

# THE SHENZHEN DECLARATION ON PLANT SCIENCES

Uniting plant sciences and society to build a green,  
sustainable Earth

## 植物科学深圳宣言

链接植物科学与社会, 共建绿色永续地球



**IBC 2017**  
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Shenzhen China



## VITAL CONNECTIONS

Actions and priorities to connect the global community of plant scientists with the world's changing societies are today more imperative than ever. Environmental degradation, unsustainable resource use, and biodiversity loss all require integrated, collaborative solutions.



## A CHANGING WORLD

As plant scientists we are increasingly aware and concerned with the accelerating rate of change of our planet and our societies. In our lifetimes we have witnessed major alterations in the structure and make-up of land, water, and the atmosphere, in use of natural resources and agricultural practices, in migration of plants, animals, and people, in rates of urbanization, and in the rise and spread of infectious diseases. The rate of species extinction is greater now than at any time in the last 65 million years. It is clear that this tremendous transformation, with its profound effect on nature, is primarily the result of human activities. The degree of pressure on the environment has never been greater -- far beyond the level at which natural systems will be able to maintain sustainable productivity. The need to act is urgent.

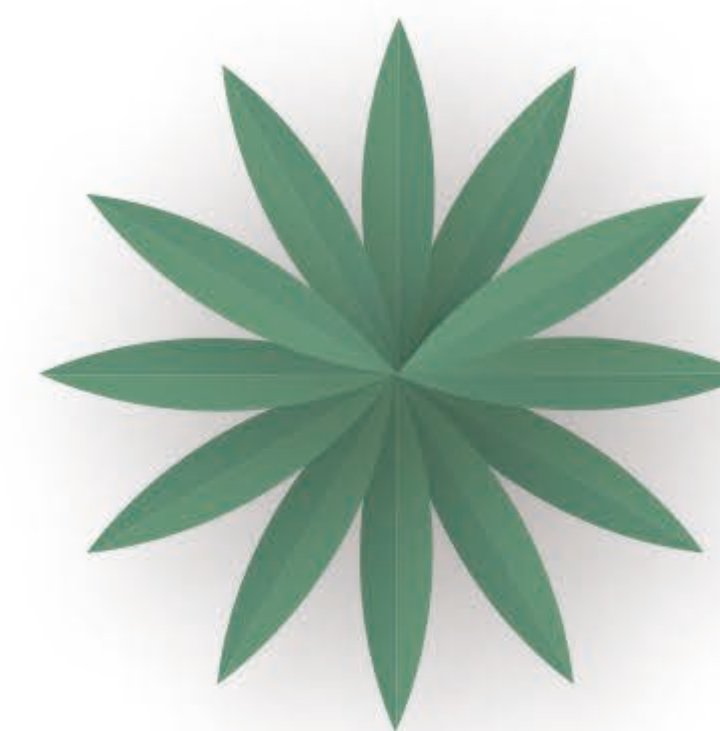
Equally in transition are our own disciplines in the plant sciences: taxonomy and systematics, morphology and development, evolution and ecology, physiology and genetics. New technologies that generate immense quantities of data are often limited by current infrastructure and information management capabilities; a growing emphasis on laboratory investigations is overshadowing the need for priority field work in rapidly disappearing environments; and balance in training for pure and applied research careers is shifting. In many nations, funding support for basic science is declining along with public trust in science. Parallel to these changes within the plant sciences are those affecting social, political, and economic contexts within which scientific research is conducted. Factors such as growing income inequality among peoples, the uneven redistribution of resources across the globe, and rising levels of conflict within and among nations all impact our ability to conduct meaningful science.

At this time of extraordinary challenges, the International Botanical Congress is being held for the first time in China. The increasing wealth of China and the prosperity of its people, coupled with the country's need for and interest in tackling serious national environmental problems, have given the country a key role in combatting climate change. China also has the potential to address biodiversity loss through the development and implementation of a strong national plan in this area. The Chinese linking of "risks" with "opportunities" has never carried more meaning than it does now, at a time when all countries need for their own sake, and for the world, to help achieve global sustainability. The hosting of IBC 2017 in Shenzhen, this Declaration, and the establishment of the Shenzhen International Award in Plant Sciences are measures of China's clear commitment to action.



