



臺灣蝶類誌

第二卷
VOL. II
SECOND EDITION

粉蝶科
PIERIDAE

徐堉峰、黃嘉龍、梁家源

行政院農業委員會林務局

臺灣蝶類誌

BUTTERFLY FAUNA
OF
TAIWAN

粉蝶科

PIERIDAE

第二卷

Vol. II

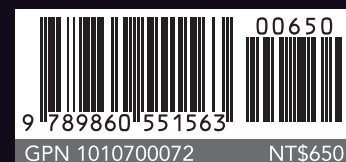
SECOND EDITION

徐堉峰 黃嘉龍 梁家源

YU-FENG HSU CHIA-LUNG HUANG JIA-YUAN LIANG



行政院農業委員會林務局
FORESTRY BUREAU C.O.A



GPN 1010700072 NT\$650

臺灣蝶類誌

— ◆ —
BUTTERFLY FAUNA
OF
TAIWAN

作者

徐堉峰

黃嘉龍

梁家源



行政院農業委員會林務局

臺灣蝶類誌

—◆—
BUTTERFLY FAUNA
OF
TAIWAN

粉蝶科

PIERIDAE

第二卷

VOL. II

—◆—
SECOND EDITION

YU-FENG HSU

CHIA-LUNG HUANG

JIA-YUAN LIANG



COUNCIL OF AGRICULTURE EXECUTIVE YUAN
FORESTRY BUREAU

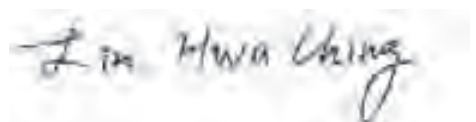
Foreword

The island of Taiwan is about 36,000 km², thus only representing 0.024% of the Earth's terrestrial surface, but butterflies proliferate across it. In the case of butterflies, the number of butterfly species in Taiwan, Japan (10 times of Taiwan in area) and Australia (213 times of Taiwan) are 380, 214 and 435 species, respectively, indicating that the diversity of butterflies in Taiwan far exceeds that of Japan and Australia; that is, the distinctiveness of Taiwan's butterfly habitat in the world. Whether from an academic research, ecological conservation, or education promotion perspective, butterfly resources research is of great importance.

“Biota” records the evolution of scientific names for species, the origin of type specimen, description, distribution, ecology, and references. In order to allow researchers to quickly consult the original documents of species as the basic data for follow-up research and development, and demonstrate the achievements of the national taxonomy, the Forestry Bureau is actively planning the publication of the “Biota”. The Forestry Bureau has completed “Vascular Plant of Taiwan” and the second edition of “The Avifauna of Taiwan” while “Mammal Fauna of Taiwan” has also in preparations at present.

In terms of the research on butterfly classification, Professor Takashi Shirôzu published the original book “Butterflies of Formosa in Colour” in 1960 and three volumes entitled “Taiwan Butterfly Design Book” in 1999 were commissioned by Professor Yu-Feng Hsu of National Taiwan Normal University (NTNU). After nearly 20 years, breakthroughs in molecular biotechnology and the evolution of the concept of species have changed butterfly classification. However, there remains a lack of tools for their taxa to explain detail. Books on classification indicate the importance and urgency of a compilation of biota. The Forestry Bureau invited Professor Yu-Feng Hsu from NTNU to supplement and update butterfly specimens for the verification of taxonomic descriptions and illustrations, textual distribution, and habitats for a long time to complete the publication of the “Butterfly Fauna of Taiwan” study, which is an important milestone in history. For the first time, a complete series of monographs on the island and the associated islands butterfly resources have been collected and reviewed with the latest data on the current status; written in both English and Chinese, for five volumes in total, with the hope to complete in six or seven years. This year, the first two collections of the monographs on Papilionidae and Pieridae have been published in the hope of providing research and application to readers both at home and abroad. It is also hoped that compatriots in Taiwan can learn more about the diversity and preciousness of Taiwan's butterflies to protect their rich natural habitat.

Direct General



Forestry Bureau, Council of Agriculture, Executive Yuan

推薦序

臺灣全島面積約 36000 平方公里，僅占世界陸域面積的萬分之二點四，卻擁有豐富的動植物資源；以蝴蝶種數為例，臺灣、日本（面積為臺灣 10 倍）與澳洲（面積為臺灣 213 倍）蝴蝶種數分別為 380 種、214 種與 435 種，可知臺灣蝶類的多樣性遠超過日本與澳洲，顯現臺灣在全球蝴蝶棲地之特殊性，深具學術研究、生態保育及教育推廣價值。

「生物誌」記載物種學名演變、模式產地、分類特徵描述、分布、生態及參考文獻。林務局為了讓研究人員快速查閱種類命名的原始文獻，做為後續研究發展的基礎資料，更為了展現國家分類學研究成果，因此，積極籌劃生物誌，目前已完成《台灣維管束植物簡誌》與《臺灣鳥類誌》第二版，而《陸域哺乳動物誌》也正籌備中。

就蝴蝶分類研究而言，自日籍學者白水隆教授 1960 年出版《原色臺灣蝶類大圖鑑》與 1999 年國立鳳凰谷鳥園委託國立臺灣師範大學徐堉峰教授出版《臺灣蝶圖鑑》三卷後，近 20 年間，分子生物技術突破以及物種概念的演變，造成蝶類分類階層異動，然而，尚缺乏一部分類論述詳盡的專著，顯見生物誌編撰的重要性與急迫性。本局邀請臺灣師範大學徐堉峰教授團隊，長期間補充與更新蝴蝶標本，查證分類特徵描述與圖示、考證分布、棲地環境等資料，完成《臺灣蝶類誌》發行，可說是臺灣蝶類分類研究史的重要里程碑。該書為國內首部完整論述本島與離島蝶類資源之專著，分年逐步編纂，中英文對照，共計五卷，期於六、七年間出版完成。本 (2018) 年首期出版、付梓鳳蝶與粉蝶科兩卷，冀望提供國內外讀者研究應用，也讓國人更了解臺灣蝴蝶資源的多樣性與珍貴性，進而保護臺灣豐富的自然生態。

行政院農業委員會林務局 局長



謹識

2017 年 12 月

愛蝶人的臺灣蝴蝶圖鑑

三十多年前，日本九州大學已故名譽教授白水隆的「原色台灣蝶類大圖鑑」，幾乎是研究台灣蝶類的聖經；而就在這個時間點，從小就熱衷蝴蝶研究的徐堉峰早已把這本日文圖鑑「讀」得滾瓜爛熟，當然為了蝴蝶，他的日文竟然是無師自通。所以，在他進入台大，到我研究室後，我們的蝴蝶研究如虎添翼，研究室也同時展開了長時間的全台蝴蝶資源調查和保育生物學的研究。畢業後他前往美國加州大學深造，但每一次返國，便會回到研究室持續協助指導學弟妹們，如今台灣蝴蝶研究之能有現在的成果，徐教授長年以來的耕耘和努力，的確功不可沒！

返國之後，徐教授除致力於研究、教學之外，已出版多套蝴蝶圖鑑，但這系列以科為別的「台灣蝶類誌」則是一套大書！非常敬佩林務局能延請徐堉峰和他的兩位高足共同執筆，相信這套大書應是繼白水隆之後，最令人期待的台灣蝴蝶圖鑑。就以即將出版的第一卷鳳蝶科來說，均依正統分類學方式製作，按科屬種方式進行編撰；每一個蝶種的介紹，包括有中名、異名表列、標本檢查、成蟲形態、世界分佈、台灣分佈、幼蟲寄主植物、種之生物學及註記等；而且每一個種類都有雄雌背、腹面標本彩圖，雌雄蟲生殖節及外性器解剖圖，當然也包括脈翅圖；全書以中、英文並列，是一本國際化的蝶類分類圖誌。「台灣蝶類誌」首先發行兩冊。以第一冊鳳蝶科來說，介紹了台灣 32 種固定出現的種類，和 1 種偶產種及其他 6 種非固定出現的蝶種，第二冊粉蝶科則介紹了台灣 37 種固定出現的種類及常見偶產種及其他 4 種非固定出現的蝶種，是目前蝶類圖誌中介紹最完整，也最詳盡的好書。

為了便於後學者研究及查閱方便，書末均附有往昔研究的文獻，以及中英文索引；恭喜林務局找到最適合的人選，持續出版系列蝶類誌，相信這也是越來越多蝶類愛好者所衷心期待的。

堉峰任職於國立台灣師範大學生命科學系，年近中年依然上山下海，執著蝶類研究，而每年也帶著學生認真出席國內外各種研討會，是極具國際化的傑出學者；身為他的老師，「青出於藍勝於藍」，的確與有榮焉，也期待後學者能以堉峰為楷模，持續讓台灣的蝶類研究及蝴蝶生態保育和環境教育工作，而且都能在國際上發光發熱！

國立臺灣大學 名譽教授



謹記

2017.11.22

Preface

The idea of writing the book series entitled “Butterfly Fauna of Taiwan” dates back to a few years ago in a conversation with my good friend Mr. Shou-Ming Wang. Mr. Wang was a senior staff serving in the Conservation Section of Forestry Department, Council of Agriculture (COA), Taiwan. By that time, we collaboratively worked on a project to organize an international symposium on butterfly research and conservation for East Asia. We both had the same impression that although the diversity of butterfly fauna in Taiwan is famous, a formal faunistic work is still lacking. Butterflies have symbolic meaning to Taiwan, thus many nature lovers take efforts to observe, study, and record them. Many guide books and handbooks on Taiwanese butterflies have been published, but they are mainly produced for use of the general public interested in butterflies, leaving out information on taxonomy and nomenclature. The most important textbook on taxonomy of Taiwanese butterflies is a classical book entitled “Butterflies of Formosa in Colour” by Takashi Shirôzu published in 1960. With splendid illustration of specimens and drawings of male genitalia, the book remains a “must have” for those who interested in studying butterflies of Taiwan. However, the book was published more than half a century ago, thus taxonomic assignments of many species included have changed, and quite a few new taxa have been added to the inventory of Taiwanese butterflies. The book series “Butterfly Fauna of Taiwan” aim to provide update information on all known species of butterflies occurring in Taiwan, including “accidentals”. The text of the series will be in both English and Chinese, so information will be available to international and local users of the book series. I invited two ex-PhD students graduated from my laboratory, Dr. Chia-Lung Huang and Dr. Jia-Yuan Liang, as co-authors. Dr. Huang chiefly deals with translation of the English text into Chinese, whereas Dr. Liang performed dissections of genitalia. The contents of the book series include the follows: Information for each family, subfamily, genus and species is provided. For each species, Sections of synonymic list, specimen examined, description, distribution, hostplants, biology, and remarks (if applicable) are given. Specimens were primarily examined from the collection housed in the Department of Life Science, National Taiwan Normal University, Taipei (NTNU), except those otherwise indicated. The condition of specimens for some accidental species is poor, and replaced using specimens from their possible source area whenever possible. Rearing codes refer to a rearing database (HSU) maintained in NTNU.



National Taiwan Normal University, Taipei

作者序

「臺灣蝶類誌」撰寫的濫觴自我多年前和當時任職於林務局保育組的好友王守民先生間的對話，其時我們正努力催生一場關於亞洲蝴蝶研究與保育的國際研討會。守民兄和我都對一件事有同感，那便是雖然臺灣蝴蝶資源聞名遐邇，卻缺少一本較專業的專著。由於蝴蝶被視為臺灣的象徵之一，許多人興趣濃厚地觀察、研究、記錄這些可愛的小生物。如今已有許多介紹臺灣蝶類的書籍出版，但內容主要是針對大眾的科普讀物，鮮少對分類及學名等資料作說明。以臺灣的蝴蝶分類研究而言，最具有里程碑意義的著作是日籍學者白水 隆博士於 1960 發表的「原色台灣蝶類大圖鑑」。該書圖片印刷精美，伴以精細的生殖器解剖手繪圖，至今仍是研究臺灣蝴蝶研究不可或缺的經典參考文獻。然而，該書的發行距今已經過半世紀以上的時光，書中介紹的蝶種許多經過諸多分類處理的變更，亟須整理，而在該書問世後，有許多新蝶種被發現，亦須補充，分布、生態等資料也因後來的研究進展使內容大不相同，這些情形均使得撰寫包含此等新資料的專書有其必要。「臺灣蝶類誌」編撰的緣由因此產生。這套專書的內容希望可以涵蓋迄今已知的臺灣所有的蝶種，包括偶產種。為了服務國內外所有對臺灣蝴蝶感興趣的朋友，內文以中英文對照呈現。撰寫期間我邀請從我研究室畢業的兩位出色的學生黃嘉龍博士及梁家源博士協助。黃博士主要致力於將英文內容中譯，梁博士則戮力進行生殖器解剖工作。本書內容包括科、亞科、屬及種的基本介紹。每一種則依序說明異名、標本檢視、形態、分布、寄主植物或食餌、生物學及註記（若有必要）。所檢標本除了特別標示者以外，基本上使用師大生科系蝴蝶研究室的收藏。少數偶產種標本品質不佳，本書儘量以其可能起源地的標本代替作為圖示。飼養編號則來自師大生科系蝴蝶研究室使用的 HSU 飼養資料庫。



2017. 11. 9. 夜於師大分部

Acknowledgments

Many friends and students provide assistance to this book series, on assistance of chores, giving helpful comments, or providing materials and literature. Overseas colleagues and friends include Dr. Dick Vane-Wright (UK), Mr. Adam Cotton (UK, now in Thailand), Dr. Michael Braby (Australia), Dr. Alexander Monastyrskiy (Russia, now in Vietnam), Dr. Tomoo Fujioka (Japan), Prof. Osamu Yata (Japan), Prof. Masaya Yago (Japan), Dr. Hideyuki Chiba (Japan), Mr. Hiroshi Tsukiyama (Japan), Mr. Motoki Saito (Japan), Mr. Gian Cristoforo Bozano (Italy), Mr. James Young (Hong Kong), Mr. Philip Yik-Fui Lo (Hong Kong), Dr. Chin-sheng Wu (mainland China), Prof. Gou-fang Jiang (mainland China), Prof. Shan-yi Zhou (mainland China), Mr. He-li Deng (mainland China), Mr. Ai-min Li (mainland China), Mr. Jian-qin Zhu (mainland China), Mr. Zhen-jun Wu (mainland China), Mr. Jia-lin Chen (mainland China), Mr. Hao Huang (mainland China), Mr. Shao-ji Hu (mainland China). Local colleagues and friends include Prof. Ping-Shu Yang, Prof. Shen-Horn Yen, Mr. Shou-Ming Wang, Ms. Shu-Chi Hsieh, Dr. Kuang-Liang Chen, Mr. Hang-Chi Huang, Mr. Cheng-Chih Lu, Mr. Chang-Ching Chen, Mr. Hui-Yung Li, Mr. Hsing Hang Li, Mr. Yu-Jung Hung, and Mr. Yung-Jen Chang. Members and ex-members of my laboratory include Mr. Li-Hao Wang, Mr. Yu-Chi Lin, Mr. Jung-Chun Lin, Mr. Chih-Wei Huang, Mr. Cheng-Jui Chang, Mr. Wen-Jie Lin, Mr. Li Huang, Ms. Ke-Yi Ho, Mr. Yu-Ming Hsu, Ms. Hsin-Yun Chen, Dr. Chih-Chien Lu, and Dr. Li-Wei Wu. Prof. Kazunori Yoshizawa of Hokkaido University kindly allowed us to examine the specimen of *Luehdorfia japonica formosana* in Matsumura collection under his care. I am here to express my cordial thanks to all of them. Conservation Section of Forestry Department, Council of Agriculture (COA) generously provides financial aid to the production of the book series. Without their support, the publication of the book series cannot be accomplished. Finally, I hope the readers of the book series may find them useful, and comments from anyone will be heartily welcomed.



National Taiwan Normal University, Taipei

致謝

除了黃嘉龍博士及梁家源博士以外，許多朋友及國立臺灣師範大學生科系的同學或協助工作進行、或作學術討論、或提供樣本與文獻，均讓本書撰寫獲益良多。海外學者包括英國的 Dick Vane-Wright 博士及 Adam Cotton 先生（現居泰國）、澳洲的 Michael Braby 博士，俄羅斯的 Alexander Monastyrskiy 博士（現居越南），日本的藤岡知夫博士、矢田 脩教授、矢後勝也教授、千葉秀幸博士、築山 洋先生、齊藤基樹先生，義大利的 Gian Cristoforo Bozano 先生，香港的楊建業先生與羅益奎先生，中國大陸的武春生博士、蔣國芳教授、周善益教授、鄧合黎先生、李愛民先生、朱建青先生、吳振軍先生、陳嘉霖先生、黃灝博士、胡邵驥博士。臺灣本地的師長與朋友包括楊平世教授、顏聖紘教授、王守民先生、謝書綺小姐、陳光亮醫師、黃行七先生、呂晟智先生、陳常卿先生、李惠永先生、李興漢先生、洪裕榮先生及張永仁先生。臺灣師範大學研究團隊的成員則有王立豪先生、林育綺小姐、林容諄小姐、黃智偉先生、張宸睿先生、林文傑先生、黃黎先生、何可蕙小姐、許育銘先生、陳歆芸小姐、呂至堅博士及吳立偉博士。北海道大學吉澤和德教授慨允檢視他負責管理的松村收藏中珍貴的臺灣記錄之虎鳳蝶標本。對以上諸君在此致上我萬分謝忱。此外，若無林務局保育組的大力支持，「臺灣蝶類誌」無法問世，在此表達最高的敬意。最後，我誠摯希冀這套書的讀者會覺得它有參考價值，並歡迎賢達批評指教。



2017. 11. 9. 夜於師大分部

Preface and acknowledgments for second edition

The volume one and two of “Butterfly Fauna of Taiwan” were published in the spring of 2018. It was a surprise when both volumes went out of print by the end of the summer of the same year. The publisher decided to produce a second edition last winter upon request from readers missing the first edition. We thus took this as a nice opportunity to correct some errors in the first edition. Special thanks are expressed here for helpful comments by Mr. Jun-ichi Asahi of the Butterfly Science Society of Japan and Mr. Hsing-Han Li, the author of “the Etymology of Scientific Names of Formosa Butterflies”.



National Taiwan Normal University, Taipei

本誌第一及第二冊於2018年春發行，令人意外的是，初版在同年夏便已告絕版，於是出版本誌的林務局基於大眾需求及教育推廣的目標，決定製作第二版。我等覺得這會是修正本誌初版中一些疏漏與謬誤的好機會，因此從善如流配合。在第二版發行之際，特藉機向提供寶貴意見的兩位賢達表達謝忱，他們分別是日本蝶類科學會的朝日純一先生及「臺灣蝴蝶拉丁學名考釋」的作者李興漢先生。



2019. 1. 24.

Contents

PIERIDAE	1
Pierinae	3
<i>Delias</i>	4
<i>Aporia</i>	19
<i>Pieris</i>	27
<i>Talbotia</i>	34
<i>Cepora</i>	37
<i>Appias</i>	48
<i>Prioneris</i>	65
<i>Leptosia</i>	69
<i>Ixias</i>	73
<i>Hebomoia</i>	77
Coliadinae	82
<i>Catopsilia</i>	83
<i>Colias</i>	94
<i>Gonepteryx</i>	98
<i>Eurema</i>	104
<i>Anthocharis</i>	129
Supplementary Notes	132
References	134
Colour Plates	138
Index	221

目錄

粉蝶科..... 1

粉蝶亞科..... 3

 豔粉蝶屬 4

 絹粉蝶屬 19

 白粉蝶屬 27

 飛龍白粉蝶屬..... 34

 脈粉蝶屬 38

 尖粉蝶屬 48

 鋸粉蝶屬 66

 纖粉蝶屬 70

 異粉蝶屬 73

 橙端粉蝶屬..... 78

黃粉蝶亞科..... 82

 遷粉蝶屬 83

 紋黃蝶屬 94

 鉤粉蝶屬 99

 黃蝶屬 104

 襟粉蝶屬 129

補充註記..... 133

文獻..... 134

彩色圖版..... 138

索引..... 223

Family PIERIDAE Duponchel, [1835]

The family is cosmopolitan, with more than 1000 species. This family are remarkable amongst butterfly for the number of migrant species, seasonal variation, and pests (Ackery *et al.*, 1999). Profound seasonal forms occur in certainly groups, often referred to as the dry season form (DSF) and wet season form (WSF) in literature. Members of the family are well represented in both temperate and tropical regions (Della Bruna, 2004).

The monophyly of Pieridae is well supported by both morphological evidence (e. g. Ackery *et al.*, 1999) and molecular data (e. g. Walberg *et al.*, 2005; Heikkilä, M. *et al.*, 2011). Unique features of this family include a few characters: 1) lateral plates of pronotum not fused medially; 2) foretarsus with bifid claws; 3) outer edge of forewing third axillary sclerite with tooth; 4) pterin pigments in wing scales.

Four subfamilies are generally recognized (Braby *et al.*, 2006): Dismorphiinae, Pseudopontiinae, Pierinae, and Coliadinae (Ackery *et al.*, 1999). Dismorphiinae contains about 100 species in 6 genera, mostly Neotropical, but a single genus *Leptidea* is found in the Palearctic. Pseudopontiinae is long considered containing just single Afrotropical species, but Mitter *et al.* (2011) recognize 5 species. Pierinae comprises about 700 species in about 55 genera, cosmopolitan in distribution. Coliadinae contains about 250 species in 12 genera, also cosmopolitan in distribution.

A total of approximately 36 species of pierid butterflies currently inhabit Taiwan and its associated islands, with a few species of accidental stray from areas outside of Taiwan. Full accounts are given to these 37 resident species and commonly found straying species in this work, with supplementary notes given to the 4 non-resident or doubtful species.

粉蝶科

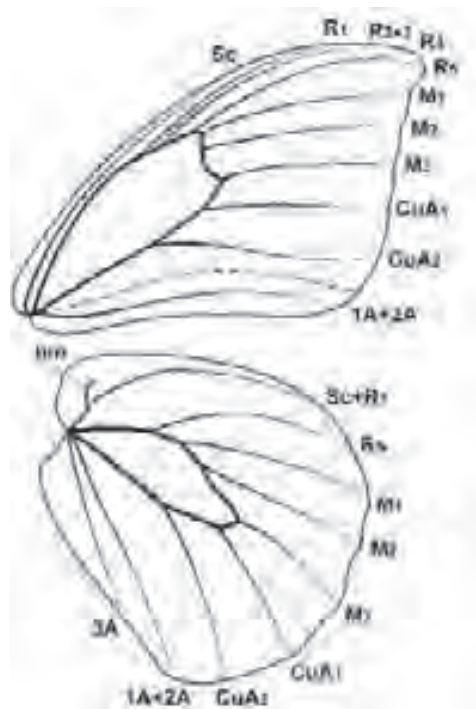
本科成員呈泛世界分布，已知超過 1000 種。粉蝶科在蝴蝶中以具遷徙性、季節性變異豐富及害蟲種類多著稱 (Ackery *et al.*, 1999)。部分類群季節型十分明顯，文

獻中常稱為乾季型 (DSF) 及雨季型 (WSF)。此科成員在溫帶及熱帶地區均十分繁盛。

形態証據 (例如 Ackery *et al.*, 1999) 及分子資料 (例如 Walberg *et al.*, 2005; Heikkilä *et al.*, 2011) 均充分支持粉蝶科為一單系群。粉蝶科獨有的特徵包括：1) 前胸背板側板中央不癒合；2) 前跗節爪二叉；3) 前翅第 3 腋骨外緣具齒突；4) 翅膀鱗片色素中含有蝶呤。

本科一般分成四亞科 (Braby *et al.*, 2006)：袖粉蝶亞科、偽雲粉蝶亞科、粉蝶亞科及黃粉蝶亞科 (Ackery *et al.*, 1999)。袖粉蝶亞科約包括 6 屬 100 種，大多見於新熱帶區，僅小粉蝶屬 *Leptidea* 分布於舊北區。偽雲粉蝶亞科長久以來被認為只包含單一個產自熱帶非洲的種，但 Mitter *et al.* (2011) 發現其中包含 5 個生物種。粉蝶亞科為泛世界分布約包括 55 屬 700 種。黃粉蝶亞科約有 12 屬 250 種，亦呈泛世界分布。

目前臺灣地區 (含離島) 約有 36 種粉蝶棲息，另有一些種類常從其他地區偶發性進入臺灣。本誌記載 37 種固有種、已定居外來種及常見偶產種，並提供 4 種偶產或疑問種之補充記要。



Text-fig. 1. Wing venation of Pieridae (*Hebomoia glaucippe*).

粉蝶科翅脈脈相圖 (橙端粉蝶為例)

Subfamily PIERINAE, Duponchel, [1835]

Ackery *et al.* (1999) listed a few diagnostic characters for the subfamily: 1) bifid pretarsal claws; 2) unisutural antennae; 3) membranous patagia; 4) hindwing Sc+R₁ running freely to margin; 5) forelegs lacking tibial epiphyses; 6) hind tibia with spurs.

The members of this subfamily are cosmopolitan in distribution. Their larval hostplants include plants families not used by other pierid subfamilies, such as Brassicaceae, Capparidaceae, Loranthaceae, and Santalaceae.

In Taiwan, a total of 23 species in 10 genera are known to occur or frequently found.

粉蝶亞科

Ackery *et al.* (1999) 列出之本亞科鑑別特徵包括：1) 前跗節爪二叉；2) 觸角單縫；3) 領片膜質；4) 後翅 Sc+R₁ 脈游離至翅緣；5) 前足無前脛距；6) 後足脛節有距。

本亞科的成員呈泛世界性分布，幼蟲所利用的寄主植物不為其他粉蝶亞科種類利用，如十字花科、山柑科、桑寄生科、檀香科等。

在臺灣已知有 10 屬 23 種棲息或經常出現。

Genus *DELIAS* Hübner, [1819]

Type species: *Papilio egialea* Cramer, [1777]

Della Bruna *et al.* (2004) listed a few diagnostic characters for the genus: 1) labial palpi short, with third segment as long as or longer than the second; 2) antennae about 1/2 length of forewing, club abrupt; 3) discoidal cell 1/2 length of forewing; 4) 3 R veins present; 5) uncus 3-lobed.

Larvae are known as specialists on semi-parasitic plants in the family Loranthaceae and Santalaceae, with an exceptional case on Euphorbiaceae in Australia (Braby, 2012).

In Taiwan, 4 species are known to occur on the main island, with an additional species recorded from Jinmen Islands.

豔粉蝶屬

Della Bruna *et al.* (2004) 列出之本屬鑑別特徵包括：1) 下唇鬚短小，第 3 節較第 2 節長或相等；2) 觸角長度約為前翅的二分之一，末端棍棒狀膨大；3) 中室長度為前翅的二分之一；4) R 脈三條；5) 鉤突三分岔。

幼蟲專食半寄生植物，如桑寄生科及檀香科，僅澳洲有 1 種例外，以大戟科植物為寄主植物 (Braby, 2012)。

在臺灣本島本屬已知有 4 種，金門地區另有 1 種記錄。

Delias pasithoe (Linnaeus, 1767)(豔粉蝶 / 紅肩粉蝶 / 基紅粉蝶 / 報喜斑粉蝶)

Papilio (Heliconius) pasithoe Linnaeus, 1767: Systema Naturae (Edn 10) 1: 755, no. 53. (Type locality: “Asia” [Canton, China]. (replacement name for *Papilio aglaja* Linnaeus, 1758)

Papilio (Nymphalis) aglaja Linnaeus, 1758: Systema Naturae (Edn 10) 1: 465, no. 44. (preocc.) (Type locality: “Asia” [Canton, China])

Papilio dione Drury, [1773]: Illustrations of Natural History, y, Wherein are Exhibited Upwards of 240 Figures of Exotic Insects 2: pl. 8, f. 3-4. (Type locality: “Bombay” [India])

Papilio porsenna Cramer, [1775]: De Uitlandsche Kapellen 1 (1-7): 68, pl. 43, f. D, E. (replacement

name for *Papilio aglaja* Linnaeus, 1758)

Ssp. *curasena* Fruhstorfer, 1908

PLATE 1, Figs. 1-2; PLATE 20, Fig. 115; PLATE 30, Fig. 155

Delias aglaja curasena Fruhstorfer, 1908: Entomologische Wochenblatt 25 (9): 38. (Type locality: “Lake Candidius”)

Ssp. *pasithoe* Linnaeus, 1767

PLATE 1, Figs. 3-4; PLATE 20, Fig. 116; PLATE 30, Fig. 156

Specimens examined:

Ssp. curasena : **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]**: 1♀, Wulai, 21. XI. 1987 (Y. F. Hsu). **TAOYUAN CITY [= TAOYUAN Co.]**: 1♂, Daman/ Xuanyuan, emgd. 1. XI. 1987 (Y. F. Hsu); 1♀, same locality, 14. XI. 1987 (Y. F. Hsu); 1♂, Fuxing, Shangbaling, 22. VIII. 2014 (C. W. Huang) (genitalia preparation JYL242). **MIAOLI Co.**: 1♂, 1♀, Puguang Temple, emgd. 14. II. 1987 (Y. F. Hsu). **NANTOU Co.**: 2♂, 6♀, Yuchi, Lianhuachi, 700m, 1. XII. 2004 (Y. F. Hsu); 1♂, 1♀, same locality, 21. XI. 2014, emgd. 29. XI. 2014 (H. C. Huang) (genitalia preparation JYL161, JYL160). **JIAYI [= CHIAYI] Co.**: 1♂, 26. X. 1996 (Y. F. Hsu); 1♂, Fanlu, Gongtian, 1. X. 2012 (J. Y. Liang). **KAOSIUNG CITY [= KAOHSIUNG Co.]**: 1♂, Taoyuan, Shidong, 600m, 11. VIII. 2011 (Y. F. Hsu).

Ssp. pasithoe: **JINMEN [= KINMEN] Co.**: 3♂, 2♀, Jinhu, Botanical Garden, 18/20. XI. 2013 (Y. F. Hsu & H. C. Huang); 1♂, same locality, 5. XI. 2015 (L. Huang); 1♂, Jinsha, Ronghu, 6. XI. 2015 (H. C. Huang) (genitalia preparation JYL163); 2♀, Jinsha, Shishan, 4. XI. 2015 (L. Huang) (genitalia preparation JYL162); 1♂, Jincheng, Gugang, 6. XI. 2015 (L. Huang).

Description. Adult – Forewing length 38–42 mm. Male (PLATE 1, Figs. 1; 3): Head hairy, dark brown mixed with white hairs on frons and vertex; chaetosemata as black, erect hair tufts. Antennae clavate distad, dark brown with white scaling distad. Proboscis dark brown. Labial palpus dark brown, sparsely mixed with white hairs. Thorax covered by dark brown tinged with gray hairs dorsally, with white hairs ventrally. Abdomen ground color dark brown dorsally, white ventrally. Valvae with outer surface hairy, brown dorsally, white ventrally. Legs dark brown mixed with white scaling, with femur

bearing 6 prominent hairs ventrad. Forewing somewhat elongate, with costa, dorsum nearly straight; termen nearly straight, somewhat convex near apex; apex obtuse. Hindwing termen rounded. Wing uppersides ground color black. Discal spots consisted of a series of small white markings. A patch of white tinged with blue markings near base of both wings. A yellow patch present along dorsum in hindwing. Small, white spot present at distal end of discoidal end of both wings. Wing underside ground color dark brown. Forewing with wing pattern similar to that of upperside, but with markings white. Hindwing with extensive yellow markings. A bright red patch present proximally. Females (PLATE 2, Figs. 2; 4): Body, wing patterns similar to male, ground color of wings paler, being brown instead of black or dark brown. Bluish white scalings and yellow patch on wing uppersides absent. Termen of forewing more concave.

Two subspecies recognized: the nominotypical subspecies (PLATE 1, Figs. 3-4) occurs in Jinmen Islands, whereas ssp. *curasena* (PLATE 1, Figs. 1-2) inhabits main island of Taiwan. The markings on wing uppersides of the nominotypical subspecies are paler than those of ssp. *curasena*.

Male genitalia (PLATE 20, Figs. 115-116) – Tegumen bearing short, lateral process subcaudad, with uncus as a slightly down-curved, conical process. Vinculum slender, bent dorsally. Saccus short, enlarged. Valva lobe-like, produced caudad, with dorsal margin convex. Phallus short, slightly bent, with phallobase possessing keel-like structure ventrally.

Female genitalia (PLATE 30, Figs. 155-156) – Corpus bursae oval. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a pair of prominent, invaginated pouches. Signum as a transverse, invaginated, dumbbell-like sclerite, with both ends armed with a few spines. Anal papillae densely setose, with setae on prominent, conical processes. Posterior apophyses and anterior apophyses short, thick, with former more prominent than latter.

Global distribution. Eastern Himalayas, Northeast India, Malay Peninsula, Indochina, Borneo, Sumatra, Java, Philippines, South to East China, and Taiwan (Yata, 1985).

Distribution in Taiwan. The nominotypical subspecies occurs in Jinmen Islands. Ssp. *curasena* occurs in main island of Taiwan (Hsu, 2013).

Larval Host plant(s). Loranthaceae: *Taxillus liquidambaricolus* (Chang & Tsai, 1984; Hamano, 1987), *T. tsaii* (Ho & Chang, 1998), *T. limprichtii* (Hsu, 2013); *T. lonicerifolius* (Chang & Tsai, 1984), *T. pseudochinensis* (Hsu, 2013). Also *Santalum album* (Santalaceae) (Lee & Wang, 1997).

Biology. This species is known to be multivoltine in occurrence (Hsu, 1999).

Remarks. The population of this species in southern China have been assigned to ssp. *porsenna* (Cramer, [1775])(e. g. Yata 1985; Chou 1992; Yashita & Nishiyama 1993; Wu 2010a), which is a replacement name for a preoccupied *Papilio aglaja* Linnaeus, 1758, but another name *Papilio pasithoe* Linnaeus, 1767 was already proposed to replace the same name, thus *Papilio porsenna* Cramer, [1775] ought to be regarded as a synonym of *Papilio pasithoe* Linnaeus, 1767. Honey & Scoble (2001) stated that the lectotype of *pasithoe* Linnaeus, 1767 was a specimen from Canton [= Guangdong], thus the population of this species in southern China should be referred to the nominotypical subspecies. Accordingly the specimens found from Jinmen Islands should also be regarded as ssp. *pasithoe* (Hsu *et al.*, 2017).

形態特徵：成蝶前翅長 38–42mm。雄蝶 (圖 1、3)：頭部被毛，呈褐色而於前額與頭頂混生白毛。毛隆為直立黑毛叢。觸角末端錘狀，暗褐色而端部有白鱗。口吻暗褐色。下唇鬚暗褐色，雜有稀疏白毛。胸部呈帶灰色之暗褐色，腹側有白毛。腹部底色於背側呈暗褐色，腹側呈白色。足呈暗褐色混雜白色，腿節腹面具長毛。前翅略修長，前緣與後緣近直線狀，外緣近直線狀，於翅頂附近略突出。翅頂圓鈍。後翅外緣圓弧狀。前、後翅中央有白斑組成之斑列，翅基附近有藍白斑。後翅沿內緣有一片黃紋。前、後翅中室端具一只小白斑。翅腹面底色暗褐色。前翅斑紋類似翅背面，斑點呈白色。後翅密布黃色紋，並於翅基附近有紅斑。雌蝶 (圖 2、4)：軀體及翅紋與雄蝶相近，但翅底色呈褐色、翅背面缺藍白紋及黃斑，且前翅外緣較圓。

於金門發現者屬於承名亞種 (圖 3–4)，棲息在臺灣本島者則屬於 ssp. *curasena* (圖 1–2)。前者翅背面斑紋色調明顯較後者為淺。

雄交尾器 (圖 115–116)：背兜近尾端具一對小側突，鉤突為下彎之錐狀小突起。基腹弧纖細，於背側彎曲。囊突短而膨大。抱器葉狀，後緣突出，背緣隆起，陽莖短，略彎曲，陽莖基腹面具龍骨狀構造。

雌交尾器 (圖 155–156)：交尾囊卵狀。交尾囊管膜質，後端膨大、漏斗狀。交尾孔板具一對內凹囊袋。花壁為內陷啞鈴形骨化構造，兩端有棘刺。肛突密生錐狀突，上具刺毛。後內骨突及前內骨突粗短。

世界分布：喜馬拉雅地區東部、印度東北部、馬來半島、中南半島、婆羅洲、蘇門答臘、爪哇、菲律賓、華南、華東及臺灣。

臺灣分布：承名亞種見於金門。亞種 *ssp. curasena* 見於臺灣本島。

幼蟲寄主植物：桑寄生科：大葉桑寄生、蓮華池桑寄生、木蘭桑寄生、忍冬葉桑寄生及恆春桑寄生等。也利用引進之藥用植物檀香科的檀香。

生物學：一年多代物種。

註記：本種之華南族群常以 *ssp. porsenna* (Cramer, [1775]) 的學名稱呼，但該名實係 Cramer([1775]) 提出用以取代已被先佔的林奈學名 *Papilio aglaja* Linnaeus, 1758，然而林奈本人其實早已提出 *Papilio pasithoe* Linnaeus, 1767 之替代名，因此 *Papilio porsenna* Cramer, [1775] 應視為無效名。Honey & Scoble (2001) 指出承名亞種 *pasithoe* Linnaeus, 1767 模式標本來自廣東，從而本種之華南族群應屬於承名亞種，故金門的本種也應屬於承名亞種 (Hsu *et al.*, 2017)。

***Delias acalis* (Godart, 1819) (丹心豔粉蝶 / 紅腋斑粉蝶)**

PLATE 2, Figs. 5-6; PLATE 20, Fig. 117; PLATE 30, Fig. 157

Pieris acalis Godart, 1819: Encyclopédie Méthodique 9 (1): 113, 148, no. 106. (Type locality: “Chine” [Canton, China].)

Papilio thysbe Cramer, [1779]: De uitlandsche kapellen 3 (17-21): pl. 233, fig. C. (preoccupied by *Papilio* (Plebejus) *thysbe* Linnaeus, 1764)

Delias acalis inomatai Nakano 1993: An illustrated list of the genus *Delias* Hübner of the world: 14, pl. 119, figs. 5-6. (Type locality: Hong Kong)

Specimens examined:

JINMEN [=KINMEN] Co.: 1♂, Jinhu, Botanical Garden, 18/20. XI. 2013 (Y. F. Hsu & H. C. Huang); 1♀, same locality, 5. XI. 2015 (C. W. Huang); 1♀, same locality, 5. XI. 2015 (L. Huang); 1♀, Jincheng, Gugang, 6. XI. 2015 (L. Huang) (genitalia preparation JYL244); 1♀, Jinhu, Shenshiqiao, 4. XI. 2015 (H. C. Huang); 1♀, Jinsha, Ronghu, 6. XI. 2015 (H. C. Huang).

Description. Adult – Forewing length 37–43 mm. Male (PLATE 2, Fig. 5): Head hairy, dark brown mixed with white hairs on frons and vertex; chaetosemata as black, erect hair tufts. Antennae clavate distad, dark brown with white scaling distad. Proboscis dark brown. Labial palpus dark brown, sparsely mixed with white hairs. Thorax covered by dark brown tinged with gray hairs dorsally, with white hairs ventrally. Abdomen ground color dark brown dorsally, white ventrally. Valvae with outer surface dark brown dorsally, white ventrally. Legs dark brown mixed with white scalings, with femur bearing prominent hairs ventrad. Forewing somewhat elongate, with costa, dorsum nearly straight; termen somewhat convex near apex; apex obtuse. Hindwing termen rounded. Wing uppersides ground color dark brown. Discal spots consisted of a series of prominent, grayish white stripes. A patch of grayish white scalings on forewing proximally. A prominent red patch present on hindwing proximally. A grayish white bar present at distal end of discoidal cells. Wing underside markings similar to those of forewing, but more prominent. Females (PLATE 2, Fig. 6): Body, wing patterns similar to male, but the marking at distal end of discoidal cells of hindwing larger, triangular in shape.

Male genitalia (PLATE 20, Fig. 117) – Tegumen bearing short, lateral process subcaudad, with uncus as straight, conical process with blunt distal end. Vinculum slender, bent dorsally. Saccus short, enlarged. Valva lobe-like, slightly produced caudad. Phallus short, slightly bent, with phallobase possessing keel-like structure ventrally.

Female genitalia (PLATE 30, Fig. 157) – Corpus bursae oval. Signum as a transverse, invaginated, dumbbell-like sclerite, with both ends armed with a few spines. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a dome-shaped pouches. Anal papillae densely setose, with setae on prominent, conical processes. Posterior apophyses short, bent cephalad; anterior apophyses vestigial.

Global distribution. Eastern Himalayas, Northeast and South India, Malay Peninsula, Indochina, West, South to East China (Yata, 1985; Yagishita, 1993).

Distribution in Taiwan. Only found on Jinmen Islands.

Larval Host plant(s). Not recorded in Jinmen.

Biology. On Jinmen Islands, this species shows up in autumn months.

形態特徵：成蝶前翅長 37–43mm。雄蝶 (圖 5)：頭部被毛，呈褐色而於前額與頭頂混生白毛。毛隆為直立黑毛叢。觸角末端錘狀，黑褐色而端部有白鱗。口吻黑褐色。下唇鬚黑褐色，雜有稀疏白毛。胸部呈帶灰色之黑褐色，腹側白色。腹部底色於背側呈黑褐色，腹側呈白色。抱器外表面背側黑褐色，腹側白色。足暗褐色混雜白色，腿節腹面具長毛。前翅略修長，前緣與後緣近直線狀，外緣近翅端處略突出，翅頂圓鈍。後翅外緣圓弧狀。前背面底色黑褐色、中央有一列明顯白條，翅基附近有藍白斑，雌蝶則此等斑紋明顯減退或缺乏。雄蝶後翅沿內緣有一片黃紋。前、後翅基部有一片灰白鱗。後翅腹面基部有鮮明紅紋。中室端有灰白色短紋。翅腹面斑紋與背面類似，但較鮮明。雌蝶 (圖 6)：軀體與翅紋與雄蝶相似，但後翅中室端灰白色紋較大而呈三角形。

雄交尾器 (圖 117)：背兜近尾端具一對小側突，鉤突為一末端鈍之錐狀突。基腹弧纖細，於背側彎曲。囊突短而膨大。抱器葉狀，後緣略突出。陽莖短，略彎曲，陽莖基腹面具龍骨狀構造。

雌交尾器 (圖 157)：交尾囊卵狀。花壁為內陷啞鈴形骨化構造，兩端有棘刺。交尾囊管膜質，後端膨大、漏斗狀。交尾孔板為圓頂狀囊袋。肛突密生錐狀突，上具刺毛。後內骨突短小，前端彎曲。前內骨突退化。

世界分布：喜馬拉雅地區東部、印度東北部及南部、馬來半島、中南半島、華西、華南、華東。

臺灣分布：目前僅見於金門。

幼蟲寄主植物：金門地區未記錄。

生物學：在金門出現於秋季。

***Delias hyparete* (Linnaeus, 1758)(白豔粉蝶 / 紅紋粉蝶 / 優越斑粉蝶)**

Papilio (Danaus) hyparete Linnaeus, 1758: Systema Naturae (Edn 10) 1: 469, no. 68. (Type locality: “Indiis” [probably Java]. Type not located)

Papilio antonoe Cramer, [1777]: De Uitlandsche Kapellen 2 (9-16): pl. 187, f. C, D. (Type locality: “Chine...Java”)

Ssp. *luzonensis* C. & R. Felder, 1862

PLATE 2, Figs. 7-8; PLATE 20, Fig. 118; PLATE 30, Fig. 158

Pieris luzonensis C. & R. Felder, 1862: Wiener entomologische monatschrift 6 (9): 285. (Type locality: Luzon)

Delias hyparete peirene Fruhstorfer, 1908: Entomologische Wochenblatt 25: 38. (Type locality: “Kagi” [= Jiayi])

Specimens examined:

TAIZHONG [= TAICHUNG] CITY: 1♂, 1♀, Heping, Defulan Trail, 4. I. 2017 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 2♂, Dawu, 3. III. 1999 (C. C. Lu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 7♂, Liugui, 300m, 6. I. 2008 (Y. F. Hsu); 2♂, 1♀, same locality, 22. I. 2008 (Y. F. Hsu) (genitalia preparation JYL233, JYL234).

Description. Adult – Forewing length 33–36 mm. Male (PLATE 2, Fig. 7): Head hairy, dark brown mixed with white hairs on frons and vertex; chaetosemata as black and white, erect hair tufts. Antennae dark brown with white scalings. Proboscis dark brown. Labial palpus dark brown, sparsely mixed with white hairs. Thorax dark brown covered by grayish white hairs dorsally, with white hairs ventrally. Abdomen ground color dark brown, covered with white scalings and hairs. Valvae with outer surface white. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Hingwing termen rounded. Wing uppersides mostly white; forewing dark brown at apex, containing faint, white stripes; hindwing with dark band along termen. Wing underside ground color white. Forewing with wing pattern similar to that of upperside, but with streaks at apex prominent, dark brown scaling along veins. Hindwing with extensive yellow markings proximally. A prominent, dark brown band containing a series of red spots present along termen. Female (PLATE 2, Fig. 8): Wing

patterns similar to those of male, but extensive dark brown scalings present along veins.

Male genitalia (PLATE 20, Fig. 118) – Tegumen bearing short, lateral process subcaudad, with uncus as a slightly down-curved, conical process. Vinculum slender, bent dorsally. Saccus short, slightly enlarged. Valva lobe-like, produced caudad with distal end round, with dorsal margin uneven. Phallus short, slightly bent, with phallobase possessing keel-like structure ventrally. Juxta elongate, with a deep dorsal cleft.

Female genitalia (PLATE 30, Fig. 158) – Corpus bursae oval. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a pair of prominent, invaginated pouches. Signum cordiform, invaginated, armed with short spines. Anal papillae densely setose. Posterior apophyses short, attenuate cephalad. Anterior apophyses vestigial.

Global distribution. Eastern Himalayas, Northeast India, Malay Peninsula, Indochina, Borneo, Sumatra, Java, Philippines, South to East China, and Taiwan (Yata, 1985; Yagishita *et al.*, 1993).

Distribution in Taiwan. This species mainly occurs in lowlands of central and southern Taiwan.

Larval Host plant(s). Loranthaceae: *Taxillus liquidambaricolus* (Hamano, 1987; Lee & Wang, 1995), *T. lonicerifolius* (Hsu, 2013), *T. pseudochinensis*, etc. (Hsu, 2013).

Biology. This species is known to be multivoltine in occurrence (Hsu, 2013).

Remarks. The population of Taiwan is sometimes considered as an endemic subspecies *peirene* Fruhstorfer, 1908 (e. g. Yata, 1985), but most researchers regard this name as a subjective synonym of *luzonensis* C. & R. Felder, 1862 (e. g. Shirôzu, 1960; Yagishita *et al.*, 1993).

形態特徵：成蝶前翅長 33–36mm。雄蝶 (圖 7)：頭部被毛，呈褐色而於前額與頭頂

混生白毛。毛隆被直立黑色及白色毛叢。觸角暗褐色而有白鱗。口吻黑褐色。下唇鬚黑褐色，雜有稀疏白毛。胸部黑褐色，背側覆有灰白色毛，腹側有白毛。腹部底色黑褐色，覆有白色鱗片及毛。足呈黑褐色混雜白色鱗片，腿節腹面明顯具毛。前翅先端圓鈍，後翅外緣圓。翅背面大部分呈白色，前翅翅端暗褐，具模糊白色條紋；後翅沿外緣具深色帶。翅腹面底色白色，前翅翅紋與背面相似但翅端白色條紋明顯，沿翅脈有褐色鱗片分布。後翅有明顯黃色斑紋，沿外緣有暗褐色帶，內含一系列紅斑。雌蝶 (圖 8)：翅紋與雄蝶相似，但沿翅脈黑褐色鱗片更為顯著。

雄交尾器 (圖 118)：背兜近尾端具一對小側突，鉤突為下彎之錐狀小突起。基腹弧纖細，於背側彎曲。囊突短、略膨大。抱器葉狀，後緣突出，末端圓弧狀，背緣不規則。陽莖短，略彎曲，陽莖基腹面有龍骨狀構造。陽基軛片修長，背側深裂。

雌交尾器 (圖 158)：交尾囊卵形。交尾囊管膜質，後端膨大、漏斗狀。交尾孔板具一對內凹囊袋。花壁心形，密生棘刺。肛突密生刺毛。後內骨突短，向後漸細。前內骨突退化。

世界分布：喜馬拉雅地區東部、印度東北部及東南部、馬來半島、中南半島、婆羅洲、蘇門答臘、爪哇、菲律賓、華南、華東及臺灣。

臺灣分布：本種主要出現在臺灣中南部低地。

幼蟲寄主植物：桑寄生科：大葉桑寄生、忍冬葉桑寄生、恒春桑寄生等。

生物學：一年多代物種。

註記：本種臺灣族群有時被認為是特有亞種 *peirene* Fruhstorfer, 1908，但現下一般認為 *peirene* 是 *luzonensis* C. & R. Felder, 1862 的主觀同物異名。

***Delias lativitta* Leech, 1893 (條斑豔粉蝶 / 胡麻斑粉蝶 / 側條斑粉蝶)**

Delias patrua var. *lativitta* Leech, 1893: Butterflies from China, Japan and Korea, Vol. 2: 422, pl. 35, f. 1. (Type locality: “Ta-chien-lu” [= Kangding] and “Moupin” [=Baoping])

Ssp. *formosana* Matsumura, 1909

PLATE 3, Figs. 9-10; PLATE 21, Fig. 119

Delias patrua var. *formosana* Matsumura, 1909: Entomologische Zeitschrift 23(19): 92. (Type lo-

cality: “Horisha” [= Puli])

Specimens examined:

TAOYUAN CITY [= TAOYUAN Co.]: 1♂, Fuxing, Baleng, 500m, 22. IV. 2003, reared from *Viscum liquidambaricolum*, emgd. 2. V. 2003, HSU 03D32 (L. W. Wu & H. S. Que); 1♀, same locality, 8. III. 2013, reared from *V. liquidambaricolum*, emgd. 29. III. 2013, HSU 13C7 (Y. F. Hsu, H. C. Huang & L. H. Wang). **XINZHU [= HSINCHU] Co.:** 1♂, Wufeng, Dalu Forest Trail, 15 km, 1500-1600m, collecting date missing; 1♂, Jianshi, Lidongshan, 1900m, 30. V. 2004 (Y. F. Hsu, H. C. Huang & K. L. Chen). **PINGDONG [= PINGTUNG] Co.:** 1♂, Wutai, Wutoushan, 1200m, 10/11. IV. 1998 (W. I. Chou) (genitalia preparation JYL217).

Description. Adult – Forewing length 39–43 mm. Male (PLATE 3, Fig. 9): Male: Head hairy, dark brown mixed with white hairs on frons and vertex; chaetosemata as black and white, erect hair tufts. Antennae dark brown with white scalings. Proboscis dark brown. Labial palpus dark brown, sparsely mixed with white hairs. Thorax dark brown covered by white hairs dorsally, with white hairs ventrally. Abdomen ground color dark brown, scattered with white scalings dorsally, white ventrally. Valvae with outer surface dark brown dorsally, white ventrally. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Hingwing termen slightly wavy. Wing uppersides ground color dark brown, an elongate, white, proximal band with a white, distal spot in each cell. An elongate white band in discoidal cells, more prominent in hindwing. A yellow band present along costa of hindwing proximally. A yellow or yellowish white patch present along dorsum from wing base to tornus of hindwing. Wing underside with arrangement of markings similar to those of uppersides, but ground color paler with markings slightly larger. Bands and spots of forewing apex and entire hindwing are mostly yellow instead of white. Female (PLATE 3, Fig. 10): Wing patterns nearly identical to those of male, except yellow patch on hindwing upperside slightly more extensive.

Male genitalia (PLATE 21, Fig. 119) – Tegumen bearing digitate, lateral process subcaudad, with uncus as a down-curved, conical process. Vinculum slender, bent dorsally. Saccus moderately long, slightly enlarged. Valva lobe-like, produced caudad with a spatulate process, with dorsal margin slightly enlarged. Phallus short, bent

downwards, with phallobase possessing keel-like structure ventrally. Juxta broad, with a deep V-shaped, dorsal cleft.

