

Particle Size Fractal Characteristics of the Gravel Soil in Original Area of Debris Flow Valleys

HUANG Qi^{1 2 3}, CHEN Ningsheng^{1 2}, ZHU Yunhua^{1 2 4}, LU Yang^{1 2 3}, LÜ Liqun^{1 2 3}

(1. Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu 610041, China;

2. Key Lab of Mountain Hazards and Surface Processes, Chinese Academy of Sciences, Chengdu 610041, China;

3. Graduate University of Chinese Academy of Sciences, Beijing 100049, China;

4. Southwest Petroleum University, Chengdu 610500, China)

Abstract: Based on the particle distribution of 75 gravel soil samples from 19 debris flow valleys, the fractal theory is applied to study the characteristics of particle composition of gravel soil. The relationship between the characteristics of fractal dimension and particle composition is discussed later. The results show that: 1. the gravel soil possesses the characteristic of fractal, and mainly in one dimension fractal; 2. particles with one dimension fractal is fine graded; particles with two dimension fractal is weak graded, and it emerges when there exists a particle abrupt; 3. the average particle size fractal is between 2.45 and 2.78 in the 19 debris flow valleys, and it goes up with the increasing of clay content. The relationship between particle size fractal in one dimension and clay content can be expressed by: $D_a = 0.108 \ln(\rho_c) + 2.511$. At last, the significance of researching on the fractal characteristics of gravel soil in original area of debris flow valleys is discussed.

Key word: debris flow; gravel soil; fractal; particle composition

征 稿 简 则

《山地学报》是专门报道山地科学研究理论与山区开发、整治、建设实践相结合等内容的综合性科技期刊,内容涵盖自然科学与人文科学两大门类中与山地研究、开发有关的多学科知识,重点报道山地资源开发与山地生态环境演变、山区工程建设与山地灾害(崩塌、滑坡、泥石流、水土流失、山洪等)防治、山区社会发展与城镇规划、山区可持续发展与产业结构调整等领域的理论文章、应用技术、研究和实验方法等。同时设有学术动态、新书介绍和书评等不固定栏目,此外还特设了青藏高原等专题栏目。投稿者请注意:

1 严格遵守国家保密规定,涉及国家和地区名称、界线、保密等政治及敏感问题须认真核实,与我国政府口径一致。

2 严格按照来稿要求投稿,凡未按要求投稿的一律按退稿处理。投稿时,请寄纸质稿件2份到编辑部。

3 稿件文责自负。本刊对来稿有修改权,如不同意请事先声明。勿一稿多投。本刊审稿周期为3个月左右,作者在投出稿件100天后未收到稿件处理意见,可另行处理。由于人手有限,稿件刊用与否均不退还原件,请自留底稿。本刊对刊用稿件酌收版面费和审稿费。如需抽印,请事先声明数量,酌收成本费用。

4 本刊所拟刊载稿件将同时优先进入各大检索数据源并上网,作者若有异议请预先申明。

5 来稿请寄:成都市一环路南二段10号中国科学院水利部成都山地灾害与环境研究所《山地学报》编辑部,邮政编码610041; E-mail: hyfeng@imde.ac.cn; 电话:(028) 85223826; 网上在线投稿 <http://www.sdxbl983.com>。作者投稿时务必附上联系电话。

《山地学报》编辑部