

嗜菊短頭脊沫蟬 (半翅目 : 沫蟬總科 : 尖胸沫蟬科) 的地理分布與寄主記述

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摘 要

石憲宗、蔡幸君、楊正澤* 2005 嗜菊短頭脊沫蟬 (半翅目 : 沫蟬總科 : 尖胸沫蟬科) 的地理分布與寄主記述 植保會刊 47 : 171 – 178

嗜菊短頭脊沫蟬(圖一), *Poophilus costalis* (Walker, 1851) 屬於昆蟲綱(Insecta) 半翅目(Hemiptera) 沫蟬總科(Cercopoidea) 尖胸沫蟬科(Aphrophoridae) 之脊沫蟬族(Ptyelini) 昆蟲。已記錄之短頭脊沫蟬屬(*Poophilus*) 約有 17 種, 其中 10 種分布於非洲、2 種橫跨分布於非洲與亞洲(分別為 *P. costalis* (Walker, 1851) 與 *P. grisencens* (Schaum, 1853), 此 2 種昆蟲在 Metcalf⁽⁸⁾ 所著的全世界尖胸沫蟬名錄中顯示臺灣亦有分布) 4 種分布於亞洲以及 1 種分布於大洋洲^(6,8)。上述 17 種短頭脊沫蟬屬昆蟲當中, 嗜菊短頭脊沫蟬為唯一具有經濟重要性者, 其分布範圍包含北緯 40 度至南緯 40 度之間、西經 15 度至東經 140 度之間的非洲與亞洲大陸部分地區或島嶼, 該種的地理分布特性呈現非連續性分布狀態, 如連結亞非大陸之間的阿拉伯半島並無分布, 非洲與亞洲地區的島嶼當中也僅分布於斯里蘭卡、海南島、金門群島、馬祖群島、臺灣及附近島嶼、琉球群島、菲律賓群島。

作者等人自 1994 年以來於台灣與鄰近各島調查本種昆蟲的地理分布, 除澎湖群島尚未發現之外, 其他如臺灣^(8, 11, 12)、蘭嶼⁽¹¹⁾、小蘭嶼島(Hsiao Lanyu Is.) (新記錄) 綠島(新記錄) 龜山島(Guishan Is.) (新記錄) 小琉球(Hsiao Liuchiu Is.) (新記錄) 金門群島⁽¹¹⁾ 與馬祖群島(新記錄) 均可發現本種昆蟲, 歸納野外採集資料發現本種昆蟲的垂直分布高度在海拔 500 m 以下, 從內陸低海拔已開發的森林邊緣(產業道路兩側) 至平地較乾燥的農作物栽培區(如空曠果園或旱作園區內外) 或濱海地區均可發現其蹤跡。上述調查所獲標本, 均已製成乾燥針

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插標本或以 70% 酒精浸泡的方式，保存於農委會農業試驗所應用動物組昆蟲與蟎類標本館，作為我國農業害蟲存證標本。



圖一、嗜菊短頭脊沫蟬(*Poophilus costalis* (Walker))。(A) 雄成蟲；(B) 雌成蟲；(C) 五齡若蟲，在大花咸豐草基部（泡沫初形成）。

Fig. 1. *Poophilus costalis* (Walker) (A) Male; (B) female; (C) fifth-instar nymph, on basal part of *Bidens pilosa* L. (with newly formed froth).

本文有關嗜菊短頭脊沫蟬的寄主範圍研究資料，除了整理自往昔研究資料以外，主要乃依據作者等人自 1994 年以來的野外調查確認記錄、以及 2001 年以來我國各農業相關試驗場所轉送至第一作者鑑定的案件資料，依此將寄主範圍與若蟲取食部位等生物學相關資料歸納如下幾點：(1) 嗜菊短頭脊沫蟬屬於多食性昆蟲，其寄主範圍包含單子葉植物（禾本科）與雙子葉植物（表一），其中具民生經濟重要性者包含禾本科的水稻⁽⁹⁾、高粱⁽³⁾、甘蔗^(2, 14)與甘薯⁽¹⁾；具國土保安重要性者如木麻黃科的木麻黃^(1, 11)；具觀賞價值或民俗植物者如山香、薰衣草、香蜂草、茵陳蒿與蘭嶼木耳菜；屬惡性雜草者如大花咸豐草、豬草、銀膠菊。(2) 1907 年由 Matsumura⁽⁷⁾首次記錄本種昆蟲於臺灣分布之後，高野秀三與柳原政之⁽²⁾於 1939 年發現本種昆蟲可為害臺灣的甘蔗。然作者等人自 1994 年以來的野外調查資料顯示，並未於臺灣的甘蔗上發現其若蟲取食為害，再由表一的結果顯示本種昆蟲的寄主記錄已從原先的 4 科 12 屬 16 種，擴增至目前的 10 科 31 屬 37 種植物，其中菊科植物種數至今已達 19 種，其寄主範圍已包含了固有種、外來種與入侵種植物。(3) 於臺灣與所屬離島的野外調查資料顯示，各類寄主當中全株植物可達 10 至 30 隻的若蟲者，包含油菊（臺中新社地區）、香蜂草（高雄旗山地

