

Pellet Casting by Non-Raptorial Birds in Malaysia

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Introduction

Birds are known to regurgitate pellets, the indigestible parts of their food items like bones, fur, feathers, bills, claws, teeth, shells, chitinous exoskeletons, seeds, plant matter, etc (Seyfe *et al.*, 2024; Gill *et al.*, 2019). Pellet casting among raptorial birds, including owls, is better known and studied. However, most species of birds cast pellets including herons, cormorants, gulls, terns, kingfishers, crows, jays, swallows, bee-eaters, most shorebirds, flycatchers and spiderhunters (Seyfe *et al.*, 2024; Wang *et al.*, 2009). The International Bird Pellet Study Group listed 18 orders comprising 67 families and 316 species of birds that cast pellets (Wang *et al.*, 2009).

This paper is to document non-raptorial birds in Malaysia observed casting a pellet.

Observations

Terek Sandpiper *Xenus cinereus*,

A Terek Sandpiper was observed casting a pellet (Plate 1) at Trombol beach, west of Kuching, Sarawak, Malaysia in March 2025 by Anthony Wong. The bird was seen drinking sea water before acting strangely - shaking the head and stretching open its mouth before casting the pellet with some difficulties. After casting of the pellet, the bird drank more water with more stretching of the mouth and rhynchokinesis before moving off. The Terek Sandpiper has not been previously documented in literature casting a pellet (Mlodinow *et al.*, 2024).



Plate 1: Terek Sandpiper casting a pellet (top 2 images). Drank more water and stretched the mouth with rhynchokinesis after casting (bottom images). Note pellet on the left of the two bottom images.

Black-headed Gulls *Chroicocephalus ridibundus*

Amar-Singh HSS and Ron Pudín (2025) recently reported a Black-headed Gull casting a pellet. See link in references.

Red-headed Trogon *Harpactes erythrocephalus*

Samuel Ong was fortunate to observe a male and female Red-headed Trogon, a short distance apart, feeding on some fruit/berry/seed in the morning and then casting the pellet out (Plate 2). This was observed at Fraser's Hill, Pahang, Peninsular Malaysia in September 2022.



Plate 2: Female (left) and male Red-headed Trogon casting a pellet.

Bee-eaters: Blue-tailed Bee-eater *Merops philippinus* & **Blue-throated Bee-eater** *Merops viridis*

Bee-eaters have been documented to cast pellets (Fry & Boesman 2020). Lee-Fung Chai saw the Blue-tailed Bee-eater regurgitating a pellet at Taman TAR, Selangor, Malaysia in February 2019. Sein-Chiong Chiu saw a Blue-throated Bee-eater casting out an undigested food pellet at Kampar, Perak, Malaysia in May 2025 (Plate 3). Lee-Fung Chai also saw a Blue-throated Bee-eater casting a pellet in September 2020 at Taman TAR, Selangor, Malaysia.

Kingfishers: Rufous-backed Dwarf-Kingfisher *Ceyx rufidorsa* & **Banded Kingfisher** *Lacedo pulchella*

Kingfishers are well known to cast pellets (Plate 4). Saravanan Palanisamy observed the Rufous-backed Dwarf-Kingfisher do this at Sungai Congkak Recreational Forest, Selangor, Malaysia in June 2024, while Sein-Chiong Chiu videoed a Banded Kingfisher doing this in June 2023 at Papan, Perak, Malaysia (video link: <https://www.youtube.com/watch?v=j7cfegF4-10>) .



Plate 3: Pellet casting by a Blue-tailed Bee-eater (left) & Blue-throated Bee-eater.



Plate 4: Pellet casting by a Rufous-backed Dwarf-Kingfisher (left) & Banded Kingfisher (video grab image).

Green Broadbill *Calypomena viridis*

In June 2022 Sein-Chiong Chiu videoed a female Green Broadbill regurgitating and casting out a pellet of undigested food (Plate 5) at Ipoh, Perak, Malaysia.

White-bellied Erpornis *Erpornis zantholeuca*

Amar-Singh HSS observed a White-bellied Erpornis regurgitating and ejecting a pellet (Plate 6) in April 2023, at a Forest Reserve, Ipoh, Perak, Malaysia (Amar-Singh HSS 2023).



Plate 5: Video-grab composite images of a Green Broadbill casting a pellet. (video link: <https://www.youtube.com/watch?v=uRCepzKDoEg>)



Plate 6: Composite image of a White-bellied Erpornis casting a pellet.

Tiger Shrike *Lanius tigrinus*

Lefranc and Worfolk (2022) state that "*Pellets are regularly regurgitated by shrikes and can be found under their favourite perches or near their nests. Pellets of mainly insectivorous shrikes, are much more fragile and break easily.*" For the Tiger Shrike whose diet is mainly insects the pellet would comprise chitinous remains of insects.



Kelvin Low observed a Tiger Shrike regurgitating a pellet (Plate 7) in February 2024 at Taiping, Perak, Malaysia.



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Plate 7: Tiger Shrike casting a pellet.

Common Hill Myna *Gracula religiosa*

The Common Hill Myna is known to cast 'pellets'. Bertram (1970) notes that fruit stones are regurgitated, usually within an hour of consumption; fruit stones with fruit still closely adhering may be swallowed again.

Amar-Singh HSS observed one bird, in a social group of 9 Common Hill Mynas, at a secondary forest site at Ipoh, Perak, Malaysian in November 2022 casting a small pellet (Plate 8) (Amar-Singh HSS 2024)..

Blue Rock-Thrush *Monticola solitarius*

Amar-Singh HSS saw a male Blue Rock Thrush that cast a pellet (no pictures) at limestone outcropping, Ipoh, Perak, Malaysia in April 2019.



