

臺灣生態之美

The Beauty of Formosan Nature



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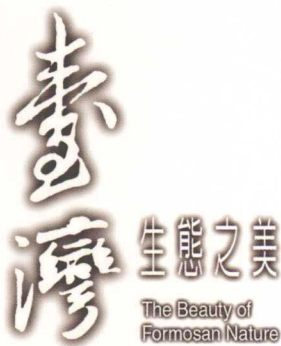
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Editorial Direction / Council for Cultural Affairs Executive Yuan

(#30-1, Peiking E. Rd. Taipei, Taiwan)

Director / Tchen Yu-chiou

Supervision / Stanley S. L. Wang

Executor / Bill Chang, Wei Chia-huei

Editorial Board / Association of Nature Caretaker

(#62-1, Alley 7, Section III, Taichung, Taiwan)

Essay Writer / Chou Mei-yen, Hsu Li-peng, Huang Chao-chou, Huang Chao-chin

English Text Adviser / Fred Steiner

Photographer / Wang Chia-hsiung, Chiou Jiin-ho, Hsu Fu-hsiung, Hsu Li-peng, Yao Cheng-te,

Chen Yung-fu, Chen Chin-jin, Hsu Jinn-juang, Huang Chih-min, Huang Chun-yuan,

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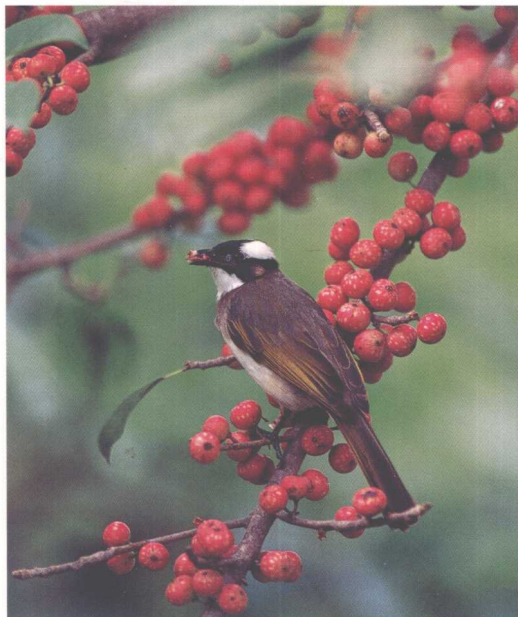
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臺灣

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行政院文化建設委員會
Council For Cultural Affairs Executive Yuan

擁抱自然之美

藝術大都起源於模仿造化。滿山蒼松、滿谷綠竹，是畫家筆下的自然之美；一朵百合、一片紅葉，是攝影家捕捉的造型之美；豎耳聆聽，自然界溪澗飛禽，是詩人筆下「間關鶯語花底滑，幽咽泉流水下灘」的有聲世界；用心感受，水中鱒魚為音樂家展演自然生機的美妙樂章。自古至今，不論中外，自然界中有生命無生命的萬物，無不以其獨特的美，不卑不亢地呈現在你我眼前；更藉由文學、繪畫、音樂等不同的藝術形式，豐富人們的精神生活。

曾幾何時，自然之美與我們漸行漸遠，賜予我們無形精神食糧的自然空間，被人類價值所倚的物質存在大量取代。高冷蔬菜、茶園、檳榔園等農作物取代原始自然山區原有的生態風貌；水泥建築叢林取代生機盎然的灌木樹叢；各種廢氣，迷濛了我們的雙眼，也讓無辜的生命蒙塵；污染的河川，也失去了悠遊的魚群。然後幾場豪雨，沖刷赤裸的土地形成土石流，帶走數十條人命，我們才驚覺人類的貪婪，不僅破壞自然界原有的平衡、殘害鳥獸蟲魚無數生命，也為人類本身帶來難以抗禦的禍害。