Female genitalia – Corpus bursae oval. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a pair of prominent, invaginated pouches. Signum cordiform, invaginated, armed with short spines. Anal papillae densely setose. Posterior apophyses short, attenuate cephalad. Anterior apophyses vestigial.

Global distribution. Bhutan, North Myanmar, Northeast India, Southwest to West China, and Taiwan (Yagishita *et al.*, 1993; Della Bruna *et al.*, 2004).

Distribution in Taiwan. This species occurs in montane zone in Taiwan.

Larval Host plant(s). Santalaceae: *Viscum liquidambaricolum*, *V. alniformosanae* (Lee & Wang, 1995), etc..

Biology. This species is known to be univoltine in occurrence (Hsu, 2013), with adults mostly found in summer months.

形態特徵：成蝶前翅長 39–43mm。雄蝶 (圖 9)：頭部被毛，呈褐色而於前額與頭頂混生白毛。毛隆被直立黑色及白色毛叢。觸角黑褐色具有白鱗。口吻黑褐色。下唇鬚黑褐色，雜有稀疏白毛。胸部黑褐色，背側及腹側有白毛。腹部底色呈黑褐色，背腹側散佈白色鱗片。抱器外表面背側呈暗褐色，腹側白色。足呈黑褐色混雜白色鱗片，腿節腹面明顯具毛。前翅翅端圓鈍，後翅外緣略波狀。翅背面底色暗褐色，各翅室近基部有一模糊的白色修長條帶，近末端則有一白斑，中室有一白色長條紋，於後翅較為明顯。後翅前緣脈近基部有一黃色條紋。後翅沿臀角及內緣有一黃色或黃白色區塊。翅腹面斑紋排列與背面相似，但底色較淡且斑紋略大。前翅翅端及整個後翅的條紋主要為黃色而非白色。雌蝶 (圖 10)：翅紋與雄蝶近似，但後翅背面黃色區較廣。

雄交尾器 (圖 119)：背兜近尾端具一對指狀側突，鉤突為下彎之錐狀突起。基腹弧纖細，於背側彎曲。囊突較長、膨大。抱器葉狀，後緣突出，具鏟狀突起，背緣略

隆起。陽莖短，向下彎曲，陽莖基腹面具龍骨狀構造。陽基軛片寬，背側 V 形深裂。

雌交尾器：交尾囊卵狀。交尾囊管膜質，末端膨大，漏斗狀。交尾孔板形成一對明顯凹陷袋。花壁心形、凹陷，佈有短刺。肛突密生毛。後內骨突短，前端縮減。前內骨突退化。

世界分布：不丹、印度東北、緬甸北部、華西南、華西及臺灣。

臺灣分布：本種分布於臺灣山區。

幼蟲寄主植物：檀香科：稠欒柿寄生、臺灣欒寄生等。

生物學：本種是一年一代物種，成蝶主要出現在夏季。

***Delias berinda* (Moore, 1872) (黃裙豔粉蝶 / 韋氏胡麻斑粉蝶 / 倍林斑粉蝶)**

Thyca berinda Moore, 1872: Proceedings of the Zoological Society of London (2): 566. (Type locality: “Khasia Hills”)

***Ssp. wilemani* Jordan, 1925**

PLATE 3, Figs. 11-12; PLATE 21, Fig. 120; PLATE 31, Fig. 159

Delias wilemani Jordan, 1925: Novitates Zoologicae 32: 281. (Type locality: “Arizan” [= Alishan])

Delias taiwana Wileman (partim), 1909: Annotationes Zoologicae Japonenses 7: 95. (Type locality: “Arisan” [= Alishan])

Specimens examined:

XINZHU [= HSINCHU] Co.: 1♂, Jianshi, Lidongshan, 1900m, 30. V. 2004 (Y. F. Hsu, H. C. Huang & K. L. Chen). **HUALIAN [= HUALIEN] Co.:** 1♀, Xiulin, Guanyuan, 25. V. 2002, emgd. 3. VI. 2002 (H. S. Que); 1♂, Xiulin, Hualuxi, 6. VI. 2005 (Y. F. Hsu); 1♀, Xiulin, Bilu, 6. VII. 2015 (L. Huang) (genitalia preparation JYL177). **NANTOU Co.:** 1♂, Lugu, Xitou, Fenghuangshan Trail, 1600-1700m, 28. V. 2012 (C. Y. Yen). **PINGDONG [= PINGTUNG] Co.:** 1♂, Wutai, Wutoushan, 1600m, 17. V. 1998 (C. C. Lu) (genitalia preparation JYL218).

Description. Adult – Forewing length 40–45 mm. Male (PLATE 3, Fig. 11): Male: Head hairy, dark brown mixed with white hairs on frons and vertex; chaetosemata as black

and white, erect hair tufts. Antennae dark brown with white scalings, notably at distal end. Proboscis dark brown. Labial palpus dark brown, sparsely mixed with white hairs. Thorax dark brown covered by grayish white hairs dorsally, with white hairs ventrally. Abdomen ground color dark brown, scattered with white scalings dorsally, white with medial dark band ventrally. Valvae with outer surface dark brown dorsally, white ventrally. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Hingwing termen slightly wavy. Wing uppersides ground color dark brown, an elongate, white, faint, proximal band or spot with a white, distal spot in each cell. An elongate white band in discoidal cells, more prominent in hindwing. A yellow, oval spot present along costa of hindwing proximally. A yellow or orange patch present around hindwing tornus. Wing underside with arrangement of markings similar to those of uppersides, but ground color paler with markings more prominent. Bands and spots of forewing apex and entire hindwing are mostly yellow instead of white. Female (PLATE 3, Fig. 12): Wing patterns nearly identical to those of male, but ground color paler, with markings on wing uppersides more prominent.

Male genitalia (PLATE 21, Fig. 120) – Tegumen bearing digitate, lateral process subcaudad, with uncus as a down-curved, conical process. Vinculum slender, bent dorsally. Saccus moderately long, enlarged cephalad. Valva lobe-like, produced caudad and dorsad. Phallus nearly straight, with phallobase possessing keel-like structure ventrally. Juxta saddle-like, with a deep V-shaped, dorsal cleft.

Female genitalia (PLATE 31, Fig. 159) – Corpus bursae oval. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a pair of prominent, invaginated pouches. Signum broad, invaginated, bu-oval, armed with short spines laterally. Anal papillae densely setose, with setae on prominent, conical processes. Posterior apophyses short, enlarged basad, attenuate cephalad. Anterior apophyses vestigial.

Global distribution. Nepal, Myanmar, Northeast India, Northern Thailand, Laos, Southwest to West China, and Taiwan (Yagishita *et al.*, 1993; Della Bruna *et al.*, 2004).

Distribution in Taiwan. This species occurs in the montane zone in Taiwan.

Larval Host plant(s). Loranthaceae: *Taxillus theifer* (Hsu, 2013), *T. lonicerifolius* (Lee & Wang, 1995), and *T. rhododendroricolius* (Hsu, 2013), etc..

Biology. This species is known to be univoltine in occurrence (Hsu, 2013), with adults mostly found in summer months.

Remarks. The population of Taiwan had been considered as an endemic species (e. g. Shirôzu, 1960), but recent works regard it as a subspecies of *berinda* Moore, 1872 (e. g. Yagishita *et al.*, 1993; Della Bruna *et al.*, 2004).

形態特徵：成蝶前翅長 40–45mm。雄蝶 (圖 11)：頭部被毛，呈黑褐色而於前額與頭頂混生白毛。毛隆被直立黑色及白色毛叢。觸角黑褐色而端部明顯有白鱗。口吻黑褐色。下唇鬚暗褐色，雜有稀疏白毛。胸部黑褐色，背側覆有灰白色毛，腹側有白毛。腹部底色黑褐色，背側散佈白色鱗片，腹側白色且中央有暗色帶。抱器外部背面黑褐色，腹面白色。足暗褐色混雜白色鱗片，腿節腹面明顯具毛。前翅翅端圓鈍，後翅外緣略呈波狀。翅背面底色黑褐色，各翅室有一白色模糊修長條帶或斑紋，其外則有一白色斑。中室具一修長白色條紋，於後翅較為明顯。後翅前緣近基部有一黃色卵狀斑。後翅沿臀角有一片黃色或橙色紋，翅腹面斑紋排列與背面相似，但底色較淺、斑紋較明顯。前翅翅端及整個後翅的條帶與斑主要呈黃色而非白色。雌蝶 (圖 12)：翅紋與雄蝶相近，但底色較淺，且翅背面斑紋較明顯。

雄交尾器 (圖 120)：背兜近尾端具一對指狀側突，鉤突為下彎之錐狀突起。基腹弧纖細，於背側彎曲。囊突較長、前端膨大。抱器葉狀，後緣及背緣突出。陽莖直，陽莖基腹面具龍骨狀構造。陽基軛片鞍狀，背側 V 形深裂。

雌交尾器 (圖 159)：交尾囊卵狀。交尾囊管膜質，後端膨大、漏斗狀。交尾孔板具一對內凹囊袋。花壁寬闊，呈兩融合之橢圓形骨化構造，兩側有棘刺。肛突密生錐狀突，上具刺毛。後內骨突短，基部粗而端部細。前內骨突退化。

世界分布：尼泊爾、緬甸、印度東北部、泰國北部、寮國、華西南、華西及臺灣。

臺灣分布：本種分布於臺灣山區。

幼蟲寄主植物：桑寄生科埔姜桑寄生、忍冬葉桑寄生、杜鵑桑寄生等。

生物學：一年一代物種，成蝶主要出現在夏季。

註記：臺灣族群過去多時被認為是臺灣特有種，但近年多視為 *berinda* Moore, 1872 之亞種。

Genus *APORIA* Hübner, [1819]

Type species: *Papilio crataegi* Linnaeus, 1758

Della Bruna *et al.*(2004) listed a few diagnostic characters for the genus: 1) labial palpi slender, subporrect, hairy in front; third segment as long nearly as long, or as or longer than the second; 2) antennae about 1/2 length of forewing, club abrupt; 3) discoidal cell more than 1/2 length of forewing; 4) 4 R veins present.

Larvae are known as specialists on the family Rosaceae, Berberidaceae, and Elaeagnaceae.

In Taiwan, 3 species are known.

絹粉蝶屬

Della Bruna *et al.*(2004) 列出一些本屬的鑑別特徵：1) 下唇鬚纖細、前伸，前端具毛；第3節幾乎與第2節等長或較長；2) 觸角約為前翅長度二分之一，末端突呈棍棒狀；3) 中室長於前翅長度二分之一；4) 具四條R脈。

幼蟲已知專食薔薇科、小蘗科及胡頹子科植物。

臺灣地區已知有3種。

***Aporia agathon* (Gray, 1831) (流星絹粉蝶 / 高山粉蝶 / 完善絹粉蝶)**

Pieris agathon Gray, 1831: The Zoological Miscellany (1): 33. (Type locality: Nepaul [Nepal])

Ssp. *moltrechti* Oberthür, 1909

PLATE 4, Figs. 13-14; PLATE 21, Fig. 121; PLATE 31, Fig. 160

Pieris moltrechti Oberthür, 1909: Bulletin de la Société entomologique de France 1909: 48. (Type locality: “Central Formosa; Arizan, vis-à-vis le Mont-Morrison; District Kaji, 8,000 pieds”)

Delias taiwana Wileman, 1909: Annotationes Zoologicae Japonenses 7 (2): 95. (Type locality: Formosa, Arisan, 7,300 feet)

Betaporia moltrechti f. *nigriscens* Matsumura, 1929: Insecta Matsumurana 3 (2/3): 90, pl. 4, fig. 4. (Type locality: Formosa)

Specimens examined:

XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]: 2♀, Wulai, Kuaishan, emgd. 30. IV. 1987; 2♂, Sanxia, Beichatianshan, 1700/1727m, 20. V. 1996 (Y. F. Hsu). **TAOYUAN CITY [= TAOYUAN Co.]:** 2♂, Fuxing, Lalashan, 9. VI. 2000, 1500/1700m (Y. T. Lo); 1♂, same locality, 8. VI. 2010 (L. H. Wang). **XINZHU [= HSINCHU] Co.:** 1♂, Wufeng, Dalu Forest Trail, 2000m, 24. VI. 2009 (H. C. Huang). **HUALIAN [= HUALIEN] Co.:** 1♂, Xiulin, Guanyuan, 2300m, 20. III. 2006 (C. M. Wu); 1♀, same locality, 6. VII. 2015 (L. Huang) (genitalia preparation JYL159). **NANTOU Co.:** 1♂, Renai, Meifeng/Yuanfeng, 2000m, 24. VI. 2016 (J. Y. Liang) (genitalia preparation JYL212).

Description. Adult – Forewing length 32–38 mm. Male (PLATE 4, Fig. 13): Head hairy, dark brown. Eyes dark brown. Antennae dark brown. Proboscis dark brown. Labial palpus dark brown, hairy. Thorax dark brown covered by grayish white hairs dorsally, dark brown ventrally. Abdomen ground with dorsum dark brown, dusted with white scalings; venter white with a longitudinal, narrow, dark brown, medial line. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Costa slightly curved; termen convex; dorsum straight. Hingwing termen rounded. Wing uppersides ground color brown with white markings on forewing, yellow markings on hindwing, consisted of a proximal and a distal spot in cells, with distal spots more prominent. A faint, white band in discoidal cells of forewing; a prominent, yellow marking in discoidal cell of hindwing. Wing underside patterns similar to those of upperside, but markings more prominent. A small, orange spot at base of costa. Female (PLATE 4, Fig. 14): Wing patterns similar to those of male, except ground color somewhat transparent.

Male genitalia (PLATE 21, Fig. 121) –Tegumen bearing short, lateral process subcaudad, with medial, flattened piece bearing small, down-curved hook caudad Vinculum slender, bent dorsally. Saccus short, slightly enlarged. Valva lobe-like, produced caudad with distal end round, dorsal margin curved. Phallus short, strongly bent downwards, with phallobase possessing keel-like structure ventrally. Juxta as a transverse piece, with a U-shaped dorsal cleft.

Female genitalia (PLATE 31, Fig. 160) – Corpus bursae oval. Ductus bursae membranous with caudal end enlarged. Sterigma forming a pair of prominent, invaginated pouches. Signum dumbbell shape, invaginated, armed with short spines. Anal papillae densely setose. Posterior apophyses short, enlarged cephalad. Anterior apophyses vestigial.

Global distribution. Himalayas, Northeast India, North Myanmar, North Vietnam, West and Southwest China, Taiwan (Della Bruna *et al.*, 2004).

Distribution in Taiwan. Montane areas of moderate elevations in Taiwan.

Larval Host plant(s). Berberidaceae: *Berberis kawakamii*, *B. brevissepta*, *Mahonia oiwakensis*, etc. (Hsu, 2013).

Biology. This species is known to be univoltine in occurrence, on the wing from June to September (Hsu, 2013).

形態特徵：成蝶前翅長 32–38mm。雄蝶 (圖 13)：頭具毛，黑褐色。複眼黑褐色。觸角黑褐色。口器黑褐色。下唇鬚黑褐色，具毛。胸部黑褐色，背面佈有灰白色毛，腹面黑褐色。腹部背面黑褐色，佈有白色鱗片，腹面白色，具有窄細的縱向黑褐色中線。足呈黑褐色，混有白色鱗片，腿節靠腹側明顯有毛。前翅先端圓鈍，前緣略彎曲，外緣凸，後緣筆直。後翅外緣圓。前翅背面底色褐色具白色斑紋，後翅具黃色斑紋，翅室內近基部及靠末端有斑點，靠末端者較明顯。前翅中室有一暗淡白色帶，後翅中室有一明顯黃色斑紋。翅腹面斑紋與背面相似，但斑紋較明顯。前緣脈基部有一小型橘色斑。雌蝶 (圖 14)：翅紋與雄蝶相似，惟底色有時較透明。

雄交尾器 (圖 121)：背兜具有略向後延伸的短側突，中央具扁平骨片，末端具下彎呈小鉤狀。基腹弧纖細，背部彎曲。囊突短，略膨大。抱器葉狀，向後延伸突起，末端圓鈍，背緣彎曲。陽莖短，強下彎，陽莖基腹面具龍骨狀構造。陽基軛片為橫向骨片，背面具 U 形凹陷。

雌交尾器 (圖 160)：交尾囊卵狀，交尾囊管膜質，末端膨大。交尾孔板形成一對明顯內凹袋。花壁為啞鈴狀、內凹，具有短刺。肛突密生毛。後內骨突短，前端膨大。前內骨突退化。

世界分布：喜馬拉雅、印度東北、緬甸北部、越南北部、華西、華西南及臺灣。

臺灣分布：臺灣中海拔山區。

幼蟲寄主植物：小蘗科臺灣小蘗、高山小蘗、十大功勞等。

生物學：本種已知為一年一世代，成蝶活動於 6 至 9 月。

***Aporia genestieri* (Oberthür, 1903) (白絹粉蝶 / 深山粉蝶 / 普通絹粉蝶)**

Pieris genestieri Oberthür, 1903: Histoire de la mission du Thibet 2: 411, f. 2. (Type locality: “la région du haut Lou-tse-kiang” [NW Yunnan])

***Ssp. insularis* Shirôzu, 1959**

PLATE 4, Figs. 15-16; PLATE 21, Fig. 122; PLATE 31, Fig. 161

Aporia hippia var. *taiwana* Matsumura, 1919: Thousand Insects of Japan. Additamenta. 3: 497. (preocc. By *Aporia taiwana* Wileman, 1909) (Type locality: “Formosa, Hoppo”)

Aporia hippia insularis Shirôzu, 1959: Kontyû 27 (1): 92. (replacement for *Aporia hippia* var. *taiwana* Matsumura, 1919)

Specimens examined:

HUALIAN [= HUALIEN] Co.: 2♂, 3♀, Xiulin, Hualuxi, 1400m, 6. VI. 2005 (Y. F. Hsu) (genitalia preparation JYL252); 1♂, Xiulin, Huoran Pavilion, 18. V. 1997 (C. Y. Hung); 2♂, Xiulin, Xinbaiyang, 24. V. 2007 (L. H. Wang) (genitalia preparation JYL251); 1♂, Central Cross- Island Highway, 138K, 28. IV. 1999, emgd. 7. V. 1999 (C. Y. Hung). **TAIDONG [= TAITUNG] Co.:** 1♀, Haiduan, Liyuan, 25/26. VI. 2016 (C. W. Huang).

Description. Adult – Forewing length 32–38 mm. Male (PLATE 4, Fig. 15): Head hairy, dark brown. Antennae dark brown. Proboscis dark brown. Labial palpus dark brown, hairy. Thorax dark brown covered by grayish white hairs dorsally, dark brown ventrally. Abdomen ground color dark brown, dusted with white scalings. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Costa slightly curved; termen convex; dorsum straight. Hingwing termen rounded. Wing uppersides ground color white with veins blackened; brown markings present at forewing apex and along termen. Wing underside patterns similar to those of upperside, but brown markings of forewing missing. Dark brown scalings present to some extent on hindwing. A small, orange spot at base of costa. Female (PLATE 4, Fig. 16): Wing patterns similar to those of male, except ground color semi-transparent instead of white.

Male genitalia (PLATE 21, Fig. 122) –Tegumen forming prominent, flattened, machete-like piece, with caudal end down-curved. Vinculum slender. Saccus short, robust. Valva lobe-like, produced caudad with distal end round, with dorsal margin curved. Phallus short, bent down-curved, with phallobase possessing keel-like structure ventrally. Juxta as a pair of separated, elongate piece.

Female genitalia (PLATE 31, Fig. 161) – Corpus bursae oval. Ductus bursae membranous with caudal part sclerotized. Signum dumbbell shape, invaginated, armed with short spines. Anal papillae densely setose. Posterior apophyses short, enlarged cephalad. Anterior apophyses vestigial.

Global distribution. West and Southwest China, Taiwan (Della Bruna *et al.*, 2004).

Distribution in Taiwan. Moderate elevations of central Taiwan.

Larval Host plant(s). Elaeagnaceae: *Elaeagnus thunbergii* (Hsu, 2013).

Biology. This species is known to be univoltine in occurrence, on the wing from May to August (Hsu, 2013).

Remarks. The population of Taiwan was misidentified as a subspecies of *Aporia hippia* (Bremer, 1861) (e. g. Shirôzu, 1960) or *A. potanini* Alphéraky, 1892 (e. g. Uchida, 1985, 1988), Della Bruna *et al.* (2004) pointed out that it should be regarded as a subspecies of *A. genestieri* Oberthür, 1902.

形態特徵：前翅長 32–38mm。雄蝶 (圖 15)：頭部具毛，黑褐色。觸角黑褐色。口器黑褐色。下唇鬚黑褐色，具毛。胸部黑褐色，背面佈有灰白色毛，腹面黑褐色。腹部底色黑褐色，撒有白色鱗片。足呈黑褐色混有白色鱗片，腿節腹側明顯有毛。前翅先端圓鈍，前緣略彎曲，外緣凸，內緣筆直。後翅外緣圓。翅背面底色白色，翅脈變深色，褐色斑紋出現於前翅翅端以及沿著外緣分布。翅腹面斑紋與背面相似，但前翅褐色斑紋消失，後翅出現一定程度數量的黑褐色鱗片，前緣基部具一小型橙色斑。雌蝶 (圖 16)：翅紋與雄蝶相似，唯底色為半透明而非白色。

雄交尾器 (圖 122)：背兜形成明顯扁平刀片狀，末端下彎。基腹弧纖細。囊突短、壯。抱器葉狀，向後突出，末端圓鈍，背緣彎曲。陽莖短，向下彎曲，陽莖基腹面具龍骨狀構造。陽基軛片為一對分離之細長骨片。

雌交尾器 (圖 161)：交尾囊卵狀，交尾囊管膜質，末端骨化。花壁啞鈴狀，內陷並具短刺。肛突密生毛。後內骨突短，前端膨大。前內骨突退化。

世界分布：華西、華西南及臺灣。

臺灣分布：分布於臺灣中部中海拔。

幼蟲寄主植物：胡頹子科鄧氏胡頹子。

生物學：本種已知為一年一世代，成蝶出現於 5 至 8 月。

註記：臺灣的族群過去被錯誤鑑定為 *Aporia hippia* 或 *A. potanini* 的亞種，Della Bruna *et al.* (2004) 指出應被視為 *A. genestieri* 的亞種。

***Aporia gigantea* Koiwaya, 1993 (截脈絹粉蝶 / 巨翅絹粉蝶)**

Aporia gigantea Koiwaya, 1993: Butterflies in Indo-China II: 91. (Type locality: Emei Shan, Sichuan, China)

Ssp. *cheni* Hsu & Chou, 1999**PLATE 5, Figs. 17-18; PLATE 22, Fig. 123**

Aporia gigantea cheni Hsu & Chou, 1999: Zoological Studies 38: 223. (Type locality: Wutai, Wutoushan, Pingtung Co., Taiwan)

Specimens examined:

KAHHSIUNG CITY [= KAHHSIUNG Co.]: 1♀, Taoyuan, Liguan, 1600m, 6. V. 2000 (Y. F. Hsu & C. Y. Hung); 1♂, same locality, 29. IV. 2005 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 4♂paratypes, Wutai, Wutoushan, 1200m, 4/5. IV. 1998 (W. I. Chou) (genitalia preparation YFH1135); 1♀ paratype, same locality, 10/11. IV. 1998 (W. I. Chou) (genitalia preparation YFH1138); 1♂paratype, same locality, 10/11. IV. 1998 (Y. F. Hsu); 1♂paratype, same locality, 10/11. IV. 1998 (W. I. Chou) (genitalia preparation JYL222); 2♂, same locality, 9. IV. 2000 (Y. F. Hsu); 1♂, same locality, 25. IV. 2003 (Y. F. Hsu).

Description. Adult – Forewing length 32–38 mm. Male (PLATE 5, Fig. 17): Head hairy, dark brown. Eyes red. Antennae dark brown. Proboscis dark brown. Labial palpus dark brown, hairy. Thorax dark brown covered by grayish white hairs dorsally, dark brown ventrally. Abdomen ground color dark brown, dusted with white scalings. Legs dark brown mixed with white scaling, with femur bearing prominent hairs ventrad. Forewing with apex obtuse. Costa slightly curved; termen convex; dorsum straight. Hingwing termen rounded. Wing uppersides ground color brown with white markings; proximal white stripes and distal short markings in cells. White band in discoidal cells, more prominent on hindwing. Wing underside patterns similar to those of upperside. A small, orange spot at base of costa. Female (PLATE 5, Fig. 18): Wing patterns similar to those of male, except ground color somewhat transparent.

Male genitalia (PLATE 22, Fig. 123) – Tegumen bearing short, lateral process subcaudad, with medial, flattened piece bearing small, down-curved hook caudad. Vinculum slender, bent dorsally. Saccus short, slightly enlarged. Valva lobe-like, produced caudad with distal end round. Phallus slender, bent ventrad, re-curved, with phallobase possessing keel-like structure ventrally.

Female genitalia (modified from Hsu & Chou, 1999) – Corpus bursae oval, with

appendix bursae attached cephalically. Ductus bursae tubular, membranous. Signum dumbbell shape, invaginated, armed with short spines. Lamella antevaginalis forming a pair of large folded oval sclerites by ostium bursae. Lamella postvaginalis forming a series of sac-like folds. Apophyses posterior forming a short rod. Apophyses anteriores short, conical. Papillae anales densely setose.

Global distribution. West and Southwest China, Taiwan (Della Bruna *et al.*, 2004).

Distribution in Taiwan. Moderate elevations of southern Taiwan.

Larval Host plant(s). Berberidaceae: *Mahonia oiwakensis* (Hsu, 1999).

Biology. This species is known to be univoltine in occurrence, on the wing from April to June (Hsu, 2013).

Remarks. The subspecies of Taiwan is named after Mr. Chang-Chin Chen, a prominent coleopterist of Taiwan as one of the discoverers of this taxon in Taiwan (Hsu, 1999).

形態特徵：成蝶前翅長 32–38mm。雄蝶 (圖 17)：頭具毛、黑褐色。複眼紅色。觸角黑褐色。口器黑褐色。下唇鬚黑褐色，具毛。胸部黑褐色，背面佈有灰白色毛，腹面黑褐色。腹部底色黑褐色，散佈白色鱗片。足呈黑褐色，混有白色鱗片，腿節靠腹側明顯有毛。前翅先端圓鈍。前緣略彎曲，外緣凸，後緣筆直。後翅外緣圓。翅背面底色褐色具白色斑紋，翅室近基部有白帶，末端有短紋，中室具白帶，後翅較為明顯。翅腹面翅紋與背面相似，前緣基部有一橙色小斑。雌蝶 (圖 18)：翅紋與雄蝶相似，唯底色有時略透明。

雄交尾器 (圖 123)：背兜具短且略向後變窄之側突，中央具扁平骨片，後端具下彎小鉤。基腹弧纖細，背面彎曲。囊突短、略膨大。抱器葉狀，向後突起，末端圓鈍。陽莖纖細，向腹面彎曲。陽莖基腹面具龍骨狀構造。

雌交尾器 (改自 Hsu & Chou, 1999)：交尾囊卵狀，交尾囊管管狀、膜質。花壁為啞鈴狀、內凹，有短刺。前交尾孔板於交尾孔邊緣形成一對大型卵狀骨摺。後交尾孔

板具一系列囊形摺。後內骨突短、桿狀。前內骨突錐形。肛突密生毛。

世界分布：華西、華西南及臺灣。

臺灣分布：臺灣南部中海拔地區。

幼蟲寄主植物：小蘗科十大功勞。

生物學：本種已知為一年一世代，成蝶出現於 4 至 6 月。

註記：臺灣亞種是以發現者之一的臺灣知名鞘翅目研究者陳常卿先生的姓氏命名。

Genus *PIERIS* Schrank, 1801

Type species: *Papilio brassicae* Linnaeus, 1758

Diagnostic characters for the genus include: 1) wings white, usually with a few discal spots and a black apical border; 2) 4 R veins on forewing, with R₅ very short.

Larval hostplants are mainly plants in the family Brassicaceae.

In Taiwan, 2 species are known.

白粉蝶屬

本屬的鑑別特徵包括：1) 翅白色，翅面中央有斑點，翅端黑色；2) 前翅具四條 R 脈，R₅ 甚短。

幼蟲寄主植物主要為十字花科。

臺灣已知有 2 種。

***Pieris rapae* (Linnaeus, 1758) (白粉蝶 / 菜粉蝶 / 紋白蝶)**

Papilio (Danaus) rapae Linnaeus, 1758: Systema Naturae (Edn 10) 1: 468. (Type locality: Sweden)

Pieris rapae var. *immaculata* de Selys-Longchamps, 1857: Annales de la Société Entomologique Belge 1: 5. (Type locality: Belgique?)

Pontia metra Stephens, 1827: Illustrations of British entomology (Haustellata) 1 (1): 19. (Type locality: "Hertford and Ripley"[England])

Pieris yreka Reakirt, 1866: Proceedings of the Academy of Natural Sciences of Philadelphia 18 (3): 238. (Type locality: California)

Ganoris rapae var. *novangliae* Scudder, 1872: The Canadian entomologist 4: 79. (Type locality: "Shelbourne and Waterville")

Pieris rapae immaculata Cockerell, 1889: Entomologist 22: 99. (preoccupied by *immaculata* de Selys-Longchamps, 1857) (Type locality: "Ireland")

Pieris rapae var. *immaculata* Skinner & Aaron, 1889: The Canadian entomologist 21: 128. (Preoccupied by *Pieris rapae immaculata* de Selys-Longchamps, 1857) (Type locality: "Pennsylvania")

Pieris rapae f. *dubiosa* Röber, 1907: in Seitz, Die Gross-Schmetterlinge der Erde 1: 46, pl. 20 c. (Type locality: "Andalusia and Asia Minor")

Pieris rapae f. *flavescens* Röber, 1907: in Seitz, Die Gross-Schmetterlinge der Erde 1: 46. (Type locality: not stated)

Pieris rapae f. *aestivus* Verity, 1913: The Journal of the Linnean Society of London 32: 178. (Type locality: Scandinavia)

Ssp. *crucivora* Boisduval, 1836**PLATE 5, Figs. 19-20; PLATE 22, Fig. 124; PLATE 31, Fig. 162**

Pieris brassicae var. *crucivora* Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 521. (Type locality: Japan)

Pieris rapae var. *orientalis* Oberthür, 1880: Etudes d'Entomologie 5 : 13. (Type locality: "Askold")

Pieris rapae var. *mandschurica* Speyer, 1882: Stettiner entomologische Zeitung 43: 379. (Type locality: Amur)

Pieris rapae wladivostokensis Kardakov, 1928: Entomologischen Mitteilungen 17 (4): 268, pl. 6, f. 7-8. (Type locality: Wladiwostok)

Specimens examined:

TAIPEI CITY: 1♂, 1♀, emgd. 26. III. 1987; 1♂, Wenshan, Gongguan campus, NTNU, 9. I. 2007 (Y. F. Hsu); 1♂, same locality, 23. I. 2014 (L. Huang) (genitalia preparation JYL173). **TAOYUAN CITY [= TAOYUAN Co.]:** 1♀, Fuxing, Xuanyuan, 6. III. 1987. **NANTOU Co.:** 1♂, 1♀, Renai, Huisun Forest Field, 600m, 27. II. 2011 (Y. F. Hsu). **YUNLIN Co.:** 1♀, Douliu, Hushan Reservoir, 12. XII. 2015 (L. Huang) (genitalia preparation JYL174). **JIAYI [= CHIAYI] Co.:** 1♂, 1♀, Xingang, Yuemei, 15m, 11. VI. 2007 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 2♀, Kangle, 27. III. 2010 (Y. F. Hsu); 1♂, Lanyu, Shidaogou, 28. III. 2010 (Y. F. Hsu & J. H. Lin); 1♀, Taitung, Pipa Lake, 25.

I. 2007 (Y. F. Hsu). **TAINAN CITY** [= **TAINAN Co.**]: 1♀, Yongkang, 9. II. 2011 (Y. F. Hsu). **KAOHSIUNG CITY** [= **KAOHSIUNG Co.**]: 1♀, Meinong, Shuangxi, 150m, 16. I. 2006 (Y. F. Hsu); 1♂, same locality, 22. I. 2007 (Y. F. Hsu); 1♂, 1♀, Xiaogang, Dalinpu, 9/10. XI. 2003, reared from *Cleome rutidosperma*, emgd. 25. XI. 2003, HSU 03L16 (Y. F. Hsu); 1♂, same locality, 24. X. 2005, reared from *C. rutidosperma*, emgd. 21. XI. 2005, HSU 05K35.1 (Y. F. Hsu); 1♂, Xiaogang, Dalinpu, 0/200m, 9/10. XI. 2003, reared from *C. rutidosperma*, emgd. 21. XI. 2003, HSU 03L13 (Y. F. Hsu); 2♀, Zuoying, Xiziwan, 26. XI. 2005 (Y. F. Hsu). **JINMEN** [= **KINMEN**] **Co.**: 1♀, Jinhu, Shenshiqiao, 29. V. 2011 (H. C. Huang); 1♂, Jianhua, 20. VI. 2010 (C. K. Wang); 1♀, Jinhu, Taiwu Park, 28. V. 2011 (Y. F. Hsu & H. C. Huang).

Description. Adult – Forewing length 23–30 mm. Male (PLATE 5, Fig. 19): Head hairy, white mixed with dark brown. Antennae dark brown with white scalings. Proboscis dark brown. Labial palpus porrect, white, with white and brown hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs white, with femur bearing prominent hairs ventrad. Forewing triangular, margins nearly straight. Wing uppersides ground color white, usually with dark brown spot in cell M_3 and CuA_2 on forewing, and a dark brown spot in cell $Sc+R_1$ of hindwing; black border present at forewing apex. Dark scalings usually present at wing bases. Wing underside patterns similar to those of upperside, but the entire hindwing, forewing apex and area near costa creamy yellow scattered with black scalings. No dark brown border at forewing apex. Female (PLATE 5, Fig. 20): Wing patterns similar to those of male, but ground color usually tinged with yellow, markings more prominent, and extensive dark scalings usually present on forewing upperside proximally.

Male genitalia (PLATE 22, Fig. 124) – Tegumen flat dorsally, uncus short with caudal end pointed. Vinculum slender. Saccus short, bulb-like. Valva lobe-like, with caudal margin rounded. Phallus slightly enlarged caudad, with phallobase short, bearing keel-like structure ventrally. Juxta slender, V-shaped.

Female genitalia (PLATE 31, Fig. 162) – Corpus bursae oval. Ductus bursae membranous with caudal part slightly narrowed. Sterigma forming a prominent, dome-like pouch.

Signum ovate, with small notches at anterior and posterior end. Anal papillae setose. Posterior apophyses moderately long. Anterior apophyses vestigial.

Global distribution. Widespread across Eurasia; invaded into and successfully established in North America, Australia, New Zealand, and North Africa.

Distribution in Taiwan. Widespread on mainland and most associated islands.

Larval Host plant(s). Brassicaceae: *Brassica oleracea*, *B. pekinensis*, *B. campestris*, *Rorippa indica*, *R. cantoniensis*, *R. palsustris*, *Lepidium virginicum*, *Capsella bursa-pastoris*, *Cardamine flexuosa*; Capparaceae: *Cleome rutiosperma*; Tropaeolaceae: *Tropaeolum majus*, etc. (Hsu, 2013; Hung, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species is a notorious agriculture pest on mustard plants, but it did not occur or very rare in Taiwan prior to 1950s.

形態特徵：成蝶前翅長 23–30mm。雄蝶 (圖 19)：頭具毛，白色混黑褐色。觸角黑褐色具白色鱗片。口器黑褐色。下唇鬚前伸，白色，腹側具白色與褐色毛。胸部黑褐色，背面佈有灰白色毛，腹面白色。腹部背面底色黑褐色，體背佈有白色鱗片，腹面白色。足呈白色，腿節近腹側明顯生有毛。前翅三角形，邊緣近筆直。翅背面底色白色，前翅 M_3 及 CuA_2 室通常具黑褐色斑點，後翅 $Sc+R_1$ 室具一黑褐色斑點。前翅先端具黑色帶，翅基通常出現暗色鱗片。翅腹面翅紋與背面相似，但整個後翅、前翅先端及近前緣脈的區域呈乳黃色並散佈黑色鱗片。前翅先端不具黑褐色帶。雌蝶 (圖 20)：翅紋與雄蝶相似，但底色通常帶有黃色，斑紋更明顯，前翅近基部有廣泛黑色鱗片。

雄交尾器 (圖 124)：背兜背面扁平，鉤突短，末端尖銳。基腹弧纖細。囊突短、球狀。抱器葉狀，末端邊緣圓。陽莖末端略膨大，陽莖基短，腹面具龍骨狀構造。陽基軛片纖細、V 形。

雌交尾器 (圖 162)：交尾囊卵狀。交尾囊管膜質，末端略變窄。交尾孔板形成一明顯圓頂袋狀。花壁卵狀，前端及後端具小缺口。肛突具毛。後內骨突甚長。前內骨突退化。

世界分布：廣泛分布於歐亞大陸，入侵北美、澳洲、紐西蘭和北非，並成功建立族群。

臺灣分布：廣分布於臺灣本島及離島地區。

幼蟲寄主植物：十字花科甘藍、結球白菜、油菜、山芥菜、廣東葶藶、溼生葶藶、北美獨行菜、薺菜、彎曲碎米薺；白花菜科平伏莖白花菜；金蓮科金蓮花等。

生物學：一年多世代性種類。

註記：本種為十字花科作物著名農業害蟲，然而臺灣在 1950 年代前極少記錄。

***Pieris canidia* (Linnaeus, 1768) (緣點白粉蝶 / 東方菜粉蝶 / 臺灣紋白蝶)**

PLATE 5, Fig. 21; PLATE 6, Fig. 22; PLATE 22, Fig. 125; PLATE 32, Fig. 163

Papilio (Danaus) canidia Linnaeus, 1768: Iter in Chinam. Upsaliae: 13. (Type locality: “Insulam Nord Eyland” [error? probably “Canton, China”])

Papilio gliciria Cramer, 1777: De uitlandsche kapellen 2 (9-16): 115, pl. 171, f. E, F. (Type locality: China)

Pieris glaphyra Godart, 1819: Encyclopédie Méthodique 9 (1): 160. (Type locality: “Chine”)

Specimens examined:

TAIPEI CITY: 3♀, Wenshan, Jingmei, 29. III. 2003 (Y. F. Hsu); 1♂, Wenshan, Gongguan campus, NTNU, 2. IV. 2000 (Y. F. Hsu); 1♀, same locality, 19. II. 2000, emgd. 26. II. 2000 (Y. T. Lo); 1♂, same locality, 22. IV. 2000 (Y. T. Lo); 1♀, same locality, 8. XI. 2005 (Y. F. Hsu); 1♂, same locality, 10. XII. 2005 (Y. F. Hsu); 1♀, same locality, 10. I. 2006 (Y. F. Hsu); 1♂, 1♀, Wenshan, Gongguan, NTNU, 26. I. 2014 (L. Huang) (genitalia preparation JYL176, JYL175). **TAIZHONG CITY [= TAICHUNG CITY/ TAICHUNG Co.]:** 1♀, Heping, Shangguguan, 900m, 29. VII. 2007 (Y. F. Hsu). **HUALIAN [= HUALIEN] Co.:** 1♂, Xiulin, Guanyuan, 2600/2700m, 26. V. 2001 (Y. F. Hsu). **NANTOU Co.:** 1♀, Renai, Beidongyanshan, 1500m, 28. X. 2006 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♀, Lanyu, Sidaogou, 18. IV. 2006 (Y. F. Hsu). **KAOSIUNG CITY [= KAOHSIUNG Co.]:** 2♀, Meinong, Shuangxi, 150m, 22. I.

2007 (Y. F. Hsu). JINMEN [= KINMEN] Co.: 2♀, Jinhu, Shenshiqiao, 27/28. V. 2011 (Y. F. Hsu & H. C. Huang); 2♀, same locality, 29. V. 2011 (Y. F. Hsu & H. C. Huang).

Description. Adult – Forewing length 25–28 mm. Male (PLATE 5, Fig. 21): Head hairy, white mixed with dark brown. Antennae dark brown with white scalings. Proboscis dark brown. Labial palpus porrect, white, with white and brown hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs white, with femur bearing prominent hairs ventrad. Forewing triangular, costa and dorsum nearly straight, termen somewhat convex. Wing uppersides ground color white, usually with dark brown spot in cell M_3 and CuA_2 on forewing; dark brown spot in cell $Sc+R_1$ of hindwing; black border present from forewing apex along termen, with inner edge serrate. A series of dark brown spots at distal ends of hindwing cells. Dark scalings usually present at wing bases. Wing underside patterns similar to those of upperside, but the entire hindwing, forewing apex and area near costa creamy yellow scattered with black scalings. No dark brown border at forewing apex. Female (PLATE 6, Fig. 22): Wing patterns similar to those of male, but markings more prominent, and extensive dark scalings usually present on forewing upperside proximally.

Male genitalia (PLATE 22, Fig. 125) – Tegumen nearly flat dorsally, uncus short, conical, with caudal end pointed. Vinculum slender. Saccus short, bulb-like. Valva lobe-like, slightly attenuate posteriorly, with caudal margin rounded. Phallus slightly enlarged caudad, with phallobase short, bearing keel-like structure ventrally. Juxta slender, V-shaped.

Female genitalia (PLATE 32, Fig. 163) – Corpus bursae oval. Ductus bursae membranous with caudal part slightly narrowed. Sterigma forming a prominent, dome-like pouch. Signum with small notches at anterior and posterior end, with small spines laterally. Anal papillae setose. Posterior apophyses moderately long. Anterior apophyses vestigial.

Global distribution. Widespread across Asiatic continent, reaching Turkey to the west, Tsushima Island of Japan to the east, south to Indochina. Recently invaded to Luzon of

the Philippines and successfully established.

Distribution in Taiwan. Widespread on mainland and most associated islands.

Larval Host plant(s). Brassicaceae: *Brassica oleracea*, *P. pekinensis*, *Rorippa indica*, *R. cantoniensis*, *R. pascuensis*, *Lepidium virginicum*, *Capsella bursa-pastoris*, *Cardamine flexuosa*, *Rhaphanus acanthiformis*; Bretschneideraceae: *Bretschneidera sinensis*, etc. (Hsu, 2013; Hung, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species is often considered as an agriculture pest on mustard crops.

形態特徵：成蝶前翅長 25–28mm。雄蝶 (圖 21)：頭具毛，白色混黑褐色。觸角黑褐色具白色鱗片。口器黑褐色。下唇鬚前伸，白色，腹面具白色及褐色毛。胸部黑褐色，背面披覆灰白色毛，腹面白色。腹部背側底色黑褐色，散佈白色鱗片，腹面白色。足呈白色，腿節近腹側明顯生有毛。前翅三角形，前緣和後緣近筆直，外緣稍微凸。翅背面底色白色，前翅 M_3 和 CuA_2 室通常具有黑褐色斑點，後翅 $Sc+R_1$ 室有黑褐色斑點。前翅先端有黑帶沿外緣分布，黑帶向內邊緣呈鋸齒狀，後翅翅室靠外側有一列黑褐色斑紋，翅基通常有黑色鱗片。翅腹面翅紋與背面相似，但整個後翅、前翅先端及靠近前緣脈的區域呈乳黃色，散佈黑色鱗片。前翅先端無黑褐色帶。雌蝶 (圖 22)：翅紋與雄蝶相似，但斑紋較明顯，前翅背面近基部通常有廣泛深色鱗片。

雄交尾器 (圖 125)：背兜背面近扁平，鉤突短、圓錐狀，末端銳尖。基腹弧纖細。囊突短、球狀。抱器葉狀，後端略截平，後緣圓。陽莖後端略膨大，陽莖基短，腹面具龍骨狀構造。陽基軛片纖細，V 形。

雌交尾器 (圖 163)：交尾囊卵狀。交尾囊管膜質，末端略窄。交尾孔板形成一明顯圓頂狀袋。花壁於前後端具小凹，側面具小刺。肛突具毛。後內骨突甚長，前內骨突退化。

世界分布：廣泛分布整個亞洲大陸，西抵土耳其，東至日本的對馬島，南至中南半島。晚近入侵至菲律賓呂宋，並成功建立族群。

臺灣分布：廣分布於本島全島及各離島。

幼蟲寄主植物：十字花科甘藍、結球白菜、山芥菜、廣東葶藶、溼生葶藶、北美獨行菜、薺菜、彎曲碎米薺、蘿蔔；鐘萼木科鐘萼木等。

生物學：一年多世代。

註記：本種常被視為十字花科蔬菜的害蟲。

Genus *TALBOTIA* Bernardi, 1958

Type species: *Pieris naganum* Pamsi Salv., 1921

Diagnostic characters for the genus include: 1) wings white, with a few discal spots and a black apical border; 2) 4 R veins on forewing, with R_5 very short; 3) discoidal cell elongate, more than half length of forewing.

Larval hostplant is in the family Bretschneideraceae.

Single species is included in the genus, and it occurs in Taiwan.

飛龍白粉蝶屬

本屬的鑑別特徵包括：1) 翅白色，翅面中央有斑點，翅端黑色；2) 前翅具四條 R 脈， R_5 甚短；3) 中室長，長度長於前翅長二分之一。

幼蟲寄主植物為鐘萼木科植物。

本屬僅產 1 種，臺灣有分布。

***Talbotia naganum* (Moore, 1884) (飛龍白粉蝶 / 輕海紋白蝶 / 嬌鑾紋白蝶)**

Mancipium naganum Moore, 1884: Journal of the Asiatic Society of Bengal 53, Pt.II (1): 45. (Type locality: Naga Hills, Assam)

Ssp. *karumii* Ikeda, 1937**PLATE 6, Figs. 23-24; PLATE 22, Fig. 126; PLATE 32, Fig. 164**

Pieris naganum karumii Ikeda, 1937: Zephyrus 7 (1): 37. (Type locality: “Hakubei, [Suo Gun, Taihoku]” [=Suao, Yilan, Taiwan])

Specimens examined:

JILONG CITY [= KEELUNG] CITY: 1♀, Anle, Xinshan Dam, 7. V. 2000 (J. R. Chen & C. M. Wu); 1♂, 1♀, same locality, 8. IV. 2015 (L. Huang) (genitalia preparation JYL164, JYL165). **TAIPEI CITY:** 2♂, Shilin, Macao, 6. VIII. 1986; 1♂, Daan Dist., East downtown, at light, 13. VII. 2014 (Y. F. Hsu). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]:** 1♂, Ruifang, Nanya, 13. X. 1998 (Y. F. Hsu); 1♂, same locality, 25. III. 2005 (L. H. Wang); 1♂, same locality, 23. III. 2007 (C. L. Huang & C. K. Wang); 2♂, same locality, 5. IX. 2008 (C. K. Wang); 1♂, same locality, 26. X. 2009 (C. K. Wang); 1♂, same locality, 12. X. 2010 (J. H. Lin); 1♂, same locality, 20. V. 2011 (Y. C. Lin & C. L. Huang); 1♀, Ruifang, Houtong, 23. III. 2007 (C. L. Huang); 1♀, same locality, 7. IV. 2011 (C. L. Huang); 2♂, same locality, 20. V. 2011 (Y. C. Lin & C. L. Huang); 1♀, Houtong, 200m, 1. III. 2010 (H. C. Chuang); 1♀, Jinshan, Yangmingshan, Dayoukeng, 600m, 21. IV. 2010, reared from *Bretschneidera sinensis*, emdg. 6. V. 2010, HSU 10D21 (W. H. Chien & N. Y. Tsai); 1♀, Ruifang, Chahushan, 500m, 1. VIII. 2003 (Y. F. Hsu).

Description. Adult – Forewing length 27–35 mm. Male (PLATE 6, Fig. 23): Head hairy, white mixed with dark brown. Antennae dark brown with white scalings. Proboscis dark brown. Labial palpus porrect, white, with white and brown hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs white, with femur bearing prominent hairs ventrad. Forewing elongate, triangular, costa and dorsum nearly straight, termen slightly convex. Wing uppersides ground color white, usually with dark brown spot in cell M₃ and CuA₂ on forewing; black border present from forewing apex along termen, with inner edge serrate. A small, dark brown bar at distal end of discoidal cell. Dark scalings usually present near wing bases. Wing underside

patterns similar to those of upperside, but the entire hindwing, forewing apex and area near costa creamy yellow. No dark brown border at forewing apex. Female (PLATE 6, Fig. 24): Wing markings more extensive than those of male, with additional long stripe on forewing upperside, a dark brown spot in cell Sc+R₁ of hindwing, and a series of dark brown spots at distal ends of hindwing cells.

Male genitalia (PLATE 22, Fig. 126) – Tegumen slightly swollen dosad, with uncus elongate with a hook caudad. Vinculum slender, bent dorsally. Saccus moderately long. Valva lobe-like, bearing single, prominent tooth caudally. Phallus elongate, with phallobase short, bearing shovel-like structure ventrally. Juxta flat, triangular.

Female genitalia (PLATE 32, Fig. 164) – Corpus bursae oval. Ductus bursae membranous with caudal end slightly enlarged. Sterigma forming a prominent, dome-like pouch. Signum dumbbell-like, invaginated, armed with spines. Anal papillae setose. Posterior apophyses long, slender. Anterior apophyses vestigial.

Global distribution. Northeast India, North Myanmar, Laos, North Vietnam, West to East China including Hainan, Taiwan.

Distribution in Taiwan. Northern hills of main island.

Larval Host plant(s). Bretschneideraceae: *Bretschneidera sinensis* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species is sometimes regarded as a member of the genus *Pieris* (e. g. Shirôzu, 1960).

形態特徵：成蝶前翅長 27–35mm。雄蝶 (圖 23)：頭具毛，白色混黑褐色。觸角黑褐色具白色鱗片。口器黑褐色，下唇鬚前伸，白色，腹側具白色及褐色毛。胸部黑褐色，背面佈有灰白色毛，腹面白色。腹部體背底色黑褐色，背面散佈白色鱗片，

腹面白色。足呈白色，腿節近腹側明顯生有毛。前翅拉長，三角形，前緣及後緣近筆直，外緣略凸。翅背面底色白，前翅 M_3 及 CuA_2 室通常具黑褐色斑點，前翅先端具黑帶，沿外緣分布，黑帶靠內側邊緣呈鋸齒，中室近外側具一小型黑褐色條帶，近翅基通常具黑色鱗片。翅腹面翅紋與背面相似，但整個後翅、前翅先端以及近前緣脈區域呈乳黃色，前翅先端不具黑褐色帶。雌蝶 (圖 24)：翅紋較雄蝶寬廣，前翅背面有額外長條帶。後翅 $Sc+R_1$ 室有一黑褐色斑點，後翅翅室於靠外端有一列黑褐色斑點。

雄交尾器 (圖 126)：背兜背面略膨出，鉤突延長，末端具鉤。基腹弧纖細，背部彎曲。囊突甚長。抱器葉狀，末端具一明顯齒。陽莖長，陽莖基短，腹面具鏟狀構造。陽基軛片扁平、三角形。

雌交尾器 (圖 164)：交尾囊卵狀，交尾囊管膜質，末端略膨大。交尾孔板形成一明顯圓頂狀袋。花壁啞鈴狀、內凹，具刺。肛突具毛。後內骨突纖細。前內骨突退化。

世界分布：印度東北、緬甸北部、寮國、越南北部、華西至華東，包括海南島及臺灣。

臺灣分布：臺灣本島北部山區。

幼蟲寄主植物：鐘萼木科鐘萼木。

生物學：一年多世代。

註記：本種有時被包括在白粉蝶屬 *Pieris* 內 (例如 Shirôzu, 1960)。

Genus *CEPORA* Billberg, 1820

Type species: *Papilio coronis* Cramer, [1775]

Diagnostic characters for the genus include: 1) 4 R veins on forewing; 2) scale pads present on venter of female abdomen; 3) a patch of upright hairs in cell 1A+2A of hindwing upperside.

Larval hostplant is in the family Capparaceae.

3 species occurs in Taiwan, including a species that is believed immigrating from the Philippines and successfully established.

