

**METEOROLOGICAL DATA, SURFACE TEMPERATURE AND MOISTURE CONDITIONS AT THE DALANTAN MARS ANALOGOUS SITE, IN QINGHAI TIBET PLATEAU, CHINA.** F. KONG and W. KONG, B. HU, M. ZHENG (Key Lab of Saline Lake resources and Environments, MLR, Institute of Mineral Resources, CAGS, Mail Address: 26 Bai Wan Zhuang Street, Beijing, China, 100037. Email: kongjie69@hotmail.com).

**Introduction:** Dalantan playa is located at the west end of Qaidam basin, on northern part of Qinghai Tibet plateau. Sulfates rich sediments have been found in this playa. This area may be an excellent analog site for understanding the formation and preservation Martian salts and to evaluate the possibility for the origin of Martian life [1,2,3].

This report focus on the statistics of the meteorological data of this area based on more than 30 years' collection, and two years observation of temperature and moisture conditions at the surface and shallow sub-surface to serve climatic background for further comparative studies.

**Site Description and Methods:** Qaidam basin is located between  $90^{\circ}00' \sim 98^{\circ}20' \text{E}$ ,  $35^{\circ}55' \sim 39^{\circ}10' \text{N}$ , on the Northeastern part of QinghaiTibet plateau, with altitude of 2500 ~ 3000 meters above the sea level, covering an area of 121,000 km<sup>2</sup>. Qaidam basin has the most ancient playas and the lakes with the highest salinity. Mg-sulfates appear in the evaporative sediments of saline lakes in Qaidam basin, which mark the final stage of evaporation sequence of K, Na, Ca, Mg, Fe, C, B, S, and Cl bearing brines. Dalangtan playa is located between  $38^{\circ}00' \sim 38^{\circ}40' \text{N}$ ,  $91^{\circ}00' \sim 92^{\circ}00' \text{E}$ , lies at the west end of Qaidam basin. We collected the data from the nearest metrological station, Mangya station. Referring to McKay(2003)[4], data loggers RHT10 (Extech, USA) have been placed under the evaporate rock to measure the temperature and moisture conditions since October 21,2010 up to now.

### Results:

#### 1. Meteorological Station Data:

The monthly average near surface air temperature, relative humidity, precipitation, irradiance, evaporation rates, atmospheric pressure, wind velocity (Fig 1-Fig7) are obtained for the past 30 years on the basis of the data recorded by local meteorological station. The annual average temperature in the area was 3.5 °C. The maximum monthly average air temperature was 16 °C in July, and the minimum was -10.7 °C in January. The average annual relative humidity was 30%. The average annual rainfall is 51mm, and most happened in June and July. However, the average annual evaporation is very high, with a value of 2590 mm. It's rather cold and dry. The monthly average air pressure was 709 mbar, about one third lower than the standard atmospheric pressure.

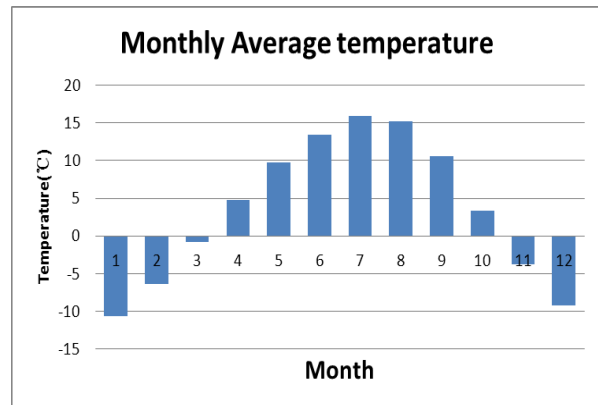


Fig 1. Monthly Average temperature at Mangya Metrological Station from 1980 to 2011

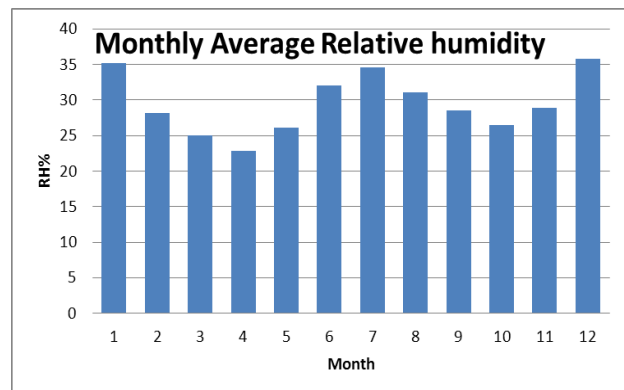


Fig 2. Monthly Average Relative Humidity at Mangya Metrological Station from 1980 to 2011

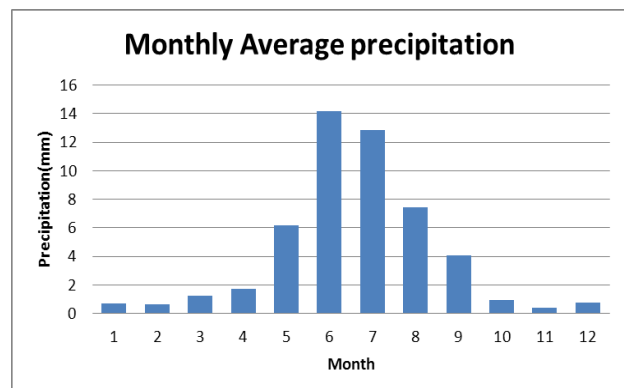


Fig3. Monthly Average precipitation at Mangya Metrological Station from 1980 to 2011

