Global Trends in Mammalian Reproductive Ability: A Cross-Species Study of Sperm Abnormalities over Time

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Animal reproduction is often overlooked in ecological research, despite it being the fundamental component of life. Abnormalities in reproductive traits such as sperm defects can be detrimental to a species’ success, as it could decrease the chances of successful reproduction. Without successful reproduction, populations may struggle to increase, regardless of extensive conservation efforts. In contrast to its importance in ecology, however, little is known about how reproductive traits are changing over the years for a given species, let alone across a wide range of species. Therefore, we conducted a meta-analysis involving peer-reviewed journals from 1977 to date and 277 terrestrial mammalian species, with 63 of them having data available. Our goal was to characterize global trends in mammalian reproductive health over time. We fit phylogenetically controlled regression models to estimate changes in sperm morphology traits over the years. Our results suggest that there seems to be an overall decline in the reported percentage of normal sperm found in samples by approximately 1.5% every year. Additionally, we observed varying trends across different taxa, indicating both decreases and increases on a species level with no clear pattern. Due to the lack of data in both our study and biological literature, further investigation will be necessary to identify stronger patterns within taxonomic structures. Nonetheless, the study provides useful information in shaping future conservation work and identifies gaps in mammalian reproductive research.