Fragility and robustness are important concepts in biology. Vulnerability is defined to evaluate the degree to which an ecosystem is vulnerable to damage when encountering abnormal conditions and disasters; Robustness, on the other hand, is defined to evaluate the ability of maintaining its self-existence, which enables the ecosystem to better resist external influences and avoid damage (Folke et al., 2002). From the perspective of stress response, biological vulnerability means the weakness of impact resistance of the ecosystem, and the impact of the outside world will cause significant results, with a higher rate of change (Hiroki Sayama et al., 2005). In contrast, biological robustness implies that the ecosystem is more impact-resistant and has a lower rate of change in response to external shocks (Gatto et al., 2010).

The example of fragility can be drawn from human and non-human factors have obvious influence on ecosystem vulnerability. One example is forest ecosystems, which can be affected by fire, pilfering, abrupt change and climate change. Forest ecosystems with single tree types are highly vulnerable to climate change and can be easily destroyed.

Examples of robustness exist at all levels of living systems, and root-system is one of them. roots of plants can penetrate deep into the soil to establish root networks that absorb water, nutrients in the soil, and protect them from drought, moisture or freezing. Root-network provides robustness to the plant because it enables the circulation of water, nutrients between plants and ecosystems, as well as resistance to changing environments. Root-system can also help to maintain soil and biodiversity, ensuring the robustness of the ecosystem.

Biological robustness enables organisms to reproduce and obtain required materials in challenging environments which lays a solid foundation for their survival and survival. For example, the robustness of many plants in the face of extreme environmental conditions can allow them to withstand extreme temperatures, growing conditions, or other adverse factors. Sea-buckthorn with complex roots that survives in water-scarce condition has fitted material and energy exchange with the ecosystem. Biological robustness helps species like sea-buckthorn cope with scarcity of water, finding new resources and adapting to higher living pressures.

Except from the perspective of species environmental interaction, the significance of biological robustness for survival can also be explained from the level of genes. Bio-robustness is essential for the survival of a species due to the deficiency of robustness will devastate the transmission of genetic information (McGill et al., 2011). Environmental pressures encourage populations to have more well-adapted individuals, which often carrying specific genes and generating, rather than going extinct from the environment because of a lack of biological robustness. In conclusion, biological robustness interacts with its genes. Diverse and excellent genes ensure the biological robustness of the species, and the biological robustness guarantees inheritance and variation after generation.

Forest ecosystems provide a variety of environments in topographical and climatic conditions, which can support different species, provide habitat and foraging conditions. Owning complex food chains, forest system also suffers from unexpected and severe consequences cause by the introduction of external factors such as environmental change, pollution and specs invasion. The vulnerability of forest ecosystems may be affected by biological invasions, which may lead to imbalances in the ecosystem and may result in disasters or harm to existing organisms. For example, severe biological invasions may alter the structure and function of ecosystems and affect environmental services, thereby affecting biodiversity (Hejda et al., 2009). For example, wildlife may suffer from predation by invaders, and forests or grasslands may be damaged by invasive species. In addition, invasive species may also spread viruses or bacteria, negatively affecting local species and the overall health of the environment (Pimentel et al., 2000).

According to Experimental Studies on Biological Vulnerability, when external factors such as humans and light change, vulnerable organisms will change rapidly, resulting in serious ecological and economic losses. The study concluded that the intensity of protection for vulnerable organisms may lead to ecological imbalance (Pamela A. Matson and William W. Boggs, 2007). In the last cases, the vulnerability of organisms to invasive bacteria leads to mass die-offs and then leads to the devastation of food chains, resulting in severe damage to the ecosystem.

The vulnerability of forest ecosystems can be reflected by the distribution and composition of their species and their associated biodiversity indicators (Levesque, 2011). Studies have shown that conserving species numbers and diversity can avoid serious damage to entire communities of some terrestrial organisms.

For forest ecosystems, biodiversity does not necessarily enhance the robustness of the system. But in general, biodiversity contributes to the robustness and resilience of ecosystems by increasing the resources available to other organisms in the system and helping to reduce adverse environmental impacts.

**reference**

Folke C, Carpenter S, Walker B, Scheffer M, Chapin T and Rockström J (2002) Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations. Ambio: A Journal of the Human Environment, 31(5), 437-440.celling.

Gatto, M., & leno, E. (2010). Biological vulnerability and robustness in species communities: a theoretical review. Ecological Modelling.

Hejda, M., Petrášová, J., Pyšek, P., & Herben, T. (2009). Impact of alien plant invasions on the spe cies richness and composition of the community in relation to its environmental context. Commun ity Ecology, 10(2), 199-209.

Lévesque, M. (2011). Forest ecosystem vulnerability: reflecting biodiversity and community interaction. Ecology & Society, 16(2).

McGill, M. J., Chisholm, R. A., & Engle, J. R. (2011). Biological robustness: A unifying principle . Ecology Letters, 14(7), 667-674.

Pimentel, D., Lach, L., Zuniga, R., & Morrison, D. (2000). Environmental and economic costs of non-indigenous species in the United States. Bioscience, 50(1), 53-65.

Sayama, Hiroki et al. (2005). System biology: an introduction. Cambridge.