Table The provenance, origin of the sample, eruption date and composition of the specific tephra deposits analyzed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tephra | Origin | Profile | Age# | Composition | Reference |
| Hekla1991 | Iceland | Fresh deposit | 1991 AD | Basaltic-Andesite | Gudmundsson et al. 1992 |
| EFJ2010\_SJV | Iceland | Fresh deposit | 2010 AD | Trachy-andesite | Unpublished dataa |
| EFJ2010\_1504 | Iceland | Fresh deposit | 2010 AD | Trachy-andesite | Gislason et al 2011a&b. |
| Fogo A | Azores, Portugal | Buried Soil | *c.* 5000 cal BP | Trachyte | Johansson et al, subm.b |
| PAS-2T39 | Argentina | Lake | 48742 cal BP | Rhyolite | Wastegård et al. 2013 |
| TC09\_48a | Kerguelen Island | Buried Soil | *c.* 1000 cal BP | Trachyte | Unpublished datac |
| Pompeii | Italy | Buried Soil | 79 AD | Tephri-phonolite | Unpublished datad |
| Vedde Ash | Iceland | Fresh deposit | 12100 cal BP | Mixed Basalt and Rhyolite | Norddahl & Haflidason 1992$ |
| Reykjanes1226 | Iceland | Soil | 1226 AD | Basalt | Gísladóttir G. et al, 2010. |
| Cav-A | Azores, Portugal | Peat bog | 1000 cal BP | Tephrite | Björck et al., 2006 |
| Saksunarvatn | Faroe Island | Lake | 10300 cal BP | Basalt | Lind & Wastegård, 2011 + Tephrabase |
| Tuhua | New Zealand | Lake | 7165 cal BP | Peralkaline Rhyolite | Heyng et al., 2012 |
| Armor1000 | Kerguelen Island | Peat bog | *c.* 1000 cal BP | Trachyte | Unpublished datae |
| Katla1500 | Iceland | Soil | 1500 AD | Basalt | Hafliðason et al., 1992 |
| Reclus R1 | Argentina | Lake | 15000 cal BP | Rhyolite | Unkel et al. 2008 |

#Reported ages expressed as calendar years (AD), calibrated 14C ages (cal BP; BP being 1950 AD by convention) and approximations based on unpublished radiocarbon dates; $ Referred to as the Skógar Tephra

a Surface grab sample collected shortly after 2010 eruption at the south side in Seljavellir (N63°34’; W19°37’), and stored dried, used data Gislason et al. 2011b for typical ash;b Surface grab sample collected from the airfall deposit (N37°43´10.6; W25°30'0.96), stored dried. cSampled along a natural cut through the fluvial, volcano-sedimentary and peat deposits, at southeast of the Rallier du Baty Peninsula (S49°41’42” ; E68°57’55”), dry pumices were extracted from the ignimbrite deposit and stored dried.  dSample taken during archaeological investigation of Pompeii, quarter VI.30, room 2 (N40° 45’; E14° 29’), stored dried. eThe Armor peat sequence (S49°27.872; E69°43.484) was sampled by drilling in CALYPSO PVC tubes ( ϕ = 11.5 cm), and stored cold (4°C) before freeze dried.



**Figure 1** Composition of glass shards in our tephra samples presented on a total alkali silica diagram (SiO2 vs. Na2O +K2O), a standard classification used for pyroclastic volcanic rocks based on non-genetic features. Geochemical boundaries are according to Le Bas et al. (1986). Data are normalized averages of EMPA analysis. No data are available for Reclus R1 Sample