

澳門

苔蘚植物

Checklist of Macao Bryophytes 名錄



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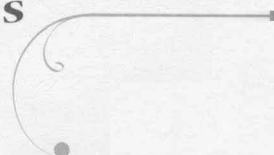
Fairylake
Botanical Garden
仙瀾柏苑

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澳門

苔蘚植物

Checklist of Macao 名錄
Bryophytes

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《澳門苔蘚植物名錄》

Checklist of Macao Bryophytes

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序 Foreword

民政總署對澳門自然資源的研究與保護工作十分重視。2003年至2007年期間完成「澳門植物物種多樣性調查研究」及《澳門植物名錄》和《澳門植物誌》的編研計劃，並已出版及發行《澳門植物名錄2004》及全套三卷的《澳門植物誌》，總共收錄維管束植物逾1,500種，反映澳門地區面積雖小，但植物資源仍相當豐富。

苔蘚植物乃植物界不可缺少的組成部分。澳門植物標本室現存的第一份苔蘚植物標本是1996年採集的楔瓣地錢東亞亞種。為了更全面地反映澳門植物資源的實況，更有效地保護這些珍貴的自然資源，2006年10月，民政總署特別邀請深圳市仙湖植物園合作展開為期三年的「澳門苔蘚植物多樣性研究」計劃。雙方研究人員不辭勞苦，攀山涉水，對全澳苔蘚植物進行了大普查，共採集苔蘚植物標本近500號，拍攝照片6,000餘張，經鑑定的種類達103種。其中，苔類14科，22屬，27種；角苔類2科，3屬，4種；蘚類18科，38屬，72種。

本名錄除記錄每個種的中文名、學名、異學名、文獻引證外，亦詳列標本編號、採集地、生境、海拔、地理分佈等，並以中英雙語出版，讓不同文化背景的專家學者及愛好大自然的讀者們，都能清晰瞭解澳門苔蘚植物多樣性的現況，同時亦是研究澳門植物資源不可或缺的工具書。

本名錄乃歷經三年野外調查的成果結晶，編寫工作得以順利完成，實有賴深圳市仙湖植物園的領導與專家們鼎力的支持，及本署工作人員的熱誠參與，為澳門苔蘚植物資源留下最詳實的記錄，亦為澳門自然資源研究立下新的里程碑。在此，本人謹向所有參與此研究計劃的同仁及關心自然生態的人士，致以衷心感謝。

民政總署管理委員會主席
譚偉文

The Civic and Municipal Affairs Bureau always attaches great importance to the research and conservation of Macao's natural resources, as in the lengthy project of preparation and publication of books on Macao's plant resources completed between 2003 and 2007, which included studies in Macao's Plant Diversity and the compilation of *Check List of Macao Plants* and *Flora of Macao*. It also played a role in the publication of *Check List of Macao Plants 2004*, volumes I, II and III of the *Flora of Macao*, which take account of more than 1,500 species of vascular plants, an evidence that shows that Macao is fairly rich in plant resources, though it is limited in geographical terms.

Bryophytes are indispensable constituents of the plant kingdom. The bryophyte specimen collected in 1996, the first ever housed in the Macao Herbarium, is that of *Marchantia emarginata* Reinw *et al.* subsp. *tosana* (Steph.) Bischl. In order to present the whole picture of Macao's plant resources so people may better protect these valuable natural resources, the IACM initiated in October 2006 a joint research project of Macao's Bryophytes Diversity with the help of Shenzhen Fairy Lake Botanical Garden. The joint research team launched a comprehensive field survey of Macao's bryophytes, and managed to round up some 500 specimens and snapped some 6,000 photo shots. As many as 103 species are identified, of which liverworts contain 27 species in 22 genera and 14 families; hornworts encompass 4 species in 3 genera and 2 families; and mosses 72 species in 38 genera and 18 families.

Every species entry in this *Checklist* comes with its Chinese name, scientific name, synonyms, references, as well as its specimens, localities, habitat, altitude and geographical distribution. The book is a bilingual edition (Chinese and English), which makes it inviting to students and nature lovers of different cultures. The book also makes an indispensable tool for research into Macao's plant resources.

This Checklist is the crystallisation of a three-year field survey. The preparation of the book would not have been so smooth were it not for the orchestrated participation and support of the leaders and experts of Shenzhen Fairy Lake Botanical Garden and the staff of the IACM, whose efforts have resulted in the most detailed record we have ever had of Macao's bryophytes, a new milestone in the research in Macao's natural resources. I would like to take this opportunity to convey my heartfelt thanks to all who have contributed in any way to the project and those who have shown concern about the ecosystems of our planet.

