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# Signs of Hypothetic Fauna and Flora on Venus and their Characterization

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## Abstract

Transmission of TV images is a commonly used modern method in both space research of celestial bodies and the search for extraterrestrial life in the solar system. In 1982 experiments in television photography instrumented by the Soviet VENERA-13 and VENERA-14 landers, returned panoramas of the Venus surface at the landing site. Over the past 33 years, no similar missions have been sent to Venus by any space agency, mainly due to the reason that the experiments were of extreme technical complexity. Analysis of treated once again VENERA panoramic images revealed objects that might indicate the presence of hypothetical forms of Venusian flora and fauna. Among them is 'amisada' that stands out with an unusual shape against the stone plates surrounding it. The 'amisada' can be included into the list of the most interesting findings of the hypothetical Venusian fauna. Among hypothetical fauna entities of Venus, certain unusual findings that have similar structure were found in different areas of the planet. Their unusual shape was repeated on various panoramas that were taken by landers' cameras and have attracted attention.

'Stems' objects possess apparent terramorphic features of Earth-like floras. 'Stems' are thin vertical trunks that have a thickness of 0.3-3 cm and are 0.1 to 0.5 m in height. On close objects, one can see that the 'stem' at the top end is provided with a large bulge, a "burgeon" or "flower" that is 2-8 cm in diameter, with "petals" surrounding a bright center. At the base of the 'stems', there are features that resemble leaves in a quatrefoil. Probably, 'stems' are widespread on the planet, because found at the different sites. The terramorphic features of the hypothetical fauna and flora of Venus, if they are confirmed, may point out at outstandingly important general laws of the animated nature. Some data on physical settings on Venus are applied together with a hypothesis on photosynthesis used by Venusian flora.

**Keywords:** Planet venus; Hypothetical fauna and flora; VENERA missions; Astrobiology; Space vehicles instruments; Planet's surface

## Introduction

### Some data on the VENERA experiments

Returning of TV images is a commonly used modern method in both space research of celestial bodies and the search for extraterrestrial life in the Solar system. Nowadays, this method is intensely applied, e.g., for investigating the planet Mars. However, using the TV method, already 40 years ago, the Venusian surface was studied by landers of the VENERA missions. In 1975, two modules landers of the Soviet VENERA series (missions VENERA-9 and -10) landed on the surface of the planet Venus. The TV investigation of the planet surface was one of the most advantageous experiments executed on the planet's surface. Seven years later, in 1982, the VENERA-13 and VENERA-14 landers performed even more advanced studies. These experiments were aimed at studies of the most general features of the planet's surface. At that time, nobody considered to search for traces of life in the Venusian carbon dioxide atmosphere free of oxygen, at a pressure of 9.2 MPa and temperature of 735 K. Nevertheless, now it is not possible to exclude the possibility that TV images obtained 41 and 34 years ago, processed anew on the basis of modern codes, might indicate the presence of hypothetical forms of Venusian flora and fauna [1]. Notes on both the optical and mechanical peculiarities of the TV cameras installed on the VENERA landers and the experiments performed were presented in [2]. According to the authors of the TV-experiments (Dr. A. Selivanov and Yu. Gektin), the idea to obtain and return images of the Venusian surface was originally put forward by the President of the Academy of Sciences of the USSR academician M. Keldysh on March 1 and 5, 1982, experiments in television photography instrumented by the landers VENERA-13 and VENERA-14, yielded 37 panoramas (or their fragments) of the Venus surface at the landing site. Over the past 34 years, no similar missions have been sent to Venus by any space agency. In connection with the renewed interest in what was occurring during the experiment and to the discovery of manifestations of possible life revealed on some of the pictures, the panoramas were re-examined.

The quest for hypothetical flora and fauna on Venus is based on analysis of the images of the landing site of the VENERA-13 and VENERA-14 landers. Due to the availability of up to eight duplicates of the images obtained and their low level of masking noise, the VENERA panoramas permit identifying and exploring some new types of hypothetical life forms of Venus.

The first group of publications that related to hypothetical signs of life on the planet Venus refers to data that was obtained by the VENERA-9 and VENERA-13 landers [1]. The results of a series of Soviet VENERA missions are the only existing observations of Venus' surface. The experiments were of extreme technical complexity (Figure 1).

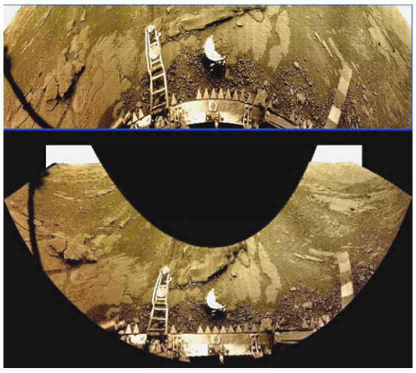

**Figure 1:** Planet's surface at the VENERA-13 landing sites. At the lower panel geometric distortions are corrected.

The special issue of "Kosmicheskiye Issledovaniya" ("Space Research"), V. XXI, No. 2-3, 1983, presented the main results of the VENERA-13 and -14 missions. The methodology of the television experiments on the surface of Venus and the date and list of the experimental data have been discussed in detail in [1,2] and are not repeated here. Some remarks on the critical features of the treatment used are given below. The lander VENERA-13 (March 1, 1982) worked longer than the others (127 min.) The coordinates of the lander landing site were 7.5°S, 303.5°E, and its height above the level of radius 6051 km was 1.9 km. The temperature was 735 K (462°C) and the pressure was 8.87 MPa, which corresponds to the atmospheric density 59.5 kg/m3, with the composition $CO_2$ (96.5%) and $N_2$ (3.5%). The local time was 10:00 am, and the solar zenith was at an angle of 37°. Illumination by the diffused sunlight was 3-3.5 kLux.

