

青海植被演化及重建

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前 言

青海省与其西南部的西藏组成世界最高高原——青藏高原，其北部与油气田储量丰富的高平原甘肃、新疆相接壤，南部与云贵高原相通，东部与黄土高原相邻，面积 $72.12 \times 10^4 \text{ km}^2$ ，占全国总土地面积的 7.5%，是我国黄河、长江、澜沧江 3 条大江河的发源地，既有高山深谷，又有宽阔的盆地平原，地形极为复杂。在复杂气候条件和多样的立地条件影响下，孕育了类型品种繁多而且独特的野生动植物资源，现已查明的维管束植物有 120 科，659 属，2 836 种，加上变种、变形和亚种达 3 730 种。这些植物种类，有的可作为纤维材料，有的可作为油料，有的可作为香料，有的含有大量淀粉，可作为饲料或代食品和蔬菜食用，有的本身含有特殊成分，可成为灵丹妙药，具有极高的开发利用价值。有待于进一步研究。

通过有关材料的积累和文献整理，我们编撰了《青海植被演化及重建》，本书对青海省植物演化过程进行系统分析，提出了青海省植物主要是本地起源假说，并通过对青海省环境现状的陈述，指出青海省环境存在的严重问题，提出了环境治理的必要，同时，提出青海省植被重建的可能和具体实施的方法措施。

全书共分 8 章，44 节，基本概括了作者在青海省多年的工作经验总结，在编写过程中，鉴于专业知识和历史条件所限，不足之处在所难免，敬请有关专家和广大读者批评指正。

编 者

2008 年 1 月

Preface

The highest plateau that Qinghai - Xizang Plateau was formed in the world by Qinghai and Xizang. The north of Qinghai is joined with Xinjiang and Gansu, and there is abundant oil resource in there, it is a desert region of higher altitude. Its south joined with Yungui Plateau. Its east is joined with Loess Plateau. Its area is 721.2 thousands km². It is 7.5% of China land. Qinghai is water head of Huanghe, Yangzi River and Lancangjiang. There are either high mountains and deep valleys, and broad expanse of gorge and basin. Its topography is varied. Varied species, particular of animals and vegetables resources are bred under the conditions of varied climates. There are vascular plants 120 families, 659 genus, and 2 836 species. Add subgenus and subspecies are 3 730 species. These vegetables are fibre resources, oil, perfumes and huge of starch are contained in some of them. They could be eating for food, forage or vegetables. They might be panacea for contained special compositions in some of them. There are very high utility values. But they have been utilized only few of them. Study degrees are humbler opinion. Studied most of them are only on how to know of them.

Evolution processes of vegetables were analyzed systemly with collect data and literatures arrange in Qinghai. Hypothesis of the locality origin were offered in Qinghai vegetables. The status quo of Qinghai environment was stated. There were serious problems in environment. Control them is necessary. At the same time, Qinghai vege-

tables rebuilding and recover ability and measures of feasible were suggested in practice.

There were 8 chapters and 44 sections in the book. Writer's job experience for many years were summarized fundamentally in Qinghai. Mistake and weakness could not avoid because of specialities knowledge and history conditions limited. Ask specialists and readers criticize and correct of them. Perhaps the works' showing will like cast a brick to attract jade.

Writers

2008 - 01

内 容 概 要

本书利用古生物学、地质学、地貌学、植物学、林学、气象学等系统阐述了青海省植被的演化过程，提出了青海省植物主要是本地起源的假说。在对青海省植被资源现状的分析过程中，列出青海省存在的珍稀动植物资源，建议对这些濒危品种进行保护的同时，进行科学的可持续开发利用。在对青海省环境现状演化系统分析过程中发现，青海省环境存在严重问题，如沙漠化、水污染等。认为沙漠土地是本区未来发展的重要土地资源，可以通过政策引导，学习美国土地开发的历史经验，形成本区的沙产业。在资源开发利用过程中，注重环境保护和可持续发展策略。全书共分八章。

