

Red Rain of Kerala and Orange Rain of Alaska

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“Sherlock Holmes: How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?”

Sir Arthur Conan Doyle, *The Sign of the Four* (1890)

Summary

The red rain that fell over Kerala, India in 2001 and the vast quantity of orange particulates that were washed ashore on August 3 2011 in Kivalina, Alaska are beginning to show remarkable parallels (see *Discovery News* reference). An extraterrestrial source cannot be excluded on the the evidence available to date.



Fig. 1 The remote village Kivalina in NW Alaska (68N, 164W) was invaded by an orange goo on August 3, 2011, first from the sea, and then from the sky. Right: close-up image of deposit.

Samples of the red rain that fell over Kerala were first collected by Godfrey Louis and analysed using a variety of techniques (Louis and Kumar, 2003, 2006). Initially, the red colour was thought to be due to dispersed red blood cells, a flock of bats bizarrely shattered by a clap of thunder. This idea suggested itself not only by the appearance of the cells under a SEM, but also by the fact that the red rain was preceded by a sonic boom in the sky. The blood theory was quickly ruled out once transmission electron microscope (TEM) studies were conducted on thin slices of the cells (eg. Fig.4). However, to this day the identity of the

cells remains uncertain. Louis and Kumar (2003, 2006) have argued that the cells could replicate at temperatures as high as 450C, and also that no DNA could be unequivocally identified. Although these claims are still challenged, the case is growing for the involvement of an unknown or alien microorganism. Rajkumar et al (2010) have verified the possibility of replication at 121C under pressure in an autoclave, thus making the red rain cells perhaps the most thermophilic eukaryotic cells yet known.

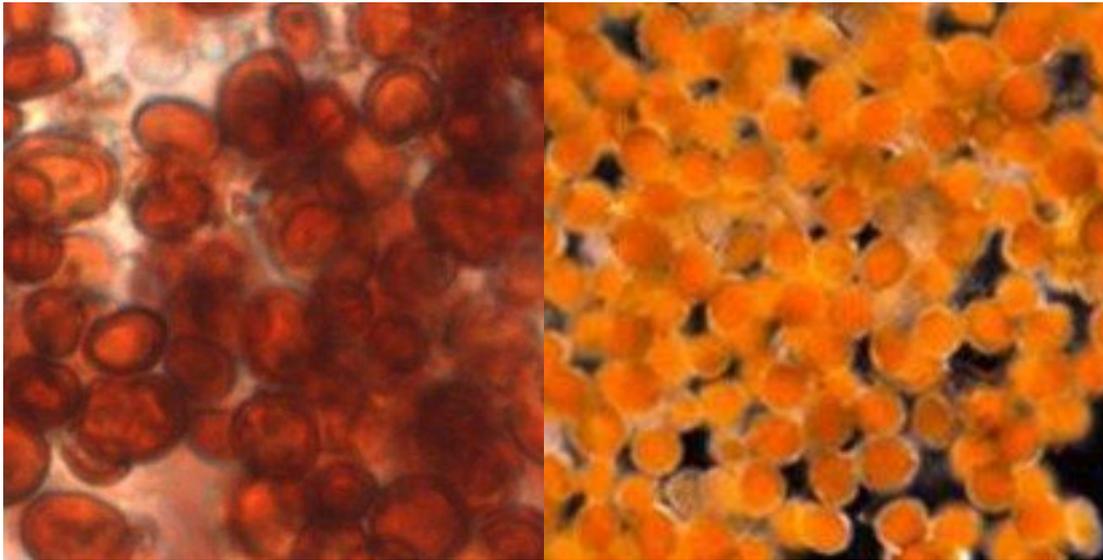


Fig. 2 Microscope images of red rain cells (Left) and Kivalina goo (Right)

On 3rd August 2011, nearly a decade after the Kerala event, an equally mysterious phenomenon is reported in Kivalina, a small Inupiat settlement some 625 miles North West of Anchorage in Alaska. An orange-coloured gummy substance was first washed ashore in vast quantities along the coast, and this was followed by rain carrying the same material and depositing it on roof tops. Figure 2 compares optical microscope images of the red rain of Kerala and the orange rain of Kivalina.

The first provisional identification of the Kivalina stuff was that they were orange “eggs” possibly of some unknown crustacean species. But this theory was soon challenged when electron micrography of individual cells was available. This latter work was reportedly carried out by the US National Oceanic and Atmospheric Administration Laboratories in Charleston, USA. Each individual “cell” in Fig. 2 (right frame) was found to be comprised of much smaller composite structures of the type represented in Fig. 3.

