A Threat of Pest? – "Foodstuff" as components of installation art for a museum exhibition

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Abstract

It is a conventional practice here that food is not allowed in museum galleries where the collections are displayed as it will attract "Pest" to infest the museum collections. However, if foodstuff is meant for use as parts of an installation art for display in a museum, would it be acceptable from the point of view of preventive conservation?

The use of genuine food in the artworks embodied many of the concerns which conservators would face in the exhibition and made the preventive conservation work extremely challenging. This poster, using a thematic exhibition "HK Foodscape – Text • Image • Installation" held at the Hong Kong Heritage Museum in summer 2004 as a case study, describes how our conservators have addressed the concerns due to the presence of real foodstuff in exhibits and the practical approach the conservators have undertaken for the care and management of the artworks to minimize the threats of pest infestation after examining the associated risks. The experience also leads to the reconsideration on some of our established preservation strategies for museum exhibits.

Introduction

As the finale to the museum's Food Culture Festival exhibition series, "Hong Kong Foodscape – Text • Image • Installation" was on display for three months at the Hong Kong Heritage Museum from mid-July to early October, 2004. In the exhibition, local poet Professor Ping-kwan Leung, Hong Kong-Canadian photo illustration artist Ka-sing Lee and Chinese Canadian Installation artist Millie Chen teamed up to explore the food culture in Hong Kong by each contributing their own speciality-poetry, photography and installation.

To echo with the theme of food culture, the installation artist Chen, a lover of food installation wanted to use foodstuffs such as tea leaves, coffee grains, Chinese herbal medicines, sugar and salt as components in her installation arts. Though conservators had advised curators and artists to consider using proxies, artificial flavourings or synthetic compounds alike rather than genuine foodstuff to generate the desired visual and odour effects, the curators tended to share the artist's intention to

communicate the meaning of the artworks through the use of original foodstuff for visitors to touch, smell or hear in the course of their visit.

Being site-specific works, the art installations were not intended to be kept by the museum or the artist after the exhibition. As a result, our focus was shifted from the long-term preservation of the works to finding a practical display solution to minimize the threats of pest infestation to other collections in the museum. Risks associated with the art installations were first studied and various preventive measures were explored.

Selection of Foodstuffs

The exhibition space was constructed into a three dimensional entity of visual and textual in which visitors can navigate and "consume" with their body sense to understand the food culture in Hong Kong. Amongst the six sections in the exhibition, a Hong Kong style cafeteria/restaurant '*cha canting*' and Scent and Sound Foodstalls were the installation arts composed of real foodstuffs.

We started from examining the list of foodstuff to be included proposed by the artist with the aim to eliminating the risks as far as possible. The artist thus agreed to exclude salt, sugar, soya beans, soya sauce, oyster sauce and chilli paste from her list. They are associated with higher risks with the following considerations:

- *salt and sugar* Though they can be used as preservatives, they are hygroscopic and unstable. It is afraid that the visitors may touch the sticky surfaces and transfer them to other areas of the museum.
- *soya beans, soya sauce, oyster sauce and chilli paste* Not only their tacky state or form will cause messes, but also their strong and unique smell will most likely attract house flies.

As "Tea-coffee" which combines the two flavours in a unique hot beverage is considered as one of the most representative beverage in Hong Kong food culture, it was not possible to restrict the proposed use of the genuine dried tea leaves and coffee grains though tea leaves will also absorb moisture in the air. The artist glued them onto the characters of the poem titled "tea-coffee" on the wall of the cafeteria installation so that the visitors could read the culture blending in Hong Kong where East meets West, and at the same time smell the scent of the genuine tea and coffee.

In view of that the greater the moisture content of the foodstuff, the higher will be the risk of pest or mold population growth, the use of dried foodstuffs such as dried ginger, dried chilli, Chinese herbal medicines etc. in the artist's list was not so objected. These foodstuffs are individually placed in 49 earthen pots in the Scent and Sound Foodstalls.

Nevertheless, the presences of dried food

or Chinese medicinal herbs were the potential source of stored product pests such as cigarette beetles or drugstore beetles. They would invite all kinds of pests and micro-organisms, ranging from moths, beetles, cockroaches, rodents, mites, to fungi and mold though they may have different degree of vulnerability to various pest and fungi attack. Therefore, a pest management program was required to guard against the threat of pest.

Pesticides or Fumigation?

Curators acknowledged the risks of pest infestation associated with the art installations and asked us to explore if fumigation or pesticides spray could be applied to the foodstuffs before they were displayed. While considering that most of the pesticides or preservatives which are effective in killing fungi or pests are also toxic to human, we did not recommend doing so as the art installations would be displayed in the gallery for visitors to touch or smell. In order to generate sensation experience for the visitors, the artists and the curators refused to take our advice to enclose the foodstuff tightly in the containers, which could serve to contain the pest or fungi problem in the enclosure once occurred. Therefore fumigation was our last resort for controlling the pests found though it would not provide any residual protection and the odour of the fumigants might inevitably mask the smell of the food.

