Relief of riverbed and roundness of cobble: an example from the middle Sagami River, central Japan

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Clastic particles in riverine environments are transported repeating “breaking” and “abrasion.” In a whole, fluvial particles decrease in diameter and become rounded. We are surveying usage of roundness as an available index of transport process.

In this study, survey was carried out on the subaerial riverbed of the middle reaches of Sagami River which had been submerged by heavy rainfall of the Typhoon 1721. The survey site was located immediately downstream side of a foot of bridge, where riverbed was scoured linearly. A survey line was set SW–NE direction perpendicular to usual river flow and 1m–1m squares were set along the line. Maximum projection image of fifty tuff pebbles (32–64 mm in long axis), which are abundant on riverbed of the Sagami River, were obtained from each square and roundness of these pebbles were measured using the Krumbein chart (Krumbein, 1941).

Comparison of average roundness between each square shows that;

(1) average roundness ranges between 0.49 to 0.59,

(2) low roundness (more angular) areas are obtained from high-water level riverbed and the scoured trench, which may contain pebbles broken by flood water,

(3) one high roundness (more rounded) area is obtained from land-side slope of scoured trench, where selective sorting of rounded gravels might take place,

(4) the other high roundness (more rounded) areas are obtained from near low-water level riverbed, where waning flooding and usual flow would transport gravels, and

(5) an additional measurement of roundness on low-water level riverbed showed a similar value with measurement on November.

Consequently, roundness may be estimated stably obtaining samples from around low-water level riverbed.

This study involves result of the graduation thesis of Y. Kimura, the 3rd author.

References

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Keywords: riverbed, pebble, roundness, Sagami River, typhoon1721, scouring

