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**Water bears can go to the heavens** Mike L Anderson

Extreme sports are all the rage these days. You will notice that animals are not invited to compete with humans. This is because the beasts would win easily. They make skiing down Everest look like a doddle. Even the silly goose casually flies over it. Yes, it really does. But when it comes to the extreme there is one animal that is a consummate survivor. The animal? The water bear or moss piglet. A German pastor in the 18th century likened it a miniature teddy bear because of its stubby legs (although it has eight of them), bear-like gait and paunch.<sup>1</sup> But don't let its charming and unassuming stature fool you. It is an extraordinary animal. It surely deserves to be dignified with its scientific name - Tardigrada.



Water bears are found everywhere, "from the highest elevations in the Himalays to the deepest trenches in the deep sea, and from hot, radioactive springs to the ice cathedrals inside the Greenland ice cap."<sup>2</sup> There are lots living in a moss patch near you! Never noticed them? That is because physically they are miniscule - never getting much more than 1 mm long. Physiologically they are giants.

Take temperature extremes for example. Emperor penguins are justly famous for being able to withstand the -70 C of the Antarctic winter. Water

bears have also been found in Antarctica<sup>3</sup>, but top that by handling -272 degrees C!<sup>4</sup> I kid you not. At the other end of the scale, camels only begin to sweat at 41 degrees C.<sup>5</sup> Impressive. But the water bear can withstand 151 degrees C.<sup>6</sup> No jokes. Or take fasting. Even the Son of God limited his fast to 40 days. There is a case of water bears going without food *and water* for over a century.<sup>7</sup> Or take pressure. Water bears have survived both the vacuum inside an electron microscope and pressures of over 6000 atmospheres!<sup>8</sup> They have even recovered from being dipped in brine, absolute alcohol, ether and liquid helium!<sup>9</sup>

### **The living dead.**

How does it do it? Its secret is to reduce all life processes to below that which can be measured. In this state it is called a "tun." It shows no detectable signs of life. Is alive or dead? The highly respected Grizmek's Animal Life Encyclopedia calls it a state of "reversible death."<sup>10</sup> If so then the animal experiences a natural resurrection! In the 19th century the water bear caused scientists to become sharply divided into the resurrectionists and anti-resurrectionists. We need not worry our heads. It is safe to say that the tun is only very slightly more alive than salt. We can avoid black-and-white thinking and unnecessary controversy by adding a third category to the alive and the dead - the "living dead" or "unalive." And unalive they certainly are if this is taken to mean lacking a fulfilling life. Their legs are withdrawn so they look like a barrel and they fail to respond to any sensory stimulation whatsoever. The tun effectively take a breath perhaps once in a decade. Zombies have more vitality.

Why does it do it? Water bears need moisture to live but moss patches periodically dry out. Migration to a wet patch is out of the question for such a tiny, clumsy creature. It uses a different tactic. It makes itself, for a time, independent of moisture. The tun has been honed by natural selection over millions of years as an effective strategy against fickle environments.

### **Reaching for the heavens**

It is just because of this capacity that the water bear has been nominated for outer space travel. Reinhardt Kristensen of the Zoological Museum in Copenhagen says "They can tolerate outer space, no doubt about it."<sup>11</sup> It has been voted the animal most likely survive a trip to Mars without much life support.<sup>12</sup> In 2007 these claims were definitively tested on a Russian satellite 270 km above the earth in a mission called TARDIS (Tardigrades in Space). Some specimens indeed survived the freezing, the dehydration, the

vacuum and the deadly solar ultraviolet radiation of space!<sup>13</sup> Water bears are truly marvels of God's creation!

### **Heaven as an extreme environment**

Tardigrades have taught us much about preserving organs for transplantation.<sup>14</sup> They have even inspired the quest for human-engineered immortality. Philosopher Nikolai Fedorov went so far as to argue that unless the resurrection can be achieved naturally, God's creation is a mistake.<sup>15</sup> Or it could just be limited. But achieving immortality is the very least of our concerns. Jesus is adamant that death of the body is inconsequential. He says, "Do not be afraid of those who kill the body but cannot kill the soul. Rather, be afraid of the One who can destroy both soul and body in hell."<sup>16</sup>

It is curious that humans are so eager to go to heaven. Heaven is a far more extreme habitat than outer space. The reason? God is there. When Moses asked to see God's glory, God himself replied, "you cannot see my face, for no one may see me and live."<sup>17</sup> If even a Moses cannot get close up to Sinless Perfection, what hope is there for the rest of us sinners? We are just not adapted for heaven. God has no difficulty resurrecting our *bodies*. That is a piece of cake for him. Even water bears evolved a way of reversing virtual death. No, the real difficulty is in preventing us from being permanently vaporized by the radiation of his glory. The real difficulty is keeping us from *spiritual* death. Those who think otherwise just do not have an adequate sense of the extreme holiness of God. Heaven requires a very special space suit indeed.

