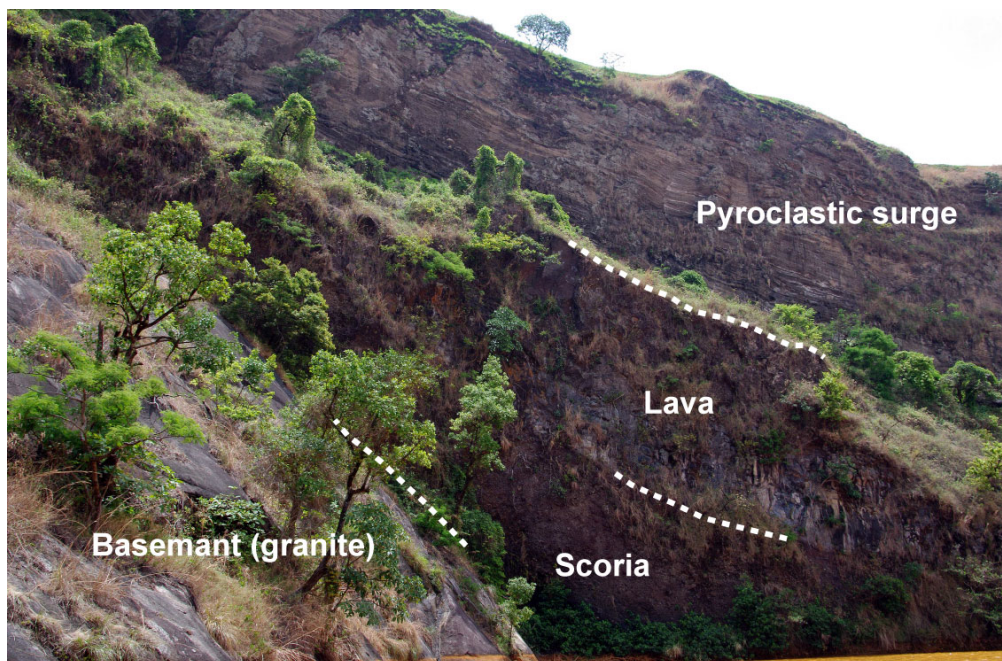


## Mission report on geological survey at Lakes Nyos in March 2014

Kobayashi, T. (Kagoshima Univ.), Aka, F.T., Kankeu, B. (IRGM), Hasegawa, T. (Ibaraki Univ.)

We performed geological survey around Lake Nyos on 17-20 March to clarify the stratigraphy and distribution of eruptive deposits from Nyos maar volcano and related scoria cone.

**17 MAR (Boating on Lake Nyos 1):** We newly found some basaltic dykes in granitic basement rock on western lakeshore wall. At northeastern wall, we described an eruptive sequence from the maar volcano as follows: *explosion breccia (unit a)*, *scoria fall (b)* and *the intercalated lava flow (c)*, and *pyroclastic surge (d)*, in ascending order (**Photo. 1**).



**Photo.1. Representative outcrop at the northeastern lakeshore wall of Nyos maar.**

**18 MAR (Exploration around scoria cone and Lake Njupi):** At least three eruption units derived from scoria cone were recognized in this field: *porous scoria fall (e)*, *volcanic bombs (f)*, and *the youngest lava flow (g)*. The porous scoria fall (e) covers pyroclastic surge deposit (d). The thickness and diameter of scoria (e) increase toward the scoria cone that is situated on 1 km northeast of Lake Nyos. Volcanic bombs (f) were emplaced on the porous scoria fall (e) and scattered within a 500 m circuit of scoria cone. The youngest lava flow (g) is widely distributed, characterized by aphyric basalt. We also recognized sector collapse of the scoria cone; e.g. many small scarps and small hummocky hills on the southern slope of the scoria cone. The collapsed

material buried the river from Njupi Lake, but large-scale landslide of the base surge deposit on the northern slope of Nyos maar also blocked the outlet from the ancient lake Njupi, which might be the main cause to form the present Lake Njupi (**Photo. 2**).



**Photo. 2. Overview of scoria cone (left) and Lake Njupi (right) from the top of the northern wall of Nyos maar.**

**19 MAR (Distal tephra layers):** We described an outcrop located on approximately 2 km northwest of Lake Nyos. Distal facies of scoria fall (b) and pyroclastic surge (d) can be recognized here. Scoria fall (b) directly covers the weathered granitic basement. The basal part of pyroclastic surge deposit (d) consists of alternating parallel layers of volcanic sand and fine ash. The latter is composed mainly of small accretionary lapilli.



**Photo. 3. We had a chance to educate for high school students coming to geological excursion.**

**20 MAR (Boating on Lake Nyos 2 and natural dam):** In the second boating, we newly recognized two different types of basaltic magmas. Although major component of juvenile materials from Nyos maar consist of relatively porphyritic basalt, minor amount of aphyric basalt with chilled margin is found in scoria fall (b) and pyroclastic surge (d). We also obtained soil samples for radio carbon dating at northern lakeshore (Photo. 4) and natural dam site.



**Photo. 4. Samples for dating were taken from the contact between granitic basement (lower) and scoria fall (b) (upper).**

We preliminarily established the stratigraphy of volcanic products (a~g, in ascending order) from the Nyos maar and adjacent scoria cone in this survey. We systematically obtained rock samples during the fieldwork. We will carry out petrological and chemical studies of these rocks to determine the magmatic processes of the volcano. Radiometric dating will contribute to reveal the history and magmatic processes of the volcanoes.