

# Oriental honey buzzards use nose and eyes to forage for sweet treats

14 September 2015, by Charlotte Bhaskar



migrating honey buzzards especially target apiaries for a tasty treat not found in nature: "pollen dough." Beekeepers make softball-sized balls of pollen dough from pollen, soybeans, and sugar to feed their bees in winter when flowers are scarce.

The unusual appearance of pollen dough (bright yellow, perfectly round, and very unlike honeycombs or bee larvae) led these *PLOS ONE* authors to [hypothesize](#) that the honey buzzards might be using their noses (olfaction) in addition to visual sightings to identify the dough as food. Olfaction doesn't appear to be very ecologically important to other raptor species, so the possibility that honey buzzards use their sense of smell as well as vision to find food is exciting.

Specifically, the authors asked:

- Can honey buzzards distinguish between visually identical doughs missing a specific food ingredient (pollen, sugar, or soybeans)?
- Are buzzards influenced by the pollen dough's color?

To test these hypotheses, the authors ran a series of field experiments.

In their first experiment, the authors focused on the buzzards' ability to smell specific ingredients in the pollen dough—specifically pollen, one of their sources of nutrition in the wild. To do so, the authors varied the pollen, soybean, or sugar content between two dough samples, but kept the appearance of both samples identical in terms of texture, brightness, and color (yellow).

Winnie the...Buzzard? The Oriental honey buzzard [Pernis orientalis](#) feeds primarily on honey and bee or wasp larvae. But how do they find their food?

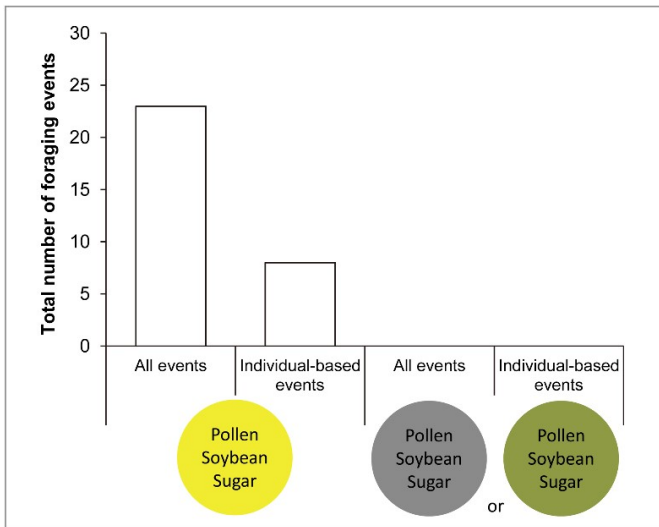
In the winter, thousands of Oriental honey buzzards [migrate](#) to Taiwan to forage. These

In the second experiment, the authors examined the buzzards' reliance on visual cues by varying the colors of two potential dough samples between yellow, black, and green. They kept the ingredients of both dough samples the same.

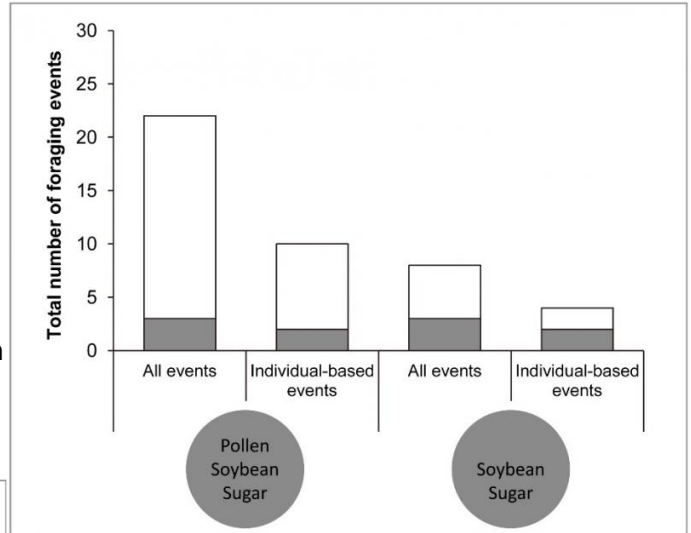
The third and final experiment was a variation on the first experiment, where the dough was dyed black instead of yellow.

The results from experiment 1 revealed that buzzards strongly preferred pollen-containing doughs.

In the second experiment, all buzzards exclusively chose to eat yellow dough instead of black or green dough as shown in the graph below.



The results from the third experiment backed up experiment 1's results, with buzzards again preferring to eat pollen-containing dough over non-pollen-containing dough, even though it was dyed black, as shown in the graph below.



Based on the results from experiments 1 and 3, the authors posit that honey buzzards prefer pollen-containing dough over dough with no [pollen](#) added. It seems probable that the ability to select between two visually identical samples is based on the buzzards' ability to smell the differences.

The authors also looked at the [olfactory receptor](#) (OR) gene repertoire size in the honey buzzard's genome. The number of different scents a species can distinguish is linked to its number of OR genes. Their gene analysis showed that the Oriental honey buzzard has the largest OR gene repertoire of the diurnal raptors—almost five times as large as the OR gene repertoire of peregrine falcons or golden eagles!

Taken together, these results suggest that the Oriental honey buzzard uses both olfaction and color vision when foraging for food. Additionally, the results of experiment 3 (where all [dough](#) samples were colored black) suggest that olfaction might predominate over vision in cases where the two senses seem to conflict.

While more work still needs to be done to discover the extent of the role olfaction plays in Oriental honey buzzards' feeding strategy, it seems clear

that in this case the nose (or beak!) knows.

**More information:** "Stop and Smell the Pollen: The Role of Olfaction and Vision of the Oriental Honey Buzzard in Identifying Food." *PLoS ONE* 10(7): e0130191. [DOI: 10.1371/journal.pone.0130191](https://doi.org/10.1371/journal.pone.0130191)

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