區)、山香(屏東麟洛與長治地區)、田菁(臺南官田、楠西、南化地區)、白竹仔菜與大花咸豐草(臺灣西部 500 m 以下地區)、馬鞍藤(蘭嶼與綠島地區)、豬草(金馬地區)、銀膠菊(金門地區)等;而全株可達 30 隻以上者,以木麻黃(金門地區)與白水木(彰化彰濱工業區)為主。(4) 本種昆蟲於臺灣年發生 3 至 4 代(高、屏地區),除當年 11 月至翌年 2 月未見或少見成蟲外,其餘各月皆可發現成蟲。以臺中霧峰地區為例,若蟲出現季節為每年 3 至 9 月,一般雌蟲多產卵於寄主的嫩莖頂部葉腋之間,卵呈圓形,散生或 2-3 粒卵排成一列,卵基部嵌於植物組織中,甫孵化的若蟲具有聚集習性(約 5-12 隻,視寄主種類與株形大小而異),於嫩枝頂端及嫩芽背部之主脈基部取食。2 至 3 齡期間主要於寄主嫩莖以下第 1 至 4 節莖部與葉腋之間取食。4 至 5 齡若蟲體色淡,乳白色;胸背板及翅芽基部具褐斑。在多數的菊科寄主上,本種昆蟲之若蟲隨齡期增長而逐步分散至近基部的莖部取食,此行為與若蟲喙部隨齡期增長有關^(4, 5)。

本種昆蟲的主要發生地區根據多年來於臺灣及離島的持續追蹤調查結果,發現其主要發生地區已從臺灣南部的屏東至中部的雲林地區,迅速擴展至全臺各地 500 m 以下的地區;若蟲的主要寄主雖仍為菊科雜草,近年來亦逐漸擴及至香草植物(如唇形花科的山香、薰衣草、香蜂草)、綠肥作物(如田菁、油菊)與行道樹(如木麻黃)。

目前已知本種昆蟲在非洲及中國福建省可造成農林作物重大經濟損失^(1, 3),例如在非洲中部與西部國家的高粱因其為害導致產量嚴重減產,且其取食為害所造成的葉片黃化或萎凋徵狀,常被誤認為是 *Pseudomonas* sp. 所造成的細菌性病原之為害病徵⁽³⁾;黃海清⁽¹⁾ 亦指出本種昆蟲在中國福建對於 3 年生以下的木麻黃幼苗可造成重大為害,嚴重時造成小枝枯死。除此,尖胸沫蟬科昆蟲之部分種類亦被證實可傳播或間接引發某些植物重要病原菌入侵至植物體內,例如 *Philaenus spumarius* Linnaeus 除可為害農作物與牧草以外,尚可傳播國際重要檢疫病害葡萄皮爾斯病(Pierce's disease)⁽¹⁰⁾,而 *Aphrophora canadensis* Walley 之若蟲刺吸植物根部所造成的機械性傷口,為 *Fusarium subglutinans* 侵入松樹維管束的絕佳管道,造成松樹潰瘍病(Canker disease)⁽¹³⁾。

表一、嗜菊短頭脊沫蟬 (*Poophilus costalis* (Walker)) 的寄主及其發生地區

Table 1. Host plants and distributional regions of host plants for *Poophilus costalis* (Walker)

