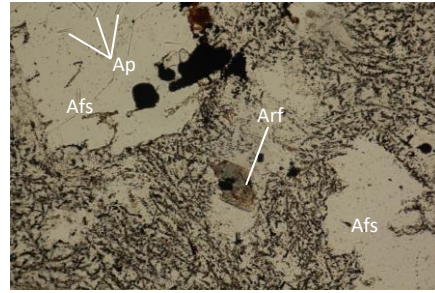
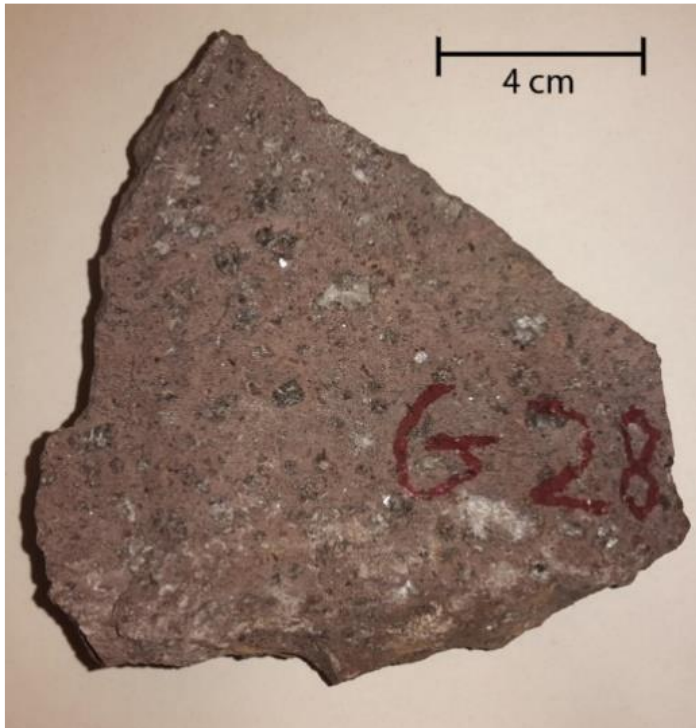
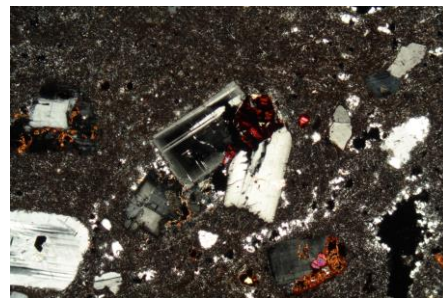
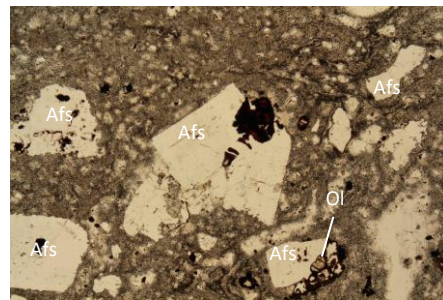


Fig. S5.1 SFF-1 samples. Hand-sample photos (left) and transmitted light petrographic images (right). Location, volcanic unit and petrographic details of the samples are in Tab. S2.1

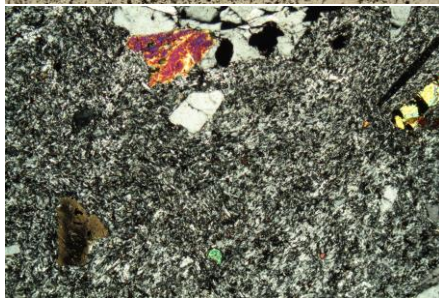
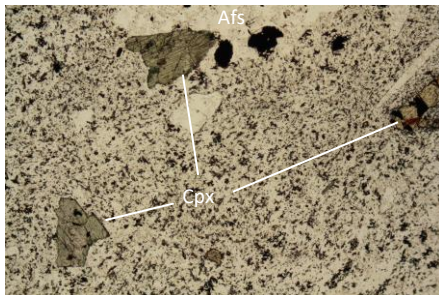
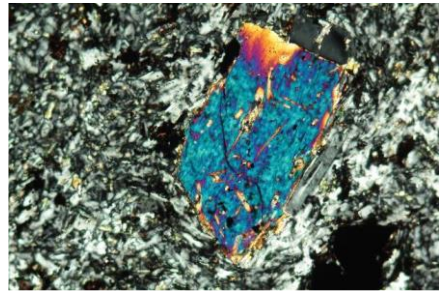
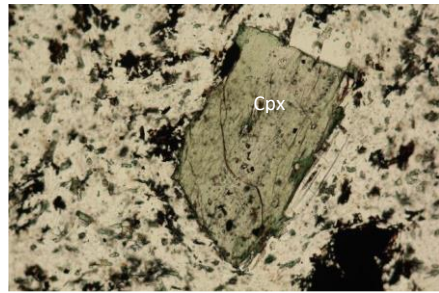
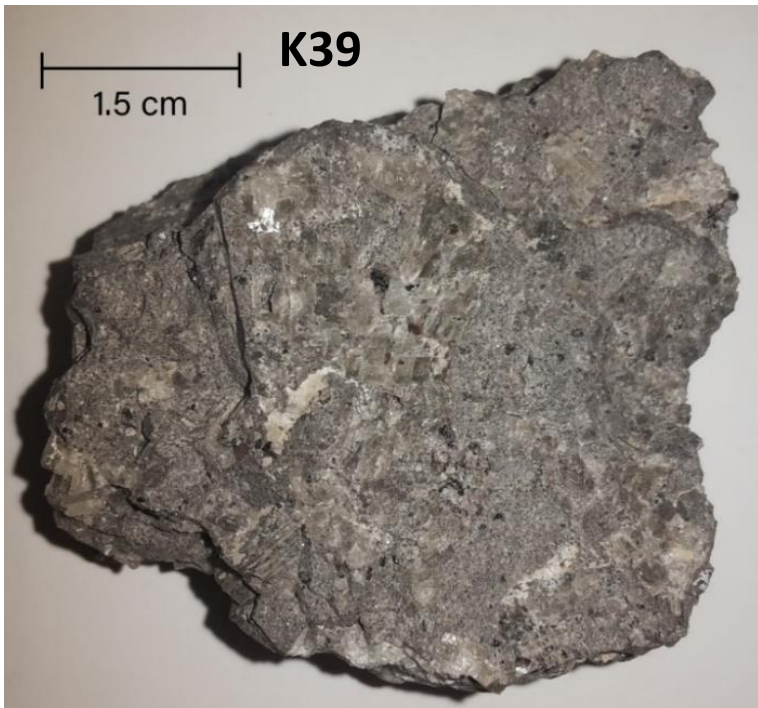
**a**



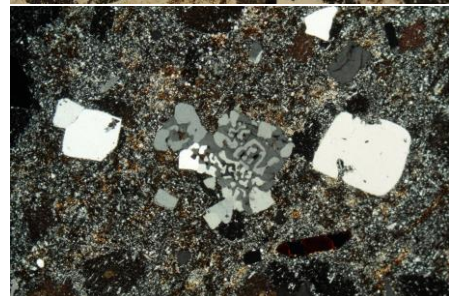
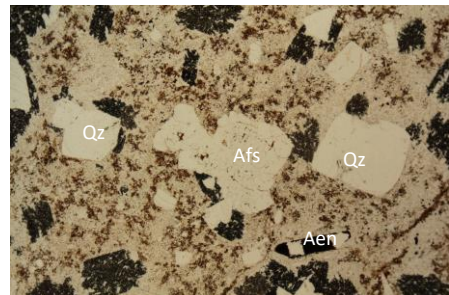
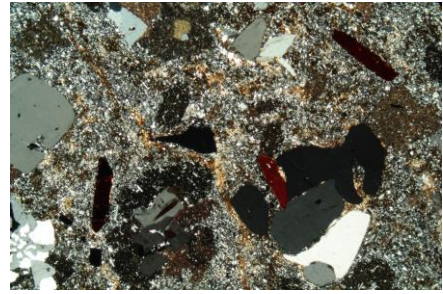
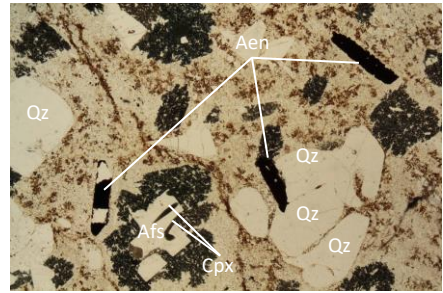
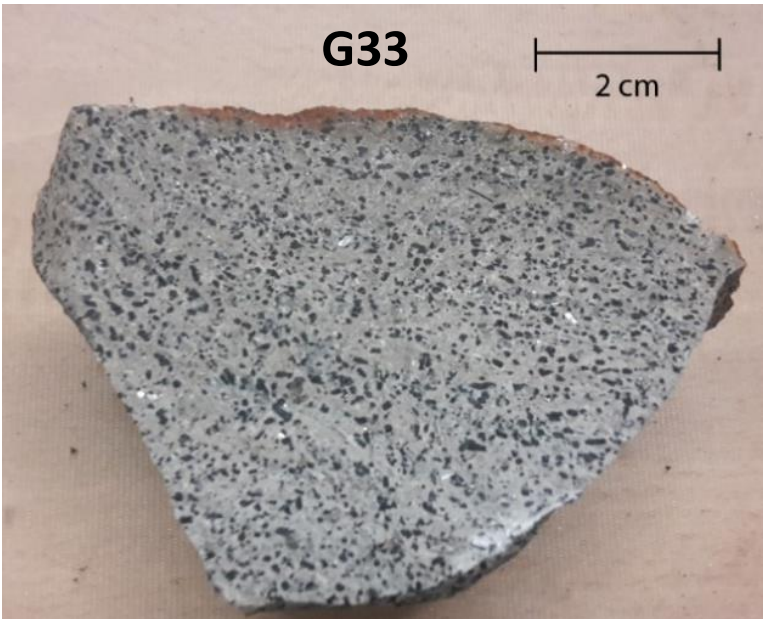
0.6 mm



