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# Abstracts Volume

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is close to lithostatic throughout the conduit regardless of  $k_w$ . In this regime,  $E_w$  is proportional to  $k_w$  and is inversely proportional to  $k_v$ . On the other hand, when  $B < 1$ , the porosity increases from 0 to 0.8 and the pressure becomes larger than the lithostatic pressure with decreasing  $k_w$ , which leads to a high-overpressure region at a shallow level in the conduit. In this regime,  $E_w$  is approximately proportional to  $k_w$ , whereas it is independent of  $k_v$ .

#### 1.1-P-34

### The Mineralogical And Petrological Characteristics Of Garnet Bearing Rhyolitic Lavas, South Of Ýzmir, Western Anatolia-Turkey And Their Comparison With Chios Island (Greece) Rhyolites

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The volcanic rocks of Görece-Ýzmir are identified as rhyolitic lavas due to their mineralogical and textural characteristics and geochemical data. They contain phenocrysts of quartz, sanidine, albite, biotite and opaque minerals which reach up to 2 mm in sizes. The matrix of lavas are composed of microliths, spherulites, lithophysae and volcanic glasses. Vitreous, trapezoidal garnets occur up to 1.5 cm diameters in some lithophysae as euhedral to subhedral crystals and are brown at cores and black at rims. In addition to vesicular textures and lithophysae assemblages observed by naked eye, axiolic structures, spherical and fan shaped spherulites, lithophysae with fibric and concentric hollows and microcrystalline lithophysae with half moon type lateral voids are determined during microscopic studies. According to Raman Confocal spectroscopic and EPMA analyses carried out at laboratories in Turkey, Switzerland, the USA and Canada, garnets are homogeneous in Fe and Mn concentrations from core to rim exhibiting spessartine-almandine compositions (51.0 and 46.6 mol percent, respectively). Quartz, cristobalite and hematite inclusions are found in garnets. The above mentioned characteristics and field observations of garnets can point out that they should form during cooling of lava, escaping vapour produced lithophysae lined with garnet. According to geochemical data, the rhyolites have high K calcalkaline character and they show extreme depletion in Sr and Ba and enrichments in Nb, Rb, Zr, Y, La, Ce and Nd. Some trace elements such as Cs, Be and Sn are slightly higher in rhyolites. Due to petrological data, it can be postulated that the Görece rhyolites should have been derived from mantle-crust interaction and contaminated by middle or upper crust. The rhyolites of Profitis Ilias, SE of Chios Island (Greece) contain primary almandine and spessartine rich garnets and zinnwaldite phenocrysts. The Görece rhyolites display some similarities when compared with mineralogical and petrological features of Chios rhyolites.

#### 1.1-P-35

### The Quaternary Volcanism and Tectonic History in the Suwa-Yatsugatake Volcanic Province, Central Japan

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Beneath Central Japan where three arcs meet, the Pacific plate and Philippine Sea plate are both subducting, resulting in a complex tectonic history. We conducted a chronological study of the Suwa-Yatsugatake Volcanic Province (SYVP) with the aim of elucidating temporal and spatial changes in the tectonic and volcanic activity in Central Japan. The SYVP consists of five volcano groups (Circum-Lake Suwa volcanoes, Utsukushigahara volcanoes, Kirigamine volcanoes, Yabashira volcanoes and Yatsugatake volcanoes). It is characterized by an enormous amount of volcanic activity, with lava flows and volcanoclastic rocks spread over a vast area of more than 1,200 km<sup>3</sup> and total eruption volume exceeding 400 km<sup>3</sup>. We determined K-Ar ages of 41 samples and examined the results together with radiogenic ages previously reported. As a result, we concluded that the volcanic activity has been occurring intermittently since ca. 2.2 Ma.

The volcanic activity in the SYVP was classified into three phases, based on clear dormant periods. Especially, the greatest eruption volume and level of activity was

#### 1.1-P-36

### New evidences on mercury emissions from Earth volcanism

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In recent years, there has been increasing environmental concern on the potential impact of volcanogenic mercury, owing to the high toxicity and long residence times of this element in the Earth's ecosystems. In order to extend the currently limited dataset on volcanogenic mercury emissions to the atmosphere, we summarize the work done on deriving of mercury emissions from a set of active open-conduit volcanoes (Stromboli, Asama, Myakejima, Montserrat, Ambrym, Yasur, and Nyiragongo). Our data suggest that volcanic emissions represent an important component of the global atmospheric Hg budget, even if all data refer to quiescent phases of the volcanic activity. Anyway, our original results allow some inferences to be made on the "quality" of previous es-