### **A heavenly space suit**

While explaining the kingdom of heaven in a parable, Jesus calls our attention to the man trying to enter the heavenly banquet without "wedding clothes."<sup>18</sup> He is thrown out. What is this suit that we must wear to dare approach the presence of God? What material could possibly protect us against the awesome power of the Almighty? Can a wrath-proof fabric even exist? What could possibly prevent the penetrating stare of the Perfect Judge? Our only hope is that God might do the seemingly impossible. Perhaps the Omniscient One can find a way to hide our sin.

If we think about it, there is only one possibility. The suit itself must be divine to withstand the divine. Only Perfect Innocence can withstand Extreme Holiness. We need to clothe ourselves with the Lord Jesus Christ. The Bible never mentions space suits of course, but it is very clear that

heaven requires special attire. It speaks of "white robes"<sup>19</sup> and "rich garments."<sup>20</sup> The context of the passages is redemption. Jesus does not merely supply robes; he is the robe.

It is curious that humans are so sober about the exacting requirement for reaching into the heavens, while often being presumptuous about entry into heaven. It is true that God has a deeply forgiving character but only under his conditions. His conditions are clear. We can never try to enter heaven under our own devices, but must rely solely on God's grace. And how great is God's grace! He supplied the suit we need at tremendous cost to himself. When Jesus died on the cross he entered heaven naked and got thrown out. Remember his cry on the cross, "My God, My God why have you forsaken me?"<sup>21</sup> He got thrown out so that we don't have to.

What a relief for the believer! At the first reaches of God's radiant glory, we don't have to withdraw into a tun like a water bear. We used to be the living dead. "But because of his great love for us, God, who is rich in mercy, made us alive with Christ even when we were dead in transgressions--it is by grace you have been saved."<sup>22</sup> We can now "approach the throne of grace with confidence."<sup>23</sup>

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If you found this article helpful please give it to someone else.

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## Notes

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- <sup>1</sup> Hutchins, M, A.S.F. Craig and D. A. Thoney (eds.) (2003) *Grzimek's Animal Life Encyclopedia*, Gale Group, Farmington Hills, MI, p. 117
- <sup>2</sup> Hutchins *et al* (2003) pp. 116-117.
- <sup>3</sup> Miteva, V. (2008) Bacteria in Snow and Galicer Ice. In *Psychrophiles: from Biodiversity to Biotechnology* Margesin, R., F. Schinner, J Marx and C. Gerday (eds.) Springer-Verlag, Berlin, p. 43.
- <sup>4</sup> Piper, R. (2007) *Extraordinary Animals: An Encyclopedia of Curious and Unusual Animals* Greenwood Press, Westport, p.276.
- <sup>5</sup> <http://en.wikipedia.org/wiki/Camel>. Retrieved 27 August 2010.
- <sup>6</sup> Wharton, D.A. (2002) *Life at the Limits: Organisms in Extreme Environments*. Cambridge University Press, p. 106.
- <sup>7</sup> Wharton, D.A. (2002) p. 105.
- <sup>8</sup> However, they succumbed after a few minutes of movement, Wharton, D.A. (2002) p. 106.
- <sup>9</sup> Brusca, R.C. and G.J. Brusca (2003) *Invertebrates* Sinauer Inc., Sunderland, p. 470
- <sup>10</sup> Hutchins *et al* (2003) , p. 118.
- <sup>11</sup> Quoted in Wharton, D.A. (2002) p. 106.
- <sup>12</sup> Plaxco, KW. and M. Gross (2006) *Astrobiology*. The John Hopkins University Press, Baltimore, p. 184.
- <sup>13</sup> Jönsson, K.I Rabbow, E. Schill, R.O. Ringdahl, M.H. and P. Rettberg Tardigrades survive exposure to space in low Earth orbit *Current Biology*,:18(17):R729-R731
- <sup>14</sup> Wharton, D.A. (2002) pp.127-128.
- <sup>15</sup> Perry, M. (2003) Historical Steps Toward the Scientific Conquest of Death *Physical Immortality* 1(1) 7-10.
- <sup>16</sup> Matthew 10:28.
- <sup>17</sup> Exodus 33:20.
- <sup>18</sup> Matthew 22:11-12.
- <sup>19</sup> Revelation 7:9.
- <sup>20</sup> Zechariah 3:4.
- <sup>21</sup> Matthew 27:46.
- <sup>22</sup> Ephesians 2:4-5.
- <sup>23</sup> Hebrews 4:16.