Environmental Control

Let alone Hong Kong's sub-tropical climate, the exhibition was held in the summer time, which is very hot and humid. Temperatures in the daytime often exceed 31℃ whereas at night, temperatures generally remain around 27℃ with the average relative humidity higher than 77%, which creates a favourable environment for most of pests and molds development (Nyberg 1987). Making the environment less favourable for the pests and molds to develop was thus our very first step of Integrated Pest Management. Likewise, studies showed that keeping stored product insects at sub-optimal temperatures could reduce the population development (table 1). As regards, the relative humidity and temperature in the gallery was kept at 60% and 23℃ throughout the exhibition period as for other organic artifacts.

Table 1. Response of stored-product insects to temperatures (University of Arkansas 2006)

Zone	Temperature (℃)	Effect
Lethal	50-60	Death in minutes
	45	Death in hours
Sub-opti	35	Development stops
mum	32.2-35	Development slows
Optimum	25-32.2	Maximum rate of development
Sub-opti	15.6-25	Development slows
mum	12-15.6	Development stops
Lethal	5-15.6	Death in days
	-17.8	Death in minutes

Monitoring Tools

Prevention is always better than cure, and

early discovery of pest infestation will greatly reduce the risk of damage occurred on the museum collections. While environmental control was adopted in hope of excluding pests or providing them with unsuitable living or growing conditions, Integrated Pest Management (IPM) also relies on scouting and sampling. Various monitoring tools were used in order to effectively detect and identify pest population.

Visual inspection

The museum gallery was opened 6 days a week (10 am to 6 pm on Mondays, Wednesdays to Saturdays and 10 am to 7 pm on Sundays) and its tile flooring was vacuum cleaned everyday as a regular housekeeping work. Curators worked closely with us to carry out daily routine inspection on the foodstuffs displayed in the '*cha canting*' and Scent and Sound Foodstalls for any signs of pest infestation and on improper sanitation as well as other undesirable conditions that will attract and allow insects to develop. A full and detailed documentation or log was kept on the inspections and actions taken.

Trapping systems

Trapping systems were employed to monitor the presence of pests. In addition, they could provide information on the extent of the pest problem, types of pests if infested and their distribution pattern within the premises. Though to different degrees, it was inevitable that the foodstuffs would attract beetles such as cigarette beetles, drugstore beetles and other crawling pests. Therefore, both sticky traps and pheromone-baited traps were used.

a) Sticky traps

Sticky traps were found suitable for use in this case as the gallery was considerably clean with good house-keeping. The traps selected were basically the ordinary type of cockroach sticky traps, Trapper ™ insect and monitor trap, made of non-poisonous glue on paper support. The sticky surface was made the base of an open box to form a small triangular prism enclosure. Inside each earthen pot containing the foodstuffs, small sticky foam boards were used instead to serve as sticky traps as the triangular sticky traps were too large to be fit in.

b) Pheromone traps

A pheromone is a natural chemical scents which insects emit to attract mates or aggregate or to announce food source. Pheromone traps containing a synthetic copy of the natural chemical scent are species specific and are used commonly in food processing pest management for monitoring a variety of stored products pests. We borrowed these excellent monitoring tools for our situation. We used Storgard ® Dome™ trap which contains a pheromone lure specifically control of cigarette beetles. In addition to the pheromones, food attractants and trap design greatly enhance the ability of the

monitoring system to capture targeted insect species. Pheromone lure was inserted into the dome shape trap and oil based food attractant for both larvae and adults were placed on absorbent pad in the catch reservoir. Once the insects fall into the traps, they are suffocated by the oil.

Monitoring Program

Placement of traps

The foodstuffs were largely found in the Scent and Sound Foodstalls and the Cafeteria called '*cha canting'*. Therefore, more traps were placed in these high-risk areas where foodstuffs were displayed while some more traps were placed as a perimeter control in the neighbouring Chinese restaurant and near the doors to monitor the pest movement into or out from the gallery.

The traps were numbered and placed in the locations where the visitors would not easily see or disturb for aesthetic and safety reasons. In the Scent and Sound Foodstalls, the traps were mainly placed on the floor, on the underside of foodstall tables, and inside each earthen pot which contained various dried foodstuffs, such as dried seaweeds, dried gingers, dried orange peels, cinnamon, dried shrimps, dang gui and other medicinal herbs, etc. Similarly, the traps were placed discreetly on the floor, on the underside of the tables, and on the upper part of the walls in the '*cha canting'* and the Chinese Restaurant. A total of 125 traps were deployed for the monitoring programme and location of each sticky and pheromone trap was marked on the floor plan of the gallery.

Checking trap catch

The beetle traps were inspected three times a week before the opening of museum and the other traps were inspected once a week during the closing day of the museum. The number and species of insect caught were recorded, identified and reported to the curators. If any insects were detected inside the earthen pots by visual inspection or trapping system, curators and the artist were advised to discard the suspected pest carrier- food and replace it with an alternate at once.