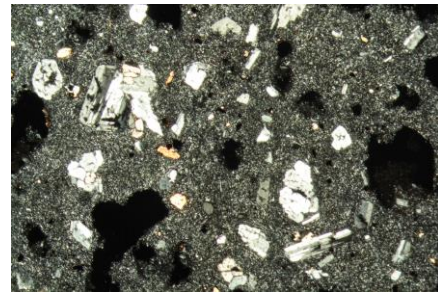
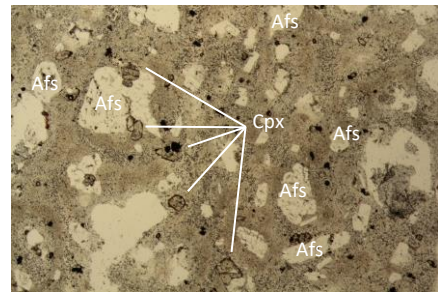
4.8 mm



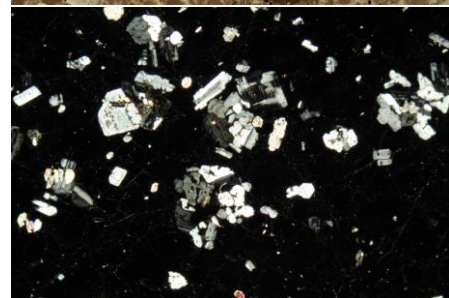
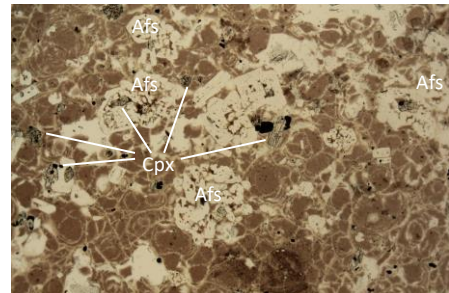
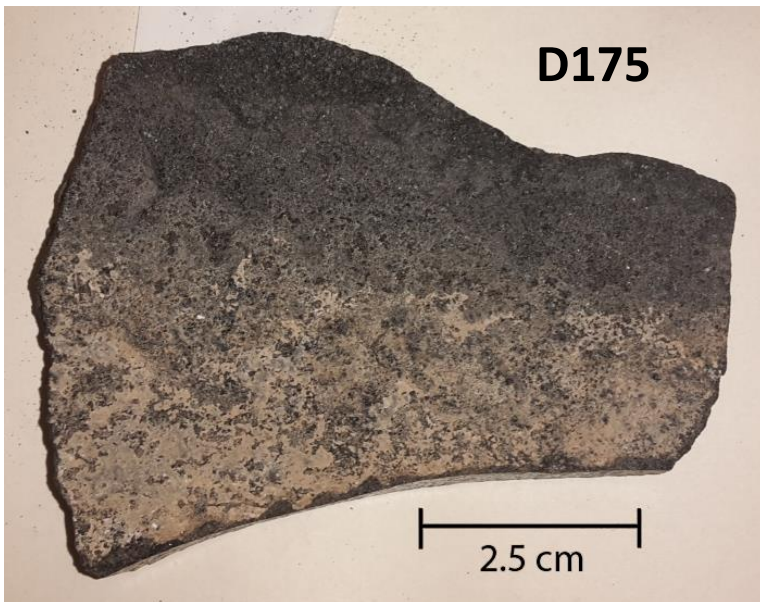
**b**



**c**



4.8 mm



Note:

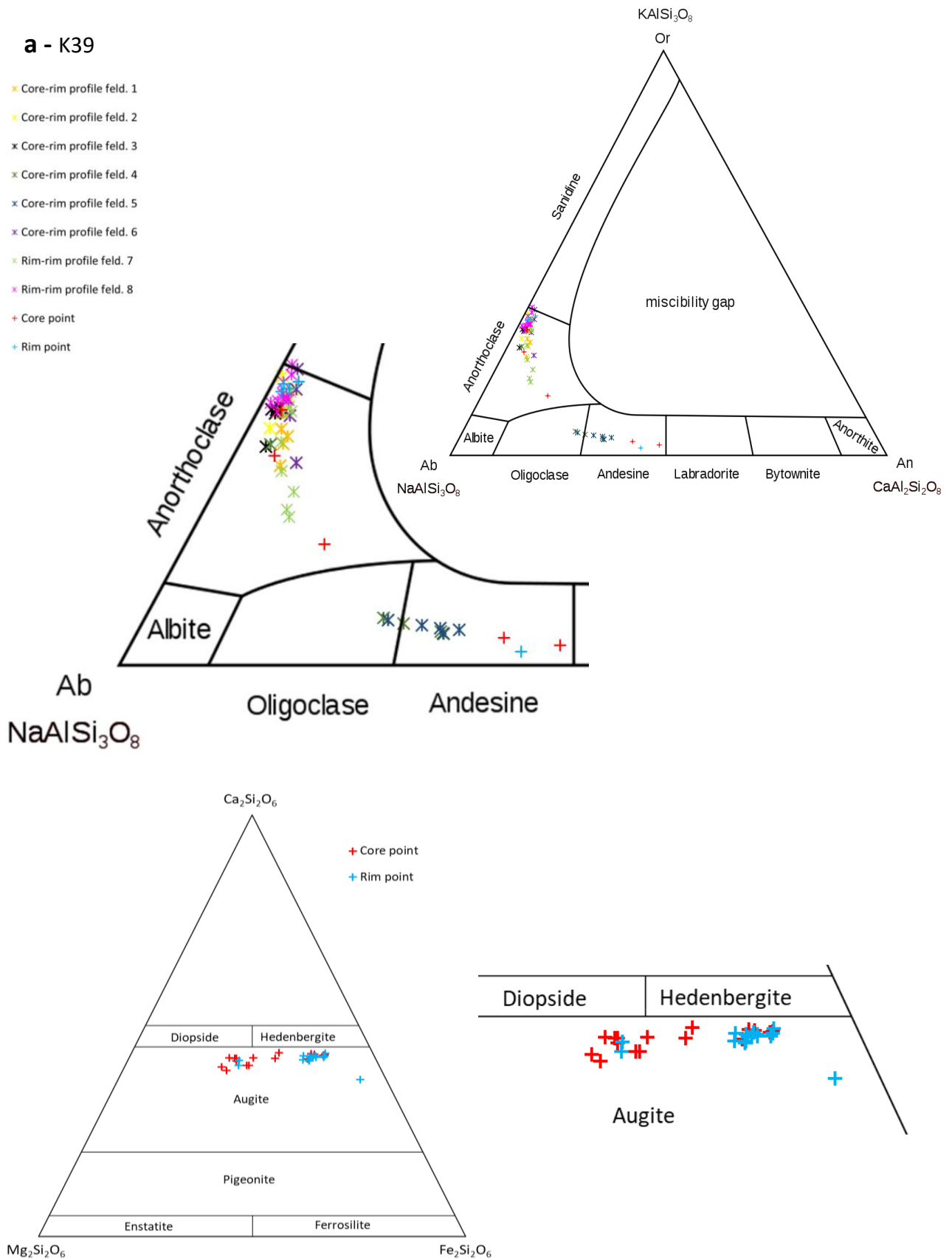
Ap, Apatite; Afs, Alkali feldspar; Cpx, Clinopyroxene; Arf, Arfvedsonite; Qz, Quartz; Aen, Aenigmatite

