

Green Power's Solar Terms Butterfly Survey proved native plant species enrich butterfly ecology with a decade of data and urged the government to plant more native species strategically

Green Power launched the Solar Terms Butterfly Survey in 2005 to study the relationship between butterfly species and number and the seasonal solar terms. Summarizing results from the past decade (2012 – 2021), we have identified a basic nectar feeding pattern of adult butterflies. Over the survey period, a total of 130 butterfly species were recorded to feed on 140 species of nectar sources, 60% of these were native plants. Levine's Syzygium (*Syzygium levinei*), Prickly Ash (*Zanthoxylum avicennae*) and Lidded Cleistocalyx (*Cleistocalyx nervosum*) were the top three among the native plants while the top three foreign species were *Bidens alba*, Golden Dewdrops (*Duranta erecta*) and Lantana (*Lantana camara*). Comparing the number one of native and foreign plant species, the native Levine's Syzygium (*Syzygium levinei*) is 2.5-fold more attractive than the foreign *Bidens alba*, based on the number of butterfly species visited in one day (for details, please refer to Table 1 in the Appendix). **Helen Yau, Education & Project Manager of Green Power**, said that the survey recorded the feeding pattern of butterflies in different seasons and found that native plants were the more preferred nectar sources. In view of the fact that foreign species still dominate in the government's plantation work, **Yau** encouraged the government to switch to native plants more to enhance local biodiversity in the long run.

Yau remarked that the top three native plants all have a short flowering period, but once they blossom, they attract a large number of butterflies. Take Levine's Syzygium (*Syzygium levinei*) as example, despite only blooming for two months, as many as 31 butterfly species were recorded feeding on it in a single day. In contrast, the top three foreign species almost blossom year round. However, only a maximum of 12 butterfly species were recorded in a day feeding on the foreign *Bidens alba*. Most butterflies are not specific on their nectar sources and will feed on numerous plants including native and foreign species. From the survey results, we found that native nectar source plants were obviously more attractive to butterflies.

Yau noticed that quite a few butterfly gardens, ecological gardens and nature reserve gardens have been set up in country parks and urban parks in recent years. However, many of them rely on foreign plants, which blossom year round, to attract butterflies. This may cause confusion that foreign species are more beneficial to the local butterfly ecology.

Yau further pointed out that Lantana (*Lantana camara*), albeit also a popular food source for butterflies, has been listed by the IUCN as one of the world's 100 worst alien species and should be avoided altogether. In addition, some foreign species which attract butterflies have limited ecological value as their leaves or fruits are not suitable food for Hong Kong's local animals. **Yau** suggested that the government should work on planting native species with different flowering period in proximity to compensate for the short flowering period. A sustained nectar source can effectively enrich local butterfly biodiversity. (For more details, please refer to Table 2 in the Appendix).

Yau noted that in recent years native trees have been the focus of the Agriculture, Fisheries and Conservation Department in its Country Parks Plantation Enrichment Programme. For example, Ivy Tree (*Schefflera heptaphylla*) and Sweet Viburnum (*Viburnum odoratissimum*) are favourable nectar sources for butterflies. **Yau** suggested that more native shrubs and climbers can be planted as they are of different heights than trees. Their different flowering periods also make them a perfect mix in gardens where people can come enjoy and learn about butterfly ecology in different times of the year. It is a much neglected fact that climbers are most attractive to butterflies. In Green Power's survey, for example, 13 butterfly species were recorded feeding on Champion's Bauhinia (*Bauhinia championii*). Climbers are also suitable decoration of walls and kiosks. Hong Kong Hawthorn (*Rhaphiolepis indica*) and *Maesa perlarius*, both shrub species, bear fruits that attract birds apart from being nectar sources. All these native plants help boost the overall ecological vibrancy of Hong Kong.

About Solar Terms Butterfly Survey

Green Power launched the Solar Terms Butterfly Survey – the first of its kind in Hong Kong – in 2005. Shing Mun Country Park and Tai Po Kau Nature Reserve were selected as the butterfly hotspots for long term collection of butterfly data. Since ancient time, the 24 solar terms have been used by traditional farmers in China to forecast weather and crop harvest in times of seasonal changes. Our butterfly survey records butterfly species and number at different solar terms regularly to analyze changes and variation.

