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Signs of Life on Venus

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The search for "habitable zones" in extrasolar planetary systems is based on the premise of "normal" physical conditions in a habitable zone, i.e. pressure, temperature range, and atmospheric composition similar to those on the Earth. However, one should not exclude completely the possibility of the existence of life at relatively high temperatures, despite the fact that at the first glance it seems impossible. The planet Venus with its dense, hot (735 K), oxigenless CO_2 - atmosphere and high 92 bar-pressure at the surface could be the natural laboratory for the studies of this type. Amid exoplanets, celestial bodies with the physical conditions similar to the Venusian can be met. The only existing data of actual close-in observations of Venus' surface are the results of a series of missions of the soviet VENERA landers which took place the 1970's and 80's in the atmosphere and on the surface of Venus. For 36 and 29 years since these missions, respectively, I repeatedly returned to the obtained images of the Venus' surface in order to reveal on them any unusual objects observed in the real conditions of Venus.
The new analysis of the Venus' panoramas was based on the search of unusual elements in two ways. Since the efficiency of the VENERA landers maintained for a long time they produced a large number of primary television panoramas during the lander's work. Thus, one can try to detect: (a) any differences in successive images (appearance or disappearance of parts of the image or change of their shape), and understand what these changes are related to (e.g., wind), and whether they are related to hypothetical habitability of a planet. Another sign (b) of the wanted object is their morphological peculiarities which distinguishes them from the ordinary surface details. The results of VENERA-9 (1975) and VENERA -13 (1982) are of the main interest. A few relatively large objects ranging from a decimeter to half meter and with unusual morphology were observed in some images, but were absent in the other or altered their shape.

What sources of energy, in principle, could be used by life in the high temperature oxigenless atmosphere? The objects found are large enough, they are not micro-organisms. It is most natural to assume that, like on Earth, Venusian fauna is heterotrophic, and the source of its life is hypothetical autotrophic flora. There is enough light for flora's photosynthesis.
Since the critical temperature of water on Venus is about 320°C and the temperature at the surface is about 460°C, the metabolism of organisms on Venus (if any) should be built without water, on the basis of some other liquid medium. Based on data analyzed it has been suggested that because of the limited energy capacity of the Venusian fauna, the temporal characteristics of their physical actions can be much longer than that of the Earth.