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## 焦點個案 Incident in Focus

# 再談食物中的麻痺性貝類毒素 More about Paralytic Shellfish Poisoning Toxins in Food

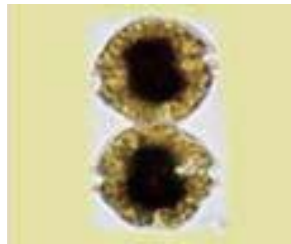
食物安全中心  
風險評估組  
科學主任陳偉仁先生報告

Reported by Mr Dicky CHAN, Scientific Officer,  
Risk Assessment Section,  
Centre for Food Safety

本港在五月發生懷疑麻痺性貝類中毒事件，有關報道再次提醒我們進食至愛港式蒸帶子引致的食物中毒。本欄藉此機會再次探討麻痺性貝類中毒。

## 由藻類產生的麻痺性貝類毒素

麻痺性貝類中毒是一種由進食含有麻痺性貝類毒素的貝類引致的疾病。患者通常在進食含有毒素的貝類後數分鐘至數小時內出現神經系統相關的症狀，而且往往會有腸胃症狀。麻痺性貝類毒素由名為“雙鞭毛藻”的微小藻類產生，這一組藻類的長度／直徑一般約為5至2 000微米。產生麻痺性貝類毒素的藻類通常生活在熱帶和溫帶水域，當中已知會產生毒素的種類包括鏈狀亞歷山大藻、巴哈馬麥甲藻及鏈狀裸甲藻等。同一種類的雙鞭毛藻產生麻痺性貝類毒素的能力各有不同，視乎藻株而定。在有利的氣候和其他環境條件下，這些藻類會迅速繁殖，並可能產生毒素，最終形成“有害藻華”。蜆、帶子、扇貝及青口等貝類如有有害藻華出現的水域覓食，在有這種藻類產生的毒素的機會較高。



鏈狀亞歷山大藻是一種可產生麻痺性貝類毒素的本港藻類。(資料來源：漁農自然護理署(漁護署))

*Alexandrium catenella* – a PSP toxins producing algae in H.K. [Source: Agriculture, Fisheries and Conservation Department (AFCD)]

## 出現水域

可產生麻痺性貝類毒素的雙鞭毛藻一向主要在北美洲、歐洲及日本附近的水域，但在亞洲出現的情況日多。現時，這種藻類亦見於中美洲、南美洲及大洋洲等其他地區。至於中國內地，浙江、福建、廣東多省亦發現其踪影。各國當局已在其水域推行紅潮／有害藻華監察及管理計劃。在本港，漁護署亦已設立紅潮管理框架制度，務求減少紅潮／有害藻華可能對本港海魚養殖活動及市民健康的影響。

## 麻痺性貝類毒素的分布

受污染貝類不同部位組織積聚的麻痺性貝類毒素含量不一，視乎貝類的品種及種類而定。就某些種類的帶子及扇貝而言，有報告指內臟積聚的麻痺性貝類毒素含量最高，而閉殼肌則最低。以往一些研究發現，扇貝的消化腺所含的麻痺性貝類毒素較閉殼肌高出約30倍，而生殖腺等其他部位所含的毒素亦高於閉殼肌。

A recent report on local suspected Paralytic Shellfish Poisoning (PSP) outbreak in May reminded us again the association between consumption of the beloved Hong Kong style steamed fan shell and food poisoning. We take this opportunity to examine again this subject matter.

## PSP Toxin Produced by Algae

PSP refers to an illness affecting human due to ingestion of shellfish containing PSP toxins. The affected persons usually present with neurological symptoms and are frequently accompanied by gastro-intestinal symptoms within minutes to several hours after consuming shellfish containing the toxin. The toxin is produced by small algae known as “dinoflagellates”.

