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An observation of bone dust feeding by Speckled Mousebirds *Colius striatus*: an unusual dietary supplement in a folivorous bird

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Abstract

Speckled Mousebirds *Colius striatus*, generally regarded as strict folivores, were observed over several months regularly feeding on bone dust in a suburban garden in Bethlehem. This behaviour suggests opportunistic intake of animal-derived nutrients, possibly for protein or mineral supplementation, but alternative explanations (taste, curiosity, training by other species) cannot be excluded. The repeated nature of the observations may indicate that such feeding is not incidental, but may reflect adaptive foraging under specific nutritional conditions or an adjustment in feeding behaviour in response to an available nutrient-rich resource.

Introduction

Mousebirds, order *Coliiformes* (family *Coliidae*), are notable for a suite of unusual characteristics, including a primarily vegetarian diet and behavioural and physiological traits that support energy conservation (McKechnie et al. 2009). They consume a diverse array of plant matter, with leaves and fruits forming the bulk of their intake, supplemented by buds, flowers and occasionally nectar (Dean 2005). Reports of insect consumption are rare and largely anecdotal (de Juana & Kirwan 2020). Sustained folivory is particularly intriguing among small-bodied birds, because it requires adaptations to cope with the low energy and protein content of fibrous plant material (Downs et al. 2000).

The observation reported here, of Speckled Mousebirds *Colius striatus* feeding on bone dust, appears to extend this pattern, suggesting that even these primarily folivorous birds may opportunistically exploit unconventional animal-derived resources, potentially as a source of protein and/or calcium.

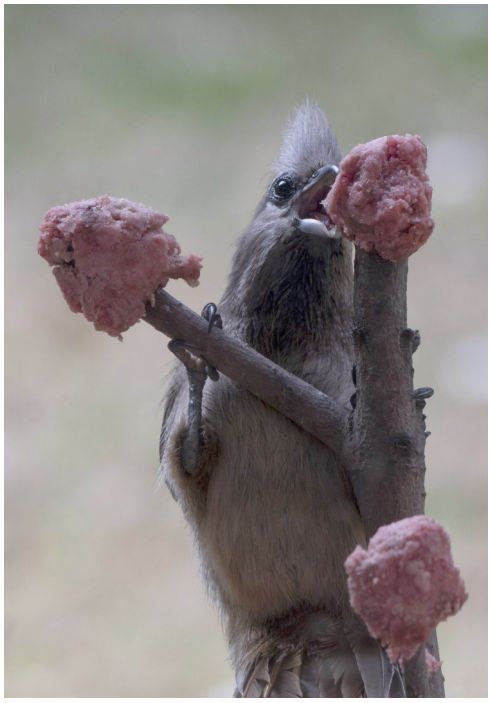
Observation

For many years, my wife and I have provided modest amounts of coarse bone dust as part of our supplementary feeding of wild birds in our garden in Bethlehem, Free State. Other items include seeds, vegetables and fruit. The bone dust is sourced from a local butchery and is obtained only from fresh beef carcasses. We avoid frozen meat, pork, or processed scraps. The bone dust is shaped into tennis ball-sized portions and frozen immediately. This allows us to thaw only what is needed, reducing the risk of spoilage and ensuring that no decaying food is left out. Offered in small amounts and removed if uneaten, this carefully handled supplement has proven particularly attractive to numerous species of garden birds.

My wife was first to observe that Speckled Mousebirds were investigating bone dust. She noticed that a mousebird would arrive and observe her closely when she stocked the feeder with bone dust, or when she scattered small balls for the resident Southern Fiscal *Lanius collaris*. These initial observations were followed by several direct observations where mousebirds would come to the feeder to feed on the offered bone dust (Figures 1, 2 & 3).

Figure 1 (left): Speckled Mousebirds *Colius striatus* feeding on bone dust, Bethlehem, 17 July 2025.

Figure 2 & 3 (bottom, left & right respectively): Speckled Mousebirds *Colius striatus* feeding on bone dust, Bethlehem, 21 July 2025.



At first, we were uncertain if it was only one specific individual who had learnt to exploit this food source. However, on subsequent occasions, several individuals were seen feeding simultaneously on the bone dust.