The lander VENERA-14 (March 5, 1982) sank at the equatorial zone at 13°S, 310°E, and the landing site's height was 1.3 km above the radius of 6051 km. The measured physical conditions were as follows: temperature 738 K, pressure of 9.47 MPa and atmospheric density approximately 65 $kg/m^3$. Gas analyzers repeated that the atmosphere is composed almost entirely of $CO_2$ (96,5%) and $N_2$ (3.5%). Local time was also at approximately 10 am, with a solar zenith angle of 36°. The scene illumination reached 3.5 kLux [1,3]. In both cases, VENERA-13 and -14, the transmission of images began with a one minute delay after landing, to prevent dust on the optical surfaces.

Information on the planet surface at the landing site, its geology and physical properties of the surface at the VENERA -14 landing site (March 1982) were presented in [4,5].

A view of the planet's surface at the VENERA -13 landing site is shown in Figure 1. In the VENERA -13 case, the view was crushed soil with stone slabs, and in the VENERA -14 case, it was plates of lithified deposits or traces of ancient volcanic eruptions.

At the time of this writing, four years have elapsed since the submission of the first manuscript for publication that was devoted to hypothetical signs of life on the planet Venus. Discovered new objects have gradually been accumulated. These objects hypothetically have characteristics of living creatures - flora or fauna. At the initial stage of the investigation, mainly panoramas of VENERA -9 and - VENERA -13 were used, in which relatively large objects were found, such as "scorpion", "mushroom", "bear-cub" and "owl" [1]. When experience using image processing was accumulated, the VENERA-14 panorama allowed an approach to the finer details. An important role was played by additional image processing, image geometric correction and the presence of up to eight duplicates of images that were obtained with good quality and low levels of noise. This arrangement enabled the selection and staking of their fragments. As a result, it managed to find and learn about a few new types of hypothetical living creatures at the VENERA-14 landing site.

## Chemistry and physics of the atmosphere and the surface at the landing site

Obtained either *in situ* or in distant measurements, the limited data on the nature of minor constituents in the atmosphere of Venus do not make it possible to draw definite inferences concerning the chemistry of the planet troposphere. According to current concepts, the atmosphere at the altitude range of 0–49 km does not contain much aerosol; a visibility of the surface is restricted mainly by Rayleigh scattering. Although it is not uniform, high transparency of the atmosphere close to the Venusian surface was observed in all *in situ* experiments. Inasmuch as the physical conditions for water on the planet are supercritical, Earth-like water-based precipitates have to be ruled out.

During the years of intense research on the planet by the VENERA and Pioneer Venus probes, some very important publications on the thermochemical cycles of interaction between the atmosphere and the surface of Venus appeared. Venus' surface is 5–20 times richer in sulfur as compared with the Earth. Because of the huge mass of the atmosphere, its dynamic features, and lack of seasonal effects, local variations of the temperature at the planet surface at a given altitude are negligible and, in fact, represent a natural thermostat.

On top of ~0.965 $CO_2$ and ~0.035 $N_2$, the gas environment at the VENERA-13 and VENERA-14 landing sites includes the following minor consituents: $1.5\times10^{-4}$ $SO_2$, $2\times10^{-5}$ $H_2O$, about $2\times10^{-5}$ $O_2$, traces of COS, chlorides ($0.4\times10^{-6}$ HCl) and fluorides [4,6-8]. There could be also traces of metals in the gas phase [9].

Following completion of the VENERA 9 and 10 lander missions, Gektin and Panfilov, the television experiment co-authors, were among the first researchers who considered models of the thermochemical equilibrium of the gaseous components in the Venusian atmosphere within the range from the surface to the altitude of 30 km [10].

More than 180 equilibrium chemical reactions between small components of the atmosphere were regarded, including NO, $NO_2$, $SO_2$, $SO_3$, COS, $H_2S$, $CS_2$, $NH_3$, CN, $C_2N_2$, etc. As to other Russian publications of the period, Volkov should be noted [11]. Using the available data on the atmospheric and surface compositions, as well as the physical conditions on the planet, he formulated the chemistry of many natural processes on Venus. The researcher points out that the near-surface part of the troposphere is in a state of a high-temperature chemical equilibrium with the surface rocks, and the redox activity of the surface is determined by the solid phase mineral buffer 'pyrite–anhydrite–magnetite' that is independent from the amount of silicon, aluminum, and iron in local rocks. Volkov suggested some basic scenarios of the Venus high-temperature atmosphere-surface chemical interactions, which include, for example, the following reaction:

$$3FeMgSiO_4+CO_2=3MgSiO_3+Fe_3O_4+CO$$

(olivine+carbon dioxide=enstatite+magnetite+carbon monoxide), as well as its various options.

