

Longitudinal distribution of incision rates in the Oshika Gorge, Tottori prefecture using terrestrial cosmogenic ^{10}Be :

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We determined longitudinal changes of incision rates in the 3 km long Oshika Gorge, Tottori prefecture, Western Japan, by exposure dating of a series of granitic strath terraces using terrestrial cosmogenic ^{10}Be . Thereby we discuss development of a waterfall sequence zone and an incised meander zone. The bedrock of the gorge consists of granite. We collected 24 granite samples from surface of erosional terraces. The oldest exposure age of a strath terrace was 50.2 kyr (relative height from river-bed is 11.0 m) and the youngest exposure age was 1.2 kyr (relative height is 1.2 m). Incision rates in the Oshika Gorge varied from 0.24 mm/yr to 1.40 mm/yr. Those of step-pool sequence zones and large boulder scatter zones were about 0.64~1.40 mm/yr, which showed increasing tendency toward downstream. Those of the waterfall-pool sequence zone were 0.24~0.57 mm/yr, which showed rapid increase toward downstream. This means that gradient of the waterfall-pool sequence zone has been under increasing conditions in these c.a.50 kyr, resulting from river-bed roughness increase according to waterfall-pool growth. The incised meander zone is located just upstream adjacent to the waterfall-pool sequence zone. Incision rate of the incised meander zone was 0.36 mm/yr, which was slower than that of step-pool sequence zones and faster than that of the waterfall-pool sequence zone. In this reach, alternate gravel bars were developed because of lower gradient and as a result, lateral migration of the river occurred and the incised meander zone was developed.

Keywords: bedrock river, incision rate, cosmogenic nuclide ^{10}Be , waterfall-pool sequence, incised meander zone