- END -

《Table 1》 Solar Terms Butterfly Survey — No. of butterfly species feeding on native and foreign nectar sources

	Native Nectar Sources	No. of Butterfly Species (Max. count in a day)	Foreign Nectar Sources	No. of Butterfly Species (Max. count in a day)
1	Levine's Syzygium <i>(Syzygium levinei)</i>	51 (31)	<i>Bidens alba</i>	79 (12)
		Butterfly species: Peacock Royal (<i>Tajuria cippus</i>), Commander (<i>Moduza procris</i>), Indian Awl King (<i>Choaspes benjaminii</i>)		Butterfly species: Forget-me-not (<i>Catochrysops strabo</i>), Plain Hedge Blue (<i>Celastrina lavendularis</i>)
2	Prickly Ash <i>(Zanthoxylum avicennae)</i>	45 (17)	Golden Dewdrops <i>(Duranta erecta)</i>	45 (8)
		Butterfly species: Cornelian (<i>Deudorix epijarbas</i>), White Dragontail (<i>Lamproptera curius</i>)		Butterfly species: Tailed Sulphur (<i>Dercas verhuelli</i>), Common Rose (<i>Pachliopta aristolochiae</i>)
3	Lidded Cleistocalyx <i>(Cleistocalyx nervosum)</i>	41 (15)	Lantana <i>(Lantana camara)</i>	42 (8)
		Butterfly species: Spotted Royal (<i>Tajuria maculata</i>), Courtesan (<i>Euripus nyctelius</i>)		Butterfly species: Golden Birdwing (<i>Troides aeacus</i>), Magpie Flat (<i>Abraximorpha davidii</i>)

《Table 2》 Green Power's suggested plant list based on their flowering periods and the 10-year data from the “Solar Terms Butterfly Survey” on butterfly feeding pattern on native nectar sources

Native Nectar Source	Total No. of Butterfly Species Feed On	Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		Jan	
		Spring Commences	Spring Showers	Insects Waken	Vernal Equinox	Bright and Clear	Corn Rain	Summer Commences	Corn Forms	Corn on Ear	Summer Solstice	Moderate Heat	Great Heat	Autumn Commences	End of Heat	White Dew	Autumnal Equinox	Cold Dew	Frost	Winter Commences	Light Snow	Heavy Snow	Winter Solstice	Moderate Cold	Severe Cold
Hong Kong Hawthorn (<i>Rhaphiolepis indica</i>)*^#	21																								
<i>Maesa perlarius</i> *^#	10																								
Sweet Viburnum (<i>Viburnum odoratissimum</i>)*^#	28																								
Chinese Holly (<i>Ilex rotunda</i>)*^#	24																								
Kwangtung Mussaenda (<i>Mussaenda kwangtungensis</i>)	18																								
Acronychia (<i>Acronychia pedunculata</i>)	30																								
<i>Vitex negundo</i>	26																								

		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		Jan			
Native Nectar Source	Total No. of Butterfly Species Feed On	Spring Commences	Spring Showers	Insects Waken	Vernal Equinox	Bright and Clear	Corn Rain	Summer Commences	Corn Forms	Corn on Ear	Summer Solstice	Moderate Heat	Great Heat	Autumn Commences	End of Heat	White Dew	Autumnal Equinox	Cold Dew	Frost	Winter Commences	Light Snow	Heavy Snow	Winter Solstice	Moderate Cold	Severe Cold		
		Lidded Cleistocalyx (<i>Cleistocalyx nervosum</i>)	41																								
Levine's Syzygium (<i>Syzygium levinei</i>) #	51																										
Prickly Ash (<i>Zanthoxylum avicennae</i>)#	45																										
Champion's Bauhinia (<i>Bauhinia championii</i>)	20																										
Rose Mallow (<i>Urena lobata</i>)*	15																										
Ivy Tree (<i>Schefflera heptaphylla</i>) ^#	32																										

Legends :

*	High ornamental value		Shrub
^	Record in some urban parks		Tree
#	Fruit attracts birds		Climber