Biological Robustness and Fragility

Biological robustness is not equal to biological vulnerability. Biological robustness refers to the robustness of biological response to human activities or changes in natural conditions, which means that sometimes, although biological response is fierce, when the external changed conditions disappear, the biological will quickly recover (in theory, it may also slowly recover or cannot recover). Vulnerability refers to the high vulnerability of organisms to changes in external conditions, which means that organisms are vulnerable to changes under the influence of external conditions. For example, ecosystems in some arid areas or limestone areas are often fragile, and it is difficult to recover or even irreversible changes once they are affected by external interference (such as man-made destruction of vegetation), Mimosa is particularly robust but not fragile to some external disturbances, because it will return to its original state when the external disturbances disappear[1].

Vulnerability, also known as vulnerability or vulnerability, is a weak link in an asset or asset group that may be threatened to cause damage. Once the vulnerability is successfully used, it may cause damage to the asset. Vulnerabilities may exist in physical environment, organization, process, personnel, management, configuration, hardware, software and information.

Vulnerability is a collection of some attributes of nature, animals and plants, animal and plant groups, society, country, system and other attributes. It represents the change trend of things in response to volatility, randomness, pressure and so on. If this change trend can not better respond to volatility, randomness, pressure and so on, it means that these things are vulnerable to volatility. If this change trend has no impact on things, It means that the thing is tough to deal with fluctuations; If things show greater adaptability to fluctuations and gain benefits, it means that things have anti vulnerability to fluctuations.

The value of biological robustness is enormous. Human beings get all the food, many medicines and industrial raw materials they need from biological robustness. For example, species provide a source of food for human beings, and crops, poultry and livestock as basic food for human beings are all derived from wild type[2]. Wild species are indispensable raw materials for cultivating new varieties, especially with the rise and development of modern genetic engineering, the preservation of species has a more far-reaching significance. Species are the source of many

medicines. With the deepening of medical research, more and more species have been found for medicinal purposes. In addition, natural species resources also provide a large number of industrial raw materials for human beings, such as fur, leather, fiber, oil, spice, gum grease, etc.

The ecological value of biological robustness is also huge. It plays an important role in maintaining natural energy flow, material circulation, improving soil, conserving water sources, regulating microclimate and many other aspects. Biological robustness is also a necessary condition to maintain the balance of the ecosystem. The extinction of some species may cause the imbalance or even collapse of the entire system. Moreover, the rich and colorful organisms and the inorganic environment on which they depend constitute the biological support system on which human beings rely for survival.

Similarly, various creatures also give people the enjoyment of beauty, which is the source of artistic creation and scientific invention. The robustness of species is indispensable to the development of science and technology[3]. For example, the development of bionics cannot be separated from the rich and strange biological world. Even, the robustness of human culture originates from the robustness of biology and its environment to a large extent.

The first manifestation of life fragility is that any creature is very small at birth, and only lactation that needs nutrition and juice can survive. Secondly, the fragility of life lies in its brevity. Many living things are short-lived. As for the potential dangers people are facing with, pathogenic microorganisms that can invade the human body and cause infection or even infectious diseases when immunity is down demonstrates one important part of human fragility. However, we could avoid this fragility by exercising to strengthen our body, utilizing drugs to prevent and control serious diseases.

Citations

[1] Yang Yuming, Tian Han, Ren Juan, et al Study on Characteristics and Vulnerability of Biodiversity in Yunnan [C]//Progress in Biodiversity Conservation and Research in China VI - National Symposium on Biodiversity Conservation and Sustainable Utilization, 2004.

[2] Tamaoki T, Tomita F. Biosynthesis of tetrocarcin. Incorporation of 14C- and 13C-labeled compounds into tetrocarcin[J]. The Journal of Antibiotics, 1983, 36(5):595-598.

[3] Sun Jing, Wang Jun, Yang Xinjun. A review of research on the resilience of social ecosystem [J] Journal of Ecology, 2007, 27 (12): 11