look at this week, which might be slightly controversial.

Is nutmeg a Christmas spice?

Yes. One hundred percent.

Good. That means we can talk about it.

Nutmeg is interesting because it used to be incredibly valuable, once even more valuable than gold by weight, and most people probably think of it as completely harmless.

Before doing this episode, I hadn't really thought of nutmeg as dangerous at all.

Same. But nutmeg is more poisonous than many people realise.

We found a 10-year retrospective review of nutmeg poisonings reported to an Illinois poison centre between 2001 and 2011.

They identified 32 cases over those ten years, with a mean age of 13 years. Around 68 percent were male, and interestingly about 47 percent were intentional exposures.

So unlike the plant exposures we have talked about so far, where almost everything was accidental, nutmeg had a surprisingly high proportion of deliberate use.

Which makes sense once you realise that some people know nutmeg can have psychoactive effects in large enough doses.

Exactly. Most of the cases did not require major treatment, although 10 were admitted to hospital. Symptoms included cardiovascular effects such as tachycardia and hypertension, gastrointestinal symptoms like nausea and vomiting, and neurological or psychiatric effects such as hallucinations, agitation, confusion, and drowsiness.

There was also one reported seizure and one case of respiratory depression in that series.

So for something most of us just grate into festive baking, that is a surprisingly broad toxicity profile.

And there has also been a reported death.

Yes. We found a case report from 2001 involving a 55-year-old woman. At post-mortem, toxicology only detected flunitrazepam at a toxic but apparently not fatal concentration, and there was no obvious explanation for death.

What led them to consider nutmeg was that the stomach contents reportedly smelled strongly of nutmeg.

Which is one of the most old-school toxicology clues imaginable. And also suggests there must have been an extraordinary amount of nutmeg present, because stomach contents do not normally smell pleasant.

The investigators went looking for myristicin, which is one of the main psychoactive compounds in nutmeg, and detected it using HPLC and UV-visible spectroscopy.

They then tried to estimate the likely dose ingested, although we should be cautious about back-calculating doses from post-mortem concentrations because that is shaky even with drugs we understand much better.

Their rough estimate was that a very large quantity had been consumed.

So what makes nutmeg toxic?

Myristicin is one of the key compounds. Structurally it has some similarities to compounds associated with psychoactive effects, and it is thought to contribute to the hallucinations, agitation, and autonomic symptoms seen in large nutmeg ingestions.

Nutmeg contains volatile oils, and in sufficiently large doses those constituents can have real toxic and psychoactive effects.

Which probably explains why almost half of the poison-centre cases were intentional exposures: people may be taking it on purpose to try to get high.

Yes, although everyone I have ever heard of doing that has deeply regretted it.

I actually knew someone who once took too much nutmeg and spent more than a day in bed feeling anxious, nauseated, and generally dreadful. It did not sound remotely enjoyable.

So in summary: nutmeg can be quite poisonous, but you generally need a lot more than the tiny amounts used in Christmas cooking.

So yes, put it in your gingerbread, put it in your Christmas cocktails, but do not go overboard.

Exactly.

So what have we learned from all of this?

I think we have debunked a few festive myths. Poinsettia is far less dangerous than its reputation suggests. Holly is probably mildly poisonous, mainly causing stomach upset. American mistletoe seems less harmful than people often assume, but European mistletoe may be more concerning. And nutmeg, surprisingly, may be the most genuinely toxic thing we have talked about today if you take enough of it.

So: don't eat poinsettia, don't eat holly, don't eat mistletoe, and don't overdo the nutmeg.

That sounds like very solid festive advice.

I think we're going to wrap it up here. I hope you've all enjoyed listening.

We're going to take a little break for Christmas and will be back on 6 January. So we hope you all have a wonderful Christmas.

Do give us a like or a follow. You can find us on Instagram at @the_tox_lab, and you can also comment on Spotify now.

If you have any feedback or suggestions for future episodes, we'd love to hear from you.

Hope you all have a wonderful festive season, and we will see you in 2025. Bye.