脈粉蝶屬

本屬的鑑別特徵包括：1) 前翅具四條 R 脈；2) 雌蝶腹部腹面具鱗墊；3) 後翅背面 1A+2A 室有一片直立毛。

幼蟲寄主植物為白花菜科植物。

臺灣產 3 種，包括 1 種被認為是從菲律賓遷入並成功建立族群的種類。

Cepora nadina (Lucas, 1852) (淡褐脈粉蝶 / 淡紫粉蝶 / 青園粉蝶)

Pieris nadina Lucas, 1852: Revue et magasin de zoologie pure et appliquée 4 (7): 333. (Type locality: “Silhet”)

Huphina liquida Swinhoe, 1890: The Annals and magazine of natural history; zoology, botany, and geology, series 6, 5: 361. (Type locality: “Mahableshwur”)

Ssp. *eunama* Fruhstorfer, 1903

PLATE 6, Figs. 25-28; PLATE 23, Fig. 127; PLATE 32, Fig. 165

Huphina nama eunama Fruhstorfer, 1903: Berliner Entomologische Zeitschrift 48 (1/2): 110. (Type locality: “Süd-Formosa...Takau”)

Huphina nama var. *koannania* Matsumura, 1909: Entomologische Zeitschrift 23 (18): 88. (Type locality: Kanshirei und Horisha)

Huphina nadina f. *hirayamai* Matsumura, 1936: Insecta Matsumurana 10 (4): 127. (Type locality: Musha)

Specimens examined:

MIAOLI Co.: 1♂, Sanyi, 22. VI. 2001 (Y. T. Lo); 1♀, same locality, collecting date missing, emgd. 3. VII. 2001 (Y. T. Lo). **TAIZHONG CITY [= TAICHUNG CITY/TAICHUNG Co.]:** 1♀, Beitun, Dakeng, 13. VI. 2004 (Y. F. Hsu). **NANTOU Co.:** 3♂, 1♀, Renai, Huisun, 600m, 22. XI. 2004 (Y. F. Hsu); 1♀, Renai, Huisun, 600/700m, 20. II. 2012 (Y. F. Hsu & H. C. Huang); 1♀, Renai, Nanshanxi, 900m, 14. III. 1996 (Y. F. Hsu); 2♀, same locality, 1. IX. 2007 (Y. F. Hsu); 1♂, 3♀, same locality, 23. I. 2008 (Y. F. Hsu), 1♂, Renai, Nanshanxi, 27. VI. 1999 (C. C. Lu); 1♂, Renai, Benbusi, 13. XII. 2015 (L. Huang) (genitalia preparation JYL166). **ZHANGHUA [= CHANGHUA] Co.:**

1♀, Shetou, Qingshuiyan, 17. I. 2006, reared from *Capparis sabiaefolia*, emgd. 19. I. 2006, HSU 06A22 (C. M. Wu). **JIAYI [= CHIAYI] Co.:** 1♂, Alishan, Shanmei, 500m, 5. V. 2007 (Y. F. Hsu). **TAINAN CITY [= TAINAN Co.]:** 1♀, Dongshan, Kantoushan, 600/800m, 4. II. 2010 (Y. F. Hsu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 1♂, Liugui, 300m, 22. I. 2008 (Y. F. Hsu); 1♀, Liugui, 27. XII. 2003 (Y. F. Hsu); 1♀, Taoyuan, Fenggashan, 800m, 6. VI. 2007 (Y. F. Hsu); 1♀, Liugui, Fenghuang Logging Trail, 1000m, 25. V. 2016 (J. Y. Liang) (genitalia preparation JYL207). **PINGDONG [= PINGTUNG] Co.:** 1♂, 2♀, Shizi, Shuangliu, 18. XII. 2005, reared from *C. sabiaefolia*, emgd. 10/18. I. 2006, HSU 05M31 (Y. F. Hsu); 1♀, same locality, same collecting date (Y. F. Hsu); 1♀, Hengchun, Dajianshan, 15. I. 2006, reared from *C. henryi* [= *C. micracantha*], emgd. 12. II. 2006, HSU 06A1.1 (Y. F. Hsu); 2♂, Wutai, Ailiaobeixi/Bayouxi, 500/900m, 14. III. 2008 (Y. F. Hsu & H. C. Huang); 1♂, Sandimen, 250m, 10. II. 2007 (Y. F. Hsu); 1♀, Mudan, Xuhai, 150m, 23. X. 2009 (Y. F. Hsu).

Description. Adult – Forewing length 23–34 mm. Male (PLATE 6, Figs. 25-26): Head hairy, white mixed with dark brown. Antennae dark brown banded with white scalings. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white tinged with olive-yellow ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs dark brown with white scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white, with dark brown border at apex and along termen of forewing; a grayish brown border along termen of hindwing. Wing underside white area only at posterior part of forewing, remaining areas covered by olive or pale brown scalings decorated with some pale color spots. Female (PLATE 6, Figs. 27-28): Wing patterns similar to those of male in dry season, but with dark brown border of forewing more prominent. Individuals of wet season with dark brown scalings on wing uppersides more extensive, with white areas more restricted. A white pad of densely packed elongate scales on venter of abdomen.

Male genitalia (PLATE 23, Fig. 127) – Tegumen swollen dorsad, with uncus forming a beak with distal end pointed. Vinculum narrowed dorsally. Saccus moderately long, digitate. Valva lobe-like, triangular with ventral margin curved, attenuate posteriorly.

Phallus elongate, strongly down-curved, with caudal end of aedeagus pointed dorsad. Juxta slender, V-shaped.

Female genitalia (PLATE 32, Fig. 165) – Corpus bursae oval. Ductus bursae membraneous. Sterigma forming a dome-like structure. Signum as a heavily sclerotized, longitudinal band, enlarged cephalically. Prominent spine tuft at both cephalic and caudal ends, surface armed with short spines. Anal papillae setose. Posterior apophyses short, rod-like. Anterior apophyses vestigial.

Variation. Seasonal variation is considerable, notably in females. Wing undersides of both sexes are duller in color with brown scalings in dry season, and brighter with olive scalings in wet season. Forewing upperside of female individuals in wet season possess extensive dark scalings.

Global distribution. South India, Sri Lanka, East Himalayas, Indochina, Sundaland, Southwest to South China, Taiwan.

Distribution in Taiwan. Mainly in low to moderate elevations of central and southern Taiwan.

Larval Host plant(s). Capparaceae: *Capparis sabiaefolia* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The specific name of the species is sometimes misspelled as *nandina* (e. g. Shirôzu & Ueda, 1992).

形態特徵：成蝶前翅長 23–24mm。雄蝶 (圖 25–26)：頭具毛，白色混有黑褐色。觸角黑褐色交雜白色帶狀鱗片。口器黑褐色，下唇鬚前伸，白色混褐色，腹側具毛。胸部黑褐色，背面覆有灰白色毛，腹面白色帶橄欖黃綠色調。腹部體背底色黑褐色，背面撒佈白色鱗，腹面白色。足呈黑褐色，具白色鱗，腿節腹側明顯有毛。前翅三

角形，前緣凸，外緣和後緣近筆直。翅背面底色白色，前翅翅先端沿外緣具黑褐色帶，後翅沿外緣具一灰褐色帶。翅腹面僅前翅前端具白色區域，其餘區域覆有橄欖綠或淺褐色鱗片並飾些淺色斑。雌蝶 (圖 27–28)：乾季時翅紋與雄蝶相似，但前翅黑褐色帶較明顯。雨季個體在翅背面黑褐色鱗較廣泛，白色區域較為侷限。腹部腹面具有由白色細長鱗片構成的鱗墊。

雄交尾器 (圖 127)：背兜背側膨大，鉤突呈喙狀，末端銳尖。基腹弧背部狹窄。囊突長、指狀。抱器葉狀、三角形，腹緣彎曲，後端截狀。陽莖長、強下彎。陽莖器尾端背面尖銳。陽基軛片纖細，V 形。

雌交尾器 (圖 165)：交尾囊卵狀。交尾囊管膜質。交尾孔板形成一圓頂狀構造。花壁為高度骨化縱帶，前端膨大，前後兩端具明顯針簇，表面佈有短刺。肛突具毛。後內骨突短、棒狀。前內骨突退化。

變異：季節變異明顯，尤其是雌蝶。翅腹面在乾季時色調較暗而呈褐色。雨季時較明亮，呈橄欖綠色。雌蝶雨季型前翅背面有廣泛暗色部分。

世界分布：南印度、斯里蘭卡、東喜馬拉雅、中南半島、巽他群島、華西南至華南及臺灣。

臺灣分布：主要分布於臺灣中南部低至中海拔地區。

幼蟲寄主植物：白花菜科毛瓣蝴蝶木。

生物學：一年多世代。

註記：本種的種小名有時被誤拼為「*nandina*」。

***Cepora nerissa* (Fabricius, 1775) (黑脈粉蝶 / 黑脈圓粉蝶)**

Papilio nerissa Fabricius, 1775: Systema Entomologiae: 471, no. 123. (Type locality: China)

Papilio coronis Cramer, [1775]: De uitlandsche kapellen 1 (1-7): 69, pl. 44, f. B, C. (Type locality: China)

Pieris hira Moore, 1865: Proceedings of the Zoological Society of London 1866: 490, pl. 31, f. 17. (Type locality: “Punjab and Oude”)

Pieris copia Wallace, 1867: Transactions of Entomological Society of London, series 3, 4: 340. (Type

locality: Bengal)

Hyphina pallida Swinhoe, 1885: Proceedings of the Zoological Society of London. 1885: 137. (Type locality: Bombay)

Ssp. *cibyra* Fruhstorfer, 1910

PLATE 7, Figs. 29-32; PLATE 23, Fig. 128; PLATE 32, Fig. 166

Huphina nerissa cibyra Fruhstorfer, 1910: in Seitz, A, Die Gross-Schmetterlinge der Erde 9: 141. (Type locality: "Formosa")

Specimens examined:

TAIDONG [= TAITUNG] Co.: 1♀, Lanyu, Sidaogou, 14/16. X. 2006, reared from *C. lanceolaris*, emgd. 2. XI. 2006, HSU 06K18.1 (Y. F. Hsu & H. C. Huang); 1♂, Lanyu, 29/31. III. 2008 (C. H. Lin, jr & N. Y. Tsai) (genitalia preparation JYL202); 1♀, Daren, Duyayuanshan, Paotai, 850m, 3/6. V. 2002 (C. L. Huang); 1♂, Liuqiu, Liuqiuyu, 7. III. 2010, reared from *C. micracantha*, emgd. 23. III. 2010 (N. Y. Tsai). **PINGDONG [= PINGTUNG] Co.:** 1♂, 2♀, Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu); 1♂, 1♀, same locality, 1. III. 2008 (Y. F. Hsu); 1♂, Shizi, Shuangliu, 7. XI. 2004 (S. C. Chen); 4♂, 1♀, same locality, 18. XII. 2005 (Y. F. Hsu); 1♀, Shizi, Shuangliu, 200/400m, 26. III. 2006 (Y. F. Hsu); 1♀, same locality, 30. IV. 2006, reared from *Capparis sabiaefolia*, emgd. 27. V. 2006, HSU 06D73 (Y. F. Hsu); 2♂, same collecting data (Y. F. Hsu); 1♀, same collecting data, reared from *C. sabiaefolia*, emgd. 1. VI. 2006, HSU 06D73.2 (Y. F. Hsu); 1♂, Shizi, Shuangliu Waterfall (S. C. Chen); 1♂, Shizi, Shuangliu/Maozishan (S. C. Chen); 1♀, Mudan, Xuhai, 150m, 23. X. 2009 (Y. F. Hsu); 1♀, Mudan, Xuhai, 4. IX. 2010 (Y. F. Hsu); 1♀, Hengchun, Dajianshan, 15. I. 2006, reared from *C. henryi* [= *C. micracantha*], emgd. 12. II. 2006, HSU 06A4 (Y. F. Hsu); 1♀, same collecting data (Y. F. Hsu); 1♂, Wutai, Old Dawu/Bayouxi, 500/900m, 17. III. 2009 (Y. F. Hsu & H. C. Huang); 1♀, Daren, Duyayuanshan, Paotai, 850m, 3/6. V. 2002 (C. L. Huang) (genitalia preparation JYL270). **LIANJIANG [= LIENCHIANG] Co.:** 2♂, Beigan, Wusha, 19. VII. 2013 (L. H. Wang & H. Y. Lee); 2♂, same locality, 20. VII. 2013 (L. H. Wang & H. Y. Lee); 2♂, 1♀, same locality, 16. IV. 2014 (C. L. Huang & H. Y. Lee); 2♂, 1♀, same locality, 7. IX. 2014 (C. L. Huang & H. Y. Lee).

Description. Adult – Forewing length 23–31 mm. Male (PLATE 7, Figs. 29-30). Head hairy, white mixed with dark brown. Antennae dark brown banded with white scalings. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white tinged with

olive-yellow ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs dark brown with white scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white, with veins darkened by dark brown scalings. Dark brown border with inner edge serrate at apex and along termen of forewing, with additional dark brown spots in M₃; a series of dark brown markings at distal ends of veins on hindwing. Wing underside with dark scalings along veins more extensive in wet season, wing surface dusted with tan scalings in dry season. Female (PLATE 7, Figs. 31-32): Wing markings more extensive than those of males, with additional spot in cell CuA₂ of forewing, and a series of dark brown spots along termen of hindwing. Two white or white tinged with orange pads of densely packed elongate scales on venter of abdomen.

Male genitalia (PLATE 23, Fig. 128) – Tegumen slightly swollen dorsad, with uncus forming a beak with distal end pointed.. Vinculum narrowed dorsally. Saccus moderately long, tapering cephalad. Valva lobe-like, with ventral margin slightly curved, dorsal margin slightly enlarged. Phallus elongate, down-curved, with caudal end of aedeagus pointed dorsad. Juxta slender, V-shaped.

Female genitalia (PLATE 32, Fig. 166) – Corpus bursae oval. Ductus bursae membranous. Sterigma forming a dome-like structure. Signum as a heavily sclerotized, longitudinal band, enlarged cephalically and caudally. Prominent spine tuft at both cephalic and caudal ends, surface armed with short spines. Anal papillae setose. Posterior apophyses short, rod-like. Anterior apophyses vestigial.

Variation. Seasonal variation is considerable, notably in females. Markings on wings of both sexes are reduced in dry season, with dark scalings of undersides nearly missing.

Global distribution. Himalayas, India, Sri Lanka, Indochina, Indonesia, Southwest to East China, Taiwan.

Distribution in Taiwan. Mainly in low elevations of southern Taiwan.

Larval Host plant(s). Capparaceae: *Capparis sabiaefolia*, *C. henryi* in main island of Taiwan, and *C. lanceolaris* in Lanyu Island (Hsu, 2013); *Capparis sepiaria* in Mazu Islands (Lee, 2000).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 23–31mm。雄蝶 (圖 29–30)：頭具毛，白色混黑褐色，觸角黑褐色雜有白色帶狀鱗。口器黑褐色。下唇鬚前伸，白色混褐色，腹面具毛。胸部黑褐色，背面覆有灰白色毛，腹面白色帶有橄欖黃綠色調。腹部體背底色黑褐色，背面散佈白色鱗，腹面白色。足呈黑褐色，具白色鱗片，腿節腹側明顯有毛。前翅三角形，前緣凸，外緣及後緣近筆直。翅背面底色白色，翅脈深色被黑褐色鱗，前翅先端沿外緣具黑褐色帶，色帶向內側的邊緣呈鋸齒狀，另外一額外黑褐色斑點位於 M_3 室，後翅翅脈近外側有一列黑褐色斑紋。翅腹面雨季時沿翅脈的暗色鱗片較廣泛，乾季時翅表面散佈棕褐色鱗片。雌蝶 (圖 31–32)：翅紋較雄蝶寬廣，前翅 CuA_2 室有額外斑，後翅沿外緣有一列黑褐色斑點分佈。腹部腹面具有由白色或泛橙黃色的細長鱗片構成的鱗墊。

雄交尾器 (圖 128)：背兜背面略膨大，鉤突喙狀，末端銳尖。基腹弧背面窄。囊突長，向前端漸縮。抱器葉狀，腹緣微彎曲，背緣略膨大。陽莖長、下彎，陽莖器尾端背面尖銳。陽基軛片纖細，V 形。

雌交尾器 (圖 166)：交尾囊卵狀。交尾囊管膜質。交尾孔板形成圓頂狀構造。花壁為高度骨化縱帶，前後兩端膨大，具明顯針簇，表面有短刺。肛突具毛。後內骨突短、棒狀。前內骨突退化。

變異：季節性變異顯著，特別是雌蝶。乾季時雌雄兩性的翅紋均減退，翅腹面的黑色鱗片幾近消失。

世界分布：喜馬拉雅、印度、斯里蘭卡、中南半島、印尼、華西南、華東及臺灣。

臺灣分布：主要分布在臺灣南部低海拔。

幼蟲寄主植物：在臺灣本島利用白花菜科毛瓣蝴蝶木及小刺山柑；在蘭嶼取食蘭嶼山柑；在馬祖利用青皮刺。

生物學：一年多世代。

***Cepora iudith* (Fabricius, 1787) (黃裙脈粉蝶 / 黃裙粉蝶 / 黃裙圓粉蝶)**

Papilio iudith Fabricius, 1787: Mantissa Insectorum 2: 22, no. 230. (Type locality: “Pulicandor”)

***Ssp. olga* Eschscholtz, 1821**

PLATE 7, Figs. 33-35; PLATE 23, Fig. 129; PLATE 33, Fig. 167

Pieris olga Eschscholtz, 1821: in Kotzebue, Entdeckungsreise in die Süd-see 3 (App. 5): pl. 9, f. 21a-b. (Type locality: Philippines)

Specimens examined:

TAIDONG [= TAITUNG] Co.: 1♂, 4♀, Lanyu, Shuangshiyan, 2. V. 2003, reared from *Capparis lanceolaris*, emgd. 26/V - 3/VI. 2003, HSU 03E14 (Y. F. Hsu); 1♂, same locality, 14. VI. 2003, reared from *C. lanceolaris*, emgd. 4. VII. 2003, HSU 03F10 (Y. F. Hsu); 2♂, same locality, 6. VIII. 2004, reared from *C. lanceolaris*, emgd. 3/VIII- 2/IX. 2004, HSU 04H6 (Y. F. Hsu, C. C. Hsieh & Y. C. Yang); 2♂, 2♀, same locality, 10. X. 2004, reared from *C. lanceolaris*, emgd. XI. 2004, HSU 04K17 (Y. Y. Chang); 1♂, same locality, 18/20. III. 2006, reared from *C. lanceolaris*, emgd. 8. IV. 2006, HSU 06C20 (Y. F. Hsu & H. C. Huang); 1♂, Lanyu, Sidaogou, 18/20. III. 2006, reared from *C. lanceolaris*, emgd. 19. IV. 2006, HSU 06C20 (Y. F. Hsu & H. C. Huang); 1♀, same locality, 18/20. III. 2006 (Y. F. Hsu & H. C. Huang) (genitalia preparation JYL220); 2♀, Lanyu, 28. XII. 2008 (C. H. Lin, jr & N. Y. Tsai); 1♂, 13. XII. 2000 (L. H. Wang) (genitalia preparation JYL211).

Description. Adult – Forewing length 23–31 mm. Male (PLATE 7, Fig. 33): Head hairy, white mixed with dark brown. Antennae dark brown banded with white scalings. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white tinged with olive-yellow ventrally. Abdomen with dorsum ground color dark brown, dusted with white scalings dorsally; venter white. Legs dark brown with white scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white on forewing, orange on hindwing, with veins darkened by dark brown scalings. Dark brown border with inner edge serrate at apex and along termen of forewing. A dark brown band present along termen on hindwing. A series of dark brown discal spots present on forewing. Wing

underside with markings similar to those of forewing, but a row of orange spots present subapically near apex on forewing, and a few faint, dark brown markings present along termen on hindwing. Female (PLATE 7, Figs. 34-35): Wing markings more extensive than those of males, with dark border along forewing and hindwing termen wider. Orange ground color of hindwing paler. Two white pads of densely packed elongate scales on venter of abdomen.

Male genitalia (PLATE 23, Fig. 129) –Tegumen slightly swollen dorsad, with uncus forming a beak with distal end pointed. Vinculum slender. Saccus moderately long, tapering anteriorly. Valva lobe-like, triangular, with distal end blunt. Phallus elongate, down-curved, with caudal end of aedeagus pointed dorsad. Juxta slender, U-shaped.

Female genitalia (PLATE 33, Fig. 167) – Corpus bursae oval. Ductus bursae mostly membraneous, with caudal end forming a sclerotized ring. Sterigma forming a dome-like structure. Signum as a heavily sclerotized, longitudinal band, enlarged cephalically. Prominent spine tuft at both cephalic and caudal ends, surface armed with short spines. Anal papillae setose. Posterior apophyses short, rod-like. Anterior apophyses vestigial.

Global distribution. Himalayas, India, Sri Lanka, Indochina, Indonesia, Southwest to East China, Taiwan.

Distribution in Taiwan. Only found in Ludao and Lanyu offshore of Taidong County for the present.

Larval Host plant(s). Capparaceae: *Capparis lanceolaris* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The populations found on Ludao and Lanyu is believed to have arrived from the Philippines, successfully established by late 1980s or early 1990s (Hsu, 2013).

形態特徵：成蝶前翅長 23–31mm。雄蝶 (圖 33)：頭具毛，白色混黑褐色。觸角黑褐色雜有白色環狀鱗。口器黑褐色，下唇鬚前伸，白色混褐色，腹面具毛。胸部黑褐色，背面覆有灰白色毛，腹面白色帶有橄欖黃綠色調。腹部體背底色黑褐色，背面散佈白色鱗，腹面白色。足呈黑褐色，具白色鱗，腿節腹面明顯有毛。前翅三角形，前緣凸，外緣和後緣近筆直。前翅背面底色白色，後翅橙色，翅脈深色被黑褐色鱗。前翅先端沿外緣有黑褐色帶，其向內側的邊緣呈鋸齒狀，後翅沿外緣有一黑褐色帶，前翅中央有一列黑褐色斑點。翅腹面斑紋與背面相似，但靠近前翅先端處有一列橙色斑點，後翅沿外緣有一些模糊黑褐色斑紋。雌蝶 (圖 34–35)：翅斑紋較雄蝶廣泛，沿前翅和後翅外緣的黑帶較寬。後翅底色較淺色，呈橙黃色。腹部腹面具有由白色細長鱗片構成的鱗墊。

雄交尾器 (圖 129)：背兜背面略膨大，鉤突形成一喙狀，末端尖銳。基腹弧纖細，囊突長，向前端漸縮。抱器葉狀、三角形、末端鈍。陽莖長、下彎，陽莖器尾端背面尖銳。陽基軛片纖細，U 形。

雌交尾器 (圖 167)：交尾囊卵狀。交尾囊管近基部膜質，末端形成骨化環。交尾孔板形成圓頂狀結構。花壁為高度骨化縱帶，前端膨大，前後兩端有明顯針簇，表面具短刺。肛突具毛。後內骨突短、棒狀。前內骨突退化。

世界分布：喜馬拉雅、印度、斯里蘭卡、中南半島、印尼、中國西南至華東及臺灣。

臺灣分布：目前僅發現於臺東外海綠島及蘭嶼。

幼蟲寄主植物：白花菜科蘭嶼山柑。

生物學：一年多世代。

註記：綠島及蘭嶼的族群被認為是於 1980 年代晚期或 1990 年代初期來自菲律賓，並且成功建立族群。

Genus *APPIAS* Hübner, [1819]

Type species: *Papilio zelmira* Stoll, [1780]

Diagnostic characters for the genus include: 1) 4 R veins on forewing, with R₄ and R₅ stalked at midway from forking point of R₄ and M₁ to distal end of R₄; 2) forewing of male pointed at apex; 3) male of many species with a pair of hair pencils on the membraenous area between saccus and A8.

Larval hostplant is in the family Capparaceae and Euphorbiaceae.

6 species have been recorded from Taiwan. Of them, 3 species are aboriginal, one may be migratory species forming metapopulation with intermittent colonies, the other immigrated and successfully established recently, another is an occidental, straying species.

尖粉蝶屬

本屬的鑑別特徵包括：1) 前翅具四條 R 脈，R₄ 與 R₅ 共柄，位置於 R₄ 與 M₁ 分叉點到 R₄ 末端中間；2) 雄蝶前翅先端尖；3) 許多種雄蝶在第 8 腹節與囊突之間的膜區具有一對毛筆器。

幼蟲寄主植物為白花菜科及大戟科植物。

本屬臺灣有記錄者 6 種，其中有 3 種是原生種，1 種可能是遷徙性種類的間歇性群聚形成的關聯族群，1 種是晚近遷入並成功建立族群，另 1 種是偶發性的物種。

Appias olferna Swinhoe, 1890 (鑲邊尖粉蝶 / 八重山粉蝶 / 利比尖粉蝶)

Appias olferna Swinhoe, 1890: The Annals and magazine of natural history; zoology, botany, and geology (Series 6) 5: 358. (Type locality: “Maldah” [Malda, India])

Appias irvinii Swinhoe, 1890: The Annals and magazine of natural history; zoology, botany, and geology (Series 6) 5: 359. (Type locality: “Mandalay, Upper Burmah”)

Appias libythea f. *sopara* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 147.

(Type locality: “Siam; Assam”)

Ssp. *peducaea* Fruhstorfer, 1910

PLATE 8, Figs. 36-39; PLATE 23, Fig. 130; PLATE 33, Fig. 168

Appias libythea peducaea Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 148.

(Type locality: “Luzon, Mindoro”)

Specimens examined:

TAINAN CITY [= TAINAN Co.]: 1♂, 1♀, Yongkang, 5. IX. 2010 (Y. F. Hsu); 1♂, 1♀, same locality, 26. IX. 2010 (Y. F. Hsu); 1♂, 2♀, same locality, 9. II. 2011 (Y. F. Hsu); 2♀, Xinhua, Dakeng, 80m, 10/11. II. 2006 (Y. F. Hsu); 1♀, same locality, reared from *Cleome rutidosperma* (16°C), emgd. 24. XII. 2006, HSU 06L25 (Y. F. Hsu); 1♀, Xinhua, 13. IX. 2009 (Y. F. Hsu); 1♂, 1♀, same locality, Xinhua, 24. XI. 2016 (L. Huang) (genitalia preparation JYL245, JYL246). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 2♂, Meinong, Shuangxi, 150m, 8. II. 2006 (Y. F. Hsu); 3♀, same locality, 31. XII. 2006 (Y. F. Hsu); 2♂, same locality, 31. XII. 2006 (Y. F. Hsu); 2♂, 2♀, same locality, 22. I. 2007 (Y. F. Hsu); 1♀, Xiaogang, Dalinpu, 0/20m, reared from *C. rutidosperma*, emgd. 7. XII. 2003, 03L49 (Y. F. Hsu); 1♀, Xiaogang, Dalinpu, 0/20m, 9/10. XI. 2003, reared from *C. rutidosperma*, emgd. 19. XI. 2003, HSU 03L16 (Y. F. Hsu); 1♂, Xiaogang, Dalinpu, 28. VIII. 2004, reared from *C. rutidosperma*, emgd. 7. IX. 2004, HSU 04H41 (Y. F. Hsu); 2♀, Fengshan, 0/40m, 9. XI. 2003, reared from *C. rutidosperma*, emgd. 21. XI. 2003, HSU 03L13 (Y. F. Hsu & S. C. Chen); 2♂, Fengshan, 8. XI. 2003, reared from *C. rutidosperma*, emgd. 24. XI. 2003, HSU 03L12 (S. C. Chen); 1♂, 1♀, Tianliao, 100m, 16. X. 2010 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, Sandimen, 300m, 2. I. 2009 (Y. F. Hsu); 1♂, same locality, 20. II. 2009 (Y. F. Hsu); 1♀, Sandimen, 250m, 10. II. 2007 (Y. F. Hsu).

Description. Adult – Forewing length 21–32 mm. Male (PLATE 8, Figs. 36-37): Head hairy, white mixed with dark brown. Antennae dark brown, creamy yellow at distal end. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white ventrally. Abdomen covered with white scalings. Legs covered with white scalings. Forewing triangular, with costa slightly convex, termen and dorsum nearly straight, apex somewhat pointed. Wing uppersides ground color white, borders decorated with dark brown, spike-shaped markings. Wing underside with veins of distal portion of forewing and most area

of hindwing darkened by dark brown scalings in wet season, but dark scalings along veins greatly reduced in dry season. A dark, narrow band present along posterior edge of discoidal cell of hindwing. Female (PLATE 8, Figs. 38-39): Dark markings much more extensive on wing uppersides, with a prominent, dark brown, thick strip along costa of forewing proximally; dark borders broad with white windows in wet season, but reduced in dry season. Dark scalings along veins of wing underside faint and tinged with olive yellow in wet season, also reduced in dry season.

Male genitalia (PLATE 23, Fig. 130) –Tegumen elongate, with uncus as a slightly down-curved, long beak. Vinculum slender, curved. Saccus short. Valva lobe-like, attenuate caudad, with distal end forming a spine. Phallus elongate, slender, straight, with distal end acute; phallobase possessing prominent keel-like structure ventrally. Juxta small, with a U-shaped depression dorsally. A pair of hair pencils consisted of brown, pale brown or white hairs present on the membraenous area between saccus and A8.

Female genitalia (PLATE 33, Fig. 168) – Corpus bursae oval. Ductus bursae membranous, broadened cephalad, with a sclerotized tube posteriorly. Sterigma forming a sclerotized crown. Signum as a heavily sclerotized, transeverse band with both ends enlarged, armed with short spines. Anal papillae densely setose. Posterior apophyses and anterior apophyses short, slender.

Variation. This species demonstrates considerable seasonal variation. Wing undersides of both sexes possesses dark scalings along veins in wet season, but dark scalings reduced, with wing undersides tinged with yellow in dry season. Markings of borders on wing uppersides are also reduced in dry season, but forewing border forms a solid band.

Global distribution. Indochina, Sundaland, Philippines (Yata, 1985), introduced to Taiwan and successfully established (Hsu, 2013).

Distribution in Taiwan. Currently lowland of southern Taiwan.

Larval Host plant(s). Capparaceae: *Cleome rutidosperma*. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The populations in Taiwan was found by 2002, probably originated from straying individuals from northern Philippines (Hsu, 2013). *A. olferna* is considered a race of *Appias libythea* (Fabricius, 1775) by some authors, but Yata (1985) regards the populations of “*Appias libythea*” east of Indochina as a distinct species, and *Appias libythea* a species endemic to India.

形態特徵：成蝶前翅長 21–32mm。雄蝶 (圖 36–37)：頭具毛，白色混黑褐色。觸角黑褐色，末端乳黃色。口器黑褐色，下唇鬚前伸，白色混褐色，腹面具毛。胸部黑褐色，背面覆灰白色毛，腹面白色。腹部覆有白色鱗。足覆白色鱗。前翅三角形，前緣略凸，外緣及內緣近筆直，先端略尖，翅背面底色白色，邊帶具有黑褐色釘狀斑紋。翅腹面在雨季時前翅外側翅脈及後翅大部分區域顏色變深並有黑褐色鱗，乾季時則沿翅脈黑色鱗減退，後翅中室沿後緣有一黑色線紋。雌蝶 (圖 38–39)：翅腹面深色斑紋廣泛，前翅沿前緣近基部具有一明顯黑褐色粗條帶；黑邊寬闊，在雨季內有白色窗格紋，但在乾季消退，雨季時，翅腹面沿翅脈有深色鱗，並帶有橄欖黃綠色調，乾季時亦減退。

雄交尾器 (圖 130)：背兜長。鉤突略下彎長喙狀。基腹弧纖細彎曲。囊突短。抱器葉狀，末端截平狀並於後端形成一刺。陽莖長、纖細、筆直，末端銳尖。陽莖基腹面具明顯龍骨狀構造。陽基軛片小，背面呈 U 形壓扁狀。囊突與第 8 腹節間膜質部份具一對褐色、淺褐色或白色毛形成之毛束。

雌交尾器 (圖 168)：交尾囊卵狀。交尾囊管膜質，前部變寬闊，後端具一骨化管。交尾孔板形成骨化冠。花壁為高度骨化橫帶，兩端膨大且有短刺。肛突密佈毛。後內骨突與前內骨突短且纖細。

變異：本種具有相當程度的季節變異。雨季時，翅腹面沿翅脈具有黑色鱗，但乾季時黑色鱗片減退，翅腹面密佈黃色鱗。乾季時翅背面的帶狀翅紋亦退化，但前翅邊緣形成實心帶狀。

世界分布：中南半島、蘇門答臘、菲律賓，已於近年進入臺灣並成功立足。

臺灣分布：目前見於南臺灣低地。

幼蟲寄主植物：白花菜科平伏莖白花菜。

生物學：一年多世代。

註記：臺灣的族群於 2002 年被發現，可能源自菲律賓北部。有些學者認為 *A. olferna* 與 *A. libythea* 同種，但 Yata (1985) 認為中南半島以東之「*A. libythea*」族群為 1 獨立種 *A. olferna*，而 *A. libythea* 則特有於印度地區。

***Appias albina* (Boisduval, 1836) (尖粉蝶 / 白翅尖粉蝶 / 尖翅粉蝶)**

Pieris albina Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 480. (Type locality: “Ambonie”)

Pieris neombo Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 539. (Type locality: “Brésil, environs de Bahia et Fernamboue” [error, = Ambon])

Tachyris cynisca Wallace, 1867: Transactions of Entomological Society London, series 3, 4 (3): 375. (Type locality: “Bouru”).

***Ssp. semperi* Moore, 1905**

PLATE 8, Figs. 40-42; PLATE 24, Fig. 131; PLATE 33, Fig. 169

Catophaga semperi Moore, 1905: Lepidoptera Indica 7: 14. (Type locality: N. Philippines)

Appias kawakamii Matsumura, 1909: Entomologische Zeitschrift 23 (18): 88. (Type locality: “Kotosho Insel”)

***Ssp. darada* C. & R. Felder, [1865]**

Pieris darada C. & R. Felder, [1865]: Reise Fregatte Novara, Bd 2 (Abth. 2) (2): 166. (Type locality: Silhet)

Appias albina confusa Fruhstorfer, 1910: in Seitz, Die Gross-Schmetterlinge der Erde 9: 154, pl. 60 d. (preoccupied by *Belenois confusa* Butler, 1872 [= *Appias albina confusa* (Butler, 1872)]) (Type locality: Sikkim; Assam; Siam; Tonkin)

Specimens examined:

Ssp. semperi : ZHANGHUA [= CHANGHUA] Co.: 1♀, Xizhou, Xipan, 25. X. 2009, reared from *Drypetes littoralis*, emgd. 3. XI. 2009, HSU 09K16 (Y. F. Hsu); 1♂, 9♀, same locality, 7. XII. 2009, reared from *D. littoralis*, emgd. 12. XII. 2009, HSU 09M1 (Y. F. Hsu); 2♂, 8♀, 1 gynandromorph, same locality, 20. XII. 2009 (Y. F. Hsu); 1♂, 1♀, Beidou [Xizhou], Xipan, 20. XII. 2009, reared from *D. littoralis*, emgd. 26. XII. 2010, HSU 09M9 (Y. F. Hsu); 3♀, same locality, 20. XII. 2009 (Y. F. Hsu); 1♂, Beidou, 8. XI. 2015 (L. Huang) (genitalia preparation JYL167). TAIDONG [= TAITUNG] Co.: 1♀, Lanyu, Longmenxi, 6/8. VIII. 2004, reared from *D. littoralis*, emgd. 25. VIII. 2004, HSU

04H9 (Y. F. Hsu, C. C. Hsieh & Y. J. Yang); 1♀, Lanyu, Sidaogou, 27/30. III. 2010 (Y. F. Hsu); 1♀, Taidong Forest Park, 30. X. 2015 (L. Huang) (genitalia preparation JYL168).

Ssp. *darada*: JINMEN [=KINMEN] Co.: 2♂, 2♀, Shuitou, emgd. 2/3. VI. 2015 (Y. J. Chang).

Description. Adult – Forewing length 20–31 mm. Male (PLATE 8, Fig. 40): Head hairy, white mixed with brown. Antennae dark brown, banded with white. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by flemish white hairs dorsally, white tinged with yellow ventrally. Abdomen dark brown, covered with white scalings. Legs covered with white scalings. Forewing triangular, with margins straight, apex pointed. Wing uppersides ground color white, somewhat glossy, with dark margin around apex of forewing. Wing underside with hindwing and distal portion tinged with yellow. Female (PLATE 8, Figs. 41-42): Forewing apex not pointed. Dark markings present by borders of wings. Wing underside also with some dark brown markings. Wing ground color white or yellow.

Two subspecies recognized: the populations found on main island of Taiwan and associated islands are considered belonging to ssp. *semperi* (PLATE 8, Figs. 40-42), whereas those found in Jinmen Islands belong to ssp. *darada*. The ground color of wing undersides of ssp. *darada* is darker, tinged with orange in contrast to nearly white or slightly tinged with yellow in ssp. *semperi*.

Male genitalia (PLATE 24, Fig. 131) – Tegumen elongate, with uncus as a slightly down-curved, long beak. Vinculum slender, curved. Saccus short, bulb-like. Valva lobe-like, produced caudad with distal end round. Phallus elongate, slender, strongly bent near base of aedeagus, with phallobase possessing prominent keel-like structure ventrally. Juxta small, pincer-like. A pair of hair pencils consisted of dark brown and pale brown hairs present on the membraenous area between saccus and A8.

Female genitalia (PLATE 33, Fig. 169) – Corpus bursae oval. Ductus bursae membranous, tapering toward caudal end, with a sclerotized ring posteriorly. Sterigma

forming a dome-like pouch. Signum as a heavily sclerotized, transeverse band armed with short spines. Anal papillae densely setose. Posterior apophyses short, slender. Anterior apophyses stout, digitate.

Variation. This species has prominent sexual dimorphism and demonstrates considerable seasonal variation. Wings of males lack dark scalings, with only few dark brown scalings near forewing apex in wet season. By contrast, ground color of wings of females may be white or yellow, and sometimes different on uppersides and undersides. Dark markings vary seasonally, with dark brown scalings more prominent in wet season.

Global distribution. South and Northeast India, Sri Lanka, Eastern Himalayas, Indochina, Sundaland, Lesser Sunda, Philippines, Sulawesi, New Guinea, North Australia, southwest and southern China, and southern Taiwan (Yata, 1985, 2016).

Distribution in Taiwan. Ssp. *semperi* is found on lowland of southern Taiwan, including Ludao and Lanyu. Individuals belonging to ssp. *darada* has been discovered from Jinmen Islands in recent years, but it requires further observation to determine if a residential population has formed.

Larval Host plant(s). Euphorbiaceae: *Drypetes littoralis* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. Population density of this species in Taiwan was usually low in the past, but in recent years, its hostplant has been planted for ornamental purpose, resulting in intermittent outbreaks of this species (Hsu *et al.*, 2016).

形態特徵：成蝶前翅長 20–31mm。雄蝶 (圖 40)：頭具毛，白色混褐色。觸角黑褐色，具白色橫帶。口器黑褐色。下唇鬚前伸，白色混褐色，腹面具毛。胸部背面褐色覆有鉛白色毛，腹面白色帶有黃色調。腹部黑褐色，覆有白色鱗片，前翅三角形，邊緣筆直，先端尖。翅背面底色白色，略帶光澤，前翅先端周圍具黑邊。翅腹面在

後翅及靠外部帶有黃色調。雌蝶 (圖 41–42)：前翅先端不尖銳，翅邊緣具黑色斑紋，翅腹面也具有一些黑褐色斑紋，翅底色白色或黃色。

臺灣地區有兩亞種：*ssp. semperi* 見於本島與鄰近島嶼 (圖 40–42)，*ssp. darada* 曾於金門地區發現。後者翅腹面色調較暗而泛橙黃色，前者則色調淺，僅略帶淺黃色。

雄交尾器 (圖 131)：背兜長。鉤突略下彎長喙狀。基腹弧纖細彎曲。囊突短、球狀。抱器葉狀，向尾端突出，末端圓鈍。陽莖修長、纖細。陽莖器近基部強彎曲。陽莖基腹面具明顯龍骨狀構造。陽基軛片小、鉗狀。囊突與第 8 腹節間膜質部份具一對黑褐色及淺褐色毛形成之毛束。

雌交尾器 (圖 169)：交尾囊卵狀。交尾囊管膜質，向尾端漸縮，後端具骨化環。交尾孔板形成圓頂狀袋。花壁為高度骨化橫帶，具短刺。肛突密生毛。後內骨突短、纖細。前內骨突粗而呈指狀。

變異：本種具明顯雌雄二型性，且季節變異顯著。雨季時，雄蝶翅黑色鱗少，僅前翅近先端呈黑褐色，雌蝶翅則底色白色或黃色，有時背、腹面不同色，黑色斑紋隨季節變化，黑褐色鱗在雨季較為明顯。

世界分布：印度南部及東北部、斯里蘭卡、東喜馬拉雅、中南半島、蘇門答臘、小巽他群島、菲律賓、蘇拉威西、新幾內亞、澳洲北部、華西南、華南。

臺灣分布：亞種 *ssp. semperi* 主要見於臺灣本島南部低地，包括綠島和蘭嶼。亞種 *ssp. darada* 近年曾出現在金門地區，是否已為長駐族群尚待觀察。

幼蟲寄主植物：大戟科鐵色。

生物學：一年多世代。

註記：本種過去在臺灣的族群密度通常很低，但近年來，其寄主植物鐵色 (*Drypetes littoralis*) 廣泛栽植用於園藝，造成間歇性族群擴張。

***Appias paulina* (Cramer, [1777]) (黃尖粉蝶 / 蘭嶼粉蝶 / 寶玲尖粉蝶)**

Papilio paulina Cramer, [1777]: De uitlandsche kapellen 2: 21, pl. 110, figs. E, F. (Type locality: “Côte de Coromandel, à Tranquebar & dans l’isle de Java, près de Batavia”)

Ssp. minato* Fruhstorfer, 1899*PLATE 9, Figs. 43-45; PLATE 24, Fig. 132; PLATE 33, Fig. 170**

Catophaga paulina minato Fruhstorfer, 1899: Entomologische Zeitung 59 (10-12) : 409. (Type locality: Ishigaki)

Specimens examined:

JILONG [= KEELUNG] CITY: 1♂, Longgang Trail, 5. IX. 2008 (C. K. Wang). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]:** 3♂, Nanya, 9. X. 1998 (Y. F. Hsu); 4♂, 1♀, same locality, 13. X. 1998 (Y. F. Hsu); 1♂, Nanya, 20m, 11. IX. 1998 (Y. T. Lo); 1♀, Ruifang, Nanya, 26. X. 2009 (C. K. Wang). **YILAN Co.:** 1♂, Toucheng, Guishan Is., 5/6. XI. 2005 (H. C. Huang); 1♂, same locality, 23. IX. 2006 (H. C. Huang); 1♂, same locality, 15. VI. 2007 (H. C. Huang). **TAIDONG [= TAITUNG] Co.:** 3♂, Lanyu, Sidaogou, 18/20. III. 2006 (Y. F. Hsu & H. C. Huang); 1♂, same locality, 18. IV. 2006 (Y. F. Hsu); 1♂, same locality, 10. IV. 2007 (Y. F. Hsu); 1♂, 2♀, same locality, 21/23. XI. 2008 (C. H. Lin, jr & C. L. Huang) (genitalia preparation JYL246, JYL265); 1♂, Lanyu, 19. II. 2009 (C. H. Lin, jr); 1♂, 1♀, same locality, 10. III. 2009, reared from *Liodendron formosanum*, emgd. 12. IV. 2009, HSU 09C17 (Y. F. Hsu); 1♀, same locality, 27/30. III. 2010 (Y. F. Hsu); 1♂, 1♀, same locality, 28. III. 2010 (Y. F. Hsu & J. H. Lin); 2♂, 1♀, same locality, 29. III. 2010 (Y. F. Hsu); 1♀, same locality, 30. III. 2010 (Y. F. Hsu & J. H. Lin).

Description. Adult – Forewing length 28–35 mm. Male (PLATE 9, Figs. 43-44): Head hairy, yellowish white mixed with brown. Antennae dark brown, banded with white. Proboscis dark brown. Labial palpus porrect, yellowish white mixed with brown, with hairs ventrad. Thorax dark brown covered by flemish white hairs dorsally, white tinged with yellow ventrally. Abdomen dark brown, covered with white scalings. Legs covered with white scalings. Forewing triangular, with margins straight, apex obtuse. Wing uppersides ground color white, with dark brown scalings along veins at apex of forewing. Wing underside with hindwing and distal portion tinged with yellow. Female (PLATE 9, Fig. 45): Dark markings present by borders of wings, with prominent dark, tilt band on forewing. Wing underside also with some dark brown markings.

Male genitalia (PLATE 24, Fig. 132) –Tegumen elongate, with uncus robust, tapering into a slightly down-curved beak. Vinculum slender, slightly curved. Saccus short, bulb-like. Valva simple, lobe-like, produced caudad with distal end rounded. Phallus elongate, slender, bent near base of aedeagus, with phallobase possessing prominent keel-like structure ventrally. Juxta pincer-like. A pair of hair pencils consisted of dark brown hairs present on the membraenous area between saccus and A8; an addition dark brown hair pencil present dorsally.

Female genitalia (PLATE 33, Fig. 170) – Corpus bursae oval. Ductus bursae membranous, tapering toward caudal end, with a weakly sclerotized ring posteriorly. Sterigma forming a dome-like pouch. Signum as a heavily sclerotized, transeverse, invaginated band armed with spines. Anal papillae densely setose. Posterior apophyses short, slender. Anterior apophyses vestigial.

Variation. This species possesses prominent sexual dimorphism and demonstrates considerable seasonal variation. Dark scalings on wings of male are not prominent. By contrast, dark markings of females are extensive with considerable seasonal variation; dark brown scalings are more prominent in wet season.

Global distribution. South India, Indochina, South East Asia, New Guinea, North and East Australia, New Caledonia, New Hebrides, Samoa, Japan (Yaeyama Islands), and Taiwan, etc. (Yata, 1985).

Distribution in Taiwan. Northeast corner and southern lowland of Taiwan, including Ludao and Lanyu.

Larval Host plant(s). Euphorbiaceae: *Drypetes littoralis* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species was considered as a straying species (e. g. Hamano, 1986),

but perhaps the species in Taiwan has a metapopulation structure, with colonies not permanently established at a few sites, merely representing intermittent colonies of metapopulation.

形態特徵：成蝶前翅長 28–35mm。雄蝶 (圖 43–44)：頭具毛，黃白色混褐色。觸角黑褐色，具白色橫帶。口器黑褐色。下唇鬚前伸，黃白色混褐色，腹面具毛。胸部黑褐色，背面覆有鉛白色毛，腹面白色帶有黃色調。腹部黑褐色，覆有白色鱗。足部覆有白色鱗。前翅三角形，邊緣筆直，先端圓鈍。翅背面底色白色，前翅先端沿翅脈具黑褐色鱗。翅腹面於後翅及靠外側帶黃色調。雌蝶 (圖 45)：翅邊緣具深色斑紋，前翅具明顯暗色斜帶，翅腹面亦有深褐色斑紋。

雄交尾器 (圖 132)：背兜長。鉤突粗大，漸細且略下彎呈喙狀。基腹弧纖細、略彎曲。囊突短、球狀。抱器簡單、葉狀，向尾端突出、末端圓鈍。陽莖修長，纖細。陽莖器近基部彎曲。陽莖基腹面具明顯龍骨狀構造，陽基軛片螯狀。囊突與第 8 腹節間膜質部份具一對褐色毛形成之毛束，背側另有一束褐色毛束。

雌交尾器 (圖 170)：交尾囊卵狀。交尾囊管膜質，向末端漸細，後端具微骨化環。交尾孔板形成圓頂狀。花壁為高度骨化之橫向內陷帶，具刺。肛突密生毛。後內骨突短、纖細。前內骨突退化。

變異：本種具明顯雌雄二型性及相當程度的季節變異。雄蝶翅面黑色鱗不顯著，雌蝶黑色斑紋則較明顯且有較多季節變異，雨季型黑褐色紋尤其顯著。

世界分布：南印度、中南半島、東南亞、新幾內亞、澳洲北部及東部、新喀里多尼亞、新赫布里底群島、薩摩亞、日本八重山群島及臺灣等。

臺灣分布：臺灣東北角地區及南部低地，包括綠島和蘭嶼。

幼蟲寄主植物：大戟科鐵色。

生物學：一年多世代。

註記：本種曾被認為是外來偶產種，但很可能本種在臺灣具有關聯族群結構，某些地點無法建立永久族群，而以關聯族群的暫時性群落存在。

***Appias lyncida* (Cramer, [1777]) (異色尖粉蝶 / 靈奇尖粉蝶 / 臺灣粉蝶)**

Papilio lyncida Cramer, [1777]: De uitlandsche kapellen 2 (9-16): 52, pl. 121, f. B. (Type locality: “Surinam”, error, = Java)

Papilio hippo Cramer, [1779]: De uitlandsche kapellen 3 (17-21): 4, pl. 195, f. B, C. (Type locality: not stated)

Pieris enyo Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 481. (Type locality: Java)

Tachyris lyncida fabiola Fruhstorfer, 1905: Societas Entomologica 20 (1): 3. (Type locality: Bawean)

Ssp. *eleonora* Boisduval, 1836**PLATE 9, Figs. 46-49; PLATE 24, Fig. 133; PLATE 34, Fig. 171**

Pieris eleonora Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 481, (Type locality: “Amboine”, error, Assam or Burma?)

Pieris formosana Wallace, 1866: Proceedings of the Zoological Society of London 1866 (2): 356. (Type locality: Formosa)

Appias vacans Butler, 1870: Transactions of the Entomological Society of London 1870 (4): 490. (Type locality: Darjeeling)

Appias hippoides Moore, 1881: Transactions of the Entomological Society of London 1881 (3): 312. (Type locality: NE.Bengal (Assam, Silhet, Darjeeling, Nepal))

Appias hippoides var. *epicoena* Swinhoe, 1889: Proceedings of the general meetings for scientific business of the Zoological Society of London 1889 (4): 398. (Type locality: Maldab, Bengal)

Appias lyncida hippoides f. *lurida* Fruhstorfer, 1910: in Seitz, Die Gross-Schmetterlinge der Erde 9 : 149. (Type locality: India)

Specimens examined:

TAIPEI CITY: 1♀, Wenshan, Gongguan campus, NTNU, 1. VI. 2004 (Y. F. Hsu); 1♀, same locality, 21. VII. 2009 (Y. F. Hsu); 1♂, Nangang, Academia Sinica, 18. V. 2015 (L. Huang) (genitalia preparation JYL170). **XINBEI CITY [= NEW TAIPEI CITY/TAIPEI Co.]:** 1♀, Wulai, Datongshan, 7. VII. 2004 (J. R. Chen). **TAOYUAN CITY [= TAOYUAN Co.]:** 1♂, Fuxing, Sule, 600m, 17. IX. 2008 (Y. F. Hsu & L. W. Wu); 1♂, Longtan, 7. IV. 2002 (Y. F. Hsu). **NANTOU Co.:** 1♂, Renai, Songchuangang, 2500m, 29. VI. 2006 (L. H. Wang). **TAIDONG [= TAITUNG] Co.:** 1♀, Lanyu, 29/31. III. 2008 (C. H. Lin, jr & N. Y. Tsai); 1♂, same locality, 8. VIII. 2008 (C. H. Wang). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 1♀, Liugui, 10. V. 2016 (J. Y. Liang) (genitalia preparation JYL169). **PINGDONG [= PINGTUNG] Co.:** 2♂, 1♀, Fangliao, Yuquan, 26. II. 2006 (Y. F. Hsu); 2♂, 2♀, Hengchun, Dajianshan, 15. I. 2006 (Y. F. Hsu); 1♀, same data, reared from *Capparis henryi* [= *C. micracantha*], emgd. 7. II. 2006, HSU 06A4; 1♀, Sandimen, 300m, 6. I. 2008 (Y. F. Hsu); 1♀, Liuqiu, Liuqiuyu, 7. III.

2010 (N. Y. Tsai); 1♀, Shizi, Xiaojianshan, 18. XII. 2005, reared from *C. henryi* [= *C. micracantha*], emgd. 26. I. 2006, HSU 05M35 (Y. F. Hsu).

