



By EMAIL & FAX

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Dear Sir/ Madam,

**Survey of Hong Kong's Pipefish and Seahorses –
Submission for Tung Chung New Town Extension Study**

1. Green Power and the Eco-Education & Resources Centre recently completed a report on the survey findings of pipefish and seahorses in Hong Kong waters including Tung Chung Bay (please see attached). The findings confirm that Tung Chung Bay is of high ecological importance for biodiversity conservation, and particularly providing important breeding and nursery habitats for pipefish.
2. In our captioned study, pipefish are observed in coastal waters in western Hong Kong. Two juveniles of Seaweed Pipefish, *Syngnathus schlegeli*, were found in Tung Chung Bay. This indicates that the coastal waters near Tung Chung River estuary may be pipefish breeding and nursery ground. In fact, this species was associated with eel grass, *Zostera* spp. which can only be found in water free of pollution.
3. However, as the proposed new town extension in Tung Chung involves extensive reclamation in Tung Chung Estuary and Tung Chung Bay, we are concerned that the pipefish habitats are threatened by the proposed reclamation works in Tung Chung Bay. We thus call for strict protection of Tung Chung Bay, estuary and Tung Chung River Valley, which are of high ecological, landscape, hydrological, fishery and cultural values, against any civil engineering works, pollution, channelization and reclamation by restricting development and zoning of compatible landuses. In particular, reclamation in Tung Chung Bay should be avoided because it has rich ecological resources as supported by our captioned

study.

4. Regarding the preservation of Tung Chung River and Tung Chung Bay, Green Power submitted a letter to the former Chief Executive of HKSAR, Mr. Donald Tsang Yam Kuen, on 21 September 2010 as well as the current Chief Executive, Mr. C. Y. Leung, on 8 January 2013, and we would like to reiterate that:
 - (a) river works should be avoided as far as possible, the natural river courses and estuary should not be altered in any scale;
 - (b) landuse planning for Tung Chung River basin and estuary should take into account of its permeability, natural landscape and ecology;
 - (c) sufficient vegetation cover should be maintained in the basin; and
 - (d) no sewage or stormwater of developed areas should be drained into Tung Chung River channel and Tung Chung Bay.

For any enquiries and questions, please do not hesitate to contact me at Green Power (T: 3961 0223; F: 2314 2661; E-mail: lkcheng@greenpower.org.hk).

Thank you for your kind attention.

Yours faithfully,



Dr. Cheng Luk-ki
Division Head, Conservation and Scientific Research
Green Power



Mr. Ken Ching S. H.
Chairman
Eco-Education & Resources Centre

Attachment:

Eco-Education & Resources Centre and Green Power (April 2012). *A Summary of Pilot Research Searching for Pipefish in Hong Kong.*

**A Summary of
*Pilot Research –
Searching for Pipefish in Hong Kong***



**Eco-Education & Resources Centre
Green Power**

April 2012

A Summary of *Pilot Research-Searching for Pipefish in Hong Kong*

1. Introduction

- 1.1 Pipefish belongs to a family of fish, Syngnathidae, which consists of about 300 species and can be found in various habitats including marine, freshwater and blackish water (Froese & Pauly, 2012). In total there are about 190 species of pipefish in 51 genera. Its elongated body is covered with series of bony rings which are important feature for their identification. Except a few freshwater species, most pipefish species are associated with estuarine and seagrass habitats and considered as an indicator species for the quality of these habitats.
- 1.2 Syngnathidae, i.e. seahorse, pipehorse and pipefish, are highly valued traditional Chinese medicine. The demand for them in the market is so huge that imposes ever-increasing fishing pressure on their wild populations. Although the market price of pipefish is not as high as seahorse, with the depletion of seahorse and other Syngnathidae species, it may eventually increase when pipefish become medicinal substitutes of seahorse. Thus, it is important to understand the biology and local distribution of pipefish which is now lacking, in order to conserve this threatened species.
- 1.3 Pipefish is naturally occurred in Hong Kong and nine species were recorded in Hong Kong water, namely *Corythoichthys flavofasciatus*, *Hippichthys cyanospilus*, *Microphis leiaspis*, *Phoxocampus diacanthus*, *Syngnathoides biaculeatus*, *Syngnathus acus*, *Syngnathus pelagicus*, *Syngnathus schlegeli* and *Trachyrhamphus serratus*. They are usually found in shallow water associated with seagrasses and sargassum (Sadovy & Cornish 2000). Pipefishes are usually caught as a by-catch from trawling, and sometimes collected as a pet for aquarium. Pipefishes in Hong Kong are also threatened by habitat destruction due to development of natural coastal areas. Unfortunately, pipefishes are not legally protected in Hong Kong and related important species information such as population, size and sex structure is unknown. Furthermore, data on local distribution and habitat preference of pipefish in Hong Kong, which are crucial for conservation and management purpose, is absent.

- 1.4 The overall objective of this pilot research conducted by Eco-Education & Resources Centre and Green Power is to understand the distribution, population size, body size and habitat preference of local pipefish through underwater surveys.

2. Materials and Methods

2.1. Underwater Visual Census

2.1.1 There is no distribution data of local pipefish population. According to previous studies, pipefishes were mainly found in habitats associated with seagrasses and sargassum. Only three species of seagrass are recorded in Hong Kong and all of them can be found in northwestern Lantau (Fong, 1998). Underwater surveys were conducted in the northwestern waters of Hong Kong including Tung Chung Bay. However, low underwater visibility, which precludes underwater visual census, would be taken into account during site selection. For site positioning purposes, global positioning system (GPS) data of all the survey locations was recorded and the areas surveyed were calculated. The horizontal underwater visibility was also recorded. The distance in which the observer could not distinguish black and white A4-sized card underwater was taken as the visibility.