This group of algae usually measures between 5 and 2 000 microns in length/diameter. PSP toxins producing algae is usually found in the tropical and moderate climate zones. Some identified toxins producing species are *Alexandrium catenella*, *Pyrodinium bahamense*, *Gymnodinium catenatum*, etc. Depending on the strains, ability to produce PSP toxins within the same species of dinoflagellates is varied. When the climatic and other environmental conditions are favourable, these algae grow rapidly and may produce toxin; and eventually cause “harmful algal bloom (HAB)”. Shellfish, such as clams, scallops, mussels, feeding in areas affected by HAB may therefore be at a higher chance of containing the toxin produced by these algae.

## Occurrence

PSP toxins producing dinoflagellates have mainly occurred in the waters near North America, Europe and Japan but occurrences in Asia are increasingly reported. Nowadays, they also occur in other regions such as Central America, South America and Oceania. In Mainland China, occurrences in Zhejiang, Fujian and Guangdong Provinces were also reported. Many national authorities have implemented red tide/HAB monitoring and management programmes in their home countries. In Hong Kong, the AFCD has also established a red tide management framework with a view to minimising the possible local impacts of red tide/HAB on marine fish culture activities and human health.

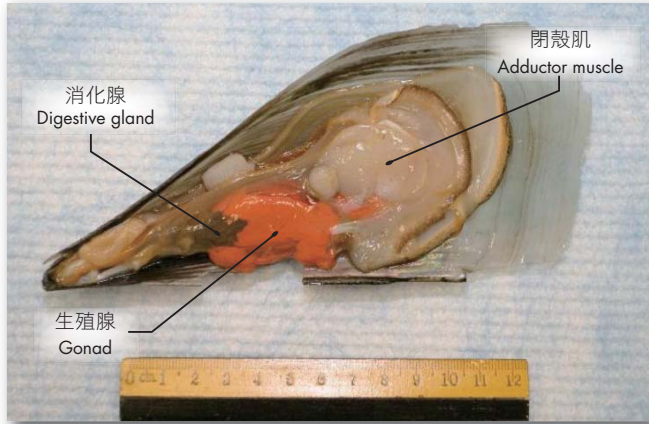
## Distribution of PSP Toxins

The levels of PSP toxins accumulated in different parts of tissues of contaminated shellfish vary depending on the types and species of shellfish. For some species of scallops, it was reported that viscera had the highest level of accumulated PSP toxins and adductor muscle contained the lowest level. Some previous studies found that the level of PSP toxins in the digestive gland of scallops was about 30 times higher than in the adductor muscle. Other parts, such as gonad, were also found containing higher level of PSP toxins than the adductor muscle.

焦點個案  
Incident in Focus

### 烹煮對麻痺性貝類毒素的影響

早前一項本港研究指，約有半數的麻痺性貝類毒素會在蒸煮過程中由扇貝的組織（內臟、鰓、套膜及閉殼肌）流到烹煮的汁液中，但生殖腺內的麻痺性貝類毒素並沒有明顯流失。一般而言，引致麻痺性貝類中毒的最主要風險因素是進食帶子或扇貝的內臟，其次是進食生殖腺及烹煮的汁液。



新鮮帶子的內部構造 (資料來源：衛生防護中心)  
Anatomy of a Fan Shell (Source: Centre for Health Protection (CHP))

### 各地情況

不同地區的麻痺性貝類中毒個案出現情況均有分別。在歐洲及南非，五月至十一月會出現較多麻痺性貝類中毒個案，但北美洲則在七月至九月會有較多呈報個案。貝類品種、雙鞭毛藻種類及氣候和環境條件(例如鹽度、溫度、營養素及陽光)都是關鍵因素。

### 本港情況

本港不時發生零星的麻痺性貝類中毒個案。衛生防護中心早前的一份報告指出，一九九七年至二零零六年間，本港共有69宗懷疑貝類中毒呈報個案，受影響人數共145人，並發現五月至六月有較多呈報個案(《傳染病直擊》第4卷第13期(只備英文版))。近年，本港發生的懷疑麻痺性貝類中毒事件，大部分與進食貝類(尤其是帶子或扇貝)有關。最新的中毒事件在今年五月中呈報(《傳染病直擊》第7卷第11期(只備英文版))，涉及14個組羣共28人，患者是因進食帶子的內臟或生殖腺而出現不適。