a) SFF-1 summit

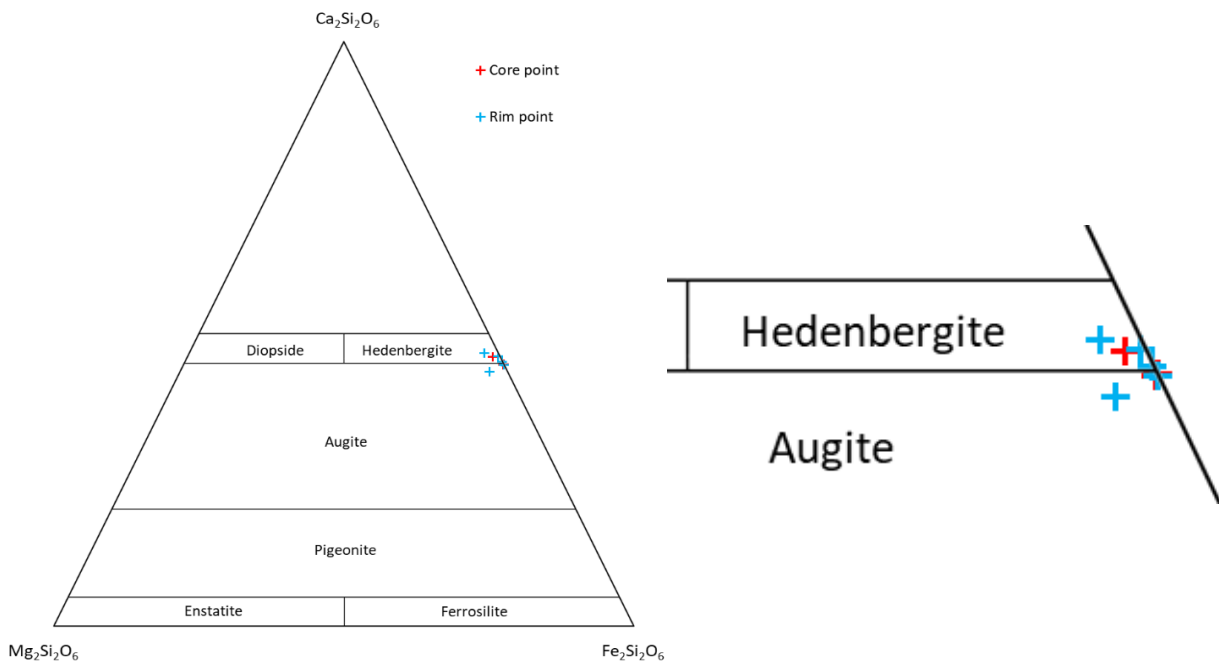
b) SFF-1 inner caldera rim

c) SFF-1 base

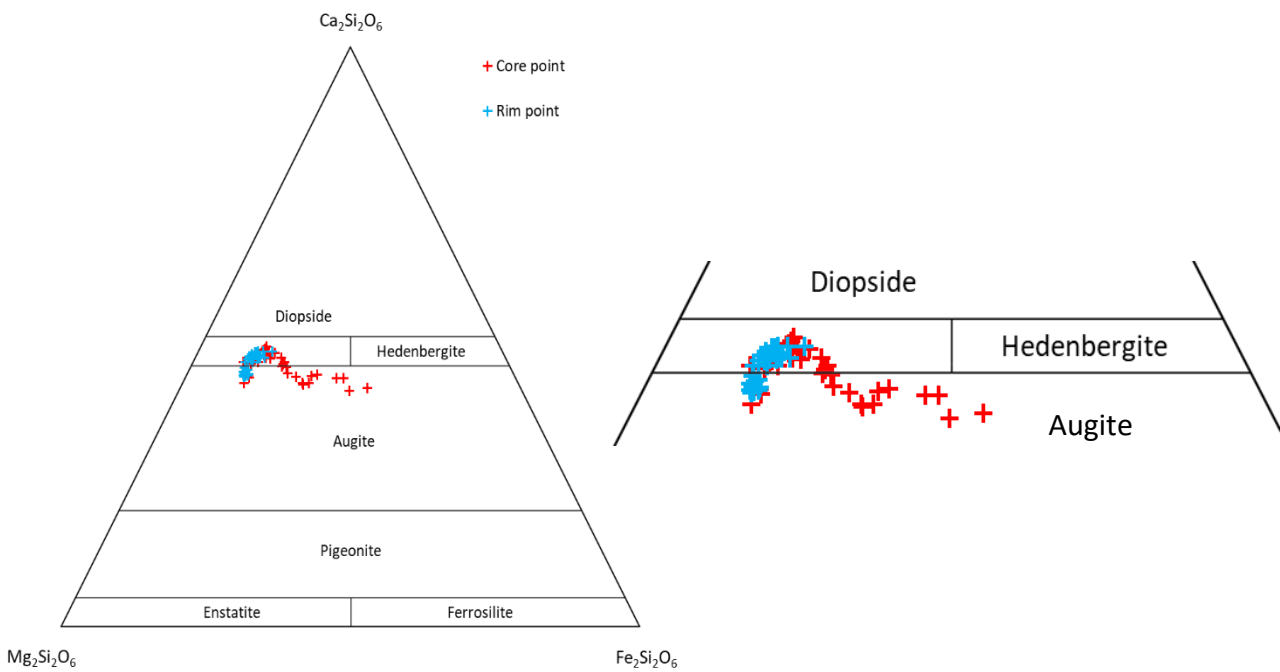
Fig. S5.2 Ternary classification diagrams for clinopyroxene and feldspar. Core and rim point analysis and core to rim and rim to rim profile analysis. a) SFF-1 b) FFD-4 c) RMF-4 - OMF-3



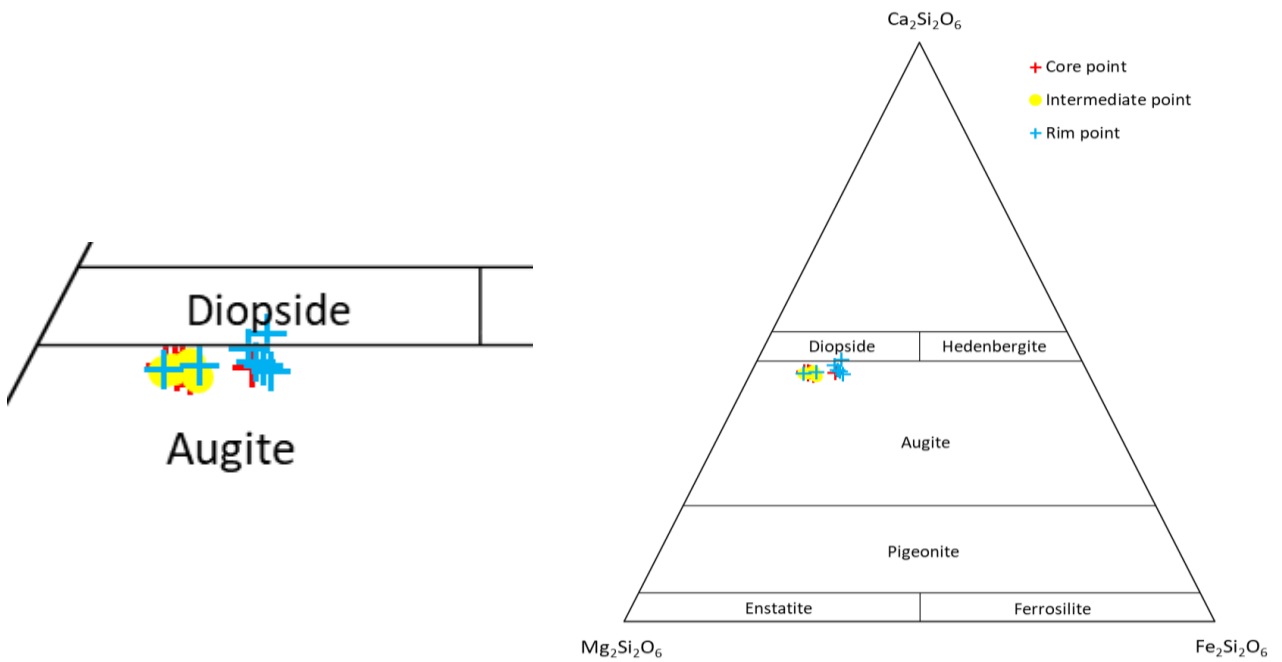
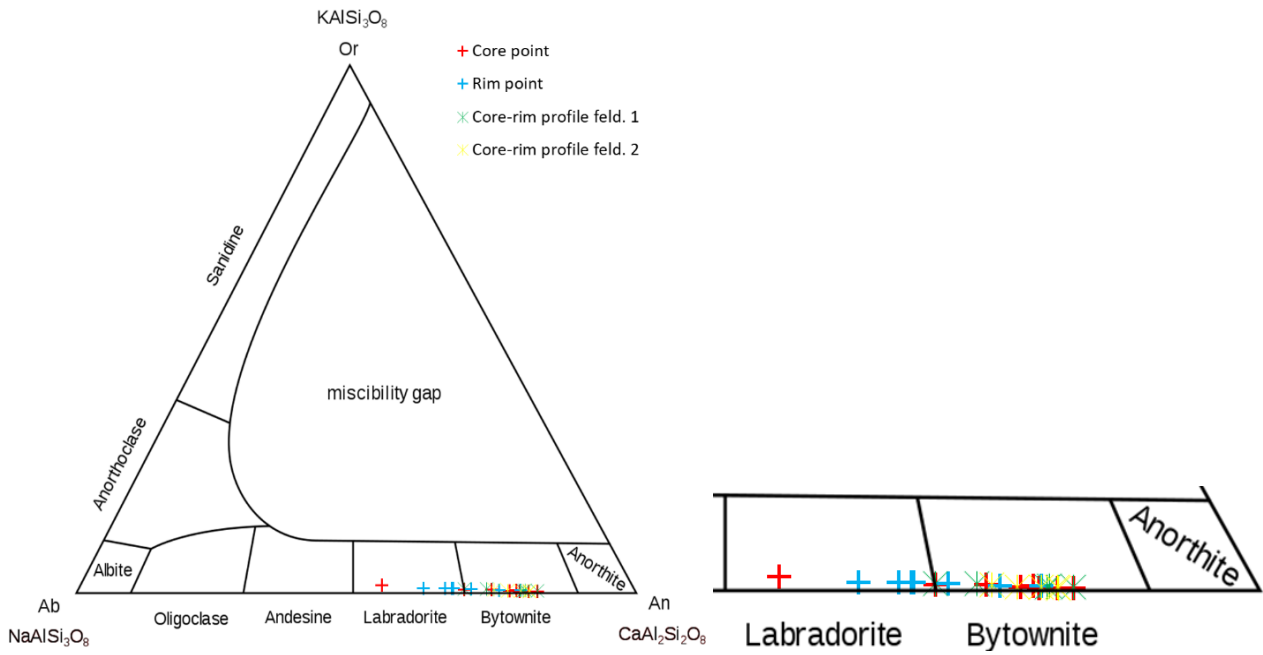
**b - G2**



