



# Scire Science Newsletter

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## **Tardigrade: The Extremophile**

**Aswini V \***

*Nehru Arts and Science College, Coimbatore, India.*

*\*Corresponding author: [aswiniashucool@gmail.com](mailto:aswiniashucool@gmail.com)*

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### **Introduction**

Life on earth is limited to certain period of time. Plenty of threats like environmental stress, diseases can wipe out entire life. However there are some tiny miraculous creatures which can outlive us all-the “tardigrade”. With a blessed genomic makeup, it is believed to survive until the end of the earth.

Tardigrades or water bears are eight legged microscopic creatures well known not only for its strange appearance but also for its superpower as planets great survivors even in vacuum of space. These are water dwelling creatures able to withstand huge amount of radiation, temperatures ranging from 150 degree celsius to near absolute zero and pressure six times greater than deepest ocean trenches.

### **Striking features**

These creatures by the means of horizontal gene transfer seemed to acquire around 6000 foreign genes from variety of organisms including plants, fungi and bacteria which constitutes around 17.5% of their genomic make up. This property makes it to withstand any unfavourable condition, hence got the name “extremophile.”

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### **Means to overcome stresses**

Tardigrades have adapted to environmental stress by undergoing a process known as cryptobiosis. Cryptobiosis is defined as a state in which metabolic activities come to a reversible standstill. Anhydrobiosis type of cryptobiosis in tardigrade is used to cope with unfavourable levels of water in environment. This suspended animation in organism due to desiccation followed by recovery by rehydration makes it tolerant to extremities. This mechanism can be applied in other life forms for long term preservation and escape from threats of nature. Tardigrade as an immortal creature is a “GENETIC TREASURE” which is at beginning state of exploration.

### **References**

1. Takuma Hashimoto, Daiki D. Horikawa, Yuki Saito, Hirokazu Kuwahara, Hiroko Kozuka-Hata, Tadasu Shin-I, Yohei Minakuchi, Kazuko Ohishi, Ayuko Motoyama, Tomoyuki Aizu, Atsushi Enomoto, Koyuki Kondo, Sae Tanaka, Yuichiro Hara, Shigeyuki Koshikawa, Hiroshi Sagara, Toru Miura, Shin-ichi Yokobori, Kiyoshi Miyagawa, Kiyoshi Miyagawa, Yutaka Suzuki, Takeo Kubo, Masaaki Oyama, Yuji Kohara, Asao Fujiyama, Kazuharu Arakawa, Toshiaki Katayama, Atsushi Toyoda and Takekazu Kunieda (2017), Extremotolerant tardigrade genome and improved radiotolerance of human cultured cells by tardigrade-unique protein, Nature commun.
2. Thomas C. Boothby, Jennifer R. Tenlen, Frank W. Smith, Jeremy R. Wang, Kiera A. Patanella, Erin Osborne Nishimura, Sophia C. Tintori, Qing Li, Corbin D. Jones, Mark Yandell, David N. Messina, Jarret Glasscock, and Bob Goldstein (2015), Evidence for extensive horizontal gene transfer from the draft genome of a Tardigrade, Proc.Natl Acad.Sci.USA 112,15976-15981.
3. Alpert P. (2005), The limits and frontiers of desiccation-tolerant life integr.comp.biol.45, pp. 685-695.