業界表示，本港零售鮮活雙殼貝類產品多數來自內地。紅潮雖然在本港屢有發生(每年約有20至30宗)，但絕少對公眾健康造成重大影響。本港食品監察計劃在二零零七至零九年間的麻痺性貝類毒素測試中，共發現12個不合格樣本。就這些不合格樣本而言，食物安全中心(中心)已評估對市民健康的風險，向有關店鋪發警告信和要求停止出售有關食物，抽取跟進樣本，盡量追查食物來源和分銷情況，適時公布結果和提醒市民不要進食有關不合格食物。

上述事故反映追查食物來源的困難。最近當局已將《食物安全條例草案》提交立法會。該草案將會實施多項食物安全管制措施，包括設立食物進口商和分銷商登記制度和規定食物商須妥為備存交易紀錄等，其中後者可確保政府能更有效追查食物來源，並在處理食物事故採取迅速行動。

### 給市民及業界的建議

- 《食物安全焦點》(二零一零年二月第四十三期)有關“急凍帶子與麻痺性貝類中毒”的專文

### 更多資料

- 中心有關“小心食用貝類海產”的電視宣傳短片
- 中心有關“預防貝類中毒”的單張
- 有關“麻痺性貝類毒素”的《風險簡訊》

### Effect of Cooking on PSP Toxins

A previous local study observed that about 50% of total PSP toxins were leaked out from fan scallop tissues (viscera, gill, mantle and adductor muscle) into the cooking liquid during steam cooking process. However, there was no significant loss of PSP toxins from gonad. In general, consumption of viscera of scallops was the most significant risk factor for causing PSP, while gonad and cooking liquid were the second most significant risk factors.

#### 注意要點:

#### Key Points to Note:

1. 帶子及扇貝內臟積聚的麻痺性貝類毒素含量通常最高，而閉殼肌的含量則最低。

Viscera of scallops normally contain the highest level of accumulated PSP toxins, while adductor muscle contains the lowest level.

2. 引致麻痺性貝類中毒的最主要風險因素是進食帶子或扇貝的內臟，其次是進食生殖腺及烹煮的汁液。

Consumption of viscera of scallops is considered as the most significant risk factor for causing PSP, while gonad and cooking liquid are the second most significant.

### International Situation

PSP occurrence varies among different regions. In Europe and South Africa, PSP cases occurred more often between May and November. However, in North America, more reported cases occurred between July and September. Types of shellfish, species of dinoflagellates, and climatic and environmental conditions, such as salinity, temperature, nutrients and sunlight, are important factors.

### Local Situation

From time to time, sporadic cases of PSP have been recorded in Hong Kong. An earlier publication of Centre for Health Protection reported 69 suspected shellfish poisoning cases affecting 145 persons from 1997 to 2006, with more cases reported in May and June (Communicable Diseases Watch Vol.4, No.13). In recent years, most suspected PSP outbreaks involved consumption of shellfish, especially scallops. The latest one was reported in mid-May 2010 (Communicable Diseases Watch Vol.7, No.11), with a total of 14 clusters and 28 persons affected. It was found that consumption of viscera or gonad of scallop was associated with the illness.

According to the trade, fresh bivalves on sale in local retail outlets are mostly imported from the Mainland. Although algal blooms occur quite frequently in Hong Kong (~20-30 incidents/year), they seldom cause significant public health impact locally. The Hong Kong food surveillance programme detected 12 samples unsatisfactory for PSP toxin testing between 2007 and 2009. For these unsatisfactory samples, the Centre for Food Safety (CFS) had assessed the health risk, issued warning letters and requested relevant traders to stop selling the concerned products, obtained follow-up samples, traced their source and distribution as far as possible, announced the results timely and reminded the public not to consume the concerned products.

