**ORIGIN AND EVOLUTION OF LINEAMENTS IN NW WAWALAG PLANITIA, STANTON QUADRANGLE (V-38), VENUS.** J. Ounar[1], H. El Bilali[2,3] R.E. Ernst [2,3], J.W. Head[4], N. Youbi[1] [1]Department of Geology, Faculty of Sciences-Semlalia, Cadi Ayyad University, Marrakesh, Morocco; jihaneounar@gmail.com, [2]Department of Earth Sciences, Carleton University, Ottawa, Ontario, Canada; richard.ernst@ernstgeosciences.com, [3]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia, [4]Department of Earth, Environmental and Planetary Sciences, Brown University, Providence, Rhode Island, USA

**Introduction:** In the global stratigraphic framework of [1-2], planitia host volcanic plains and represent the oldest units after the tesserae.

Outstanding questions on lineaments in regional volcanic plains include: 1) What is the origin and sequence of lineaments in the regional plains that make up the planitia?, 2) What is the sense of deformation (e.g., extension, compression, shear)?, 3) Do the lineaments decrease in abundance as a function of time (distribution in older versus younger units)? 4) What is their orientation (particularly in relation to regional structure)?, 5) Do any of these lineaments show radial or circumferential structure that might be linked to potential centres of magmatism [3]? 6) Can we distinguish extensional lineaments related to underlying dykes from purely tectonic extensional structures?

**Wawalag Planitia:** We have selected Wawalag Planitia (Fig. 1) for detailed mapping (1:500,000) in order to attempt to provide insights into the above questions. Wawalag Planitia spans southeast Stanton Quadrangle (V-38) southwest Taussig (V-39), northeast Isabella (V-50) and northwest Imdr Regio (V-51). Of these, only V-39 has been mapped at the quadrangle scale [4]. Preliminary geological mapping results for V-50 are reported in [5-6]. Preliminary mapping results for V-51 are reported in [7].

**Lineament Mapping:** Initial mapping of the portion of Wawalag Planitia in southeast Stanton Quadrangle (Fig. 2) reveals a complex pattern of extensional lineament systems and many of these are provisionally interpreted to represent the surface expression as dyke swarms on the basis of criteria outlined in [3]. Both radiating and circumferential dike swarms have been identified and both types are interpreted to be associated with magmatic centres.

**Observations and Interpretations:** A total of ten magmatic centres have been identified thus far in this map area (Fig. 2). Figure 3 shows that R1 dykes (light blue) radiate from magmatic centre 8 (Fig. 3a, b). The R3 (dark pink) and Q1 (light red) dykes each converge toward a magmatic centre to the north in Jokwa Linea [cf. 8] (Fig. 3c). The R5 (pink) dykes converge toward another centre in Jokwa Linea to the north (Fig. 4d, cf. [8]). Cross-cutting relationships indicate that R3 (pink) dykes are older than R1 dykes (light blue) and thus the magmatic centre in Jokwa Linea to which R3 dyke swarms is linked is older than magmatic center 8 (the source of R1).

Future mapping is focusing on distinguishing the extensional lineaments associated with these features interpreted as dyke swarms, and additional lineaments that are of purely tectonic origin, and placing them in the chronologic context of the global planitia units [1-2]. Future work will cross-integrate the geological history of northern Wawalag (this study) with the detailed history being developed for the adjacent Jokwa linea [8], in order to characterize the relationship between planitia and adjacent linea/groove belts.

**References:** [1] Ivanov, M.A., Head, J.W. (2011). Planet. Space Sci., 59, 1559-1600. [2] Ivanov, M.A., Head, J.W. (2015). Planet. Space Sci., 113-114, 10–32. [3] Buchan, K.L., Ernst, R.E. (2021). Gond. Res. Research 100, 25–43. [4] Brian, A.W., et al. (2005) USGS SIM 2813. [5] Bleamaster, L.F. (2006) 37th LPSC Abstract 2233. [6] Bleamaster, L.F. (2008). Abstr. Ann. Mtng Planet. Geol. Mappers, Abstr.. [7] Lang, N.P., Thomson, B.J. (2020). Planet. Geol. Mappers, abstr 7037. [8] Oukhro et al. (2021) LPSC abst. 1087.