**c - G8**



D170



G20

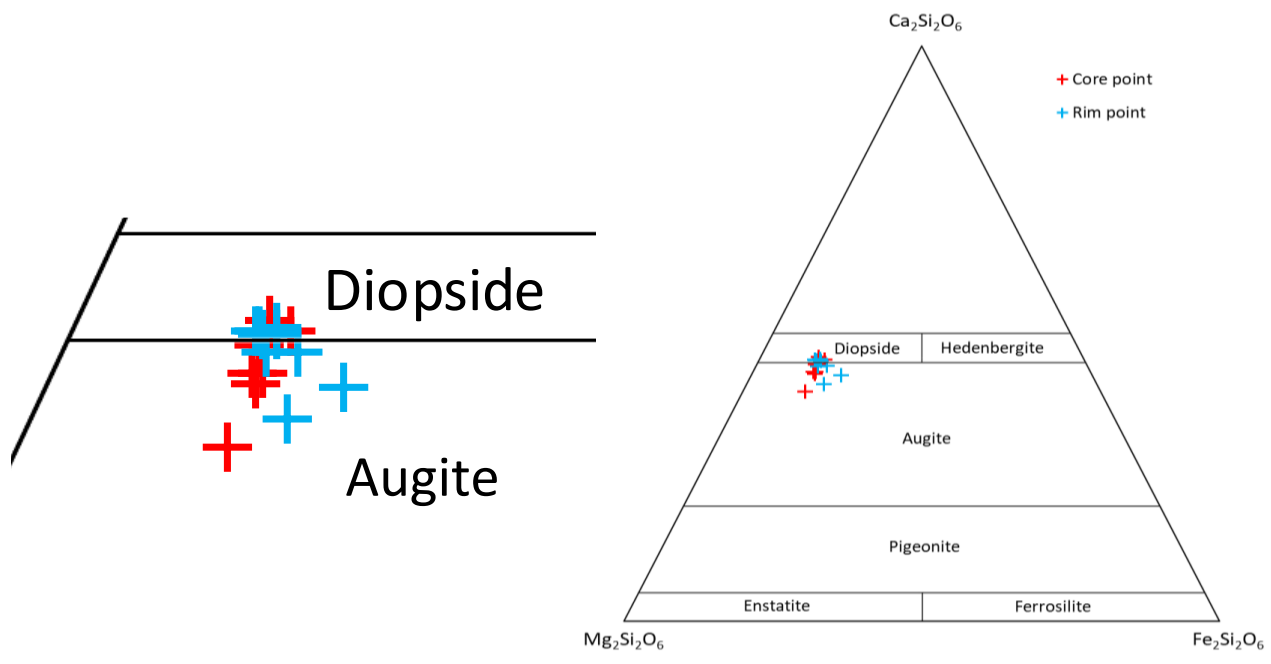
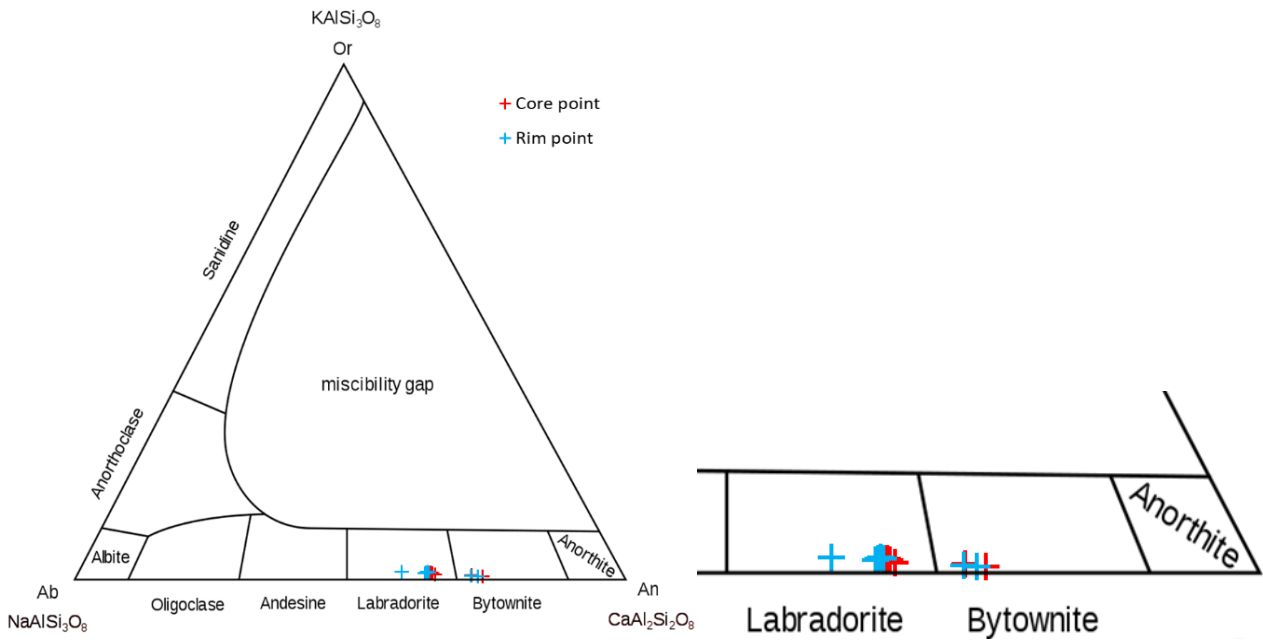
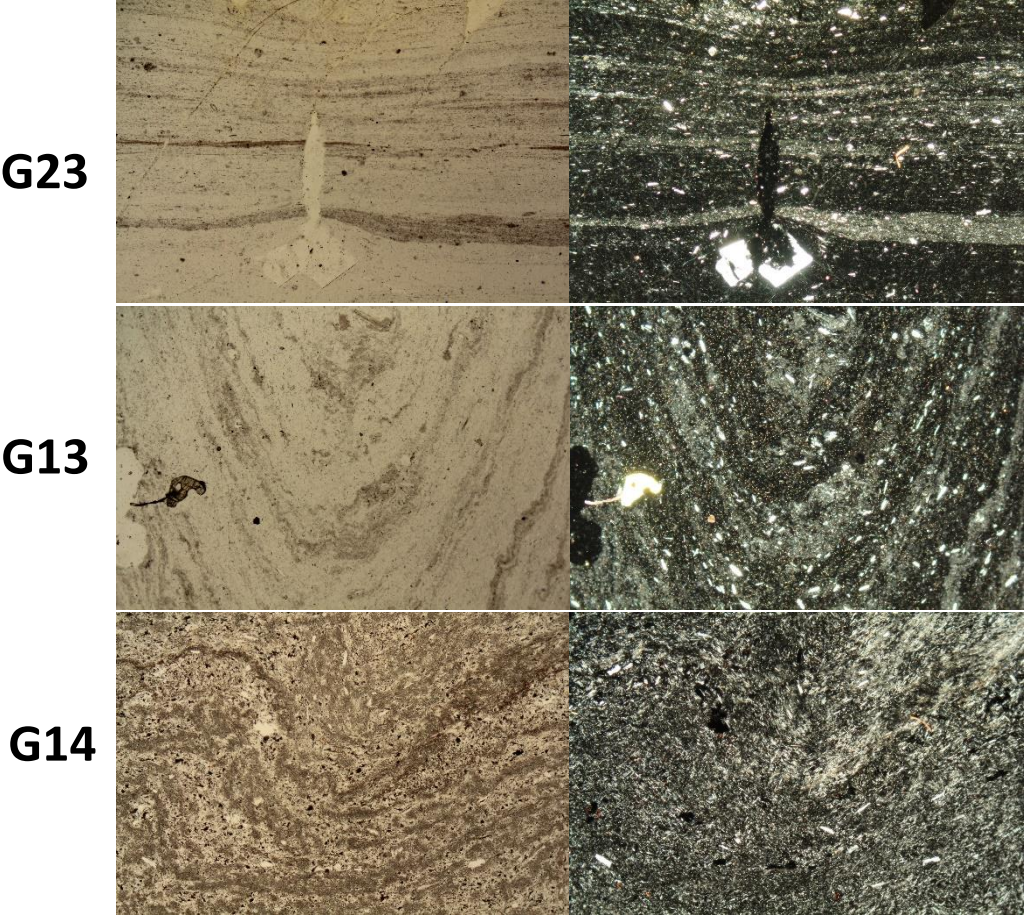


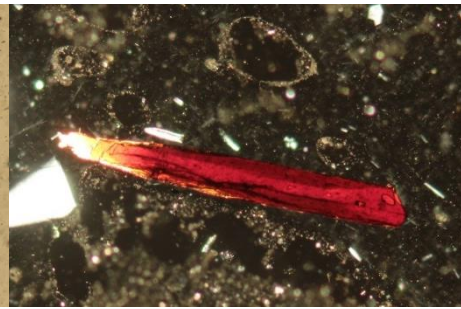
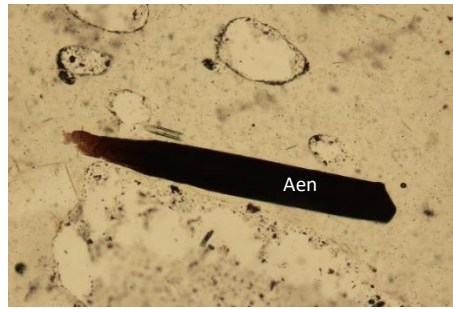


Fig. S5.3 FFD-4 samples. Hand-sample photos and transmitted light petrographic images. Location, volcanic unit and petrographic details of the samples are in Tab. S2.1.