# THE SHENZHEN CALL FOR ACTION: SEVEN PRIORITIES

We endorse the following seven priorities for strategic action in the plant sciences. Vigorous development of these areas will allow society, with the help of science, to mitigate impacts of human activities on plant species, habitats, and distributions, and to approach formation of a sustainable world for ourselves and those who follow us.



- 1 To become responsible scientists and research communities who pursue plant sciences in the context of a changing world.**  
Plant scientists must contribute to regional and global sustainability as directly and efficiently as possible. Key efforts, such as the urgent preservation of plant diversity and the adaptation of agriculture to increasingly warm climates, must be strengthened greatly if we are to meet the challenges ahead. Our research is not conducted in a vacuum, and we cannot continue to act as if we have a great deal of time available, when we simply and clearly do not. We must confront challenges swiftly and directly to mitigate rapidly deteriorating environmental conditions.
- 2 To enhance support for the plant sciences to achieve global sustainability.**  
Plants play a central role in functioning ecosystems. They also are our sole source of food (directly or indirectly), and provide many of our medicines, building materials, clothing materials, and other essential products. Plants deserve a far greater level of scientific attention through enhanced public and private funding than they are receiving at present. Integrated studies are necessary to develop robust solutions to environmental problems. Support across plant sciences, from description to use, should be provided at adequate levels and sustained.
- 3 To cooperate and integrate across nations and regions and to work together across disciplines and cultures to address common goals.**  
Science is by its very nature international, with the plant sciences no exception. Although progress has been made in moving forward with together, stronger international cooperation will be needed to halt biodiversity loss, improve agriculture, and maintain a stable climate. Working together has never been more important. Stable global partnerships are badly needed to overcome barriers and provide integrated, effective solutions to urgent environmental challenges as rapidly as possible.
- 4 To build and use new technologies and big data platforms to increase exploration and understanding of nature.**  
New technical approaches to information and information sharing will only accelerate in the years to come, making sustainability of data platforms imperative. Increasingly large, linked databases reveal new connections and relationships about life on Earth. Our rapidly advancing ability to sequence genomes leads to new ways of understanding the diversity, evolution, and functioning of life on our planet. As these and other new technologies expand, we must apply them in timely, integrated, and practical ways to organize information and address environmental problems.
- 5 To accelerate the inventory of life on Earth for the wise use of nature and the benefit of humankind.**  
More than half of the land plant species could be extinct in nature by the end of the present century. Although we have given names to many, we know very little about most of them, and there are more that await discovery. Those we know now can be protected or preserved, but the urgency of finding and learning about the unknowns before they become extinct is clear. Doing so will require integration and collaboration on a scale we have not yet achieved. We need to know plants in order to save them, but time is short.
- 6 To value, document, and protect indigenous, traditional, and local knowledge about plants and nature.**  
Indigenous, traditional, and local knowledge about nature is disappearing even more rapidly than is biodiversity itself. Once lost, such knowledge, with its unique insights into nature, can never be regained. Plant scientists must work together with holders of this knowledge to understand and achieve sustainable environmental stewardship. Cultural diversity, coupled with crop genetic diversity, will be of central importance for future food security. We will need informed collaboration coupled with urgent, rigorous planning and implementation across cultures and knowledge systems.
- 7 To engage the power of the public with the power of plants through greater participation and outreach, innovative education, and citizen science.**  
We need to engage the power of the public with the power of nature. People who care about the environment are motivated to do a great deal to protect it and ensure its future. The creation of an ecological civilization, where societies work together in the creation of knowledge and implementation of solutions, cannot remain only an abstract concept. We all need plants, and they need our care now more than ever- we depend absolutely upon them for our very existence. Embedding that need into the very fabric of our societies will require global engagement, across nations and cultures - this will require all of us.

We believe that, by working together, we can unite innovative plant sciences with the needs and strengths of human societies, helping to create new paths to a green, sustainable future for Earth, with plants and people in harmony.

