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Poisoning related to the consumption of soup prepared with contaminated *Radix Fici Simplicissimae*

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Introduction

In Hong Kong, many people believe that traditional Chinese soup is rich in nutrients and good for health. Many different ingredients could be used to prepare soup and *Radix Fici Simplicissimae* is one of the popular ingredients.

Radix Fici Simplicissimae

Radix Fici Simplicissimae is the root of *Ficus hirta* belongs to Moraceae family.[1] As the shape of the leaves of *Ficus hirta* is similar to a pattern of "five fingers" and its fruit is peach-shaped with hairy surface, it is commonly known as "five-fingered hairy peach" in Chinese.

Radix Fici Simplicissimae is the plant for soup preparation in Lingnan region of China. Due to its coconut smell and health effects, therefore it is popular among the general public.

In Hong Kong, *Radix Fici Simplicissimae* is not regarded as Chinese Herbal Medicines under the Chinese Medicine Ordinance (Chapter 549). *Radix Fici Simplicissimae* per se is not toxic but its plant grows in wild areas where some toxic plants are prevalent, such as *Gelsemium elegans* (a toxic plant belongs to the Loganiaceae family). As the appearance of the roots of *Ficus hirta* (*Radix Fici Simplicissimae*) and *Gelsemium elegans* are quite alike, there is a chance to mix them up during excavating.

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Gelsemium elegans

Gelsemium elegans is a toxic plant native to Southeast Asia.[2] It is an evergreen twining climber, glabrous throughout, to 3-12m long, with opposite, ovate to ovate-lanceolate leaves to 7-12cm long and 2-5.5cm wide. Flowers in a terminal dichotomal cyme, corolla orange, funnel-form, limb 5-lobed. Fruit an ellipsoid or ovoid capsule, 10-15mm long, 6-10 mm in diameter. It flowers from May to November and grow in scrubby forests and thickets.[3]

All parts of *Gelsemium elegans* are toxic including flower, leave, fruit, root and stem.[4] More than 120 alkaloids have been identified in the plant.[5]

	Ficus hirta	***Gelsemium elegans***
Plant		
Leave		
Stem	 *	

Table 1: Comparison between major characteristics of *Ficus hirta* and *Gelsemium elegans*

	Ficus hirta	*Gelsemium elegans*
Fruit		
Root	 (*Radix Fici Simplicissimae*) Greyish yellow or yellowish-brown surface with reddish-brown spots, but without annular cracks Fracture with filiform fibres at the bark  Wood with concentric ring in transverse section	 Greyish-brown or brown surface with annular cracks frequently found; without filiform fibres in fracture of the bark  Wood with radial striations and small holes in transverse section

Table 1: Comparison between major characteristics of *Ficus hirta* and *Gelsemium elegans* (cont')

Photo source:

1. Chinese Medicine Regulatory Office, Department of Health, HKSAR. Interesting Chinese Herbs.
2. Hospital Authority Toxicology Reference Laboratory. Atlas of Poisonous Plants Hong Kong. A Clinical Toxicology Perspective
3. *Agriculture, Fisheries & Conservation Department (AFCD), HKSAR

Clinical features of Gelsemium poisoning

According to "Herbal China", Gelsemium has the effects of dispelling wind and removing toxin; dispersing nodules and swelling; and pain relief. It may be used for eczema, sores and skin infection with local redness and swelling, joint pain due to wind dampness, obstruction, traumatic injuries. It is highly toxic as its alkaloids have inhibitory effects on neurological and respiratory systems. The mechanism of toxicity is not certain. In general, the onset of Gelsemium poisoning is rapid, usually within 15 minutes to 2 hours after ingestion. Common symptoms include dizziness, vomiting, blurred vision, hoarseness of voice, muscle weakness, palpitation, impaired consciousness etc. In severe cases, it can cause coma, respiratory failure and even death. Due to its toxicity, it is listed in the Schedule II of the Chinese Medicine Ordinance which implies that the wholesale and retail of Gelsemium is regulated by law.

Diagnosis and Treatment

If there is clinical suspicion on Gelsemium poisoning (e.g. onset of symptoms compatible with this poisoning after consumption of the herbal soup), it is useful to check the presence of Gelsemium alkaloids in patients' urine specimens and herbal remnants.[6]

Treatment for Gelsemium poisoning is mainly supportive as there is no antidote currently available. It is important to closely monitor the patient's ventilation to have early detection of respiratory failure. Respiratory support with endotracheal intubation might be required in some severe cases.

Local situation

In Hong Kong, there are Gelsemium poisoning cases due to the consumption of soup prepared with contaminated *Radix Fici Simplicissimae* in the past.

From 2014 to 2019 (up to 2019 3rd Quarter), the Centre for Health Protection of the Department of Health (DH) has recorded a total of 19 persons (involved 6 clusters) affected by Gelsemium poisoning caused by intake of *Radix Fici Simplicissimae* suspected to be mixed with contaminated Gelsemium (Table 1). A total of 8 males and 11 females were included and their ages ranged from 2 years old to 74 years old (median age: 43 years).

