

Objective

Gloriosa superba (glory lily) is a popular flowering plant in gardens all over Europe. This plant belongs to the family Colchicaceae and hence contains colchicine, with the highest concentration of about 0.3 to 0.6 % in the tuber.

Toxicity of colchicine is well known, and formulations of this substance, as well as ingestion of colchicine-containing plants regularly lead to severe intoxications and even deaths.

We report on one case of accidental ingestion of *Gloriosa superba* “tea” where potentially (very) toxic blood levels were detected, but the patient fortunately failed to develop any severe symptoms.

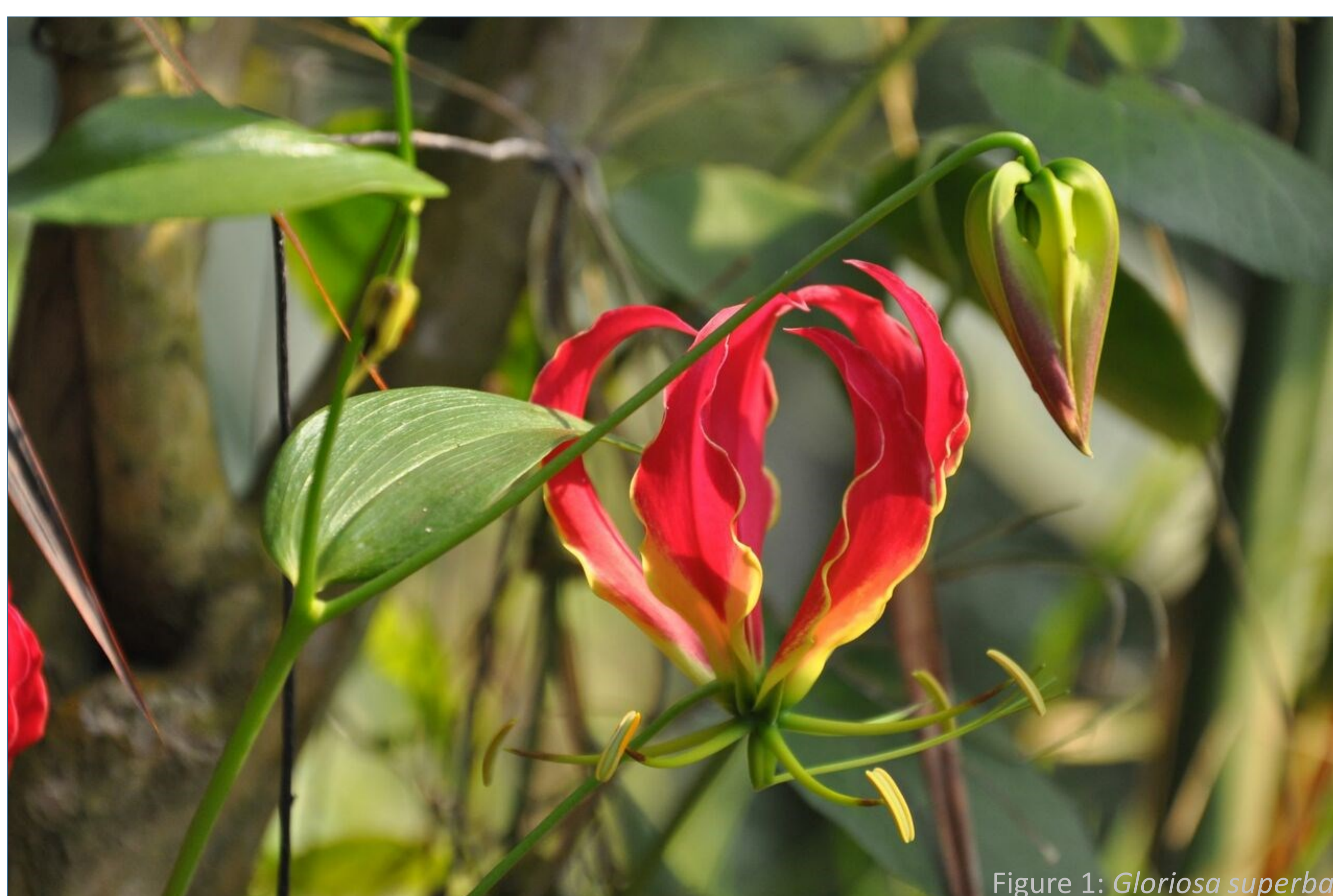


Figure 1: *Gloriosa superba*

Case Report

A 17-year-old adolescent felt slightly ill and therefore wanted to brew himself some ginger tea. He used a ginger-like-looking tuber from the garden, cut about 50 grams of it up and then infused it with about 500 milliliters of hot water. Of this infusion he then drank a relatively large cup before he became aware to his mistake and alerted his parents, who contacted the Poisons Information Centre Erfurt.

Due to the known severe toxicity of colchicine, we recommended prompt referral to hospital and advised the parents to call an ambulance. About two hours after ingestion the patient arrived in the emergency department. Activated charcoal was applied immediately plus repeated doses every 4 hours were recommended, and the patient was transferred to ICU for observation. A blood sample was sent for analytics and an initial colchicine plasma level (sampled 2 hours after ingestion) of 20 ng/mL was found – which is described as potentially lethal in the literature [1].

In ICU, the patient merely developed some minor gastrointestinal disturbances such as nausea, abdominal pain, and discomfort, but no cardiac symptoms or organ toxicity occurred. Repeated doses of activated charcoal were applied every four hours for 24 hours, and repeated measurements of plasma levels were performed. After 16 hours, colchicine plasma level had dropped to 3.2 ng/mL, and after 36 hours to 2 ng/mL. Further measurements over the next 7 days all found levels below 2 ng/mL – corresponding with “normal” plasma levels at therapeutic doses [1]. The patient developed no further symptoms and could be discharged without sequelae.

