A monkey's life is full of stress: pressures from a disease and the lack of good food and their effects on abundance

Despite strong links between patterns that individuals deal with others and their success at breeding that ultimately affect the size of animal populations, the particular social and ecological factors that lead to endangerment are not well understood. We synthesized ~30 years of data that highlight dynamics in forest composition, food availability, food nutritional quality, disease, physiological stress, and population size of endangered leaf-eating red colobus monkeys (Procolobus rufomitratus).

Fig. 1. A male red colobus monkey from Kibale National Park, Uganda.

We found a decline in the nutritional quality of leaves over 30 years that corresponds to predictions from greenhouse experiments suggesting that protein content of leaves will decline, while fiber content increases as climate changes. The consumption of a low quality diet in one month was associated with higher stress levels in the subsequent month and stress levels in groups in degraded forest fragments where diet was poor was more than twice those in old-growth forest groups. In contrast, forest composition has changed and there was an increase in the availability of high-quality food trees. Despite these changing social and ecological factors, the abundance of red colobus has remained stable, possibly through a combination of increasing group size and behavioural flexibility. By using this information conservation biologist can now predict how climate change and changes in forest structure occurring through human action will impact populations of this and similar species.

Publication

Competing pressures on populations: how disease may interact with food availability and stress to influence animal abundance.
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