Description. Adult – Forewing length 26–38 mm. Male (PLATE 9, Figs. 46-47): Head hairy, white mixed with brown. Antennae dark brown, banded with white. Proboscis dark brown. Labial palpus porrect, yellowish white mixed with brown, with hairs ventrad. Thorax dark brown covered by white hairs dorsally, white tinged with pale yellow ventrally. Abdomen dark brown, covered with white scalings. Legs covered with white scalings. Forewing triangular, with margins nearly straight, apex obtuse. Wing uppersides ground color white, with dark brown scalings along veins by termen forewing and hindwing. Wing underside ground color white, but hindwing and apex of forewing yellow. Prominent dark brown borders present along costa and termen of forewing, along termen of hindwing. Inner edge of dark borders along termen serrate. Female (PLATE 9, Figs. 48-49): Dark markings more extensive than those of males, especially in wet season, in which most of wing uppersides dark brown, with white stripes only in a few cells. Wing undersides of females in wet season with yellow scaling greatly reduced.

Male genitalia (PLATE 24, Fig. 133) – Tegumen elongate, with uncus as a down-curved hook. Vinculum slender, curved. Saccus short, bulb-like. Valva lobe-like, produced caudad with distal end round. Phallus elongate, slender, slightly down-curved, with phallobase possessing prominent fin-like structure ventrally. Juxta as a small triangular piece. A pair of hair pencils consisted of brown and pale brown hairs present on the membraenous area between saccus and A8.

Female genitalia (PLATE 34, Fig. 171) – Corpus bursae oval. Ductus bursae membranous, tapering toward caudal end, with a sclerotized ring posteriorly. Sterigma forming a dome-like pouch. Signum as a heavily sclerotized, transeverse, dumbbell-like band armed with short spines. Anal papillae densely setose. Posterior apophyses and anterior apophyses short, slender.

Variation. This species has prominent sexual dimorphism and demonstrates considerable seasonal variation. Dark scalings on wings of female are usually more prominent. In dry

season, wing patterns of female are similar to those of males, but with additional dark band along forewing costa on wing upperside. In wet season, much of wing uppersides are covered by brown scalings, with yellow scalings of wing undersides reduced.

Global distribution. South India, Sri Lanka, Indochina, South East Asia, West to East China, Taiwan (Yata, 1985).

Distribution in Taiwan. Lower to moderate elevations of main island, including Guishan Island.

Larval Host plant(s). Capparaceae: *Crateva adansonii*, *Capparis formosana*, *Ca. henryi*, and *Ca. floribunda*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The population in Taiwan was often considered as a subspecies, ssp. *formosana* Wallace, 1866, endemic to Taiwan (e. g. Shirozu, 1960), but Yata (1985) suggested it represents a synonym of ssp. *eleonora* (Boisduval, 1836).

形態特徵：成蝶前翅長 26–38mm。雄蝶 (圖 46–47)：頭具毛，白色混褐色。觸角黑褐色，雜白色帶。口器黑褐色。下唇鬚前伸，黃白色混褐色，腹面具毛。胸部背面黑褐色覆有白色毛，腹面白色帶有淺黃色調。腹部黑褐色，覆有白色鱗。足覆有白色鱗。前翅三角形，邊緣近筆直，先端圓鈍。翅背面底色白色，前翅與後翅外緣沿翅脈有黑褐色鱗片，翅腹面底色白色，但後翅與前翅先端黃色，沿前翅前緣及外緣，以及沿後翅外緣有明顯黑褐色帶，沿外緣的黑色帶靠內側邊緣呈鋸齒狀。雌蝶 (圖 48–49)：黑色斑紋較雄蝶廣泛，特別是雌蝶在溼季翅背面大多呈黑褐色，白色條帶僅出現在一些翅室。雨季時翅腹面黃色鱗明顯減退。

雄交尾器 (圖 133)：背兜長。鉤突下彎鉤。基腹弧纖細彎曲。囊突短、球狀。抱器葉狀，向後突出，末端圓鈍。陽莖長、纖細、略下彎。陽莖基腹面具明顯鰭狀構造。陽基軛片為三角形小片。囊突與第 8 腹節間膜質部份具一對褐色及淺褐色毛形成之毛束。

雌交尾器 (圖 171)：交尾囊卵狀。交尾囊管膜質，向末端漸縮，後端具骨化環。交尾孔板形成圓頂狀袋。花壁為高度骨化之啞鈴狀橫帶，具短刺。肛突密生毛。後內骨突和前內骨突短而纖細。

變異：本種具明顯雌雄二型性，並有明顯季節變異。雌蝶翅面黑色鱗通常較雄蝶明顯。乾季時，雌蝶翅紋與雄蝶相似，但翅背面沿前緣脈有額外的黑邊，雨季時，翅背面則大部分覆有褐色鱗，翅腹面黃色部份減退。

世界分布：南印度、斯里蘭卡、中南半島、東南亞、華西至華東及臺灣。

臺灣分布：分布本島低至中海拔，包括龜山島。

幼蟲寄主植物：白花菜科魚木、臺灣山柑、小刺山柑、多花山柑。

生物學：一年多世代。

註記：臺灣的族群曾常被視為 1 特有亞種 *ssp. formosana*，Yata (1985) 則認為其為亞種 *ssp. eleonora* 的同物異名。

***Appias indra* (Moore, 1857) (雲紋尖粉蝶 / 雲紋粉蝶 / 雷震尖粉蝶)**

Pieris indra Moore, 1857: Proceedings of the Zoological Society of London 1857: 103, pl. 44, f. 5. (Type locality: Darjeeling)

Pieris indra Moore, [1858]: in Horsfield & Moore, Catalogue of the lepidopterous insects in the museum of the Hon. East-India company 1: 74. (Type locality: Darjeeling)

Appias mahana Moore, 1877: The Annals and magazine of natural history, 4th series 20: 48. (Type locality: Darjeeling)

Hyposcritia imbecilis Moore, 1884: Journal of the Asiatic Society of Bengal 53: 46. (Type locality: Silhet; Assam)

Tachyris indigis Weymer, 1887: Entomologische Zeitung 48 (1-3): 11, pl. 1, fig. 3. (Type locality: "Nord Indien; Singapore")

***Ssp. aristoxemus* Fruhstorfer, 1908**

PLATE 10, Figs. 50-53; PLATE 24, Fig. 134; PLATE 34, Fig. 172

Appias indra aristoxemus Fruhstorfer, 1908: Entomologische Wochenblatt 25 (9): 38. (Type locality: "Formosa, Kagi")

Specimens examined:

JIAYI [= CHIAYI] Co.: 2♂, Fanlu, Chukou, 350m, 21. V. 2006 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♀, Lanyu, 29/31. III. 2008 (C. H. Lin, jr & N. Y. Tsai); 1♀, Lanyu, Sidaogou, 10. III. 2009 (Y. F. Hsu); 1♀, Donghe, Donghe Farm, 350m, 16. X. 2007 (Y. F. Hsu); 1♀, Hongye, 8. II. 1988 (Y. F. Hsu); 1♀, same locality, 16. V. 1988 (Y. F. Hsu); 1♀, Guanshan, Tienkuang, 20. X. 2001 (L. W. Wu & C. L. Huang) (genitalia preparation JYL249). **PINGDONG [= PINGTUNG] Co.:** 1♀, Shizi, Lilongshan, 17. II. 2008 (Y. F. Hsu); 1♂, 1♀, same locality, 500m, 1. III. 2008 (Y. F. Hsu); 6♂, 6♀, Shizi, Shuangliu, 200m, 10. VI. 2007, reared from *Drypetes littoralis*, emgd. 12/17. VI. 2007, HSU 07F5 (Y. F. Hsu); 1♀, Shizi, Shuangliu, 18. XII. 2005 (Y. F. Hsu); 2♀, Chunri, Dahanshan, 1300/1400m, 4. IV. 2000 (Y. F. Hsu); 1♂, Wutai, Ali, 31. V. 2016 (L. H. Wang) (genitalia preparation JYL250).

Description. Adult – Forewing length 22–32 mm. Male (PLATE 10, Figs. 50-51): Head hairy, white mixed with brown. Antennae dark brown, banded with white. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by flemish white hairs dorsally, white tinged with yellow ventrally. Abdomen dark brown, covered with white scalings. Legs covered with white scalings. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white, forewing with a prominent, dark brown border with a few small, white windows. Wing underside with hindwing and distal portion yellow or yellowish brown mottled with dark scalings to various extent; a prominent dark brown band by posterior edge of yellow area at forewing apex. Dark markings more extensive than those of males, with additional dark brown band or series of markings along hindwing termen. Dark brown band of forewing underside thicker.

Male genitalia (PLATE 24, Figs. 134) –Tegumen elongate, with uncus as a down-curved hook. Vinculum slender, curved. Saccus short, stout. Valva lobe-like, produced caudad with distal end truncate. Phallus elongate, slender, slightly down-curved, with phallobase possessing prominent keel-like structure ventrally. Juxta small, V-shaped. A pair of hair pencils consisted of white and brown hairs present on the membraenous area between saccus and A8.

Female genitalia (PLATE 34, Figs. 172) – Corpus bursae oval. Ductus bursae

membranous, tapering toward caudal end, with a sclerotized ring posteriorly. Sterigma forming a dome-like pouch. Signum as a heavily sclerotized, transeverse band armed with short spines. Anal papillae and densely setose. Posterior apophyses and anterior apophyses long, slender.

Variation. This species has considerable seasonal variation, especially in the females. Dark brown bands of hindwing uppersides are reduced in dry season. Yellow scalings on wing undersides are duller in dry season, turning brown or pale brown.

Global distribution. South and Northeast India, Sri Lanka, Eastern Himalayas, Indochina, Sundaland, Lesser Sunda, Mindanao, Southwest to South China, Taiwan (Yata, 1985).

Distribution in Taiwan. Mainly lowland of southern Taiwan.

Larval Host plant(s). Euphorbiaceae: *Drypetes littoralis* and *Liodendron formosanum* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. Although this species usually inhabit lowland of southern Taiwan, it may perform long distance migration and a large number may show up in central and northern Taiwan or areas of high elevations from time to time.

形態特徵：成蝶前翅長 22–32mm。雄蝶 (圖 50–51)：頭具毛，白色混有褐色。觸角黑褐色，雜白色橫紋。口器黑褐色。下唇鬚前伸，白色混褐色，腹面具毛。胸部背面黑褐色覆有鉛白色毛，腹面白色帶黃色調。腹部黑褐色，覆有白色鱗。足覆白色鱗。前翅三角形，前緣凸，外緣和內緣近筆直，翅背面底色白色，前翅具一明顯黑褐色帶，內有一些白色小窗紋。翅腹面於後翅及外側黃色或黃褐色，並雜有不同程度的黑色斑點，明顯黑褐色帶位於前翅先端黃色區域的後緣。雌蝶 (圖 52–53)：黑色斑紋較雄蝶廣泛，沿後翅外緣有額外黑褐色帶或條列斑紋，前翅腹面的黑褐色帶較粗。

雄交尾器 (圖 134)：背兜長。鉤突下彎鉤狀。基腹弧纖細、彎曲。囊突短、粗大。抱器葉狀，向後突出，末端截狀。陽莖長、纖細，略下彎。陽莖基腹面具明顯龍骨狀構造。陽基軛片小，V 形。囊突與第 8 腹節間膜質部份具一對白色及褐色毛形成之毛束。

雌交尾器 (圖 172)：交尾囊卵狀，交尾囊管膜質，向末端漸縮，後端具骨化環。交尾孔板形成圓頂狀袋。花壁為高度骨化橫帶，具短刺。肛突密生毛。後內骨突和前內骨突長且纖細。

變異：本種具相當程度的季節變異，尤其是雌蝶。乾季時後翅背面黑褐色帶減退，翅腹面黃色鱗較暗，呈褐或淺褐色調。

世界分布：印度南部及東北部、斯里蘭卡、東喜馬拉雅、中南半島、蘇門答臘、小巽他群島、民答那峨、華西南至華南及臺灣。

臺灣分布：主要分布臺灣南部低地。

幼蟲寄主植物：大戟科鐵色及臺灣假黃楊。

生物學：一年多世代。

註記：本種雖然主要棲息在臺灣南部低地，但具有長距離遷飛行為，有時會大量出現在臺灣中北部或高海拔地區。

Genus *PRIONERIS* Wallace, [1867]

Type species: *Pieris thestylis* Doubleday, 1842

Diagnostic characters for the genus include: 1) 4 R veins on forewing, with R₄ and R₅ stalked near midway from forking point of R₄ and M₁ to distal end of R₄; 2) a row of teeth present along forewing costa.

Larval hostplants are in the family Capparaceae.

1 species occurs in Taiwan.

Some authors considered the resemblance of the members of this genus to *Delias* species may involve mimicry significance, but Eliot (1992) pointed out that *Prioneris* species are much faster on the wing.

鋸粉蝶屬

本屬的鑑別特徵包括：1) 前翅具四條 R 脈，R₄ 與 R₅ 共柄位於接近 R₄ 與 M₁ 分叉點與 R₄ 末端之中央；2) 前翅前緣具有一列鋸齒。

幼蟲寄主植物為白花菜科植物。

臺灣有 1 種。

有些研究者認為本屬中與艷粉蝶屬相似之物種，可能涉及擬態現象，但 Eliot (1992) 指出鋸粉蝶屬的種類飛行速度較快，擬態關係是否成立仍存疑。

Prioneris thestylis (Doubleday, 1842) (鋸粉蝶 / 斑粉蝶)

Pieris thestylis Doubleday, 1842: In Gray: Zoological Miscellany: 76. (Type locality: "N. India")

Pieris seta Moore, 1857: Proceedings of the Zoological Society of London 1857 (333): 102, pl. 44, fig. 3. (Type locality: "Bootan" [Bhutan])

Prioneris watsonii Hewitson, 1868: Transactions of Entomological Society of London, series 3 (1): 99. (Type locality: N. India?)

Prioneris thestylis jugurtha Fruhstorfer, 1910: in Seitz, Die Gross-Schmetterlinge der Erde 9: 136. (Type locality: Thailand)

Ssp. formosana Fruhstorfer, 1903

PLATE 10, Fig. 54; PLATE 11, Fig. 55; PLATE 25, Fig. 135; PLATE 34, Fig. 173

Prioneris thestylis formosana Fruhstorfer, 1903: Berliner Entomologische Zeitschrift 48 (1/2): 109. (Type locality: "Süd-Formosa, Takau")

Specimens examined:

XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]: 1♂, 1♀, Sanzhi, Datunshan, 950m, 3. VII. 2008 (Y. F. Hsu); 1♂, Wulai, 29. IV. 2001 (D. J. Lin & X. H. Xiao);

1♀, Shiding, Ergeshan, 600m, 5. II. 2010 (N. Y. Tsai); 1♀, Sanxia, Beichatianshan, 1200/1700m, 18. V. 2001 (Y. T. Lo). **NANTOU Co.:** 1♂, Renai, Huisun, 29. IV. 2006 (Y. F. Hsu); 1♀, Renai, Jiantai Forest Trail, reared from *Capparis sabiaefolia*, emgd. 3. II. 2009 (C. C. Lu); 1♂, 1♀, Renai, Guandaoshan, 27. VII. 2016 (J. Y. Liang) (genitalia preparation JYL223, JYL209). **ZHANGHUA [= CHANGHUA] Co.:** 1♂, 1♀, Qingshuiyan, 16. III. 2006 (C. M. Wu). **PINGDONG [= PINGTUNG] Co.:** 1♀, Shizi, Shuangliu, 200/400m, 8. III. 2006 (Y. F. Hsu); 1♀, Shizi, Lilongshan, 17. II. 2008 (Y. F. Hsu); 1♂, same locality, 1. III. 2008 (Y. F. Hsu); 1♂, Wutai, Yichangshan, 1100/1400m, 15/16. III. 2009 (Y. F. Hsu & H. C. Huang); 1♂, Wutai, Xiaogui Lake, 20. IV. 2002 (L. W. Wu); 1♂, Wutai, Ailiaobeixi/Bayouxi, 500/900m, 14/17. II. 2008 (Y. F. Hsu & H. C. Huang); 1♂, Wutai, Wutoushan, 1200m, 10/11. IV. 1998 (Y. F. Hsu).

Description. Adult – Forewing length 37–44 mm. Male (PLATE 10, Fig. 54): Head hairy, dark brown mixed with white. Antennae dark brown, with white scalings at distal end. Proboscis dark brown. Labial palpus porrect, brown mixed with white, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, dark brown mixed with white ventrally. Abdomen with dorsum ground color dark brown, covered with white scalings. Legs dark brown with white scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight, apex slightly produced. A row of teeth present along costa of forewing. Wing uppersides ground color white, with dark brown borders along forewing costa and termen, and along termen of hindwing. Additional dark brown discal bands in anterior portion of forewing. Veins darkened with underside and apex mostly yellow. Wing undersides with dark brown markings more extensive than those of uppersides, forming a “network” pattern. Female (PLATE 11, Fig. 55): Wing patterns similar to those of male but dark markings further developed, with discal band present on hindwing upperside. No teeth along costa of forewing.

Male genitalia (PLATE 25, Fig. 135) – Tegumen broad, with a transverse, medial depression; uncus, stout, down-curved, beak-like. Saccus moderately elongate, rod-shaped. Valva lobe-like, with distal end forming a triangular process. Phallus slightly twisted. Juxta small, with lateral arms.

Female genitalia (PLATE 34, Fig. 173) – Corpus bursae oval, with prominent appendix bursae. Ductus bursae mostly heavily sclerotized. Sterigma forming a elongate dome. Signum ovate, armed with spines laterally. Anal papillae setose. Posterior apophyses slender, bent. Anterior apophyses robust.

Variation. The ground color of wing uppersides of female is usually tinged with yellow in wet season.

Global distribution. Himalayas, Northeast and Northwest India, Indochina, Malaya, Southwest to South China, Taiwan.

Distribution in Taiwan. Mainly in low to moderate elevations, but seldom seen in Northern Taiwan.

Larval Host plant(s). Capparaceae: *Capparis sabiaefolia*. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. Wing pattern of this species is somewhat similar to *Delias lativitta* and *D. berinda* occurring in Taiwan (Shirôzu, 1960), but *P. thestylis* is faster and more powerful on the wing compared to *Delias* species. Moreover, *P. thestylis* is mainly found at low elevational habitats in Taiwan, whereas *D. lativitta* and *D. berinda* are mainly found at higher elevations.

形態特徵：成蝶前翅長 37–44mm。雄蝶 (圖 54)：頭具毛，黑褐色混白色。觸角黑褐色，末端具白色鱗片。口器黑褐色，下唇鬚前伸，褐色混白色，腹面具毛。胸部黑褐色，背面覆有灰白色毛，腹面黑褐色混白色。腹部體背底色黑褐色，覆有白色鱗片。足呈黑褐色，具白色鱗片，腿節腹側明顯有毛。前翅三角形，前緣凸，外緣和後緣近筆直，先端略突出。前翅沿前緣有一列齒。翅背面底色白色，前翅前緣、外緣及沿後翅外緣具有黑褐色邊，前翅前方有黑褐色中央帶，翅腹面及先端翅脈深，多為黃色。翅腹面黑褐色斑紋較背面廣泛，形成網狀模樣。雌蝶 (圖 55)：翅紋與雄蝶相似，但深色斑紋更發達，後翅背面具中央帶，前翅沿前緣無鋸齒。

雄交尾器 (圖 135)：背兜寬闊，中間呈橫向壓扁。鉤突粗壯，下彎呈喙狀。囊突中等長、棒狀。抱器葉狀，末端形成三角形突出。陽莖略扭曲，陽基軛片小，具側支。

雌交尾器 (圖 173)：交尾囊卵狀，具顯著附囊。交尾囊管高度骨化。交尾孔板形成長圓頂狀。花壁卵狀，側面具刺，肛突具毛。後內骨突纖細。前內骨突粗壯。

變異：雨季雌蝶個體翅背面底色常帶有黃色調。

世界分布：喜馬拉雅、印度東北及西北、中南半島、馬來亞、中國西南、華南及臺灣。

臺灣分布：主要分布於低至中海拔地區，但北臺灣少見。

幼蟲寄主植物：白花菜科毛瓣蝴蝶木。

生物學：一年多世代。

註記：本種翅紋有時與同樣分布臺灣的條斑豔粉蝶 *Delias lativitta* 和黃裙豔粉蝶 *D. berinda* 相似，但與豔粉蝶屬 *Delias* 相比，本種飛行較快速且強而有力，再者，本種主要發現於臺灣低海拔棲地，而條斑豔粉蝶 *Delias lativitta* 和黃裙豔粉蝶 *D. berinda* 主要分布於較高之海拔。

Genus *LEPTOSIA* [Hübner, 1819]

Type species: *Leptosia chlorographa* Hübner, [1819]

Diagnostic characters for the genus include: 1) body slender; 2) M₁ staked with M₂ at base.

Larval hostplants are in the family Capparaceae.

1 species occurs in Taiwan.

纖粉蝶屬

本屬的鑑別特徵包括：1) 軀體纖細；2) M_1 與 M_2 於基部共柄。

幼蟲寄主植物為白花菜科植物。

臺灣有 1 種。

Leptosia nina (Fabricius, 1793) (纖粉蝶 / 黑點粉蝶)

Papilio Danai nina Fabricius, 1793: Systema Entomologiae 3 (1): 194, no. 604. (Type locality: “India orientali”)

Papilio Danai candidi xiphia Fabricius, 1781: Species Insectorum 2: 43. (preoccupied by *Papilio xiphia* Fabricius, 1775 [*Pararge xiphia* (Fabricius, 1775)]) (Type locality: “India orientali”)

Leptosia chlorographa Hübner, 1818: Zuträge zur Sammlung exotischer Schmettlinge 1: 13: pl. [9], figs. 47-48. (Type locality: “Florida” [Java?])

Ssp. niobe Wallace, 1866

PLATE 11, Figs. 56-57; PLATE 25, Fig. 136; PLATE 34, Fig. 174

Pontia niobe Wallace, 1866: Proceedings of the Zoological Society of London 1866 (2): 357. (Type locality: Formosa)

Specimens examined:

JILONG [= KEELUNG] CITY: 1♂, Haimentienxian, 7. I. 2001 (M. X. Lin); 1♂, same locality, 8. I. 2001 (M. X. Lin); 1♂, same locality, 9. I. 2001 (M. X. Lin); 1♂, Longgang Trail, 5. IX. 2008 (C. K. Wang & C. H. Yen). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]:** 2♂, Wulai, Jiajiuliao, 150m, 10. IX. 2008 (Y. F. Hsu); 1♂, 1♀, Ruifang, Santiaoling, 12. IX. 2015 (L. Huang) (genitalia preparation JYL172, JYL171). **NANTOU Co.:** 1♂, Nanshanxi, 14. III. 1996 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 1♂, Dapu, Zhutoushan, 26. IX. 2005 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♀, Lanyu, Langdao, 3. V. 2003 (Y. F. Hsu). **TAINAN CITY [= TAITUNG Co.]:** 1♂, Baihe, Guanziling, 400m, 3. V. 2003 (Y. F. Hsu); 1♂, Yongkang, 26. IX. 2010 (Y. F. Hsu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 1♀, Liugui, 7. IX. 2000, reared from *Cleome viscosa*, emgd. 24. IX. 2000, HSU 00J26 (C. H. Wu); 1♀, Meinong, Shuangxi, 150m, 31. XII. 2006 (Y. F. Hsu); 1♀, Taoyuan, Fenggangshan, 900m, 30. I. 2008 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, 1♀, Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu); 2♂, 1♀, Fangliao, Yuquan, 1. III. 2008 (Y. F. Hsu); 1♂, Liuqiu, Liuqiuyu, 7. III. 2010 (N. Y. Tsai).

Description. Adult – Forewing length 20–25 mm. Male (PLATE 11, Fig. 56): Head hairy, dark brown mixed with white. Antennae dark brown, banded with white. Proboscis dark brown. Labial palpus porrect, brown mixed with white, with hairs ventrad. Thorax dark brown covered by grayish white hairs dorsally, white tinged with yellow ventrally. Abdomen covered with white scalings. Legs dark brown with white scalings. Wings rounded. Wing uppersides ground color white, with dark brown border at forewing apex; a dark brown spot in cell M₃ of forewing. Wing undersides with hindwing and area along costa of forewing decorated by fine green or olive markings. Female (PLATE 11, Fig. 57): Wing patterns as those of male.

Male genitalia (PLATE 25, Fig. 136) – Tegumen swollen dorsally, with uncus conical, attenuate into distal point. Vinculum slender, curved. Saccus moderately long, bulb-like. Valva lobe-like, simple, with distal margin rounded. Phallus straight, with aedeagus slightly bent; phallobase with a pair of lateral projections with acute tip, possessing keel-like structure ventrally. Juxta small, Y-shaped.

Female genitalia (PLATE 34, Fig. 174) – Corpus bursae oval, with prominent appendix bursae. Ductus bursae membranous with caudal end enlarged, funnel-like. Sterigma forming a dome-like pouches. Signum a transverse band, armed with short spines. Anal papillae densely setose. Posterior apophyses and anterior apophyses short, pin-like.

Global distribution. Himalayas, India, Sri Lanka, South East Asia, Southwest to South China, Taiwan.

Distribution in Taiwan. Low to moderate elevations, including Lanyu and Guishan Island.

Larval Host plant(s). Capparaceae: *Crateva adansonii*, *Capparis sabiaefolia*, *Ca. henryi*, *Ca. lanceolaris*, *Cleome rutidosperma*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. *Leptosia nina* was considered a species inhabiting lowland forests (Uchida, 1988), but the weedy herb *Cleome rutidosperma*, a favorable host plant for *L. nina*, invaded Taiwan by late 1970s and subsequently established and became widespread, leading the small butterfly to inhabit urban environments in southern Taiwan.

形態特徵：成蝶前翅長 20–25mm。雄蝶 (圖 56)：頭具毛，黑褐色混白色。觸角黑褐色，具白色橫帶。口器黑褐色。下唇鬚前伸，褐色混白色，腹面具毛。胸部背面黑褐色覆有灰白色毛，腹面白色帶有黃色調。腹部覆有白色鱗片。足呈黑褐色，具白色鱗。翅形頗圓，翅背面底色白色，前翅先端具黑褐色邊，前翅 M_3 室有一黑褐色斑點。翅腹面於後翅及前翅沿前緣飾有細小綠色或橄欖綠色斑紋。雌蝶 (圖 57)：翅紋與雄蝶相同。

雄交尾器 (圖 136)：背兜背部膨出，鉤突圓錐狀，向末端縮減、銳尖。基腹弧纖細、彎曲。囊突長度中庸、球狀。抱器葉狀、構造簡單，末端邊緣圓鈍。陽莖筆直，陽莖器略彎曲。陽莖基具一對側邊延伸且末端銳尖，腹面具有龍骨狀構造。陽基軛片小，Y 形。

雌交尾器 (圖 174)：交尾囊卵狀，具顯著附囊。交尾囊管膜質，尾端膨大呈漏斗狀。交尾孔板形成一圓頂狀袋。花壁呈橫帶，具短刺。肛突密生毛。後內骨突和內骨皮突短、針狀。

世界分布：喜馬拉雅、印度、斯里蘭卡、東南亞、華西南至華南及臺灣。

臺灣分布：分布低至中海拔，包括蘭嶼和龜山島。

幼蟲寄主植物：白花菜科魚木、毛瓣蝴蝶木、小刺山柑、蘭嶼山柑、平伏莖白花菜。

生物學：一年多世代。

註記：本種原被認為是棲息於低地森林的種類 (Uchida, 1988)，然而被認為是雜草的平伏莖白花菜 (成功白花菜) *Cleome rutidosperma* 於 1970 年代晚期入侵臺灣，並建立族群，且不久後即遍布南臺灣低地，它成為纖粉蝶喜好的寄主植物，致使此小型蝴蝶現已入居南臺灣都市棲地。

Genus *IXIAS* Hübner, [1819]

Type species: *Papilio pyrene* Linnaeus, 1764

Diagnostic characters for the genus include: 1) 4 R veins, with R₄+R₅ stalked with M₁ near base; 2) 3rd segment of labial palpus minute.

Larval hostplants are in the family Capparaceae.

1 species occurs in Taiwan.

異粉蝶屬

本屬的鑑別特徵包括：1) 具四條 R 脈，R₄+R₅ 共柄於 M₁ 近基部處；2) 下唇鬚第 3 節甚小。

幼蟲寄主植物為白花菜科植物。

臺灣產 1 種。

Ixias pyrene (Linnaeus, 1764)(異粉蝶 / 雌白黃蝶 / 橙粉蝶)

Papilio (Danaus) pyrene Linnaeus, 1764: Museum S:ae R:ae M:tis Ludovicae Ulrica Reginae: 241. (Type locality: “China” [Canton])

Papilio aenippe Cramer, [1777]: De uitlandsche kapellen 2 (9-16): 13, pl. 105, figs. C, D. (Type locality: “China” [Canton])

Ssp. *insignis* Butler, 1879

PLATE 11, Figs. 58-61; PLATE 25, Fig. 137; PLATE 34, Fig. 175

Ixias insignis Butler, 1879: Cistula entomologica 2 (21): 431, pl. 8, fig. 1. (Type locality: “Tai-wan-foo, Formosa”)

Ixias splendida Swinhoe, 1916: The Annals and magazine of natural history zoology, botany, and geology (series8) 18 (108): 481. (Type locality: “Polisha, Jainau, Formosa”)

Ssp. *pyrene* Linnaeus, 1764

PLATE 12, Figs. 62-65; PLATE 25, Fig. 138; PLATE 34, Fig. 176

Specimens examined:

Ssp. *insignis*: **MIAOLI Co.:** 1♂, Sanyi, 7. VI. 2015 (L. Huang) (genitalia preparation JYL158). **TAIZHONG CITY [= TAICHUNG CITY/ TAICHUNG Co.]:** 1♀, Heping, Shangguguan, 900/1200m, 28. VII. 2007 (Y. F. Hsu). **NANTOU Co.:** 1♂, Renai, Nanshanxi, 14. III. 1996 (Y. F. Hsu); 1♂, same locality, 11. I. 2000 (C. Y. Hung); 1♂, same locality, 6. IV. 2002 (C. C. Lu); 3♂, 3♀, same locality, 900m, 1. IX. 2007 (Y. F. Hsu); 1♂, 4♀, same locality, 23. I. 2008 (Y. F. Hsu); 1♂, Renai, Huisun, 600/700m, 22. XI. 2004 (Y. F. Hsu); 1♂, same locality, 20. II. 2012 (Y. F. Hsu & H. C. Huang); 1♂, Renai, Beidongyanshan, 1500m, 28. X. 2006 (Y. F. Hsu). **ZHANGHUA [= CHANGHUA] Co.:** 1♂, Shetou, Qingshuiyan, 17. I. 2006, reared from *Capparis sabiaefolia*, emgd. 19. I. 2006, HSU 06A22 (C. M. Wu). **JIAYI [= CHIAYI] Co.:** 1♂, Dapu, Zhutoushan, 21. IX. 2000 (Y. F. Hsu); 1♂, Dapu, Zhutoushan, 300m, 2. VII. 2003 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♂, Taoyuan, Hongye, 25. III. 2001 (C. C. Lu); 1♂, Donghe, Donghe Farm, 350m, 16. X. 2007 (Y. F. Hsu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 2♂, Taoyuan, Fenggangshan, 900m, 30. I. 2008 (Y. F. Hsu); 1♀, Liugui, Fenghuang Logging Trail, 1000m, 25. V. 2016 (J. Y. Liang) (genitalia preparation JYL208). **PINGDONG [= PINGTUNG] Co.:** 1♂, 1♀, Wutai, Ali, 1000m, 31. V. 2006 (L. H. Wang & C. C. Lu); 1♂, Wutai, Ali, 1200m, 5. III. 2011 (Y. F. Hsu); 1♀, same locality, 4. IV. 2011 (Y. F. Hsu); 1♀, Wutai, Wutoushan, 1200m, 6. VI. 2009 (Y. F. Hsu); 1♂, Chunri, Dahanshan, 4. I. 2003 (Y. F. Hsu); 1♀, Shizi, Lilongshan, 25. VIII. 2007 (Y. F. Hsu); 1♀, same locality, 500m, 17. II. 2008 (Y. F. Hsu); 1♂, Sandimen, 800m, 6. I. 2008 (Y. F. Hsu).

Ssp. *pyrene*: **LIANJIANG [= LIENCHIANG] Co.:** 1♀, V. 2003 (Y. A. Lin); 4♂, 2♀, Beigan, Wusha, 19. VII. 2013 (L. H. Wang & H. Y. Lee); 4♂, same locality, 7. IX. 2014 (C. L. Huang & H. Y. Lee); 1♀, same locality, 10. X. 2014 (L. H. Wang & H. Y. Lee) (genitalia preparation JYL205); 1♂, same locality, 12. X. 2014 (L. H. Wang & H. Y. Lee) (genitalia preparation JYL204).

Description. Adult – Forewing length 25–32 mm. Male (PLATE 11, Figs. 58-59; PLATE 12, Figs. 62-63): Head hairy, dark brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow mixed with brown, with hairs ventrad. Thorax dark brown covered by gray hairs dorsally, yellow ventrally. Abdomen

dark brown dorsally, white ventrally. Legs dark brown with yellow scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, with a prominent orange patch on forewing edged by dark brown borders; a dark brown band present along termen of hindwing. A dark brown spot at distal end of discoidal cell of forewing. Wing underside with ground color yellow, covered by scattered small, fine dark brown markings, plus a few brown spots on hindwing. Female (PLATE 11, Figs. 60-61; PLATE 12, Figs. 64-65): Ground color of wings white or pale yellow. No orange patch on forewing.

Two subspecies recognized: the populations found on main island of Taiwan are considered belonging to *insignis* (PLATE 11, Figs. 58-61), whereas those found in Jinmen Islands belong to the nominotypical subspecies (PLATE 12, Figs. 62-65). The orange patch on forewing uppersides of the male is paler in color and narrower in shape in the nominotypical subspecies, with no “dog-face” pattern found in ssp. *insignis*. The female of the the nominotypical subspecies has additional yellow form, which is not seen in that of ssp. *insignis*.

Male genitalia (PLATE 25, Figs. 137-138) – Tegumen with posterior margin produced; uncus blade-like, down-curved. Vinculum slender, straight. Saccus elongate, digitate. Valva lobe-like, with distal end rounded. Phallus elongate, with aedeagus strongly bent at basad; phallobase possessing keel-like structure ventrally. Juxta with a V-shaped dorsal cleft.

Female genitalia (PLATE 35, Figs. 175-176) – Corpus bursae oval. Ductus bursae membranous with a sclerotized caudal tube, which narrowed distad. Sterigma forming a dome-like structure, with associated sternum VIII forming a V-shaped invagination. Signum dumbbell-shaped, armed with spines. Posterior apophyses and anterior apophyses short, rod-like.

Variation. Dark brown markings on wing uppersides are reduced in dry season, with borders of hindwing completely missing in certain period of time.

Global distribution. South India, Sri Lanka, East Himalayas, Indochina, Sundaland, Southwest to South China, Taiwan.

Distribution in Taiwan. Mainly in low to moderate elevations of central and southern Taiwan.

Larval Host plant(s). Capparaceae: *Capparis sabiaefolia* (Hsu, 2013); *C. sepiaria* in Mazu Islands (Lee, 2000).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. Populations of main island of Taiwan is considered a distinct species by Yata (1985). Population of Mazu islands belongs to the nominotypical subspecies of *I. pyrene* (Lee, 2000).

鑑別特徵：成蝶前翅長 25–32mm。雄蝶 (圖 58–59、62–63)：頭具毛，黑褐色。觸角黑褐色，具白色橫帶。口器黑褐色，下唇鬚前伸，黃色混褐色，腹面具毛。胸部背面褐色覆有灰色毛，腹面黃色。腹部背面黑褐色，腹面白色。足呈黑褐色，具黃色鱗，腿節腹面明顯有毛。前翅三角形，前緣凸，外緣及後緣近筆直。翅背面底色黃色，前翅邊緣具一明顯橙色區塊，並具黑褐色邊，沿後翅外緣有一黑褐色帶。前翅中室靠外側有一黑褐色斑點。翅腹面底色黃色，覆有分散小型細小黑褐色斑紋。後翅有一些褐色點。雌蝶 (圖 60–61、64–65)：翅底色白色或淺黃色。前翅無橙色區。

臺灣地區有兩亞種：臺灣亞種 *ssp. insignis* 見於臺灣本島，承名亞種則見於馬祖地區。承名亞種雄蝶前翅背面橙色區域較淺色、形狀較狹長、外緣較平直，沒有臺灣亞種呈現的「狗臉紋」。雌蝶翅底色有白、黃色兩型、臺灣亞種則只有白色型。

雄交尾器 (圖 137–138)：背兜後緣突出。鉤突刀狀、下彎。基腹弧纖細、筆直。囊突長、指狀。抱器葉狀，末端圓鈍。陽莖長，陽莖器基部強彎曲。陽莖基腹面具龍骨狀構造。陽基軛片 V 形。

雌交尾器 (圖 175–176)：交尾囊卵狀。交尾囊管膜質，具骨化尾管且末端窄。交尾

孔板成圓頂狀結構，並與相對應之第八腹節形成 V 形內陷。花壁啞鈴狀，具刺。後內骨突和前內骨突短、棒狀。

變異：乾季時翅背面黑褐色斑紋減退，後翅黑邊在某些時期常完全消失。

世界分布：南印度、斯里蘭卡、東喜馬拉雅、中南半島、蘇門答臘、華西南至華南及臺灣。

臺灣分布：主要分布臺灣中南部低至中海拔。

幼蟲寄主植物：白花菜科毛瓣蝴蝶木。

生物學：一年多世代 (Hsu, 2013)。

註記：Yata (1985) 視臺灣本島的族群為 1 獨立種。馬祖的族群屬於異粉蝶 *Ixias pyrene* 承名亞種 (Lee, 2000)。

Genus *HEBOMOIA* Hübner, [1819]

Type species: *Papilio glaucippe* Linnaeus, 1758

Diagnostic characters for the genus include: 1) 4 R veins, with R₄ stalked with R₅; 2) base of R₄₊₅ and M₁ close but separate; 3) 3rd segment of labial palpus stout, short.

Larval hostplants are in the family Capparaceae.

1 species occurs in Taiwan.

橙端粉蝶屬

本屬的鑑別特徵包括：1) 具四條 R 脈，R₄ 與 R₅ 共柄；2) R₄₊₅ 基部與 M₁ 脈接近但分離；3) 下唇鬚第 3 節粗短。

幼蟲寄主植物為白花菜科植物。

臺灣產 1 種。

Hebomoia glaucippe (Linnaeus, 1758) (橙端粉蝶 / 端紅蝶 / 鶴頂粉蝶)

Papilio (Danaus) glaucippe Linnaeus, 1758: Systema Naturae (Edn 10) 1: 469. (Type locality: “Asia” [China, Canton])

Ssp. formosana Fruhstorfer, 1908

PLATE 12, Fig. 66; PLATE 13, Fig. 67; PLATE 26, Fig. 139; PLATE 35, Fig. 177

Hebomoia glaucippe formosana Fruhstorfer, 1908: Entomologische Zeitschrift 22 (25): 102. (Type locality: “Koshun; Taihanroku [Formosa]”)

Hebomoia glaucippe formosana f. *subgrisea* Nakahara & Esaki, 1932: Zephyrus 4: 95. (Type locality: “Polisha [Formosa]”)

Ssp. glaucippe (Linnaeus, 1758)

PLATE 13, Figs. 68-69; PLATE 26, Fig. 140

Specimens examined:

Ssp. formosana: **TAIPEI CITY**: 1♀, Wenshan, Gongguan, NTNU, 2. VII. 2015 (L. Huang) (genitalia preparation JYL157); 1♂, Neihu, Yanpingkung, 10. II. 2016 (L. Huang) (genitalia preparation JYL238). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]**: 2♂, Ruifang, Nanya, 14. VI. 2002 (C. L. Huang); 1♂, same locality, 15. VI. 2007 (C. L. Huang); 1♂, 4♀, Xindian, Sikanshui, 4. XI. 2008, reared from *Crateva andersonii*, emgd. 28/X-28/XI. 2008, HSU 08L1 (L. H. Wnag); 2♀, same locality, 22. XI. 2008, reared from *Cr. andersonii*, emgd. 12/14. XII. 2008, HSU 08L12 (Y. F. Hsu & C. H. Yen); 1♂, 1♀, Xiandian, Ankeng, 20. II. 2012, reared from *Capparis hainanensis*, emgd. 24/III-6/IV. 2012, HSU 12B36 (C. Y. Yen); 1♂, Bali, Guanyinshan, 500m, 18. X. 2011 (Z. H. Yen). **MIAOLI Co.**: 1♀, Sanyi, 13. IX. 2015 (L. Huang). **HUALIAN [= HUALIEN] Co.**: 1♂, Xiulin, Zuocang Trail, 7. III. 2006 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.**: 1♂, Yanping, Hongye, 600m, 27. VIII. 2010 (Z. H. Yen). **KAOSIUNG CITY** [=

KAOHSIUNG Co.]: 1♂, Taoyuan, Fenggangshan, 800m, 6. VI. 2007 (Y. F. Hsu).

Ssp. glaucippe: **LIANJIANG [= LIENCHIANG] Co.:** 2♂, 1♀, Beigan, Wusha, 20. VII. 2013 (C. L. Huang & H. Y. Lee); 3♂, 2♀, same locality, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang) (genitalia preparation JYL226).

Description. Adult – Forewing length 47–51 mm. Male (PLATE 12, Fig. 66; PLATE 13, Fig. 68): Head hairy, pale brown. Antennae covered by dark brown scalings dorsally. Proboscis dark brown. Labial palpus porrect, white mixed with brown, with hairs ventrad. Thorax dark brown covered by flemish gray hairs dorsally, pale brown ventrally. Abdomen flemish gray dorsally, white ventrally. Legs dark brown with pale brown scalings, with femur bearing prominent hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight, apex sometimes produced, pointed. Wing uppersides ground color white or pale yellow, with a prominent orange patch on forewing edged by dark brown borders, a series of dark brown flakes in orange patch; a series of dark brown flakes present along hindwing term, with additional series of dark brown discal spots on hindwing. Wing underside with ground color of hindwing and distal half of forewing darkened, covered by dark brown, fine wrinkles. A prominent, dark brown line running from wing base to distal end of cell M₂. Female (PLATE 13, Figs. 67; 69): Ground color of wings usually yellow. Dark markings more prominent than those of male.

Two subspecies recognized: Populations found on main island of Taiwan is considered a subspecies, *ssp. formosana*, endemic to Taiwan, whereas the population in Mazu Islands belong to the nominotypical subspecies. *Ssp. formosana* differs from the nominotypical subspecies by ground color of the wing uppersides tinged with yellow, and deeper color in the orange patch on forewing uppersides.

Male genitalia (PLATE 26, Figs. 139-140) – Tegumen broad; uncus elongate, down-curved, with caudal end bifid. Saccus moderately elongate. Valva lobe-like, with distal end forming two process; dorsal one short with distal end obtuse, ventral one long, with distal end acute. Phallus robust, with aedeagus up-curved caudally. Juxta small, U-shaped.

Female genitalia (PLATE 35, Fig. 177) – Corpus bursae oval, with prominent appendix bursae. Ductus bursae membranous, elongate. Sterigma forming a dome. Signum as a transverse band with medial constriction, armed with spines laterally. Anal papillae setose. Posterior apophyses short, bent. Anterior apophyses vestigial.

Variation. Apex of forewing is more produced in dry season.

Global distribution. Himalayas, India, Sri Lanka, Southeast Asia, South Japan, Southwest to East China, Taiwan (Yata, 1985).

Distribution in Taiwan. Low to moderate elevations in main island of Taiwan, and Mazu Islands.

Larval Host plant(s). Capparaceae: *Crateva adansonii*, *Capparis sabiaefolia*, *Ca. henryi*, *Ca. floribunda*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 47–51mm。雄蝶 (圖 66、68)：頭具毛、淺褐色。觸角背面覆有黑褐色鱗片。口器黑褐色，下唇鬚前伸，白色混褐色，腹面具毛。胸部黑褐色，背面覆有鉛灰色毛，腹面淺褐色。腹部背面鉛灰色，腹面白色。足呈黑褐色，被淺褐色鱗。腿節腹面生明顯有毛。前翅三角形，前緣凸，外緣和後緣近筆直，先端有時突出呈尖銳，翅背面底色白色或淺黃色，前翅邊緣具一明顯橙色區，並有黑褐色邊，有一列黑褐色片狀斑於橙色區內，一列黑褐色片狀斑沿後翅外緣分布，另外有一列黑褐色斑於後翅後端。翅腹面於後翅底色和前翅外半部顏色深，覆有黑褐色細紋，自翅基部到 M₂ 室外端具一明顯黑褐色線。雌蝶 (圖 67、69)：翅底色通常淺黃色，深色斑紋較雄蝶明顯。

臺灣地區有 2 亞種：臺灣本島的族群被視為臺灣特有亞種 *ssp. formosana*。馬祖的族群則屬於承名亞種。臺灣亞種與承名亞種不同之處在於翅背面底色帶有黃色調，前翅背面橙色區顏色較深。

雄交尾器 (圖 139–140)：背兜寬闊，鉤突下彎、修長，末端二分叉。囊突長度中庸。抱器葉狀，末端形成兩個突起，背側突起短而末端圓鈍，腹側突起長而末端銳尖。陽莖粗壯，陽莖器後端上彎。陽基軛片小，U 形。

雌交尾器 (圖 177)：交尾囊卵狀，具顯著附囊。交尾囊管膜質、修長。交尾孔板形成圓頂狀。花壁為橫帶，中間收縮，側面佈有刺。肛突具毛。後內骨突短、彎曲。前內骨突退化。

變異：乾季時前翅端較為突出。

世界分布：喜馬拉雅、印度、斯里蘭卡、東南亞、日本南部、華西南至華東及臺灣。

臺灣分布：分布於臺灣本島低至中海拔地區及馬祖。

幼蟲寄主植物：白花菜科魚木、毛瓣蝴蝶木、小刺山柑、多花山柑；在馬祖利用青皮刺。

生物學：一年多世代 (Hsu, 2013)。

Subfamily COLIADINAE Sawinson, 1827

Ackery *et al.* (1999) recognized no obvious synapomorphies for this subfamily, but a few dubious characters were given: reduction or absence of humeral vein in hindwing; reduction of third segment of palpus; loss of VT3 on first instar larval head.

The members of this subfamily are cosmopolitan in distribution. Larval mainly feed on plants in the family Fabaceae, Rhamnaceae and Zygophyllaceae. Specific and sexual signaling in some groups within the subfamily involves iridescent UV reflectance patterns produced by the structure of specialized scales on the upperside of the wings in males (Silberglied & Taylor, 1978).

In Taiwan, a total of 14 species in 5 genera are known.

黃粉蝶亞科

Ackery *et al.* (1999) 認為本亞科沒有明顯的共衍徵，但列出一些可疑的特徵包括：後翅肩脈退化或消失、下唇鬚第 3 節退化、1 齡幼蟲頭部缺乏 VT3 刺毛。

本亞科成員在分布上呈世界性分布，幼蟲主要取食豆科、鼠李科、蒴藋科植物。

本亞科內有些類群具有特定的性訊號，牽涉奪目之 UV 反射光彩，主要由雄蝶背面特化鱗片的構造產生 (Silberglied & Taylor, 1978)。

臺灣地區已知 5 屬 14 種。

Genus *CATOPSILIA* Hübner, [1819]

Type species: *Papilio crocale* Cramer, [1775]

Diagnostic characters for the genus include: 1) a prominent patch of androconia near base of hindwing upperside, associated with a large hair tuft at dorsum on hindwing underside; 2) pseuduncus present at posterior margin of A8 in males.

Species in the genus are well-known migrants capable to perform cross sea water travels.

Larval hostplant is in the family Fabaceae.

3 species are found in Taiwan, including one originated from a straying species from the Philippines.

遷粉蝶屬

本屬的鑑別特徵包括：1) 後翅背面近基部有明顯的發香鱗區域，與後翅腹面內緣的毛叢相關；2) 雄蝶第 8 腹節後緣具偽鉤突。

本屬成員為著名遷移能力種類，具有越洋飛行能力，幼蟲寄主植物為豆科植物。

臺灣產 3 種，包括 1 種源自菲律賓的已定居外來種。

***Catopsilia pyranthe* (Linnaeus, 1758) (細波遷粉蝶/水青黃蝶/波紋粉蝶/梨花遷粉蝶)**

PLATE 14, Figs. 70-73; PLATE 26, Fig. 141; PLATE 35, Fig. 178

Papilio (Danaus) pyranthe Linnaeus, 1758: Systema Naturae (Edn 10) 1: 469. (Type locality: “Asia” [China, Canton])

Papilio alcyone Cramer, [1775]: De uitlandsche kapellen 1 (1-7): 89, pl. 58, figs. A, B, C. (Type locality: “China”)

Papilio gnoma Fabricius, 1775: Systema Entomologiae: 828. (Type locality: “India”)

Papilio flavocinerascens Goeze, 1779: Entomologische Beyträge 3 (1): 183. (Type locality: “Indische”)

Papilio philippina Stoll, [1781]: in Cramer De uitlandsche kapellen 4 (29-31): 139, pl. 361, figs. C, D. (Type locality: “Coromandel”)

Papilio nephte Fabricius, 1793: Systema Entomologiae 3 (1): 190. (Type locality: “China”)

Papilio ilea Fabricius, 1798: Systema Entomologiae (Supplementum): 426. (Type locality: “India orientali”)

Callidryas thisorella Boisduval, 1836: Histoire naturelle des insectes 1: 609. (Type locality: “Bengale”)

Specimens examined:

TAIPEI CITY: 1♀, same locality, XI. 2003, reared from *Cassia alata* [= *Senna alata*], emgd. 24. XII. 2005; 1♂, same locality, 17. IX. 2008 (N. Y. Tsai); 1♀, same locality, 3. XI. 2009 (Y. F. Hsu); 1♀, same locality, 19. XII. 2005 (Y. F. Hsu); 1♂, Wenshan, Gongguan campus, NTNU, 10. XI. 2009, reared from *Senna alata*, emgd. 24. XI. 2009, HSU 09L2.1 (Y. F. Hsu); 2♀, same locality, 10. XI. 2009, reared from *S. alata*, emgd. 11/18. XI. 2009, HSU 09L2 (Y. F. Hsu); 1♀, NTU Farm, reared from *C. alata* [= *S. alata*], emgd. 25. XI. 2003, HSU 03L34 (Y. F. Hsu); 1♀, Beitou, Qilian, 21. XI. 2005, reared from *C. fistula*, emgd. 30. XI. 2005, HSU 05L37 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 1♀, Alishan, Shizhou/ Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♂, 2♀, Lanyu, 18/22. VIII. 1998, reared from *C. tora* [= *S. tora*], emgd. 28. VIII. 1998 (Y. T. Lo) (genitalia preparation JYL267). **TAINAN CITY [= TAINAN Co.]:** 1♀, Xinhua, 13. IX. 2009 (Y. F. Hsu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 2♂, Qijin, Dongsha Is., 2/7. X. 2008 (Y. F. Hsu); 1♂, Jiaxian, 13. XI. 2006, reared from *C. alata* [= *S. alata*], emgd. 30. XI. 2006, HSU 06L22.1 (Y. F. Hsu); 2♂, Liugui, 23. X. 2005, reared from *C. alata* [= *S. alata*], emgd. 3. IX. 2005, HSU 05K25 (Y. F. Hsu); 1♂, Liugui, Baolai, 400m, 28. III. 2003, reared from *Senna alata*, emgd. 16. VI. 2003, HSU 03C46 (Y. F. Hsu). **PENGHU Co.:** 1♂, Magong, 14. VII. 2014 (C. L. Huang & H. Y. Lee); 1♀, Xingren Dam, 18. XI. 2013. **JINMEN [= KINMEN] Co.:** 1♀, Wuhushan, 28/30. X. 2000 (C. C. Lu & Y. T. Lo); 2♀, Jinhu, Shenshiqiao, 27/28. V. 2011 (Y. F. Hsu & H. C. Huang); 1♀, same locality, 29. V. 2011 (Y. F. Hsu & H. C. Huang); 1♂, 1♀, same locality, 28. VIII. 2011, reared from *Senna occidentalis*, emgd. 12. IX. 2011, HSU 11H48 (H. C. Huang); 1♂, 1♀, same locality, 3. XI. 2013 (C. L. Huang & H. C. Huang); 1♀, same locality, 4. XI. 2015 (L. Huang) (genitalia preparation JYL184).