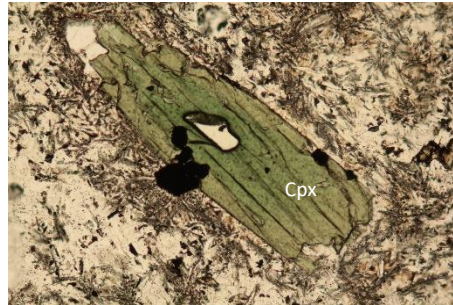


4.8 mm

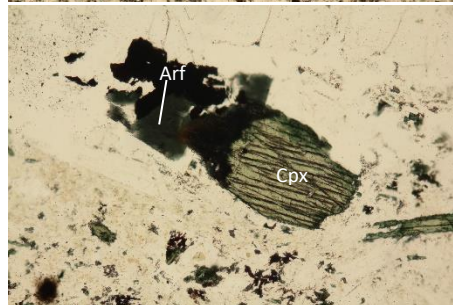
**G22**



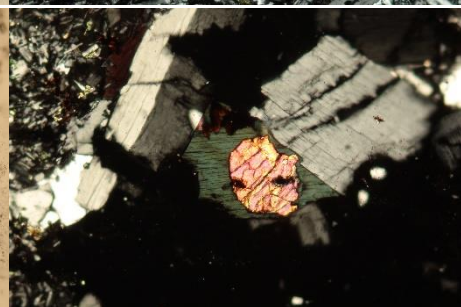
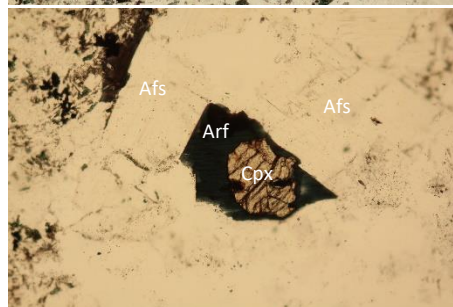
**G2**



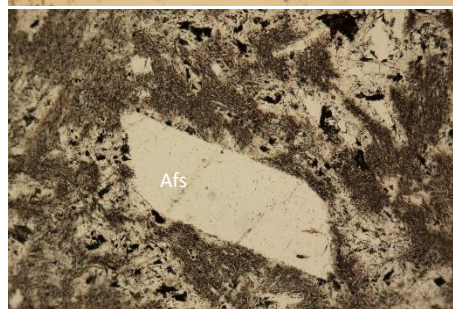
**G18**



**G18**



**G18**



1.2 mm

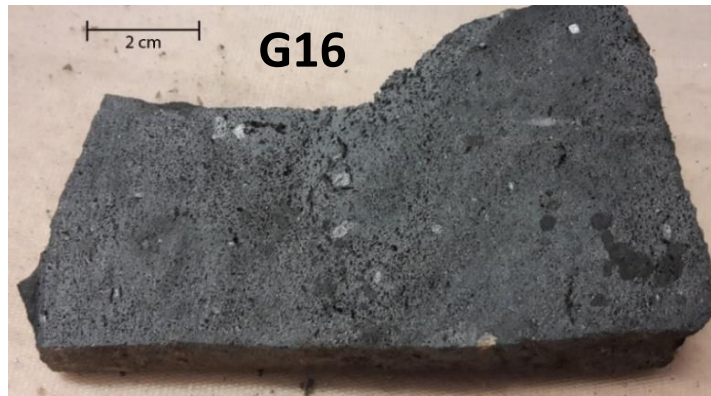


Note:

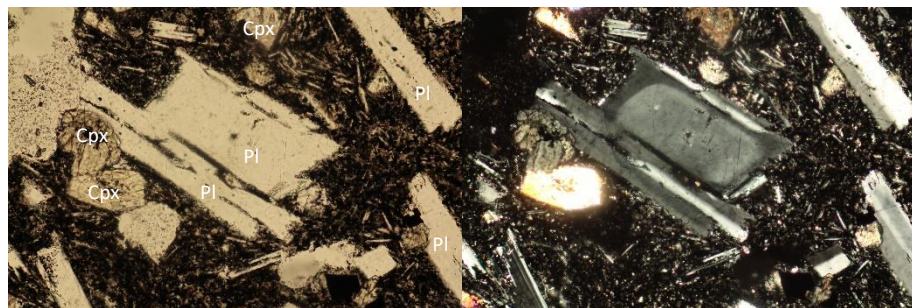
Cpx, Clinopyroxene; Arf, Arfvedsonite; Aen, Aenigmatite; Afs, Alkali feldspar

Fig. S5.4 OMF-3 and RMF-4 samples. Hand-sample photos and transmitted light petrographic images. Location, volcanic unit and petrographic details of the samples are in Tab. S2.1

**a**

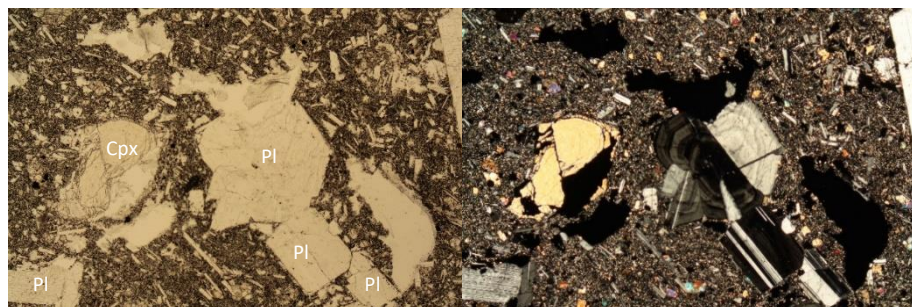


**G16**



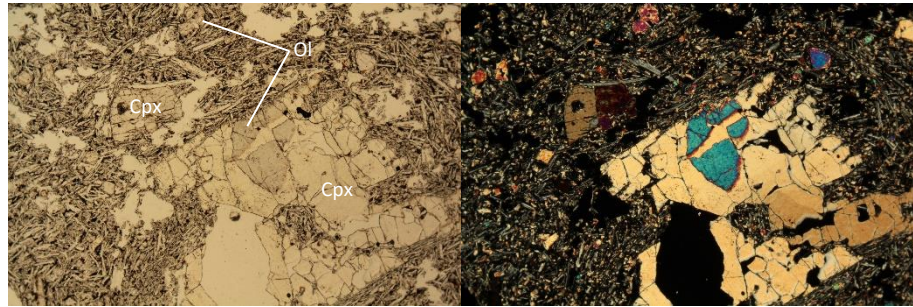
0.6 mm

**K35**



4.8 mm

**K32**



4.8 mm



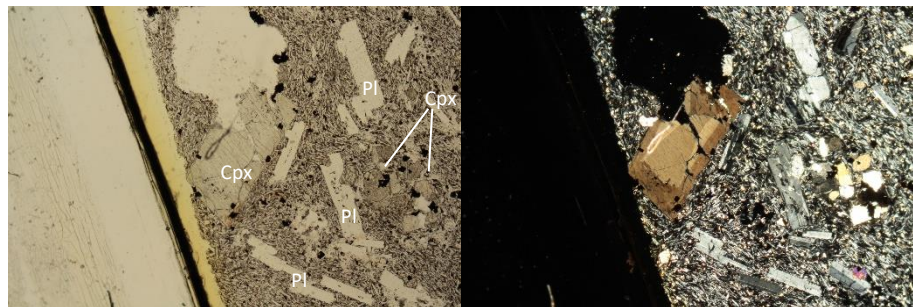
**b**

4 cm

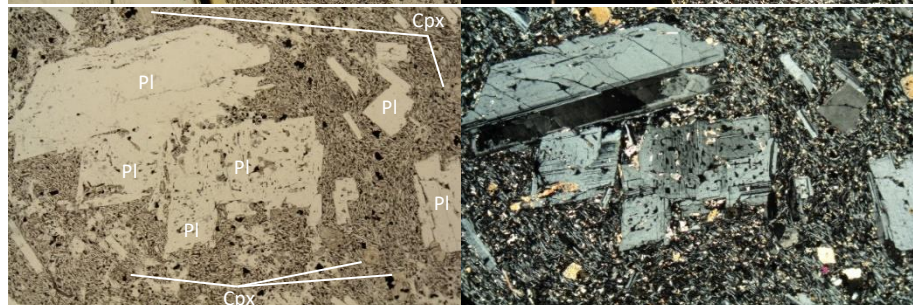
**G19**



**G19**



**G19**



4.8 mm



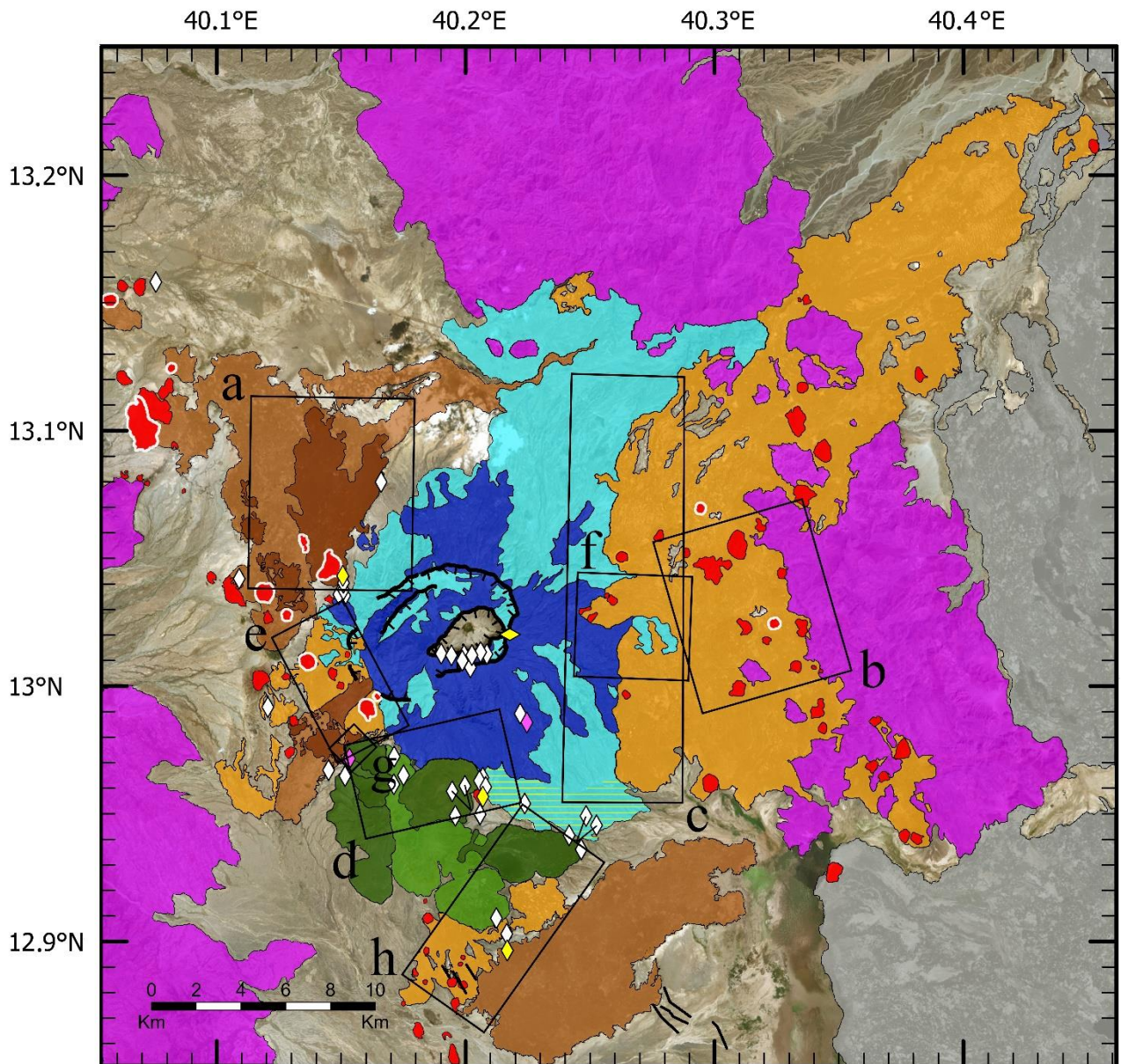
Note:

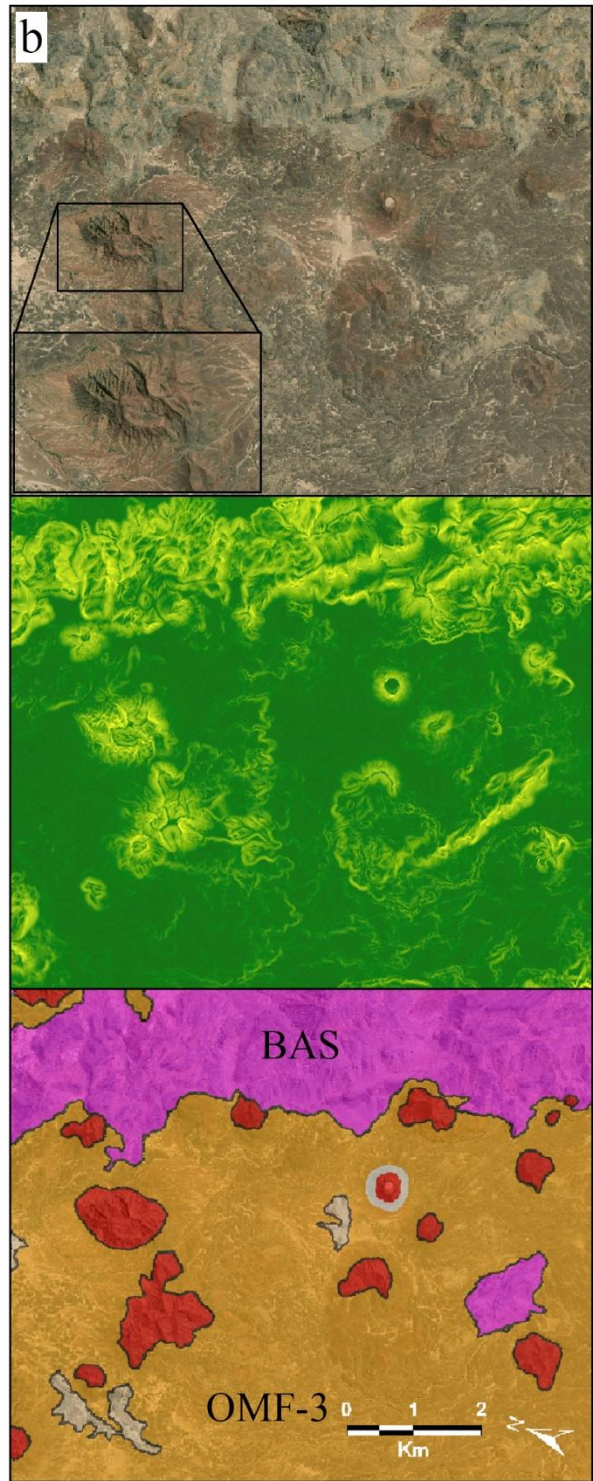
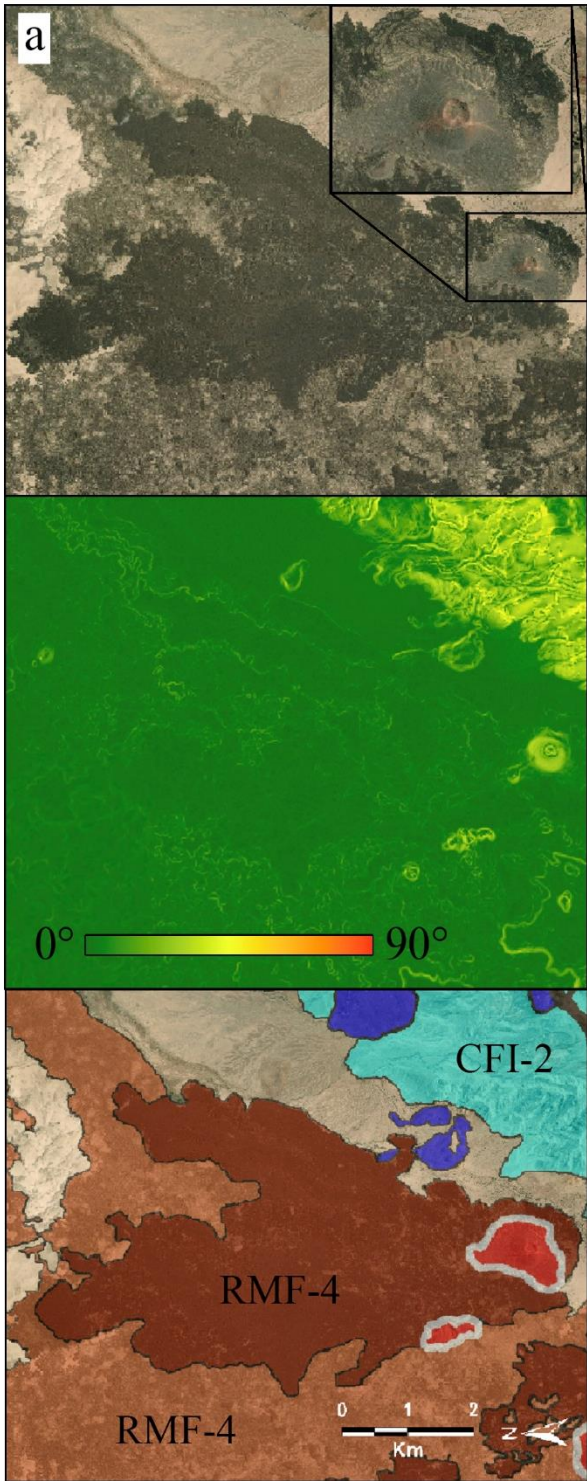
The petrographic images are taken from the respective hand-sample. Cpx, Clinopyroxene; Pl, Plagioclase; Ol, Olivine