Discussion

Leaf-eating among birds, or folivory, is an uncommon dietary strategy. Only a few avian groups have evolved to subsist largely on foliage, including ratites (Herd & Dawson 1984), certain ducks (Dawson et al. 1989), ptarmigans (Gasaway et al. 1975), the nocturnal Kakapo *Strigops habroptilus* (Powlesland et al. 1992), and some neotropical passerines, e.g. plantcutters *Phytotoma spp.* and saltators *Saltator spp*. (Munson & Robinson 1992). Its rarity reflects the demanding physiology required to extract sufficient energy and nutrients from fibrous, low-protein plant material, which often constrains activity levels and body size (Downs et al. 2000).

Mousebirds form a small African lineage of six species that have successfully mastered this balance. With an average mass of around 50 g, they are the smallest known folivorous birds (Downs et al. 2000). Despite their modest size, they inhabit a wide range of environments, from dry thornveld to moist woodland, and rely on a diet primarily composed of leaves, fruits, buds, and flowers (Bosque et al. 2017).

Because leaves and fruits provide limited caloric and protein value, mousebirds have evolved a suite of behavioural and physiological adaptations to meet their metabolic needs. Their digestive system includes structural and microbial specializations that facilitate fermentation of fibrous food, producing volatile fatty acids as an additional energy source (Downs et al. 2000). Behaviourally, they emphasize energy conservation: extensive sunning, communal roosting, and the ability to adjust body temperature, traits often linked to heterothermy, help reduce thermoregulatory costs and support digestion (Bartholomew & Trost 1970; Bosque et al. 2017).

Field observations indicate that mousebirds spend much of the day perched or sunning, with only a small fraction of time devoted to feeding. For example, White-backed Mousebirds *Colius colius* may spend over half of daylight hours exposing their ventral plumage to

direct sunlight, while feeding occupies just a few percent of the daily time budget (Bosque et al. 2017). This behaviour likely elevates body and gut temperatures, facilitating the digestion of fibrous plant material. Speckled Mousebirds perch vertically while sunning, extending their legs and exposing the belly and gut to sunlight, a posture that may enhance this process (per. obs) (Figure 4).

Although generally considered strictly vegetarian, occasional ingestion of insects has been recorded, including termites and ants (de Juana & Kirwan 2020). In Kenya, some birds have even been observed consuming large amounts of raw and cooked meat offered to attract carnivorous mammals (de Juana & Kirwan 2020). Such opportunistic intake of animal protein or minerals indicates that mousebirds may supplement their diet when plant-based resources are insufficient. The observation reported here, of Speckled Mousebirds *Colius striatus* feeding on bone dust, extends this pattern, possibly suggesting that even primarily folivorous species may exploit unconventional animal-derived resources, potentially for protein or calcium supplementation.

Figure 4: Speckled Mousebirds *Colius striatus* exposing the belly while sunning, Bethlehem, 11 October 2025.

Mousebirds display flexibility in their feeding habits, adjusting intake according to the availability and nutritional quality of food. While leaves provide a consistently available but low-energy diet, the opportunistic consumption of higher-quality items, such as fruit allows additional nutrient acquisition with minimal foraging effort. By relying on a low-quality baseline diet, Speckled Mousebirds can minimize energy expenditure, aided by efficient digestive processing and adaptable thermoregulation (Bartholomew & Trost 1970, Brown & Foster 1992, Downs et al. 2000).

The generally low energy demands of mousebirds mean they spend less time actively feeding, a pattern further enhanced when nutrient-rich resources are abundant and easy to access. Reduced foraging and flying frees time for social interactions (Figure 5) and sunning, behaviours that likely support both digestion and thermoregulation.

Feeding on bone dust may exemplify this strategy, representing a targeted exploitation of a nutrient-rich, unconventional resource while maintaining the energy-minimizing lifestyle characteristic of folivorous birds.

Limitations

This note is based solely on field observations conducted in a domestic garden setting, without experimental control or quantitative data. Although the feeding behaviour was observed repeatedly and under consistent conditions, the specific nutritional or physiological motivations behind the ingestion of bone dust could not be determined. Controlled studies will be required to confirm whether this behaviour represents a deliberate strategy for protein or mineral supplementation, a response to environmental factors, or simply opportunistic foraging.

Figure 5: Speckled Mousebirds *Colius striatus* socializing and dust bathing, Bethlehem, 6 November 2024.

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