第一章，青海省古生代的生物环境及演化。古生代时的青海省是一个海洋环境，属于浅海，有多种头足类、腕足类、珊瑚、蠕虫、腹足类、甲壳类动物生长，都属于淡水生物。在古生代末期，祁连山、昆仑山、巴颜喀拉山、阿尔金山等岛屿有低等藻类、藓类和高大蕨类木本植物，这是一个气候炎热的水的世界。

第二章，青海省中生代的植被状况及环境。中生代时的青海省经历了多次海浸、海退，每次的海浸海退都伴随旧有品种消失和新种的诞生，或者说是进化，开始出现裸子植物，环境属于热带森林。中生代的后期，青海省结束了海浸的历史，岛屿连为一体成为大陆，植物品种繁多，是鱼卡、大头羊沟、大煤沟、木里、热水、大通等地煤矿的形成时期。

第三章，青海省第三纪的植被状况及环境。第三纪是喜马拉雅运动最强烈的时期，海拔升高最快的时期，也是生物进化最快

的时期。早第三纪的古新世青海省的地层资料缺失,被子植物大量出现,环境气候发生变化,出现季节,气候出现干旱和湿润季节的交替,海拔增高,沙漠开始出现。

第四章,青海省第四纪的植被状况及环境。喜马拉雅运动进行到第三幕,冰期间冰期交替出现,影响到青海省冷暖、干湿气候多次交替出现,使得森林、草原和荒漠发生了进退、更替和消失等波动式演进,湖盆盐含量增高,热带植被逐渐被温带植被代替,高原上升,草原化、荒漠化在大部分地方已经完成。

第五章,青海省全新世的植被状况及环境。全新世青海省的环境和植被已经非常接近现代,干冷、暖湿的气候波动仍在继续,人类对环境的影响成分增加。全新世初期,古人类以狩猎活动为主,全新世后期,人类活动频繁,森林面积退缩,耕地面积增加,人类的活动由狩猎转为畜牧,由畜牧转为半农半牧,草原面积和沙漠面积扩展,高原湖泊面积退缩甚至干涸,热带亚热带植被成分灭绝。

第六章,青海环境状况及其对植被的影响。青海省随着各行各业开发力度的加大,生态环境退化现象日渐凸现,由于过分强调开发利用,而忽视了防止污染和环境保护,造成青海省土地沙化,草原退化,湖泊面积退缩甚至干涸,河流断流或成为季节河。对此提出利用政策导向,采取可持续利用发展模式,资源利用的同时,采取保护措施。

第七章,青海省植被重建。植被重建不可能把植被重建恢复到全新世以前的水平,但是,可以通过造林、封育、引种、控制利用强度等措施,提高森林资源总量,提高森林覆盖率,提高森林涵养水源的效率;采取容器育苗、设施种植、保护珍稀濒危品种等措施,达到改善环境的目的。

第八章,问题讨论。提出青海的植被主要是本地起源。沙漠化是青海省的严重问题,由于沙漠化的发展,造成草原退化,湖

泊水文状况恶化。水是沙漠治理重要的先决条件之一，提出南水北调工程中开发西藏水源，那里海拔高，水资源比青海省更丰富，采用管道输水，管道输水具有许多优越性，如便于控制、水利用率高、安全可靠等，提出开发利用荒漠土地的条件已成熟，荒漠土地是未来土地开发利用的重要资源。

Summury

The process of vegetations evolution were stated systematic by paleontology, topology, geomorphology, botany, forestry, meteorology and so on in Qinghai. Qinghai vegetation originate is mainly the place originate which hypothesis was proposed. There are a lot of rare animals and vegetations resources after vegetation resoures were analyzed in Qinghai. These rare animal and vegetation would be protected and exploited utility reasonably and sustainably. It was found that there are serious environment problems in Qinghai after its environment evolution status quo was analyzed systematic. For example, desertification, water pollution et al. It is considered that desert land is importance land resources for future development. Sand industry will be formed by policy introduction, learn from America history exploit experiment. Pay attention to environment protect and sustainable development during exploit utility resources. There were 8 chapters in the book.