Host plants	Distributional regions of host plants (province or county)	Feeding sites	Reference
Poaceae (禾本科)			
<i>Oryza sativa</i> L. (水稻)	Japan	-	(9)
	China (Fujian)	-	(1)
<i>Saccharum sinensis</i> Roxb. (甘蔗)	Taiwan ¹⁾	stem	(2)
<i>Saccharum officinarum</i> L. (秀貴甘蔗)	the Philippines	-	(14)
<i>Sorghum bicolor</i> (L.) Moench (高粱)	West and central Africa	all parts of the sorghum plant, including the panicles	(3)

<i>Chaetochloa italica</i> Scribn. var. <i>germanica</i> Scribn. (大粟)	Taiwan (Taichung, Changhua, Yunlin, and Nantou)	stem (near the blade)	Present study
Commelinaceae (鴨跖草科)			
<i>Commelina diffusa</i> Burm f. (白竹仔 菜)	Taiwan (western Taiwan)	stem (near the blade or on internode)	Present study
Asteraceae (菊科)			
<i>Ageratum conyzoides</i> L. (霍香薷)	Taiwan (Tainan and Pingtung)	stem (near axilla or ground)	Present study
<i>Ageratum houstonianum</i> Mill. (紫花 霍香薷)	Taiwan	stem (near axilla or ground)	Present study
<i>Ambrosia artemisiifolia</i> L. (豬草)	Kinmen (Fujian)	stem (near axilla or ground)	(11)
	Matsu (Fujian)	stem (near axilla or ground)	Present study
<i>Artemisia capillaries</i> Thunb. (茵陳蒿)	Taiwan (Miaoli)	stem (near axilla or ground)	Present study
	Kinmen (Fujian)	stem (near axilla or ground)	(11)
<i>Aster ciliolus</i> (Turcz.) Hand. -Mazz. (華南狗娃花)	Matsu (Fujian)	stem (near ground)	Present study
<i>Bidens pilosa</i> L. (大花咸豐草)	Taiwan (Orchid Is., Green Is., Hsiao Liuchiu Is.) and Matsu (Fujian)	stem (near axilla or ground), leaf (dorsal main vein)	Present study
	Kinmen (Fujian)	stem (near axilla or ground), leaf (dorsal main vein)	(11)
<i>Chrysanthemum indicum</i> L. (油菊)	Taiwan (Taichung)	stem (near axilla or ground)	Present study
<i>Crassocephalum rabens</i> (Juss. Ex Jacq.) S. Moore (昭和草)	Taiwan (Nantou and Taichung)	stem (near axilla or ground), leaf (dorsal main vein)	Present study
<i>Emilia sonchifolia</i> (L.) DC. (紫背草)	Taiwan	stem (near axilla or ground), leaf (dorsal main vein)	Present study
	Kinmen (Fujian)	stem (near axilla or ground), leaf (dorsal main vein)	(11)
<i>Erigeron canadensis</i> L. (加拿大飛蓬)	Taiwan (Yunlin, Chayi, Taichung, and Hualien)	stem (near axilla or ground)	Present study
<i>Gynura elliptica</i> Yabe & Hayata (蘭 嶼木耳菜)	Taiwan (Orchid Is.)	stem (near axilla or ground)	Present study
<i>Lactuca indica</i> L. (山萵苣)	Taiwan (Nantou, Taichung and Miaoli; Orchid Is.) and Matsu (Fujian)	stem (near ground), leaf (dorsal main vein)	Present study
<i>Parthenium hysterophorus</i> L. (銀膠)	Kinmen (Fujian)	stem (near axilla)	Present

