and blood samples were received by the National Poison Centre for TTX analysis within a week of the incident. Due to the rapid metabolism of TTX, only urine samples were analysed and the levels were quantified according to the developed and validated GC-MS assay. TTX was detected in four of the five urine samples with the highest concentration in the urine sample of the deceased (93.4 ng/mL). The victim, a 72-year-old male died a few hours after admission to hospital. The other three victims survived (TTX, 1.3–17.3 ng/mL) despite experiencing various degrees of poisoning symptoms to TTX exposure. No TTX was detected in the fifth urine sample. Since there is no guarantee on the safety in the consumption of horseshoe crab, it would be beneficial for relevant authorities to make available information on the risks and hazards of consuming horseshoe crab and its by-products for public safety.

(87) The Effect of Mycotoxin Citrinin on Cardiac Development in Zebrafish (*Danio rerio*) Embryos

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Citrinin (CTN), a fungal secondary metabolite from *Penicillium* and *Aspergillus* species, is frequently detected in wheat, corn, rice, and barley. Although CTN is considered to be a teratogen in rat, its effect on the early embryonic development is not clear. The zebrafish is considered as a good animal model for a toxicological study because of its short generation time and transparent embryos. In this study, zebrafish embryos were treated with CTN from 6 h post-fertilization (6 hpf) or 24 to 120 hpf, and the LC50 values were found to be 15.3 and 16.6 μM, respectively. The morphology of CTN-treated embryos was heart tube malformation and yolk sac edema with red blood accumulation. With whole-mount immunostaining using MF20and S46 as probes, the formation of small hearts with abnormal looping showed a dosage-dependent manner in the 24–72 hpf CTN-treated embryos. Furthermore, the Tg (BMP4: EGFP), with fluorescence in heart chambers, was used to measure the heart shape and size after toxin treatment. When embryos were treated with 50 μM CTN from 24 to 72 hpf, the distance between sinus venosus to bulbus arteriosus was significantly decreased to 78.7 % of the control level. In addition, the areas of ventricle and atrium in CTN-treated groups were decreased to 51.5 and 49.8 % of vehicle-treated groups, respectively. The heartbeats of 50 μM CTN-treated embryos were also decreased from 154.9+4.8 to 107.5+5.8/min, suggesting that CTN may trigger bradycardia in zebrafish embryos. On the other hand, we did not observe any morphological change of pronephric kidney in CTN-treated embryos; either glomerulus or pronephric tubes/ducts did not demonstrate apparent difference comparing to control groups. On the basis of these results, we suggested that CTN is able to induce cardiotoxicity in zebrafish embryos.

(88) Toxic Plants Poisoning Cases Reported to National Poison Center (2006–2009)

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Introduction: Some plants have medicinal values whilst others may have toxic components. Poisoning regarding plants may occur due to intentional or unintentional consumption of the plants. These plants can be found both growing wild and in gardens, school compounds or public parks.
Objective: The aim of the study is to review the trend of cases involving plant poisoning reported to the National Poison Center (NPC) for the period of 2006–2009.
Methods: We analysed the calls registered by the NPC 24-h information and consultation service for the period between 2006 and 2009 focusing on the poisoning cases that involved plants. Age, gender, date of exposure, route of exposure, and type of NT poisoning were evaluated. SPSS version 15 was used for descriptive analysis of the data collected.
Results: Data analysis showed that 17 poisoning cases caused by poisonous plants have been reported which contributed to 5.82 % of the total poisoning cases caused by natural toxin. All calls were made by medical doctors. Plant poisoning occurred mostly in males (58.82 %). These plants include *Datura* sp. (four cases), *Jatropha* sp. (three cases), *Antiaris toxicaria* (three cases), *Mitragyna speciosa* (two cases) and one case of *Caladium* sp. It was observed that there was an increasing trend in the number of calls received.
Conclusion and Recommendation: There has been an increase in the number of calls received by the NPC involving plant poisoning. Although poisoning cases caused by plants are quite rare but it is still important to inform the public about the types or species of poisonous plants around us. Certain degree of precaution or awareness should be inculcated as danger posed by such plants can cause physical discomfort and mental stress. It could also lead to death. More national studies should be carried out regarding plant chemistry and toxicity.

(89) Evaluation of an Educational Intervention on Management of Pesticides Poisoning Among Pharmacists in Government Hospitals in Malaysia

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