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用3E原则评价云南野生裸子植物遗传资源收集保存的优先性

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Priorities for genetic resource collection and preservation of wild gymnosperms in Yunnan: an analysis based on the “3E” principle

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摘要 为了探讨局部地区遗传资源优先性评价的方法和管理问题，我们采用“3E”原则对云南裸子植物进行了评价。“3E” 分别指珍稀濒危的(Endangered)、特有的(Endemic)和具有经济价值的(Economic)三个方面。我们首先介绍了“3E”原则的由来、内涵和价值，并应用 “3E”原则，以种(变种)为分析单元，对分布于云南的10科29属107种(变种)野生裸子植物遗传资源的状况进行了分析，确定了需要优先保护的遗传资源类群。结果表明，云南省野生裸子植物资源兼有受威胁严重、特有率高、经济价值高等多种特征，如南方红豆杉(*Taxus chinensis* var. *mairei*)、灰干苏铁(*Cycas hongheensis*)、油麦吊云杉(*Picea brachytyla* var. *complanata*)等58种不仅受威胁严重，而且具有重要的经济价值和潜在的开发利用价值。具有“3E” 特性的裸子植物遗传资源有72种，其中贡山三尖杉(*Cephalotaxus lanceolata*)、苏铁(*Cycas revoluta*)、大理罗汉松(*Podocarpus forrestii*)、德保苏铁(*C. debaoensis*)、德钦柏(*Juniperus baimashanensis*)、巧家五针松(*Pinus squamata*)、灰干苏铁、万钧柏(*J. chengii*)、毛枝五针松(*P. wangii*)等9种亟待进行抢救性保存，中甸冷杉(*Abies ferreana*)、绿春苏铁(*C. tangingii*)、麦吊杉(*Picea brachytyla*)、怒江冷杉(*A. nukiangensis*)、河内苏铁(*C. tonkinensis*)等40种需要优先收集和保存。保存的方式包括原地保存、异地保存、设施保存和栽培利用等综合措施。将“3E”原则应用于云南裸子植物遗传资源的管理，具有科学合理性和可操作性，对遗传资源的保护和可持续利用具有一定的参考价值。

关键词： 3E原则 遗传资源保存 优先类群 裸子植物

Abstract: The “3E” principle has been used to determine priorities for preservation of genetic resources in conservation and research projects. The three “E” s refer to Endangered, Endemic, and Economic. Here, we applied this principle to explore wild gymnosperm genetic resources (or germplasm resources) at the species (varieties) level occurring in Yunnan, and to determine their priority for preservation, research and management. There are 107 species and varieties of gymnosperms in Yunnan belonging to 10 families and 29 genera. Among them, 72 species were attributed to “3E” genetic resources. According to the “3E” principle, 9 species were defined as “highest priority” and should be urgently collected and preserved, i.e. *Cephalotaxus lanceolata*, *Cycas revoluta*, *Podocarpus forrestii*, *Cycas debaoensis*, *Juniperus baimashanensis*, *Pinus squamata*, *Cycas hongheensis*, *Juniperus chengii*, and *Pinus wangii*. Forty species were classified as “priority” for collection and preservation, e.g. *Abies ferreana*, *Picea brachytyla*, *Abies nukiangensis*, *Cycas tonkinensis*, etc. There are a multitude of *in situ* and *ex situ* conservation and cultivation methods that can help to conserve these genetic resources. Finally, we discussed the contents and merits of the “3E” principle, and concluded that the principle is a scientific and rational way in which to evaluate the genetic resources contained within this group of gymnosperms. The principle can be adopted in efforts for the collection, conservation and sustainable use of genetic resources.

Keywords: 3E principle genetic resources preservation priority taxa gymnosperm

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