Tracing of food source is a problem in these incidents. The Food Safety Bill has recently been introduced into the LegCo which will provide food safety measures including, among others, a registration scheme for food importers and distributors and a requirement for food traders to maintain proper transaction records, which ensures that the Government can trace the source of the food more effectively and take prompt actions when dealing with food incidents.

### Advice to Public and Trade

- Food Safety Focus (43rd Issue, February 2010) on “Frozen Scallops and Paralytic Shellfish Poisoning”

### Further Information

- The CFS television advertisement on “Safety Tips on Consumption of Shellfish”
- The CFS pamphlet on “Prevent Shellfish Poisoning”
- Risk in Brief on “Paralytic Shellfish Poisoning (PSP) Toxins”

# 營養標籤與公眾健康 Nutrition Labelling and Public Health

食物安全中心  
風險評估組  
科學主任廖珮珊女士報告

Reported by Ms. Melissa Liu, Scientific Officer,  
Risk Assessment Section,  
Centre for Food Safety

在食物標籤上提供營養資料，是推廣均衡飲食、保障公眾健康的重要方法。本欄會由今期起詳細介紹營養標籤，首先我們會探討營養標籤與公眾健康的關係。

## 我們為何需要營養標籤？

本港約有四成市民屬於超重或肥胖。此外，隨着人口不斷老化，慢性退化疾病日趨普遍，每十名市民約有一人患有糖尿病，成年人中多達一成患有高血壓。癌症、心臟病、腦血管病及糖尿病屬於本港十大致命殺手病，二零零九年本港死亡人口中接近六成是死於上述四類疾病。飲食失衡，尤其是高脂、高糖及高鈉的飲食，正是主因之一。世界癌症研究基金會已把肥胖症列為本港頭號致命殺手病癌症的主要成因，又建議公眾限制進食高能量食物、鹽及含糖飲料。

有見及此，世界衛生組織(世衛)表示，各國須採取更果斷的措施預防慢性疾病，推廣更健康的飲食。世衛又指，消費者需要準確劃一、易於明白的食物成分資料才能選擇健康的食物，因此支持推行營養資料標籤制度。

## 本港之“1+7”制度

強制性營養資料標籤制度已經制定，將於今年七月一日生效。有關制度訂明預先包裝食物需加上標準格式及內容的營養標籤，規定在食物標籤上提供有關能量及七種指定營養素(即所謂“1+7”)的資料。

營養標籤上的“1+7”是指能量值和七種指定營養素(即蛋白質、碳水化合物、總脂肪、飽和脂肪、反式脂肪、鈉及糖)的含量，當中蛋白質、碳水化合物及脂肪屬於三大常量營養素，可提供能量和構成人體組織。能量和這三種營養素的標示要求幾乎見諸於世界各地所有營養資料標籤制度中。

此外，本港制度又規定列出另外四種營養素。飽和脂肪及反式脂肪屬於總脂肪含量項下的兩個細類。脂肪可大致分為飽和脂肪及不飽和脂肪兩類。在不飽和脂肪的類別中，有一組構型特別的細類名為“反式脂肪”，一向是特別受關注的公眾健康問題。過量攝入飽和脂肪及反式脂肪可造成動脈堵塞，增加罹患冠心病和中風的風險。

糖亦是碳水化合物項下的細類，可為肌肉及腦部即時提供能量。不過，過量攝入糖可引致肥胖症。

鈉是人體必需的一種礦物質，有助維持體內細胞外液和酸鹼的平衡，亦是神經傳送和肌肉收縮方面的必需元素。不過，過量攝入鈉可引致高血壓。

Provision of nutrition information on food label is an important public health tool to promote a balanced diet. From this issue, we will have a closer look at nutrition labelling. First, we will study how nutrition labelling is related to the health of the public.