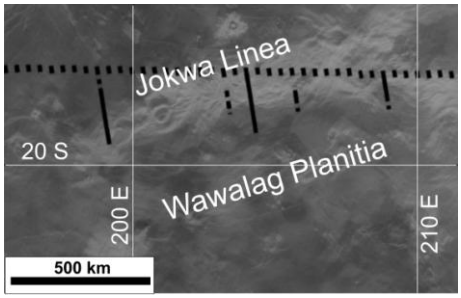
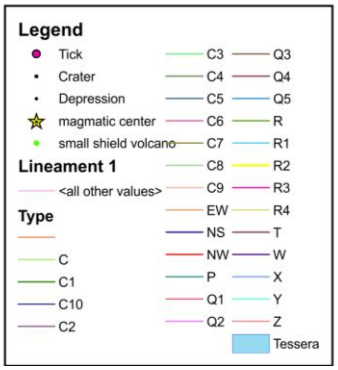



***Figure 1**: Regional location map.*



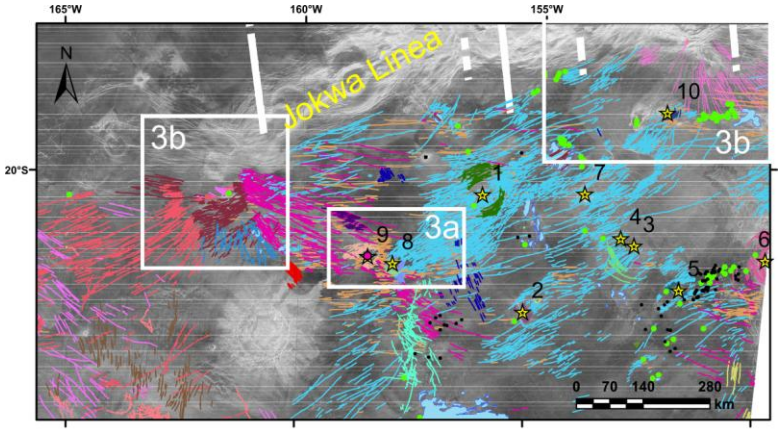



***Figure 2**: Detailed lineament pattern in northern Wawalag Planitia, adjacent to Jokwa Linea (legend above).*

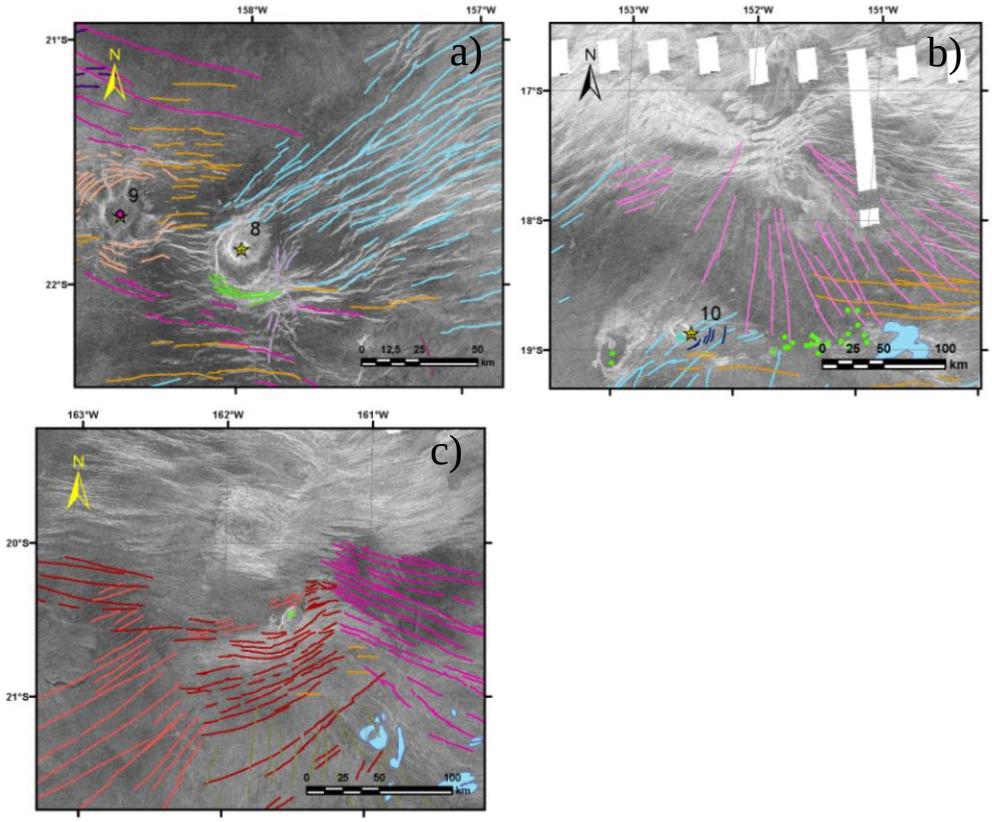



***Figure 3**: a) Dykes (light blue) converge towards center 8. b) Dykes (pink) converge toward a centre in Jokwa Linea to the north. Green dots are small shield volcanoes and blue areas are local lava flows c) Dykes (pink) and (brown) converge toward centers to the north in Jokwa Linea (blue areas are local lava flows).*