Discussion

Therapeutic and toxic levels of colchicine are well known: “normal” plasma levels at therapeutic oral doses range from 0.3 to 2.5 ng/mL, toxic levels are (greater than) 5 ng/mL. Plasma levels of 10 to 66 ng/mL are given as “comatose-fatal”, although no sampling times are stated [1]. In studies from Sri Lanka, case fatality after *Gloriosa superba* self-poisoning was 10 to 15 %, and concentrations greater than 5.8 ng/mL were predictive for a fatal outcome [3]. Hence, our patient’s initial plasma level of 20 ng/mL led us to expect severe toxicity.

After therapeutic oral administration, colchicine concentrations are at a maximum between 0.5 to 2 hours. It can therefore be assumed that the 2-hour-plasma level in this case approximates to the peak plasma colchicine level.

It is a known fact that activated charcoal adsorbs colchicine. In vitro investigation of colchicine released from different parts of *Gloriosa superba* could show that a single dose of activated charcoal effectively binds (any) free colchicine at a 1:10 ratio of plant:charcoal [2].

Furthermore, as colchicine is known to undergo enterohepatic circulation, repeated doses of activated charcoal were deemed beneficial.

Conclusion

During the observation period in ICU, the patient did not develop any of the symptoms expected in severe colchicine poisoning.

We conclude that our patient vastly benefited from the prompt and repeated dosing with activated charcoal. On this account, activated charcoal - as a single dose for gastric decontamination as well as multiple doses for enhanced elimination - should be recommended in cases of *Gloriosa superba* ingestion.

References

- Schulz et.al. Therapeutic and toxic blood concentrations of nearly 1,000 drugs and other xenobiotics. Crit Care 2012;16(4):R136.
- Zawahir et.al. Activated charcoal significantly reduces the amount of colchicine released from *Gloriosa superba* in simulated gastric and intestinal media. Clin Toxicol 2017;55(8):914-918.
- Wijerathna et.al. Epidemiology, toxicokinetics and biomarkers after self-poisoning with *Gloriosa superba*. Clin Toxicol. 2019;57(11):1080-1086.