縱然自然生態的破壞是全球性的，但眼觀台灣在921地震、納利、利奇馬颱風之後的滿目瘡痍，稍具良知的心，怎能不感到痛。於是我們願以最悲憫的心發最大的願，摒棄人類主觀的價值意識，對自然多一點尊重、多一點愛護，捐棄高傲與自大，體認人類本是大自然生態系統的一環，應與其他萬物和諧共存。

出版「台灣生態之美」，是這心願最初步的實踐。我們希望以台灣現存的豐碩生命，喚醒在人類物質橫流中逐漸枯竭的性靈，在自然之美的潤澤下，對自然與人的關係重新思索定位，瞭解自然於我們而言，有形的、無形的價值是同等重要；對自然高瞻遠矚的永續利用，要比短視近利強取豪奪對人類有益。跨出閉鎖的自以為是，讓我們以視聽觸聞等感官去知覺自然，同時也用心去感受自然、聆聽自然、擁抱自然之美。

行政院文化建設委員會

主任委員

陳郁秀



Embracing the Beauty of Nature

Most art derives from the imitation of Nature. Painters represent natural beauty with mountains of green pines and valleys of verdant bamboo; photographers, with a lotus petal or single red leaf. To the attentive ear, the natural realm of flowing mountain streams and flitting birds is the subject of poetry; and even sporting river trout have inspired great music. Since time immemorial, the animate and inanimate objects in nature, each with its own unique beauty, have presented themselves to us with neither humility nor haughtiness. Transformed into literature, paintings, music and other art forms, nature continues to enrich our spiritual lives.

Only relatively recently did the beauty of nature start to become remote as the natural space of spiritual sustenance bestowed upon us was mostly replaced by the material existence on which human values depend. Crops from vegetable farms, tea plantations and betel nut orchards supplanted the pristine natural mountain ecology. Forests of urban concrete buildings replaced trees and shrubs rich in vitality, clogging our eyes with smog, and enveloping innocent life in dust. Polluted rivers became bereft of their meandering schools of fish. It took several bouts of heavy rainfall denuding the hillsides and causing landslides with a heavy toll on human life before we woke up to the fact that human avarice has destroyed the balance of the original natural order, has wrought havoc on the lives of human beings and countless other life forms, and has brought calamities upon mankind that we now find hard to withstand.


Even though ecological degradation is a global phenomenon, witnessing the destruction that the September 21, 1999 earthquake, Typhoon Nari, and Typhoon Lekima brought to Taiwan would pain anyone with a conscience. With the greatest compassion we must make a collective vow to abandon the ideology of subjective anthropocentric values, and respect nature more, love nature more, renouncing human arrogance and conceit. We must acknowledge that we are a part of nature, and that we must live in harmony with the rest of the world.

The publication of *The Beauty of Taiwan's Ecology* marks a first step toward realizing this wish. We hope to use Taiwan's current abundant vitality to reawaken a natural disposition that has atrophied amidst the currents of material culture, to nourish with the beauty of nature a predilection for reexamining how we define the relationship between Nature and mankind and for understanding that Nature has equal tangible and intangible value to us. Farsighted sustainable development will benefit mankind more than shortsighted scrambles for immediate profit. We must open our minds and reconnect with nature via all our sensory organs-seeing, hearing, feeling and smelling it. We must diligently feel nature and listen to it, embracing Taiwan's natural beauty.