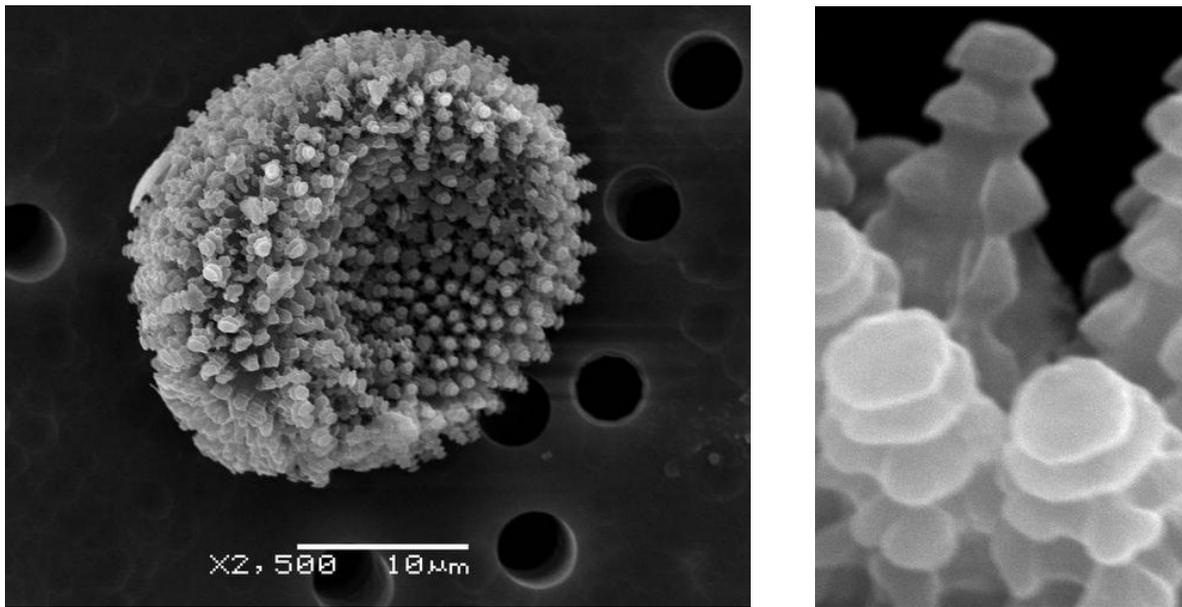


Fig.3 Electron micrographs of Kivalina cells distributed to media by the National Oceanic and Atmospheric Administration, USA. Left: object resembling fungal spore. Right: enlargement of spines on the spore. (Courtesy of S.Morton)

Thus it transpired that studies by S. Morton and colleagues quickly ruled out the theory that the orange goo was comprised of “eggs”. They were in fact much smaller, similar to the sizes of the Kerala red rain cells. The current explanation is that the orange stuff of Alaska was comprised of spores of a rust fungus of the kind that often attacks plants. However, no infestation in plants has been reported in the locality so far, and in any case the terrain around Kivalina extending over many hundreds of square miles is singularly inhospitable to vegetation of any kind. The scientists experts who studied this material have commented that the spores appear to be unlike any they have encountered so far in any rust fungus. It is of course possible that here we have a totally new species of rust fungus, distinct from the 7800 or so known species - but that remains a conjecture that needs to be backed up.

The Kerala red rain cells (see TEM of Fig 4)

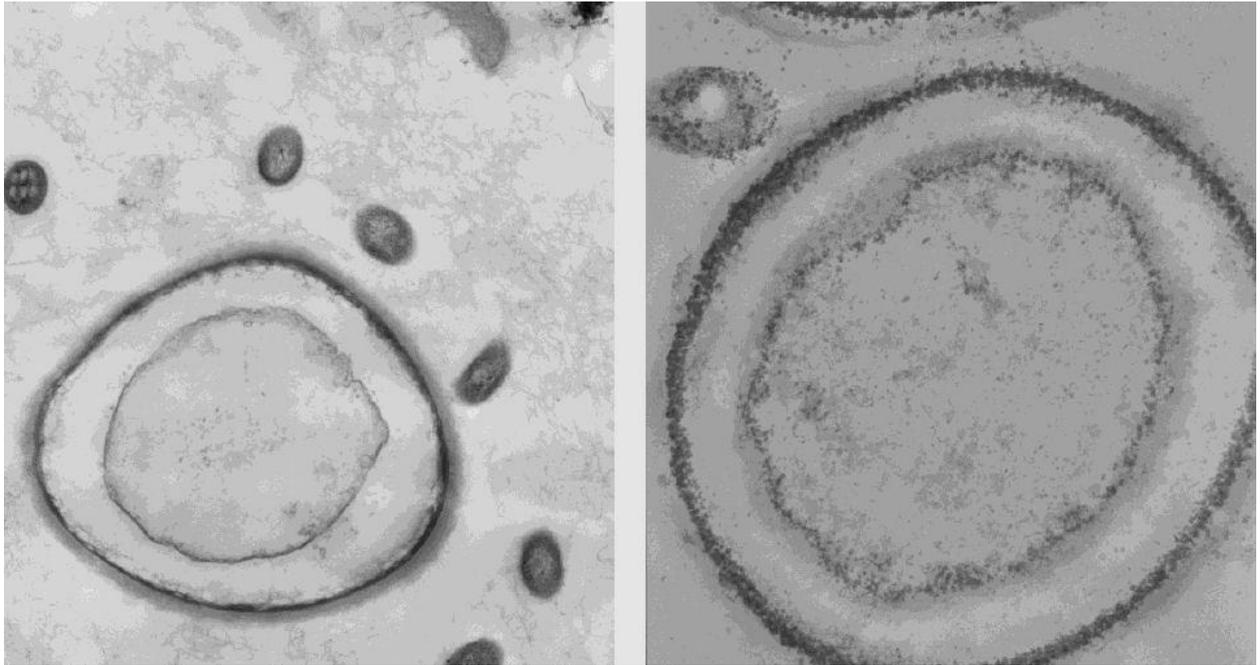


Fig.4 TEM of Kerala red rain cell with daughter cells expelled from the interior (Courtesy of G. Rajkumar)

and the Kivalina cells are not identical. Figure 3 shows an organism in a spore state; figure 3 shows vegetative cells. They are probably hitherto unknown fungal-type cells and spores which have established a transient reservoir in the atmosphere. The failure so far to identify these cells with any known terrestrial species leaves wide open the possibility of their extraterrestrial origin thus supporting the theories of panspermia (Hoyle and Wickramasinghe, 2000; Wickramasinghe, Wickramasinghe and Napier, 2010).

In conclusion it is worth noting that historical accounts of “blood rain” are well documented and go back to Biblical times and earlier (McCafferty, 2008). Such historical events cannot ofcourse be probed scientifically, but with ongoing events science has an important role to play.

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