

**THE ARROYO CHARCON, AN UNUSUAL ECLOGITE FROM THE
ESCAMBRAY MASSIF, CUBA: PETROLOGY AND ZIRCONOLOGY**

SOMIN, M.L.¹, MATTINSON, J.M.², RODIONOV, N.V.³, BEREZHNYAYA, N.G.³
KRÖNER, A.⁴, KONILOV, A.N.⁵ & SERGEEV, S.A.³

¹Institute of Physics of the Earth, B. Gruzinskaya str., 10. 123995 Moscow, Russia

²University of California, Santa Barbara, CA 93106, USA

³VSEGEI Centre of Isotopic Research, Sredniy prospect 74, 199106, St-Petersburg, Russia

⁴Institut für Geowissenschaften, Universität Mainz, 559099 Mainz, Germany

⁵Geological Institute, Pyzhevski per., 7 117119 Moscow, Russia

e-mail: konilov@iem.ac.ru

In the Escambray Massif (EM) of Cuba, well known for Mesozoic HP/LT metamorphic rocks SOMIN et al. (1975), DOBRETISOV et al. (1987) and SOMIN et al. (1992) described apparently coherent bodies of eclogite placed within blueschist metasediments. One of these bodies near Arroyo Charcon (ACH) is a lens 1 m wide and 5 m long. The rock is composed of fresh garnet and omphacite; paragonite and deerite are subordinate phases; rutile, sulphide and zircon are accessories. Quartz, phengite and clinozoisite are present as small inclusions inside garnet and rutile. Microprobe analyses show two-stage evolution of the rock. Garnet I (cores) associated with chlorite reflects the first stage of uncertain (probably LT) parameters. The outer, wider garnet II zones and omphacite gave $P = 14 - 16$ kbar and $T \leq 600$ °C. These results are close to those of SCHNEIDER et al. (2004) on other eclogite bodies of the EM.

The Zr-content at 820 ppm in the ACH eclogite is unusually high. The zircons have complex morphologies. SEM photos show they originally had rounded form due probably to sedimentary transport; later metamorphic overgrowths are expressed as flat facets on some of the zircons. CL images demonstrate oscillatory zoning in many grains, some sharply limited cores and the rare, thin metamorphic rims. In one case phengite was detected inside zircon. These observations show mostly magmatic, rarely metamorphic origin of the zircons. At the same time, the evidence of reworking indicates an alien, clastic origin for the parent grains.

U-Pb zircon dating in Santa Barbara, USA, using a multistep CA-TIMS procedure (MATTINSON, 2005) revealed 245 Ma as a mean age of the least soluble zircons, the possibility of younger event at 110 Ma, plus older material of at least 375 Ma. SHRIMP-2 dating was done independently at St-Petersburg (VSEGEI) and Perth. A range of ages clustered around 245 Ma was obtained in both cases; the age range is 270 - 140 Ma (VSEGEI) and 256 - 201 Ma (Perth) due evidently to differences in grain selection and analytical quantity. Determination of the metamorphic rims' exact age remains our next goal.

We infer a mixed origin of the ACH eclogite and probable Central-American provenance of its Jurassic and older zircons. Sedimentation of terrigenous material on the ocean bottom and heavy mineral concentration by currents are a possible source for such abundant deformed zircon in the ACH eclogite.

References

- DOBRETISOV, N.L., DOBRETISOVA, L.V., MILLAN, G. & SOMIN, M.L. (1987): Dokl. A. N., 292, 179-184.
MATTINSON, J.M. (2005): Chem. Geol. (in press).
SCHNEIDER, J., BOSCH, D., MONIE, P., GUILLOT, S., GARCIA-CASCO, A., LADREAUX, J.M., TORRES-ROLDAN, R.L. & MILLAN TRUJILLO, G. (2004): J. Metam. Geol., 22, 227-247
SOMIN, M.L., ARAKELIANTS, M.M. & KOLESNIKOV, E.M. (1992): Intern. Geol. Rev., 4, 75-89.
SOMIN, M.L., DOBRETISOV, N.L., LAVRENTIEV, Y.G. & MILLAN, G. (1975): Dokl. A. N., 221, 454-457