## Why Do We Need Nutrition Labelling?

In Hong Kong, around 40% people are either overweight or obese. In addition, with an ageing population, chronic degenerative diseases are ever more common. About 1 in 10 people have diabetes, and up to 10% adults have hypertension. Cancers, heart diseases, cerebrovascular diseases and diabetes, four of the top ten killers in Hong Kong, have caused nearly 60% of deaths in 2009. Imbalanced diet, particularly those high in fat, sugars and sodium, is one of the important causes. The World Cancer Research Fund has clearly identified obesity as a key cause of cancer, the top killer in Hong Kong, and has recommended the public to limit the intake of energy-dense foods, salt and sugary drinks.

As such, the World Health Organization remarked that all countries must act more decisively to prevent chronic diseases by supporting healthier diet. It pointed out that consumers require accurate, standardised and comprehensible information on the content of food items to make healthy choices, and therefore supported the adoption of nutrition labelling schemes.

## The Local “1+7” Scheme

A mandatory nutrition labelling scheme has been developed and will come into force on 1 July 2010. This scheme defines the need for prepackaged food to provide nutrition labels, with standardised format and content. It requires information on energy and seven specified nutrients, or so called “1+7”, to be listed on food labels.

The “1+7” on the nutrition label refers to energy values and the amount of seven specified nutrients, namely, protein, carbohydrates, total fat, saturated fat, trans fat, sodium and sugars. Among them, protein, carbohydrates, and fats are the three main groups of macro-nutrients providing energy and building blocks of human body. Requirements on energy and these three items are almost universal in any nutrition labelling schemes throughout the world.

The Hong Kong scheme also specifies four other nutrients. Saturated fat and trans fat are two sub-sets of the total fat content. Fat can be broadly divided into saturated and unsaturated fats. Among the unsaturated fats, a group with special configuration called “trans fat” has also been found to be of special public health concerns. Excessive intake of both saturated fat and trans fat may lead to clogging of arteries and increase the risks of coronary heart disease and strokes.

Sugars are also a sub-set of carbohydrates, which can provide immediate energy source for the muscles and the brain. However, excessive intake of sugars can lead to obesity.

Sodium is one type of minerals required by the human body. It helps maintain the extra-cellular fluid balance and acid-base balance in the body. It is required for nerve transmission and muscle contraction. However, excessive sodium intake can lead to hypertension.

## 食物中不同營養素及其相關的健康問題 Nutrients in food and their associated health problems

營養素 Nutrient	相關的健康問題 Associated health problems
飽和脂肪 Saturated fat	心血管病、糖尿病、乳癌 Cardiovascular disease, diabetes, breast cancer
反式脂肪 Trans fat	心血管病 Cardiovascular disease
糖 Sugars	肥胖症、糖尿病、結腸直腸癌 Obesity, diabetes, colorectal cancer
鈉 Sodium	高血壓、腎病、胃癌 Hypertension, renal disease, stomach cancer

## 結語

在制定營養標籤規定時，當局已仔細考慮不同因素，包括本港市民的健康和疾病狀況、對食物種類的影

## Conclusion

In formulating the nutrition labelling requirements, various factors have been carefully considered. These included local health and disease patterns, implication on food choice, views of the trade and public, as well as principles

響、業界及市民的意見以及負責制定食物標準的國際機構採用的原則。我們將會在未來兩期探討如何善用營養資料選擇健康的食物。

adopted by international food standard setting agency. In the coming two issues, we will study how to make use of nutrition information to choose healthy foods.

食物事故點滴  
Food Incident Highlight

可能破損的瓶裝即溶咖啡

今年五月二十日，食物安全中心(中心)發出食物警報，提醒市民切勿飲用五款可能破損的玻璃瓶裝即溶咖啡。中心已呼籲業界停售有關產品。

Soluble Coffee in Jars Susceptible to Breakage

On 20 May 2010, the Centre for Food Safety (CFS) issued a food alert advising the public not to drink five soluble coffee products contained in glass jars susceptible to breakage. The CFS has alerted the trade to stop selling the products.