Plate 8: Common Hill Myna casting a pellet.

Flycatchers

It is interesting how many flycatcher species have been observed casting a pellet. Flycatchers are generally insectivores and pellets or indigestible material are formed in the gizzard and regurgitated. Often these pellets are small, approximately 1cm in size and hard to find for analysis. Flycatchers observed casting a pellet locally include (Plate 9):

1. **Asian Brown Flycatcher** *Muscicapa dauurica* by Amar-Singh HSS in October 2017 at a Forest Reserve, Ipoh, Perak, Malaysia (Amar-Singh HSS 2017). This occurred early in the morning suggesting that pellets take time to form and are expelled early in the morning or late in the day.
2. **Brown-streaked Flycatcher** *Muscicapa williamsoni* by Sein-Chiong Chiu in May 2025 at Taiping, Perak, Malaysia. (video link: <https://www.youtube.com/watch?v=P983BEEIts8>)
3. **Large Niltava** *Niltava grandis* by Amar-Singh HSS in March 2015 at Cameron Highlands, Pahang, Malaysia
4. **Indigo Flycatcher** *Eumyias indigo* by Amar-Singh HSS in March 2024 at Kinabalu National Park, Sabah, Borneo, Malaysia. Interestingly this bird regurgitated 2 pellets in rapid succession. Most birds are seen to regurgitate a single pellet.
5. **Indochinese Blue Flycatcher** *Cyornis sumatrensis* by Kang-Hui Ooi in March 2025 at Taiping, Perak, Malaysia. A pair was seen and the male cast the pellet which could not be retrieved in the forest. (video link: <https://youtu.be/c3bsMZD16IM>)
6. **Little Pied Flycatcher** *Ficedula westermanni* by Amar-Singh HSS in September 2023 at Cameron Highlands, Pahang, Malaysia. A juvenile male was seen casting a pellet.

There is an online post by Koel Ko of a **Bornean Blue Flycatcher** *Cyornis superbus* regurgitating a pellet (Macaulay Library ML377934461) in April 2010 at Danum Valley, Sabah, Malaysia.



Plate 9: Flycatchers casting a pellet. Clockwise from top left Asian Brown Flycatcher, Brown-streaked Flycatcher, Large Niltava, Little Pied Flycatcher, Indochinese Blue Flycatcher, Indigo Flycatcher.

Purple-naped Spiderhunter *Kurochkinogramma hypogrammicum*

While watching a Purple-naped Spiderhunter feeding on the fruit of the *Macaranga bancana*, Amar-Singh HSS spotted a self-feeding juvenile cast a small pellet (Plate 10). It was not possible to find the pellet as the undergrowth was too thick (Amar-Singh HSS 2024).



Plate 10: Juvenile Purple-naped Spiderhunter casting a pellet.

There has been inadequate attention given locally to the collection and analysis of bird pellets. Collecting and studying pellets enlarges our understanding of the diet and natural history of birds. They also offer insights into seasonal and long-term diet changes.

The Appendix provides some guidelines on the analysis of bird pellets.

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Appendix: Steps to Analyse a Bird Pellet, from Preparation to Interpretation

Amar-Singh HSS

1. Preparation and Safety

Note that the pellets are not sterile and can contain bacteria or viruses. It is important to wear gloves and probably a mask. Remember to wash your hands after the analysis and clean the work surface with disinfectant. The items you will require include:

- Bird pellet
- Fine-tipped forceps
- Dissecting needles or probes
- Petri dish or a shallow tray
- White paper (to better see food items)
- Small brush (optional, for delicate cleaning)
- Magnifying glass
- Gloves (for safety)
- Mask (for dust/safety)
- Notebook for recording observations
- Digital camera (for documentation)
- Container for preserved contents (e.g., small vial or zip-top bag)
- Disinfectant for tools and workspace.

2. Initial Observation and Macroscopic Analysis

Examine the intact pellet and record observations, including the date, location found, and any other relevant context (e.g., species of bird if known, habitat). Assign a unique identifier to each pellet if you have multiple samples. Note the following:

- Shape and Size: Note the overall shape and measure its length and width. These can sometimes give clues about the bird species.
- Colour: Observe the colour, may vary depending on the prey items and the bird's digestive processes.
- Texture: Feel the pellet (gently, with gloved hands) to assess its firmness or fragility.
- External Contents: Look for any obvious large components protruding from the pellet (e.g., large bones, feathers, fur tufts).

3. Dissection and Microscopic Analysis

- Softening (optional but useful for hard pellets): If the pellet is extremely hard and brittle, you can try to soften it by gently misting it with a small amount of water. Be careful not to over saturate it. Some recommend heating the wet sample (Yalden 2009).
- Careful Dissection: Place the pellet in a petri dish or on a clean surface. Using forceps and dissecting needles, gently break apart the pellet. Start from one end and work your way through, or carefully split it lengthwise. Be meticulous and avoid crushing delicate contents.
- Sort and Separate Contents: As you dissect, separate the different types of materials into distinct piles. Common categories include: bones, fur, feathers, insect exoskeletons (head capsules, legs, wings, etc), plant matter (seeds, leaves, stems), miscellaneous including synthetic materials.
- Try to identify the items consumed by using reference guides or image search. Some fragments may not be identifiable down to the species level.

Data Recording and Interpretation

- Document items by photography.
- Count the number of individual prey items represented and estimate the relative proportion of each prey type. Summarise the prey composition of the pellet.
- Consider the implications for the bird's diet and foraging habits.
- Post findings in eBird and the Malaysian Bird Report.

Preservation (Optional)

If you wish to keep the pellet contents for future reference or study, place the sorted materials in small, labelled vials or sealed bags. You might use a desiccant packet to prevent mould growth.

Useful Sites/Books

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