

Hong Kong firefly survey report 2021-2022

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ABSTRACT

11 members of the Hong Kong Firefly Survey Team 2021-2022 were recruited. After intensive lecture and field trainings, members did the surveys in three different modes - clarifying the range of *Oculogryphus chenghoiyanae*, monitoring population trend of *O. chenghoiyanae* and *Rhagophthalmus hiemalis*. Totally, 53 surveys were done from 2021 December to 2022 June. *O. chenghoiyanae* has not been found out of its current distribution range. Continue decline of population of *O. chenghoiyanae* and *R. hiemalis* is shown. It is the first time larva of *Vesta* is discovered locally.

Key words: Lampyridae, firefly surveys, Hong Kong

INTRODUCTION

Following the success of Firefly Survey Team 2020-2021. Open recruitment for the Firefly Survey Team 2021-2022 was done from 3 June to 23 June 2021. Target was to recruit 5-10 members. 16 applications was received and 11 members were recruited (Fig. 1). Selection criteria were the same as the previous recruitment (Yiu, 2021). Opening ceremony and the first training was held on the World Firefly Day - 3 July 2021.

100% attendance to training lectures was required. Members were also required to pass an examination. Attendance requirement for practical trainings in the wild was four out of the six taken place from August to December. Content of training lectures and places for practical trainings were generally the same as previous year (Yiu, 2021). The main difference is all the trainings were done face-to-face this year.

MATERIALS & METHODS

Trained members of the Hong Kong Firefly Survey Team were arranged to do surveys in small groups of two to three persons. For every survey site, the route map, requirements, methods, location of observation points and a short video showing the site and route were provided to the members beforehand. Each survey should last for 60 minutes or more. After each survey, members were required to fill in an online Firefly Survey Record Form. The form contains name(s) of surveyor, date, start time, end time of survey; moon phrase, temperature, wind speed, cloud coverage, precipitation, fog/mist, number and location of the target firefly species found.

There are three different modes of survey done from

December 2021 to June 2022:

Survey mode 2b - Clarifying the range of a restricted species - *Oculogryphus chenghoiyanae*. Three different routes with similar land features and vegetation as the sites with records of the species were selected, namely Tei Tong Tsai Country Trail, Wong Lung Hang Country Trail, Nei Lak Shan Country Trail. Members were required to walk along more or less a distance of two km along the designated route in slow pace within the active time of the female adult displaying light – 19:30 to 21:00, and check for the occurrence of light display female adults. Surveys were done within the flight period – May to early June.

Survey mode 3a - Monitoring population trend of a restricted species - *O. chenghoiyanae*. Surveys were done along a foot path in Tei Tong Tsai. Members were required to walk along designated routes in a slow pace – not faster than 2 km/h, within the active time of the female adult displaying light – 18:00 to 19:00, check every encountered light spots and count the number of light displaying females found along the two sides of the routes – transect count. The routes is about 2 km long. Surveys were done within the flight period – May to early June. Same counting was done along the same routes in previous years.

Survey mode 3b - Monitoring population trend of a restricted species - *Rhagophthalmus hiemalis*. Surveys were done along a road in Lin Fa Shan (MacLehose Trail Section 9), from late December to late February. Members were required to walk along a designated routes in a slow pace – not faster than 2 km/h, within the active time of the female adult displaying light – 18:00 to 19:00, check every encountered light spots and count the number of light displaying females found along the two sides of the routes – transect count. The routes is about 2 km long. Same counting was done along the same routes in previous years.

RESULTS

Survey mode 2b - Clarifying the range of a restricted species - *O. chenghoiyanae*

11 members participated and 18 surveys were done, three surveys along Wong Lung Hang Country Trail, 11 along Tei Tong Tsai Country Trail and four along Nai Lak Shan Country Trail. The target species was not found in all surveys.