Description. Adult – Forewing length 26–32 mm. Male (PLATE 14, Figs. 70-71): Head

hairy, pink. Antennae covered by pink scalings. Proboscis dark brown. Labial palpus porrect, pale yellow. Thorax covered by white and pale yellow hairs and scalings. Abdomen white. Posterior margin of A8 tergite forming a medial axe-like projection. Legs covered with white scalings, with femur bearing short hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Hindwing termen slightly wavy. Wing uppersides ground color white, with prominent dark brown borders by forewing apex. A dark brown spot present at distal end of discoidal cell of forewing. Wing underside with ground color of hindwing and distal half of forewing tinged with pale yellowish green, decorated by fine, olive wrinkles. Small silver spots encircled by red rings at distal ends of discoidal cells in dry season. Sexual brand oblong, white. Female (PLATE 14, Figs. 72-73): Dark brown marking more extensive than males.

Male genitalia (PLATE 26, Fig. 141) – Tegumen with posterior margin possessing a medial, digitate process; uncus tapering caudally, down-curved, hook-like. Vinculum bent dorsally. Saccus stout, short. Valva triangular, with distal end forming a projection pointing upwards; dorsal margin with a small lobe-like extension. Phallus elongate, strongly down-curved; phallobase possessing long, rudder-like structure ventrally. Juxta as a bi-lobed piece with deep dorsal cleft.

Female genitalia (PLATE 35, Fig. 178) – Corpus bursae oval with prominent appendix bursae. Ductus bursae thick, with medial portion heavily sclerotized. Sterigma forming a pair of pouch-like structures, with associated sternum VIII forming a shallow V-shaped invagination. Signum as a transverse band with both ends slightly enlarged, armed with spines. Anal papillae densely setose. Posterior apophyses moderately long, slender. Anterior apophyses vestigial.

Variation. Silver spots on wing undersides appear in dry season. Females in wet season have dark markings more extensive, with additional dark brown border along hindwing termen.

Global distribution. Entire Oriental Region, North and East Australia, Solomons, New Hebrides. (Yata, 1985).

Distribution in Taiwan. Low to moderate elevations of Taiwan and most associated islands.

Larval Host plant(s). Fabaceae: *Cassia occidentalis*, *C. hirsuta*, *C. sophora*, *C. fistula*, *C. alata*. Also *C. sulfurea* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 26–32mm。雄蝶 (圖 70–71)：頭具毛、粉紅色。觸角覆粉紅色鱗片。口器暗褐色。下唇鬚前伸、淺黃色。胸部覆有白色及淺黃色毛和鱗片。腹部白色，第 8 腹節後緣中央形成一斧狀突。足覆有白色鱗，腿節腹面生有短毛。前翅三角形，前緣凸，外緣及後近筆直。後翅外緣略呈波狀。翅背面底色白色，前翅先端具明顯黑褐邊，前翅中室外端具一黑褐色斑點。翅腹面後翅底色及前翅外半部帶淺黃綠色調，飾有細小橄欖綠色細紋，乾季時中室外端有小型銀色斑點，外圍鑲有紅圈，性標橢圓形、白色。雌蝶 (圖 72–73)：黑褐色斑紋較雄蝶發達。

雄交尾器 (圖 141)：背兜後緣中央具一指狀突出。鉤突向末端漸細、下彎、鉤狀。基腹弧背面彎曲。囊突粗短。抱器三角形，末端形成向上指之延伸突起，背緣具小葉狀延伸。陽莖長、強下彎。陽莖基腹面具長舵狀構造。陽基軛片為雙頁片，背部具深凹。

雌交尾器 (圖 178)：交尾囊卵狀，具顯著附囊。交尾囊管粗，中間部位高度骨化。交尾孔板形成一對袋狀結構，與相對應的第 8 腹節形成淺 V 形內陷。花壁為橫帶，兩端略膨大、有刺。肛突密生毛。後內骨突甚長、纖細。前內骨突退化。

變異：乾季時翅腹面出現銀斑。雌蝶於雨季有較多黑色斑紋，並沿後翅外緣有深褐色帶。

世界分布：分布於整個東洋區、澳洲北部及東部、所羅門及新赫布里底群島。

臺灣分布：分布臺灣低至中海拔地區及大多數離島。

幼蟲寄主植物：豆科望江南、毛決明、澎湖決明、阿伯勒、翼柄決明、黃槐等。

生物學：一年多世代 (Hsu, 2013)。

***Catopsilia pomona* (Fabricius, 1775) (遷粉蝶 / 淡黃蝶)**

PLATE 14, Figs. 74-76; PLATE 15, Figs. 77-79; PLATE 26, Fig. 142; PLATE 36, Fig. 179

Papilio pomona Fabricius, 1775: Systema Entomologiae: 479, no. 158. (Type locality: “nova Hollandia” [New Holland])

Papilio crocale Cramer, [1775]: De uitlandsche kapellen 1 (1-7): 87, pl. 55, figs. C, D. (Type locality: “Indes Orientalis”)

Papilio jugurtha Cramer, [1777]: De uitlandsche kapellen 2 (9-16): 138, pl. 187, figs. E, F. (Type locality: “Coromandel”)

Papilio nigropunctatus Goeze, 1779: Entomologische Beyträge 3 (1): 185. (Type locality: “Amerikanische” [error])

Papilio catilla Cramer, [1779]: De uitlandsche kapellen 3 (17-21): 63, pl. 229, figs. D, E. (Type locality: “Coromandel”)

Papilio hilaria Stoll, [1781]: in Cramer, De uitlandsche kapellen 4 (29-31): 95, pl. 339, figs. A, B. (Type locality: “Coromandel”)

Papilio lalage Herbst, 1792: in Jablonsky: Natursystem aller bekannten in- und ausländischen Insekten. Der Schmetterlinge 5: 163, pl. 106, figs. 1-2. (Type locality: “Ostindia” [East India])

Papilio alcmeone Fabricius, 1793: Systema Entomologiae 3 (1): 193. (Type locality: “Coromandel”)

Papilio titania Fabricius, 1798: Systema Entomologiae (Supplementum): 428. (Type locality: “Indian orientali”)

Colas jugurthina Godart, 1819: Encyclopédie Méthodique 9 (1): 96. (Type locality: Bengal; Coromandel)

Callidryas ender Boisduval, 1832: in d'Urville: Voyage de la corvette l'Astrolabe (Faune entomologique, Pacifique) 1: 63, pl. 2, figs. 3-4. (Type locality: “Nouvelle Hollande” [Australia])

Callidryas phlegus Wallace, 1867: Transactions of Entomological Society of London, series 3, 4 (3): 401. (Type locality: Timor)

Catopsilia heera Swinhoe, 1885: Proceedings of the Zoological Society of London 1885: 140. (Type locality: Poona)

Catopsilia crocale f. *flavescens* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 162, 69 c. (Type locality: not stated)

Catopsilia crocale f. *latilimbata* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 163, 69 c. (Type locality: “Java”)

Catopsilia crocale micromalayana Fruhstorfer, 1910: in Seitz, Die Gross-Schmetterlinge der Erde 9: 163. (Type locality: Lesser Sunda Islands)

Catopsilia crocale f. *virosa* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 163, 60 e. (Type locality: “Sumba; Alor”)

Catopsilia crocale celebica Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 163, pl. 68 e, 69 a. (Type locality: “Celebes”)

Catopsilia crocale f. *ostentata* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 163, pl. 69 a. (Type locality: “Celebes, Saleyer, Kalao”)

Catopsilia pura Lindsey, 1924: Entomologische Rundschau 41: 2. (Type locality: India)

Catopsilia f. *formosana* Sonan, 1930: Zephyrus 2 (3): 171. (Type locality: Taihoku [Taipei])

Specimens examined:

JILONG [= KEELUNG] CITY: 1♂, Longgang Trail, 26. VIII. 2008 (C. K. Wang). **TAIPEI CITY:** 1♀, Wenshan, Gongguan campus, NTNU, 27. VII. 2004; 1♀, same locality, 22. VIII. 2004, reared from *Senna fistula*, emgd, 7. IX. 2004 (J. R. Chen); 1♀, same locality, 22. VIII. 2005 (J. R. Chen); 1♀, same locality, 14. XI. 2005 (C. R. Chen); 1♀, same locality, 18. IX. 2006, reared from *S. alata*, emgd. 24. IX. 2006, HSU 06J32 (Y. F. Hsu); 1♂, 2♀, same locality, 10. XI. 2009, reared from *S. alata*, emgd. 18/24. XI. 2009, HSU 09L2.1 (Y. F. Hsu); 1♀, same locality, 10. XI. 2009, reared from *S. alata*, emgd. 14. XI. 2009, HSU 09L2 (Y. F. Hsu); 1♂, same locality, 13. XII. 2009 (Y. F. Hsu); 2♀, same locality, 19. II. 2000, reared from *Cassia fistula*, emgd. 11. IX. 2005 (J. R. Chen); 1♂, Daan, NTU, 4. VI. 2015 (L. Huang) (genitalia preparation JYL213). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]:** 1♀, Shiding, Ergeshan, VIII. 2009 (C. H. Lin, jr); 3♀, Sanchong, 27. X. 2008 (C. H. Lin, jr). **YILAN Co.:** 1♂, Yilian station, 21. VI. 2001, emgd. 3. VII. 2001. **TAIZHONG CITY [= TAICHUNG CITY/ TAICHUNG Co.]:** 3♀, Dongshi, Dongshi Forest Garden, 1. VII. 1996 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 1♀, Xingang, Yuemei, 15m, 11. VI. 2007 (Y. F. Hsu); 1♀, Alishan, Shanmei, 500m, 29. IX. 2007 (Y. F. Hsu); 1♀, Lantan, 1. V. 2006 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♀, Taitung, Pipa Lake, 4. VI. 2006 (Y. F. Hsu); 1♀, Lanyu, Longmen Harbor, 17. II. 2013 (Y. F. Hsu); 1♀, Lanyu, Zhongai Bridge, 28. VIII. 2015, (L. Huang) (genitalia preparation JYL185). **TAINAN CITY [= TAINAN Co.]:** 1♀, Baihe, Guanziling, 9. X. 2005 (Y. F. Hsu). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 1♀, Jiaxian, 13. XI. 2006 (Y. F. Hsu); 2♂, 2♀, reared from *C. javanica*, emgd. 15/24. XI. 2005, HSU 05L23 (Y. F. Hsu); 3♀, reared from *C. alata* [= *S. alata*], emgd. 20. X. 2005, HSU 05L22 (Y. F. Hsu); 1♂, same locality, 9. X. 2005, reared from *S. alata*, emgd. 15. X. 2005, HSU 05K6 (Y. F. Hsu); 1♀, Tianliao, 100m, 16. X. 2010 (Y. F. Hsu); 1♀, Meinong, Shuangxi, 150m, 8. II. 2006 (Y. F. Hsu); 1♀, Liugui, Baolai, 400m, 28. III. 2003, reared from *S. alata*, emgd. 14. VI. 2003, HSU 03C46 (Y. F. Hsu); 1♀, same locality, 28. VIII. 2004 (Y. F. Hsu). **JINMEN [= KINMEN] Co.:** 1♂, Jinsha, nr. Houling Park, 28/29. VIII. 2011 (Y. F. Hsu & H. C. Huang); 2♂, Jinhu, Shenshi Bridge, 27/28. V. 2011 (Y. F. Hsu & H. C. Huang).

Description. Adult – Forewing length 26–32 mm. Male (PLATE 14, Figs. 74-75): Head hairy, pink. Antennae covered by pink scalings. Proboscis dark brown. Labial

palpus porrect, pale yellow. Thorax covered by white and pale yellow hairs and scalings. Abdomen pale yellow. Posterior margin of A8 tergite forming a medial axe-like projection. Legs covered with pale yellow scalings, with femur bearing short hairs ventrad. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white, with a yellow patch proximally, apex with narrow, dark brown borders. Wing underside with ground color of hindwing and distal half of forewing yellow without markings in wet season, white tinged with yellow with small silver spots encircled by red rings at distal ends of discoidal cells in dry season. Sexual brand oblong, white. Female (PLATE 14, Fig. 76; PLATE 15, Figs. 77-79): Head and antenna without pink scalings. Ground color of wings white or yellow, with dark brown marking more extensive than males. Silver spots also present in dry season, with additional red markings to various extent.

Male genitalia (PLATE 26, Fig. 142) – Tegumen with posterior margin possessing a medial, digitate process; uncus tapering caudally, down-curved, hook-like. Vinculum bent dorsally. Saccus stout, short. Valva broad, short, with dorsal margin forming a hill-like extension. Phallus elongate, strongly down-curved; phallobase possessing long, rudder-like structure ventrally; aedeagus bearing small teeth antero-ventrad. Juxta as a bi-lobed piece with deep dorsal cleft.

Female genitalia (PLATE 36, Fig. 179) – Corpus bursae oval with prominent appendix bursae. Ductus bursae thick, partially sclerotized. Sterigma forming a pair of pouch-like structures, with associated sternum VIII forming a shallow V-shaped invagination. Signum as a transverse band with both ends enlarged, extending anteriorly, armed with spines. Anal papillae densely setose. Posterior apophyses moderately long, slender. Anterior apophyses vestigial.

Variation. This species is famous for prominent sexual dimorphism and considerable seasonal variation. Silver spots on wing undersides appear in dry season, sometimes given a name called ‘form *pomona*’. By contrast, these spots are absent in wet season, called ‘form *crocale*’. Females in dry season tends to have yellow wings with less dark brown markings compared to individuals of wet season, which usually have white wings and more dark brown. Female individuals in dry season bearing extensive red markings

is sometimes given a name as ‘form *catilla*’.

Global distribution. Entire Oriental Region and much area of northern Australian Region (Yata, 1985).

Distribution in Taiwan. Low to moderate elevations of Taiwan and most associated islands.

Larval Host plant(s). Fabaceae: *Cassia siamea*, *C. fistula*, *C. alata*. Also *C. sulfurea*, but seldom used. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. Populations of this butterfly in southern Taiwan frequently undergo outbreaks due to large area of plantation of *Cassia siamea*, forming a famous tourists’ scene called “Yellow Butterfly Valley” (Chen, 1977).

形態特徵：成蝶前翅長 26–32mm。雄蝶 (圖 74–75)：頭具毛、粉紅色。觸角覆有粉紅色鱗片。口器黑褐色。下唇鬚前伸、淺黃色。胸部覆有白色及淺黃色毛及鱗片。腹部淺黃色，第 8 腹節後緣中央形成一斧狀突。足覆淺黃色鱗片，腿節腹面生有短毛。前翅三角形，前緣凸，外緣及後緣近筆直。翅背面底色白色，近基部有一黃色區塊，先端有窄黑褐色邊。翅腹面於雨季後翅底色及前翅外半部黃色，且無斑紋，乾季時白色帶有黃色調，中室靠外側有小型銀色斑，外圍圍繞紅色環，性標橢圓形、白色。雌蝶 (圖 76–79)：頭、觸角不具粉紅色鱗片，翅底色白色或黃色，黑褐色斑紋較雄蝶廣泛，乾季時也有銀斑，並具有不同程度的紅色斑紋。

雄交尾器 (圖 142)：背兜後緣中間具指狀突出。鉤突末端漸細、下彎、鉤狀。基腹弧背面彎曲。囊突粗短。抱器寬闊、短，背緣形成脊狀延伸。陽莖長、強下彎。陽莖基腹面具長舵狀構造。陽莖器腹側前方具小齒。陽基軛片為葉狀、二分，背側深凹。

雌交尾器 (圖 179)：交尾囊卵狀，具顯著附囊。交尾囊管粗，部份骨化。交尾孔板

形成一對袋狀結構，與相對應的第八腹節形成淺 V 形內陷。花壁為橫帶且兩端膨大、有刺。肛突密生毛。後內骨突長度中庸、纖細。前內骨突退化。

變異：本種以雌雄二型性明顯著稱，並有相當程度的季節變異。乾季時翅腹面出現銀白色斑點，常稱為「銀紋型」‘form *pomona*’，雨季時則缺少銀白色斑點，稱為「無紋型」‘form *crocale*’。雌蝶於乾季傾向翅呈黃色而黑褐色斑紋較少，雨季則翅色偏白且有較多黑褐色斑紋。紅斑明顯的乾季雌蝶個體有時被稱為「紅斑型」‘form *catilla*’。

世界分布：分布於整個東洋區及澳洲區北部大部分地區。

臺灣分布：分布臺灣低至中海拔及多數離島。

幼蟲寄主植物：豆科鐵刀木、阿伯勒、翼柄決明，也利用黃槐，但較少見。

生物學：一年多世代。

註記：本種臺灣南部的族群常因為鐵刀木的成片栽植而有大發生現象，形成有名的旅遊景點，高雄美濃地區更有以本種為主角的特色風景區，稱為「黃蝶翠谷」。

***Catopsilia scylla* (Linnaeus, 1763) (黃裙遷粉蝶 / 大黃裙粉蝶 / 鎬黃遷粉蝶)**

Papilio (*Danaus*) *scylla* Linnaeus, 1763: *Amoenitates academicae* 6: 404. (Type locality: “Java”)

Papilio (*Danaus*) *scylla* Linnaeus, 1764: *Museum s:æ r:æ m:tis Ludovicæ Ulricæ reginæ*: 242. (Type locality: “Java”)

***Ssp. cornelia* Fabricius, 1787**

PLATE 15, Figs. 80-81; PLATE 27, Fig. 143; PLATE 36, Fig. 180

Papilio cornelia Fabricius, 1787: *Mantissa Insectorum* 2: 21, no. 229. (Type locality: “Tranquebariae” [Tharangambadi, India])

Catopsilia scylla chengkong Chen, 1974: *Butterflies of Taiwan in Colour*: 102. (Type locality: not stated [Taiwan])

Specimens examined:

KAOHSIUNG CITY [= KAOHSIUNG Co.]: 5♂, 4♀, Xizi Bay, 8. IX. 2000, reared from *Cassia sulfurea* [= *Senna sulfurea*], emgd. 2/6. X. 2000, HSU 00J22.1 (Y. F. Hsu, C. C. Lu & C. M. Wu); 1♂, Liugui, 300m, 25. XI. 2007, reared from *S. tora*, emgd.

10. XII. 2008, HSU 07L27 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, 5♀, Hengchun, Kending, 7. IX. 2000, reared from *C. tora* [= *Senna tora*], emgd. 29/IX- 29/X. 2000, HSU 00J20 (Y. F. Hsu, C. C. Lu & C. M. Wu); 2♂, Hengchun, Xiangjiaowan, 7. IX. 2000, reared from *C. sulfurea* [= *S. sulfurea*], emgd. 22/IX- 8/X. 2000, HSU 00J21 (Y. F. Hsu & M. H. Lin); 1♂, Hengchun, Shehdi, 27. XI. 1991 (W. I. Chou) (genitalia preparation JYL216); 1♀, Laiyi, 28. XI. 1991 (W. I. Chou) (genitalia preparation JYL215).

Description. Adult – Forewing length 24–32 mm. Male (PLATE 15, Fig. 80): Head hairy, brown. Antennae covered by pink scalings. Proboscis dark brown. Labial palpus porrect, orange. Thorax covered by white hairs dorsally, orange ventrally. Abdomen white. Posterior margin of A8 tergite with two digitate processes. Legs covered with yellow scalings. Forewing triangular, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color white in forewing, orange in hindwing. Prominent dark brown borders from forewing apex along termen, with inner edge serrate. A dark brown spot present at distal end of discoidal cell of forewing. A series of small, dark brown spots along hindwing termen. Wing underside with ground color mostly orange except for a white patch along forewing costa. Female (PLATE 15, Fig. 81): Dark brown marking more extensive than males, with additional series of discal spots on forewing, and dark, wavy discal line on underside.

Male genitalia (PLATE 27, Fig. 143) – Tegumen slightly convex dorsally; uncus tapering caudally, down-curved, hook-like, with distal tip blunt. Vinculum bent dorsally. Saccus stout, short. Valva broad, short, with dorsal margin forming a hill-like extension. Phallus elongate, strongly down-curved, enlarged caudad; phallobase possessing long, rudder-like structure ventrally. Juxta as a bi-lobed piece with V-shaped dorsal cleft.

Female genitalia (PLATE 36, Fig. 180) – Corpus bursae oval. Ductus bursae membranous with caudal half sclerotized. Sterigma forming a pair of prominent, invaginated pouches. Signum as a transverse band with lateral wings, armed with spines. Anal papillae densely setose. Posterior apophyses short, attenuate cephalad. Anterior apophyses vestigial.

Global distribution. Indo China, Sundaland, Sulawesi, Lesser Sunda, North and Northeast Australia, Philippines. (Yata, 1985).

Distribution in Taiwan. Lowland of South Taiwan.

Larval Host plant(s). Fabaceae: *Cassia sulfurea*, *C. tora*, and *C. alata* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species was a rare strays to Taiwan in the past (Hamano, 1986), but successfully established in southern Taiwan by 1990s (Hsu, 2002). It is still seldom seen today.

形態特徵：成蝶前翅長 24–32mm。雄蝶 (圖 80)：頭具毛、褐色。觸角覆有粉紅色鱗片。口器黑褐色。下唇鬚前伸，橙黃色。胸部背面覆有白色毛，腹面橙黃色。腹部白色，第 8 腹節後緣具有 2 個指狀突起。足覆有黃色鱗。前翅三角形，前緣凸，外緣及後緣近筆直。翅背面前翅底色白色，後翅橙黃色，前翅從翅端沿外緣有明顯黑褐色邊，黑邊靠內側邊緣呈鋸齒狀，前翅中室外端有黑褐色斑點。後翅外緣有一列小型黑褐色斑點。翅腹面底色幾乎全為橙黃色，惟前翅後緣有一白色區。雌蝶 (圖 81)：黑褐色斑紋較雄蝶更廣泛，前翅中央有斑點，腹面中央具黑色波狀線。

雄交尾器 (圖 143)：背兜背部略凸起。鉤突向尾端漸縮，下彎、鉤狀，末端鈍。基腹弧背部彎曲。囊突粗短。抱器寬闊、短，背緣形成脊狀延伸。陽莖長、強下彎，尾端膨大。陽莖基腹面具舵狀結構。陽基軛片葉狀、二分，背側有 V 形內凹。

雌交尾器 (圖 180)：交尾囊卵狀。交尾囊管膜質，尾端半部骨化。交尾孔板形成一對顯著之凹袋。花壁橫帶狀，具側翼、具刺。肛突密生毛。後內骨突短，前端漸細。前內骨突退化。

世界分布：中南半島、蘇門答臘、蘇拉威西、小巽他群島、澳洲北部及西北部等。

臺灣分布：南臺灣低地。

幼蟲寄主植物：豆科黃槐、決明、翼柄決明等。

生物學：一年多世代 (Hsu, 2013)。

註記：本種過去為稀有偶產種，於 1990 年代成功在南臺灣建立族群，但目前仍非常見種類。

Genus *COLIAS* Fabricius, 1807

Type species: *Papilio hyale* Linnaeus, 1758

Diagnostic characters for the genus include: 1) 4 R veins, only R₁ separately arising from discoidal cells, other R veins arising from vein M₁; 2) pseuduncus present at posterior margin of A8 in males.

Species in the genus are well-known migrants capable to perform cross sea water travels.

Larval hostplant is in the family Fabaceae.

1 species is found in Taiwan.

紋黃蝶屬

本屬的鑑別特徵包括：1) 具四條 R 脈，其中僅 R₁ 源自中室，其餘 R 脈從 M₁ 脈分出；2) 雄蝶於第 8 腹節後緣具假鉤突。

本屬多數種類以遷飛能力著稱，能作越洋長距離飛行。

臺灣產 1 種。

***Colias erate* (Esper, 1805)(紋黃蝶 / 東亞豆粉蝶 / 斑緣豆粉蝶)**

Pap. Dan. cunditus erate Esper, 1805: Die Schmetterlinge in Abbildungen nach der Natur, Th I,

Suppl. Th. 2 (11): 13, pl. 119, fig. 3. (Type locality: “Sarepta” [Russia])

Colias erate ab. *edusoides* Krulikovsky, 1903: Revue russe d'entomologie 3: 301. (Type locality: “Aksu” [Russia])

Ssp. *formosana* Shirôzu, 1955

Colias erate formosana Shirôzu, 1955: Sieboldia 1 (3): 229, pl. 30, figs. 1-4. (Type locality: Pianan-anbu(ca 1810m), Taihoku Pref., North Formosa[= Siyuanyakou])

PLATE 15, Figs. 82-84; PLATE 27, Fig. 144; PLATE 36, Fig. 181

Ssp. *sinensis* Verity, 1911

Colias erate sinensis Verity, 1911: Rhopalocera Palaearctica 1: 349, pl. 69, figs. 19-22. (Type locality: “Kioi-Kiang, Chang-Yang”)

Specimens examined:

Ssp. formosana: **JILONG [= KEELUNG] CITY**: 1♀, Jilongyu, 25. IX. 2011 (H. C. Huang); 1♀, Pengjia Island, 17. X. 2009 (H. C. Huang); 1♀, NTOU campus, 26. IX. 2006 (Y. F. Hsu); 1♂, 1♀, Bisha Harbor, 26. X. 2008 (W. H. Chien); 1♂, Longgang Trail, 20. V. 2001 (M. H. Lin); 3♀, Taian Fall, 200m, 21. X. 2008 (Y. F. Hsu); 1♀, Gangziliao, 4.X. 2015 (L. Huang) (genitalia preparation JYL188). **TAIPEI CITY**: 1♀, Daan, Gongguan, 14. I. 2003 (Y. A. Lin); 1♂, same locality, same date (Y. F. Hsu & C. L. Huang); 1♂, Wenshan, Gongguan, NTNU, 8. XI. 2013 (L. Huang) (genitalia preparation JYL187). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]**: 1♂, Tamsui, 15. III. 2003, reared from *Medicago lupulina*, emgd. 10. IV. 2003, HSU 03C24 (Y. F. Hsu); 1♂, 2♀, Shimen, Linshanbi, 27. V. 2010 (H. C. Huang). **YILAN Co.**: 1♂, Toucheng, Guishan Is., 23. IX. 2006 (H. C. Huang). **XINZHU [= HSINCHU] Co.**: 3♂, Jianshi, Zenxibao, 1600m, 2. III. 2010 (Y. F. Hsu, L. H. Huang & W. H. Chien). **TAIZHONG CITY [= TAICHUNG CITY/ TAICHUNG Co.]**: 1♀, Heping, Wuling, 2100/2200m, VI. 2008, reared from *Trifolium repens*, emgd. 21. VI. 2008, HSU 08F18 (K. F. Chang); 1♀, same locality, 11. X. 2008 (C. L. Huang). **NANTOU Co.**: 1♂, Renai, Songgang, 11. I. 2000 (C. Y. Hung). **TAIDONG [= TAITUNG] Co.**: 1♀, Lanyu, Sidaogou, 18. IV. 2006 (Y. F. Hsu); 1♀, same locality, 14/16. X. 2006 (Y. F. Hsu & H. C. Huang).

Ssp. sinensis: **LIANJIANG [= LIENCHIANG] Co.**: 1♀, Nangan, Shengli Dam, 9/10. XII. 2006, reared from *Medicago lupulina*, emgd. 24. XII. 2006, HSU 06M6 (Y. F. Hsu); 1♂, Nangan, Renai, Baba Tunnel, 28. VI. 2013.

Description. Adult – Forewing length 23–30 mm. Male (PLATE 15, Fig. 82): Head hairy, yellow on frons, pink dorsally. Antennae covered by pink scalings. Proboscis dark brown. Labial palpus porrect, yellow with pink tip. Thorax covered by white hairs dorsally, yellow ventrally. Abdomen covered by yellow scalings. Legs covered with yellow and pink scalings. Forewing triangular, with costa and termen slightly convex, dorsum straight. Wing uppersides ground color yellow, with prominent dark brown borders from forewing apex along termen, usually with a series of small windows, a series of dark brown spots along termen of hindwing. A dark brown spot present at distal end of discoidal cell of forewing, an orange spot present at distal end of discoidal cell of hindwing. Wing underside with ground color mostly orange, with silver spots at distal end of discoidal cell of hindwing; a dark brown spot at distal end of discoidal cell of forewing. A series of discal spots present on forewing. Female (PLATE 15, Figs. 83–84): wing patterns as those of males, but a white form with ground color of wings and scalings on body white instead of yellow.

Two subspecies are known, viz. ssp. *formosana* from main island of Taiwan and ssp. *sinensis* from Mazu Island, but they are difficult to separate.

Male genitalia (PLATE 27, Fig. 144) – Tegumen with posterior margin possessing a medial, digitate process; uncus tapering caudally with acute distal tip. Vinculum slender, somewhat twisted. Saccus enlarged, bulb-like. Valva lobe-like, with distal part narrowed into a flap-like extension with ventral beak. Phallus elongate, strongly down-curved; phallobase possessing long, rudder-like structure ventrally. Juxta as a simple plate with shallow V-shaped dorsal cleft.

Female genitalia (PLATE 36, Fig. 181) – Corpus bursae oval with prominent appendix bursae. Ductus bursae with caudal portion sclerotized. Sterigma forming a dome-like structure, with associated sternum VIII forming a U-shaped invagination. Signum as a transverse band with both ends truncated, armed with spines. Anal papillae densely setose. Posterior apophyses moderately long, slender. Anterior apophyses vestigial.

Global distribution. Widespread in Eurasia, reaching North Africa (Verhulst, 2000).

Distribution in Taiwan. Lowland to higher elevations, including associated islands (Hsu, 2013; Hsu *et al.*, 2009).

Larval Host plant(s). Fabaceae: *Trifolium repense*, *Medicago lupulina*, *Melilotus suaveolens*, *Mel. indicus*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The population found in Jinmen and Matsu islands have dark brown scalings more extensive, and tentatively regarded as ssp. *sinensis* Verity, 1911. Lee (2000) assigned the colony found in Matsu Islands to the nominotypical subspecies of *C. erate*, which is restricted to western Palearctics (Verhulst, 2000), thus not applicable to populations found in Matsu or Jinmen.

Some authors considered populations in eastern Palearctic Region as a separate species *C. poliographus* Motschulsky, 1860 (type locality "Khokodody", [Japan]), with both *formosana* Shirôzu, 1955 and *sinensis* Verity, 1911 as its subspecies (e. g. Wu, 2010). The other authors still accept a “*sensu lato*” species concept of *C. erate*, including these taxa as subspecies (e. g. Verhulst, 2000).

形態特徵：成蝶前翅長 23–30mm。雄蝶 (圖 82)：頭部具毛，前額黃色，背面粉紅色。觸角覆有粉紅色鱗。口器黑褐色。下唇鬚前伸、黃色，末端粉紅色。胸部背面覆有白色毛，腹面黃色。腹部覆有黃色鱗。足覆有黃色及粉紅色鱗。前翅三角形，前緣及外緣略凸，後緣筆直。翅背面底色黃色，前翅先端沿外緣具明顯黑褐色邊，通常有一列窗格狀小紋，沿後翅外緣有一列黑褐色斑，前翅中室靠外側有一黑褐色斑點，後翅中室靠外側有一橙黃色斑點。翅腹面底色大多為橙黃色，後翅中室靠近外側有銀斑，前翅中室靠外側有一黑褐色斑點，前翅中央有一列斑點。雌蝶 (圖 83–84)：翅紋與雄蝶相同，惟白色型翅底色為白色，軀體亦為白色。

臺灣地區記錄 2 亞種：本島與鄰近離島的 ssp. *formosana* 及馬祖地區的 ssp. *sinensis*，但兩者難以藉外觀區分。

雄交尾器 (圖 144)：背兜後緣中央具指狀突出。鉤突向尾端漸細，末端銳尖。基腹弧纖細，略扭曲。囊突膨大、球狀。抱器葉狀，向後漸窄而延伸呈帆狀，腹面具喙狀突起。陽莖長、強下彎，陽莖基腹面具長舵狀構造。陽基軛片簡單板狀，背部具 V 形淺凹。

雌交尾器 (圖 181)：交尾囊卵狀，具顯著附囊。交尾囊管後段骨化。交尾孔板形成圓頂狀構造，與相對應的第 8 腹節形成 U 形凹陷。花壁橫帶狀，兩端截平、具刺。肛突密生毛。後內骨突長度中庸、纖細。前內骨突退化。

世界分布：廣分布於歐亞大陸，延伸至北非。

臺灣分布：分布本島低至高海拔，包括離島。

幼蟲寄主植物：豆科白花三葉草、天藍苜蓿、草木樨、印度草木樨等。

生物學：一年多世代。

註記：發現於金門和馬祖的族群之翅面黑褐色部分較發達而暫視為亞種 *ssp. sinensis*。該族群曾被認為屬於 *C. erate* 承名亞種 (Li, 2000)，但 *C. erate* 承名亞種分布侷限於古北區西部，因此該處理不大恰當。

有些研究者認為古北區東部的族群為 1 獨立種 *C. poliographus* Motschulsky, 1860 (模式產地日本)，而 *formosana* Shirôzu, 1955 和 *sinensis* Verity, 1911 為其亞種 (例如 Wu, 2010)，另一些研究者仍採用較廣義的種概念將此等族群仍視為 *C. erate* 的亞種 (例如 Verhulst, 2000)。

Genus *GONEPTERYX* Leach, [1815]

Type species: *Papilio rhamni* Linnaeus, 1758

Diagnostic characters for the genus include: 1) forewing costa strongly curved, apex pointed; 2) 4 R veins, with R₁ and R₂ arising from discoidal cells; 3) hindwing pointed at distal end of CuA₁; 4) tarsus without pulvillus.

Larval hostplants are in the family Rhamnaceae.

2 species are found in Taiwan.

鉤粉蝶屬

本屬的鑑別特徵包括：1) 前翅前緣強彎曲，先端尖銳；2) 具四條 R 脈，R₁ 與 R₂ 源自中室；3) 後翅 CuA₁ 脈末端突出而尖銳；4) 跗節不具褥盤。

幼蟲寄主植物為鼠李科植物。

臺灣已知 2 種。

***Gonepteryx amintha* (Blanchard, 1871) (圓翅鉤粉蝶 / 紅點粉蝶)**

Rhodocera amintha Blanchard, 1871: Comptes rendus hebdomadaires des séances de l'Académie des sciences 72: 810. (Type locality: "Mou-pin")

Ssp. *formosana* Fruhstorfer, 1908

PLATE 16, Figs. 85-86; PLATE 27, Fig. 145; PLATE 36, Fig. 182

Rhodocera formosana Fruhstorfer, 1908: Entomologische Zeitschrift 22 (25): 102. (Type locality: "Taihanroku, Formosa")

Specimens examined:

XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]: 1♂, Xindian, Feicui Dam, 18. IV. 2012 (Y. F. Hsu); 1♂, Sanxia, Beichatianshan, 1700m, 11/14. VI. 1999 (Y. T. Lo); 1♂, Wulai, 250m, 16. X. 2008, reared from *Rhamnus formosana*, emgd. 14. IX. 2008, HSU 08K27.1 (C. L. Huang). **TAOYUAN CITY [= TAOYUAN Co.]:** 1♂, Fuxing, Xuanyuan, 6. IV. 2016 (L. Huang) (genitalia preparation JYL214). **HUALIAN [= HUALIEN] Co.:** 1♂, Xiulin, Tianxiang, 500m, 11. X. 2008 (M. H. Sun). **JIAYI [= CHIAYI] Co.:** 1♂, Fanlu, Shizhou/Dabang, 900/1000m, 8. V. 2010 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♂, Hairui (Haiduan), Xiangyangshan, 3400m, 20. VIII. 2008 (C. L. Huang); 1♀, Haiduan, Liyuan, 17. VIII. 2015 (J. Y. Liang) (genitalia preparation JYL219). **PINGDONG [= PINGTUNG] Co.:** 1♂, Wutai, Ali, 1200m, 5. III. 2011 (Y. F. Hsu); 1♂, Wutai, Wutoushan, 1200m, 6. VI. 2009 (Y. F. Hsu).

Description. Adult – Forewing length 32–36 mm. Male (PLATE 16, Fig. 85). Head hairy, brown. Antennae covered by dark brown and pink scalings. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs dorsally, yellow ventrally. Abdomen covered by yellow scalings. Legs covered with yellow scalings. Forewing with costa strongly curved, termen and dorsum nearly straight, apex pointed; hindwing rounded. Wing uppersides ground color yellow, forewing mostly orange. Orange spot present at distal end of discoidal cell of both forewing and hindwing. Wing underside with hindwing and anterior portion of forewing greenish yellow, with Sc+R₁ and several veins associated with posterior vein of discoidal cell of hindwing overlaid by additional white scalings. Reddish brown spot present at distal end of discoidal cell of both forewing and hindwing. Female (PLATE 16, Fig. 86): wing patterns similar to those of males, but ground color of wing uppersides pale yellow.

Male genitalia (PLATE 27, Fig. 145) – Tegumen broad; uncus conical with caudal end pointed. Vinculum slender, curved. Saccus elongate, with cephalic end slightly enlarged. Valva lobe-like, with distal end forming a digitate process; a prominent, conical, inner tooth present near posterior end. Phallus elongate, straight, with caudal end slightly down-curved. Juxta slender, with dorsal end acute.

Female genitalia (PLATE 36, Fig. 182) – Corpus bursae oval, with prominent appendix bursae. Ductus bursae membranous, enlarged toward caudal end. Sterigma forming a dome-like structure, with associated sternum VIII forming a semi-circular invagination. Signum as a transverse band, armed with spines anteriorly. Anal papillae setose.

Global distribution. West to East China, Taiwan.

Distribution in Taiwan. Lowland to higher elevations.

Larval Host plant(s). Rhamnaceae: *Rhamnus formosana* (Hsu, 2013), also *R. parvifolia* (Lu & Chen, 2014).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 32–36mm。雄蝶 (圖 85)：頭具毛、褐色。觸角覆有黑褐色和粉紅色鱗片。口器黑褐色，下唇鬚前伸、黃色。胸部背面覆有白毛，腹面黃色。腹部覆有黃色鱗片。足被黃色鱗。前翅前緣強彎曲，外緣及後緣近筆直，翅端銳突出、尖銳，後翅圓。翅背面底色黃色，前翅大部分呈橙色，前翅及後翅在中室外端有橙色斑點。翅腹面在後翅及前翅前部黃綠色，Sc+R₁ 脈和數條與後翅中室後方相關的翅脈覆蓋白色鱗片，前翅及後翅中室外端有紅褐色斑點。雌蝶 (圖 86)：翅紋與雄蝶相似，但翅背面底色呈淺黃色。

雄交尾器 (圖 145)：背兜寬闊，鉤突圓錐狀、末端尖。基腹弧纖細、彎曲，囊突長、前端略膨大。抱器葉狀，末端形成指狀突出，近後端具顯著圓錐狀內齒。陽莖長而直，末端略下彎。陽基軛片纖細，背側銳尖。

雌交尾器 (圖 182)：交尾囊卵狀，具顯著附囊。交尾囊管膜質，向尾端漸膨大。交尾孔板形成圓頂狀結構，與第 8 腹節形成半圓形凹陷。花壁為橫帶狀，前端具刺。肛突具毛。

世界分布：華西至華東、臺灣。

臺灣分布：低至高海拔。

幼蟲寄主植物：鼠李科桶鉤藤、小葉鼠李。

生物學：一年多世代 (Hsu, 2013)。

***Gonepteryx taiwana* Paravicini, 1913 (臺灣鉤粉蝶 / 小紅點粉蝶)**

PLATE 16, Figs. 87-88; PLATE 27, Fig. 146; PLATE 37, Fig. 183

Gonepteryx taiwana Paravicini, 1913: Supplementa Entomologica 2: 76. (Type locality: “von Hoozan”)

Specimens examined:

TAOYUAN CITY [= TAOYUAN Co.]: 1♀, Fuxing, Lalashan, 4. IV. 2000 (C. C. Lu); 1♂, same locality (Y. T. Lo & B. C. Jo) (genitalia preparation JYL206). **XINZHU [= HSINCHU] Co.:** 3♂, 2♀, Jianshi, Lidongshan, 1500m, 3. IX. 2005 (Y. F. Hsu). **PINGDONG Co.:** 1♂, Wutai, 6. IV. 2015 (L. H. Wang) (genitalia preparation JYL248).

Description. Adult – Forewing length 30–32 mm. Male (PLATE 16, Fig. 87): Head hairy, brown. Antennae covered by dark brown and pink scalings. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs dorsally, yellow ventrally. Abdomen covered by yellow scalings. Legs covered with yellow scalings. Forewing with costa strongly curved, termen and dorsum nearly straight, apex pointed; hindwing wavy along termen. Wing uppersides ground color pale yellow, forewing with deep yellow scalings proximally. Orange spot present at distal end of discoidal cell of both forewing and hindwing. Wing underside with hindwing and anterior portion of forewing greenish yellow, with Sc+R₁ and several veins associated with posterior vein of discoidal cell of hindwing overlaid by additional white scalings. Reddish brown spot present at distal end of discoidal cell of both forewing and hindwing. Female (PLATE 16, Fig. 88): wing patterns similar to those of males, but ground color of wing uppersides pale yellow.

Male genitalia (PLATE 27, Fig. 146) – Tegumen broad; uncus elongate, down-curved, conical, with caudal end acute. Vinculum slender, curved. Saccus elongate, with cephalic end slightly enlarged. Valva lobe-like, with distal end forming a digitate process; a prominent, digitate, inner process present near posterior end. Phallus elongate, twisted, with caudal part down-curved.

Female genitalia (PLATE 37, Fig. 183) – Corpus bursae oval, with prominent appendix bursae. Ductus bursae membranous. Sterigma not recognized. Signum as a transverse band, armed with spines laterally. Anal papillae setose.

Global distribution. Endemic to Taiwan.

Distribution in Taiwan. Moderate to higher elevations.

Larval Host plant(s). Rhamnaceae: *Rhamnus nakaharai* and *R. parvifolia*, etc. (Hsu, 2013).

Biology. Univoltine in occurrence, with adults in diapause in winter (Hsu, 2013).

Remarks. This taxon is sometimes considered as a subspecies of *G. mahaguru* (e. g. Shirôzu, 1960; Hamano, 1986), but recently authors mostly regard it as a distinct species endemic to Taiwan (e. g. Wu, 2010; Bozano, 2016).

形態特徵：成蝶前翅長 30–32mm。雄蝶 (圖 87)：頭具毛、褐色。觸角覆有黑褐色與粉紅色鱗片。口器黑褐色，下唇鬚前伸、黃色。胸部背面覆有白色毛，腹面黃色。腹部覆有黃色鱗。足覆黃色鱗。前翅前緣強彎曲，外緣及後緣近筆直，翅端突出、尖銳，後翅外緣波狀。翅背面底色淺黃色，前翅基部具深黃色鱗，前翅與後翅中室末端有橙色斑點。翅腹面在後翅及前翅前部黃綠色，Sc+R₁ 脈及後翅中室後方相關的翅脈散佈額外白色鱗片，前翅及後翅中室外端有紅褐色斑點。雌蝶 (圖 88)：翅紋與雄蝶相似，但翅背面底色淺黃色。

雄交尾器 (圖 146)：背兜寬闊。鉤突長、下彎、圓錐狀，尾端銳尖。基腹弧纖細、彎曲。囊突長，前端略膨大。抱器葉狀，末端指狀，近後端具顯著指狀內突。陽莖長、扭曲，末端下彎。

雌交尾器 (圖 183)：交尾囊卵狀，具顯著附囊。交尾囊管膜質。交尾孔板不發達。花壁橫帶狀，側面具刺。肛突具毛。

世界分布：臺灣特有種。

臺灣分布：分布於中高海拔地區。

幼蟲寄主植物：鼠李科中原氏鼠李、小葉鼠李等。

生物學：一年一世代，冬季以成蟲態越冬。

註記：本分類群有時被視為尖鉤粉蝶 *G. mahaguru* 的亞種 (例如 Shirôzu, 1960; Hamano, 1986)，但近年來學者多認為其為一獨立種，且為臺灣特有種 (例如 Wu, 2010; Bozano, 2016)。

Genus *EUREMA* Hübner, [1819]

Type species: *Papilio delia* Cramer, [1780]

Diagnostic characters for the genus include: 1) 4 R veins; R₁ and R₂ separately arising from discoidal cells, R₄₊₅ stalked with M₁; 2) wings mostly yellow with dark brown border.

Larval hostplants are in the family Fabaceae, Rhamnaceae, Euphorbiaceae and Guttiferaceae.

7 species are found in Taiwan.

黃蝶屬

本屬鑑別特徵包括：1) 具四條 R 脈，R₁ 及 R₂ 分別源自中室，R₄₊₅ 與 M₁ 共柄；2) 翅面主要呈為黃色，並有黑褐色邊。

幼蟲寄主植物包括豆科、鼠李科、大戟科與金絲桃科。

臺灣地區有 7 種。

Eurema brigitta (Stoll, [1780]) (星黃蝶 / 無標黃粉蝶)

Papilio brigitta Stoll, [1780]: in Cramer, De uitlandsche kapellen 4 (26b-28): 82, pl. 331, figs. B, C.
(Type locality: “Guiné” [Guinea, W. Africa])

Ssp. hainana Moore, 1878

PLATE 17, Figs. 89-90; PLATE 28, Fig. 147; PLATE 37, Fig. 184

Terias hainana Moore, 1878: Proceedings of the Zoological Society of London 1878 (3): 700. (Type locality: Hainan)

Eurema libythea f. *formosana* Matsumura, 1919: Thousand insects of Japan (Additamenta) 3: 510, pl. 34, fig. 13. (Type locality: Formosa [Horisha; Tappan])

Eurema dorothea Nakahara, 1922: Entomologist 55 (709): 123. (Type locality: Horisha, Formosa)

Specimens examined:

TAOYUAN CITY [= TAOYUAN Co.]: 2♂, Longtan, 15. IX. 1999 (Y. F. Hsu); 1♀, same locality, 18. IX. 1999 (Y. F. Hsu); 1♀, same locality, 27. IX. 2002 (Y. F. Hsu); 1♂, 1♀, same locality, 29. IX. 2002, reared from *Chamaecrista mimosoides*, emgd. 19/20. X. 2004, HSU 02J49 (C. L. Huang); 1♂, Daxi, Dingliao, 26. III. 2003 (Y. F. Hsu); 1♂, same locality, 6. XII. 2009 (C. H. Lin, jr); 3♂, 3♀, Daxi, Dingliao, 200m, 21. IX. 2009 (Y. F. Hsu); 2♂, same locality, 6. XII. 2009 (C. H. Lin, jr); 4♂, 4♀, same locality, 7. XII. 2009 (Y. F. Hsu). **TAIZHONG CITY [= TAICHUNG CITY/ TAICHUNG Co.]:** 1♀, Dadushan, 20. X. 2008 (Y. F. Hsu); 1♂, 1♀, Heping, Defulan, 15. VII. 2015 (L. Huang) (genitalia preparation JYL196, JYL195). **NANTOU Co.:** 2♀, Renai, Guandaoshan, 24. IX. 2000, reared from *C. mimosoides*, emgd. 5. X. 2000, HSU 00J46 (C. Y. Huang); 1♂, Renai, Nanshanxi, 900m, 1. IX. 2007 (Y. F. Hsu); 1♂, Renai, Jiantai Froest Trail, 9. VIII. 2007, reared from *C. mimosoides*, 23. VIII. 2007 (C. L. Huang); 1♀, Renai, Jiantai Froest Trail, 1100/1200m, 4. XII. 2010 (J. H. Lin). **JIAYI [= CHIAYI] Co.:** 1♂, 3♀, Zhuqi, Shizhou, 1200m, 10. X. 2005 (Y. F. Hsu); 2♂, Zhuqi, Shizhou, 1300m, 10. X. 2005 (Y. F. Hsu); 2♂, Alishan, Shizhou/Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♂, Daren, Dazhuxi, 500m, 23/26. XI. 2001 (C. L. Huang). **KAOHSIUNG CITY [= KAOHSIUNG Co.]:** 2♂, Liugui, 23. X. 2005 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, Chunri, Dahanshan, 850m, 4. I. 2003 (Y. F. Hsu); 1♂, 1♀, Wutai, Wutoushan, 1200m, 6. VI. 2009 (Y. F. Hsu).

Description. Adult – Forewing length 15–23 mm. Male (PLATE 17, Fig. 89): Head hairy, brown mixed with pink. Antennae covered by dark brown and pink scalings. Proboscis dark brown. Labial palpus porrect, yellow and pink. Thorax covered by white hairs dorsally, yellow ventrally. Abdomen dark brown, covered by yellow scalings laterally and ventrally. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, with dark brown border distally on forewing, along termen on hindwing. Wing underside with ground color paler, with dark brown markings mostly on hindwing. Discal band with markings in cell Rs, M₁ and M₂ in a line. Short, dark brown bar present at distal end of discoidal cells. Female (PLATE 17, Fig. 90): Ground color of wing uppersides paler, with dark scalings more extensive.

Male genitalia (PLATE 28, Fig. 147) – Tegumen swollen dorsally, abruptly narrowed,

tapering caudad; uncus with bifid distal end. Vinculum slender, curved dorsally. Saccus elongate, with length as long as or longer than tegumen height. Valva lobe-like, produced caudad into down-curved hook-like projection; several digitate processes on inner surface, including 3 on costa+ampulla, 1 on harpe. Phallus elongate, slightly down-curved, phallobase thick. Juxta bi-lobed, with dorsal, medial cleft.

Female genitalia (PLATE 37, Fig. 184) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of sclerotized lobes. Signum a transverse, curved band armed with spines. Anal papillae densely setose. Posterior apophyses and anterior apophyses elongate, slender.

Variation. Fringe is pink in dry season, dark brown in wet season.

Global distribution. Widespread in Afrotropical Region, Oriental Region, and Australian Region, but not in the Philippines (Yata, 1985).

Distribution in Taiwan. Mainly in low to moderate elevations, less common in northern Taiwan (Hsu, 2013).

Larval Host plant(s). Fabaceae: *Chamaecrista mimosoides* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 15–23mm。雄蝶 (圖 89)：頭具毛、褐色混粉紅色。觸角覆有黑褐色及粉紅色鱗片。口器黑褐色，下唇鬚前伸、黃色及粉紅色。胸部背面覆白色毛，腹面黃色。腹部黑褐色，側面及腹面覆黃色毛。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣及內緣近筆直。翅背面底色黃色，前翅外側及後翅外緣有黑褐色邊。翅腹面底色較淺，黑褐色紋大部分見於後翅，中央帶紋於 R_s 、 M_1 及 M_2 室斑紋呈一直線，中室末端具一短黑褐色短條。雌蝶 (圖 90)：翅背面底色較淺，黑色鱗較發達。

雄交尾器 (圖 147)：背兜背部膨大，向後突窄，尾端漸細。鉤突末端二分叉。基腹

弧纖細，背側彎曲。囊突長，長度與背兜高度等長或更長。抱器葉狀，向尾端延伸形成下彎鉤之狀突起，內面具多指狀突起，三突起位於抱器背和抱器內突處，一突起位於抱握鉗。陽莖長，略下彎。陽莖基粗。陽基軛片葉狀、二分，背側中央凹陷。

雌交尾器 (圖 184)：交尾囊卵狀。交尾囊管略骨化，朝尾端漸細。交尾孔板形成骨化壁，具一對骨化葉。花壁為橫向彎帶，具刺。肛突密生毛，後內骨突和前內骨突細長。

變異：乾季時緣毛粉紅色，雨季時黑褐色。

世界分布：廣分布於熱帶非洲區、東洋區、澳洲區，但不包括菲律賓。

臺灣分布：主要分布低至中海拔，臺灣北部較少見。

幼蟲寄主植物：豆科假含羞草。

生物學：一年多世代。

***Eurema laeta* (Boisduval, 1836) (角翅黃蝶 / 端黑黃蝶 / 尖角黃粉蝶)**

Terias laeta Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 674. (Type locality: “Bengale” [Bengal])

Terias jaegeri Ménétriés, 1855: Catalogue de la collection entomologique de l'Académie impériale des sciences de St.-Petersbourg 2: 84, 1: pl. 2, fig. 1. (Type locality: “Haïti” [error?])