Tam Vai Man
Chairman of the Administration Committee
Civic and Municipal Affairs Bureau

序 Foreword



從《澳門植物名錄2004》出版發行起，有關專家學者和廣大讀者就一直期待《澳門苔蘚植物名錄》的出版。經過深圳市仙湖植物園和澳門民政總署園林綠化部三年的共同努力，如今這一願望終於實現了。

《澳門苔蘚植物名錄》以中英雙語出版，記載了產於澳門的103種苔蘚植物。每一種包括中文名、拉丁學名、異學名、憑證標本、產地、生境、分佈範圍。頗值欣喜的是，在名錄中記載的一些極為珍稀的種類也產自澳門，例如中華細指苔、單月苔、腺褐角苔、東亞短角苔、小囊蘚和海南明葉蘚等。可以說，在《澳門苔蘚植物多樣性調查》課題開始前，我對澳門苔蘚植物多樣性的瞭解幾近空白，是深圳澳門兩地的專家與同仁，讓我享受到這一遠超預期的豐碩成果。

本書包含的資訊，對於完善澳門植物多樣性的瞭解將提供極為重要的基礎資料。她與《澳門苔蘚植物誌》各有側重，內容互補，可以當成她的姊妹篇。兩者交互使用，更能發揮她的價值。我相信，隨着本書的出版，苔蘚植物的研究將會受到更多人的關注，其前景將更加廣闊。

深圳市城市管理局局長
吳子俊

Since the publication of the *Check List of Macao Plants 2004*, specialists and the general public have anticipated the *Checklist of Macao Bryophytes*. After three years of orchestrated effort by the Department of Gardens and Green Areas of the Civic & Municipal Affairs Bureau of Macao and the Shenzhen FairyLake Botanical Garden, this expectation has come true.

The *Checklist of Macao Bryophytes* comes in a bilingual edition (Chinese-English), and documents 103 species of bryophytes found in Macao. Each species includes the Chinese name, Latin name, synonyms, specimens, localities, habitats, and worldwide distribution. The exciting surprise is that some rare and threatened species were found in Macao, such as *Kurzia sinensis*, *Monosolenium tenerum*, *Folioceros glandulosus*, *Nothothylas javanica*, *Micromitrium tenerum* and *Vesicularia hainanensis*. Before this bryological survey, we knew nearly nothing about bryophyte diversity in Macao. Thanks should be extended to the experts and colleagues from Macao and Shenzhen for their hardworking and devotion so that I can take unexpected enjoyment in their gorgeous achievement

The information offered in this book may well serve as a stepping-stone for the understanding of the flora diversity in Macao. It may also be seen as a sister volume to the *Bryophyte Flora of Macao* - the two complement each other in terms of content and focuses. Its value will be maximized if they are used in cross-reference. I believe that with the publication of this book, the study of bryophytes will attract more concern and effort, and the future will be brighter.

Wu Zijun
Director
Bureau of Urban Management of Shenzhen Municipality

前言

在對某個地區的某類生物進行開發利用或多樣性保育之前，必須知道一些基本的資料。以澳門的苔蘚植物為例，如果我們想對澳門的苔蘚植物進行開發利用或多樣性保育，那至少必須知道澳門有多少種苔蘚植物？哪些種類有藥用或經濟價值？哪些類型的生境之苔蘚植物多樣性最高？哪些環境因素對苔蘚植物的多樣性影響最大？哪些苔蘚植物屬於珍稀或瀕危的種類？這些珍稀或瀕危的種類有什麼特點？本地苔蘚植物面臨哪些威脅？

倘若時間倒退3年，我們對澳門苔蘚植物的瞭解近乎一無所知。如果當時說要對澳門的苔蘚植物進行開發利用或進行保育工作，肯定是無稽之談。值得欣喜的是，3年後，情況有了很大的變化。自2006年10月起，澳門特別行政區民政總署和深圳市仙湖植物園聯合開展了澳門苔蘚植物多樣性的調查和研究工作。在這3年裏，來自深、澳兩地的專家和工作人員對澳門的苔蘚植物進行了深入、全面的調查，採集了約500號標本，確認澳門產苔蘚植物103種，隸屬於34科，57屬。其中苔類14科，22屬，27種；角苔類2科，3屬，4種；蘚類18科，38屬，72種。不難發現，前述的問題，在本書裏已經可以找到相當一部分答案了。