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During the same period, a number of other writers also considered possible scenarios of the atmosphere-surface interactions [12,13]. The latter paper examined some processes of rock weathering: in particular, the reaction between mineral fayalite $Fe_2SiO_4$ and carbonyl sulfide COS, a minor atmospheric component:

$Fe_2SiO_4+4COS<==>2FeS_2+SiO_2+Fe_3O_4+2CO_2+2CO$

With the reaction shifting to the right at lower temperatures. In other words, pyrite $FeS_2$ proves to be stable in mountains. Of course, it would be naive to expect that all the basic chemical chains could be established at this early stage of research. No inferences concerning possible phase transitions of the compounds near the surface, at the temperatures of 730 K, were found in the aforementioned (or subsequent) publications.

Interesting results were obtained during the MAGELLAN mission; its radar experiment made it possible to map almost the entire planet's surface [14]. In 1995, intense reflectivity areas were found both in the mountainous surroundings of Lakshmi Planum and at Maxwell Montes (containing the highest peak of Venus). An examination led to a hypothesis of precipitation falling in these mountainous areas (the altitudes corresponding to the temperature range of 650-700 K [15]. It is on record that high reflectance properties may pertain to soils with a high dielectric constant and high electrical conductivity, as well as to an intensely fragmented surface. The hypothesis of precipitation, however, has got a better theoretical support. It is assumed that pyrites, tellurium, and metal sulfides (in particular, sulfides of lead and bismuth) can change their phase state at these temperatures [16]. Nevertheless, no suggestions have been offered about the agents with the phase transitions at the level close to the planet's mean radius (6051 km).

An appealing observation was made in [5]. The instrument for measuring soil mechanical properties had a built-in system for measuring the electrical conductivity of the soil. After the VENERA-13 landing, the steady state value of resistance in the circuit of the probe sensor that penetrated into the soil was about $2\times10^6$ Ohm, and then (at the 59th min) it dropped dramatically to $3.6\times10^3$ Ohm. Next, the resistance grew up slowly to its original value. At the VENERA-14 landing site the probe sensor showed the value of resistance $4\times10^3$ Ohm that didn't change significantly for 1 hour. It can be suggested that the observed changes in conductivity at the VENERA-13 landing site are associated with a contact properties between the sensor and soil. Chemical composition of the soil at the landing site is quite close to that of the Earth' tholeitic basalt [6] shown in Table 1.

| **Oxides Content** | **Content** | |
|---|---|---|
| | **VENERA-14,%** | **Tholeitic basalt,%** |
| $SiO_2$ | 48.7 ± 3.6 | 50.6 |
| $TiO_2$ | 1.25 ± 0.41 | 1.2 |
| $Al_2O_3$ | 17.9 ± 2.6 | 16.3 |
| FeO | 8.8 ± 1.8 | 8.8 |
| MnO | 0.16 ± 0.08 | 0.2 |
| MgO | 8.1 ± 3.3 | 8.5 |
| CaO | 10.3 ± 10.2 | 12 |
| $Na_2O$ | 2.4 ± 0.4 | 2.4 |
| $K_2O$ | 0.2 ± 0.07 | 0.1 |
| S | 0.35 ± 0.28 | 0.07 ± 0.01 |
| Cl | < 0.4 | 0.01 |

**Table 1:** Chemical composition of the soil at the VENERA-14 landing site.

The chemistry of the atmosphere and the surface of Venus is studied by many researchers [8] of importance is a question about the sources of energy for the hypothetical Venusian inhabitants. The interest in the hypothetical autotrophic flora of the planet as a source of the existence of its fauna was noted in [1,17]. It is natural to assume that like on the Earth, the Venusian fauna is heterotrophic, and the source of its existence is hypothetical autotrophic flora. Although the direct rays of the Sun, as a rule, do not reach the surface of the planet, there is enough light for photosynthesis of the Earth-like type there. In the case of the Earth, a diffuse illumination of 0.5-5 kLux is sufficient for photosynthesis even in the depths of the dense forests. The measured illuminance on Venus is of the same order, at the range of 0.4 to 9 kLux. of course, photosynthesis at high temperatures and in a non-oxidizing environment should be based on a completely different, unknown biophysical mechanism (Figure 2).

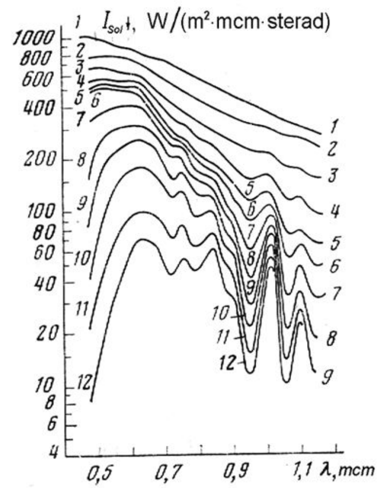


**Figure 2:** Scattered solar radiation spectra measured by the VENERA-14 spectrometer in the atmosphere and at the surface [6]. 1 - above clouds, 2 – at 62 km altitude, 3 – 55, 4 – 52, 5 – 49, 6 – 40, 7 – 25, 8 – 16.5, 9 – 10, 10 – 4.5, 11- 1, 12 – 0 km.

The day illuminance reached 3.5 kLux [1-3] and even attains 5-8 kLux. Very special is spectral composition of illumination (Figure 2) that is connected directly with a content of this paper. The atmosphere absorbs blue rays and the sky is of a yellowish color. The solar disk is hardly distinguished through the permanently present high-altitude cloud layer (above 50 km level). The cloud layer is formed by micron-sized droplets of concentrated sulfuric acid. The daytime and nighttime durations are 58.4 Earth days each.

