

Self-medication in animals

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A.k.a zoopharmacognosy

- Self-medication in animals typically evokes images of chimpanzees seeking out medicinal herbs to treat their diseases
- Belief that self-medication is associated with high cognitive abilities (learning...)
- Many animals can use medication through innate rather than learned responses. Animal pharmacists: moths, ants, fruit flies...
- Antiparasite self-medication

Medication

- Typical view: chewing non-nutritive substances such as plant piths or leaves.
- Increased ingestion of particular chemicals that are already in their diets

Chew and swallow plant materials with antiparasitic properties

Types of animal medication

Behavior displayed by:

Healthy individual

Diseased individual

Prophylactic self-medication

Therapeutic self-medication

Self



Plant toxins ingestion to kill parasites

Target of medication

Transgenerational prophylaxis (offspring)

Transgenerational therapeutic medication (offspring)



Kin

Social prophylaxis (other relatives)



Types of animal medication

Behavior displayed by:

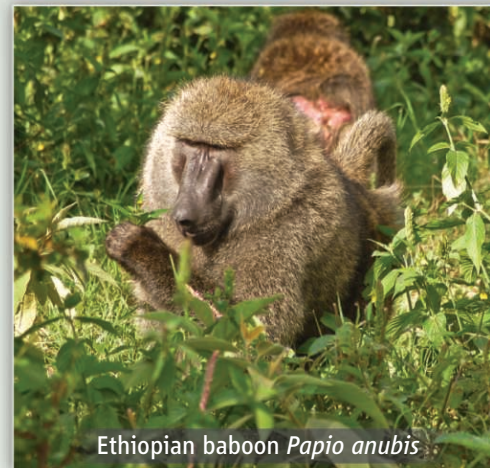
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Lay down eggs in high-ethanol food in the presence of parasitoid wasps

Incorporate antimicrobial resin from conifer trees into their nests

Parasite-infected butterflies protect their offspring against parasites by laying their eggs on antiparasitic milkweed

Medication and consequences on host-parasite interaction

- What is the impact of the medication on the parasite transmission and virulence evolution? Preliminary evidence for some effects...
- Effects of medication on the evolution of the immune systems: medication provides an alternative to immune responses.
- In honeybees: medication behaviors (e.g. antimicrobial resin into their nests) but lack of several genes associated with the immune system, which are present in other insects.

Implications for human food production and health

- Human interference with ability of agricultural organisms to self-medicate.
- For example, beekeepers select bees with reduced resin deposition, which is thought to be linked with increases in parasitism and disease in honeybees.
- As self-medicating animals, humans derive many of their medicines from natural products, such as plants. Studies of animal medication may lead to the discovery of new drugs for human health.