本名錄就是對過去3年的考察成果作概括總結，詳細列舉了澳門產的103種苔蘚植物，書末附有中文和拉丁名稱索引。苔類和角苔類的排列順序按Piippo (1990) 的系統排列，蘚類則採用了《Moss Flora of China》(Vols. 1-4, 6-8) 的系統，僅少數地方有所更改。命名人依據Crandall-Stotler *et al.* (2009)、Goffinet *et al.* (2009)、Renzaglia *et al.* (2009)及相關的《中國苔蘚誌》中英文版進行了統一。苔類和角苔類的中文名儘量按《中國苔蘚誌》（第9-10卷）和《雲南植物誌》（第17卷）為主；蘚類則按《Moss Flora of China》(Vols. 1-4, 6-8) 為準，部分在《中國苔蘚誌》（第1-4，6-8卷）中用過的名稱，則置於中文名後的括弧內，以供參考；少數新擬的中文名則以「*」號加以注明。名錄中所列舉的所有種都包括了中文名、學名（包括部分常見的異學名）、產地、生境、詳細標本引證、國內外分佈等資訊。除特別說明外，引證標本均為本人所採。引證格式為採集人「姓」加「採集號」。所有引證標本藏於深圳市仙湖植物園標本館（SZG）和澳門植物標本室。

同期發行的《澳門苔蘚植物誌》，是本名錄的姊妹篇。該誌對科、屬、種均有簡要的描述，所有的種還附有形態線條圖，且約95%的種附有一至多張彩色照片。如果讀者想進一步瞭解或鑑定澳門產的苔蘚植物，《澳門苔蘚植物誌》是很好的參考書。

最後，感謝深圳市仙湖植物園主任李勇博士、副主任潘新良先生、劉興堯先

生、科技部部長李楠博士、辦公室主任謝海標先生、政工人事部部長賴麗梅女士、林展二先生等在各方面給予的鼓勵與支持；澳門特別行政區民政總署園林綠化部的相關領導和工作人員在過去幾年予以的協助及卓有成效的合作；上海華東師範大學朱瑞良教授、西安植物園張滿祥研究員幫忙鑑定和確認部分細鱗苔科和灰蘚科標本，以及我的夫人張瑛女士在背後所作出的默默奉獻。

本名錄雖力求全面、完美，但由於時間倉促，疏漏難免，還望讀者多多批評指正。

深圳市仙湖植物園研究員
張力

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Preface

It is necessary to know some basic information before we plan to exploit or conserve certain groups of organisms. If we want to do something on the exploitation and conservation of Macao's bryophytes, we must at least know the following questions. How many species of bryophytes are there in Macao? How many and which species possess medicinal or economical value? Which habitats harbour the highest diversity of bryophytes? What are the environmental factors that most affect bryophyte diversity? How many and which species are rare or endangered? Do the rare or endangered species have any features in common? What are the major threats to bryophytes?

If we look back three years ago, we will find that we knew almost nothing of Macao's bryophytes. Back then, it would have been just empty talk to exploit or conserve them. Fortunately the situation is totally changed three years later. Since October 2006, the Civic and Municipal Affairs Bureau of Macao Special Administrative Region has worked with Shenzhen Fairy Lake Botanical Garden to investigate the diversity of Macao's bryophytes jointly. In these three years, experts and colleagues from Shenzhen and Macao conducted thorough and comprehensive survey on Macao's bryophytes, and about 500 pockets of specimens were collected. It is confirmed that there are 103 species of bryophytes in 57 genera and 34 families occurred in Macao. Of these, liverworts account for 27 species in 22 genera and 14 families, hornworts 4 species in 3 genera and 2 families, and mosses 72 species in 38 genera and 18 families. The questions outlined above have been partly answered.