The known requirements of the terrestrial type photosynthesis to the spectral features of the absorbing radiation is difficult to reconcile with the measured spectral distribution of solar radiation at the surface of Venus (the vertical scale is logarithmic) (Figure 3).

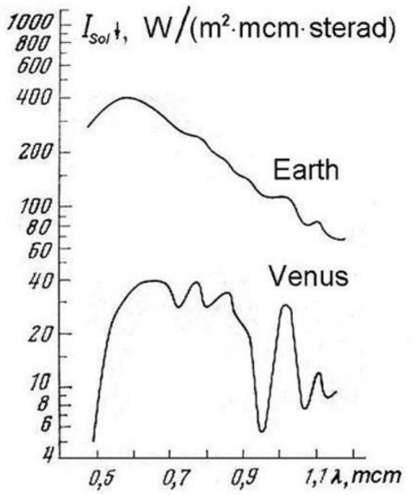


**Figure 3:** Intensity and spectral distribution of the solar radiation at surfaces of Earth (clean sky) and Venus.

The data were obtained in spectral experiments on VENERA-14 lander [3]. The shortwave optical radiation in the range 410-500 nm is suppressed almost completely by the planet's atmosphere. Illumination in the orange-red region (600-720 nm) reaches 5-7 kLux and by its intensity is well sufficient for Earth type photosynthesis (Figure 4).

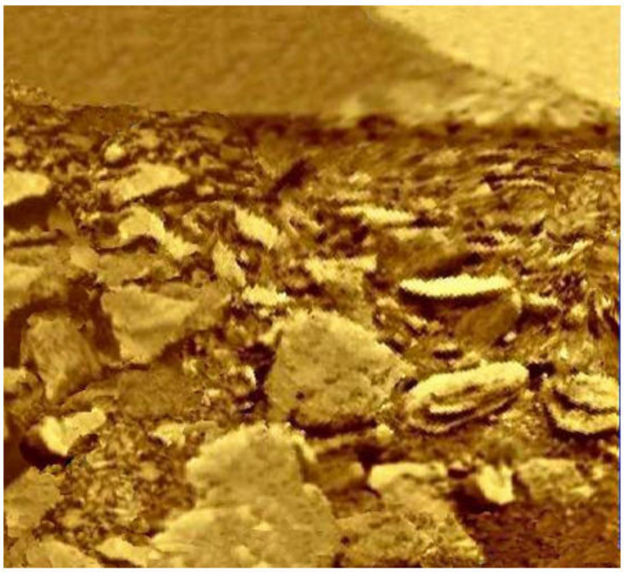

**Figure 4:** Image of the planet's surface based on VENERA-9 panoramas of the landing site (1975) in modern processing.

In the near-infrared illumination on Venus is high also, but drops sharply at a band of water vapor (0.93 microns).

The typical Venusian landscape is a waterless hot stones (Figure 4), or friable flat desert, sometimes with mountains or even volcanoes.

## Hesperas and 'stems' as hypothetically identified objects of venusian flora and fauna

As was noted many times, identification of various objects on the surface of Venus as examples of Venusian flora and fauna is hypothetical, and the (current) names proposed for them, such as Scorpion, Bear Cub, and others, remain conditional. For the sake of convenience, we have proposed for all objects of hypothetical fauna the general term "hesperas" (originating from the ancient Greek name of Venus), and the term 'stems' for plants (objects of Venusian flora), respectively. The term "hespera" was already exploited in [1]. However, to avoid a misunderstanding, for the hypothetical entities described there, we offer to apply the term "hespas". We cannot state that all the hesperas and 'stems' available on panoramas of the Venusian surface have already been found. But all large size and intermediate-size objects, with minor exceptions, have already been presented in our publications. In particular, an exception is the hespera on the VENERA-14 panoramas, which resembles a small open elongated snake (similar to that described in [18,19]). On subsequent images, the position of the snake varies. Unfortunately, the open snake is located at a distance exceeding that of the close hespera 'amisada'. Therefore, it is hard to present its convincing images. There are also several unidentified objects still analyzed (Figure 5).

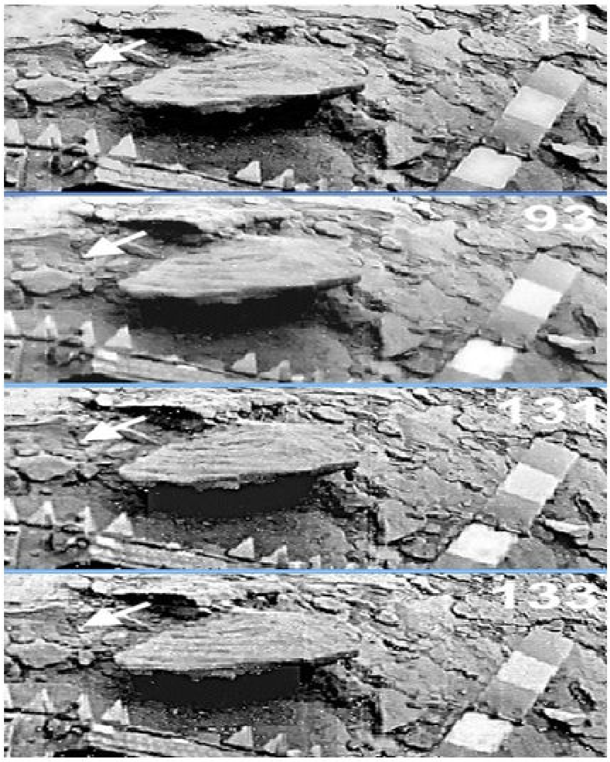


**Figure 5:** Unprocessed fragments of the image surface of the planet at the landing site of VENERA-14. 'Stems' are shown by arrows.

