

Evolution processes of the Oshika Gorge, in Tottori Prefecture

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In general, nick-zone of a river retreats. But according to previous studies, Oshika Gorge in Misasa, Tottori-prefecture with dynamic equilibrium stage seems to incise vertically. We estimated evolution processes of the Oshika Gorge using in-situ Terrestrial Cosmogenic Nuclides dating (¹⁰Be and ²⁶Al) to determine dominant erosion mode; retreating or down cutting mode. The bedrock of the gorge consists of granite. We collected 12 granite samples from surface of erosional terraces; 8 samples were collected at A site. And We extracted one sample at a time at B~E points. At A site, strath terraces developed 7 terraces and present streambed. Incision rate of A site is calculated to be about 0.25mm/yr. But B, C and D sites are calculated to be 1.31mm/yr, 1.38mm/yr, 5.28mm/yr, respectively. E site is calculated to be 5.28mm/yr. These results suggest down cutting mode fits the Oshika Gorge from incision rate of B, C, and D. Uplifting rate of the Chugoku-Mountains estimates 0.1mm/yr (Ohmori, 1980). Incision rate of the Gorge is ten times faster than uplifting rate.

Keywords: Nick zone, Downcutting process, in-situ cosmogenic radionuclides, Incision rate, Oshika Gorge, Dynamic equilibrium