Terias venata Moore, 1857: in Horsfield & Moore: A catalogue of the lepidopterous insects in the museum of the Hon. East-India Company 1: 65, pl. 2a, fig. 2. (Type locality: “N. India”)

Terias laetissima Hewitson, 1862: Illustrations of new species of exotic butterflies 3: 7, pl. 7, figs. 45-46. (replacement name for *Terias laeta*, invalid emendation)

Terias santana C. & R. Felder, 1865: Reise der österreichischen Fregatte Novara Bd 2 (Abth. 2) (2): 211. (Type locality: “Bengalia: Calidungi”)

***Ssp. punctissima* Matsumura, 1909**

PLATE 17, Figs. 91-93; PLATE 28, Fig. 148; PLATE 37, Fig. 185

Terias punctissima Matsumura, 1909: Entomologische Zeitschrift 23 (18) : 88. (Type locality: “Koshun” [= Hengchun, Taiwan])

Specimens examined:

NANTOU Co.: 1♀, Renai, Nanshanxi, 900m, 1. IX. 2007 (Y. F. Hsu); 1♂, 2♀, Renai,

Huisun, 600/700m, 20. II. 2012 (Y. F. Hsu & H. C. Huang). **JIAYI [= CHIAYI] Co.:** 1♂, Zhuqi, Shizhou, 1200m, 11. IX. 2004, reared from *C. mimosoides*, emgd. 2. X. 2004, HSU 04J29 (Y. F. Hsu); 1♂, 2♀, same locality, 25. IX. 2005, reared from *Chamaecrista mimosoides*, emgd. 6. X. 2005, HSU 05J57 (Y. F. Hsu); 5♂, 1♀, same locality, 10. X. 2005 (Y. F. Hsu); 3♂, 2♀, Zhuqi, Shizhou, 1300m, 11. IX. 2004 (Y. F. Hsu & R. K. Dong) (genitalia preparation JYL225); 1♂, same locality, 29. IX. 2007 (Y. F. Hsu); 1♂, same locality, 2. V. 2010 (R. K. Dong & Y. F. Hsu) (genitalia preparation JYL224); 1♂, Alishan, Shizhou/ Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 3♂, 2♀, Yanping, Hongye, 500m, 28. I. 2009 (M. H. Sun). **KAHHSIUNG CITY [= KAHHSIUNG Co.]:** 1♂, Maolin, Shanping, 26. I. 2003 (C. L. Huang); 2♂, Taoyuan, Meishan, 800m, 26. II. 2011 (H. C. Huang). **PINGDONG [= PINGTUNG] Co.:** 1♂, Xiaoguihu Trail, 28. VI. 2003 (C. L. Huang); 1♂, Wutai, Ali, 1000m, 2. I. 2009 (C. C. Lu).

Description. Adult – Forewing length 18–21 mm. Male (PLATE 17, Fig. 91): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight, apex angled. Wing uppersides ground color yellow, with dark brown border distally on forewing, along termen on hindwing. Wing underside with ground color paler, with dark brown markings mostly on hindwing. Discal band with markings in cell Rs, M₁ and M₂ forming a dark brown straight line. Minute dark brown dot present at distal end of discoidal cells. Sexual brands as patches of specialized scales near base of forewing underside and anterior portion of hindwing upperside. Female (PLATE 17, Figs. 92-93): Ground color of wing uppersides paler, with dark scalings more extensive. No sexual brand.

Male genitalia (PLATE 28, Fig. 148) – Tegumen slightly swollen dorsally, abruptly narrowed, tapering caudad; uncus with blunt distal end. Vinculum slender, curved dorsally. Saccus elongate, over 2/3 of tegumen height. Valva lobe-like, produced caudad into axe-like projection; several digitate processes on inner surface, including 3 on costa+ampulla, none on harpe. Phallus elongate, slightly down-curved, phallobase thick.

Juxta bi-lobed, with dorsal, medial cleft.

Female genitalia (PLATE 37, Fig. 185) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of sclerotized lobes. Signum a transverse, curved band armed with spines. Anal papillae densely setose. Posterior apophyses and anterior apophyses elongate, slender.

Variation. Apex of forewing angled, and wing underside overlaid by reddish brown scalings in dry season.

Global distribution. Himalayas, India, Sri Lanka, Indochina, Luzon, South Korea, South Japan, West to East China, Taiwan (Yata, 1985).

Distribution in Taiwan. Mainly in moderate elevations of central and southern Taiwan.

Larval Host plant(s). Fabaceae: *Chamaecrista mimosoides* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. The population of this species seems to have suffered a considerable decline in abundance in Taiwan in recent years (Hsu, 2013).

形態特徵：成蝶前翅長 18–21mm。雄蝶 (圖 91)：頭具毛、褐色。觸角黑褐色，有白環。口器黑褐色，下唇鬚前伸、黃色。胸部覆有白色毛和鱗片。腹部黑褐色，覆黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣及後緣近筆直，翅端呈尖角狀。翅背面底色黃色，前翅外側及沿後翅外緣具黑褐色邊。翅腹面底色較淺，黑褐色紋主要見於後翅，中央斑帶於 R_s 、 M_1 及 M_2 室形成一黑褐色直線條，中室外端具一黑褐色小斑點，性標為一特化鱗片區域，位於前翅腹面近基部以及後翅背面前端。雌蝶 (圖 92–93)：翅背面底色較淺，黑色鱗較廣泛。無性標。

雄交尾器 (圖 148)：背兜背部膨大，朝後端突窄，並向後漸細。鉤突末端鈍。基腹

弧纖細，背部彎曲。囊突長，超過背兜高度三分之二。抱器葉狀。尾端延伸呈斧狀突出，內面具多指狀突，三突起位於抱器背和抱器內突處，抱握缺不具內突。陽莖長，略下彎。陽莖基粗。陽基軛片葉狀、二分，背側中央凹陷。

雌交尾器 (圖 185)：交尾囊卵狀。交尾囊管略骨化，朝尾端漸細。交尾孔板形成骨化壁，具一對骨化葉。花壁為橫向彎曲帶、具刺。肛突密生毛，後內骨突和前內骨突細長。

變異：乾季時前翅翅端呈尖角狀，翅腹面散布紅褐色鱗片。

世界分布：喜馬拉雅地區、印度、斯里蘭卡、中南半島、呂宋、朝鮮半島南部、日本南部、華西至華東、臺灣。

臺灣分布：主要分布在中南部中海拔山區。

幼蟲寄主植物：豆科假含羞草。

生物學：一年多世代 (Hsu, 2013)。

註記：近年本種族群在臺灣似乎數量銳減 (Hsu, 2013)。

***Eurema andersoni* (Moore, 1886) (淡色黃蝶 / 安迪黃粉蝶)**

Terias andersonii Moore, 1886: The Journal of the Linnean Society of London 21 (1): 47. (Type locality: "Sullivan Island; Elphinstone Island")

Terias andamana Moore, 1907: Lepidoptera Indica, Vol. VII: 75, Pl. 575, fig. 2a. (Type locality: Andamans) (part)

Terias lacteola prabha Fruhstorfer 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 169. (Type locality: Palawan)

Terias jordani Corbet, 1936: Proceedings of the Royal Entomological Society of London. Series B, 5: 168. (Type locality: Sikkim)

Ssp. *godana* Fruhstorfer, 1910

PLATE 17, Figs. 94-97; PLATE 28, Fig. 149; PLATE 37, Fig. 186

Terias andersoni godana Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 169. (Type locality: Formosa)

Specimens examined:

XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]: 1♂, Wulai, 10. XII. 1986; 3♂, same locality, 15. IV. 2005 (Y. F. Hsu); 2♀, same locality, 5. VI. 2005 (Y. F. Hsu); 1♂, same locality, 2. III. 2007 (Y. F. Hsu); 2♂, Wulai, Jiajiuliao, 200m, 20. X. 2010 (Y. F. Hsu); 1♂, same locality, 24. X. 2011 (Y. F. Hsu); 1♂, Xindian, Feicui Dam, 15. III. 2000 (Y. F. Hsu); 1♂, Ruifang, Santiaoling, 12. IX. 2015 (L. Huang) (genitalia preparation JYL192). **TAOYUAN CITY [= TAOYUAN Co.]:** 2♂, Fuxing, Baleng, 1000m, 11. VII. 2011 (H. C. Huang). **HUALIAN [= HUALIEN] Co.:** 1♀, Xiulin, Huide Tunnel, 30m, 15. XII. 2008 (M. H. Sun); 2♂, Xiulin, Taroko, 60m, 11. XI. 2007 (M. H. Sun). **NANTOU Co.:** 2♂, Lugu, Fonghuanggu Bird Park, 10. VII. 1996 (Y. F. Hsu); 1♂, same locality, 25. X. 1996 (Y. F. Hsu); 1♀, Yuchi, Lianhuachi, 700m, 21. VIII. 2002 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 1♀, Fanlu, Chukou, 350m, 5. IX. 2010 (Y. F. Hsu); 1♀, Fanlu, Chukou, 400m, 30. VII. 2009 (Y. F. Hsu). **TAIDONG [= TAITUNG Co.]:** 1♂, 1♀, Jingfeng, Manuerxi, 8. IV. 2000 (Y. F. Hsu) (genitalia preparation JYL293); 1♂, Beinan, Zhiben, 10. VII. 1996 (H. Y. Lee); 3♂, Donghe, Donghe Farm, 350m, 16. X. 2007 (Y. F. Hsu). **TAINAN CITY [= TAINAN Co.]:** 1♂, Baihe, Guanziling, 9. X. 2005 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, 1♀, Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu); 1♂, Shizi, Shuangliu, 200/400m, 26. III. 2005 (Y. F. Hsu).

Description. Adult – Forewing length 16–22 mm. Male (PLATE 17, Figs. 94-95): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, with dark brown border along costa and termen on forewing, and along termen on hindwing. Wing underside ground color paler, with dark brown markings forming way lines on hindwing. Dark brown bars present at distal end of discoidal cells. Single, small, dark brown marking in discoidal cell of forewing. Sexual brand as a linear strip on vein of posterior part of discoidal cell. Female (PLATE 17, Figs. 96-97): Ground color of wing uppersides paler, with dark brown border along forewing costa absent. No sexual brand.

Male genitalia (PLATE 28, Fig. 149) – Tegumen elongate, straight, tapering caudad; uncus bearing raising projecting with bifid distal end. Vinculum slender. Saccus with

length approximately 1/2 of tegumen height. Valva lobe-like, produced caudad into a simple projection; several processes on inner surface, including 1 on ventral margin of costa+ampulla, 2 on harpe. Phallus elongate, strongly down-curved, phallobase thick. Juxta bi-lobed, with deep dorsal, medial cleft.

Female genitalia (PLATE 37, Fig. 186) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of prominent, sclerotized lobes. Signum a narrow transverse band armed with spines. Anal papillae densely setose. Posterior apophyses short. Anterior apophyses shorter than posterior apophyses.

Variation. Dark brown borders on wing uppersides are more prominent in wet season.

Global distribution. South India, Sri Lanka, Indochina, Sundaland, Lesser Sunda, Borneo, Palawan, Taiwan (Yata, 1985), also southern China according to Wu (2010).

Distribution in Taiwan. Mainly in low to moderate elevation.

Larval Host plant(s). Rhamnaceae: *Ventilago elegans* and *V. leiocarpa* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 16–22mm。雄蝶 (圖 94–95)：頭具毛、褐色。觸角黑褐色、有白環。口器黑褐色，下唇鬚前伸、黃色。胸部覆白色毛和鱗片。腹部黑褐色，覆黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣及後緣近筆直。翅背面底色黃色，沿前翅前緣、外緣及沿後翅外緣有黑褐色邊。翅腹面底色較淺，後翅具黑褐色斑紋形成條線，中室外側有黑褐色條帶。前翅中室具一枚黑褐色小紋，性標為一線狀細條，位於中室後側翅脈上。雌蝶 (圖 96–97)：翅背面底色較淺，前翅前緣缺少黑邊。無性標。

雄交尾器 (圖 149)：背兜長而直，尾端漸細。鉤突有向上突起，末端二分叉。基腹弧纖細。囊突長度約背兜高度二分之一。抱器葉狀，尾端延伸形成簡單突起，內面

具多延伸突起，一突起位於抱器背和抱器內突之腹緣，兩突起位於抱握缺。陽莖長，強下彎。陽莖基粗。陽基軛片葉狀、二分，背側中央深凹。

雌交尾器 (圖 186)：交尾囊卵狀。交尾囊管略骨化，朝尾端漸細。交尾孔板形成骨化壁，具一對顯著骨化葉。花壁為窄橫帶，具刺。肛突密生毛。後內骨突短，前內骨突更短於後內骨突。

變異：雨季時黑褐色帶較為明顯。

世界分布：南印度、斯里蘭卡、中南半島、巽他陸塊、小巽他群島、婆羅洲、巴拉望、華南、臺灣。

臺灣分布：主要分布低至中海拔。

幼蟲寄主植物：鼠李科翼核木與光果翼核木。

生物學：一年多世代 (Hsu, 2013)。

***Eurema hecabe* (Linnaeus, 1758) (黃蝶 / 荷氏黃蝶 / 寬邊黃粉蝶)**

PLATE 18, Figs. 98-101; PLATE 28, Fig. 150; PLATE 38, Fig. 187

Papilio (Danaus) hecabe Linnaeus, 1758: Systema Naturae (Edn 10) 1: 470. (Type locality: “Asia” [China, Canton])

Papilio (Danaus) hecabe Linnaeus, 1764: Museum s:æ r:æ m:tis Ludovicæ Ulricæ reginæ: 249. (Type locality: “Asia” [China, Canton])

Papilio luzonicus Linnaeus, 1764: Museum s:æ r:æ m:tis Ludovicæ Ulricæ reginæ: 249. (Type locality: “Asia” [China, Canton])

Papilio rahel Fabricius, 1787: Mantissa Insectorum 2: 22. (Type locality: “India”)

Terias suava Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 670. (Type locality: “Japon; Borneo”)

Terias sinensis Lucas, 1852: Revue et magasin de zoologie pure et appliquée, series 2, 4 (9): 429. (Type locality: “Chine”)

Terias hecabeoides Ménétériés, 1855: Catalogue de la collection entomologique de l'Académie impériale des sciences de St.-Pétersbourg 2: 85, 1: pl. 2, f. 2. (Type locality: “Haiti”)

Terias aesiope Ménétériés, 1855: Catalogue de la collection entomologique de l'Académie impériale des sciences de St.-Pétersbourg 2: 85, 1: pl. 2, f. 3. (Type locality: “Haiti”)

Terias anemone C. & R. Felder, 1862: Wiener entomologische monatschrift 6 (1): 23. (Type locality: “Ning-po”)

- Terias nicobariensis* Felder, 1862: Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 12 (1/2): 480. (Type locality: Nicobar)
- Terias fimbriata* Wallace, 1867: Transactions of Entomological Society London, series 3, 4 (3): 323. (Type locality: Mussooree, N. India)
- Terias attenuata* Moore, 1878: Proceedings of the Zoological Society of London 1878 (3): 700. (Type locality: Hainan)
- Terias arcuata* Moore, 1878: Proceedings of the Zoological Society of London 1878 (3): 700. (Type locality: Hainan)
- Terias subdecorata* Moore, 1878: Proceedings of the Zoological Society of London 1878 (3): 699. (Type locality: Hainan)
- Terias unduligera* Butler, 1880: Proceedings of the Zoological Society of London 1880: 668. (Type locality: Formosa)
- Terias simulata* Moore, [1881]: The Lepidoptera of Ceylon 1 (3): 119, pl. 45, f. 2, 2a. (Type locality: Ceylon)
- Terias excavata* Moore, 1882: Proceedings of the Zoological Society of London 1882 (1): 252. (Type locality: "Kangra district (Dharmasala)")
- Terias purreea* Moore, 1882: Proceedings of the Zoological Society of London 1882 (1) : 252. (Type locality: "Kangra district")
- Terias apicalis* Moore, 1882: Proceedings of the Zoological Society of London 1882 (1): 253, pl. 12, f. 2. (Type locality: "Kangra district")
- Terias irregularis* Moore, 1882: Proceedings of the Zoological Society of London 1882 (1) : 253, pl. 12, f. 3, TL: Kangra. (Type locality: "Kangra district")
- Terias patruelis* Moore, 1886: The Journal of the Linnean Society of London 21 (1): 46, pl. 4, f. 5. (Type locality: "Mergui; Elphinstone Island; Pataw Island")
- Terias merguiana* Moore, 1886: The Journal of the Linnean Society of London 21 (1): 47, pl. 4, f. 7. (Type locality: "Mergui; Zediwon; Kisseriang Island; Elphinstone Island; Sullivan Island")
- Terias fraterna* Moore, 1886: The Journal of the Linnean Society of London 21 (1): 46, pl. 4, f. 6. (Type locality: "Mergui; Yimiki and Thaing, King Island; Elphinstone Island")
- Terias swinhoei* Butler, 1886: The Annals and magazine of natural history; zoology, botany, and geology -series 5 (17), 99: 216. (Type locality: "Bombay and Poona")
- Terias simplex* Butler, 1886: The Annals and magazine of natural history; zoology, botany, and geology -series 5 (17), 99: 217. (Type locality: Kangra, North-west Himalayas)

Specimens examined:

JILONG [= KEELUNG] CITY: 1♀, Pengjia Island, 17. X. 2009 (H. C. Huang).

TAIPEI CITY: 3♂, Shilin, Huagang, 3. VI. 1999, reared from *Breynia officinalis* [= *B. accrescens*], emgd. 10/13. VI. 1999, HSU 99F12 (L. H. Wang); 2♂, 2♀, same locality, 8. IX. 1999, reared from *B. officinalis* [= *B. accrescens*], emgd. 26/IX- 10/X. 1999, HSU 99J22 (L. H. Wang & Y. F. Hsu); 3♂, 2♀, same locality, 14. VI. 2000, reared from *B. officinalis* [= *B. accrescens*], emgd. 24/25. VI. 2000, HSU 00F13 (L. H. Wang); 2♂, Wenshan, Gongguan Campus, NTNU, 22. X. 1999, reared from *A. julibrissin*, emgd. 25.

X. 1999, HSU 99K25 (Y. F. Hsu); 1♂, same locality, 1. XI. 1999 (genitalia preparation YFH 1222, Y. H. Hsu); 2♂, 2♀, same locality, 6. XII. 1999, reared from *Albizia julibrissin*, emgd. 20/23. XII. 1999, HSU 99M5 (Y. F. Hsu); 1♂, same locality, 9. VII. 2003; 1♀, same locality, 29. VIII. 2006, reared from *A. julibrissin*, emgd. 1. IX. 2006, HSU 06H40 (Y. F. Hsu); 1♂, Daan, Gongguan, 16. I. 2003 (Y. F. Hsu). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]**: 1♂, Wulai, 16. I. 2007 (Y. F. Hsu). **TAOYUAN CITY [= TAOYUAN Co.]**: 1♀, Fuxing Dist., Gaoyi, 15. X. 1999 (Y. T. Lo); 1♂, Longtan, 7. IV. 2002 (Y. F. Hsu); 1♀, Daxi, Dingliao, 200m, 7. XII. 2009 (Y. F. Hsu); 1♂, Xinwu, 15. XI. 2002 (H. T. Chiu). **XINZHU [= HSINCHU] CITY**: 1♂, NTHU Campus, 25. VIII. 2012 (Y. F. Hsu). **MIAOLI Co.**: 1♀, Sanyi, 250m, 10. V. 2001 (Y. T. Lo); 1♂, 1♀, Sanyi, 7. VI. 2015 (L. Huang) (genitalia preparation JYL200, JYL201). **HUALIAN [= HUALIEN] Co.**: 1♂, Xiulin, Shikongzai, 60m, 14. XII. 2008 (M. H. Sun). **NANTOU Co.**: 1♂, 2♀, Lugu, Dongding, reared from *Sesbania cannabiana*, emgd. 7. I. 2003, HSU 02M43 (Y. F. Hsu). **ZHANGHUA [= CHANGHUA] Co.**: 1♀, Changhua, Baguashan, 21. XII. 1995. **TAIDONG [= TAITUNG] Co.**: 1♀, Lanyu, 1. V. 2003, reared from *B. vitis-idaea* [= *B. accrescens*], emgd. 12. V. 2003, HSU 03E6 (Y. F. Hsu); 1♂, same locality, 10. XII. 2003 (Y. F. Hsu); 1♂, same locality, 19. II. 2009 (C. H. Lin, jr); 1♂, Lanyu, Sidaogou, 1/3. V. 2003 (Y. C. Hsu & Y. T. Lo); 1♀, same locality, 28/29. IX. 2003 (Y. F. Hsu); 1♂, same locality, 18/20. III. 2006 (Y. F. Hsu & H. C. Huang); 1♂, same locality, 18/29. III. 2006 (Y. F. Hsu & H. C. Huang); 1♀, same locality, 18. IV. 2006 (Y. F. Hsu); 2♂, 1♀, same locality, 3/5. III. 2007 (Y. F. Hsu & H. C. Huang); 1♀, same locality, 17. III. 2007 (Y. F. Hsu); 1♂, same locality, 17/18. XI. 2007 (Y. F. Hsu & C. C. Hsieh); 2♂, same locality, 10. III. 2009 (Y. F. Hsu); 1♂, same locality, 27/30. III. 2010 (Y. F. Hsu); 1♀, same locality, 16/18. III. 2012 (Y. F. Hsu & H. C. Huang); 1♀, Lanyu, Xiaotianchi, 8. IX. 2008 (C. H. Yen); 2♂, Lanyu, 21/23. XI. 2008 (C. H. Lin, jr & C. L. Huang); 1♂, Lanyu, Shuangshiyan, 29. VI. 2008 (C. H. Lin); 1♂, Lanyu, Yeyin, 30. VI. 2008 (C. H. Lin); 2♂, Lanyu, Langdao, 12. VIII. 2009 (C. C. Lu); 1♂, 1♀, Donghe, Beiyuan, 150m, 25. I. 2007 (Y. F. Hsu); 1♂, Kangle, 27. III. 2010 (Y. F. Hsu); 5♂, 2♀, Taitung Airport, reared from *Galactia tenuiflora*, emgd. 1/29. XI. 2015, HSU 15K41 (L. Huang). **TAINAN CITY [= TAINAN Co.]**: 2♂, Xinhua, 20. I. 2007 (Y. F. Hsu); 5♀, same locality, 9. II. 2007, reared from *B. vitis-idaea* [= *B. accrescens*], emgd. 14/15. III. 2007, HSU 07B14 (Y. F. Hsu); 1♂, same locality, 9. II. 2007 (Y. F. Hsu); 1♂, Xinhua, Dakeng, 1. I. 2007 (Y. F. Hsu); 3♂, Xinying, 17. X. 2000, reared from *Cassia surattensis* [= *Senna sulfurea*], emgd. 14. XI. 2000, HSU 00K44 (Y.

F. Hsu); 5♀, same locality, 30. X. 2000, reared from *C. sulfurea* [= *S. sulfurea*], emgd. 13/21. XI. 2000, HSU 00K85 (Y. F. Hsu); 2♂, same locality, 30. X. 2000, reared from *Ca. surattensis* [= *Se. sulfurea*], emgd. 21. XI. 2000, HSU 00K85 (Y. F. Hsu); 1♂, Baihe, Guanziling, 9. X. 2005 (Y. F. Hsu); 1♂, Baihe, Wuchagou, 17. XII. 2002 (Y. F. Hsu). **KAOHSIUNG CITY** [= **KAOHSIUNG Co.**]: 1♀, Tianliao, Daganshan, reared from *B. vitis-idaea* [= *B. accrescens*], 14. III. 2002, HSU 02C10 (Y. F. Hsu); 2♂, 3♀, Xizhi Bay, Campus of National Sun Yat-sen University, 8. IX. 2000 (Y. F. Hsu, M. H. Lin & C. M. Wu); 2♂, 1♀, same locality, 8. IX. 2000, reared from *Ca. sulfurea* [= *Se. sulfurea*], emgd. 24/27. IX. 2000, HSU 00J22 (Y. F. Hsu, M. H. Lin & C. M. Wu); 1♀, Meinong, Shuangxi, 150m, 8. II. 2006 (Y. F. Hsu); 1♂, 2♀, same locality, 22. I. 2007 (Y. F. Hsu); 1♂, Liugui, 300m, 30. X. 2006, reared from *Chamaecrista mimosoides*, emgd. 30. XI. 2006, HSU 06K51 (Y. F. Hsu); 2♀, same locality, 25. XI. 2007, reared from *Sen. tora*, emgd. 3. XII. 2007, HSU 07L28 (Y. F. Hsu); 2♂, 1♀, same locality, 22. I. 2008 (Y. F. Hsu); 1♂, 1 gynandromorph, Liugui, 8. IX. 2000, reared from *A. falcataria*, emgd. 18. IX. 2000, HSU 00J24 (Y. F. Hsu); 1♀, Xiaogang, Dalinpu, 28. VIII. 2004 (Y. F. Hsu). **PINGDONG** [= **PINGTUNG**] **Co.**: 2♂, 2♀, Hengchun, Eluanbi, 7. IX. 2000, reared from *B. officinalis* [= *B. accrescens*], emgd. 28. IX. 2000, HSU 00J4 (Y. F. Hsu & C. R. Chen); 1♀, same locality, 29. I. 2003, reared from *B. vitis-idaea* [= *B. accrescens*], emgd. 19. III. 2003, HSU 03A68 (Y. F. Hsu); 1♀, same locality, 2. IV. 2004, reared from *Breynia* sp., emgd. 2. IV. 2004 (Y. Y. Chuang); 4♂, 5♀, Hengchun, Kending, 7. IX. 2000, reared from *Cas. tora* [= *Sen. tora*], emgd. 19/28/29. IX. 2000, HSU 00J20.1 (Y. F. Hsu, M. H. Lin, C. C. Lu & C. M. Wu); 1♂, Shizi, Shuangliu, 18. XII. 2005 (Y. F. Hsu); 1♂, Fangliao, Yuquan, 26. II. 2006 (Y. F. Hsu); 1♀, same locality, 21. I. 2007, reared from *B. vitis-idaea* [= *B. accrescens*], emgd. 22. II. 2007, HSU 07A29 (Y. F. Hsu); 1♀, Sandimen, 250m, 10. II. 2007 (Y. F. Hsu); 1♂, Chunri, Dahanshan, 850m, 4. I. 2003 (Y. F. Hsu). **JINMEN** [= **KINMEN**] **Co.**: 1♂, Guningtou, 2. X. 2000 (Y. T. Lo & C. C. Lu); 3♂, 3♀, same locality, 28. X. 2000, reared from *Se. cannabiana*, emgd. 14/23. XI. 2000, HSU 00K66 (M. H. Lin, Y. T. Lo & C. C. Lu).

Description. Adult – Forewing length 17–26 mm. Male (PLATE 18, Figs. 98-99): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing

triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, with dark brown border along termen on forewing and hindwing. Wing underside ground color paler, with dark brown markings forming way lines on hindwing. Dark brown bars present at distal end of discoidal cells. Two, small, dark brown markings in discoidal cell of forewing. Scattered dark scales present. Sexual brand as a linear strip on vein of posterior part of discoidal cell. Fringe of forewing yellow mixed with brown. Female (PLATE 18, Figs. 100-101): Ground color of wing uppersides paler, with dark brown border along forewing costa absent. No sexual brand.

Male genitalia (PLATE 28, Fig. 150) – Tegumen swollen dorsally, tapering caudad; uncus bearing raising projecting with bifid distal end. Vinculum slender. Saccus elongate, with length over 2/3 of tegumen height. Valva lobe-like, produced caudad into an angled projection; several digitate processes on inner surface, including 1 on costa+ampulla, 1 on dorsal margin subapically, 2 on harpe. Phallus elongate, down-curved, phallobase thick, aedeagus attenuate caudally. Juxta bi-lobed, with deep dorsal, medial cleft.

Female genitalia (PLATE 38, Fig. 187) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of prominent, sclerotized lobes. Signum a transverse band armed with spines of various sizes; largest spines at lateral ends. Anal papillae densely setose. Posterior apophyses short. Anterior apophyses 2X as long as posterior apophyses.

Variation. Dark brown borders are more prominent in wet season. Scattered dark scalings more prominent in dry season.

Global distribution. Widespread in Afrotropical Region, Oriental Region, and Australian Region, and eastern Palearctic Region (Yata, 1985).

Distribution in Taiwan. Widespread from low to high elevations, including associated islands.

Larval Host plant(s). Fabaceae: *Albizia jubrissin*, *Cassia sulfurea*, *C. siamea*, *C. fistula*, *C. alata*, *Pithecellobium dulce*, *Sesbania cannabiana*, *Aeschynomene indica*; Eupobiaceae: *Breynia officinalis*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 17–26mm。雄蝶 (圖 98–99)：頭具毛、褐色。觸角黑褐色，有白環。口器黑褐色，下唇鬚前伸、黃色。胸部覆白色毛和鱗片。腹部黑褐色，覆黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣及後緣近筆直。翅背面底色黃色，前翅及後翅外緣具黑褐色邊。翅腹面底色較淺，後翅具黑褐色斑紋形成線條，中室末端具黑褐色短條，前翅中室具兩個小型黑褐色斑紋，散布黑色鱗片，性標為一線狀細條，位於中室後側翅脈上，前翅緣毛黃色混褐色。雌蝶 (圖 100–101)：翅背面底色較淺，前翅前緣缺少黑邊。無性標。

雄交尾器 (圖 150)：背兜背側膨大，向尾端漸細，鉤突有向上突起，末端二分叉。基腹弧纖細。囊突長，長度超過背兜高度三分之二。抱器葉狀，向尾端延伸呈角狀突起，內面具多指狀突，一突起於抱器背和抱器內突處，一突起於背緣亞端部，兩突起於抱握鈹。陽莖長，下彎。陽莖基粗。陽莖器向尾端漸細。陽基軛片葉狀、二分，背側中央深凹。

雌交尾器 (圖 187)：交尾囊卵狀。交尾囊管略骨化，向尾端漸細。交尾孔板形成骨化壁，具一對顯著骨化葉。花壁橫帶狀，具大小不同刺突，最大刺突位於側端。肛突密生毛。後內骨突短。前表皮突約為後表皮突兩倍長。

變異：雨季翅背面黑褐色邊紋較明顯，乾季時翅腹面散布之黑褐色鱗較明顯。

世界分布：廣布於非洲熱帶區、東洋區、澳洲區及古北區東部。

臺灣分布：廣分布於低至高海拔地區，包括離島。

幼蟲寄主植物：豆科合歡、黃槐、鐵刀木、阿伯勒、翼柄決明、金龜樹、田菁、合萌；大戟科紅仔珠等。

生物學：一年多世代 (Hsu, 2013)。

Eurema mandarina* (de l'Orza, 1869) (北黃蝶 / 北黃粉蝶)*PLATE 18, Figs. 102-105; PLATE 29, Fig. 151; PLATE 38, Fig. 188.***Terias mandarina* de l'Orza, 1869: Les Lepidopteres japonais: A la grande exposition international de 1867: 18. (Type locality: Japan)**Specimens examined:**

JILONG [= KEELUNG] CITY: 1♂, Pengjiayu, 15. VIII. 2010 (Y. F. Hsu); 2♂, 3♀, same locality, 18. VIII. 2011 (H. C. Huang). **XINBEI CITY [= NEW TAIPEI CITY/TAIPEI Co.]:** 1♀, Jinshan, 2. VIII. 2011 (H. C. Huang); 1♂, Wulai, Jiajiuliao, 150m, 10. IX. 2008 (Y. F. Hsu); 1♂, Wulai, 10. XII. 1986; 1♂, same locality, 20. X. 1999, reared from *Sageretia randaiensis*, emgd. 5. XI. 1999 (C. C. Lu); 1♀, same locality, 16. I. 2007 (Y. F. Hsu); 2♀, Bali, Guanyinshan, 400m, 13. VIII. 2011 (Z. H. Yen); 1♂, Shimen, Linshanbi, 2. X. 2010 (H. C. Huang). **TAOYUAN CITY [= TAOYUAN Co.]:** 2♂, Fuxing, Kala, 900m, 13. VII. 2011 (H. C. Huang); 2♂, Fuxing, Baleng, 1000m, 11. VII. 2011 (H. C. Huang); 1♂, Fuxing, Baleng, 28. V. 2016 (L. Huang) (genitalia preparation JYL239). **XINZHU [= HSINCHU] Co.:** 1♀, Wufeng, E. branch Dalu Forest Trail, 2000m, 20. X. 2009 (L. H. Wang & C. H. Huang). **HUALIAN [= HUALIEN] Co.:** 1♂, Xiulin, Shikongai, 100m, 25. VII. 2008 (M. H. Sun); 1♀, Xiulin, Shikongai, 100/300m, 11. X. 2008 (M. H. Sun); 1♂, 1♀, Xiulin, Huide Tunnel, 30m, 15. XII. 2008 (M. H. Sun); 2♀, Xiulin, Huitouwan, 700m, 30. I. 2007 (Y. F. Hsu) (genitalia preparation JYL266); 1♂, same locality, 30. I. 2007, reared from *Lespedeza formosa* [= *L. chinensis*], emgd. 11. II. 2007, HSU 07A46 (Y. F. Hsu). **NANTOU Co.:** 1♂, 2♀, Renai, Renzhiguan, 23. XI. 1996, reared from *Rhamnus formosana*, emgd. 6/9. XII. 1996, HSU 96L34 (Y. F. Hsu); 4♂, 1♀, Renai, Aowanda, 1200m, 29. IX. 2009 (Y. F. Hsu); 2♂, 1♀, Xinyi, Dongpu, 1100/1200m, 31. VII. 2009 (Y. F. Hsu); 1♀, Xinyi, Dongpu, 1500/1600m, 2. IX. 2007 (Y. F. Hsu); 1♀, Renai, Huisun, 600/700m, 20. II. 2012 (Y. F. Hsu & H. C. Huang); 1♀, Renai, Qingjing Farm, 12. X. 1996, reared from *L. cuneata*, emgd. 25. X. 1996, HSU 96K14 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 1♂, Dapu, Zhutoushan, 26. IX. 2005 (Y. F. Hsu). **TAIDONG [= TAITUNG] Co.:** 1♂, Lanyu, 21/23. IX. 2008 (H. C. Huang & C. H. Lin, jr); 1♂, Lanyu, Sidaogou, 16/18. III. 2012 (Y. F. Hsu & H. C. Huang). **PINGDONG [= PINGTUNG] Co.:** 1♂, Wutai, Wutoushan, 1200m, 7/8. V. 2006 (Y. F. Hsu); 1♂, Wutai, Wutoushan, 1100m, 5. V. 2007 (Y. F. Hsu); 1♂, 1♀, Shizi, Nunaishan, 200m, 26. III. 2006 (Y. F. Hsu); 1♀, Sandimen, 300m, 2. I. 2009 (Y. F. Hsu). **JINMEN [= KINMEN] Co.:** 1♂, Liangshan, 4. VI. 2000 (Y. F. Hsu); 2♂, 1♀, Jinsha, nr. Houling

Park, 28/29. VIII. 2011 (Y. F. Hsu & H. C. Huang); 1♂, Zhongshan Forest, 1. X. 2000 (Y. T. Lo, C. C. Lu & B. C. Chen); 1♂, Jinhu, Shenshiqiao, 28/29. VIII. 2011 (Y. F. Hsu & H. C. Huang). **LIANJIANG [= LIENCHIANG] Co.:** 1♂, Beigan, Wusha, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang).

Description. Adult – Forewing length 17–26 mm. Male (PLATE 18, Figs. 102-103): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, usually with dark brown border along termen on forewing and hindwing. Wing underside ground color paler, with dark brown markings forming way lines on hindwing. Dark brown bars present at distal end of discoidal cells. Two, small, dark brown markings in discoidal cell of forewing. Scattered dark scales present. Sexual brand as a linear strip on vein of posterior part of discoidal cell. Fringe of forewing yellow. Female (PLATE 18, Figs. 104-105): Ground color of wing uppersides paler, with dark brown border along forewing costa absent. No sexual brand.

Male genitalia (PLATE 29, Fig. 151) – Tegumen swollen dorsally, tapering caudad; uncus bearing raising projection with bifid distal end. Vinculum slender. Saccus elongate, with length over 2/3 of tegumen height. Valva lobe-like, produced caudad into an angled projection; several digitate processes on inner surface, including 1 on costa+ampulla, 1 on dorsal margin subapically, 2 on harpe. Phallus elongate, down-curved, phallobase thick, aedeagus attenuate caudally. Juxta bi-lobed, with deep dorsal, medial cleft.

Female genitalia (PLATE 38, Figs. 188) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of prominent, sclerotized lobes. Signum a transverse band armed with spines of various sizes; largest spines at lateral ends. Anal papillae densely setose. Posterior apophyses shorter than anterior apophyses.

Variation. Dark brown borders are more prominent in wet season, with scattered dark

scales on wing undersides more prominent in dry season.

Global distribution. Japan, North to South China, South Korea, Taiwan (Hsu, 2013).

Distribution in Taiwan. Widespread from low to high elevations, including Lanyu.

Larval Host plant(s). Rhamnaceae: *Rhamnus formosana*, *R. parvifolia*, *Sageretia thea*; Fabaceae: *Lespedeza cuneate*, *L. formosa*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

Remarks. This species was long considered a synonym of *E. hecabe*, but a series of experiments conducted by Yoshiomi Kato's lab discovered differentiation on wing patterns of adults and host usage has occurred between these two taxa (Kato, 2000a, 2000b, Kato *et al.*, 1992; Kobayashi *et al.*, 2001), and Kato and Yata (2005) concluded they represent distinct biological species.

形態特徵：成蝶前翅長 17–26mm。雄蝶 (圖 102–103)：頭具毛、褐色。觸角黑褐色，有白環。口器黑褐色。下唇鬚前伸、黃色。胸部覆白色毛與鱗片。腹部黑褐色，覆黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣與後緣近筆直。翅背面底色黃色，前翅及後翅沿外緣通常有黑邊。翅腹面底色較淺，後翅具黑褐色斑紋形成條線，中室外側有黑褐色條帶，前翅中室具兩枚小型黑褐色斑紋，翅面散佈暗色鱗，中室後部脈上具有線狀性標，前翅緣毛黃色。雌蝶 (圖 104–105)：翅背面底色較淺，前翅前緣無黑緣，無性標。

雄交尾器 (圖 151)：背兜背側膨大，向尾端漸細。鉤突具向上之突起，末端二分叉。基腹弧纖細。囊突長，長度超過背兜高度三分之二。抱器葉狀，向尾端延伸呈一角狀突，內面具多指狀突，一突起位於抱器背和抱器內突處，一突起位於背緣亞端點處，兩突起位於抱握鉗。陽莖長、下彎，陽莖基粗。陽莖器向尾端漸細。陽基軛片雙叉，背面中間深凹。

雌交尾器 (圖 188)：交尾囊卵狀。交尾囊管略骨化，向尾端漸窄。交尾孔板形成骨

化壁，具一對顯著骨化葉。花壁橫帶狀，具大小不同刺突，最大刺突位於側端。肛突密生毛。後內骨突短於前內骨突。

變異：雨季時黑褐色邊較明顯，乾季時翅腹面散布之黑色鱗較明顯。

世界分布：日本、華北至華南、朝鮮半島南部及臺灣。

臺灣分布：廣分布於低至高海拔，包括蘭嶼。

幼蟲寄主植物：鼠李科桶鉤藤、小葉鼠李、雀梅藤；豆科鐵掃帚、毛胡枝子。

生物學：一年多世代。

註記：本種長久以來被視為黃蝶 *E. hecabe* 的同物異名。但由日籍學者加藤義臣研究團隊一系列的實驗發現成蝶翅紋及寄主利用在此兩分類群間具有分化現象。Kato & Yata (2005) 總結兩者應視為不同生物種。

***Eurema alitha* (C. & R. Felder, 1862) (島嶼黃蝶)**

Terias alitha C. & R. Felder, 1862: Wiener entomologische monatschrift 6 (9): 289. (Type locality: Mindanao)

Ssp. *esakii* Shirôzu, 1953

PLATE 19, Figs. 106-108; PLATE 29, Fig. 152; PLATE 38, Fig. 189

Eurema esakii Shirôzu, 1953: Sieboldia 1(2): 152 (Type locality: Naihonrokugoe (Fujieda-Rokki), Takao Pref., South Formosa)

Specimens examined:

NANTOU Co.: 3♂, Renai, Aowanda, 1200m, 29. IX. 2009 (Y. F. Hsu); 1♂, Renai, Beidongyanshan, 1500m, 1. IX. 2006 (L. H. Wang). **TAIDONG [= TAITUNG] Co.:** 1♂, 1♀, Taitung, 12. II. 2009, reared from *Galactia* sp., emgd. 27. II. 2009, HSU 09B8 (Y. F. Hsu); 1♀, Yanping, Hongye, 450/500m, 16/17. X. 1999, reared from *G. tenuiflora*, emgd. 28. X. 1999, HSU 99K13 (Y. F. Hsu & J. J. Young); 1♂, Yanping, Hongye, 8. II. 1988; 1♂, same locality, 7. IX. 1999, reared from *G. tenuiflora*, emgd. 18. IX. 1999, HSU 99J9 (Y. F. Hsu); 1♂, same locality, 23. I. 2000, reared from *G. tenuiflora*, emgd. 24. II. 2000, HSU 00A16 (L. W. Wu); 1♀, 1♂, same locality, emgd. 13. V. 2002 (L. W.

Wu) (genitalia preparation JYL269); 1♂, same locality, 11. I. 2009 (C. H. Lin, jr); 1♂, 2♀, Kangle, 24. VIII. 2009, reared from *Galactia* sp., 1/2. IX. 2009, HSU 09H18 (Y. F. Hsu); 1♂, 1♀, Haiduan, Xinwu, 412m, 26. XI. 1999, reared from *G. tenuiflora*, emgd. 7. XII. 1999, HSU 99L4 (Y. F. Hsu) (genitalia preparation JYL268). **TAINAN CITY** [= **TAINAN Co.**]: 1♂, Baihe, Guanziling, 300m, 24. IX. 2003 (Y. F. Hsu). **KAOHSIUNG CITY** [= **KAOHSIUNG Co.**]: 1♂, Meinong, Shuangxi, 150m, 8. II. 2006 (Y. F. Hsu). **PINGDONG** [= **PINGTUNG**] **Co.**: 1♂, 1♀, Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu); 2♂, Sandimen, 300m, 6. I. 2008 (Y. F. Hsu).

Description. Adult – Forewing length 19–22 mm. Male (PLATE 19, Fig. 106): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight. Wing uppersides ground color yellow, with dark brown border along costa and termen on forewing, and along termen on hindwing. Wing underside ground color paler, with dark brown markings forming way lines on hindwing. Dark brown bars present at distal end of discoidal cells. Two, small, dark brown markings in discoidal cell of forewing. Sexual brand as a linear strip on vein of posterior part of discoidal cell. Fringe of forewing dark brown. Female (PLATE 19, Figs. 107-108): Ground color of wing uppersides paler, with dark brown border along forewing costa absent. No sexual brand.

Male genitalia (PLATE 29, Fig. 152) – Tegumen swollen dorsally, tapering caudad; uncus bearing raising projecting with weakly bifid distal end. Vinculum slender. Saccus elongate, with length over 2/3 of tegumen height. Valva lobe-like, produced caudad into an narrow projection; several digitate processes on inner surface, including 1 on costa+ampulla, 1 on dorsal margin subapically, 2 on harpe. Phallus elongate, down-curved, phallobase thick, aedeagus attenuate caudally. Juxta broad, bi-lobed, with V-shaped, dorsal, medial cleft.

Female genitalia (PLATE 38, Fig. 189) – Corpus bursae oval. Ductus bursae weakly sclerotized, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of prominent, sclerotized lobes. Signum a transverse band armed with spines of various

sizes; largest spines at lateral ends. Anal papillae densely setose. Posterior apophyses short. Anterior apophyses shorter than posterior apophyses.

Variation. Dark brown borders are more prominent in wet season.

Global distribution. Sundaland, Lesser Sunda, Sulawesi, New Guinea, Philippines, Taiwan (Yata, 1985), also northern Australia (Braby, 2000).

Distribution in Taiwan. Low to moderate elevations of the main island (Hsu, 2013).

Larval Host plant(s). Fabaceae: *Galactia tenuiflora* (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 19–22mm。雄蝶 (圖 106)：頭具毛，褐色。觸角黑褐色，有白色環。口器黑褐色。下唇鬚前伸、黃色。胸部覆有白色毛和鱗片。腹部黑褐色覆有黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣和後緣近筆直。翅背面底色黃色，前翅沿前緣及外緣、後翅沿外緣具黑褐色邊。翅腹面底色較淺，後翅有黑褐色斑紋形成線條，中室末端有黑褐色短條，前翅中室具兩枚黑褐色小紋，性標為一線狀細條，位於中室後側脈上，前翅緣毛黑褐色。雌蝶 (圖 107–108)：翅背面底底較淺，前翅前緣缺少黑褐色邊，無性標。

雄交尾器 (圖 152)：背兜背側膨大，向尾端漸細。鉤突具向上之突起，末端二分叉。基腹弧纖細。囊突長，長度超過背兜高度三分之二。抱器葉狀，向尾端延伸形成窄突起，內面具多指狀突，一突起於抱器背與抱器內突處，一突起於背緣的亞端點處，兩突起位於抱握鈹。陽莖長，下彎。陽莖基粗。陽莖器向尾端漸細。陽基軛片寬闊，葉狀、二分，背部中央具 V 形凹陷。

雌交尾器 (圖 189)：交尾囊卵狀。交尾囊管略骨化，向尾端漸細。交尾孔板形成骨化壁，具一對顯著骨化葉。花壁橫帶狀，具大小不同刺突，最大刺突位於側端。肛突密生毛。後內骨突短，前內骨突較後內骨突更短。

變異：雨季時黑褐色邊較明顯。

世界分布：巽他陸塊、小巽他群島、蘇拉威西、新幾內亞、菲律賓及臺灣。

臺灣分布：本島低至中海拔地區。

幼蟲寄主植物：豆科細花乳豆。

生物學：一年多世代 (Hsu, 2013)。

***Eurema blanda* (Boisduval, 1836) (亮色黃蝶 / 臺灣黃蝶 / 璧黃粉蝶)**

Terias blanda Boisduval, 1836: Histoire naturelle des insectes; espèces général des lépidoptères 1: 672. (Type locality: “Batavia” [= Jakarta, Java])

Terias phanospila C. & R. Felder, 1865: Reise der Österreichischen Fregatte Novara, Bd 2 (Abth. 2) (2): 209. (Type locality: Java)

Terias snelleni Moore, [1907]: Lepidoptera Indica 7: 78. (Type locality: “Mid Sumatra”)

Ssp. *arsakia* Fruhstorfer, 1910

PLATE 19, Figs. 109-112; PLATE 29, Fig. 153; PLATE 38, Fig. 190

Terias blanda arsakia Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 169. (Type locality: Formosa)

Terias blanda arsakia f. *aphia* Fruhstorfer, 1910: in Seitz: Die Gross-Schmetterlinge der Erde 9: 169. (Type locality: Formosa)

Specimens examined:

JILONG [= KEELUNG] CITY: 1♂, Longgang Trail, 14. I. 2010 (W. H. Chien & J. H. Lin). **TAIPEI CITY:** 1♀, Lungan Temple, 8. XII. 1997 (Y. F. Hsu); 2♂, Wenshan, NTNU Gongguan Campus, 9. I. 2007 (Y. F. Hsu); 1♂, same locality, 1. XI. 1999 (Y. F. Hsu); 6♂, 4♀, same locality, 25. II. 2008, reared from *Senna alata*, emgd. 2. III. 2008, HSU 08B19 (Y. F. Hsu); 1♂, 1♀, Shilin, Zhishanyan, 15. I. 2007 (Y. F. Hsu). **XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.]:** 2♂, Wulai, 22. VII. 2000 (Y. T. Lo); 2♂, Wulai, Fushan Research Station, 700m, 4/5. VIII. 2006 (Y. F. Hsu & H. C. Huang); 1♀, same collecting data, reared from *Albizia* sp., emgd. 6. VII. 2006, HSU 06H16 (Y. F. Hsu & H. C. Huang); 1♀, Wulai, Zhongzhi, 21. X. 2006, reared from *Albizia* sp., emgd. 25. X. 2006, HSU 06K27 (Y. F. Hsu); 1♂, Wulai, Jiajiuliao, 150m, 10. IX. 2008 (Y. F. Hsu); 1♂, Wulai, 16. I. 2007 (Y. F. Hsu); 1♀, same locality, 2. III. 2007 (Y. F. Hsu); 1♀,

Shiding, Ergeshan, 500/600m, 5. VIII. 2001, reared from *Archidendron lucidum*, emgd. 30. VIII. 2001 (L.W. Wu); 1♂, Xindian, Sikanshui, 13. X. 2008 (Y. F. Hsu); 1♀, Sanxia, Yuanshan, 320m, 5. VII. 2010 (C. K. Wang). **TAOYUAN CITY [= TAOYUAN Co.]**: 1♂, Fuxing, Xuanyuan, 1000m (Y. F. Hsu & L. W. Wu). **HUALIAN [= HUALIEN] Co.:** 1♀, Xiulin, Taroko, 60m, 11. XI. 2007 (M. H. Sun). **NANTOU Co.:** 1♀, Yuchi, Lianhuachi, 21. XI. 2001 (Y. F. Hsu & H. Chiba); 1♀, Yuchi, Lianhuachi, 700m, 21. VIII. 2002 (Y. F. Hsu); 1♀, Renai, Huisun, 700m, 14. XI. 2004 (Y. F. Hsu); 1♂, same locality, 7/8. II. 2009 (Y. F. Hsu); 1♀, Beidongyanshan, 1300m, 1. IX. 2006 (L. H. Wang); 1♂, Xinyi, Dongpu, 1100m, 31. VII. 2009 (Y. F. Hsu). **JIAYI [= CHIAYI] Co.:** 2♂, Alishan, Shizhou/Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu); 1♂, Fanlu, Chukou, 350m, 5. IX. 2010 (Y. F. Hsu); 1♂, Fanlu, Chukou, 250m, 29. VIII. 2008 (Y. F. Hsu); 2♂, Fanlu, Chukou, 400m, 30. VII. 2009 (Y. F. Hsu); 1♂, NCYU, Lantan Campus, 1. VII. 2016 (L. Huang) (genitalia preparation JYL240). **TAIDONG [= TAITUNG] Co.:** 1♀, Jingfeng, Manuexi, 8. IV. 2000 (Y. F. Hsu); 1♂, Dawu/Xinhua, 3. III. 1999 (C. C. Lu); 1♂, Donghe, Beiyuan, 150m, 25. I. 2007 (Y. F. Hsu); 2♂, Lanyu, Sidaogou, 18. IV. 2006 (Y. F. Hsu); 1♀, Lanyu, Hongtou, 18. IV. 2006, reared from *Al. retusa*, emgd. 21. IV. 2006, HSU 06D52 (Y. F. Hsu). **TAINAN CITY [= TAINAN Co.]**: 1♂, Guantian, Wushantou Dam, 30. X. 2000 (Y. F. Hsu); 2♂, Baihe, Zhentoushan, 500m, 17. IX. 200 (Y. F. Hsu); 1♂, Xinhua, 20. I. 2007 (Y. F. Hsu); 1♀, Baihe, Guanziling, 28. X. 2016 (J. Y. Liang) (genitalia preparation JYL241). **KAHHSIUNG CITY [= KAOHSIUNG Co.]**: 1♂, Jiaxian, 250m, 10. XII. 2003, reared from *Ar. dulce*, emgd. 10. XI. 2003, HSU 03M7.1 (Y. F. Hsu & C. C. Hsieh); 1♂, Meinong, Shuangxi, 150m, 31. XII. 2000 (Y. F. Hsu); 1♂, same locality, 8. II. 2006 (Y. F. Hsu); 3♂, 1♀, same locality, 22. I. 2007 (Y. F. Hsu); 2♂, 1♀, Liugui, 200m, 31. XII. 2006 (Y. F. Hsu). **PINGDONG [= PINGTUNG] Co.:** 1♂, 1♀, Chunri, Dahanshan, 850m, 4. I. 2003 (Y. F. Hsu); 1♂, 1♀, Chunri, Dahanshan, 4. I. 2003 (Y. F. Hsu); 1♂, same locality, 26. III. 2006 (Y. F. Hsu); 1♂, 1♀, Shizi, Shuangliu, 200/400m, 30. IV. 2006 (Y. F. Hsu).