The sections 4 and 5 address the objects of the hypothetical Venusian fauna. However, before it, is important to show, as an example of detection, a 'stem' on the VENERA-13 and -14 panoramas.

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### 'Stems' at the landing buffer of the VENERA-14

As for flora, what was found are numerous vertically standing knotty black 'stems' with heights of up to half a meter. Specifically, 'stems' are the most numerous group of samples of hypothetical flora. The first 'stems' object was detected due to its being close to the entrance of the TV camera, and the remaining were detected by similarities in their shapes and positions to the first 'stem'.

In input images, a 'stem' resembles just a thin scratch, but it is repeated at all panoramas and in the same place (Figure 5). When processed the 'stems' are vertically arranged thin knotty trunks, which are 0.3-2 cm thick and 0.2-0.5 m tall. On color panoramas, they look black. The first 'stem' object that was detected (Figure 6), has a large bulge at the top end, a "burgeon", with a lighter center.

Below are other 'stems' shown where the "burgeon" is observed in development. The 'stems' (Figure 6) is located close to the camera. At the 'stem's' base, on the surface, there is a visible group of details that resembles a quatrefoil. Each of the "leaves" has a size of approximately 5-10 cm, and possibly, they have a radial structure. In the vicinity of VENERA-14, the number of 'stems' at the panorama is approximately eight. All of the 'stems' are placed vertically, with the exception of one of the largest, which bends to the surface.

**Figure 6:** The first found 'stem' is a thin vertically arranged knotty trunk that has a height of approximately 42 cm and a thickening ("burgeon") on the top. The 'stem' is located at a distance of approximately 40 cm from the landing buffer of the VENERA-14 lander and is seen from above. Bottom: a sample of an earthly cruciferous plant.

To find the height z of the 'stem' in Figure 6, one should use geometric relations and a photoplan (because, on the original panoramas, the distances are significantly distorted). A photoplan of the landing site of VENERA-14 is not shown here. The input window of the TV camera is located at a height of h=90 cm, the distance a from the projection point of the TV-camera lens onto the surface, to the base of the 'stem' is approximately 40 cm, and the top of the 'stem' is projected onto the surface details, roughly at the distance of b=75 cm. If the stem is placed vertically; from the right triangle, then the angle $\alpha$ at its apex is found to be $\text{tg}\ \alpha=b/h$, and the 'stem' height is $z=(b-a)/\text{tg}\ \alpha=42$ cm. An error is possible as the ground surface is uneven (Figures 7 and 8).

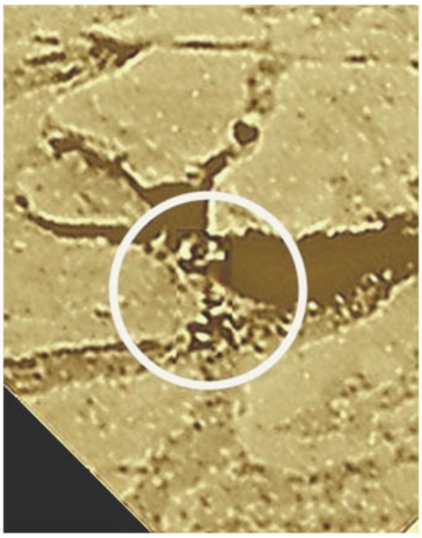

**Figure 7:** Processed image of the landing site of VENERA-13: a 'stem', "quatrefoil" at its base and the opening "burgeon", crowning the top of the 'stem'.

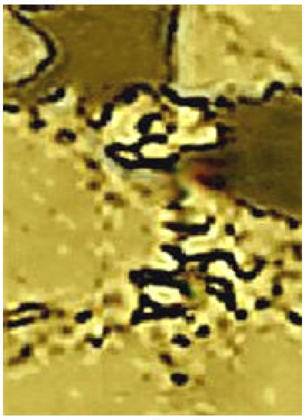

**Figure 8:** Flower - the same object as in Figure 7, with lowered contrast and detailed image of the "flower" with light central part and leaves at the base. The diameter of the flower and the "quatrefoil" at the base are 5-8 cm.

To search for other 'stems', an additional processing of the VENERA-13 and -14 panoramas has been made to improve the clarity of the details. All of the 'stems' that were found are solitary. Unlike VENERA-14, at the VENERA-13 landing site, only one or two such objects were found. The synthetic color panorama was used to obtain some information about the colors of the objects. In all of the cases, the bases of the 'stems' were located in crevices between stones.

A picture of the VENERA-13 'stem' is highlighted by the circle in Figure 7. There are eight distinct images (duplicates), which allows for batch processing. The object is visible from above, and its height, which is found by its position on the photoplan, is only approximately 20-30 cm at the base in the crack between the stones.