## 至关重要的联系

本宣言旨在确定一些重大行动和优先领域，以期在全球植物科学家群体与不断变化的社会之间建立更紧密的联系。在今天，资源不可持续利用、环境退化、生物多样性流失等问题都需要一个整体的、相互协作的解决方案。这种联系就显得尤为迫切。

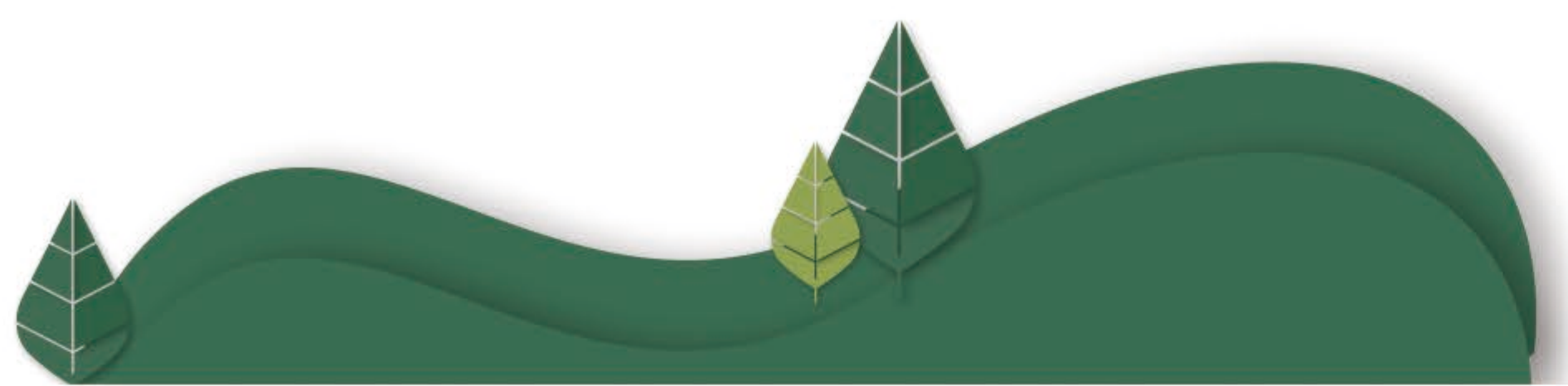
## 一个变化的世界

作为植物科学家，我们对地球和社会不断加速的变化越来越感到担忧。在有生之年，我们已经目睹了许多重大变化发生在陆地、水体和大气的结构和成分上，发生在自然资源的利用和农业实践上，在植物、动物和人类的迁徙上，以及城市化率和传染病的发生和扩散上。物种灭绝的速度超过以往6500万年里的任何时期。非常确切的是，这些巨大改变及其对自然的影响，主要是人类活动的结果。环境承担的压力从来没有如此之大，远远超出了自然系统可以维持永续发展的水平，我们必须马上行动。

同样的转变也发生在我们植物科学的各个分支，包括分类学和系统学、形态与发育、进化和生态学、生理学和遗传学。产生大量数据的新技术往往受到当前基础设施和信息管理能力的限制；对实验室研究的日益重视，让人们忽略了在迅速消失的环境中优先开展野外考察的重要性；纯理论研究和应用研究失去了应有的平衡。在很多国家，对基础科学的资助和公众对科学的信任出现“双下滑”。与此同时，开展植物科学研究的社会、政治、经济环境也发生了深刻变化。不断攀升的贫富差距、全球范围资源再分配的不平等、不断加剧的国内和国家之间的冲突等因素都影响了我们开展更有意义的科学研究的能力。

在人类面临巨大挑战之际，国际植物学大会首次在中国召开。随着中国综合国力的增强，人民生活水平的提高，以及解决环境问题的迫切需求，中国在应对全球气候变化中已经承担了关键的角色。中国也具有制定和落实全国性计划来解决生物多样性流失问题的潜力。在世界各国为了自身和共同目的追求可持续发展目标之时，中国将“危机”与“机遇”并存的理念，在今天比以往任何时候都更有意义。举办本届国际植物学大会、发布本宣言以及设立深圳国际植物科学奖，都体现了中国展开行动的决心。