已破損或容易破損的玻璃容器會對消費者造成物理危害。此外，其他異物(例如金屬碎片及石屑)有時亦會在預先包裝食物內，並可能在人們進食時造成割傷。食物製造商應奉行優良製造規範，選用適合的食物包裝物料，並在處理生產設備及搬運產品時小心留神。如發現生產線有問題，業界應採取措施回收產品，並立即通知市民。

Glassware that is defective or prone to breakage poses physical hazard to consumers. Other foreign matters such as metal fragments and stone chips are also sometimes found in pre-packaged food products and may cause cuts when ingested. Food manufacturers should adopt good manufacturing practice, choose suitable food packaging materials and exercise care in handling equipment and products. In case a fault is found in the production chain, measures should be implemented to recall the products and inform the public immediately.



(由左至右)五款問題即溶咖啡分別是 CAP COLOMBIE、ALTA RICA DECAFF、SURAYA、ESPRESSO及ALTA RICA。

The five affected soluble coffee products, from left to right, "CAP COLOMBIE", "ALTA RICA DECAFF", "SURAYA", "ESPRESSO" and "ALTA RICA".

食物智庫  
Food for Thought

帶子及扇貝

帶子及扇貝是港人十分喜愛的海產，兩者均屬於濾食性雙殼類軟體動物。帶子及扇貝體內有各類危害，這主要由於其生態環境和覓食習慣所致。不過，不同的地方菜式和烹調方法會影響進食帶子及扇貝的風險水平。在大部分西方國家，人們一向只吃閉殼肌，但本港市民則會把內臟和肌肉一併吃下。受歡迎的蒸帶子或蒸扇貝伴有令人垂涎的濃汁，以致肌肉、生殖腺及內臟格外美味，使消費者忍不住吃下整個帶子或扇貝(包括當中的危害)。

Scallop

Scallops are very popular seafood items in Hong Kong. There are two main types, the fan scallop and fan shell. These scallops are filter-feeding bivalve molluscs. Scallops have been known to be associated with various types of hazards, mainly due to its ecological environment and feeding practice. Nonetheless, different cuisines and culinary practice can modify the level of risk associated with consumption of scallops. In most Western countries only the adductor muscle is traditionally consumed, while both viscera and flesh are eaten locally. The popular steamed scallop will give rise to condensed tasty liquid which makes the flesh, gonads and viscera all very tasty and delicious tempting the consumers to eat up all traces – including the hazards.

主要的食物安全問題 Significant Food Safety Concerns	給市民的建議 Advice to the Public
<p>貝類毒素 Shellfish Toxins</p> <ul style="list-style-type: none"> <li>貝類毒素不能透過烹煮消除，而內臟的毒素含量通常較閉殼肌為高。毒素種類可能取決於撈捕地點。 Shellfish toxins cannot be destroyed by cooking and usually are found at a higher concentration in the viscera as compared with the adductor muscles. The types of toxins contained may depend on the harvesting locations.</li> </ul>	<ul style="list-style-type: none"> <li>向可靠來源購買貝類。 Purchase shellfish from reliable source.</li> <li>清洗和擦淨外殼後才烹調貝類。 Scrub and clean shells before cooking.</li> <li>烹煮前先摘除貝類的內臟，以及食用前先棄掉烹煮的汁液。 Remove viscera before cooking and discard any cooking liquid before consumption.</li> <li>徹底煮熟貝類才進食。 Cook thoroughly before consumption.</li> <li>避免過量進食貝類，保持均衡飲食。 Avoid over-indulgence in shellfish consumption and maintain a balanced diet.</li> </ul>
<p>重金屬(例如鎘) Heavy Metals, such as cadmium</p> <ul style="list-style-type: none"> <li>長期攝入鎘會損害腎功能。 Chronic exposure to cadmium would affect the kidney function.</li> </ul>	
<p>微生物污染 Microbiological Contamination</p> <ul style="list-style-type: none"> <li>帶子及扇貝在覓食時會受副溶血性弧菌、諾如病毒及甲型肝炎病毒污染。 Scallops can be contaminated by <i>Vibrio parahaemolyticus</i>, norovirus and hepatitis A virus during feeding.</li> </ul>	

風險傳達  
工作一覽  
Summary of  
Risk Communication Work

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