参考译文

Some Lichen Fungi Let Genes Go Bye

一些地衣真菌与基因分离

“Lichens are really cool successful organisms that are composed of at least two symbiotic partners: a fungal partner that provides structure and protection and a photosynthetic partner that likely provides energy in the form of sugar.”

“地衣真菌是非常酷的有机生物，它至少由两个共生伴侣组成：一个提供结构和保护真菌伴侣，另一个可能以糖形式提供能量的光合作用伴侣。”

Cloe Pogoda, a graduate researcher at the University of Colorado. She led research that found that this partnership extends to the genetic level. The fungal partner in many lichen jettison a gene that’s critical for energy production—making them completely dependent on their algal associates.

科罗拉多大学研究生研究员Cloe Pogoda。她领导了科研发现，这种伙伴关系延伸能够延伸到到基因层面。许多地衣真菌伙伴抛弃了一个对能源生产至关重要的基因，这使得它们完全依赖于藻类伴侣。

Although scientists have long appreciated that general division of labor, what’s been less clear is whether the relationship was entirely obligatory. In other words, are the cohorts changed by their evolutionary association in such a way that they can no longer make it alone?

尽管科学家们长期以来一直认识到这里面的普遍分工关系，但没有研究清楚的是，这种关系是否完全是强制性的。换句话说，这些种群关系是否因为他们的进化联系而改变了某种关联，以至于他们不能再独自生存下来呢?

To find out, the team sequenced the genomes of 22 lichen species collected in the southern Appalachian Mountains. And they concentrated on the participants’ mitochondria, which contain genomes of their own.

为了找到这一答案，这个小组对在南部阿巴拉契亚山脉采集的22种地衣物种，进行了基因组测序。他们专注研究该物种的线粒体，这些线粒体携带自身基因组。

“Because there are so many copies of these genomes in each cell, and because they’re so conserved across all domains of life the mitochondrial genomes were the focus of our study.” Kyle Keepers, also at the University of Colorado.

“因为这些基因组在这些细胞中有很多拷贝基因，并且因为它们在生命的各个领域都非常保守，所以线粒体基因组是我们研究重点。”科罗拉多大学Kyle Keepers说。

What the researchers found is that a key mitochondrial gene was missing from the fungal partner in 10 of the lichen species they examined. These species hailed from three different evolutionary lineages.

研究人员发现，他们测评的10种地衣属真菌伴侣中，缺失了关键的线粒体基因。 这些物种来自三种不同的物种进化谱系。

CP: “This is a really cool result because it demonstrates that this lichen relationship is obligate. And that the same strategy for genome streamlining was employed three different times over evolution.” The findings appear in the journal Molecular Ecology.

CP：“这是一个非常棒的结果，因为它证明了，这种地衣真菌的关系是有义务的。 而且，基因组精简的相同策略，在进化过程中有三个不同时间。”该研究结果发表在《分子生态学》杂志上。

Genome streamlining makes sense because it reduces redundancy on a molecular level.“Think of it like two partners moving in together. And they each have their own printer. Who needs two printers?” Erin Tripp, the study’s principal investigator, is the curator of botany at the university’s Museum of Natural History.

基因组简化是有道理的，因为它可以减少分子水平上的冗余。“你可以把它们想象成，像两个合作伙伴共进退的关系。他们每个人都有自己的独特特征。谁需要两种一样的特征呢?“该研究的首席研究员Erin Tripp是该大学自然历史博物馆植物学的馆长。

Letting the algae provide the cellular energy likely makes the fungal partner more efficient, perhaps allowing it to focus on building a stable structure and reproducing. Tripp wonders whether some of the bacteria living in our guts might have developed similar molecular co-dependencies.

让藻类提供细胞能量，可能会使真菌伴侣更有效率，或许可以让它专注于建立稳定的结构和繁殖关系。Tripp想知道，生活在我们肝胆器官中的某些细菌，是否可能发展出类似的分子共依赖性。

ET: “What this data analysis pipeline, moreover, creates is motivation to look for similar forms of gene loss in other types of symbioses, such as that between humans and their gut microbiomes. It may very well be that some bacteria are completely dependent on their human hosts and thus coevolving with us, whereas others can come and go.”

ET：“此外，数据分析流程还能为寻找其他类型共生物的类似基因分析，提供一些动因分析线索，例如人类与其肠道微生物群之间的共生关系，很可能有些细菌完全依赖于它们的人类宿主，因此与我们人类存在共生关系，而另一些细菌可以来去自如。“

听力原文

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