

Antarctic Biota's Hidden Value: A Narrative Review of Antarctic Biota as Potential Neuroprotection Therapy

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Structured Abstract

Background: The interest in researching neuroprotection activity in the Antarctic has recently increased, despite the paucity of studies in this field. The low temperatures in Antarctica are recognized as extreme conditions, which limits research in the region. This, this review aims to examine the potential neuroprotective qualities of the Antarctic biota. Extreme and isolated, Antarctica dwells on a wide variety of biota that have evolved specifically to withstand the harsh conditions there. Recent research has revealed the potential neuroprotective properties of various Antarctic native organisms. This region's microbes, plants and marine animals have developed complex metabolic pathways and compounds with neuroprotective qualities. These compounds can reduce damage to neurons, improve cellular resiliency and alter important pathways implicated in neurodegenerative diseases.

Literature Review: It is possible to develop innovative therapeutic agents in neurology by comprehending the mechanisms underlying the neuroprotective potential of the Antarctic biota. This insight is about Antarctica's varied biota and how it may contribute to neuroprotection, presenting an innovative opportunity for more research and the creation of cutting-edge neurotherapeutics. Antarctica is an important site for scientific research in glaciology, climatology and polar ecology because of its extremely low temperatures and sparse biodiversity.

Literature Review: However, because neurodegenerative diseases have intricate mechanisms, treating them can be difficult when the disease has severe symptoms. For many neurodegenerative diseases, there are currently no available disease-modifying therapies. It is logistically challenging for researchers to explore Antarctica's biota for possible neuroprotective activity because of its isolation and harsh climate. The unique neuroprotection properties of the Antarctic are attributed to antioxidant, anti-inflammatory agents and signalling pathways.

Conclusion: In conclusion, the compounds found in the Antarctic have shown a potential to reduce neuronal damage, promoting cell survival and enhancing neural repair mechanisms. Their ability to modulate oxidative stress and inflammation makes them a potential agent for treating neurodegenerative diseases. Perhaps because of a lack of funding, research on neuroprotection in Antarctic organisms is still in its beginnings.

Keywords: Antarctic, neurodegenerative diseases, antarctic biota, neuroprotection, compounds

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