This checklist is a summary of the results of the investigation conducted over the past three years. It documents 103 species of bryophytes found in Macao in detail, and the indexes of Chinese and Latin names were also supplied. The liverworts and hornworts are arranged according to Piippo (1990), while mosses following *Moss Flora of China* (Vols. 1-4, 6-8), with only few changes. Names of the authors follow Crandall-Stotler *et al.* (2009), Goffinet *et al.* (2009), Renzaglia *et al.* (2009) and published volumes of *Moss Flora of China* and *Flora Bryophytarum Sinicorum*. The Chinese names of liverworts and hornworts follow *Flora Bryophytarum Sinicorum* (Vols. 9-10) and *Flora Yunnanica* (Tomus 17) wherever possible, while mosses mainly follow *Moss Flora of China* (Vols. 1-4, 6-8). The alternative names used in *Flora Bryophytarum Sinicorum* (Vols. 1-4, 6-8) are placed in brackets after the Chinese names for reference. A few newly proposed Chinese names are marked with asterisks (*). For all accepted species in this checklist, information includes a Chinese name, a scientific name (including some common synonyms), references, habitat, examined specimens, and local and worldwide distribution. Unless otherwise stated, all specimens were collected by myself.

Specimens cited in this checklist are as the following format "the collector's surname and collection number". All specimens are deposited in the herbarium of Shenzhen FairyLake Botanical Garden (SZG) with duplicates in Macao Herbarium.

The *Bryophyte Flora of Macao* is a sister publication to this checklist. It details all families, genera and species. Each species was accompanied with an illustration of line drawing, and species of about 95% with more than 1 colour images. If you want to identify or know more about Macao's bryophytes, please consult it.

I would like to take this opportunity to extend my gratitude to Dr. Li Yong, the Director of Shenzhen FairyLake Botanical Garden, Mr. Pan Xinliang and Mr. Liu Xingyao, the deputy directors, Dr. Li Nan, the Head of the Science and Technology Department, Mr. Xie Haibiao, the Head of the General Office, Ms. Lai Limei, the Head of the Personnel Department, and her colleague Mr. Lin Zhaner for their encouragement and various support. I would also like to thank the officials and officers of the Department of Gardens and Green Areas of the Civic and Municipal Affairs Bureau for their assistance and close cooperation during the past years, Prof. Zhu Ruiliang of East China Normal University, and Prof. Zhang Manxiang of Xi'an Botanical Garden for their identifying and verifying some specimens of families of Lejeuneaceae and Hypnaceae, and at last my wife Ms. Zhang Ying for her devoted support.

Although all efforts have been made to make this checklist comprehensive and perfect, there may still be deficiencies due to time constraints. I would appreciate all the comments and corrections for errors.

Zhang Li,
Research Professor
Shenzhen FairyLake Botanical Garden

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苔類植物門

MARCHANTIOPHYTA

指葉苔科 LEPIDOZIACEAE

鞭苔屬 *Bazzania* Gray

三裂鞭苔

Bazzania tridens (Reinw. *et al.*) Trev., Mem. Reale Ist. Lombardo Sci., Ser. 3, Cl. Sci. Mat. **4**: 415, 1877. — *B. albicans* Steph., Hedwigia **32**: 204, 1893. — *B. sinensis* Gott. ex Steph., Hedwigia **25**: 208, 1886.

路 環： 陸軍路山溪，林下溪邊石生，海拔55 m，張5278；海拔60 m，張5289。石排灣郊野公園徑至情人橋山溪，林下溪邊土生，海拔30 m，張5313，5568；海拔40 m，張5473；海拔50 m，張5572。石面盆古道，疏林下石生，海拔130 m，張5326，5596。九澳村，林下石生，海拔30 m，張5454。馬格蘭石材企業有限公司（雲石廠）至陸軍路山溪，林下石生，海拔40 m，張5479。

Coloane: Stream alongside Estrada Militar, on rock by stream in woodland, alt. 55 m, Zhang 5278; alt. 60 m, Zhang 5289. Stream from Seac Pai Van Park Walk to Lover's Bridge, on soil by stream in woodland, alt. 30 m, Zhang 5313, 5568; alt. 40 m, Zhang 5473; alt. 50 m, Zhang 5572. Seac Min Pun Ancient Path, on rock in sparse woodland, alt. 130 m, Zhang 5326, 5596. Ká-Hó Village, on rock in woodland, alt. 30 m, Zhang 5454. Stream from Magran Industrial Transformação de Mármorese Grantossarl to Estrada Militar, on rock in woodland, alt. 40 m, Zhang 5479.

分 佈： 中國（澳門、香港、廣東、海南、廣西、湖南、江西、福建、臺灣、浙江、江蘇、安徽、湖北、四川、貴州、雲南、西藏、內蒙古、吉林）。韓國、日本、印度、尼泊爾、不丹、菲律賓、婆羅洲、巴布亞新幾內亞、薩摩亞。

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