1 Introduction

The Yuanshui basin of western Hunan Province, in the 1950-60s, was producing up to 0.6-0.7 million carats diamond from four rich placer deposits, but no economic primary deposits had been found in this area. Geological Bureau of Hunan, Hubei, Guizhou and Guangxi, from the mid-fifties to nineties, actively explored the southeast Yangtze carton for lamproite, which was considered as the potential hosted-rock of these placer deposits. Their respective efforts led to discovery of three important lamproite clusters (i.e. Zhenyuan, Ningxiang and Dahongshan) and other related rocks (Fig.1). Among them, Zhenyuan and Ningxiang areas have been confirmed as weakly diamondiferous lamproites.

2 Zhenyuan

In 1965, the first diamondiferous lamproite of China, named Dongfang No. 1, was discovered by No.101 Brigade in this area. After regional stream and artificial heavy mineral sampling, combined with drilling aerial magnetic targets, 600-700 lamproite bodies were gradually discovered during the period 1975-1996. Except for ten lamproite bodies that produced 4000 carats of diamond, they all are barren or weakly diamondiferous. The lamproites, controlled by the EW- and NE-trending deep faults, are hypabyssal and diamtreme facies, porphyritic, possile olivine-phlogopite lamproite. Miroprobe studies of chrome spinels from some lamproite bodies show strong evidence of xenocryst with the depth of diamond-spinel phase (Chi et al., 1996). Whole rock Sm-Nd and Rb-Sr isochron methods and K-Ar method constrain the emplacement age at 503-497 Ma and the cooling time at 442.6-435.5 Ma (Fang et al., 2002). The emplacement age is consistent with zircon age of 486±6 Ma reported by Zheng et al. (2006).

3 Ningxiang

The lamproites in this area comprise 6 pipes and 20 dykes with the first discovered by No.413 Brigade in 1990.
according to the chrome spinel anomaly. Three of the lamproite pipes contain 65 grains diamonds. In 1991-1993, this area was rediscovered with several diamonds and indicator minerals as well as hundreds of aerial magnetic targets by heavy mineral sampling and high-resolution magnetic surveys. However, the overall low grade of the pipes and the small size of the stones led China Geological Survey to withdraw from the area until 2006. In 2006-2013, 3 grain diamonds and large numbers of indicator minerals (i.e. chrome spinel, pyrope, olivine) were discovered from diabase dykes in the western of this area. The lamproites are diatreme facies, volcanic breccia and phlogopite-diopside-olivine lamproite. No.413 Brigade obtained whole rock Sm-Nd and Rb-Sr isochron ages of 345±10 Ma and 328±4 Ma in 1990. These ages are consistent with zircon rim age of 325 Ma reported by Zheng et al. (2006). We obtained zircon U-Pb age of 227.3±5.2 Ma for the diamondiferous diabase.

6 North Guangxi

Most of the lamprophyre pipes or dykes in this area were located by Geological Bureau of Guangxi during the period 1962-1981. 34 grain diamonds in the Quaternary sedimentary and 1 grain diamond in the Devonian conglomerate were discovered by artificial and stream heavy mineral sampling. Recent work has shown that only number of the pipes is the lamproite with zircon U-Pb age of 254±14 Ma.

7 Preliminary Conclusions

As part of a project to systematically map and describe all the lamproites and related rocks in the southeast Yangtze craton, heavy mineral samples and indicator element anomalies have been collected. Not all are true lamproites, and emplacement ages range from paleozoic to Cenozoic. The discoveries of diamond placer deposits and lamproite indicator minerals as well as indicator element anomalies show good mantle conditions and prospect for diamond in this area.

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References