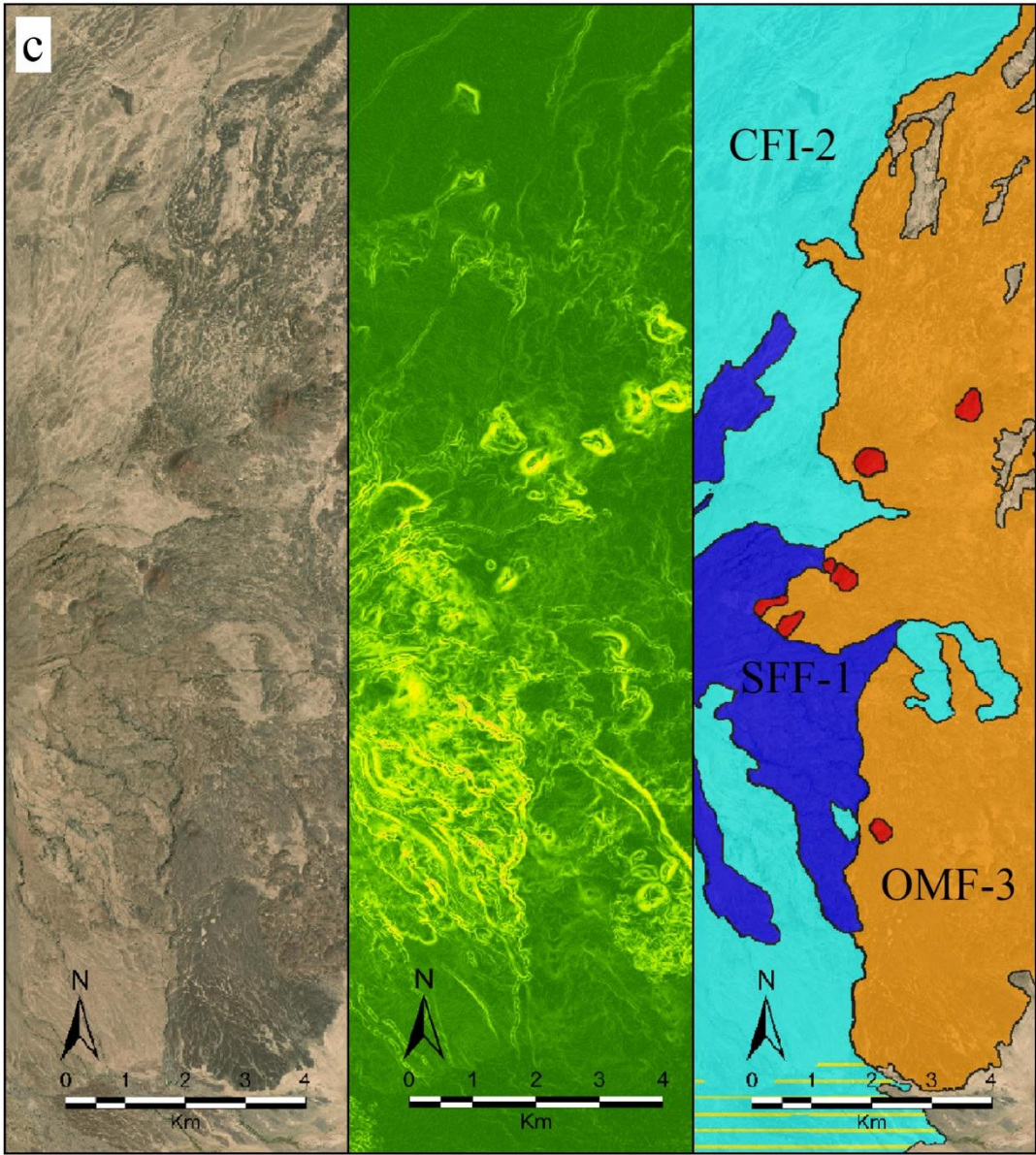
a) RMF-4

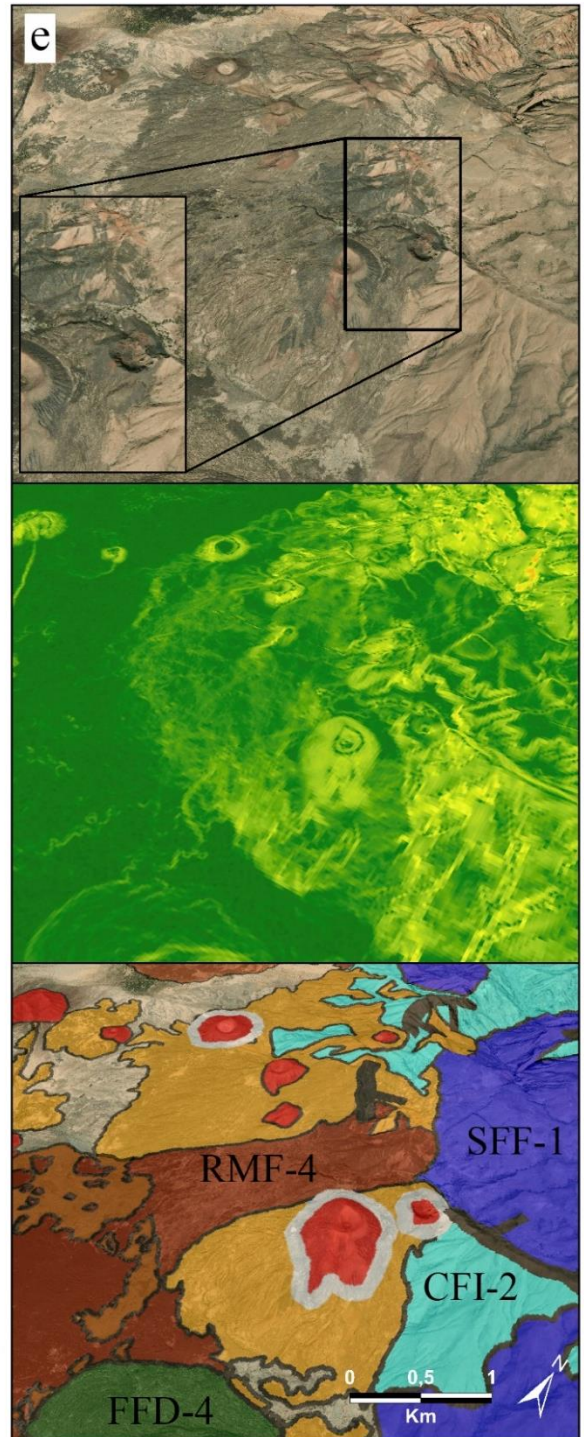
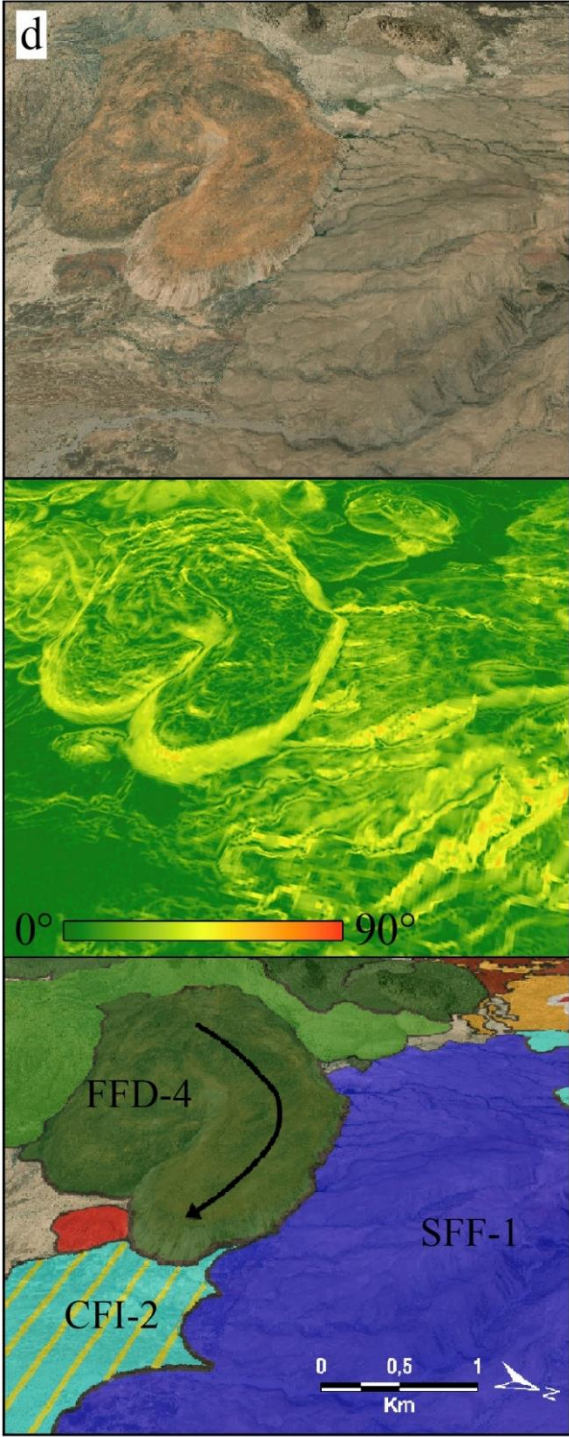
b) OMF-3

Fig. S5.5 Combined set of images including satellite, geological and slope in degrees images used to reconstruct the relative stratigraphy between the MVF deposits.

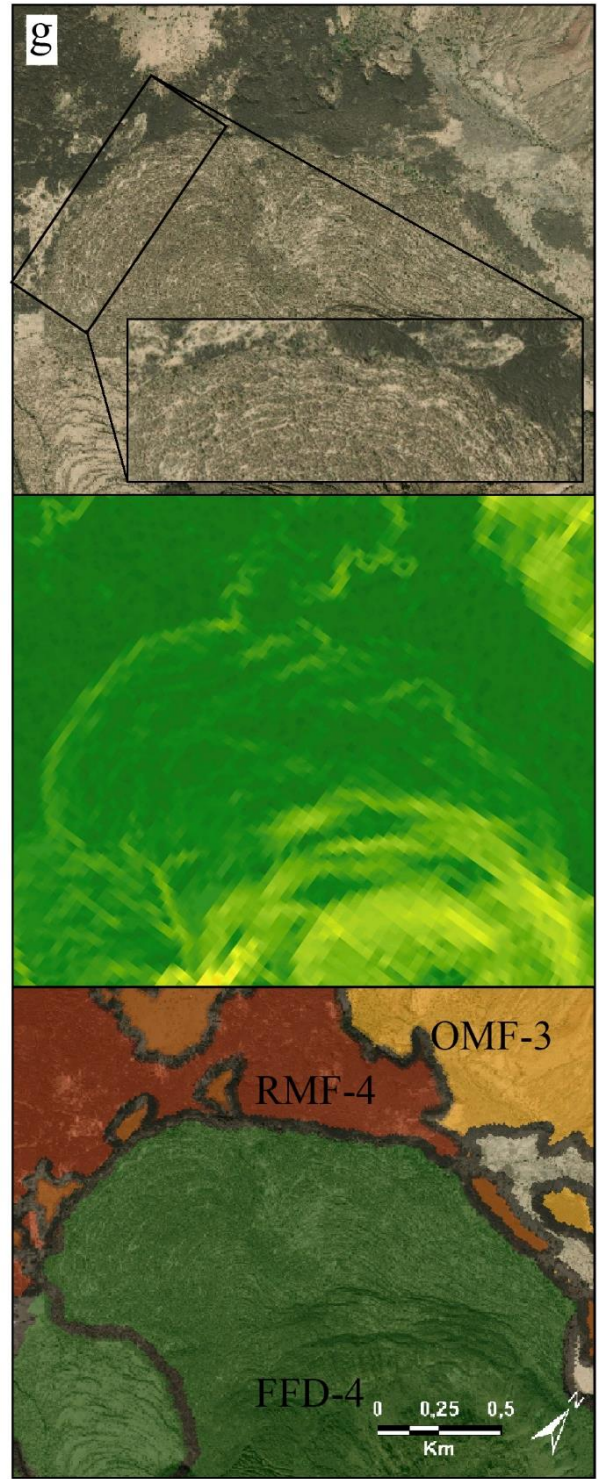
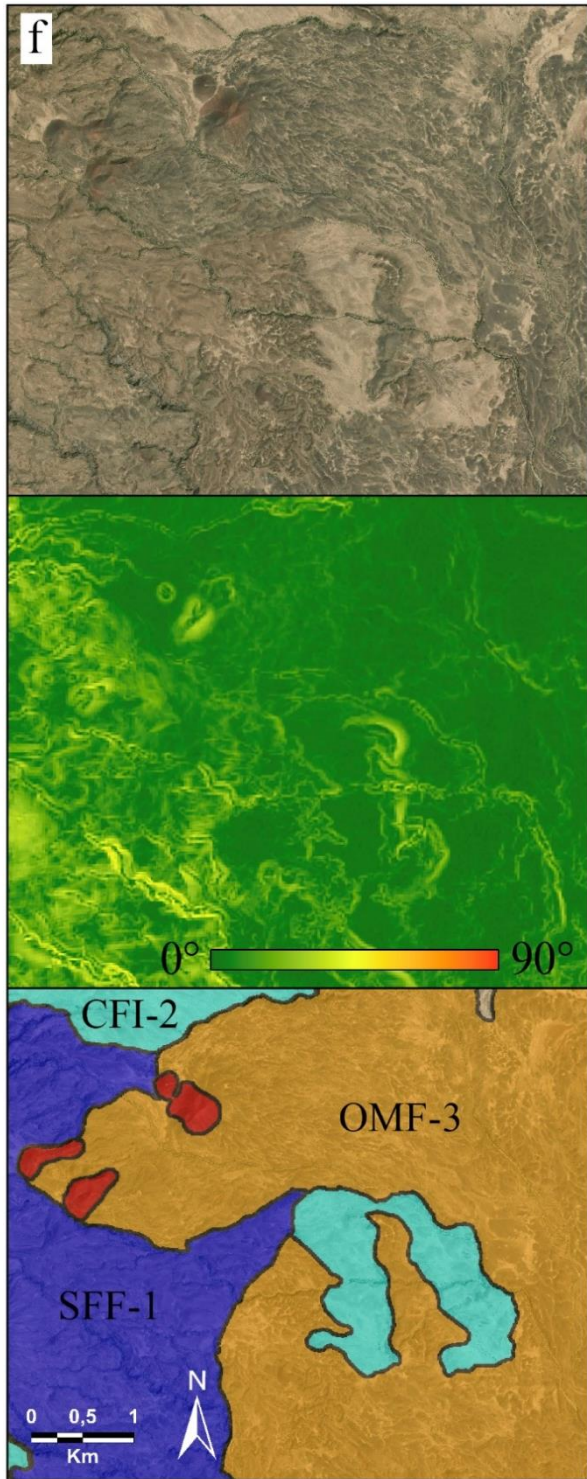












