

Of Fennel and birds

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In June 2018 while birdwatching at Medhurst Bridge near Martindale, I observed four bird species feeding in some Fennel *Foeniculum vulgare* growing alongside the road. They appeared to be eating seeds from the plants. In this note I speculate on the possible reasons the birds were doing that and provide some interesting information on Fennel and animal self-medication.

The species I saw feeding in Fennel that day were Spiny-cheeked Honeyeater *Acanthagenys rufogularis*, White-plumed Honeyeater *Ptilotula penicillata*, Striped Honeyeater *Plectorhyncha lanceolata* and Golden Whistler *Pachycephala pectoralis* (a female) (**Figure 1**). The documented diets of each species are as follows (from Menkhorst *et al.* 2017):

- Spiny-cheeked Honeyeater – nectar, insects, small vertebrates, eggs and nestlings, fruits, seeds;
- White-plumed Honeyeater – insects, lerps and nectar;
- Striped Honeyeater – nectar, insects, fruits and seeds;
- Golden Whistler – arthropods from foliage and bark.

I did not see any evidence in the Fennel plants of an insect infestation or of any spider webs. Although I cannot fully exclude the possibility that the birds were taking aphids or thrips, they seemed to me to be eating seeds. That was unusual behaviour based on the reported diets of these species (Menkhorst *et al.* 2017) and led me to pose the questions: Why were these birds, which are not normally seed eaters, eating seed? Was it for food, essential minerals or was there perhaps some other benefit?

After reviewing available information, I concluded they may have been eating the Fennel seeds for medicinal purposes. Below I outline why I reached that conclusion.

FENNEL

Fennel is a native plant of southern Europe, northern Africa and western Asia (Australian Government 2020). In Australia it is an introduced weed, growing in urban and roadside locations. It was recorded as being sown in the Colony of New South Wales in 1803. By the 1880s it had become naturalised in many parts of Australia (Australian Government 2020).

Fennel is a rich source of beta-carotene and vitamin C, as well as calcium, magnesium, iron, and lesser amounts of other metals (Merck Index 2020). It is a traditional and popular herb with a long history of use as a medicine. A series of studies showed that Fennel effectively controls numerous infectious disorders of bacterial, fungal, viral, mycobacterial, and protozoal origin (Badgujar *et al.* 2014).

A search on the Internet established that many UK and American bird species feed on Fennel, in particular birds of the Warbler family. They eat unripened seed heads and the ripe or dry seeds.

Fennel is used in some veterinary practices in Australia as a treatment for sick birds. The head veterinarian at the Sugarloaf Animal Hospital told me: “In the Sugarloaf Animal Hospital we actually use fennel tea as a treatment for conditions such as “sour crop” where its recognised spasmolytic (relieving spasms which hold the intestines in a contracted phase thereby preventing normal peristalsis, and gently promoting contractions) and pro-kinetic effects (increasing strength and rhythm of waves of contractions of peristalsis) can help these birds recover. Interestingly these real actions are the reason it has long been used as a carminative (an agent which controls flatulence and pain associated with gastro-intestinal tract build-up of gas due to an absence of contractions). I think the common thread in the effect of fennel and the treatment of those diseases is in the



Figure 1. Species feeding in Fennel at Medhurst Bridge in June 2018, from top: Spiny-cheeked Honeyeater, White-plumed Honeyeater, Striped Honeyeater, female Golden Whistler.

management of ileus (paralysis of the gut and absence of peristalsis). Ileus is one of the symptoms of those diseases, AND it makes those diseases worse, while the treatment of ileus will help in recovery. Fennel is probably not as profound as some medications we can use, but it almost certainly helps in cases of ileus". (M. Simpson pers. comm.).

ZOOPHARMACOGNOSY

In 1993, the term “zoopharmacognosy” was coined from the Greek roots *zoo* ("animal"), *pharma* ("drug"), and *gnosy* ("knowing") (Wikipedia 2020). The term gained traction from academic works and a popular book (Engel 2002). Zoopharmacognosy is a behaviour in which non-human animals apparently self-medicate by selecting and ingesting or topically applying plants, soils, insects, and psychoactive drugs to prevent or reduce the harmful effects of pathogens and toxins (Wikipedia 2020).

