学 术 报 告

报告主题：Brachiopod Heaven & Hell – Mass occurrence & Death in the *Obolus* Sea

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主　　办：全国重点实验室、科技处、综合处、人教处

报告简介：During the late Furongian to early Tremadocian, the Baltoscandian epicratonic basin exhibited pronounced environmental heterogeneity. A central black shale depocentre (Alum Shale) was bordered in northern Estonia by coastal plains and shoal complexes, hosting low-diversity benthic assemblages dominated by linguliform brachiopods (*Obolus*, *Oepikites*, *Schmidtites*, *Ungula*) characterized by organo-phosphatic shells. *Skolithos* trace fossils were abundant, indicative of opportunistic colonization of soft, mobile substrates influenced by tidal and storm dynamics. From the mid Cambrian onwards, these nearshore environments were marginal habitats for most benthic taxa, preceding the Ordovician radiation of molluscs. Obolid-dominated communities, however, proliferated steadily, reaching a peak during the latest Furongian (*Cordylodus andresi–C. proavus* zones). Brachiopod shell accumulations formed bioclastic-rich siliciclastic sediments, which served as a major source of biogenic phosphate. This led to the formation of economically significant phosphorite ore bodies, such as the Toolse deposit, with proven reserves exceeding 27 million tons of P_2O_5—representing only a portion of the total phosphate accumulation during this interval.

Subsequent early Tremadocian (*C. lindstromi–C. angulatus* zones) marine transgressions, coeval with the expansion of the Alum Shale, led to the widespread decline of these shallow marine communities. Low net sedimentation allowed extensive Furongian shell beds to remain at the sediment–water interface, promoting redox-sensitive phosphate recycling. This process likely drove coastal eutrophication, with episodic nutrient enrichment and fluctuating oxygen levels in the water column. The presence of chemogenic phosphorite crusts and concretions at the basin margins supports sustained high phosphate availability. The ecological simplicity of these systems—dominated by a few suspension feeders with minimal trophic complexity or predation—likely contributed to their instability. The unchecked proliferation of obolids under nutrient-enriched conditions may have played a role in the ecological collapse and subsequent extinction of these communities.

报告人简介：Lars Holmer，瑞典乌普萨拉大学地球科学系教授，林奈学会会员，国际地层委员会奥陶系分会选举委员，乌普萨拉大学行政院前主任，国际古生物学会前秘书长，2000-2007 年担任国际腕足动物典籍（Treatise on Invertebrate Paleontology, Part H）主编，他曾带领的研究团队在 2007 年国际学术评估（International KoF 2007）中被认定为国际最高水平和世界先进单位（“Internationally high standard” and “World-leading”）。Holmer 教授主要从事腕足动物的起源、分类、系统发育和生态学研究，通过对化石记录中丰富的腕足动物壳体进行详细的古生物学并结合分子系统学和形态学/解剖学研究，来解决腕足类动物和其他冠轮动物的起源和早期演化。目前共发表学术论文或专辑 300 余篇/部，曾获美国地质学会颁发的最佳专辑金奖，美国国家科学基金会南极科考奖章，比约肯科学奖，瑞典地质学会古斯塔夫奖等。