COMPARATIVE AGE DISTRIBUTIONS AND INTERNAL STRUCTURES OF ARCHAEAN ZIRCONS FROM QUARTZITES FROM MT NARRYER AND THE JACK HILLS, WESTERN AUSTRALIA

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We report SHRIMP U-Pb analyses and internal structures of detrital zircons from a sillimanite-bearing quartzite from Mt Narryer (W461) and the W74 metaconglomerate sample site in the Jack Hills, northwestern Yilgarn Craton. The abundance of >3900Ma zircons in the Mt Narryer sample, of approximately 12%, is equivalent to the abundance of > 3900 Ma zircons in sample W74 from the Jack Hills. The age distributions of the older (>3900Ma) zircons from the Narryer and Jack Hills samples are different, suggesting a complex provenance for the ancient zircons. The > 3900Ma zircons from Narryer have a higher proportion of oscillatory zoned grains that resemble those described from Archaean granitoids [1] whereas the Jack Hills zircons have a greater proportion of complex forms. Zircons from the Jack Hills show strong recent Pb loss whereas the Narryer zircons have had a more complex history and have experienced at least one early Pb loss event, possibly associated with the high-grade metamorphism at ca 2700Ma, and a further disturbance of the U-Pb systems during relatively recent times. The younger zircon population from Jack Hills sample W74 lacks the strong age peak from 3600 to 3750 Ma present in the Narryer population, and conversely the strong zircon age group at ca 3350-3500 Ma in the Jack Hills population is only weakly represented in the Narryer zircon population, suggesting significant differences in the source rocks. The distribution of ages in the younger population of Mt Narryer zircons is similar to that reported for zircons from the surrounding Meeberrie gneiss, supporting previous suggestions that zircons from the gneisses or their precursors were a major contributor to the detrital zircons. The major age component in the Jack Hills zircons is similar to ages determined on zircons from surrounding granitoids suggesting that they also contain a significant local component.

References:

[1] Nemchin A.A. and Pidgeon R.T. (1997) *J.Petrol.* 38, 625-649.