Year	**No. of clusters**	**Total no. of persons affected**
2014	2 clusters with 4 and 3 persons respectively	7
2015	1 cluster of 3 persons	3
2016	0	0
2017	1 cluster of 2 persons	2
2018	2 clusters with 4 and 3 persons respectively	7
2019 (as of 30 Sep)	0	0
Total	**6**	**19**

Table 2: Number of clusters and persons affected by Gelsemium poisoning (2014 – 2019 3rd quarter)

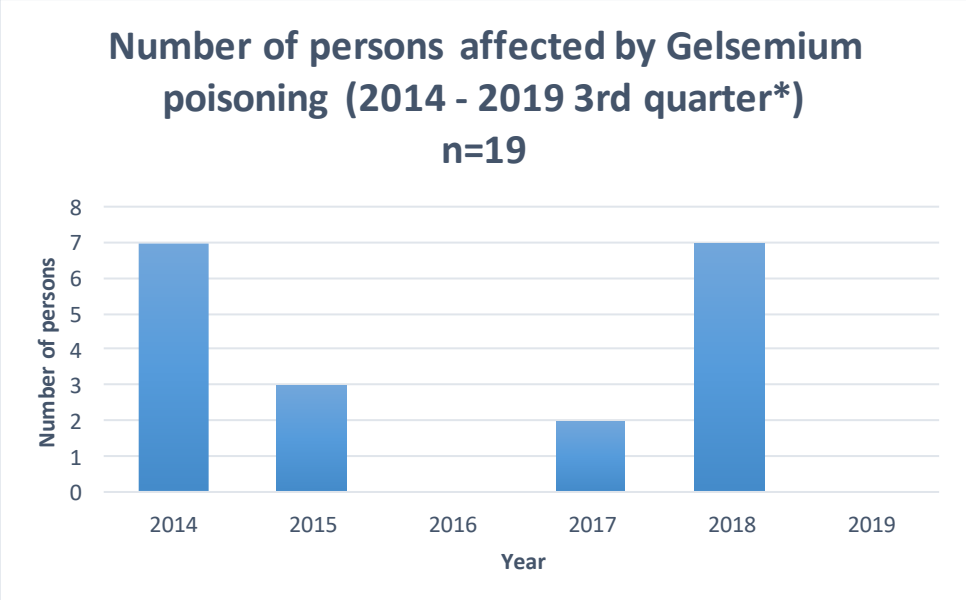


Figure 1: Number of persons affected by Gelsemium poisoning (2014 – 2019 3rd quarter)
*as of 30 Sep 2019

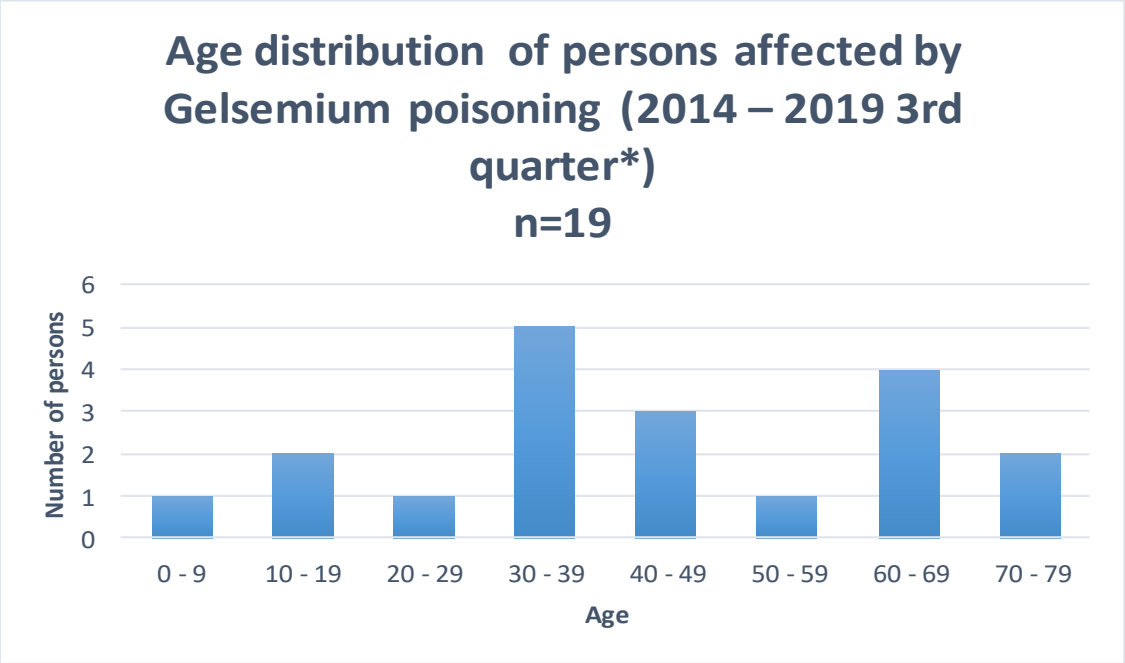


Figure 2: Age distribution of persons affected by Gelsemium poisoning (2014 – 2019 3rd quarter*)
*as of 30 Sep 2019