# 深圳发出的行动号召： 7个优先领域



我们支持植物科学在以下7个优先领域制定行动战略。这些领域的长足发展,将让全社会在科学的帮助下,降低人类活动对植物物种、生境和分布的不利影响,并为我们和我们的子孙后代留下一个永续发展的世界。

## 1

**为了应对变化和挑战,植物科学研究者要向负责任的科学家和研究群体转型**

植物科学必须为地区和全球可持续发展做出更直接、更有效的贡献。如果我们想赢得挑战,必须在保护植物多样性、研发能适应气候持续变暖的农业等关键领域发力。植物科学研究不是在真空中进行,我们不能继续表现得好像我们仍然拥有大量的时间,我们必须快速有力地应对挑战,缓解日益恶化的环境问题。

## 2

**为了实现全球可持续发展,要进一步强化对植物科学的支持**

植物在整个生态系统功能的发挥中起着核心的作用,它是人类食物(直接或间接)的唯一来源,也是许多药物、建筑材料、纺织材料等必需品的来源。植物应当获得比当前多得多的科学关注,加强公共和私人基金投入,改善当前的资助状况非常必要。解决当前环境问题需要综合的研究方法,植物科学的所有领域,从描述研究到应用研究,都需要得到全面且持续的支持。

## 3

**为了我们共同的目标,要加强跨国家和跨区域合作、加强跨学科和跨文化合作**

科学的本质是国际性的,植物科学也不例外。虽然我们在共同前进的道路上取得了很大进步,但是要阻止生物多样性流失、促进农业发展、维持稳定的气候,仍然需要更加强有力的国际合作。今天比以往任何时候都需要共同努力。稳定的全球伙伴关系是跨越障碍和有效应对全球环境挑战的迫切需要。

## 4

**为了增进对自然的探索和理解,要建立和应用新技术以及大数据平台**

信息及信息共享新技术在未来几年将加速出现,建立持续稳定的大数据平台势在必行。庞大的、相互连接的数据库,为我们揭示了地球生命的新联系、新关系;快速发展的基因测序技术,也为我们提供了理解地球生命的多样性、进化及功能的新途径。随着新技术的不断扩张,我们必须及时地、以综合和务实的方式来应用这些新技术,从而整合各类信息,解决环境问题。

## 5

**为了明智地利用自然、为了人类的福祉,要加快地球生命的编目研究**

到本世纪末,将有超过一半的陆地植物物种在自然中灭绝。虽然我们已经命名了很多植物,但是我们对其中的大多数知之甚少,很多植物仍然有待发现。我们可以保护和保存那些已发现的植物,而对于未发现的物种,在灭绝前发现并了解它们显得尤为迫切。开展这些工作所需的具有一定规模的合作和整合机制尚未建立。拯救植物需要了解植物。时间已经十分紧迫。

## 6

**为了保护生物多样性,我们要重视、记载、保护关于植物和自然的文化多样性**

关于自然的土著知识、传统知识和乡土知识的消失速度已超过了生物多样性流失的速度。一旦消失,这种知识连同它对自然的独特见解将一同消失。植物科学家必须和拥有这些知识的人携手合作,全面理解和掌握可持续环境管理的办法。这种文化多样性,连同农作物的遗传多样性,对维护未来粮食安全至关重要。我们需要建立良好的跨文化、跨知识系统的合作,制定快速周密的计划并加以落实。

## 7

**为了形成合力,我们要鼓励公众参与、广泛开展创新性教育和公众科学活动**

最后,我们要形成公众与自然的合力。关心环境的人们有动力为保护环境、保障未来做出更大的贡献。建立生态文明不是一个抽象的概念,它要求社会各界共同创造知识、共同落实解决问题的方案。我们都需要植物,现在植物比以往任何时候都更需要我们的帮助,我们绝对地依赖植物而存在。将这个理念根植到社会结构之中,需要全球参与,需要跨越不同国家和文化,需要我们每一个人。

我们相信,只要大家一起努力,我们就能够把创新的植物科学与人类社会的需求和优势联系起来,构建一条通向绿色永续地球的崭新道路,实现人类与植物的和谐共生。



Care for plants  
**关注植物**

Care for our future  
**关注未来**

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