Description. Adult – Forewing length 22–29 mm. Male (PLATE 19, Figs. 111–112): Head hairy, brown. Antennae dark brown banded with white. Proboscis dark brown. Labial palpus porrect, yellow. Thorax covered by white hairs and scalings. Abdomen dark brown, covered by yellow scalings. Legs covered with yellow scalings. Forewing triangular, somewhat elongate, with costa convex, termen and dorsum nearly straight.

Wing uppersides ground color bright yellow, with dark brown border along termen. Wing underside ground color paler, with dark brown markings forming way lines on hindwing. Dark brown bars present at distal end of discoidal cells. Three, small, dark brown markings in discoidal cell of forewing. Scattered dark brown scales present on wing undersides in dry season. Sexual brand as a linear strip on vein of posterior part of discoidal cell. Fringe of forewing dark brown. Female (PLATE 19, Figs. 109-110): Ground color of wing uppersides paler. No sexual brand.

Male genitalia (PLATE 29, Fig. 153) – Tegumen broad, tapering caudad; uncus bearing raising projecting with bifid distal end. Vinculum slender. Saccus elongate, with length over 2/3 of tegumen height. Valva lobe-like, produced caudad into a serrate flat projection; several processes on inner surface, including 2 digitate, on costa+ampulla; 1 tiny, on dorsal margin; 2 on harpe, with outer one serrate, inner one digitate. Phallus elongate, down-curved, phallobase thick. Juxta V-shaped.

Female genitalia (PLATE 38, Fig. 190) – Corpus bursae oval. Ductus bursae membranous, tapering toward caudal end. Sterigma forming a sclerotized wall, with a pair of prominent, sclerotized lobes. Signum a transverse band armed with spines of various sizes; largest spines at lateral ends. Anal papillae densely setose. Posterior apophyses short. Anterior apophyses longer than posterior apophyses.

Variation. Dark brown borders are more prominent in wet season. Scattered dark brown scales present on wing undersides in dry season.

Global distribution. Sundaland, Lesser Sunda, Sulawesi, New Guinea, Philippines, Taiwan (Yata, 1985).

Distribution in Taiwan. Low to moderate elevations, including some associated islands (Hsu, 2013).

Larval Host plant(s). Fabaceae: *Albizia jubrissin*, *A. lebbek*, *A. falcate*, *Ceasalpinia cista*, *Ce. minax*, *Gleditsia rolfei*, *Cassia sulfurea*, *Cas. siamea*, *Cas. fistula*, *Cas. alata*,

Pithecellobium dulce, *Calliandra emarginata*, etc. (Hsu, 2013).

Biology. Multivoltine in occurrence (Hsu, 2013).

形態特徵：成蝶前翅長 22–29mm。雄蝶 (圖 111–112)：頭具毛、褐色。觸角黑褐色，有白環。口器黑褐色，下唇鬚前伸、黃色。胸部覆白色毛和鱗片。腹部黑褐色，覆黃色鱗。足覆黃色鱗片。前翅三角形，略長，前緣凸，外緣及後緣近筆直。翅背面底色亮黃色，沿外緣有黑褐色邊。翅腹面底色淺，後翅有黑褐色斑紋形成線條，中室末端有黑褐色短條，前翅中室有三枚小型黑褐色斑紋。乾季時翅腹面散佈黑褐色鱗片。性標為一線狀細條，位於中室後側翅脈上，前翅緣毛黑褐色。雌蝶 (圖 109–110)：翅背面底色較淺，翅面無性標。

雄交尾器 (圖 153)：背兜寬闊，尾端漸縮。鉤突有向上突起，末端二分叉。基腹弧纖細，囊突長，長度超過背兜高度三分之二。抱器葉狀，向尾端延伸呈鋸齒片突出，內面具多突起，兩指狀突位於抱器背和抱器內突處，一突起細小，位於背緣，兩突起位於抱握鉗，外側突起鋸齒狀，內側突起指狀。陽莖長、下彎。陽莖基粗。陽基軛片 V 形。

雌交尾器 (圖 190)：交尾囊卵狀，交尾囊管膜質，向尾端漸細。交尾孔板形成骨化牆，並具一對顯著骨化葉。花壁橫帶狀，具大小不同刺突，最大刺突位於側端。肛突密生毛。後內骨突短。前內骨突比後內骨突長。

變異：雨季時黑褐色邊較明顯。乾季時翅腹面密布黑褐色鱗片。

世界分布：巽他陸塊、小巽他群島、蘇拉威西、新幾內亞、菲律賓及臺灣。

臺灣分布：分布於低至中海拔地區，包括離島。

幼蟲寄主植物：豆科合歡、闊葉合歡、麻六甲合歡、華南雲實、蓮實藤、恒春皂莢、黃槐、鐵刀木、阿伯勒、翼柄決明、金龜樹、紅粉撲花等。

生物學：一年一世代 (Hsu, 2013)。

Genus **ANTHOCARIS** Boisduval, Rambur, Duméril & Graslin, 1833

Type species: *Papilio cardamines* Linnaeus, 1758

Diagnostic characters for the genus include: 1) antenna short, with blunt tip; 2) 3rd segment of labial palpus short, hairy; 5 R veins, with R_4+R_5 stalked with R_3 , R_{3+4+5} stalked with M_1 ; 3) an orange patch usually present on forewing upperside in male; 4) mottled patterns present on wing undersides.

Larval hostplants are in the family Brassicaceae.

1 species occurs in Mazu Islands.

襟粉蝶屬

本屬的鑑別特徵包括：1) 觸角短，先端截狀；2) 下唇鬚第3節短，具毛；具五條R脈， R_4+R_5 與 R_3 共柄， R_{3+4+5} 與 M_1 共柄；3) 雄蝶前翅背面通常具一橙色區域；4) 翅腹面花紋斑駁狀。

幼蟲寄主植物為十字花科植物。

僅1種產於馬祖島。

***Anthocharis scolymus* Butler, 1866 (黃尖襟粉蝶 / 黃鉤粉蝶)**

Anthocharis scolymus Butler, 1866: The Journal of the Linnean Society of London, Zoology 9 (34): 52. (Type locality: "Hakodati, North Japan", [Hokkaido])

Ssp. *mandschurica* Bollow, 1932

PLATE 19, Figs. 113-114; PLATE 29, Fig. 154; PLATE 39, Fig. 191

Midea scolymus subsp. *mandschurica* Bollow, 1932: in Seitz, A, Die Gross-Schmetterlinge der Erde 1, Supplement: 105. (Type locality: "Harbin in Manchuria")

Specimens examined:

LIANJIANG [= LIENCHIANG] Co.: 7♂, 4♀, Nangan, Wusha, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang); 1♂, Nangan, Meiyuan, 15. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang); 2♂, 1♀, Qinbi, 16. IV. 2014 (Y. F. Hsu) (genitalia preparation JYL291, JYL290).

Description. Adult – Forewing length 19–25 mm. Male (PLATE 19, Fig. 113): Head hairy, dark brown dorsally, white on frons. Antennae with distal end clubbed, dark brown dorsally, white ventrally and distally. Proboscis dark brown. Labial palpus porrect, white, hairy ventrad. Thorax dark brown covered by gray hairs dorsally, brown ventrally. Abdomen dark brown dorsally, white dorsally. Legs dark brown with yellow scalings. Forewing somewhat elongate, with apex produced, pointed; costa convex, dorsum nearly straight. Wing uppersides ground color white; apex with dark brown marking surrounding an orange spot; a prominent dark brown bar at distal end of discoidal cell. Some dark brown scalings present on hind wing. Undersides with hindwing and apex of forewing decorated with mottled green or greenish brown markings. Dark bar at distal end of discoidal cell of forewing also present. Female (PLATE 19, Fig. 114): Wing patterns similar to those of male, but without orange spot on forewing.

Male genitalia (PLATE 29, Fig. 154) – Tegumen broad; uncus tapering caudad with distal end forming a blunt tip. Vinculum slender, straight. Saccus approximately 1/2 of tegumen height. Valva lobe-like, with distal margin truncate. Phallus down-curved mesad, slightly raised caudad. Juxta as a narrow ring.

Female genitalia (PLATE 39, Fig. 191) – Corpus bursae oval. Ductus bursae membranous with caudal end sclerotized. Sterigma forming a sclerotized dome. Anal papillae setose. Posterior apophyses short, slender, attenuate. Anterior apophyses short, more robust.

Global distribution. Japan, Korea, North to South China.

Distribution in Taiwan. Only found on Mazu Islands.

Larval Host plant(s). Brassicaceae: chiefly *Brassica campestris* on Mazu Islands.

Biology. Univoltine in occurrence, with adults on the wing in spring (Lee, 2000).

Remarks. The population found from Mazu islands were not treated to subspecific level (Lee, 2000; Hsu *et al.* 2018). Asahi (2010) stated that the populations of *Anthocharis scolymus* from Asian continent and Tsushima island of Japan should be assigned to ssp. *mandschurica* due to lack of dark scalings around wing bases and smaller size, accordingly the population found from Mazu islands should also belong to ssp. *mandschurica*.

形態特徵：成蝶前翅長 19–25 mm。雄蝶 (圖 113)：頭具毛，背面黑褐色，前額白色。觸角末端棍棒狀，背面黑褐色，腹面及末端白色。口器黑褐色。下唇鬚前伸、白色，腹面具毛。胸部背面深褐色，覆有灰色毛，腹面褐色。腹部背面黑褐色，腹面白色。足呈黑褐色具黃色鱗片。前翅長，翅端突出、尖銳，前緣凸，後緣筆直。翅背面底色白色，翅端具黑褐色斑紋環繞一橙色紋，中室末端有一明顯黑褐色條帶，後翅散布一些黑褐色鱗。腹面於後翅及前翅翅端飾有斑駁狀綠色或綠褐色斑紋，前翅中室末端亦有黑色條帶。雌蝶 (圖 114)：翅紋與雄蝶相似，但前翅無橙色斑紋。

雄交尾器 (圖 154)：背兜寬闊。鉤突向尾端漸細，末端鈍。基腹弧纖細、直。囊突長度約背兜高度二分之一。抱器葉狀，末端邊緣截狀。陽莖中間下彎，尾端略升。陽基軛片為窄環狀。

雌交尾器 (圖 191)：交尾囊卵狀。交尾囊管膜質，末端骨化。交尾孔板形成骨化圓頂。肛突具毛。後內骨突短、纖細。前內骨突短、粗壯。

世界分布：日本、韓國、華北至華南。

臺灣分布：僅見於馬祖。

幼蟲寄主植物：在馬祖地區主要為十字花科的油菜。

生物學：一年一世代，成蝶出現於春季 (Li, 2000)。

註記：馬祖的族群先前未有亞種層級之分類處理。Asahi (2010) 基於翅基缺乏黑色鱗及體型較小之特性，將亞洲大陸及日本對馬島之族群歸屬於亞種 ssp. *mandschurica*，從而馬祖的族群亦歸屬於該亞種。

Supplementary Notes

A few pierid species were recorded from Taiwan in literature, but probably involving mis-labelling, doubtful sources of specimens, or rare straying species. They are discussed as the followings:

***Appias nero domitia* (C. & R. Felder, 1862) 紅尖粉蝶 / 紅粉蝶 / 紅翅尖粉蝶**

This species is widespread in the Oriental Region (Yata, 1985). An impermanent colony appeared to have existed in southern cape of Taiwan by the fall of 1933 (Shirôzu, T. 1960), with sporadic records found in southern Taiwan afterwards (Yamanaka, 1972).

***Prioneris hypsipyle* Weymer, 1997 蘇門答臘鋸粉蝶**

The sole record of this species in Taiwan was a male collected from Tainan, southern Taiwan (Chiba & Hsu, 2003). As this species is endemic to Sumatra (Yata, 1985), the specimen is apparently originated from an anthropogenic introduction, possibly through an escape from pet market.

***Delias belladonna* (Fabricius, 1793) 美艷粉蝶 / 艷婦斑粉蝶**

A photograph of an individual of this species was taken from Jinmen Islands by a local observer in November, 2011 (Hsu *et al.*, 2017), evidently a stray from adjacent area in Fujian province of East China.

***Pieris brassicae* (Linnaeus, 1758) 大白粉蝶 / 歐洲粉蝶**

This notorious, invasive pest on mustard plants was said to have been observed on June 9th, 2014, from Songgang, Nantou Co. of central Taiwan by Sugisaka (2016), but Yago (2017) pointed out that the photographs shown in the article was actually an individual of *Pieris canidia*, thus no reliable observation of *P. brassicae* has been made in Taiwan.

補充註記

文獻中有一些曾被記載出現於臺灣的粉蝶，但可能是標籤錯誤、標本來源存疑、或稀有的偶產蝶，這些種類概述如下：

紅尖粉蝶 / 紅粉蝶 / 紅翅尖粉蝶

本種廣泛分布於東洋區，1933 年秋天曾有族群短暫出現於臺灣南部恆春半島，此後則於南臺灣有零星的記錄。

蘇門答臘鋸粉蝶

本種在臺灣的唯一記錄是採自臺灣南部台南的一隻雄蝶，由於本種是蘇門答臘特有種，此標本顯然來自於人為引入，可能是從寵物市場逸出者。

美艷粉蝶 / 艷婦斑粉蝶

2011 年 11 月由一位當地觀察家於金門島拍攝到本種一隻個體，顯然是由華東地區福建省等鄰近地區進入該島。

大白粉蝶 / 歐洲粉蝶

本種是著名的十字花科作物的入侵性害蟲。Sugisaka (2016) 報告於臺灣中部南投縣松崗觀察到一隻雄蝶，但 Yago (2017) 指出報告中的照片其實是緣點白粉蝶，因此目前臺灣地區並無可靠的大白粉蝶觀察記錄。

References

- Ackery, P. R., R. de Jong, R. I. Vane-Wright. 1999. The butterflies: Hydyloidea, Hesperioidea and Papilionoidea. Pp. 263-300. In: Kristensen, N. P. (ed.), Handbook of Zoology, Band IV, Part 35. Lepidoptera, Moths and Butterflies, Vol. 1: evolution, Systematics, and Biogeography. 491 pp. Walter de Gruyter, Berlin and New York.
- Asahi, J. 2010. Miscellaneous notes on *Anthocharis scolymus* Butler, 1866 of Tsushima Island and the position of the continental populations. *Yadoriga* 224: 9–21.
- Bozano, G. C., J. Coutsis, P. Herman, G. Allegrucci, D. Cesaroni, V. Sbordoni. 2016. Guide to Butterflies of the Palearctic Region. Pieridae, Part III. 70 pp. Omnes Artes, Milano.
- Braby, M. 2000. Butterflies of Australia, Their Identification, Biology and Distribution. 976 pp. CSIRO, Collingwood.
- Braby, M. F. 2012. The taxonomy and ecology of *Delias aestiva* Butler, 1897 stat. rev. (Lepidoptera: Pieridae), a unique mangrove specialist of Euphorbiaceae from northern Australia. *Biological Journal of the Linnean Society* 107: 697–720.
- Braby, M. F., R. Vila, N. E. Pierce. 2006. Molecular phylogeny and systematics of the Pieridae (Lepidoptera: Papilionoidea): higher classification and biogeography. *Zoological Journal of the Linnean Society* 147: 239 – 275.
- Chen, W. S. 1977. Dancing Butterflies in Nature. 128 pp. White Cloud Cultures Publisher Ltd.
- Della Bruna, C., E. Gallo, V. Sbordoni. 2004. Guide to Butterflies of the Palearctic Region. Pieridae, Part I. 86 pp. Omnes Artes, Milano.
- Hamano, E. 1986. Ecological Encyclopedia of Taiwanese Butterflies. 474 pp. Kodansha Ltd., Tokyo.
- Heikkilä, M., L. Kaila, M. Mutanen, C. Peña, N. Wahlberg. 2012. Cretaceous origin and repeated tertiary diversification of the redefined butterflies *Proceedings of the Royal Society, B* 279: 1093–1099.
- Honey, M.R., M. J. Scoble. 2001. Linnaeus's butterflies (Lepidoptera: Papilionoidea and Hesperioidea). *Zoological Journal of the Linnean Society* 132: 277–399.
- Hsu, 1999. Butterflies of Taiwan, Vol. I. 344 pp. National Fonghuanggu Bird and Ecology Park. Lugu.
- Hsu, Y. F. 2002. Butterflies of Taiwan, Vol. II. 383 pp. National Fonghuanggu Bird and Ecology Park. Lugu.
- Hsu, Y. F., H. Chiba. 2003. Notes on Taiwan butterflies. *The Nature & Insects* 38(6): 32-35.
- Hsu, Y. F., W. I. Chou. 1999. Discovery of a new pierid butterfly, *Aporia gigantea cheni* Hsu and Chou (Lepidoptera: Pieridae), from Taiwan and its significance. *Zoological Studies* 38: 222-227.

- Hsu, Y. F., H. C. Huang, H. Chiba. 2009. Butterflies of Taiwan: more than a big island. *The Nature & Insects* 44(3): 22-31.
- Hsu, Y. F., H. C. Huang, C. C. Lu. 2016. Outbreaks of *Appias albina* in Taiwan. *The Nature & Insects* 51(9): 20-23.
- Hsu, Y. F., H. C. Huang, C. C. Lu. 2017. On mysterious occurrence of butterflies in the genus *Delias* at Jinmen Islands, with clarification on the nomenclature of *D. pasithoe* (Linnaeus, 1767) and *D. acalis* (Godart, 1819) in southern China. *Zootaxa* 4276 (2): 245–254.
- Hsu, Y. F., C. L. Huang, J. Y. Liang, 2018. *Butterfly Fauna of Taiwan*, Vol. II. 224 pp. Forestry Bureau, Taipei.
- Hung, Y. J. 2013. *A Comprehensive Guide to Hostplants of Butterflies in Taiwan*. 324 pp. Owl Publishing House Co., Ltd.
- Kobayashi, A., M. Hiroki, Y. Kato. 2001. Sexual isolation between two sympatric types of the butterfly *Eurema hecabe* (L.). *Journal of Insect Behavior* 14: 353-362.
- Kato, Y. 2000a. Overlapping distribution of two groups of the butterfly *Eurema hecabe* differing in the expression of seasonal morphs on Okinawa-jima Island. *Zoological Science* 17: 539 – 547.
- Kato, Y. 2000b. Host-plant adaptation in two sympatric types of the butterfly *Eurema hecabe* (L.)(Lepidoptera: Pieridae). *Entomological Sciences* 3: 459 – 463.
- Kato, Y., M. Hiroki, H. Handa. 1992. Interpopulation variation in adaptation of *Eurema hecabe* (Lepidoptera, Pieridae) to host plant. *Japanese Journal of Entomology* 60: 740-759.
- Kato, Y., O. Yata. 2005. Geographical distribution and taxonomical status of two types of *Eurema hecabe* (L.) (Lepidoptera, Pieridae) in south-western Japan and Taiwan. *Tyô to Ga* 56: 171-183.
- Lee, J. Y. 2000. *Butterflies of Matsu Islands*. 245 pp. Lienchiang County Government, Lienchiang.
- Lu, F.Y. 2011. *Flora of Kinmen*. 615 + 874 pp. Kinmen National Park, Jinnin.
- Lu, C. C., J. R. Chen. 2014. *The Life History of Butterflies in Taiwan*. 479 pp. Morning Star Publishing Inc., Taichung.
- Mitter, K. T., T. Larsen, W. De Prins, J. De Prins, S. Collins, G. Vande Weghe, F. Sáfián, E. V. Zakharov, D. J. Hawthorne, A. Kawahara, J. C. Regier. 2011. The butterfly subfamily Pseudopontiinae is not monobasic: marked genetic diversity and morphology reveal three new species of Pseudopontia (Lepidoptera: Pieridae). *Systematic Entomology* 36: 139–163.
- Shirôzu, T. 1960. *Butterflies of Formosa in Colour*. 481 pp. Hoikusha, Osaka.
- Shirôzu, T., K. Ueda. 1992. Pieridae. Pp. 134-136. In Heppner, J. B., H. Inoue (eds). 276 pp. Association for

- Tropical Lepidoptera, Gainesville.
- Silberglied, R. E., O. R. Taylor. 1978. Ultraviolet reflection and its behavioral role in the courtship of the sulfur butterflies *Colias eurytheme* and *C. philodice* (Lepidoptera, Pieridae). Behavioral Ecology and Sociobiology 3: 203–243.
- Uchida, H. 1985. Life-history of *Aporia potanini insularis* Shirôzu from Taiwan. Tyô to Ga 36: 26-30.
- Uchida, H. 1988. Amidst the Lantana Flowers: Butterflies of Taiwan - nature and man. 183 pp. Self-published, Mumazu.
- Verhulst, J. T. 2000. Les *Colias* du Globe, Monograph of the Genus *Colias*. Goecke & Evers, 308 pp. Keltern, Germany.
- Wahlberg, N., M. F. Braby, A. V. Z. Brower, R. de Jong, M. M. Lee, S. Nylin, N. E. Pierce, F. A. H. Sperling, R. Vila, A. D. Warren, E. Zakharov. 2005. Synergistic effects of combining morphological and molecular data in resolving the phylogeny of butterflies and skippers. Proceedings of the Royal Society, B 272: 1577–1586.
- Wu, C. 2010. Fauna Sinica, Insecta Vol. 52, Lepidoptera. Papilionidae. 416 pp, 16 pls. Science Press, Beijing.
- Yamanaka, 1972. Distribution of Formosan butterflies (2). Tyô to Ga 23, Supplement 1: 1-48.
- Yagishita, A., S., Nakano, S. Morita. 1993. An Illustrated List of the genus *Delias* Hübner of the World. 384 pp., 207 pls. Khepera Publishers, Tokyo.
- Yata, O. 1985. Pieridae, pp. 205-438. In: Tsukada, E. (ed.): Butterflies of the South East Asian Islands. Vol. II. Part I. Pieridae and Danaidae. 623 pp. Plapac Co. Ltd., Tokyo.
- Yata, O. 2016. The common albatross, *Appias albina*, its taxonomy and ecology. The Nature and Insects 51 (9): 2-7.

COLOUR PLATES

Note. Scale bars represent 1 cm.

 : Uppersides

 : Undersides

1. *Delias pasithoe curasena* Fruhstorfer, 1908 豔粉蝶
♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Taoyuan, Shidong, 600 m, 11. VIII. 2011 (Y. F. Hsu).
2. *Delias pasithoe curasena* Fruhstorfer, 1908 豔粉蝶
♀. NANTOU Co., Yuchi, Lianhuachi, 700 m, 1. XII. 2004 (Y. F. Hsu).
3. *Delias pasithoe pasithoe* (Linnaeus, 1767) 豔粉蝶
♂. JINMEN Co., Jinhu, Botanical Garden, XI. 18/20. 2013 (Y. F. Hsu & H. C. Huang).
4. *Delias pasithoe pasithoe* (Linnaeus, 1767) 豔粉蝶
♀. JINMEN Co., Jinsha, Shihshan, 4. XI. 2015 (L. Huang).



5. *Delias acalis acalis* (Godart, 1819) 丹心豔粉蝶

♂. JINMEN Co., Jinhu, Botanical Garden, 18/20. XI. 2013 (Y. F. Hsu & H. C. Huang).

6. *Delias acalis acalis* (Godart, 1819) 丹心豔粉蝶

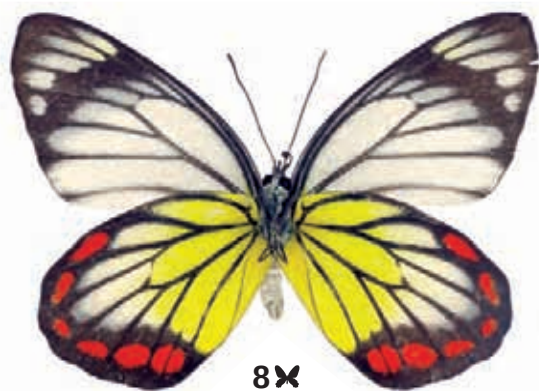
♀. JINMEN Co., Jinhu, Botanical Garden, 5. XI. 2015 (C. W. Huang).

7. *Delias hyparete luzonensis* (C. & R. Felder, 1862) 白豔粉蝶

♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Liugui, 300m, 6. I. 2008 (Y. F. Hsu).

8. *Delias hyparete luzonensis* (C. & R. Felder, 1862) 白豔粉蝶

♀. KAOHSIUNG CITY [= KAOHSIUNG Co.], Liugui, 300m, 22. I. 2008 (Y. F. Hsu).



9. *Delias lativitta formosana* Matsumura, 1909 條斑豔粉蝶

♂. TAOYUAN CITY [= TAOYUAN Co.], Fuxing, Baleng, 500m, 22. IV. 2003, reared from *Viscum liquidambaricolum*, emgd. 2. V. 2003, HSU 03D32 (L. W. Wu & H. S. Que).

10. *Delias lativitta formosana* Matsumura, 1909 條斑豔粉蝶

♀. XINZHU Co., Jianshi, Lubishan, 500 m, 8. III. 2013, reared from *Viscum liquidambaricolum*, emgd. 29. III. 2013, HSU 13C7 (Y. F. Hsu, H. C. Huang & L. H. Wang).

11. *Delias berinda wilemani* Jordan, 1925 黃裙豔粉蝶

♂. HUALIAN Co., Xiulin, Hualuxi, 6. VI. 2005 (Y. F. Hsu).

12. *Delias berinda wilemani* Jordan, 1925 黃裙豔粉蝶

♀. HUALIAN Co., Xiulin, Guanyuan, 25. V. 2002, emgd. 3. VI. 2002 (H. S. Que).



9 ✕



9 ✕



10 ✕



10 ✕



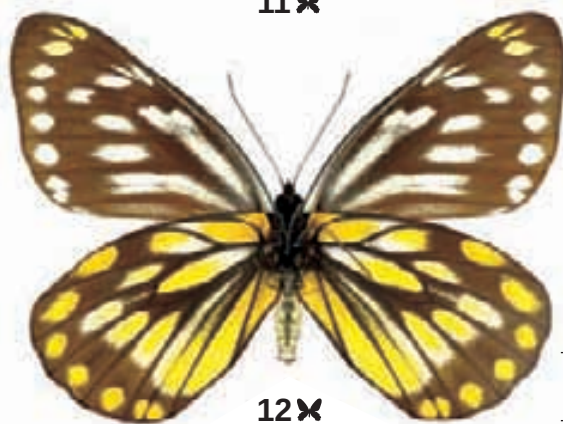
11 ✕



11 ✕

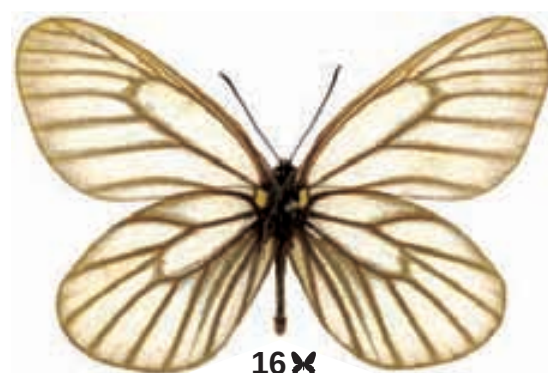


12 ✕



12 ✕

13. *Aporia agathon moltrechti* (Oberthür, 1909) 流星絹粉蝶
♂. HUALIAN Co., Xiulin, Guanyuan, 2300m, 20. III. 2006 (C. M. Wu).
14. *Aporia agathon moltrechti* (Oberthür, 1909) 流星絹粉蝶
♀. XINBEI CITY [=NEW TAIPEI CITY/ TAIPEI Co.], Wulai, Kuaishan, emgd.
30. IV. 1987 (Y. F. Hsu).
15. *Aporia genestieri insularis* Shirôzu, 1959 白絹粉蝶
♂. HUALIAN Co., Xiulin, Hualuxi, 1400m, 6. VI. 2005 (Y. F. Hsu).
16. *Aporia genestieri insularis* Shirôzu, 1959 白絹粉蝶
♀. HUALIAN Co., Xiulin, Hualuxi, 1400m, 6. VI. 2005 (Y. F. Hsu).



17. *Aporia gigantea cheni* Hsu & Chou, 1999 截脈絹粉蝶
♂. PINGDONG Co., Wutai, Wutoushan, 1200m, 4/5. IV. 1998, paratype (W. I. Chou).
18. *Aporia gigantea cheni* Hsu & Chou, 1999 截脈絹粉蝶
♀. KAOHSIUNG CITY [= KAOHSIUNG Co.], Taoyuan, Liguan, 1600m, 6. V. 2000 (Y. F. Hsu& C. Y. Hung).
19. *Pieris rapae crucivora* Boisduval, 1836 白粉蝶
♂. TAIPEI CITY, Wenshan, Gongguan campus, NTNU, 9. I. 2007 (Y. F. Hsu).
20. *Pieris rapae crucivora* Boisduval, 1836 白粉蝶
♀. JIAYI Co., Xingang, yuemei, ca 15m, 11. VI. 2007 (Y. F. Hsu).
21. *Pieris canidia* (Linnaeus, 1768) 緣點白粉蝶
♂. TAIPEI CITY, Wenshan, Gongguan campus, NTNU, 2. IV. 2000 (Y. F. Hsu).



17✂



17✂



18✂



18✂



19✂



19✂



20✂



20✂



21✂



21✂

22. *Pieris canidia* (Linnaeus, 1768) 緣點白粉蝶
♀. TAIPEI CITY, Wenshan Dist, Jingmei, 29. III. 2003 (Y. F. Hsu).
23. *Talbotia naganum karumii* (Ikeda, 1937) 飛龍白粉蝶
♂. XINBEI CITY [=NEW TAIPEI CITY/ TAIPEI Co.], Ruifang, Nanya, 13. X. 1998 (Y. F. Hsu).
24. *Talbotia naganum karumii* (Ikeda, 1937) 飛龍白粉蝶
♀. XINBEI CITY [=NEW TAIPEI CITY/ TAIPEI Co.], Ruifang, Houtong, 7. IV. 2011 (C. L. Huang).
25. *Cepora nadina eunama* (Fruhstorfer, 1903) (WSF) 淡褐脈粉蝶 (高溫 / 雨季型)
♂. JIAYI Co., Alishan, Shanmei, 500m, 5. V. 2007 (Y. F. Hsu).
26. *Cepora nadina eunama* (Fruhstorfer, 1903) (DSF) 淡褐脈粉蝶 (低溫 / 乾季型)
♂. PINGDONG Co., Wutai, Ailiaobeixi-Bayouxi, 500-900m, 14. III. 2008 (Y. F. Hsu & H. C. Huang).
27. *Cepora nadina eunama* (Fruhstorfer, 1903) (WSF) 淡褐脈粉蝶 (高溫 / 雨季型)
♀. MIAOLI Co., Sanyi, emgd. 3. VII. 2001 (Y. T. Lo).
28. *Cepora nadina eunama* (Fruhstorfer, 1903) (DSF) 淡褐脈粉蝶 (低溫 / 乾季型)
♀. TAINAN CITY [= TAINAN Co.], Dongshan, kantoushan, 600-800m, 4. II. 2010 (Y. F. Hsu).



22 ♀



22 ♂



23 ♀



23 ♂



24 ♀



24 ♂



25 ♀



25 ♂



26 ♀



26 ♂



27 ♀



27 ♂



28 ♀



28 ♂

29. *Cepora nerissa cibyra* (Fruhstorfer, 1910) (DSF) 黑脈粉蝶 (低溫 / 乾季型)
♂. PINGDONG Co., Shizi, Shuangliu, 18. XII. 2005 (Y. F. Hsu).
30. *Cepora nerissa cibyra* (Fruhstorfer, 1910) (WSF) 黑脈粉蝶 (高溫 / 雨季型)
♂. PINGDONG Co., Shizi, Shuangliu, 200-400m, 30. IV. 2006 (Y. F. Hsu).
31. *Cepora nerissa cibyra* (Fruhstorfer, 1910) (DSF) 黑脈粉蝶 (低溫 / 乾季型)
♀. PINGDONG Co., Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu).
32. *Cepora nerissa cibyra* (Fruhstorfer, 1910) (WSF) 黑脈粉蝶 (高溫 / 雨季型)
♀. TAIDONG Co., Lanyu, Sidaogou, 14/16. X. 2006, reared from *Capparis lanceolaris*, emgd. 2. XI. 2006, HSU 06K18.1 (Y. F. Hsu & H. C. Huang).
33. *Cepora iudith olga* (Eschscholtz, 1821) 黃裙脈粉蝶
♂. TAIDONG Co., Lanyu, Sidaogou, 18/20. III. 2006, reared from *Capparis lanceolaris*, emgd. 19. IV. 2006, HSU 06C20 (Y. F. Hsu & H. C. Huang).
34. *Cepora iudith olga* (Eschscholtz, 1821) 黃裙脈粉蝶
♀. TAIDONG Co., Lanyu, Shuangshiyan, 10. X. 2004, reared from *Capparis lanceolaris*, emgd. XI. 2004, HSU 04K17 (Y. Y. Chang).
35. *Cepora iudith olga* (Eschscholtz, 1821) 黃裙脈粉蝶
♀. TAIDONG Co., Lanyu, 28. XII. 2008 (C. H. Lin & N. Y. Tsai).



29 ♂



29 ♀



30 ♂



30 ♀



31 ♂



31 ♀



32 ♂



32 ♀



33 ♂



33 ♀



34 ♂



34 ♀

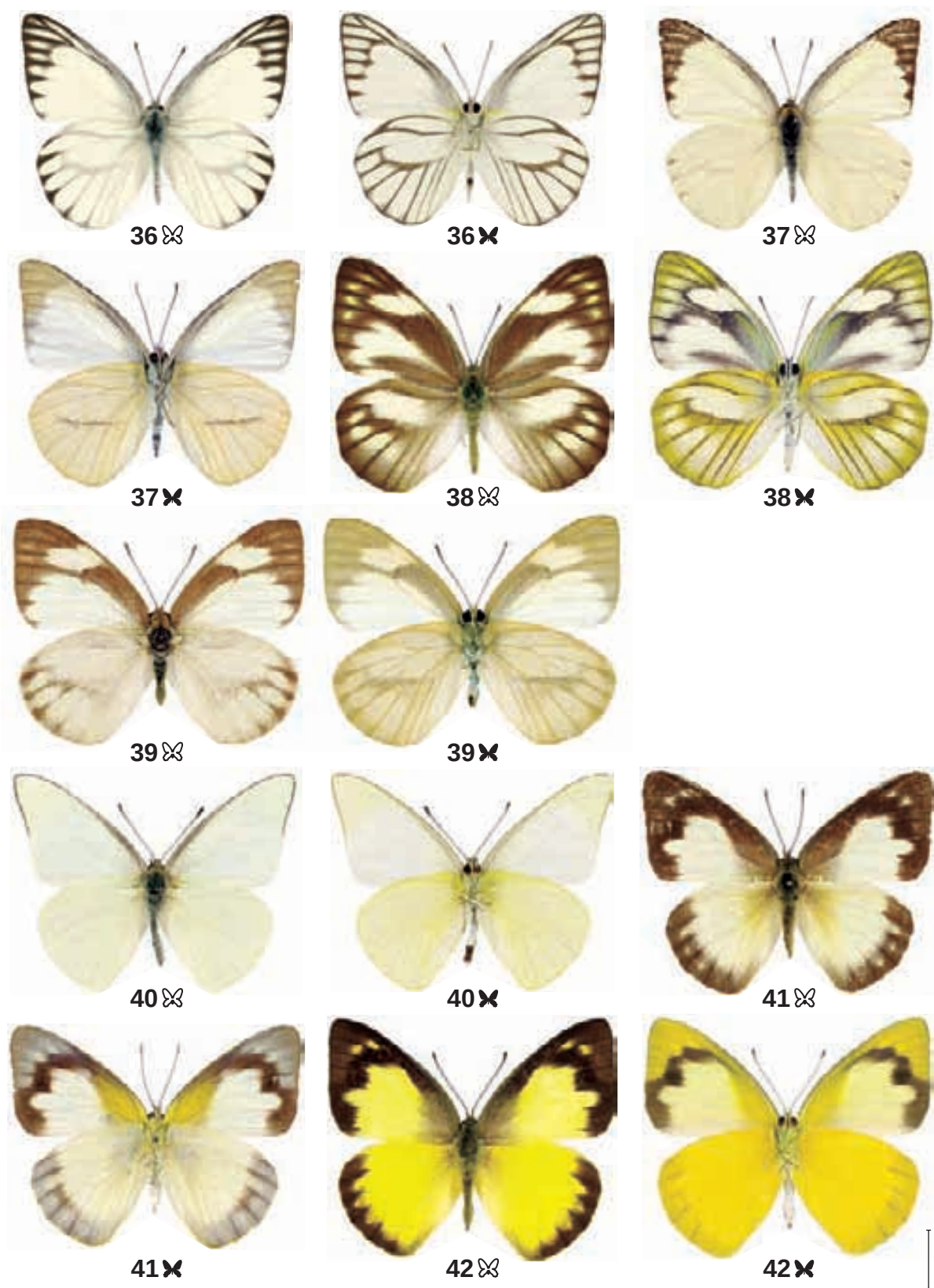


35 ♂



35 ♀

36. *Appias olferna peducaea* Fruhstorfer, 1910 (WSF) 鑲邊尖粉蝶 (高溫 / 雨季型)
♂. TAINAN CITY [= TAINAN Co.], Yongkang, 5. IX. 2010 (Y. F. Hsu).
37. *Appias olferna peducaea* Fruhstorfer, 1910 (DSF) 鑲邊尖粉蝶 (低溫 / 乾季型)
♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Meinong, Shuanxi, 150m, 8. II. 2006 (Y. F. Hsu).
38. *Appias olferna peducaea* Fruhstorfer, 1910 (WSF) 鑲邊尖粉蝶 (高溫 / 雨季型)
♀. KAOHSIUNG CITY [= KAOHSIUNG Co.], Xiaogang Dist., Dalinpu, 0/20m, 9/10. XI. 2003, reared from *Cleome rutidosperma*, emgd. 19. XI. 2003, HSU 03L16 (Y. F. Hsu).
39. *Appias olferna peducaea* Fruhstorfer, 1910 (DSF) 鑲邊尖粉蝶 (低溫 / 乾季型)
♀. TAINAN CITY [= TAINAN Co.], Yongkang, 9. II. 2011 (Y. F. Hsu).
40. *Appias albina semperi* (Moore, 1905) 尖粉蝶
♂. ZHANGHUA Co., Xizhou, Xipan, 25. X. 2009, reared from *Drypetes littoralis*, emgd. 12. XII. 2009, HSU 09M1 (Y. F. Hsu).
41. *Appias albina semperi* (Moore, 1905) ('White form') 尖粉蝶 (白色型)
♀. TAIDONG Co., Lanyu, Longmenxi, 6/8. VIII. 2004, reared from *Drypetes littoralis*, emgd. 25. VIII. 2004, HSU 04H9 (Y. F. Hsu, C. C. Hsieh & Y. J. Yang).
42. *Appias albina semperi* (Moore, 1905) ('Yellow form') 尖粉蝶 (黃色型)
♀. ZHANGHUA Co., Xizhou, Xipan, 20. XII. 2009, reared from *Drypetes littoralis*, emgd. 26. XII. 2010, HSU 09M9 (Y. F. Hsu).



43. *Appias paulina minato* (Fruhstorfer, 1899) 黃尖粉蝶
♂. YILAN Co., Toucheng, Guishan Is., 23. IX. 2006 (H. C. Huang).
44. *Appias paulina minato* (Fruhstorfer, 1899) 黃尖粉蝶
♂. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Nanya, 13. X. 1998 (Y. F. Hsu).
45. *Appias paulina minato* (Fruhstorfer, 1899) 黃尖粉蝶
♀. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Ruifang, Nanya, 26. X. 2009 (C. K. Wang).
46. *Appias lyncida eleonora* (Boisduval, 1836) (WSF) 異色尖粉蝶 (高溫 / 雨季型)
♂. NANTOU Co., Renai, Songchuangang, 2200m, 29. VI. 2006 (L. H. Wang).
47. *Appias lyncida eleonora* (Boisduval, 1836) (DSF) 異色尖粉蝶 (低溫 / 乾季型)
♂. PINGDONG Co., Hengchun, Dajianshan, 15. I. 2006 (Y. F. Hsu).
48. *Appias lyncida eleonora* (Boisduval, 1836) (DSF) 異色尖粉蝶 (低溫 / 乾季型)
♀. TAIPEI CITY, NTNU campus, 1. VI. 2004 (Y. F. Hsu).
49. *Appias lyncida eleonora* (Boisduval, 1836) (WSF) 異色尖粉蝶 (高溫 / 雨季型)
♀. PINGDONG Co., Hengchun, Dajianshan, 15. I. 2006 (Y. F. Hsu).



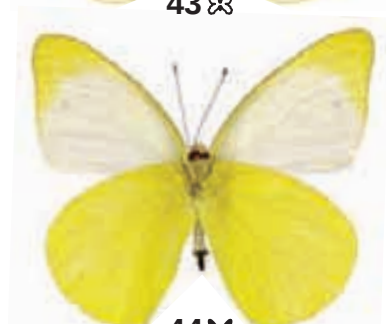
43 ♂



43 ♀



44 ♂



44 ♀



45 ♂



45 ♀



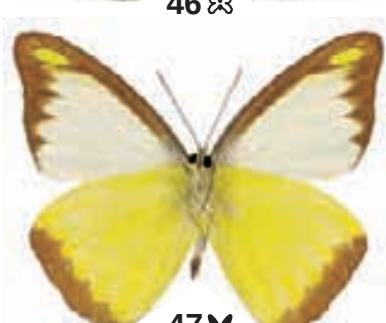
46 ♂



46 ♀



47 ♂



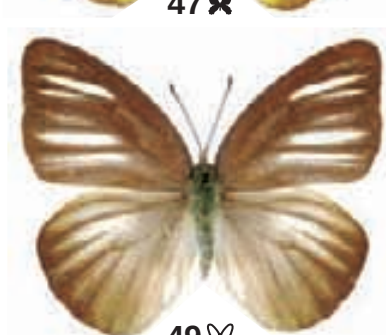
47 ♀



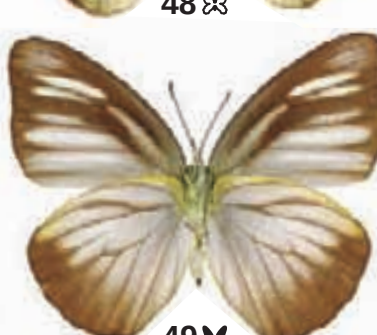
48 ♂



48 ♀



49 ♂



49 ♀

50. *Appias indra aristoxemus* Fruhstorfer, 1908 (WSF) 雲紋尖粉蝶 (高溫 / 雨季型)
♂. PINGDONG Co., Shizi, Lilongshan, 500m, 1. III. 2008 (Y. F. Hsu).
51. *Appias indra aristoxemus* Fruhstorfer, 1908 (DSF) 雲紋尖粉蝶 (低溫 / 乾季型)
♂. PINGDONG Co., Shizi, Shuangliu, 200m, 10. VI. 2007, reared from *Drypetes littoralis*, emgd. 12/17. VI. 2007, HSU 07F5 (Y. F. Hsu).
52. *Appias indra aristoxemus* Fruhstorfer, 1908 (WSF) 雲紋尖粉蝶 (高溫 / 雨季型)
♀. TAIDONG Co., Lanyu, 29/31. III. 2008 (C. H. Lin, jr& N. Y. Tsai).
53. *Appias indra aristoxemus* Fruhstorfer, 1908 (DSF) 雲紋尖粉蝶 (低溫 / 乾季型)
♀. PINGDONG Co., Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu).
54. *Prioneris thestylis formosana* Fruhstorfer, 1903 鋸粉蝶
♂. ZHANGHUA Co., Qinshuiyan, 15. III. 2006 (C. M. Wu).



50 ♀



50 ♂



51 ♀



51 ♂



52 ♀



52 ♂



53 ♀



53 ♂



54 ♀



54 ♂

55. *Prioneris thestylis formosana* Fruhstorfer, 1903 鋸粉蝶
♀. PINGDONG Co., Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu).
56. *Leptosia nina niobe* (Wallace, 1866) 織粉蝶
♂. TAINAN CITY [= TAINAN Co.], Baihe, Guanziling, 400m, 3. V. 2003 (Y. F. Hsu).
57. *Leptosia nina niobe* (Wallace, 1866) 織粉蝶
♀. KAOHSIUNG CITY [= KAOHSIUNG Co.], Liugui, 7. IX. 2000, reared from *Cleome viscosa*, emgd. 24. IX. 2000, HSU 00J26 (C. H. Wu).
58. *Ixias pyrene insignis* Butler, 1879 (WSF) 異粉蝶 (高溫 / 雨季型)
♂. NANTOU Co., Renai, Nanshanxi, 900m, 1. IX. 2007 (Y. F. Hsu).
59. *Ixias pyrene insignis* Butler, 1879 (DSF) 異粉蝶 (低溫 / 乾季型)
♂. PINGDONG Co., Wutai, Ali, 1000m, 31. V. 2006 (L. H. Wang & C. C. Lu).
60. *Ixias pyrene insignis* Butler, 1879 (DSF) 異粉蝶 (低溫 / 乾季型)
♀. PINGDONG Co., Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu).
61. *Ixias pyrene insignis* Butler, 1879 (WSF) 異粉蝶 (高溫 / 雨季型)
♀. PINGDONG Co., Wutai, Ali, 1200m, 4. IV. 2011 (Y. F. Hsu).



55



55



56



56



57



57



58



58



59



59



60



60



61



61

62. *Ixias pyrene pyrene* (Linnaeus, 1764) 異粉蝶 (高溫 / 雨季型)
♂. LIANJIANG Co., Beigan, Wusha, 7. IX. 2014.
63. *Ixias pyrene pyrene* (Linnaeus, 1764) 異粉蝶 (低溫 / 乾季型)
♂. LIANJIANG Co., Beigan, Wusha, 16. IV. 2014.
64. *Ixias pyrene pyrene* (Linnaeus, 1764) (WSF) 異粉蝶 (高溫 / 雨季型)
♀. LIANJIANG Co., Beigan, Wusha, 19. VII. 2013 (L. H. Wang & H. Y. Lee).
65. *Ixias pyrene pyrene* (Linnaeus, 1764) (DSF) 異粉蝶 (低溫 / 乾季型)
♀. LIANJIANG Co.: V. 2003 (Y. A. Lin).
66. *Hebomoia glaucippe formosana* Fruhstorfer, 1908 橙端粉蝶
♂. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Ruifang, Nanya, 4. XI. 2008, reared from *Crateva andersonii*, emgd. 28. X. 2008, HSU 08L1 (L. H. Wnag).



62 ♀



62 ♂



63 ♀



63 ♂



64 ♀



64 ♂



65 ♀



65 ♂



66 ♀



66 ♂

67. *Hebomoia glaucippe formosana* Fruhstorfer, 1908 橙端粉蝶

♀. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Xindian, Sikanshui, 4. XI. 2008, reared from *Crateva andersonii*, emgd. 26. XI. 2008, HSU 08L1 (L. H. Wang).

68. *Hebomoia glaucippe glaucippe* (Linnaeus, 1758) 橙端粉蝶

♂. LIANJIANG Co., Beigan, Wusha, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang).

69. *Hebomoia glaucippe glaucippe* (Linnaeus, 1758) 橙端粉蝶

♀. LIANJIANG Co., Nangang Wusha, 15/16. IV. 2014 (Y. F. Hsu).



67



67



68



68



69



69

70. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶
♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Jiaxian, 13. XI. 2006, reared from *Cassia alata*, emgd. 30. XI. 2006, HSU 06L22.1 (Y. F. Hsu).
71. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶
♂. KAOHSIUNG CITY, Qijin Dist., Dongsha Is., 2/7. X. 2008 (Y. F. Hsu).
72. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶
♀. TAIPEI CITY, Wenshan, NTNU Campus, 10. XI. 2009, reared from *Senne alata*, emgd. 11. XI. 2009, HSU 09L02 (Y. F. Hsu).
73. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶
♀. TAIPEI CITY, NTU Farm, 18. XI. 2003, reared from *Cassia alata*, emgd. 25. XI. 2003, HSU 03L34 (Y. F. Hsu).
74. *Catopsilia pomona pomona* (Fabricius, 1775) (f. *pomona*) 遷粉蝶 (銀紋型)
♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Jiaxian, 13. XI. 2006, reared from *Cassia javanica*, emgd. 17. XI. 2005, HSU 05L23 (Y. F. Hsu).
75. *Catopsilia pomona pomona* (Fabricius, 1775) (f. *crocale*) 遷粉蝶 (無紋型)
♂. YILAN Co., Yilian station, 21. VI. 2001, emgd. 3. VII. 2001.
76. *Catopsilia pomona pomona* (Fabricius, 1775) (f. *pomona*) 遷粉蝶 (銀紋型)
♀. JIAYI CITY, Lantan, 1. V. 2006 (Y. F. Hsu).



70♂



70♀



71♂



71♀



72♂



72♀



73♂



73♀



74♂



74♀



75♂



75♀



76♂



76♀

77. *Catopsilia pomona pomona* (Fabricius, 1775) (f. *catilla*) 遷粉蝶 (紅斑型)
♀. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Shiding, Ergeshan, VIII. 2009 (C. H. Lin).
78. *Catopsilia pomona pomona* (Fabricius, 1775) (intermediate form) 遷粉蝶 (中間型)
♀. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Sanchong, 27. X. 2008 (C. H. Lin).
79. *Catopsilia pomona pomona* (Fabricius, 1775) (f. *crocale*) 遷粉蝶 (無紋型)
♀. JINMEN Co., Jinsha, nr. Houling Park, 28/29. VIII. 2011 (Y. F. Hsu & H. C. Huang).
80. *Catopsilia scylla cornelia* (Fabricius, 1787) 黃裙遷粉蝶
♂. KAOHSIUNG CITY, Xizi Bay, 8. IX. 2000, reared from *Cassia sulfurea*, emgd. 2. X. 2000, HSU 00J22.1 (Y. F. Hsu, M. H. Lin, & C. M. Wu).
81. *Catopsilia scylla cornelia* (Fabricius, 1787) 黃裙遷粉蝶
♀. KAOHSIUNG CITY, Xizi Bay, 8. IX. 2000, reared from *Cassia sulfurea*, emgd. 3. X. 2000, HSU 00J22.1 (Y. F. Hsu, M. H. Lin, & C. M. Wu).
82. *Colias erate formosana* Shirôzu, 1955 紋黃蝶
♂. XINZHU Co., Jianshi, Zhenxibao, 20. XI. 2009 (L. H. Wang).
83. *Colias erate formosana* Shirôzu, 1955 ('Yellow form') 紋黃蝶 (黃色型)
♀. XINZHU Co., Jianshi, Zhenxibao, 20. V. 2010 (L. H. Wang).
84. *Colias erate formosana* Shirôzu, 1955 ('White form') 紋黃蝶 (白色型)
♀. XINZHU Co., Jianshi, Zhenxibao, 26. II. 2009, emgd. 25. III. 2009, HSU 09B35 (L. H. Wang).



77 ☒



77 ✕



78 ☒



78 ✕



79 ☒



79 ✕



80 ☒



80 ✕



81 ☒



81 ✕



82 ☒



82 ✕



83 ☒



83 ✕



84 ☒



84 ✕

85. *Gonepteryx amintha formosana* (Fruhstorfer, 1908) 圓翅鉤粉蝶
♂. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Wulai, 250m, 16. X. 2008,
reared from *Rhamnus formosana*, emgd. 14.IX. 2008, HSU 08K27.1 (C. L. Huang).
86. *Gonepteryx amintha formosana* (Fruhstorfer, 1908) 圓翅鉤粉蝶
♀. PINGDONG Co., Wutai, Ali, 1200m, 5. III. 2011 (Y. F. Hsu).
87. *Gonepteryx taiwana* Paravicini, 1913 臺灣鉤粉蝶
♂. XINZHU Co., Jianshi, Lidongshan, 1500m, 3. IX. 2005 (Y. F. Hsu).
88. *Gonepteryx taiwana* Paravicini, 1913 臺灣鉤粉蝶
♀. XINZHU Co., Jianshi, Lidongshan, 1500m, 3. IX. 2005 (Y. F. Hsu).