It has been suggested that the complex structure of the top of the 'stems' is an opened burgeon. When processing the image with a decreasing contrast, this assumption was confirmed and allowed us to see the whole "flower" of a regular shape (Figure 8), with a white spot (pestle?) in the center and six to eight light petals surrounding. For more details and other 'stems' [20] (Figure 9).

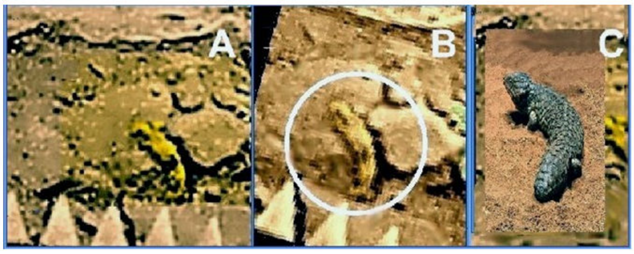


**Figure 9:** (a) Amisada climbing up a stone, (b) stacking of 6 original fragments of VENERA-14 panoramas, (c) sluggish Australian Shingleback lizard whose size and shape resemble the amisada.

## Amisada

The most interesting novel recognized hypothetic object related to hesperas is the spotty object nicknamed 'amisada' that turned out to be close to the input window of the TV camera. The conditional term 'amisada' originates from the shortened name Ammizaduqa of the Babylonian king (sixteenth century BC). At that time, ancient astronomers registered on ceramic tables the time of morning and evening elongations of Venus.

The shape of the amisada resembles a lizard climbing up a barrier. The spotty amisada is, apparently, seen in motion. Seemingly, It is climbing up or creeping on a 5-8 cm stone. The upper part of amisada is located on the flat surface of the stone, and the lower part envelops a ledge of course, it cannot be excluded that spotty amisada does not go up but comes down from the stone and that the upper part is not its head (Figure 10).

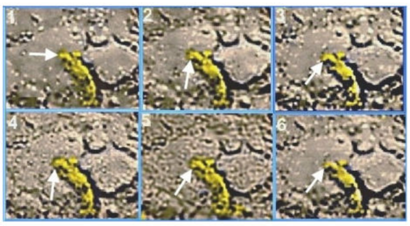

**Figure 10:** Nonaveraged processed fragments of original panoramas. Positions of arrows indicate the sequentially varied directions of the forward part of the amisada, whose size and motion resemble a human finger. Arrows indicate how the forward part changes its direction.

The amisada was located close to the TV-camera input; therefore, we managed to resolve many of its fine details. This amisada is interesting in connection with the fact that by virtue of the low-noise TV images of VENERA-14, it is possible to see and to recognize fine and slow displacements of the amisada's parts. In Figure 9a, a single image of the amisada is presented, which corresponds to about the 30th minute of activity of the TV camera of the VENERA-14 lander.

In Figure 9b, the averaged shape (for 6 original images) of the amisada is shown. Further, in Figure 9c, the sluggish Australian Shingleback lizard is also presented, which according to its shape and size (10–15 cm) resembles the amisada. The images of the amisada were additionally processed, which made it possible to see the motion of its upper part as a sequence of six sequential positions.

Position variation of the upper part of the amisada is shown in Figure 10 as changes in the direction of arrows. Here, fragments of the six available panoramas are given.

The images are presented in chronological order, with the intervals between them being, on average, of about 13 min. In frame 1 of Figure 10, the upper part fragment of the amisada is directed to the left (9 h), whereas the shadow under it is almost absent. We should recall that for scattered natural illumination on the Venusian surface, shadows appear only in the case of low positions of an object with respect to the surface

In this case, the altitude of the object above the surface should be comparable to its size. Most likely, the absence of a shadow indicates that the object's part is lifted above the surface. In frame 2, the amisada's upper fragment is displaced along the 7 h direction, and no shadow is also present. Finally, in frame 3, the edge fragment corresponds to, approximately, the 8 h direction with a deep shadow under it.

Further variations are given by the frame sequence 4 to 6. The size and displacements of the fragment are close to those of a human finger and its motions.

The displacement, in itself, attains 1 to 2 cm. (The procedure of the search for, discovery, and processing of images of terramorphic objects is described in [17] using the amisada as an example.)

## Amisada-1 and Amisada -2

In addition to the spotty amisada, there are two similar hesperas nearby that we call amisada-1 and -2. The result of the processing of their images is presented in Figure 11. For panoramas' fragments of series 1/6 (on the left) and series 9/13 (on the right), the image clearness was considerably improved, which allowed us to observe an object that had been missed previously.

In the figure, the layered structure of the planet stony surface with numerous cracks is clearly seen. The scale is given by the color-monitoring panel (on the right), each field of which is represented by a square 10 cm in size. The distance between the teeth of the landing buffer is 5 cm, and the size of the foreground stony fragment is about 50 cm.

The amisada-1 object resides in a small cavity to the left of the foreground fragment near the left boundary of the figure. The amisada-1 is positioned rather favorably: it is located relatively close to the optical entry of the camera at a distance of about 1.2 m and is observed at an angle of about 60° to the horizon.

The combinations of parts of independently obtained images have made it possible to reveal the more detailed shape of the fragment for which the geometry was partially corrected (Figures 11-13).

