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黑龙江省东部马家街群碎屑锆石年代学及其大地构造意义

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摘要:

马家街群分布在黑龙江省东部佳木斯地块桦南隆起的西南缘, 主要由一套经历了接触变质作用的富铝、富碳沉积碎屑岩所组成。区域上, 这套接触变质岩系具有变质矿物分带特征, 由西向东依次出现十字石、红柱石、石榴石和黑云母。红柱石碳质板岩和石榴云母石英片岩2件样品获得的LA-ICP-MS U-Pb碎屑锆石年龄谱均显示有272~310Ma、479~533Ma和>800Ma三组年龄。根据两件样品显示的最小年龄均未小于272Ma, 而且二者的最小年龄组(272~310Ma)具有类似的峰值年龄, 分别为276Ma和279Ma, 这限定了马家街群主体岩石沉积年龄的下限应在中二叠世之前。侵入马家街群的花岗岩的锆石年龄为259Ma, 说明其接触变质作用时代为晚二叠世早期, 限定了马家街群形成时代的上限。479~533Ma年龄组中, 2件样品的峰值年龄分别为499Ma和522Ma, 这是佳木斯地块麻山群中最为重要的高级变质和花岗岩浆作用年龄。>800Ma的年龄组具有多个峰值年龄, 说明源区(佳木斯地块)具有前寒武纪-早前寒武纪地壳。上述证据表明, 马家街群是晚二叠世早期形成的一套接触变质岩系, 而非前寒武纪区域变质岩系。鉴于479~533Ma的麻山群在佳木斯地块中普遍存在, 说明以麻山群为代表的早古生代变质结晶岩系既是马家街群沉积的基底, 也是重要的物源区; 而276~279Ma的早二叠世火山岩在佳木斯地块东缘分布广泛, 表明其对马家街群的沉积也具有一定的贡献。

英文摘要:

Majiajie Group, exposed in the southwestern part of the Huanan Uplift in the Jiamusi Massif, in eastern Heilongjiang Province, northeastern China is a suit of contact metamorphic rocks, which is characteristics of metamorphic mineral zonation from staurolite, andalusite, garnet to biotite from the west to the east. The LA-ICP-MS zircon U-Pb dating of the andalusite-bearing carbon slate and garnet quartz schists from Majiajie Group give the three age populations: 272~310Ma, 479~533 and >800Ma. The two rock samples with the minimal age population of 272~310Ma show a similar peak age of 276Ma and 279Ma and the youngest age of 272Ma, suggesting that the deposition time of the Majiajie Group was before the Middle Permian. The zircon age of the granite intruding the Majiajie Group is 259Ma, suggesting that the time of contact metamorphism of the Majiajie Group occurred in the early Late Permian. The age population of 479~533Ma in the two samples gives a similar peak ages of 499Ma and 522Ma, which are the most important age of high-grade metamorphism and granitic intrusion in the Jiamusi Massif. The age population of >800Ma shows several peak ages of 975Ma, 1063Ma, 1284Ma and 1422Ma, which suggest that there were Precambrian crust in the source region for the Majiajie Group. These evidences indicate that the Majiajie Group was a suit of contact metamorphic rocks related to the early Late Permian granitic intrusion, instead of the Precambrian metamorphic rock series. In view of the facts that the zircon ages of 479~533Ma and >800Ma are widespread in the Mashan Group and the Early Permian volcanics with the zircon ages of 276~279Ma are widely distributed in the eastern margin of the Jiamusi Massif, it is concluded that the Mashan Group as the basement and material source made great contributions to the formation of the Majiajie Group, and the Early Permian volcanic rocks made a certain contribution to the deposition also.

关键词: [马家街群](#) [接触变质](#) [碎屑锆石年龄](#) [佳木斯地块](#) [黑龙江省东部](#)

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