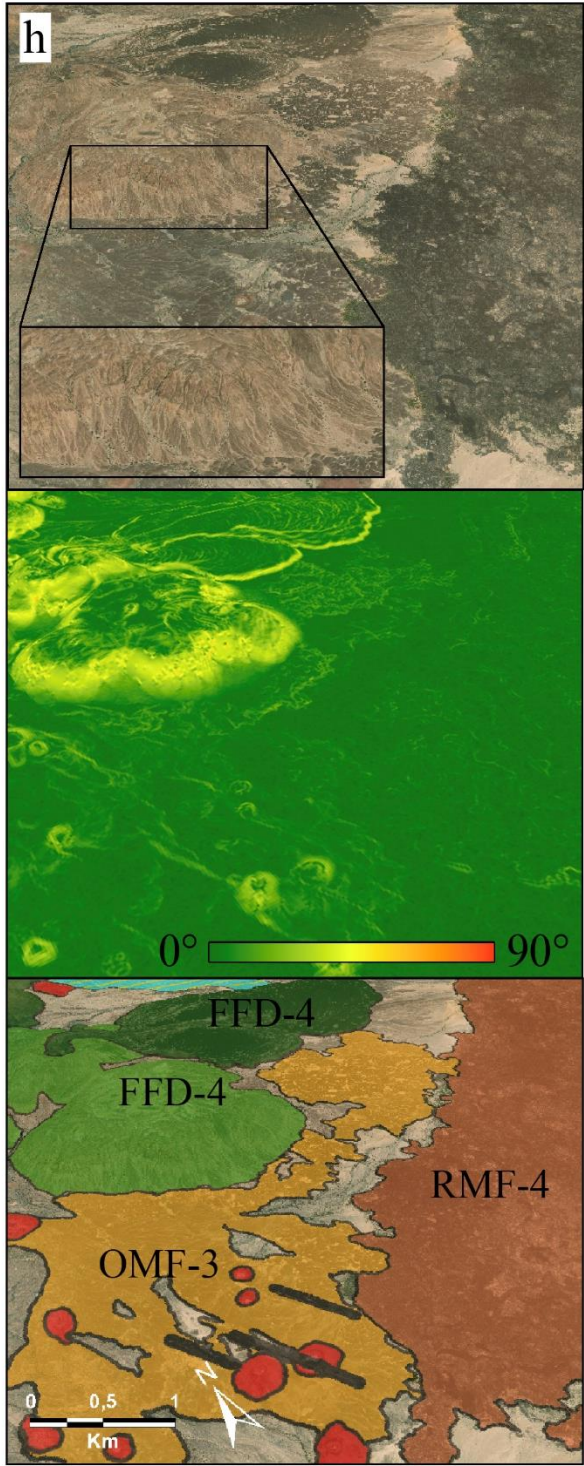


Fig. S5.6 Trace element variations in bulk rocks from the two main phases of Ma'Alalta volcanic field. The Dabbahu volcano whole rocks analyses are from Hutchison et al. (2018).

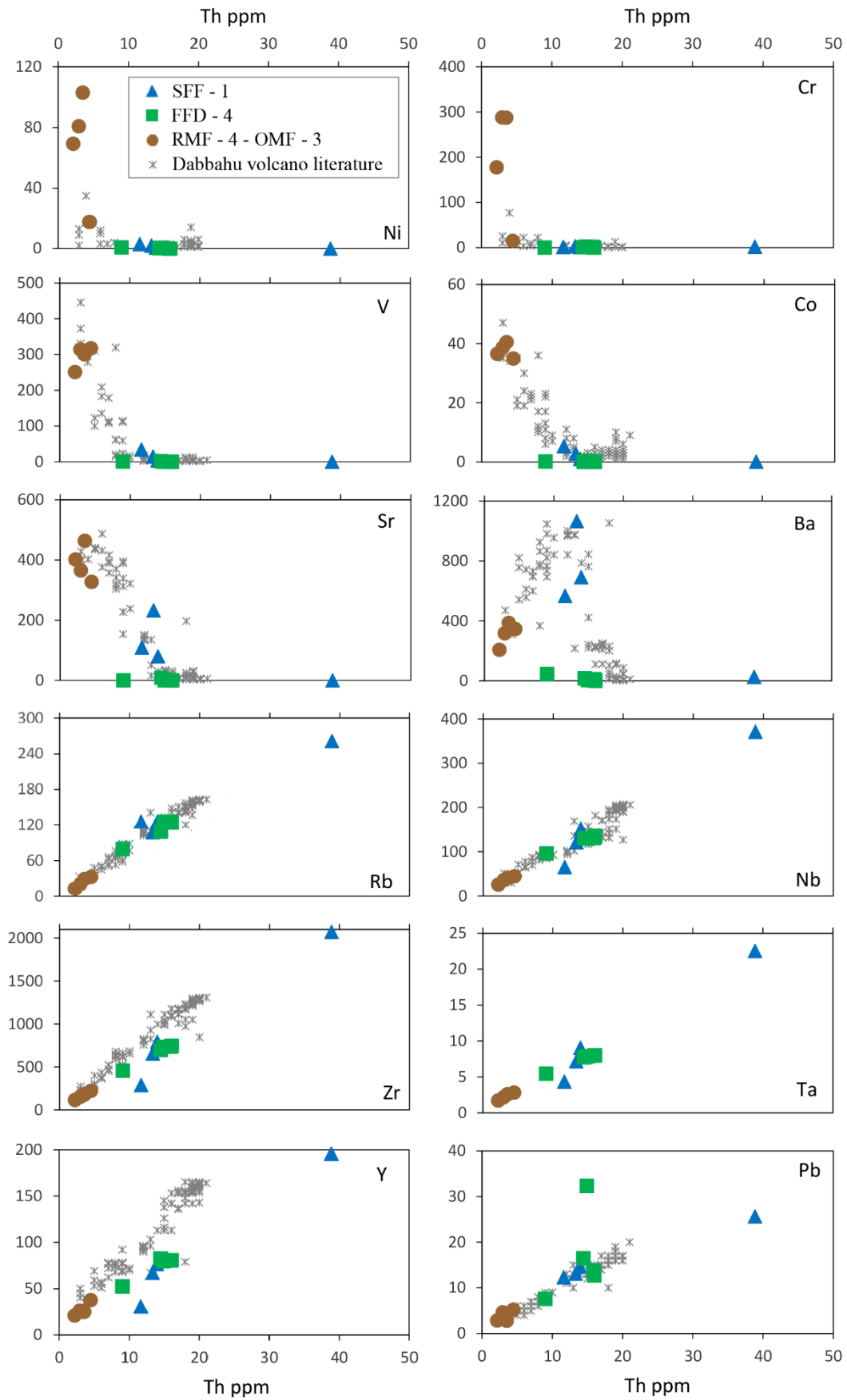


Fig. S5.7 Incompatible trace elements variations in bulk rocks from the two main phases of Ma'Alalta volcanic field. The Dabbahu volcano whole rocks analyses are from Hutchison et al. (2018). Symbols as in Fig. S5.7.