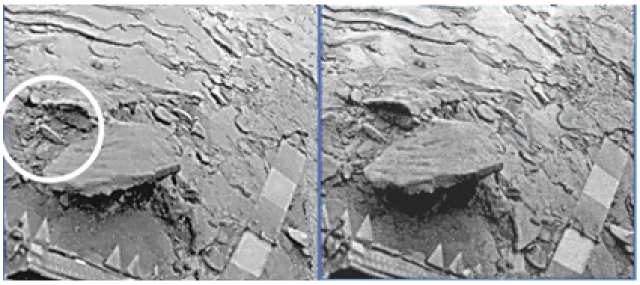

**Figure 11:** A new processing of panoramas of the Venusian surface improves their clearness. On the left: VENERA-14 panorama fragment. Camera 1, series 1/6; on the right: the same fragment on panoramas of series 9/13. Circled is the amisada-1.

Observed from above, the amisada-1 has a bulky elongated body and may resemble a fish. Its length (without the outstanding left part) is approximately 12 cm. Assuming that the left part of the object is its forward ("head"), the amisada-1 is terminated by a regular white spotty structure. A more detailed image is demonstrated by Figure 13.

The "head" part of the amisada-1 is surrounded by an inclined structure consisting of isolated round unresolved elements that form a crown, i.e., the semi-circle outstanding by 2–3 cm. On the right, the amisada body is terminated by a short narrow "tail".

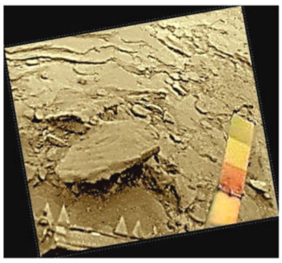

**Figure 12:** Two amisadas are seen on the image of improved clearness, which was composed of both parts of Figure 2 and color fragments.

It seems that the amisada-1 rests on outstanding parts of its body's lower side. Their number on the body side turned towards the reader can reach 3 or 5. A deep shadow is seen under the object, which indicates the relief character of the form under discussion.

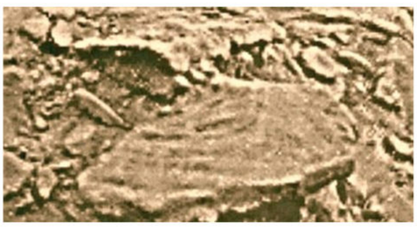

**Figure 13:** Amisada-1: a hypothetical object of Venusian fauna. The object size is about 12 cm.

The left-hand side of the amisada is surrounded by a structure resembling the inclined semicircle consisting of isolated unresolved elements.

The analysis of Figure 12 has allowed finding the next one, amisada-2, located at twice the distance with respect to the first one (in the picture center, behind the stone). This amisada-2 resembles a short arc. Apparently, amisada-2 is somewhat larger than amisada-1 and both are directed almost opposite. Using the animation method, we have managed to see that, for the observation time, both the amisada and amisada-1 moved 1 to 2 cm, and the crown of the amisada-1 has changed its inclination (Figure 14).

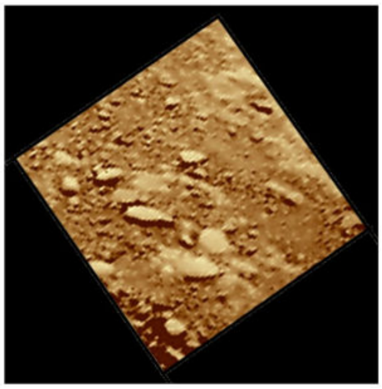

**Figure 14:** Result of processing of the fragment of VENERA-13 panoramas upon employment of all available images.

The number of good images is insufficient to perform more detailed studies. In any case, the estimate of the maximum displacement velocity for Venusian fauna (1 mm $s^{-1}$), which was given in [1,17,19], is not exceeded here. Figures 11 and 12 show that both amisadas are located in small cavities. The regularity and similarity of shapes for the amisadas and the proximity of their positions apparently prove their actual existence. By virtue of the larger distance to amisada-2, its details are distinguished worse. Only the tail, the crown, and spots on the body are visible. The lower side of the amisada is seen partially. Nevertheless, the similarity of images is evident. The crown actually relates to the amisada-1, which elongates it up to 12–14 cm. In the case of amisada-2, its length can attain 15 cm. We may suppose that on the same panoramas, other remote amisadas are observed. However, the amisada located immediately next to the landing buffer turned out to be most interesting.

Analogous suspicious object was also found on VENERA-13 panoramas obtained at a distance of 900 km from the VENERA-14 landing site. The processing methods employed improve significantly the quality of images, which is demonstrated by final image in Figure 14.

The elongated body shown in Figure 14 actually has a similarity with the amisada. However, due to the large distance of the object from the camera lens, the resolution is insufficient for detection of fine details such as crown, spots, and other characteristic features of the object, which are more confidently traced on VENERA-14 panoramas (Figures 9 and 12).

## Conclusion

In this paper we have described few terramorphic objects of hypothetical flora and fauna found on VENERA-14 and -13 panoramas. 'stems' are thin vertical trunks that have a thickness of 0.3-3 cm and are 0.1 to 0.5 m in height. On close objects, one can see that the 'stems' at the top end is provided with a large bulge, a "burgeon" or "flower" that is 2-8 cm in diameter. The 'stems' are an important complement to the objects of a hypothetical Venusian flora discussed in [10]. If the tops of the 'stems' really are burgeons and flowers, one should reflect their role. The flowers of terrestrial plants are intended for their pollination and reproduction. Pollination is conducted either by insects or by the wind. Wind-pollinated plants do not require blooms in principle, for example, the case of the poplar "fluff". Flowers attract insects. Do the tops of the 'stems' in Figures 6-8, at least indirectly, hint on the likely participants in the process of pollination?