2.1.2 To investigate the abundance of pipefish in Hong Kong water, active search for pipefish was conducted. Any pipefish species encountered was identified, counted and measured.

2.2 Pipefish size measurement and sex determination

Pipefishes found within the survey area were measured underwater using caliper and their sex was determined.

2.3 Larval sampling

Due to low mobility, the early life stage of pipefishes is important for their distribution. For investigation of the nursery ground of pipefishes, plankton trawling was performed to collect the larval samples. All samples were collected during daylight hours and with identical sampling gears. A bongo net with 50 cm diameter and 0.5 mm mesh size were used in towing. The net was lowered to 1 m above the sea

bed and towed at 1 to 2 knots for 10 minutes. The net was gradually winched up towards the water surface during the whole towing. The starting and end points of the trawling transect were established us with GPS device in order to ensure the consistency of sampling locations. The samples collected were then fixed with 95% ethanol in the field. Samples were collected once per month for each study site. The number of individuals was counted and the standard length (SL) of each individual was measured with the accuracy of 0.5mm. For identification, the numbers of trunk and tail rings, the pectoral, dorsal, caudal and anal fin rays of sample individual were recorded under the microscope. The species were identified with the above-mentioned information and distinctive morphological features.

3. Results and Discussion

3.1. Underwater Visual Census

3.1.1 During the survey, only one adult pipefish, *Syngnathoides biaculeatus*, Alligator Pipefish, was found in Yam O Bay. It is a sexually mature individual (Figure 2). The species was confirmed by the number of rings and ray of fins, i.e. D. 38-48 ; A. 4-6 ; P. 20-24 ; Rings 15-18+40-54. Its standard length is 197mm. *Syngnathoides biaculeatus* is usually found in shallow coastal water, seagrass and floating weed (Fishbase 2012) and it was first recorded in Kat O in 2000. Its distribution and the population in Hong Kong were unclear and this specimen was the first record of this species in western Hong Kong water. Yam O is the only natural lumber preservation zone in Hong Kong, many natural lumbers were on stilts in the bay and this might provide an important habitat for *S. biaculeatus*. *Syngnathoides biaculeatus* is a poor swimmer and their migration range is limited. Thus, the whole population will be eliminated if the habitat is removed or damaged. Recently, Yam O is proposed as one of the twenty-five reclamation sites in Hong Kong, and very likely *S. biaculeatus* inhabited in Yam O is under threat.

3.1.2 Although no record shows that seagrass was found in Yam O, according to Fong (1998), seagrass was found at San Tau and Tai Ho, i.e. the western side of Yam O in vicinity. The presence of *Syngnathoides biaculeatus* might imply that seagrass is present Yam O. As seagrass bed provides an important habitat for various organisms and it is regarded as important habitat in Hong Kong. Further study

should be done to investigate the presence of seagrass bed at Yam O Bay.

3.2. Larval sampling

In this study, two juvenile pipefish of the species, *Syngnathus schlegeli*, seaweed Pipefish, were discovered in Tung Chung Bay. The species of *Syngnathus schlegeli* was confirmed with the number of fin rays and the number of trunk and tail rings, i.e. D. 30-47; A4; P. 11-15; C10; Ring 18-20 + 38-46. The maximum size of this species is 300 mm in total length, and the size of the specimen found in this study was 40.0 mm and 46.0 mm (Fig 3). Adult *S. schlegeli* was recorded at different parts of Hong Kong water, including Ping Chau (Sadovy & Cornish 2000) and Sha Chau (Personal observation). This species was found associated with eel grass, *Zostera* spp. and sargassum (Watanabe & Watanabe 2001). Seagrass, *Zostera japonica*, *Halophila ovata* and *Halophila beccarii* were recorded in San Tau, which is consistent with our findings. Both of our specimens were collected in the dry season. According to previous studies, most pipefish breed during the summer time that was different from our finding. To better understand the biology of *S. schlegeli* in Hong Kong, more studies should be done to investigate the spatial and temporal variation of pipefish in this area.

4. Conclusion

- 4.1 This study proves that pipefish are distributed in Western Hong Kong water and this area is very likely their important habitat and nursery ground. However, these important habitats were threatened by rapid coastal development in Hong Kong. More studies should be done to investigate the spatial and temporal change of pipefish population and biodiversity of these areas. This study reveals that Tung Chung Bay is nursery ground for pipefish and the coastal habitat and the bays should be preserved to conserve local population of pipefish

5. References

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Table 1. Sampling Schedule.

Research duration: From September 2011 to January 2012

Sample Date	Time	Location
16/9/2011	0900-1800	Yan O, Tung Chung Bay and Sha Lo Wan
5/10/2011	0900-1800	Tung Chung Bay and Sha Lo Wan
20/10/2011	0900-1800	Yan O and Tung Chung Bay
29/11/2011	0900-1800	Yan O, Tung Chung Bay and Sha Lo Wan
8/12/2011	0900-1800	Yan O, Tung Chung Bay and Sha Lo Wan
15/01/2012	0900-1800	Yan O, Tung Chung Bay and Sha Lo Wan

Figure 1. Sampling sites of pipefish in Hong Kong water. (Black stars indicate the larval sampling site while yellow star indicates the location for underwater visual census.)



Figure 2. *Syngnathoides biaculeatus*



Figure 3. *Syngnathus schlegelii*

