OMICS Group Conferences
Accelerating Scientific Discovery

International Symposia on
Entomology

September 04, 2013 Holiday Inn Orlando International Airport, Orlando, FL, USA

Ant-nest model as a unique geologic-geophysical feature

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Objective: Formulate the concept of a generalized geologic-geophysical model of red ant (Formica rufa) nest-tops (dome). Nest-tops (domes) are considered to be a unique bio-geological system. Geophysical, mineralogical and topographic investigation results of more than 50 ant nest-tops throughout Siberia were obtained. Isolated ant mound (*Formica cinerea M. and Lasius flavus*) nest-tops were investigated in mountainous areas. Factual information and unified technology verified the stated results. The valid method was applied to the methodology itself and the investigation techniques.

I. Key aspect of the model:

1. Boundary location on the Earth surface (lithosphere-atmosphere boundary);
2. Pentactinal surface symmetry;
3. Internal architecture, mainly arched with winding chambers;
4. Natural material composition – organo-mineral. Magnetic mineral content is 20% of the mineral fraction mass, or 1% of the total mass.
5. Material physical properties: density: 0.2 – 2.0 gr/cm3; magnetic susceptibility (10-5 SI system): from 5 .– 25 to 36. – 250; porosity: 5 – 80 %; compression resistance up to 0.5 – 1kPa (0.05 – 0.01 kg.sec./cm2); elasticity: nearly ideal.

II. Integrated model pattern of ant nest-tops as an engineering-biological and epistemic investigation subject:

1. Advanced field and laboratory investigation involving prominent and non-traditional ideas and technologies
2. Appropriate application of non-destructive geophysical methods (magnetometric and radiometric), their impact and monitoring.

Basic areas:

2.1 Ecological
2.2 Engineering- ethological
2.3 Mining-geological
2.4 Seismological
2.5 Educational and didactical

Conclusion: Based on the environment parameters the properties and dome shape have been determined as a unique and stable bio-geosystem. The nest-top itself and the insect behavior can be studied by the instrumental or well-defined methods. The dynamic nest-top as a boundary element of the rigid biosphere is described by special physico-mathematical tools, applied further in the plotting of prognostic environmental models. Electronic information technology (EIT) is used for imaging.

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