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GABAR GOSHAWKS AND SOCIAL SPIDERS REVISITED: UNTANGLING THE WEB

J.R. Henschel, R.E. Simmons & J.M. Mendelsohn

We greatly value the observations and comments by Steyn (1992) on our suggestions for evaluating the intriguing association between Gabar Goshawks *Melierax gabar* and *Stegodyphus* spiders. True to the Socratic tradition, explanations of the association by us (Henschel *et al.* 1991) and others, are based solely on *ad hoc* observations and arguments. As long as this occurs, hypotheses such as those proposed cannot be tested effectively. With clever arguments and some observations one can always find some support or rebuttals for any possible explanation; but one can go no further. With specific predictions, however, generated from hypotheses and tested with simple experiments, one can quickly pare away the unlikeliest explanations to reveal the best. This was the aim of our note.

Steyn's favoured explanation is that the spider web acts as camouflage. Why only Gabars require this and other small hawks do not remains unanswered. Different viewpoints (in this case literally) must be considered for terrestrial vs aerial predators. Does the spider web really camouflage Gabar nests from flying raptors? Since the spider does not typically occur above the nest this is unlikely. By contrast, it can be argued that spider webs at such an unusual height in the tree could make the Gabar nests more conspicuous - especially when festooned with bright yellow *Acacia* flowers!

At this point, any explanation, including the "far fetched" food hypothesis (point 5) is fair game. Predators like Gabars could partake of a spider meal and would join a long list of known avian predators of *Stegodyphus* (Seibt & Wickler 1988, Henschel in press).

As for the anti-parasite hypothesis, indeed spiders may not reduce insect parasites on left-over food if little food occurs on the nest. They may, however, reduce parasite loads on the chicks themselves. Parasitic mites, for example, are

known to reduce chick growth rates and survival in swallows (Møller 1990). Hence there should be selection to reduce parasitism. For predatory birds where food is cached, some, such as owls, introduce anti-parasitic agents (in the form of blind snakes) to reduce the parasitic larvae which consume the food (Gelbach & Baldrige 1987). Also, consider the common behaviour of raptors introducing green leaves or bark chips to their nests (Newton 1979). The idea that this is an anti-parasite behaviour has been previously suggested for passerines (Clark & Mason 1985), for which there is some circumstantial evidence (Cowie & Hinsley 1988). For raptors it has rarely been given much air time. We consider that spiders may act for Gabars and Chanting Goshawks *Melierax canorus*, as green leaves do for other birds - as natural pesticides. If so, then Gabars are no different to other raptors - they simply use live pesticides (spiders), not dead ones (green leaves). This is a testable hypothesis.

Steyn (1992), other raptorphiles, and arachnophiles (not many of those, alas) are justified in criticising injudicious use of insecticides or removal of spider nests from Gabar nests. So the second point of this note is to clarify that we do not advocate casual Gabar-spider observers to do so. We will endeavor to do these experiments ourselves because they require carefully chosen controls. We justify the use of such experimental manipulations because they are the basis of modern scientific methodology and they allow critical insights into such questions. Done well, they also have minimal impacts on the study animals and can provide irrefutable answers.

What we require now is empirical evidence. This is why we requested information and we reiterate that anyone finding a Gabar nest should please fill in our questionnaire (Henschel *et al.* 1991). Thus, when observing Gabar nests please take special note of:

1. Nest lining: where exactly, on or away from the

Gabar nest, is the spongy (dense) spider nest itself situated? Please provide distances from the Gabar nest itself.

2. Camouflage: What is the exact location (above, below, etc) of the sticky capture web relative to the Gabar nest, and how large is it in relation to the Gabar nest?

3. Nest cohesion: what proportion of the Gabar nest is bound by the spider silk and does the web connect the nest with the surrounding branches?

4. Parasite reduction: does the web contain bird parasites? Spiders bind many insect remains into their nest, so please collect old spider nests from abandoned Gabar nests and send them to us. Take note of parasites on gabar nests that do not have spider webs. Finally, do Gabars leave food on the nest and does it attract flies?

5. Food: do Gabars ever eat their tiny nest mates? Careful observations of incubating/brooding Gabars should reveal any interactions.

It is unlikely that the Socratic method (question and answer) will solve all the arguments, but your collective wisdom and, most of all, your collective data, may assist us in untangling this particular sticky web. We thank Peter Steyn and you for your input.

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