Further investigations uncovered the following extracts from articles:

“Animals wage a continuous battle against parasites using a variety of defence mechanisms, ranging from simple behavioural avoidance to complex immune responses. One poorly understood mechanism is self-medicating behaviour, i.e. defence against parasites by one species using substances produced by another.” (Clayton & Wolfe 1993, p. 60)

“Medicinal herbs are used by animals and humans with the apparent prophylactic effects of reducing the likelihood or severity of illness from pathogens or parasites in the future. Medicinal herbs with anti-inflammatory, antimicrobial, immunomodulatory and/or analgesic properties are used in a therapeutic way to treat acute infections and inflammatory conditions.” (Hart 2005, p975).

“Birds, bees, lizards, elephants, and chimpanzees all share a survival trait: They self-medicate. These animals eat things that make them feel better, or prevent disease, or kill parasites like flatworms, bacteria, and viruses, or just to aid in digestion.” (Shurkin 2014, p. 17339)

There are numerous specific examples, such as:

- In Kenya, elephants enter caves to access the calcium and sodium rich alkaline rocks;
- In Peru, macaws and parrots use riverbank clay to help augment a sodium-poor diet;

- In Europe and UK, some birds (such as Common Starling *Sturnus vulgaris*) choose specific plants to include in their nests (Smith 2016). The aromatic compounds in the plants boost the immune systems of the chicks and reduce their bacterial loads.

Australian bird species are susceptible to several diseases, such as Salmonellosis (bacterial infection, often begins in the intestinal tract), Trichomoniasis (protozoal infection), Aspergillosis (fungal infection), Avian tuberculosis (mycobacterium infection, uncommon in native birds), Avian pox virus (viral infection) and Lyme Disease (tick infection) (Rose 2005). They often also become infested with mites and lice. As previously noted studies showed that Fennel effectively controls similar infectious disorders of bacterial, fungal, viral, mycobacterium, and protozoal origin (Badgular *et al.* 2014). It seems reasonable then to assume that bird species would recognise opportunities to self-medicate for these conditions.

CONCLUSIONS

Whilst I cannot be certain that the birds at Medhurst Bridge were eating Fennel seeds, they appeared to be doing so. As to why they would be eating Fennel seeds, perhaps it was for the purpose of self-medication?

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REFERENCES

- Australian Government (2020). Weeds of Australia. (http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weeddetails.pl?taxon_id=14687). Accessed 12 January 2020.
- Badgular, S.B., Patel, V.V. and Bandivdekar, A.H. (2014). *Foeniculum vulgare* Mill: A Review of Its Botany, Phytochemistry, Pharmacology, Contemporary Application, and Toxicology. *BioMed. Research Internat.* DOI: [10.1155/2014/842674](https://doi.org/10.1155/2014/842674).
- Clayton, D. and Wolfe, N. (1993). The adaptive significance of self-medication. *Trends in ecology & evolution*; DOI:10.1016/0169-5347(93)90160-Q
- Engel, C. (2002). 'Wild Health: How animals keep themselves well and what we can learn from them'. (Harcourt Mifflin Harcourt: New York.)
- Hart, B. (2005). The evolution of herbal medicine: behavioural perspectives. *Animal Behaviour* Vol 70, Issue 5, pp. 975-989.
- Menkhorst, P., Rogers, D., Clarke, R., Davies, J., Marsack, P. and Franklin, K. (2017). 'The Australian Bird Guide'. (CSIRO Publishing: Clayton South, Victoria).
- Merck Index (2020). <https://www.sigmaaldrich.com/life-science/nutrition-research/learning-center/plant-profiler/foeniculum-vulgare.html>. Accessed 12 January 2020.
- Rose, K. (2005). Common Diseases of Urban Wildlife: Birds. Australian Registry of Wildlife Health. <https://arwh.org/common-diseases/birds>.
- Shurkin, J. (2014). Animals that self-medicate. *Proceedings of the National Academy of Sciences*, 111 (49), pp. 17339-17341; DOI: 10.1073/pnas.1419966111
- Smith, J. (2016). Self Medication, Wildlife Style: How birds and other creatures use medicinal plants. Cool Green Science. The Nature Conservancy. <https://blog.nature.org/science/2016/06/20/self-medication-wildlife-style-how-birds-creatures-medicinal-plants/>.
- Wikipedia (2020). <https://en.wikipedia.org/wiki/Zoopharmacognosy>. Accessed 12 January 2020.