

## EARLY PARENT-YOUNG INTERACTIONS IN RED JUNGLEFOWL: EARLOBE PECKING

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After hatching, Red Junglefowl chicks (*Gallus gallus*) remain in the nest where the hen broods them for 12 to 24 h before calling them out of the nest in apparent search for food. Although a few studies describe parent-young interactions in wild and domestic chickens (McBride et al. 1969, Stokes 1971), relatively little is known about the social interactions that occur in the nest during the pre-exodus brooding period.

While recording maternal vocalizations of Red Junglefowl hens at nest sites in the field, I noted other types of interactions between parents and young during the pre-exodus period. These observations were made at a field station near Raleigh, North Carolina, U.S.A. A free-ranging population of 10 to 30 non-wing-clipped adult Red Junglefowl is maintained year-round at the field station. The birds I studied were crosses of three subspecies of Red Junglefowl—Burmese Red Junglefowl (*G. g. spadiceus*), Tonkinese Red Junglefowl (*G. g. jabouillei*), and Indian Red Junglefowl (*G. g. murghi*). (While the breeder of the stock believes these birds to be purely wild junglefowl, the possibility remains that there may have been some admixture of domestic fowl in their ancestry.)

I watched the nesting junglefowl hens from a tent located 10 to 20 m from each natural nest site. Eight hens were observed with their young from the time of hatching until leaving the nest.

The first hen was observed by Gilbert Gottlieb and me in the spring of 1974 without the aid of binoculars or telephoto lenses. During the brooding period, the young occasionally emerged from under the brooding hen to sit beside her or to feed. At these times, parental feeding (of the kind described by Stokes 1971) often occurred; that is, the hen, while still sitting on the nest, pecked at the ground (presumably at a morsel of food) and simultaneously uttered a "food call," which prompted the young to gather

around the area at which she was pecking and also proceed to peck. When the young were gathered near the hen's head during these periods, we noticed that occasionally the hen appeared to pick up a chick and toss it up in the air, sometimes over her head, causing the chick either to land on her back or fall to the ground in front of her. At that time, we could not explain this repeated act of apparent aggression by the hen.

In the spring of 1976, I had the opportunity to observe seven more nesting junglefowl hens, this time with optical equipment. The act that had previously seemed to be caused by the hen was now found to be caused by the chick itself. I discovered that the chicks were pecking and pulling the earlobes of the brooding hen. Red Junglefowl hens have white earlobes that contrast with the surrounding dark reddish plumage (Fig. 1). It was common for chicks to continue pulling on the hen's earlobe as she raised her head, which resulted in the chick being hoisted into the air (Fig. 2) and sometimes being tossed over the hen's head (depending on the force with which the hen raised her head).

Earlobe-pecking and pulling of the type described above was observed in seven of the eight nests under observation. Such early interactions between hens and chicks were fairly common during the brooding period before nest departure. I ceased my observations when each hen departed from her nest, and therefore do not know if this behavior persists after the departure. Also, as the chicks were not individually marked, I do not know how many in each clutch were involved in earlobe pecking. The primary purpose of my study was to record vocalizations by the hen, so it was not feasible to measure the incidence of earlobe-pecking per observation period (usually 8 to 10 h per day). However, the behavior occurred up to 20 times daily, depending on such factors as the particular hen and brood under observation, the number of times the chicks emerged from beneath the hen, and my ability to see the activity in the nest.

The chicks pecked not only at the hen's earlobes, but also at her comb and wattles (both of which are red), and at her beak. Pecking at the comb or wattles also sometimes caused the chick to be lifted. The chicks pecked at the earlobes more than at other places on the hen's head. Perhaps the earlobes offer a more conspicuous target for the chicks than the comb and wattles. Dawkins (1971) and Kruijt (1964) noted that chicks tend to peck at high-contrast objects.

McBride et al. (1969) remarked that chicks of feral domestic fowl peck at the hen's head, earlobes, and



FIGURE 1. Head of a Red Junglefowl hen with the conspicuous white earlobe being stretched by a chick.