Results

During the exhibition period, it was interesting to notice that large pools of tiny "mold beetles" or minute brown scavenger beetles were caught particularly in the Pheromone traps around the foodstalls in the first two weeks.

"Mold beetles" belong to the class Lathridiidae. The size of the insects is 0.8 – 3 mm. The insects of Lathridiidae class are found in decaying plant materials, under bark, woodpiles, mammal, damp cereals, grains, herbs, spices and cheese, etc. They are mold-feeding insects and may feed on fungi developing on stored foods and seeds in damp locations. The life cycle of the insects is about 50 days. The beetles are household nuisance pest

and the basic management strategy towards them is prevention. (Antonelli 2003; Lyon 1991)

The mold beetles were mostly caught near the areas of foodstall. Though their source could not be identified, we increased the frequency of cleaning around the foodstalls as a corrective measure. The population of "mold beetles" was declining over the exhibition period and the infestation did not spread to other areas. As a consequence, the "mold beetles" was not threatening the collections in the museum much.

Cigarette beetles were expected to be detected in our trapping system. A total of 17 cigarette beetles were caught over the 12 weeks exhibition period and one to two cigarette beetles were found per week on average (Table 2).

Cigarette beetles may feed on all kinds of plant material including tobacco, seeds, grain, nuts, bean, spices, dried food and vegetables, flour, dried herbarium specimens, leather, woolen cloth, etc. Their life cycle may last from 40 to 90 days and is dependent on the food source and environmental condition. The optimal condition for development is 30 to 35 ℃ and at relative humidity 70 –80%. (Merchant 2002)

Table 2 Distribution of cigarette beetles Lasioderma serricorne

Day	Location	Quantity
23,30	Inside food pots	2
16,18,23,30,37,51,67, 69,81	Fire-exit door	10
13	Foodstall table 1	1
62	Foodstall table 6	1
51	Foodstall table 7	1
86	Text wall of cafeteria/cha canting	2

A higher population of the cigarette beetles was caught near the Fire-exit door of the gallery. Since cigarette beetles were good fliers and preferred subdued light, it was very likely that they were attracted to the "Exit" sign at the Fire-exit door during nighttime. We had also conducted inspection on the adjoining galleries after some were caught near the Fire-exit door and no insects were found.

Table 3:Distribution of other insect species

Day	Insect species	Qty	Location(Number of insects caught)
16,23,34	Silverfish Lespisma saccharina	5	Foodstall table 4(1), Foodstall table 5 (1), Foodstall table 6 (1), Foodstall table 7 (1), Fire-exit door(1)
79	Drugstore beetle Stegobium paniceum	1	Inside food pot
51,79	Booklice Liposcelis corrodens	3	Foodstall table 2(2), Cafeteria (1)
23	Nymph of cockroach	4	Inside food pot
23	Larva in white (suspected from beetles)	1	Inside food pot

The presence of cigarette beetles, both adults and larva, and other pests inside the food pots containing dried foods (table 3) indicated that foodstuffs were largely the source of these pests. Once pests were found inside the food pots, the food was discarded immediately and other types of food were replaced. With resort to such kind of corrective measure, there was no serious outbreak of cigarette beetles.

Discussion

This exhibition was extraordinary to have included real foodstuffs for display in a museum which had imposed a challenge to normal preventive conservation practice. The input from conservation in integrated pest management had provided useful information such as the activity of pests, type of species and the extent of infestation at an early stage. Therefore, remedial measures could be taken in time to minimize the risk of outbreak of pests. The joint effort of the curators in regular inspection of the food and the gallery was also essential to reduce the occurrence of pest infestation. It was evident that the finding of cigarette beetles was due to the presence of some particular type of food. Though the exact source of the "mold beetles" was not clearly known from our survey, the presence of foodstuffs might increase the chance of bringing in or attracting various kinds of pests. The findings of our monitoring work also indicate that the museum is susceptible to pest infestation despite of its routine housekeeping programs, and hence the continuation of the monitoring program is deemed necessary though it can be tuned to a lesser scale.

Conclusion

The control of food in the museum forms part of the museum policy in the context of preventive conservation. When food becomes part of the exhibits, conservators would face the possible occurrence of pest in association with the food. Integrated pest management was employed in this food installation exhibition. Extensive monitoring of insect traps was conducted in the gallery. Some common insects were found during the exhibition period. The suspected pest carrying foodstuffs were thus discarded and changed to a safer alternate. Through the IPM conducted and appropriate management measures taken, no serious outbreaks of pest occurred during the exhibition period and the risk of pest infestation was put under control.

It seems that the experience may pave the way out for future exhibitions of similar kind. Nevertheless, it comes the next question of why such exhibition has to be held in museums, not to say the manpower resources deployed for pest monitoring and inspection throughout the exhibition period. Being entrusted to take care of the museum collections for the community at large, there are in fact certain standards and guidelines for practice that curators working in a public museum should observe.

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