菊)			or ground)	study
<i>Siegesbeckia orientalis</i> L. (豨薟草)	Taiwan (Maioli and Hsinchu)	stem (near axilla	or ground)	Present study
<i>Tridax procumbens</i> L. (長柄菊)	Taiwan (Taichung and Maioli)	stem (near ground), leaf	(dorsal main vein)	
<i>Vernonia cinerea</i> (L.) Less. (一枝香)	Taiwan	stem (near axilla	or ground)	Present study
	Kinmen (Fujian)	stem (near axilla	or ground)	(11)
<i>Wedelia chinensis</i> (Osborn) Merr. (蟛蜞菊)	Taiwan (Orchid Is., Green Is., and Guishan Is.)	stem (near axilla	or ground)	Present study
	Kinmen (Fujian)	stem (near axilla	or ground)	(11)
<i>Wedelia prostrata</i> (Hook. Et Arn.) Hemsl. (天蓬草舊)	Kinmen (Fujian)	stem (near axilla	or ground)	(11)
<i>Youngia japonica</i> (L.) DC. (黃鶉菜)	Kinmen (Fujian)	stem (near axilla	or ground)	(11)
Lamiaceae (唇形花科)				
<i>Hyptis suaveolens</i> (L.) Poir. (山香)	Taiwan (Pingtung)	young shoot		Present study
<i>Lavandula</i> sp. (薰衣草)	Taiwan (Kaoshung and Taichung)	young shoot		Present study
<i>Melissa officinalis</i> L. (香蜂草)	Taiwan (Kaoshung)	young shoot		Present study
Boraginaceae (紫草科)				
<i>Messerschmidia argentea</i> (L.) Johnston (白水木)	Taiwan (Changhua)	stem (near axilla	or ground), leaf	Present study
		(dorsal main vein)		
Convolvulaceae (旋花科)				
<i>Ipomoea batatas</i> (L.) Lam. (甘薯)	China (Fujian)	-		(1)
<i>Ipomoea pescaprae</i> (L.) Sweet subsp. <i>brasiliensis</i> (L.) Oostst. (馬鞍藤)	Taiwan (Taitung; Orchid Is. and Green Is.)	stem (near axilla)		Present study
Fabaceae (蝶形花科)				
<i>Sesbania</i> sp. (田菁)	Taiwan (Tainan)	twig (near stem)		Present study
Mimosaceae (含羞草科)				
<i>Mimosa pudica</i> L. (含羞草)	Taiwan (Taichung, Yunlin, and Tainan)	stem (near axilla)		Present study
Moraceae (桑科)				
<i>Humulus scandens</i> (Lour.) Merr. (葎草)	Taiwan (Taichung and Miaoli)	stem (near axilla)		Present study
Casuarinaceae (木麻黃科)				
<i>Casuarina equisetifolia</i> L. (木麻黃)	China (Fujian)	twig		(1)
	Kinmen (Fujian)	twig		(11)
	Matsu (Fujian)	twig		Present

<i>C. fraseriana</i> Mig. (佛氏木麻黃)	Kinmen (Fujian)	twig	study (11)
<i>C. glauca</i> Sieber ex Mig. (銀木麻黃)	Kinmen (Fujian)	twig	(11)

¹⁾ No materials were found from this area at present study.

雖然臺灣至今尚未有本種昆蟲造成農作物直接為害(造成作物經濟價值下降或死亡)與間接為害(傳播植物木質部病害)的證據,但由本調查可預期未來本種昆蟲的寄主範圍仍有機會擴大,因此作者等將持續調查本種昆蟲的分布與寄主範圍是否持續擴大,以利掌握其為害資訊。

(關鍵詞:沫蟬總科、嗜菊短頭脊沫蟬、分布、寄主植物)

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ABSTRACT

Shih, H. T.¹, Tsay, H. C.², and Yang J. T.^{3*}. Notes on the geographic distribution and host plants for *Poophilus costalis* (Walker, 1851) (Hemiptera: Cercopoidea: Aphrophoridae). Plant Prot. Bull. 47: 171-178. (¹Applied Zoology Division, Taiwan Agricultural Research Institute, Council of Agriculture, Wufeng, Taichung 413, Taiwan (ROC); ²Plant Germplasm Division, Taiwan Agricultural Research Institute, Council of Agriculture, Wufeng, Taichung 413, Taiwan (ROC); ³Department of Entomology, National Chung Hsing University, Taichung 402, Taiwan (ROC))

Information on the distribution, host plants, and feeding behavior of the froghopper *Poophilus costalis* (Walker, 1851) was investigated. It has hitherto been known from Africa and Asia from 40°N to 40°S latitude and 15°W to 140°E longitude, with the exception of northern Africa, the Arabian Peninsula, and parts of West Asia. New records for the Matsu Islands (under Taiwanese government control, located offshore Fujian Province, southeastern China) and some other small islands near Taiwan, i.e., Hsiao Liuchiu Is., Hsiao Lanyu Is., Green Is., and Guishan Is. are reported herein. The distributional pattern is apparently intermittent for this species. In addition, after a literature review and our field survey, our results show that this froghopper feeds on 37 host plants belonging to 10 families and 31 genera, of which 31 host plants belong to the family Asteraceae.

(Key words: Cercopoidea, *Poophilus costalis*, distribution, host plants)

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