学 术 报 告

报告主题：石炭纪两栖昆虫改写昆虫登陆演化历史

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报告时间：8 月 26 日（周三） 下午 14:00

报告地点：图书馆三楼报告厅

主办：古动物室、全重、科技处、人教处

报告简介：

近日，中国科学院南京地质古生物研究所联合多国科研团队，报道距今约3.24亿年的干群昆虫——先驱乔昔虫。研究借助交叉偏振光成像解析化石精细解剖结构，证实该昆虫具备半水生两栖生活习性，结合重新修订的多件古生代六足动物化石，填补困扰学界的“六足动物空缺期”，调和分子钟与实体化石记录的矛盾。研究突破昆虫登陆为跨越式演化的传统认知，证实昆虫登陆曾经历半水生两栖过渡阶段，厘清腹部附肢退化是昆虫适应陆地的关键演化革新，还原从水生甲壳动物向陆生六足昆虫的躯体构型转变过程。同时揭示早期昆虫在水陆交界地带承担分解者等多元生态功能，是组成古生代陆地生态系统的关键类群。该成果为解析昆虫起源、六足动物登陆和陆地生态系统早期演化提供关键化石实证。

Recently, researchers from the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, in collaboration with international teams, reported a stem-group insect, *Chosha praecursor*, dated back to approximately 324 million years ago. Using cross-polarized light imaging to resolve fine anatomical structures of the fossils, the team confirmed that this ancient insect possessed a semi-aquatic, amphibious lifestyle. By systematically revising multiple Palaeozoic hexapod fossils, the study fills the long-standing “hexapod gap” in palaeontological research and reconciles the discrepancies between molecular clock estimates and physical fossil records. Challenging the traditional view that insect terrestrialization occurred as an abrupt evolutionary leap, this study demonstrates that insects underwent a prolonged semi-aquatic amphibious transitional process during land colonization. The research clarifies that the reduction of abdominal appendages represents a key evolutionary innovation for terrestrial adaptation, reconstructing the body-plan transformation from aquatic crustacean ancestors to fully terrestrial hexapod insects. Furthermore, the results reveal that early insects fulfilled diverse ecological roles such as decomposers at aquatic-terrestrial ecotones and constituted a pivotal component of Palaeozoic terrestrial ecosystems. This study provides crucial fossil evidence for understanding the origin of insects, the terrestrialization of hexapods, and the early evolution of terrestrial ecosystems.