Among the 19 affected persons in the 6 clusters, the onset of symptoms ranged from 30 minutes to 2 hours after consumption of soup, including 19 (100%) of them presented with dizziness, 15 (78.9%) presented with nausea or vomiting; and 4 (31.5%) presented with blurred vision. Among the 19 affected persons, three cases refused seeking medical advice, the other sixteen (84.2%) persons required either observation in the Accident and Emergency Department (A&ED) of Hospitals or hospitalization. None of them required admission to intensive care unit and there was no fatal case. Among the 16 persons who were either observed in A&ED or hospitalised, 14 of them had Gelsemium alkaloid were detected in the urine specimens. Gelsemium alkaloids were detected in the herbal remnants of all 6 clusters.

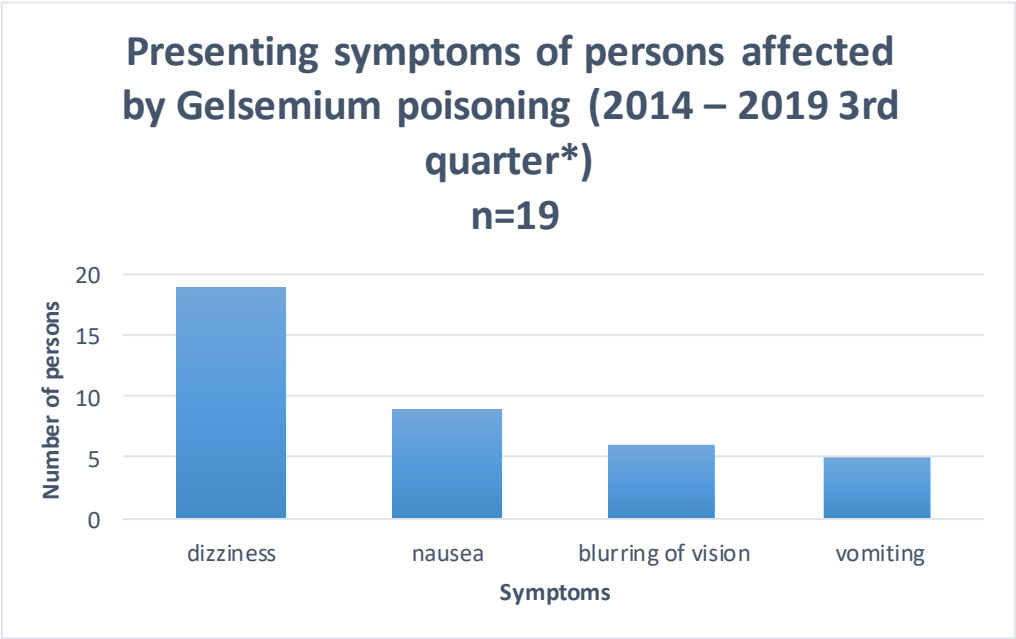


Figure 3: Presenting symptoms of persons affected by Gelsemium poisoning (2014 – 2019 3rd quarter*)
*as of 30 Sep 2019

Among the 6 clusters, the sources of *Radix Fici Simplicissimae* in four clusters were from mainland China including Guangdong and Quangxi while the remaining 2 clusters purchased it in wet market in Hong Kong.

Prevention and Control

Upon notification of suspected Gelsemium poisoning cases, DH will commence epidemiological investigation immediately which includes contacting the notifying doctors for detailed clinical information, reviewing and verifying with the patients about their clinical conditions and product consumption history, contact tracing of possible collaterals with consumption history of the concern medicinal plants, collection of remnants for laboratory examination, and joint site visits to the premises with relevant government departments where appropriate. Moreover, appropriate public health control measures such as conducting health risk communications by issuing press release and health education will be implemented.

To prevent Gelsemium poisoning, members of the public should:

- Purchase medicinal plants from shops with a good reputation;
- Avoid consume plants with medicinal property of unknown origin. If in doubt, it is better not to consume them;
- Avoid picking wild plants for food;
- Seek advice from healthcare professionals immediately if feel unwell after consumption of *Radix Fici Simplicissimae* or other plants.

If doctors encounter any suspected poisoning cases related to the consumption of *Radix Fici Simplicissimae* soup with possible contamination with Gelsemium, they should notify the Centre for Health Protection.

Notification form can be downloaded from the Centre for Health Protection website https://www.chp.gov.hk/files/pdf/hpf-form3-en-20150109.pdf

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