

大宮台地および武蔵野台地北部の地下地盤強度の空間分布

Study in Spatial Distribution of Sediment Strength in Omiya and north Musashino Uplands

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In order to investigate the N -values of underground sediments in Omiya and north Musashino uplands, isopleth maps were drawn using ArcGIS (ver 10. 3. 1, ESRI Japan Corporation). First, the summarized N -values data¹⁾ were referred and picked up the values of 3-m depth intervals. Then, by using the GIS software, each boring point was plotted and made isopleth maps of each 3-m interval. As a result, high N -value with the sediments composed by gravel is distributed in Musashino uplands, whereas low N -values less than 10 with mud and silt sediments between 24-33m depth in Omiya uplands. Sediment layers existing fossil shells are also pointed out in the original boring core data¹⁾ in Omiya uplands. The low N -value area is corresponded to the distributed area of Kioroshi formation, which deposited during Shimosueyoshi transgression. From these analyses of mapping data, it is concluded that it is important to choose it by not only surface landscapes but also considering the history of landscape development as well as geotechnical parameters such as N -values, when we decide the suitable low-cost construction site.

キーワード：N値、大宮台地、武蔵野台地、ボーリングコア試料、地理情報システム

Keywords: N-value, Omiya upland, Musashino upland, Boring core sample, GIS

山岳河川における単一チャネルの隆起に対する応答：モデル実験

Response to the uplift of a single channel in mountain rivers: Laboratory experiments

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山岳河川の発達を考える上で、下刻と側刻が発生するタイミングや順序について知ることは極めて重要であるが、これについては未だにわかっていない。隆起を受けた山岳河川網の挙動についてモデル実験を行った先行研究では、実験領域全体の時間あたりの侵食量が隆起量と釣り合ってから地形凹凸の側方移動が活発になる」と述べられているが、この報告は流域全体を真上から写真で観察したことによるもので、流路単位で調べたものではなく、この点について検証した例は非常に少ない。そこで本研究は、モデル実験を用いて、山岳地域におけるチャネルが隆起を受けた際の詳細な変動プロセスを明らかにすることを目的とし、単一チャネルに観察対象を絞り、高精度の測定を行った。

実験は2回（実験AとB）行い、1回の実験につき、隆起（ベースレベルからの上昇）は下流端に設けられた堰を1cm単位で2度下げることによって発生させた。1度目の実験は300分間行い、隆起は標高が安定したと思われるタイミングで発生させた。一方、2度目の実験は260分間行い、チャネルの状態に関係なく、1度目とほぼ同じタイミングで隆起を発生させた。

結果は一部を除いて、チャネルは、隆起の発生後に生じた遷急点が通過するまでは下刻により標高を低下させ続け、その後側刻が発生するというような挙動が観察された。流域全体の土砂収支に基づいた先行研究の観察事実と矛盾しない。ただし、流路内をより細かく局所的に見るとその限りではないこともわかった。例えば、実験Bの2回目の隆起の直後、下刻による標高の低下が収まるよりも早く側刻が発生したが、これは隆起を発生させる直前の縦断面の状態が不安定であったことに起因すると考えられる。また、実験Aおよび実験Bの1回目の隆起では、上流部はしばらくの間下刻が発生しなかったが、これは、流れの中に浸食ツールとして含まれる堆積物の量が少ないためと考えられる。

今後勾配や流量、砂の量比等を変え、複数回更に実験を重ねる必要があると思われる。

キーワード：下刻、側刻、縦断形

Keywords: downward erosion, lateral erosion, profile

屋久島，宮之浦川における巨大河床礫の運搬プロセスと地形

Transport processes of huge riverbed boulder and landforms of the Miyanoura River in the Yaku Island, southern Japan

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There are huge boulders on the riverbeds of most rivers in the Yaku Island, southern Japan. The Miyanoura River is the most typical river and one of the largest rivers originated in the central part of the island. This study aims to discuss the production and transport processes of such huge riverbed boulders and relationships between the processes and landforms of the basin.

Most part of the Yaku Island, including the central part, is underlain by granitic rocks. The Miyanoura River, whose length is 17 kilometers, flows down in granitic area except the lowest section of 4 kilometers. Maximum diameter of the riverbed boulders is about 10 meters in the upper reaches. It decreases downstream to several tens centimeters as the channel slope decreases. Although uniform granite is underlain by this basin, maximum diameter of riverbed boulders correlates with channel slope. This indicates such boulders are transported by river being affected by sorting process. In the reaches of maximum boulder size being over 5 meters, relative height between ridges and valley bottoms is as large as 500m. There are many landslide scars in the tributary basins which join the Miyanoura River in these reaches. At the junctions these tributaries with steep channel slope develop alluvial cones on the valley floor. The deposits of the riverbed and the alluvial cones include huge boulders with several meters in diameter. Alluvial cone development across the Miyanoura River formed a dam. A dam break during a heavy rain event caused torrential floods and huge boulder transportation.

There is a continuous terrace along the middle reaches of the Miyanoura River. The terrace deposits consist of huge boulders of several meters in diameter. This terrace is not covered with the Koya pyroclastic flow deposits, which was erupted at 7,300 y.B.P. and which covered the valley side slopes around there. The cause of terrace is an important key to solve the cause of the huge riverbed boulders.

キーワード：巨大河床礫、土砂移動プロセス、地形、宮之浦川、屋久島、南日本

Keywords: huge riverbed boulder, sediment transport process, landform, Miyanoura River, Yaku Island, southern Japan