timates of global volcanic Hg inventories. The acquired data from 7 volcanoes allowed us to derive a global volcanic Hg flux from “persistent degassing” of  $\sim 95 \text{ t}\cdot\text{yr}^{-1}$  (still in the 6-900  $\text{t}\cdot\text{yr}^{-1}$  range of Pyle and Mather’s 2003 estimate). Besides, their cumulative emissions would represent about 55% of mercury being yearly contributed by passively degassing volcanoes at global scale ( $75 \text{ t}\cdot\text{yr}^{-1}$ ), suggesting that published inventories are potentially underestimating global Hg budgets from volcanic degassing. Our range of the bulk plume GEM/SO<sub>2</sub> mass ratios is in fair agreement with previous estimates of passive emissions from all non-erupting volcanoes ( $3.7\cdot 10^{-6}$ ), and falls within the best estimated range ( $10^{-4}$  to  $10^{-6}$ ) previously proposed for non-explosive volcanic plumes. It is likely that the volcanic contribution of Hg to the stratosphere will be even more important during *large eruptive* events, suggesting that the long-term time-averaged Hg emission rate from these volcanoes may become even higher would the eruptive contribution be taken into account.

### 1.1-P-37

#### Holocene Explosive Eruptions in the Rungwe Volcanic Province, Tanzania

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The fundamental principle of volcanic hazard assessment on any volcano is the detailed documentation of its eruptive history. Although the presence of extensive superficial pumice deposits has long been known in the Rungwe Volcanic Province (RVP, SW Tanzania, East African Rift), the recent eruptive history had never been studied in detail before. The two main RVP volcanoes, Rungwe and Ngozi, display deposits of several explosive eruptions in their recent history. Field observations of tephra deposits were combined with whole-rock major (ICP-OES) and trace (ICP-MS) element analyses to correlate deposits. <sup>14</sup>C ages on palaeosols constrain all recognized deposits to <10 ka. Trace element data, e.g. Zr/Y ratios, allow discriminating between Ngozi and Rungwe volcanoes as source of the deposits. All studied samples are trachyte to phonolitic trachyte.

We show evidence of two large-scale Ngozi eruptions and five Rungwe pumice fallout deposits, and also identify several more intercalated poorly preserved pumice and ash deposits. The Ngozi eruptions (1 plinian fallout at ca. 10 ka and 1 ignimbrite-forming eruption less than 1 ka ago) possibly played a role in shaping the present-day caldera. The Rungwe record includes a ca. 2.5 km<sup>3</sup> deposit of a Plinian-style eruption dated at ca. 4 ka (Rungwe Pumice), a sub-Plinian one at ca. 2 ka and at least three additional smaller-scale fallout deposits.

The stratigraphic record shows that both Ngozi and Rungwe volcanoes experienced several moderate to large explosive eruptions, including eruptions generating pyroclastic flows, in their recent past. The late Holocene record is characterized by 1 Rungwe eruption

every 500 – 1000 years. A plinian eruption similar to the Rungwe Pumice one would cover the poorly constructed houses of ca. 185,000 people with more than 25 cm of tephra. This study highlights the need for monitoring the RVP volcanoes.

### 1.1-P-38

#### Magnetic Petrology of Clastogenic Lava of Izu-Oshima Volcano, Japan

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Izu-Oshima Volcano is one of the most active volcanoes in Japan. During the last fatal eruption in 1986, basaltic-andesite and andesite lavas were erupted from the fissures opened at and around the summit crater and various types of lava flows were formed from fire fountain. Large amount of clastogenic lava (B Lava) was produced at the peak of the eruption, while continuous coherent lavas were overspilled from the crater, resulting usual aa lava (C Lava). In order to clarify the eruption processes and physical conditions of the 1986 activity and to characterize each type of lavas, we have carried out magnetic petrologic analyses on the lava samples. As a result, we found each lava showed distinct magnetic petrologic characteristics. Rock magnetic results of C Lava were simply explained by different grain size distributions due to different cooling rate of each sample. Difference in grain size was also observed under microscope. Although most completely coalesced lava samples suffered oxyexsolution, produced titanohematite, the other parts of lava contained titanomagnetite only. It was suggested that all lavas were cooled rapidly from high temperatures above 800 degrees C. B Lava had most unusual demagnetization curves of artificial remanences, indicating the intense bimodality of coercivity. Microscopic observation revealed that samples which showed bimodal coercivity distributions contained small dendritic titanomagnetite. Its skeletal shape may cause high coercivity, resulting intense bimodality of coercivity. Dendrite was preserved in lava samples with high cooling rate. Titanomagnetite in the samples with low cooling rate had polyhedral or granular shape. This difference was probably produced at the fountain and the spatter cone, depending on difference of cooling rate and the degree of undercooling. Dendritic magnetic minerals and their distinct magnetic characteristics may be helpful to identifying varying volcanic materials produced from fountain-fed eruption.

### 1.1-P-39

#### Permeability of Alkaline Magmas: a Study from Campi Flegrei

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