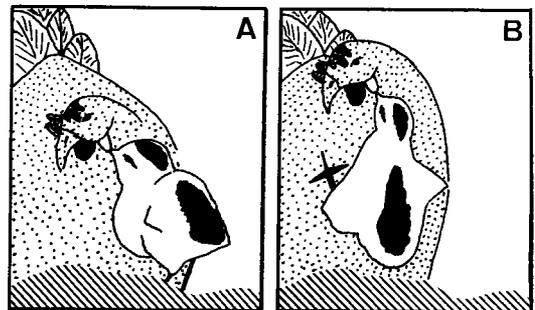


FIGURE 2. (A) A Red Junglefowl chick pulling the earlobe of a broody hen and (B) subsequently being lifted in the air as the hen raises her head. (Redrawn from photographs.)

beak while she pecks at the ground during "tidbitting" (directing the young to a morsel of food). I have also seen chicks (of a female White Leghorn × male Red Junglefowl) peck at the red comb and wattles of the White Leghorn hen during the brooding period; this sometimes caused the young to be tossed into the air.

Pecking occurs frequently in newly-hatched chicks (see also Nice 1962, Kruijt 1964, Hogan 1971). The adaptive significance (if any) of earlobe-pecking is unknown, but it seems reasonable to speculate that it improves the accuracy with which the young subsequently peck at food (cf. Hess 1956, Hailman 1967) and the efficiency with which they grasp food objects. This problem is open to laboratory and field investigation (Miller 1977) and may provide insight into our knowledge of the development of pecking preferences and feeding behavior (Hogan 1973a, 1973b, 1975; Fischer et al. 1975).

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#### FOODS OF JUVENILE, BROOD HEN, AND POST-BREEDING PINTAILS IN NORTH DAKOTA

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The Pintail (*Anas acuta*) is a common to abundant nesting species in North Dakota, becoming more numerous during years of favorable water conditions and less so during drought. Stewart and Kantrud (1974) estimated breeding populations of 304,000, 111,000 and 379,000 pairs in the Prairie Pothole Region of North Dakota during 1967-69, respectively. We studied food habits of juvenile and adult Pintails during the brood-rearing and post-breeding periods in North Dakota to learn their food requirements during these phases of the life cycle. Food habits of flightless juveniles have been studied in Alberta (Sugden 1973) and limited information on downy Pintail ducklings has been reported from the Soviet Union (Dement'ev and Gladkov 1967). Published information is lacking on food habits of fledged juveniles, brood hens, and post-breeding adults during the summer months on the breeding grounds. Food habits

of breeding Pintails in North Dakota have been described by Krapu (1974a, 1974b).

We collected juveniles, brood hens, and post-breeding hens while they fed in prairie wetlands of Stutsman, Barnes, and Logan counties of eastern North Dakota from June through August of 1969, 1970, and 1971. Hens were considered post-breeders when occurring in flocks during late spring and summer. Additional Pintails were collected during October 1976 on a wetland staging area in western Stutsman Co. A shotgun was used to collect birds feeding in natural wetlands and a municipal sewage lagoon. The digestive tract of each bird was removed immediately after collection and esophageal contents were flushed into a glass bottle containing 80% ethanol to minimize postmortem digestion. Volumetric measurements are presented by the aggregate percent method (Martin et al. 1946) and frequency of occurrence is given for each food item. We identified invertebrates and plant material with the aid of guides by Pennak (1953), Ward and Whipple (1959), and Martin and Barkley (1961). Esophageal contents were measured volumetrically by water displacement.

Animal foods formed 66% of the diet of 23 juvenile Pintails; dipterans accounted for 42% of the animal matter consumed and larvae of the family Chironomidae formed 99% of the total. Other dipteran families identified were Ceratopogonidae and Anthomyiidae. Snails ranked second in percent aggregate volume;