Survey mode 3a - Monitoring population trend of a restricted species - *O. chenghoiyanae*

11 members and the team leader had participated, 20 surveys were done. Out of the 20 surveys, nine surveys had no record of the target, six surveys had one record of *O. chenghoiyanae* female adult in each; two surveys have two records in each; one survey has three records; one survey has four records; Inputting the data of 2022 and the previous data since 2014 into the IUCN Criteria A example worksheet (IUCN, 2012, 2013), the past reduction over 10 years (longer than three generations) is -65.2% for the population of this species under the assumption that the reduction of number has been constant over time.

Survey mode 3b - Monitoring population trend of a restricted species - *R. hiemalis*

11 members had participated, 11 surveys were done. Out of the 15 surveys, 12 surveys have no record of the target species, three surveys have one record of *R. hiemalis* female adult in each. In the survey done in Dec 2020 to Feb 2021, out of the 31 surveys, three surveys have two records of *R. hiemalis* female adult in each; and 11 surveys have one record of *R. hiemalis* female adult in each. Continue decline is shown (Yiu, 2022).

Other findings

1. Discovery of a larva of *Vesta* (Fig. 2), most probably *Vesta sinuata* which is the only known *Vesta* in Hong Kong.
2. First record of whole-body fluorescence (except the head) of female *Stenocladus bicoloripes* under UV light (Fig. 3)
3. Discovery of diving ability of *Lamprigera taimoshana* larvae under water
4. Two new location records of *Lamprigera taimoshana* (larva) on Tai Mo Shan
5. New location records of *Rhagophthalmus motschulskyi* in Ma On Shan, Mui Wo and Mount Parker Road.
6. New location record of *Aquatica leii* in Sha Lo Tung
7. New location record of *Luciola curtithorax* in Mui Wo
8. New location record of Species inquirenda 1 in Nei Lak Shan
9. New location record of *Luciola* nr. *nicollieri* in Mount Parker and Mount Butler.

DISCUSSION

O. chenghoiyanae is only known along the path near its type locality, but nowhere else. Intensive efforts had been

made to look for the occurrence of *O. chenghoiyanae* in similar habitats in Lantau for two consecutive years, it is not found. It is likely that this species only survive within the current known, very narrow geographic range, much smaller than the threshold of 100km² of Extent of Occurrence and 10km² of Area of Occupancy, and it will fall into the Critically Endangered Category of Criteria B of the IUCN Red List Categories and Criteria (IUCN, 2012). Since the erection of the strong street lamps along the path of its type locality, the population has dropped sharply, -65.2% reduction over 10 years (longer than three generations), and it falls into the Endangered Category of Criteria A. In addition to the strong street lamps, the threats of increasing light pollution from the rapidly expanding Tung Chung city and the airport is also a major concern. There is a high probability of extinction of this species in the near future. A full Red List Assessment report has been submitted to the IUCN Red List Unit.

R. hiemalis is only known from Hong Kong, in Tai Mo Shan, Tsuen Kam Au, Mui Tsz Lam (Shatin) and Shatin Pass. It is no longer found in Mui Tsz Lam site and Tai Mo Shan site after repeated searching in recent years. Repeated quantitative surveys done along the same belt transect along the MacLehose Trail Section 9 finds that the past reduction over 10 years (longer than three generations) is -87.0% for the population of *R. hiemalis* under the assumption that the reduction of number has been constant over time (Yiu, 2022). Applying Criterion A2 of the IUCN Red List Assessment, the species could be listed in the category of Critically Endangered (IUCN, 2012). The main threats to the species is increasing light pollution and habitat degradation intensified by biking activities outside the designated tracks. There is a high probability of extinction of this species in the near future. A full Red List Assessment report has been submitted to the IUCN Red List Unit.

The survey team members has also contributed a lot of new and interesting discoveries about Hong Kong Fireflies.

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FIGURES



Figure 1. The Hong Kong Firefly survey Team 2021-2022. Photo by author.



Figure 2. Larva of *Vestia*. Photo by Fung Chun-Sang.



Figure 3. Whole-body fluorescence (except the head) of female *Stenocladus bicoloripes* under UV light. Photo by Fung Chun-Sang.