

GEOLOGICAL MAPPING OF THE EASTERN PART OF QUADRANGLE V-36: THETIS REGIO, VENUS. E.N. Guseva^{1,2}, A.T. Basilevsky^{1,2} and J.W. Head², ¹Vernadsky Institute, 119991, Moscow, Russia Guseva-Evgeniya@yandex.ru, ²Department of Geological Sciences, Brown University, 02912, Providence, RI, USA.

Introduction: This work is a continuation of the 1:5M geologic mapping of the V-36 quadrangle of Venus that is a part of the USGS planetary mapping project [1]. The mapping is based on photogeologic analysis of the Magellan images and other data gained by this mission. The western half of the quadrangle was mapped earlier and the mapping results were presented in [2]. Here we present the results of the mapping of the eastern part of the quadrangle.

As a result of the mapping were identified and mapped twelve material and three structural units. The material units include (from older to younger): 1) tessera terrain material (tt), 2) material of fractured and ridged plains (pfr), 3) material of shield plains (psh), 4-5) material of plains with wrinkle ridges (pwr) including the lower (pwr₁) and upper (pwr₂) units, 6) material of lineated plains (pli), 7) material radar dark smooth plains (psd), 8) material smooth plains of intermediate brightness (psi), 9) material of lobate plains (plo), 10) material of fractured plains (pf), 11) material of craters having no radar-dark haloes (c₁), 12) and material of craters having clear dark haloes (c₂). The three structural units are: 1) tessera transition terrain (ttt), 2) fracture belts (fb) and 3) rifted terrain (rt).

The oldest (**material**) tessera terrain unit (tt) has a radar-bright surface and is characterized by at least two intersecting systems of ridges and grooves. It forms relatively small outcrops among different plains units which obviously embay it.

The material of fractured and ridged plains (pfr) has a surface with intermediate radar brightness and is characterized by the presence of relatively broad subparallel ridges. Its outcrops are relatively small and embayed by various plains units. In the mapped area the unit pfr shows no direct contacts with the tt unit and their age relations are established based on analogies in other areas of Venus [e.g., 3,4].

The unit of shield plains (psh) has a fragmentary distribution at the northern and south-eastern parts of the mapped area. Its material locally embays the units tt and pfr and is embayed by the unit pwr₁ and by the younger units.

The unit of plains with wrinkle ridges is divided into lower (pwr₁) and upper (pwr₂) subunits, a configuration seen in many other areas of Venus [3,4]. The upper (more radar-bright) subunit obviously covers the darker lower one. The unit pwr is observed in the eastern part of the mapped area where it is locally covered by the smooth and lobate plains units.

The lineated plains (pli) unit is identified by the presence of numerous parallel lineaments that provide intermediate brightness of the unit's surface. The unit pli is distributed at the southern part of mapped area. It embays the plains with wrinkle ridges (pwr) and is embayed by the younger material of the dark smooth plains (psd).

The unit of smooth radar-dark plains (psd) is distributed in small spots in the northern, central and southern parts of the mapped area. It embays the lineated plains (pli) and is embayed by the unit psi.

The unit of smooth plains of intermediate brightness (psi) is distributed mainly in the northwestern, central and southwestern parts of the mapped area. Its material embays the older units and is covered by the material of lobate plains (plo). In the northwestern and central parts of the mapped area the unit psi is cut by structures of rifted terrain (rt). The unit of lobate plains (plo) is rather widely distributed in the mapped area. Here and in the western part of V36 it typically looks less lobate than in other areas of the planet [2,3,4]. The plo plains are usually radar-bright and spatially associated with the rift zones (rt). Material of unit plo embays the older units including the smooth plains of the intermediate brightness (psi).

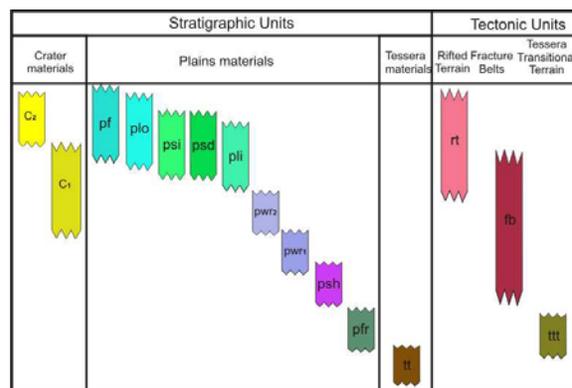
The unit of fractured plains (pf) is identified by the presence of lineaments, which make the surface radar-bright. It is spatially associated with the rift zones. Its structures cut the lobate plains (plo) and are cut by the younger fractures of the rift zones (rt).

The crater units c1 and c2 obviously represent an age sequence [2,3,4]. Unit c1 is represented by five craters, and unit c2, by six.

The oldest **structural** unit: tessera transition terrain (ttt), has rather distinguishable precursor material units: (pfr and pdf) and is cut by the relatively young faults and has an appearance quite close to that of tessera terrain [2,4].

The structural unit of fracture belt (fb) is identified by clusters of linear to arcuate faults. In the mapped area it is observed only in a few small places where it is seen that it is embayed by psh and younger plains.

The youngest structural unit is rifted terrain (rt). It is widely distributed in the mapped area and continues to the east and west of it. The rift faults deform all units mentioned above.



References: [1] Tanaka K.K. (1994) USGS Open File Report 94-438 [2] Basilevsky A.T. & Head J.W. (2008) Ann. Meeting Planet. Geol. Mappers, Flagstaff, AZ, [3] Basilevsky A.T. & Head J.W. (2000) PSS, 48, 75-111. [4] Basilevsky A.T. & McGill G.E. (2007) Exploring Venus As Terr. Planet, Geophys. Monograph Series 176, 23-43.