Chapter one, Qinghai Biologic Environment in the Palaeozoic Era. Qinghai was shallow sea environment in Palaeozoic era. There were so much kinds of cephalopod, lamp shell, coral, mollusk, pelecypoda, crustacean and so on. All of them were lived in freshwater and marine organism. There were lower phycomycetes, moss and higher and bigger ferns wood in islands of Qilian Mountain, Kunlun Mountain, Bayankala Mountain, A - erjin Mountain and so on in the end of palaeozoic era. It was a water world of hot and damp.

Chapter two, Qinghai Vegetation Condition and Environment in Mesozoic Era. Qinghai experienced much more transgression and regression in Mesozoic era. There were old species lose and new one birth or evolution with every transgression and regression. Gymnospermae had been found and the climate was belong to tropical forests. The history of transgression was over since later Mesozoic era in Qinghai. All of those islands were touched each other to form a land. There were more species of vegetation. This was the time to form coal mines of Yuka, Datouyanggou, Muli, Reshui, Datong and so on places.

Chapter three, Qinghai Vegetation and Environment in Tertiary Period. Ximalaya movement was strongest in Tertiary period. Altitude was increased fastest. Biological evolution was also fastest. Stratum datas was short of in Palaeocene Epoch early Tertiary period. Most of angiosperm were be found. Environment and climate were changed faster. There were seasons in that time. Climate of dry and damp season were happened alternately. Desert was formed with altitude increased.

Chapter four, Qinghai Vegetation and Environment in Quaternary Period. Ximalaya movement was undergoing the third period. Glacial epoch and inter - glacial epoch were happened alternately. Qinghai climate of dry and damp, cold and hot alternately happened was effected long time. Forests, grassland and desert were increasing and decreasing which evolution waves rising and falling. Salt content was increased in lakes. Tropical plants were replaced by temperature vegetational type gradually. The plateau was raised. Grassland and deserts were formed in most place.

Chapter five, Qinghai Vegetation and Environment in Recent Ep-

och. Vegetation and environment of Qinghai was very like modern conditions in Recent epoch. Climate of dry cold and warm damp were alternated continue. Human effect factor were increased to environment. The ancients were mainly hunting for their life at ealer Recent epoch. Humanity activities were more frequently at later time. Forests area were decreased, farmland area were increased. Humanity hunting were changed into animal husbandry. And then the animal husbandry was changed into mixed pastoral - agriculture. Grassland and deserts area were increased. Plateau lakes areas were decreased and even dry up. The vegetations of tropics and subtropics became extinct.

Chapter six, Environment Conditions and its Effect in Qinghai. Ecology environment deteriorate phenomenon are conspicuous more and more with all trades and professions exploit in Qinghai dynamic increased. For example, the land is desertification, grassland is degeneration, lakes area are decreased and even dry up, and rivers are become season rivers or dry up. The model of sustainable development is suggested with policy guide. The resources should be utility and protect at same time.

Chapter seven, Revegetation in Qinghai. The standard of revegetation are 'nt enable renew before Recent epoch. But forest resources could be increased, forests cover rate could be increased, forest conserve water effect could be increased by plantation, hill closure, introduction, control utility strength. The environment could be improved by the measures of container raise seedlings, installations culture and protect rare and species in imminent danger.

Chapter eight, Problem Discuss. It is offered that vegetation originate is mainly in the place Qinghai. Desertification is a serious problem in Qinghai. Grassland was deteriorated, lakes hydrology condi-

tions were worsened because of desertification development. Water is an importance conditions for control desert in Qinghai. Xizang water transprot into Qinghai Chaidamu suggestion is offered during south water transport to north construction. Because of Xizang altitude is higher than Qinghai, water resources is richer than Qinghai. Transport water is by pipeline. There are a lot of advantages transport water by pipline. For example, easy control, higher use rate and more safe reliable and so on. Measures of exploite utility desert land are suggested. Desert land is an importance land resources for Qinghai development in future.

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