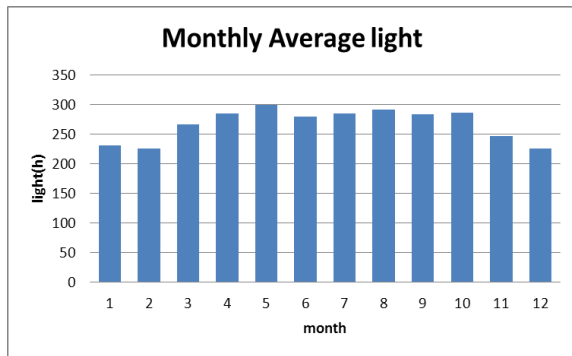


Fig4. Monthly Average light at Mangya Metrological Station from 1980 to 2011

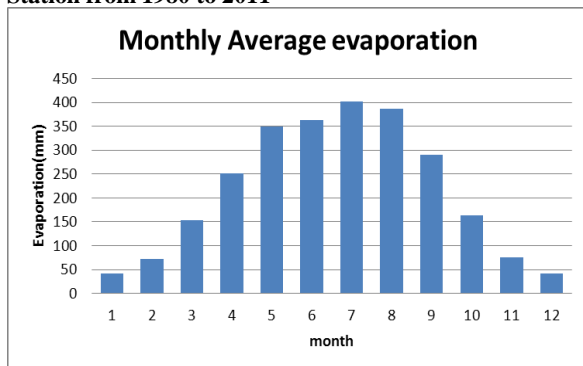


Fig5. Monthly Average evaporation at Mangya Metrological Station from 1980 to 2009

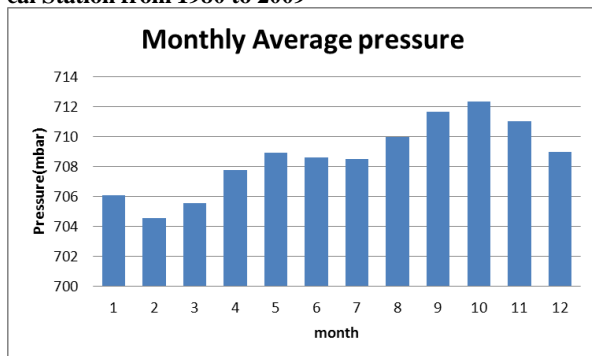


Fig6. Monthly Average pressure at Mangya Metrological Station from 1980 to 2011

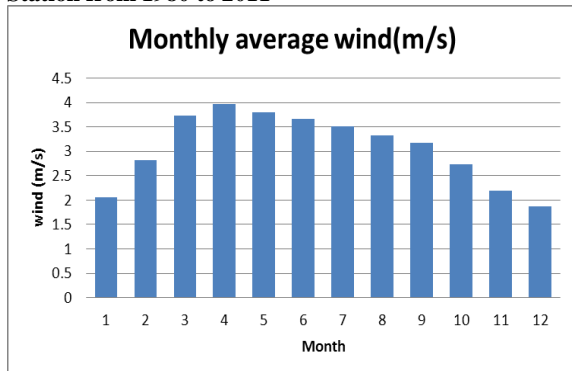


Fig7. Monthly Average wind at Mangya Metrological Station from 1980 to 2011

2. *Surface Observation of Temperature and Moisture conditions:* Two years of Surface Observation of Temperature and Moisture conditions on Dalantan playa was carried out using data logger RHT10 (Extech corp., USA). Fig 8 shows part of the results obtained during the summer of 2011. The average monthly temperature was 4.1 °C, The maximum temperature at day time was 27.6 °C, and the minimum temperature at nighttime was -24.4 °C. So the diurnal temperature variation was high. The total average relative humidity was 31%.

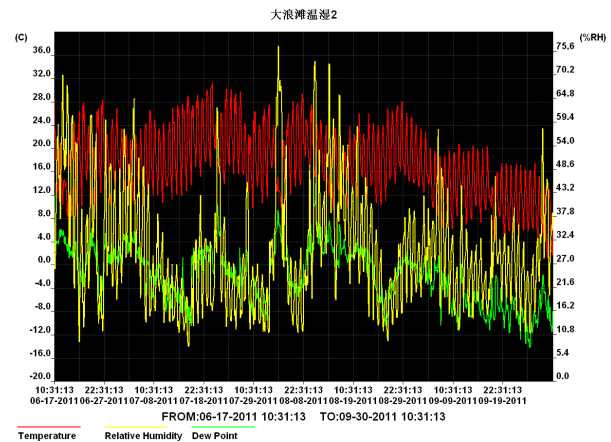


Fig 8 The record of Temperature(Red), Relative humidity(yellow), dew points(dew point) by data logger in sub-surface at Dalangtan from Jun 17,2011 to Sept 30, 2011.

**Conclusion:** The metrological data listed above shows that the climate of Dalantan area was dry and cold. It's one of the driest areas in the world, with low temperature; high altitude. The climatic conditions and salt mineralogy within the lacustrine deposits of the Qaidam basin indicate that this area can serve as an excellent analogue site for studying the precipitation sequence and subsequent dehydration/degeneration of Martian salts and life.

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**References:**

- [1] Wang. A etc (2009) *LPS*. XXXX , Abstract # 1858, [2] Kong, W ,etc, this volume. [3] Kong F. etc (2009) *LPS*. XXXX , Abstract # 1216. [4] McKay C. P. etc (2003), *Astrobiology*,3 :393-406.