Terramorphism of hypothetical objects of the flora and fauna of Venus was observed repeatedly in many entities [1,18-20]. Flowers with their petals in Figure 8 are new objects that are surprising to find. It is strange to find the occurrence of the same forms of living objects on different planets that have radically different physical settings.

The details about hypothetical Venusian fauna are thoroughly described for one kind only of the objects found on panoramas of the VENERA -13 and VENERA -14 landers. As a result of their processing, we present to readers properties of novel objects of Venusian fauna, nick-named amisadas. Each amisada has a well-distinguished body that resembles a lizard, when observed from above. However, other amisadas resembling a fish have organs of rest (and, probably, of motion) like reptiles. The structure and the role of the organ that resembles a crown consisting of isolated elements, which terminates the forward (or backward) side of an amisada is not clear. Three amisadas are observed on a small fragment of the VENERA-14 panorama. Their motion is slow and similar to motions of other objects of Venusian hypothetical fauna.

If the hypothetical Venusian fauna is heterotrophic, the source of its existence should be hypothetical autotrophic flora. Direct rays of the Sun, as a rule, do not reach the surface of the planet, nevertheless there is enough light for photosynthesis of the Earth-like type there. In the case of the Earth, a diffuse illumination of 0.5-5 kLux is sufficient for photosynthesis. The measured illuminance on Venus is of the same order, at the range of 0.4 to 9 kLux. Of course, photosynthesis at high temperatures and in a non-oxidizing environment should be based on a completely different, unknown biophysical mechanism.

Certain forms of assumed Venusian fauna exhibit surprising similarity to the living world of the Earth [1,17,19]. We call this strange repetition of terrestrial forms terramorphism. The discovery of this phenomenon is no less important than that of the extraterrestrial life itself. Certainly, the phenomenon relates to most deep problems of the search for life in the Universe.

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## References

1. Ksanfomality LV (2013) Possible signs of life on the planet Venus. IJAA 3: 57-79.
2. Selivanov AS, Gektin M, Gerasimov MA (1983) Continuation of the TV investigation of Venus surface by means of landers. Kosmich Issled 21: 176-182.
3. Moshkin BE, Economov AP, Moroz VI (1983) Spectrophotometric experiment on VENERA-13, -14 landers. Kosmich Issled 21: 236-245.
4. Florensky KP, Basilevsky AT, Kruchkov VP (1983) Geologic and morphologic analysis of VENERA-13 and VENERA-14 panoramas. Kosmicheskiye Issledovaniya 21: 340-350.
5. Kemurjian AL, Brodsky PN, Gromov VV (1983) Preliminary results of determination of physical-mechanic properties of the venusian soil by VENERA-13, VENERA-14. Kosmicheskiye Issledovaniya 21: 323-330.
6. Surkov A, Moskaleva LP, Scheglov OP (1983) Elemental composition of rocks on Venus.
7. von Zahn U, Kumar S, Niemann H, Prinn R (1983) Composition of the Venus atmosphere. In: Venus, Hunten DM, Colin L, Donahue, TM, Moroz VI (eds.) Univ Arizona p: 299-430.
8. Lewis JS (2004) Physics and chemistry of the solar system (2nd edn). Academic Press.
9. Schaefer L, Fegley B (2004) Heavy metal frost on Venus. Icarus 168: 215-219.
10. Gektin M, Panfilov AS (1978) Statistics of contrasts and peculiarities of the relief on panoramas of the surface of Venus. Kosmicheskiye Issledovaniya 16: 557-562.
11. Volkov VP (1983) Chemistry of atmosphere and surface of Venus. Nauka Fizmatlit p: 205.
12. Khodakovsky IL (1982) Atmosphere-surface interaction on Venus and implications for atmospheric evolution. Planet Space Sci 8: 803-817.
13. McGill GE, Warner JL, Malin MC (1983) Topography, surface properties and tectonic evolution. In: Hunten DM, Colin L, Donahue TM, Moroz VI (eds). The Univ of Arizona p: 69-136.
14. Pettengill GH, Ford PG, Nozette S (1982) Venus: global surface radar reflectivity. Science 217: 640-642.
15. Brackett RA, Fegley B, Arvidson RE (1995) Volatile transport on Venus and implications for surface geochemistry and geology. J Geophys Res 100: 553-1563.
16. Hausler BM, Tyler G, Simpson R (2006) Radio science investigations by VeRa onboard the Venus Express spacecraft. Planetary and Space Sci 54: 1315-1335.
17. Ksanfomality LV (2013) Quest for hypothetic fauna of Venus at the VENERA-14 landing site: Amisadas. Doklady Physics 58: 272-276.
18. Ksanfomality LV (2014) Hypothetical flora and fauna of Venus. Acta Astronautica 105: 521-533.
19. Ksanfomality LV (2014) "Snake": new object of hypothetical venusian fauna. IJAA 4: 29-38.
20. Ksanfomality LV (2014) Hypothetical plants found on Venus. J of Astrobiol 1: 5-12.