Yu-chiou Tchen

Chairwoman, Council of Cultural Affairs

Executive Yuan





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台灣植被概說

General Introduction to
the Vegetation of Taiwan



台灣是一海島，地處亞洲大陸東南，介於北緯 $20^{\circ} 50'$ 至 $25^{\circ} 20'$ 之間。東臨太平洋，西瀕台灣海峽，北迴歸線經過本島中部，因鄰近赤道，地屬副熱帶地區，高溫、多雨及多颱風為其氣候特徵。南北全長幾近400公里，東西最寬亦達142公里，面積約35,970平方公里。遠古時代的板塊運動造就出縱貫台灣南北的中央山脈，三千公尺以上山峰超過百座，聞名之玉山海拔3,952公尺，榮登東亞第一高峰之美譽。此外，一千公尺以上的山地占台灣三分之一，島內溪谷交錯，山巒層疊，地形起伏，加上洋流經過及季風之影響，使得自平地至玉山頂孕育出具有熱帶、溫帶及寒帶的植物種類，其多樣性之高更是世上少有，其中更有不少原生的特有植物（endemic species），因此三百多年前葡萄牙人看到台灣時，即讚頌它是美麗之島「Formosa」，當時台灣隨處可見青山綠水、鳥語花香，動植物生趣盎然，一片欣欣向榮的景象。

就植物而言，台灣產的原生植物約有4,000餘種，特產於台灣的（台灣特有種）就占1,130餘種，以植物演化與植物地理的觀點而言，是提供植物學者研究種的形成及天擇的地方。

依據學者研究台灣的生態環境，將台灣的植被帶以垂直的海拔分布來闡釋，茲分述如下：

Taiwan is situated to the southeast of the Chinese mainland, between northern latitudes $20^{\circ} 50'$ and $25^{\circ} 20'$. This island is bounded by the Pacific Ocean to the east, and by the Taiwan Straits to the west, with the Tropic of Cancer crossing the center of the island. Taiwan's location is in the subtropical zone, with high temperatures, torrential rains and typhoons. It is approximately 400 kilometers long from north to south and 142 kilometers across at its widest point from west to east, with a total area of about 35,970 square kilometers. Tectonic plate movement long ago formed its massive Central Mountain Range, which contains at least one hundred peaks over 3,000 meters in elevation, including Jade Mountain (Yushan), the highest peak in northeast Asia at 3,952 meters in height. Foothills over 1,000 meters in elevation cover one-third of the island. The undulating terrain, ocean currents and monsoons have created a number of climatic zones including tropical, subtropical, temperate and frigid, each with vegetation unique to that zone. There are also a number of native endemic species. With such diverse vegetation it is no wonder that Portuguese explorers named this island Formosa, meaning "beautiful," more than 300 years ago.

With more than 4,000 species of native plants, of which about 1,130 are endemic, Taiwan provides an excellent location for botanists interested in plant evolution and phytogeography to research speciation and natural selection.

According to previous research on Taiwan's ecology, its vegetation can be divided into vertically distributed zones.

一、高山植群帶

Alpine vegetation zone



主要分布海拔3,600公尺以上的高山地帶，大多為高山頂峰，年平均溫度約5°C以下，屬亞寒帶（subarctic）之氣候帶，因本地帶經年受強風吹襲，冬雪堆壓，裸岩碎石林立，土壤保水力差，地表蒸發量高，形成乾燥又寒冷的環境，故生長於此的植物都以匍匐性姿態出現，較具代表性的植物有玉山圓柏、玉山杜鵑、玉山小蘗、玉山薔薇、高山沙參、玉山水苦蕒、玉山佛甲草、尼泊爾籜簫。

This zone mainly includes high mountain peaks of over 3,600 meters in elevation. The mean annual temperature is below 5°C, making this a frigid climatic zone. It is characterized by strong winds, accumulated snow, exposed rock and gravel. Since it is hard for the soil to retain water, there is a high amount of evaporation, which creates a cold dry environment, suited to creeping plants. Representative plants include *Juniperus squamata* var. *morrisonicola*, *Rhododendron pseudochrysanthum*, *Berbergis morrisonensis*, *Rosa sericea* var. *morrisonensis*, *Adenophora uehatae*, *Veronica marrisonicola*, *Sedum morrisonensis*, and *Anaphalis nepalensis*.



