

## rps4作为苔藓植物候选条形码的可行性:基于GenBank数据的分析

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## The *rps4* locus as an alternative marker for barcoding bryophytes: evaluation based on data mining from GenBank

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摘要

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**摘要** 对于苔藓植物DNA条形码研究来说, 目前已提议的可用片段只有*rbcl*和*trnH-psbA*, 并且均具有一定局限性。本文基于GenBank中3,365条*rps4*序列, 利用遗传距离法和分子系统学方法评价它作为苔藓植物候选条形码的可行性。结果显示: (1)*rps4*序列覆盖了藓纲96%的科和苔纲88%的科, 具有通用性; (2)*rps4*物种分辨能力为73.0%, 并且它在6个序列最丰富的苔藓植物属(*Plagiochila*, *Tortula*, *Plagiomnium*, *Pyrrhobryum*, *Pogonatum*, *Grimmia*)内的物种识别能力均高于*rbcl-a*在同属中的分辨能力; (3)GenBank中已经积累了大量已知物种来源的*rps4*序列, 可为DNA条形码物种鉴定提供一个参考数据库。因此, 本文建议将*rps4*作为苔藓植物候选DNA条形码。尤其是当*rbcl*和*trnH-psbA*在某个具体类群中无法取得理想的物种识别效果时, *rps4*可作为补充。

**关键词:** 隐花植物 陆生植物条形码 叶绿体DNA 物种鉴定

**Abstract:** Among the candidate DNA barcoding loci suggested for land plants, only *rbcl* and *trnH-psbA* are available for barcoding bryophytes. However, both loci have limitations in discriminating among species. The present study evaluated the feasibility of using the cpDNA *rps4* locus as an additional marker to complement other candidate barcodes for bryophytes. We analyzed 3,365 *rps4* sequences retrieved from Gen-Bank using pair-wise distance and phylogenetic methods. Our results demonstrated the universality of *rps4* in bryophytes; the locus covers 96% of moss families and 88% of liverwort families. The *rps4* locus resolved 73.0% of the species we tested. The discriminatory ability of *rps4* is better than that of *rbcl-a* in each of the six bryophyte genera (i.e. *Plagiochila*, *Tortula*, *Plagiomnium*, *Pyrrhobryum*, *Pogonatum*, *Grimmia*) most commonly represented in the database. Moreover, large numbers of *rps4* sequences from individuals of known bryophyte identities have been compiled in GenBank, thereby providing a reference for species identification. Therefore, we propose *rps4* as an additional barcode, especially when *rbcl* and *trnH-psbA* do not perform well in certain bryophyte taxa.

**Keywords:** cryptogamic plants land plant barcoding plastid DNA species identification

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