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藏北羌塘奥陶纪平行不整合面的厘定及其构造意义

作者	单位	E-mail
杨耀	成都理工大学地球科学学院, 成都 610059; 大陆构造与动力学国家重点实验室, 中国地质科学院地质研究所, 北京 100037	
赵中宝	中国地质大学, 北京 100083; Department of Geosciences, Eberhard Karls University Tübingen, Tübingen D-72074	
苑婷媛	大陆构造与动力学国家重点实验室, 中国地质科学院地质研究所, 北京 100037; 中国地质大学, 北京 100083	
刘焰	大陆构造与动力学国家重点实验室, 中国地质科学院地质研究所, 北京 100037	yanliu0315@126.com
李聪颖	中国科学院广州地球化学研究所, 广州 510640	

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摘要:

西藏羌塘块体有无变质基底、其前新生代构造属性与演化过程是长期争论的议题。本文报道南羌塘块体北部,中、上奥陶统塔石山组底砾岩平行不整合于浅变质中厚层石英砂岩夹薄层泥灰岩之上。近600粒碎屑锆石测年结果表明浅变质石英砂岩的最大沉积年龄为 $527 \pm 7\text{Ma}$, 300余粒碎屑锆石测年结果表明塔石山组底部石英砂岩的最大沉积年龄为 $471 \pm 6\text{Ma}$ 。不整合面上、下石英砂岩最大沉积年龄之差达56Myr,表明这两套石英砂岩之间存在明显的沉积间断,证实了该平行不整合面的时代为奥陶纪早期。另一独立的证据是在邻区发现了早奥陶世花岗岩类岩石($471 \sim 477\text{Ma}$)侵位于该浅变质石英岩,因此将不整合面之下的浅变质石英岩暂命名为荣玛组,归入寒武系地层。阴极发光与年代学研究进一步表明不整合面之上的碎屑锆石主要来源于在“泛非”运动晚期形成的结晶岩,为近源锆石,表明“泛非运动”晚期所形成的结晶岩在奥陶纪早期就已隆升,遭受剥蚀,为区内中上奥陶统沉积岩的形成提供物质来源。该奥陶纪平行不整合面的发现,表明南羌塘块体与喜马拉雅、拉萨等块体相似,同属冈瓦纳大陆体系。南、北羌塘早古生代地层系统之间的显著差异表明在寒武-奥陶纪之交,南、北羌塘块体已被古大洋盆分隔开,开始各自独立演化。

英文摘要:

Several issues have been disputed for a long time in Qiangtang terrane, northern Tibet, such as whether it has the metamorphic basement, as well as the pre-Cenozoic tectonic history. Here we report the Tashishan Formation, which is located in the northern portion of southern Qiangtang terrane, of Middle and Late Ordovician is parallel unconformity on thick-bedded fossil-free low-grade metamorphic quartz sandstones which has been interbedded by thin layer of marl. Nearly 600 detrital zircons dating results indicate that the maximum sedimentary age of the low-grade metamorphic quartz-sandstone is $527 \pm 7\text{Ma}$. And more than 300 detrital zircons dating results indicate that the maximum sedimentary age of quartz sandstone at the bottom of Tashishan Formation is $471 \pm 6\text{Ma}$. The sedimentary age gap between the quartz sandstones above the unconformity and the underlying low-grade metamorphic quartz sandstones is up to 56Myr, indicative of an obvious depositional hiatus between the two quartz sandstones. This further confirms that the unconformity between the two quartz sandstones is Early Ordovician. An independent piece of evidence is that the fossil-free low-grade quartz sandstones were intruded by Early Ordovician granitoids ($471 \sim 477\text{Ma}$). The sedimentary rock underlying the unconformity is, therefore, named as Rongma Formation and classified in Late Cambrian era in this study. Cathodoluminescence images and geochronological studies indicate that detrital zircons of the quartz sandstones above the unconformity were mainly from crystalline rocks which formed in the late period of the Pan-African event and close to their provenance. This implies that the Late Pan-African crystalline rocks had exhumed in Early Ordovician, and then, underwent denudation, providing material sources for the Middle and Late Ordovician sedimentary rocks. The discovery of the parallel unconformity of Ordovician reflects that the south Qiangtang terrane is one portion of the Gondwana supercontinent, as Himalayan and Lhasa terranes. The distinctive difference in Paleozoic strata between South Qiangtang and North Qiangtang terranes shows that there is an ancient ocean basin between the two terranes in the Early Ordovician at least, and the two terranes evolved independently.

关键词: [碎屑锆石](#) [奥陶纪不整合面](#) [泛非运动](#) [藏北南羌塘](#) [冈瓦纳大陆](#)

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单位地址：北京9825信箱/北京朝阳区北土城西路19号

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