二、冷杉林帶

Abies zone

台灣冷杉林帶主要分布於海拔3,100至3,600公尺的地區，年平均溫度約5°C至8°C，屬冷溫帶之氣候帶，本林帶為台灣森林界線之所在，代表性的植物以台灣冷杉及玉山箭竹最具特色。台灣冷杉主要分布在濕度高之北向向陽的谷地上，且常常形成大面積純林。在台灣冷杉林出現的植物以刺柏、玉山鬼督郵、玉山佛甲草較常見。玉山箭竹為台灣分布海拔最高的竹類，常在陽光極強的南向坡形成大片草原，玉山箭竹是一種適應力極強能屈能伸的植物，在強風盛行的環境下，株高不及30公分，但在森林大樹之庇護下則高達4公尺。玉山箭竹草原伴生植物有台灣龍膽、阿里山龍膽、玉山飛蓬、阿里山薊等較常出現。

Taiwan's *Abies* zone, mainly found between elevations of 3,100 and 3,600 meters, has a mean annual temperature of 5°C to 8°C, making this a cold-temperate climatic zone. This zone marks the demarcation line of Taiwan's forests. Representative plants include *Abies kawakamii* and *Yushania niitakayamensis*. *Abies* are mainly found in valleys with high humidity facing the north and the sun, and often form large forests. Plants seen in Taiwan *Abies* zone are *Juniperus formosana* and *Sedum morrisonensis*. *Yushania niitakayamensis* is the only bamboo species at these high elevations. It is often found in large meadows on southern facing slopes with strong sunlight. *Yushania niitakayamensis* is an adaptable plant. It reaches a height of only 30 cm in an environment with strong winds, but could be higher than 4 meters if under the protection of large trees. Plants usually found in *Yushania niitakayamensis* meadows include *Gentiana atkinsonii* var. *formosana*, *Gentiana arisanensis*, *Erigeron morrisonensis*, and *Cirsium arisanense*.



三、鐵杉雲杉林帶

Tsuga-Picea zone

本林帶主要分布於海拔2,500公尺至3,100公尺之間，年平均溫度約8°C至11°C，屬涼溫帶之氣候帶，代表性植物有鐵杉、台灣雲杉、華山松、高山芒、台灣二葉松等。鐵杉、台灣雲杉、華山松等大多分布在向陰或北向坡的溪谷。高山芒則分布於開闊的向陽坡。台灣二葉松主要分布於南向向陽的山坡，氣候乾燥，土壤貧瘠，常與華山松形成大面積的松林，其下則有玉山箭竹或高山芒所覆蓋，由於松樹內含油脂，加上乾燥環境，故常發生森林火燒，導致演替頻繁，因此出現不同演替階段的鑲嵌植被。





Mainly found between 2,500 and 3,100 meters, this zone has a mean annual temperature of 8°C to 11°C, making this a cool-temperate climatic zone. Representative plants include *Tsuga chinensis* var. *formosana*, *Picea morrisonicola*, *Pinus armandii* var. *masteriana*, *Miscanthus transmorrisonensis* and *Pinus taiwanensis*. These are mostly found in shady, sunny or northward-facing valleys. Due to the oily resin of pine trees and the dry environment, forest fires are common, and thus so is succession. Vegetation is mosaic due to the different substitution stages.



四、櫟林帶

Quercus zone

此處之櫟林帶即是以殼斗科植物為代表的森林帶，主要分布於海拔1,500公尺至2,500公尺之間的山地，年平均溫度約11°C至17°C，屬溫帶之氣候帶。此林帶為本島的盛行雲霧帶，其所代表為針闊葉混生林，尤以紅檜數量最多。本林帶代表性植物有紅檜、台灣扁柏、台灣杉、台灣紅榨槭、青楓等。

The Quercus zone is a forest zone found between 1,500 and 2,500 meters in elevation and represented by plants of the Fagaceae family. The mean annual temperature is between 11°C and 17°C, making this a temperate zone. It is also in the cloud forest zone, and features conifers and broadleaf trees, especially *Chamaecyparis formosensis*. Representative plants include *Chamaecyparis formosensis*, *Chamaecyparis obtusa* var. *formosana*, *Taiwania cryptomerioides*, *Acer morrisonense*, and *Acer serrulatum*.