85 ☼



85 ✕



86 ☼



86 ✕



87 ☼



87 ✕

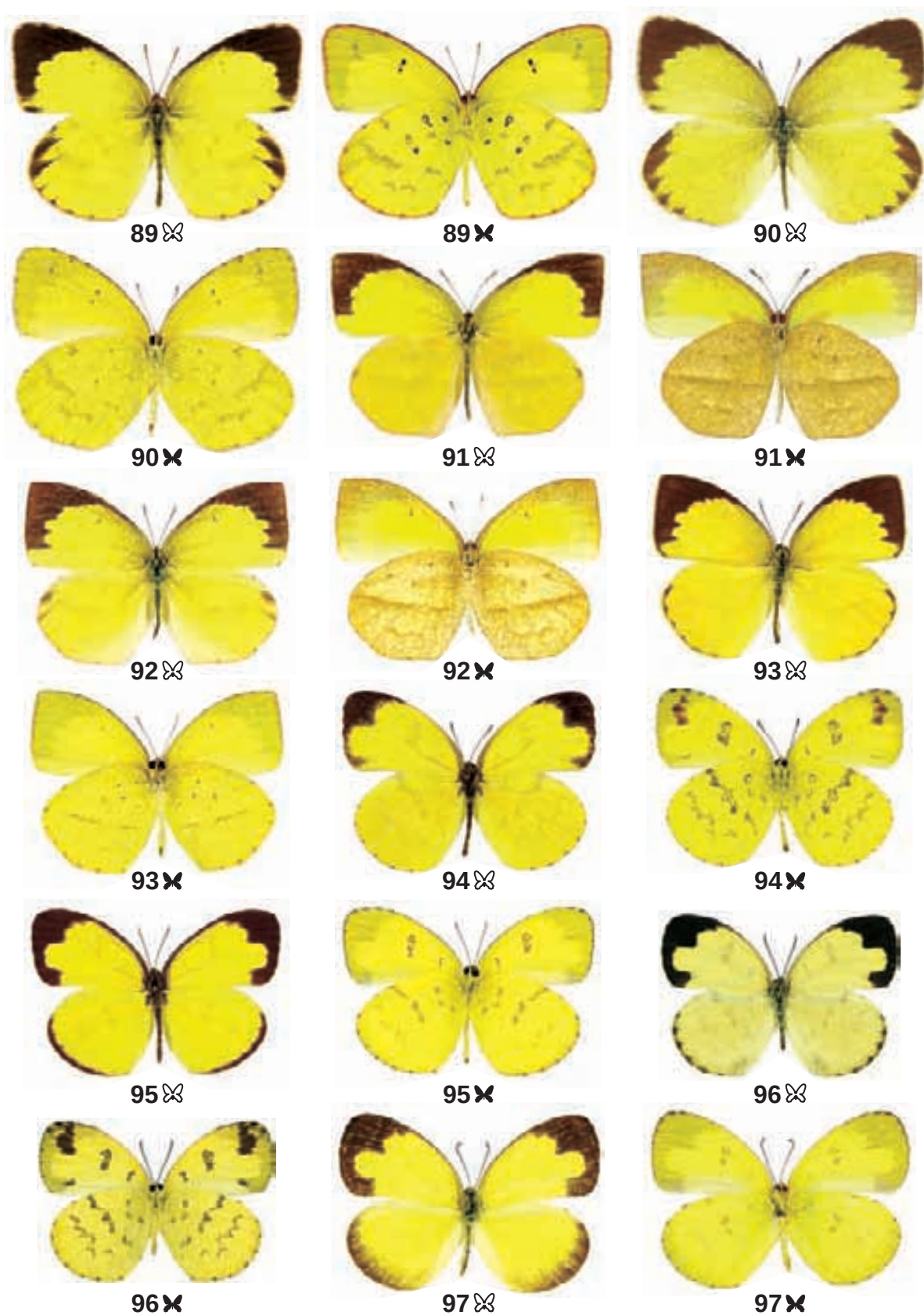


88 ☼



88 ✕

89. *Eurema brigitta hainana* (Moore, 1878) 星黃蝶
♂. TAOYUAN CITY [= TAOYUAN Co.], Daxi, Dingliao, 200m, 6. XII. 2009 (C. H. Lin).
90. *Eurema brigitta hainana* (Moore, 1878) 星黃蝶
♀. JIAYI Co., Zhuqi, Shizhuo, ca 1200m, 10. X. 2005 (Y. F. Hsu).
91. *Eurema laeta punctissima* (Matsumura, 1909) 角翅黃蝶
♂. JIAYI Co., Alishan, Shizhou/Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu).
92. *Eurema laeta punctissima* (Matsumura, 1909) (DSF) 角翅黃蝶 (低溫 / 乾季型)
♀. TAIDONG Co., Yanping, Hongye, 500m, 28. I. 2009 (M. H. Sun).
93. *Eurema laeta punctissima* Matsumura, 1909 (WSF) 角翅黃蝶 (高溫 / 雨季型)
♀. JIAYI Co., Zhuqi, Shizhuo, ca 1200m, 11. IX. 2004, reared from *Chamaecrista mimosoides*, emgd. 2. X. 2004, HSU 04J29 (Y. F. Hsu).
94. *Eurema andersoni godana* (Fruhstorfer, 1910) 淡色黃蝶 (低溫 / 乾季型)
♂. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Wulai, 15. IV. 2005 (Y. F. Hsu).
95. *Eurema andersoni godana* (Fruhstorfer, 1910) 淡色黃蝶 (高溫 / 雨季型)
♂. TAIDONG Co., Donghe Farm, 350m, 16. X. 2007 (Y. F. Hsu).
96. *Eurema andersoni godana* (Fruhstorfer, 1910) (DSF) 淡色黃蝶 (低溫 / 乾季型)
♀. PINGDONG Co., Shizi, Lilongshan, 500m, 17. II. 2008 (Y. F. Hsu).
97. *Eurema andersoni godana* (Fruhstorfer, 1910) (WSF) 淡色黃蝶 (高溫 / 雨季型)
♀. XINBEI CITY [= NEW TAIPEI CITY/ TAIPEI Co.], Wulai, 5. VI. 2005 (Y. F. Hsu).



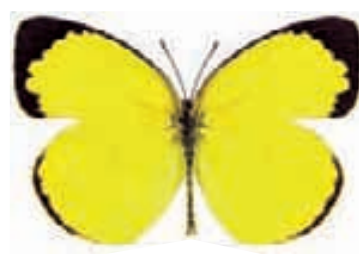
98. *Eurema hecabe* (Linnaeus, 1758) (DSF) 黃蝶 (低溫 / 乾季型)
♂. TAIPEI CITY, Daan, Gongguang, 16. I. 2003 (Y. F. Hsu).
99. *Eurema hecabe* (Linnaeus, 1758) (WSF) 黃蝶 (高溫 / 雨季型)
♂. KAOHSIUNG CITY, Xizhi Bay, Campus of National Sun Yat-sen University, 8. IX. 2000 (Y. F. Hsu, M. H. Lin & C. M. Wu).
100. *Eurema hecabe* (Linnaeus, 1758) (DSF) 黃蝶 (低溫 / 乾季型)
♀. TAIPEI CITY, Wenshan, NTNU campus, 6. XII. 1999, reared from *Albizia julibrissin*, emgd. 23. XII. 1999, HSU 99M5 (Y. F. Hsu).
101. *Eurema hecabe* (Linnaeus, 1758) (WSF) 黃蝶 (高溫 / 雨季型)
♀. TAINAN Co., Xinying, 30. X. 2000, reared from *Albizia julibrissin*, emgd. 14. XI. 2000, HSU 00K85 (Y. F. Hsu).
102. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) (WSF) 北黃蝶 (高溫 / 雨季型)
♂. HUALIAN Co., Xiulin, Shikongai, 100m, 25. VII. 2008 (M. H. Sun).
103. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) (DSF) 北黃蝶 (低溫 / 乾季型)
♂. JINMEN Co., Jinhu, Shenshiqiao, 28/29. ViII. 2011 (Y. F. Hsu & H. C. Huang).
104. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) (DSF) 北黃蝶 (低溫 / 乾季型)
♀. XINZHU Co., Wufeng, E. branch Dalu Forest Trail, 2000m, 20. X. 2009 (L. H. Wang & C. H. Huang).
105. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) (WSF) 北黃蝶 (高溫 / 雨季型)
♀. JINMEN Co., Jinsha, nr. Houling Park, 28/29. VIII. 2011 (Y. F. Hsu & H. C. Huang).



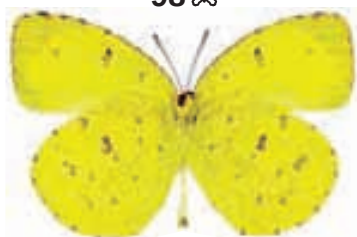
98 ♂



98 ♀



99 ♂



99 ♀



100 ♂



100 ♀



101 ♂



101 ♀



102 ♂



102 ♀



103 ♂



103 ♀



104 ♂



104 ♀

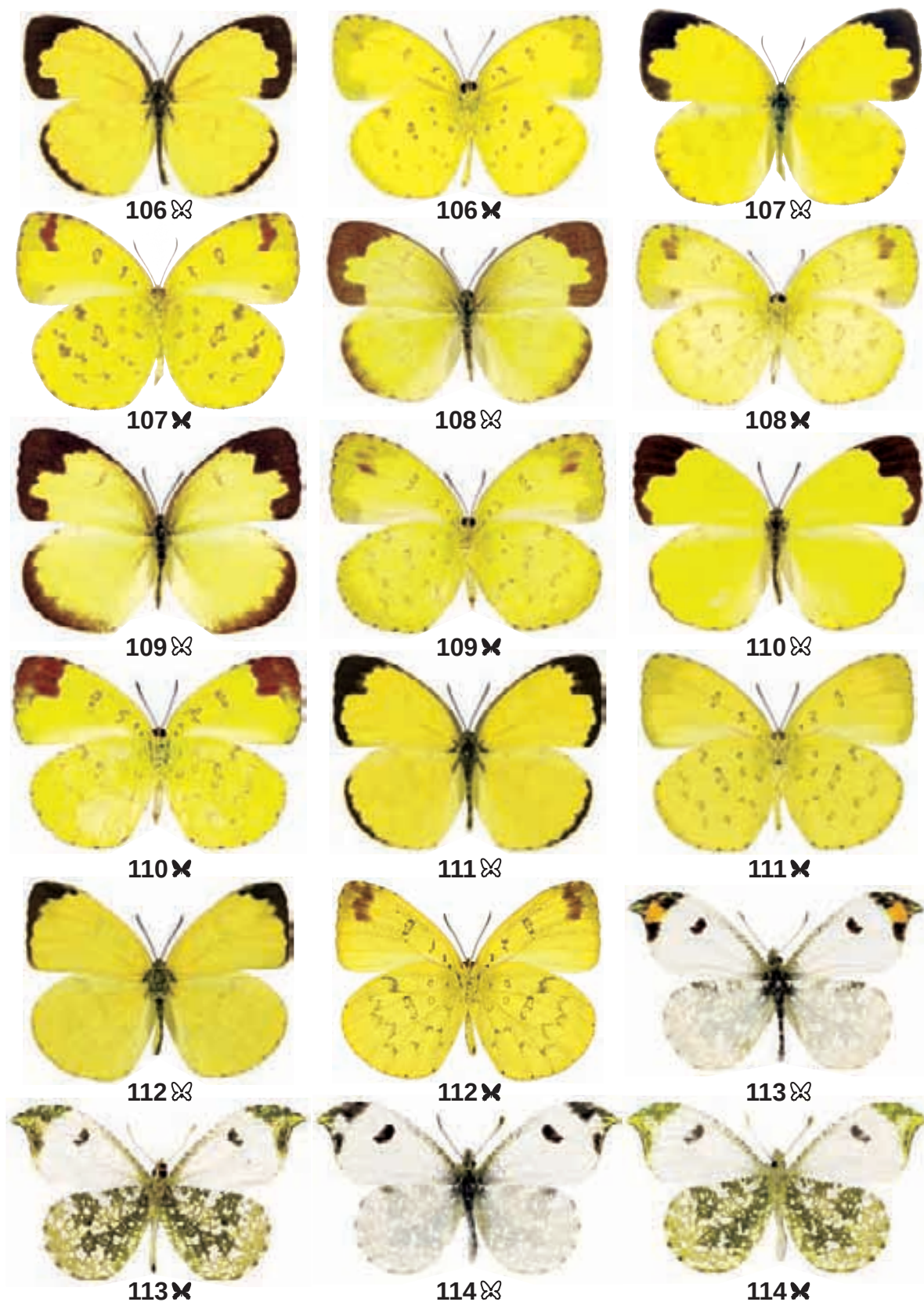


105 ♂



105 ♀

106. *Eurema alitha esakii* Shirôzu, 1953 島嶼黃蝶
♂. PINGDONG Co., Sandimen, 300m, 6. I. 2008 (Y. F. Hsu).
107. *Eurema alitha esakii* Shirôzu, 1953 (DSF) 島嶼黃蝶 (低溫 / 乾季型)
♀. TAIDONG Co., TAIDONG, 12. II. 2009, reared from *Galactia* sp., emgd. 28. II. 2009, HSU 09B8 (Y. F. Hsu).
108. *Eurema alitha esakii* Shirôzu, 1953 (WSF) 島嶼黃蝶 (高溫 / 雨季型)
♀. TAIDONG Co., Yanping, Hongye, 450/500m, 16/17. X. 1999, reared from *Galactia tenuiflora*, emgd. 28. X. 1999, HSU 99K13 (Y. F. Hsu & J. J. Young).
109. *Eurema blanda arsakia* (Fruhstorfer, 1910) (WSF) 亮色黃蝶 (高溫 / 雨季型)
♀. NANTOU Co., Renai, Beidongyanshan, 1300m, 1. IX. 2006 (L. H. Wang).
110. *Eurema blanda arsakia* (Fruhstorfer, 1910) (DSF) 亮色黃蝶 (低溫 / 乾季型)
♀. JILONG CITY, Longgang Trail, 14. I. 2010 (W. H. Chien & J. H. Lin).
111. *Eurema blanda arsakia* (Fruhstorfer, 1910) (WSF) 亮色黃蝶 (高溫 / 雨季型)
♂. JIAYI Co., Alishan, Shizhou/Dabang, 900/1000m, 25. IX. 2010 (Y. F. Hsu).
112. *Eurema blanda arsakia* (Fruhstorfer, 1910) (DSF) 亮色黃蝶 (低溫 / 乾季型)
♂. TAIPEI CITY, Wenshan Dist, NTNU campus, 25. II. 2008, reared from *Senna alata*, emgd. 2.III.2008, HSU 08B19 (Y. F. Hsu).
113. *Anthocharis scolymus mandschurica* Bollow, 1932 黃尖襟粉蝶
♂. LIANJIANG Co., Beigan, Wusha, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang).
114. *Anthocharis scolymus mandschurica* Bollow, 1932 黃尖襟粉蝶
♀. LIANJIANG Co., Beigan, Wusha, 15/16. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang).



MALE GENITALIA

Note. Scale bars represent 1 mm.

115. *Delias pasithoe curasena* Fruhstorfer, 1908 豔粉蝶
♂. TAOYUAN CITY, Fuxing, Shangbaling, 22. VIII. 2014 (C. W. Huang)
(genitalia preparation JYL242).
116. *Delias pasithoe pasithoe* (Linnaeus, 1767) 豔粉蝶
♂. JINMEN Co., Jinsha, Ronghu, 6. XI. 2015 (H. C. Huang) (genitalia preparation
JYL163).
117. *Delias acalis* (Godart, 1819) 丹心豔粉蝶
♂. YUNNAN, 2009 (genitalia preparation JYL243).
118. *Delias hyparete luzonensis* (C. & R. Felder, 1862) 白豔粉蝶
♂. KAOHSIUNG CITY [= KAOHSIUNG Co.], Liugui, 300m, 22. I. 2008 (Y. F.
Hsu) (genitalia preparation JYL233).



115



116



117



118



119. *Delias lativitta formosana* Matsumura, 1909 條斑豔粉蝶
♂. PINGDONG Co., Wutai, Wutoushan, 1200m, 10/11. IV. 1998 (W. I. Chou)
(genitalia preparation JYL217).
120. *Delias berinda wilemani* Jordan, 1925 黃裙豔粉蝶
♂. PINGDONG Co., Wutai, Wutoushan, 1600m, 17. V. 1998 (C. C. Lu) (genitalia
preparation JYL218).
121. *Aporia agathon moltrechti* (Oberthür, 1909) 流星絹粉蝶
♂. NANTOU Co., Renai, Meifeng/Yuanfeng, 2000m, 24. VI. 2016 (J. Y. Liang)
(genitalia preparation JYL212).
122. *Aporia genestieri insularis* Shirôzu, 1959 白絹粉蝶
♂. HUALIAN Co., Xiulin, Xinbaiyang, 24. V. 2007 (L. H. Wang) (genitalia
preparation JYL251).



119



120



121



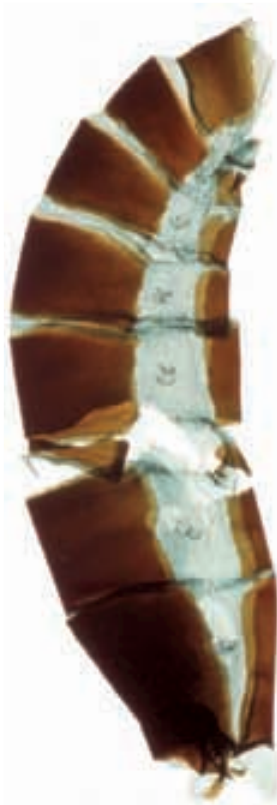
122



123. *Aporia gigantea cheni* Hsu & Chou, 1999 截脈絹粉蝶
♂. PINGDONG Co., Wutai, Wutoushan, 1200m, 10/11. IV. 1998, paratype (W. I. Chou) (genitalia preparation JYL222).
124. *Pieris rapae crucivora* Boisduval, 1836 白粉蝶
♂. TAIPEI CITY, Wenshan, Gongguan, NTNU, 23. I. 2014 (L. Haung) (genitalia preparation JYL173).
125. *Pieris canidia* (Linnaeus, 1768) 緣點白粉蝶
♂. TAIPEI CITY, Wenshan, Gongguan, NTNU, 26. I. 2014 (L. Haung) (genitalia preparation JYL176).
126. *Talbotia naganum karumii* (Ikeda, 1937) 飛龍白粉蝶
♂. JILONG CITY, Anle, Xinshan Dam, 8. IV. 2015 (L. Huang) (genitalia preparation JYL164).



127. *Cepora nadina eunama* (Fruhstorfer, 1903) 淡褐脈粉蝶
♂. NANTOU Co., Renai, Benbusi, 13. XII. 2015 (L. Huang) (genitalia preparation JYL166).
128. *Cepora nerissa cibyra* (Fruhstorfer, 1910) 黑脈粉蝶
♂. TAIDONG Co., Lanyu, 29/31. III. 2008 (C. H. Lin & N. Y. Tsai) (genitalia preparation JYL202).
129. *Cepora iudith olga* (Eschscholtz, 1821) 黃裙脈粉蝶
♂. TAIDONG Co., Lanyu, 13. XII. 2000 (L. H. Wang) (genitalia preparation JYL211).
130. *Appias olferna peducaea* Fruhstorfer, 1910 鑲邊尖粉蝶
♂. TAINAN CITY [= TAINAN Co.], Xinhua, 24. XI. 2016 (L. Huang) (genitalia preparation JYL245).



127



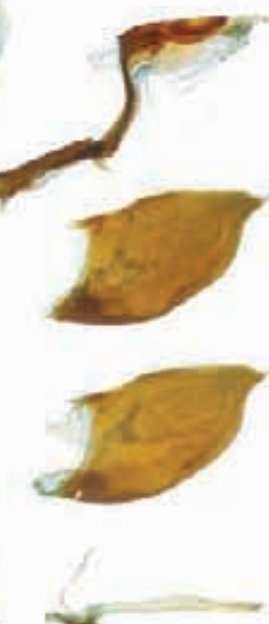
128



129



130



131. *Appias albina semperi* (Moore, 1905) 尖粉蝶
♂. ZHANGHUA Co., Beidou, 8. XI. 2015 (L. Huang) (genitalia preparation JYL167).
132. *Appias paulina minato* (Fruhstorfer, 1899) 黃尖粉蝶
♂. TAIDONG Co., Lanyu, 21/23. XI. 2008 (C. H. Lin & C. L. Huang) (genitalia preparation JYL246).
133. *Appias lyncida eleonora* (Boisduval, 1836) 異色尖粉蝶
♂. TAIPEI CITY, Nangang, Academia Sinica, 18. V. 2015 (L. Huang) (genitalia preparation JYL170).
134. *Appias indra aristoxemus* Fruhstorfer, 1908 雲紋尖粉蝶
♂. PINGDONG Co., Wutai, Ali, 31. V. 2016 (L. H. Wang) (genitalia preparation JYL250).



131



132



133



134

135. *Prioneris thestylis formosana* Fruhstorfer, 1903 鋸粉蝶

♂. NANTOU Co., Renai, Guandaoshan, 27. VII. 2016 (J. Y. Liang) (genitalia preparation JYL223).

136. *Leptosia nina niobe* (Wallace, 1866) 纖粉蝶

♂. XINBEI CITY [=NEW TAIPEI CITY]., Ruifang, Sandiaoling, Santiaoling, 12. IX. 2015 (L. Huang) (genitalia preparation JYL172).

137. *Ixias pyrene insignis* Butler, 1879 異粉蝶

♂. MIAOLI Co., Sanyi, 7. VI. 2015 (L. Huang) (genitalia preparation JYL158).

138. *Ixias pyrene pyrene* (Linnaeus, 1764) 異粉蝶

♂. LIANJIANG Co., Beigan, Wusha, 12. X. 2014 (L. H. Wang & H. Y. Lee) (genitalia preparation JYL204).



135



136



137



138

190

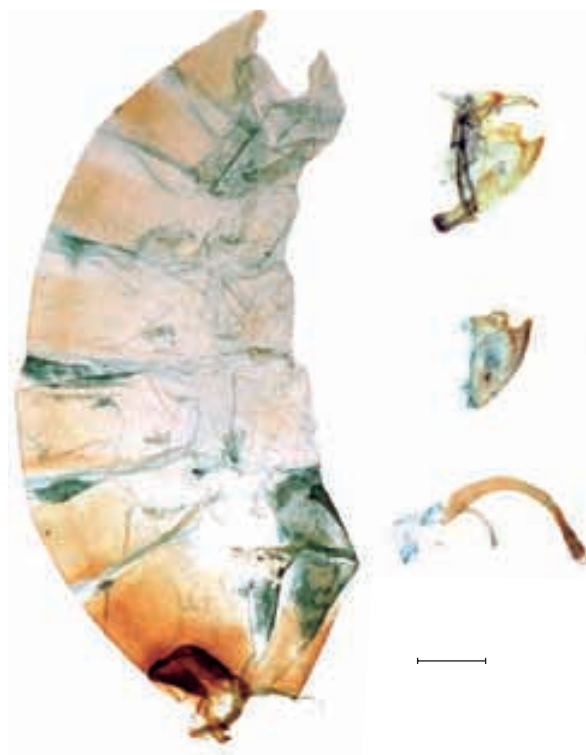
139. *Hebomoia glaucippe formosana* Fruhstorfer, 1908 橙端粉蝶
♂. TAIPEI CITY, Neihu, Yanpinggong, 10. II. 2016 (L. Huang) (genitalia preparation JYL238).
140. *Hebomoia glaucippe glaucippe* (Linnaeus, 1758) 橙端粉蝶
♂. LIANJIANG Co., Beigan, Wusha, 15. IV. 2014 (Y. F. Hsu, H. C. Huang & C. L. Huang) (genitalia preparation JYL226).
141. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶
♂. TAIDONG Co., Lanyu, 18/22. VIII.1998 (Y. T. Lo) (genitalia preparation JYL267).
142. *Catopsilia pomona pomona* (Fabricius, 1775) 遷粉蝶
♂. TAIPEI CITY, Daan, NTU, 4. VI. 2015 (L. Huang) (genitalia preparation JYL213).



139



140



141



142

143. *Catopsilia scylla cornelia* (Fabricius, 1787) 黃裙遷粉蝶
♂. PINGDONG Co., Hengchun, Shehdi, 27. XI. 1991 (W. I. Chou) (genitalia preparation JYL216).
144. *Colias erate formosana* Shirôzu, 1955 紋黃蝶
♂. TAIPEI CITY, Wenshan, Gongguan, NTNU, 8.XI. 2013 (L. Huang) (genitalia preparation JYL187).
145. *Gonepteryx amintha formosana* (Fruhstorfer, 1908) 圓翅鉤粉蝶
♂. TAOYUAN CITY, Fuxing, Xuanyuan, 6. IV. 2016 (L. Huang) (genitalia preparation JYL214).
146. *Gonepteryx taiwana* Paravicini, 1913 臺灣鉤粉蝶
♂. TAOYUAN CITY [= TAOYUAN Co.], Fuxing, Lalashan (Y. T. Lo & B. C. Jo) (genitalia preparation JYL206).



143



144



145



146

147. *Eurema brigitta hainana* (Moore, 1878) 星黃蝶
♂. TAIZHONG CITY, Heping, Defulan, 15. VII. 2015 (L. Huang) (genitalia preparation JYL196).
148. *Eurema laeta punctissima* (Matsumura, 1909) 角翅黃蝶
♂. JIAYI Co., Alishan, Shizhou/Dabang, 900/1000m, 2. V. 2010 (R. K. Dong & Y. F. Hsu) (genitalia preparation JYL224).
149. *Eurema andersoni godana* (Fruhstorfer, 1910) 淡色黃蝶
♂. XINBEI CITY [= NEW TAIPEI CITY], Ruifang, Sandiaoling, 12. IX. 2015 (L. Huang) (genitalia preparation JYL192).
150. *Eurema hecabe* (Linnaeus, 1758) 黃蝶
♂. MIAOLI Co., Sanyi, 7. VI. 2015 (L. Huang) (genitalia preparation JYL200).



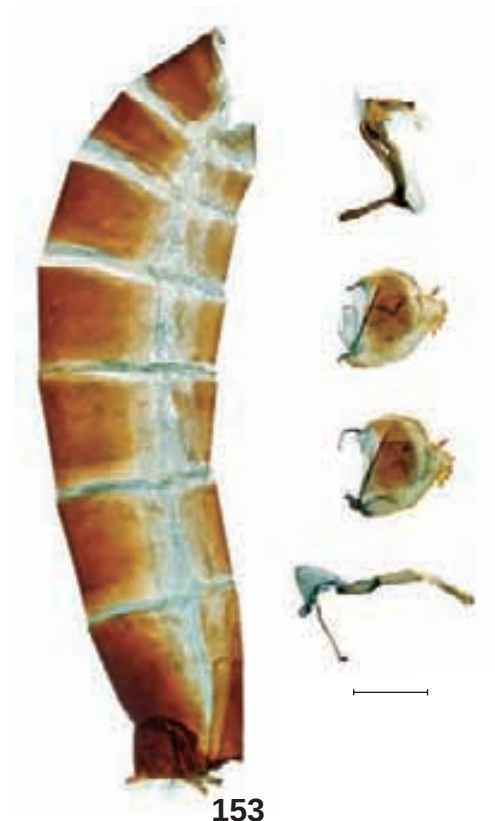
151. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) 北黃蝶
♂. TAOYUAN CITY, Fuxing, Baleng, 28. V. 2016 (L. Huang) (genitalia preparation JYL239).
152. *Eurema alitha esakii* Shirôzu, 1953 島嶼黃蝶
♂. TAIDONG Co., Yanping, Hongye, emgd. 13. V. 2002 (L. W. Wu) (genitalia preparation JYL269).
153. *Eurema blanda arsakia* (Fruhstorfer, 1910) 亮色黃蝶
♂. JIAYI CITY, NCYU, Lantan Campus, 1. VII. 2016 (L. Huang) (genitalia preparation JYL240).
154. *Anthocharis scolymus mandschurica* Bollow, 1932 黃尖襟粉蝶
♂. LIANJIANG Co., Beigan, Qinbi, 16. IV. 2014 (Y. F. Hsu) (genitalia preparation JYL291).



151



152



153



154

FEMALE GENITALIA

Note. Scale bars represent 1 mm.

155. *Delias pasithoe curasena* Fruhstorfer, 1908 豔粉蝶
♀. NANTOU Co., Yuchi, Lianhuachi, 700m, 21. XI. 2014, emgd. 29. XI. 2014 (H. C. Huang) (genitalia preparation JYL160).
156. *Delias pasithoe pasithoe* (Linnaeus, 1767) 豔粉蝶
♀. JINMEN Co., Jinsha, Shishan, 4. XI. 2015 (L. Huang) (genitalia preparation JYL162).
157. *Delias acalis* (Godart, 1819) 丹心豔粉蝶
♀. JINMEN Co., Jincheng, Gugang, 6. XI. 2015 (L. Huang) (genitalia preparation JYL244).
158. *Delias hyparete luzonensis* (C. & R. Felder, 1862) 白豔粉蝶
♀. KAOHSIUNG CITY [= KAOHSIUNG Co.], Liugui, 300m, 22. I. 2008 (Y. F. Hsu) (genitalia preparation JYL234).



155



156



157



158



159. *Delias berinda wilemani* Jordan, 1925 黃裙豔粉蝶
♀. HUALIAN Co., Xiulin, Bilu, 6. VII. 2015 (L. Huang) (genitalia preparation JYL177).
160. *Aporia agathon moltrechti* (Oberthür, 1909) 流星絹粉蝶
♀. HUALIAN Co., Xiulin, Guanyuan, 6. VII. 2015 (L. Huang) (genitalia preparation JYL159).
161. *Aporia genestieri insularis* Shirôzu, 1959 白絹粉蝶
♀. HUALIAN Co., Xiulin, Hualuxi, 1400m, 6. VI. 2005 (Y. F. Hsu) (genitalia preparation JYL252).
162. *Pieris rapae crucivora* Boisduval, 1836 白粉蝶
♀. YUNLIN Co., Douliu, Hushan Reservoir, 12. XII. 2015 (L. Huang) (genitalia preparation JYL174).



159



160



161



162

163. *Pieris canidia* (Linnaeus, 1768) 緣點白粉蝶

♀. TAIPEI CITY, Wenshan, Gongguan, NTNU, 26. I. 2014 (L. Huang) (genitalia preparation JYL175).

164. *Talbotia naganum karumii* (Ikeda, 1937) 飛龍白粉蝶

♀. JILONG CITY, Anle, Xinshan Dam, 8. IV. 2015 (L. Huang) (genitalia preparation JYL165).

165. *Cepora nadina eunama* (Fruhstorfer, 1903) 淡褐脈粉蝶

♀. KAOHSIUNG CITY, Liugui, Fenghuang Logging Trail, 1000m, 25. V. 2016 (J. Y. Liang) (genitalia preparation JYL207).

166. *Cepora nerissa cibyra* (Fruhstorfer, 1910) 黑脈粉蝶

♀. PINGDONG Co., Daren, Duyayuanshan, Paotai, 850m, 3/6. V. 2002 (C. L. Huang) (genitalia preparation JYL270).



163

164



165

166

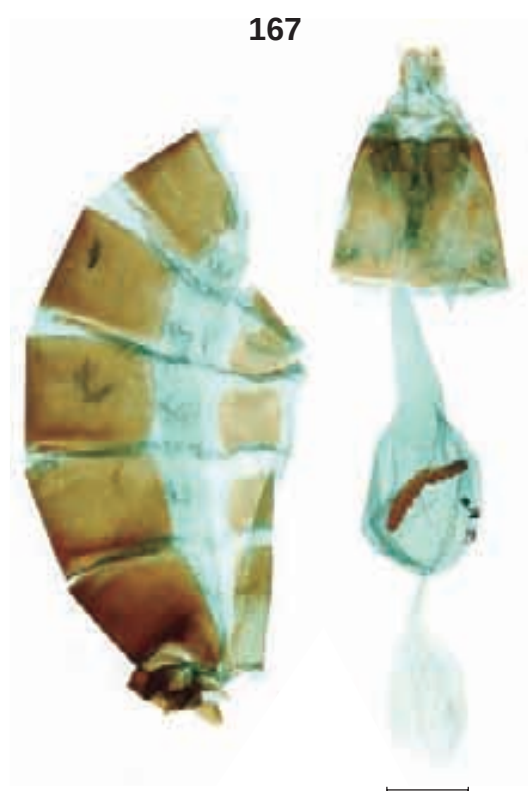
167. *Cepora iudith olga* (Eschscholtz, 1821) 黃群脈粉蝶
♀. TAIDONG Co., Lanyu, Shuangshiyan, 18/20. III. 2006 (Y. F. Hsu & H. C. Huang) (genitalia preparation JYL220).
168. *Appias olferna peducaea* Fruhstorfer, 1910 鑲邊尖粉蝶
♀. TAINAN CITY, Xinhua, 24. XI. 2016 (L. Huang) (genitalia preparation JYL246).
169. *Appias albina semperi* (Moore, 1905) 尖粉蝶
♀. TAIDONG Co., Taidong Forest Park, 30. X. 2015 (L. Huang) (genitalia preparation JYL168).
170. *Appias paulina minato* (Fruhstorfer, 1899) 黃尖粉蝶
♀. TAIDONG Co., Lanyu, 21/23. XI. 2008 (C. H. Lin & C. L. Huang) (genitalia preparation JYL265).



167



168



169



170

171. *Appias lyncida eleonora* (Boisduval, 1836) 異色尖粉蝶
♀. KAOHSIUNG CITY, Liugui, 10. V. 2016 (J Y. Liang) (genitalia preparation JYL169).
172. *Appias indra aristoxemus* Fruhstorfer, 1908 雲紋尖粉蝶
♀. TAIDONG Co., Guanshan, Tienkuang, 20. X. 2001 (L. W. Wu & C. L. Huang) (genitalia preparation JYL249).
173. *Prioneris thestylis formosana* Fruhstorfer, 1903 鋸粉蝶
♀. NANTOU Co., Renai, Guandaoshan, 27. VII. 2016 (J. Y. Liang) (genitalia preparation JYL209).
174. *Leptosia nina niobe* (Wallace, 1866) 纖粉蝶
♀. XINBEI CITY [= NEW TAIPEI CITY], Ruifang, Sandiaoling, 12. IX. 2015 (L. Huang) (genitalia preparation JYL171).



171



172



173



174

175. *Ixias pyrene insignis* Butler, 1879 異粉蝶

♀. KAOHSIUNG CITY, Liugui, Fenghuang Logging Trail, 1000m, 25. V. 2016 (J. Y. Liang) (genitalia preparation JYL208).

176. *Ixias pyrene pyrene* (Linnaeus, 1764) 異粉蝶

♀. LIANJIANG Co., Beigan, Wusha, 10. X. 2014 (L. H. Wang & H. Y. Lee) (genitalia preparation JYL205).

177. *Hebomoia glaucippe formosana* Fruhstorfer, 1908 橙端粉蝶

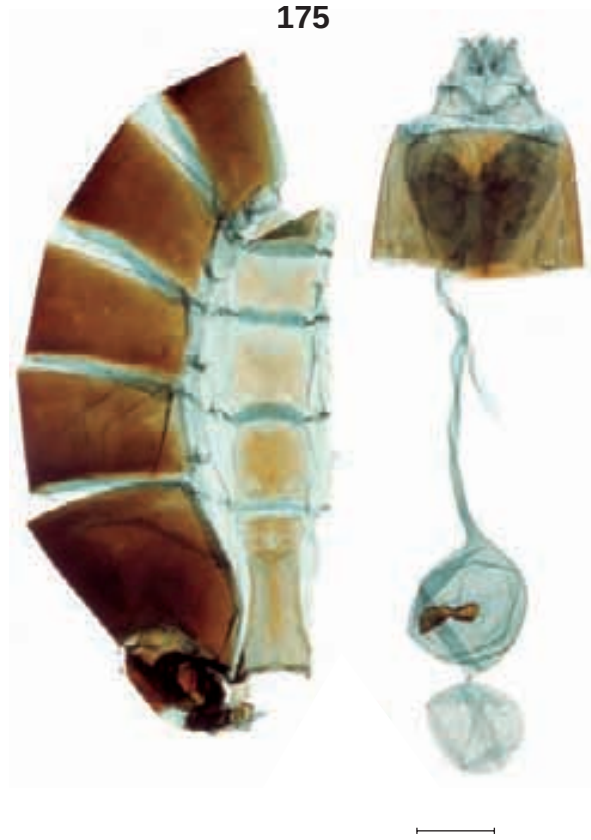
♀. TAIPEI CITY, Wenshan, Gongguan, NTNU, 2. VII. 2015 (L. Huang) (genitalia preparation JYL157).

178. *Catopsilia pyranthe pyranthe* (Linnaeus, 1758) 細波遷粉蝶

♀. JINMEN Co., Jinhu, Shenshiqiao, 4. XI. 2015 (L. Huang) (genitalia preparation JYL184).



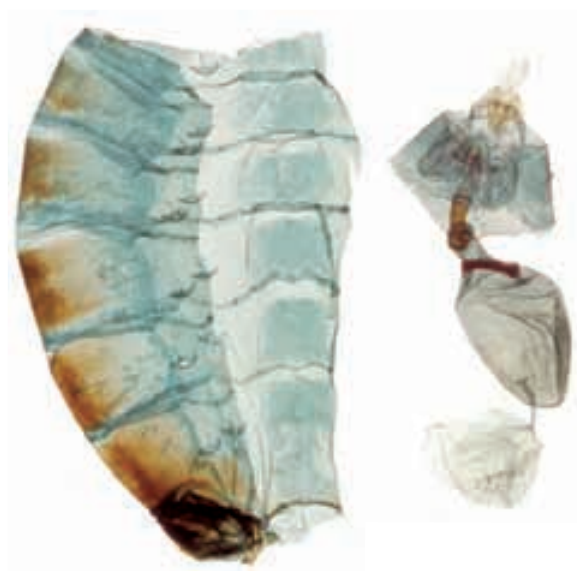
175



177



176



178

179. *Catopsilia pomona pomona* (Fabricius, 1775) 遷粉蝶
♀. TAIDONG Co., Lanyu, Zhongai Bridge, 28. VIII. 2015 (L. Huang) (genitalia preparation JYL185).
180. *Catopsilia scylla cornelia* (Fabricius, 1787) 黃裙遷粉蝶
♀. PINGDONG Co., Laiyi, 28. XI. 1991 (W. I. Chou) (genitalia preparation JYL215).
181. *Colias erate formosana* Shirôzu, 1955 紋黃蝶
♀. JILONG CITY, Gangziliao, 4. X. 2015 (L. Huang) (genitalia preparation JYL188).
182. *Gonepteryx amintha formosana* (Fruhstorfer, 1908) 圓翅鉤粉蝶
♀. TAIDONG Co., Haiduan, Liyuan, 17. VIII. 2015 (J. Y. Liang) (genitalia preparation JYL219).



179



180



181



182



183. *Gonepteryx taiwana* Paravicini, 1913 臺灣鉤粉蝶
♀. PINGDONG Co., Wutai, 6. IV. 2015 (L. H. Wang) (genitalia preparation JYL248).
184. *Eurema brigitta hainana* (Moore, 1878) 星黃蝶
♀. TAIZHONG CITY, Heping, Defulan, 15. VII. 2015 (L. Huang) (genitalia preparation JYL195).
185. *Eurema laeta punctissima* (Matsumura, 1909) 角翅黃蝶
♀. JIAYI Co., Zhuqi, Shizhou, 1300m, 11. IX. 2004 (Y. F. Hsu & R. K. Dong) (genitalia preparation JYL225).
186. *Eurema andersoni godana* (Fruhstorfer, 1910) 淡色黃蝶
♀. TAIDONG Co., Jingfeng, Manuerxi, 8. IV. 2000 (Y. F. Hsu) (genitalia preparation JYL293).



183



184



185



186

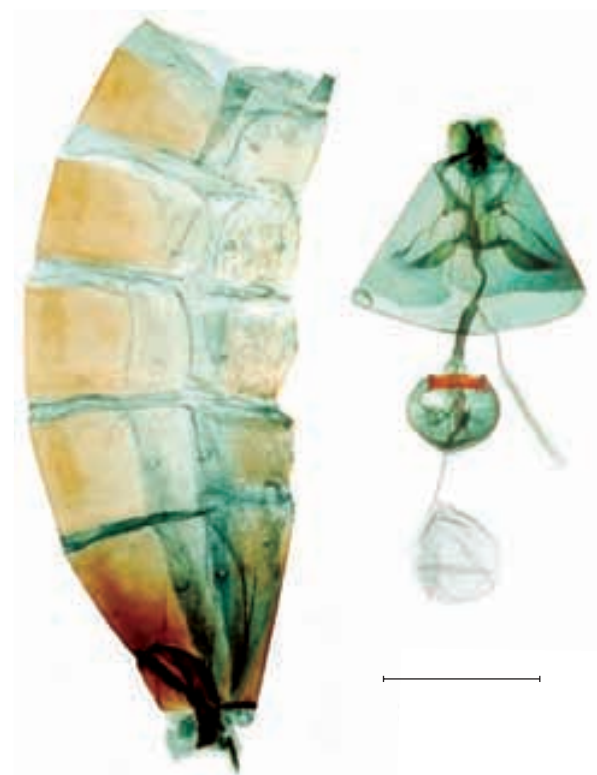
187. *Eurema hecabe* (Linnaeus, 1758) 黃蝶
♀. MIAOLI Co., Sanyi, 7. VI. 2015 (L. Huang) (genitalia preparation JYL201).
188. *Eurema mandarina* (de l'OrxaLinnaeus, 1758) 北黃蝶
♀. HUALIAN Co., Xiulin, Huitouwan, 700m, 30. I. 2007 (Y. F. Hsu) (genitalia preparation JYL266).
189. *Eurema alitha esakii* Shirôzu, 1953 島嶼黃蝶
♀. TAIDONG Co., Haiduan, Xinwu, 412m, 26. XI. 1999 (Y. F. Hsu) (genitalia preparation JYL268).
190. *Eurema blanda arsakia* (Fruhstorfer, 1910) 亮色黃蝶
♀. TAINAN CITY, Baihe, Guanziling, 28. X. 2016 (J. Y. Liang) (genitalia preparation JYL241).



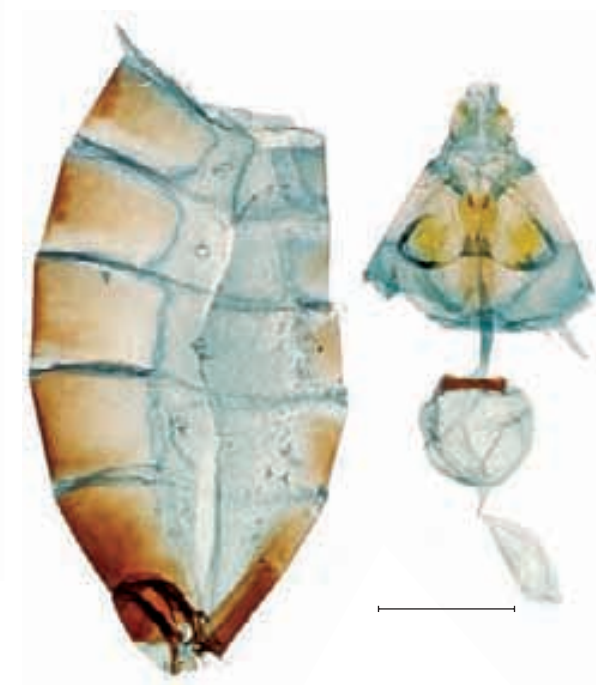
187



188



189



190

191. *Anthocharis scolymus mandschurica* Bollow, 1932 黃尖襟粉蝶

♀. LIANJIANG Co., Beigan, Qinbi, 16. IV. 2014 (Y. F. Hsu) (genitalia preparation JYL290).



191

Index

A

acalis, **8**, 141, 179, 201
agathon, **20**, 145, 181, 203
albina, **52**, 153, 187, 207
alitha, **122**, 175, 197, 217
amintha, **99**, 169, 193, 213
andersoni, **110**, 171, 195, 215
Anthocharis, **129**
Aporia, **19**
Appias, **48**
aristoxemus, *indra*, **62**, 157, 187, 209
arsakia, *blanda*, **125**, 175, 197, 217

B

belladonna, **132**
berinda, **16**, 143, 181, 203
blanda, **125**, 175, 197, 217
brassicae, **132**
brigitta, **104**, 171, 195, 215

C

canidia, **31**, 147, 183, 205
Catopsilia, **83**
Cepora, **37**
cheni, *gigantea*, **25**, 147, 183
cibyra, *nerissa*, **42**, 151, 185, 205
Colias, **94**
cornelia, *scylla*, **91**, 167, 193, 213
crucivora, *rapae*, **28**, 147, 183, 203
curasena, *pasithoe*, **5**, 139, 179, 201

D

darada, *albina*, **52**
Delias, **4**
domitia, *nero*, **132**

E

eleonora, *lyncida*, **59**, 155, 187, 209
erate, **94**, 167, 193, 213

esakii, *alitha*, **122**, 175, 197, 217
eunama, *nadina*, **38**, 149, 185, 205
Eurema, **104**

F

formosana, *amintha*, **99**, 169, 193, 213
formosana, *erate*, **95**, 167, 193, 213
formosana, *glaucippe*, **78**, 161, 191, 211
formosana, *lativitta*, **13**, 143, 181
formosana, *thestyli*, **66**, 157, 189, 209

G

genestieri, **22**, 145, 181, 203
gigantea, **24**, 147, 183
glaucippe, **78**, 161, 191, 211
glaucippe, *glaucippe*, **78**, 163, 191, 211
godana, *andersoni*, **110**, 171, 195, 215
Gonepteryx, **98**

H

hainana, *brigitta*, **104**, 171, 195, 215
Hebomoia, **77**
hecabe, **113**, 173, 195, 217
hyparete, **11**, 141, 179, 201
hypsipyle, **132**

I

indra, **62**, 157, 187, 209
insignis, *pyrene*, **73**, 159, 189, 211
insularis, *genestieri*, **22**, 145, 181, 203
iudith, **45**, 151, 185, 207
Ixias, **73**

K

karumii, *naganum*, **35**, 149, 183, 205

L

laeta, **107**, 171, 195, 215
lativitta, **13**, 68, 143, 181
Leptosia, **69**
luzonensis, *hyparete*, **11**, 141, 179, 201

lyncida, **59**, 155, 187, 209

M

mandarina, **119**, 173, 197, 217
mandschurica, **129**, 175, 197, 219
minato, paulina, **56**, 155, 187, 207
moltrechti, agathon, **20**, 145, 181, 203

N

nadina, **38**, 149, 185, 205
naganum, **35**, 149, 183, 205
nerissa, **41**, 151, 185, 205
nero, **132**
nina, **70**, 159, 189, 209
niobe, nina, **70**, 159, 189, 209

O

olferna, **48**, 153, 185, 207
olga, iudith, **45**, 151, 185, 207

P

pasithoe, **4**, 139, 179, 201
pasithoe, pasithoe, **5**, 139, 179, 201
paulina, **56**, 155, 187, 207
peducaea, olferna, **49**, 153, 185, 207
Pieris, **27**
pomona, **87**, 165, 191, 213
Prioneris, **65**
punctissima, laeta, **107**, 171, 195, 215
pyranthe, **83**, 165, 191, 211
pyrene, **73**, 159, 189, 211
pyrene, pyrene, **74**, 159, 189, 211

R

rapae, **28**, 147, 183, 203

S

scolymus, **129**, 175, 197, 219
scylla, **91**, 167, 193, 213
semperi, albina, **52**, 153, 187, 207
sinensis, erate, **95**

T

taiwana, **101**, 169, 193, 215
Talbotia, **34**
thestyliis, **66**, 157, 189, 209

W

wilemani, berinda, **16**, 143, 181, 203

索引

三劃

大白粉蝶, 133

四劃

丹心豔粉蝶, 8, 141, 179, 201

五劃

白粉蝶, 28, 147, 183, 203

白粉蝶屬, 27

北黃蝶, 119, 173, 197, 217

白絹粉蝶, 22, 145, 181, 203

白豔粉蝶, 11, 141, 179, 201

六劃

尖粉蝶, 52, 153, 187, 207

尖粉蝶屬, 48

七劃

角翅黃蝶, 107, 171, 195, 215

九劃

紅尖粉蝶, 133

亮色黃蝶, 125, 175, 197, 217

流星絹粉蝶, 20, 145, 181, 203

星黃蝶, 104, 171, 195, 215

飛龍白粉蝶, 35, 149, 183, 205

飛龍白粉蝶屬, 34

美艷粉蝶, 133

十劃

脈粉蝶屬, 38

紋黃蝶, 94, 167, 193, 213

紋黃蝶屬, 94

島嶼黃蝶, 122, 175, 197, 217

十一劃

淡色黃蝶, 110, 171, 195, 215

細波遷粉蝶, 83, 165, 191, 211

條斑豔粉蝶, 13, 69, 143, 181

淡褐脈粉蝶, 38, 149, 185, 205

十二劃

異色尖粉蝶, 59, 155, 187, 209

異粉蝶, 73, 159, 189, 211

異粉蝶屬, 73

黃尖粉蝶, 56, 155, 187, 207

黃尖襟粉蝶, 129, 175, 197, 219

黃裙脈粉蝶, 45, 151, 185, 207

黃裙遷粉蝶, 91, 167, 193, 213

黃裙豔粉蝶, 16, 143, 181, 203

黃蝶, 113, 173, 195, 217

黃蝶屬, 104

雲紋尖粉蝶, 62, 157, 187, 209

黑脈粉蝶, 41, 151, 185, 205

十三劃

圓翅鉤粉蝶, 99, 169, 193, 213

絹粉蝶屬, 19

鉤粉蝶屬, 99

十四劃

截脈絹粉蝶, 24, 147, 183

臺灣鉤粉蝶, 101, 169, 193, 215

十五劃

緣點白粉蝶, 31, 147, 183, 205

十六劃

遷粉蝶, 87, 165, 191, 213

鋸粉蝶, 66, 157, 189, 209
遷粉蝶屬, 83
鋸粉蝶屬, 66
橙端粉蝶, 78, 161, 191, 211
橙端粉蝶屬, 78

十九劃

襟粉蝶屬, 129

二十二劃

蘇門答臘鋸粉蝶, 133

二十三劃

織粉蝶, 70, 159, 189, 209
織粉蝶屬, 70

二十五劃

鑲邊尖粉蝶, 48, 153, 185, 207

二十八劃

豔粉蝶, 4, 139, 179, 201
豔粉蝶屬, 4

國家圖書館出版品預行編目 (CIP) 資料

臺灣蝶類誌．第二卷，粉蝶科／徐堉峰，黃嘉龍，梁家源著．

-- 初版.-- 臺北市：農委會林務局，民 107.01

面；公分

中英對照

ISBN 978-986-05-5156-3(精裝)

1. 蝴蝶 2. 臺灣

387.793

107000075

臺灣蝶類誌第二卷粉蝶科

Butterfly Fauna of Taiwan Volume II Pieridae (Second Edition)

著 者——徐堉峰、黃嘉龍、梁家源

發行人——林華慶

總策劃——楊宏志、廖一光、邱立文

策 劃——夏榮生、羅尤娟、許曉華、謝書綺、王守民

出版機關——行政院農業委員會林務局

地 址——100 台北市中正區杭州南路一段 2 號

網 址——<http://www.forest.gov.tw/>

電 話——+886-2-23515441

美術設計——陳姿伶

印 刷——伯驊印刷有限公司

出版日期——中華民國 107 年 1 月初版一刷

中華民國 108 年 1 月再版一刷

定 價——NT\$650

展售處——國家書店 臺北市松江路 209 號 1 樓 +886-2-25150207

五南文化書局 臺中市山中路 6 號 +886-4-22260330

著作財產權人保留對本書依法享有之所有著作權利。擬重製、改作、編輯或公開口述本書全部或部份內容者，須先徵得著作財產權管理機關之同意或授權。

ISBN 978-986-05-5156-3

GPN 1010700072