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## OBSERVATIONS ON THE SOCIAL BEHAVIOUR OF HELMET-SHRIKES

by P. W. Greig-Smith

Received 4 March 1976

The helmet-shrikes Prionops plumata and Prionops caniceps are the only members of their subfamily (Laniidae: Prionopinae) that occur in West Africa. They have distinctive habits characterised by intense sociability, and a co-operative breeding system in which several birds assist in nest-building, brooding and care of the young. P. plumata is a savanna woodland species, while P. caniceps is restricted to forest. This paper describes some differences in social behaviour between them, and considers how their social behaviour is affected by co-operative breeding and general ecology.

P. plumata was studied in the Guinea savanna zone at Mole National Park, Northern Region, Ghana, from 4 July to 3 September and from 30 October to 3 December 1975. P. caniceps was observed in mature secondary forest at Ife, Western State, Nigeria, between 28 September and 3 October 1975.

## OBSERVATIONS

Prionops plumata

Birds were encountered regularly throughout and the species is probably resident at Mole all year. There is no evidence for its migration in Nigeria (Elgood, Fry & Dowsett 1973), although in southern Africa it is apparently prone to local movements (Vernon 1966). Breeding dates at Mole are not known, but records elsewhere (Mackworth-Praed & Grant 1973) suggest that birds might be expected to nest in the late dry season (March to April). No breeding activity was seen during the present study.

Social groups

On all but one occasion the birds were seen in groups, ranging in size from 3 to 13. In early July three flocks, of 8, 9 and 10 birds, were present in one area of savanna, and the groups appeared to be constant and coherent. During August they became less coherent and broke up into smaller units (Fig. 1). The small sample from November indicates that larger groups had reformed.

Fig. 2 shows the composition of a sample of 18 birds (in two groups) that were mist-netted in mid-July. The population appears to

contain four categories: (a) large adult birds, (b) smaller adults, (c) small juveniles, and (d) juveniles and sub-adults intermediate in size between (a) and (b). It is probable that (a) and (b) represent males and females respectively, in various age-classes. (c) and (d) may be either female and male offspring of the current year's breeding season, or (d) might be one-year-old birds which have not achieved full adult plumage. Bannerman (1933-1951) recorded sexual dimorphism in size for P. plumata.

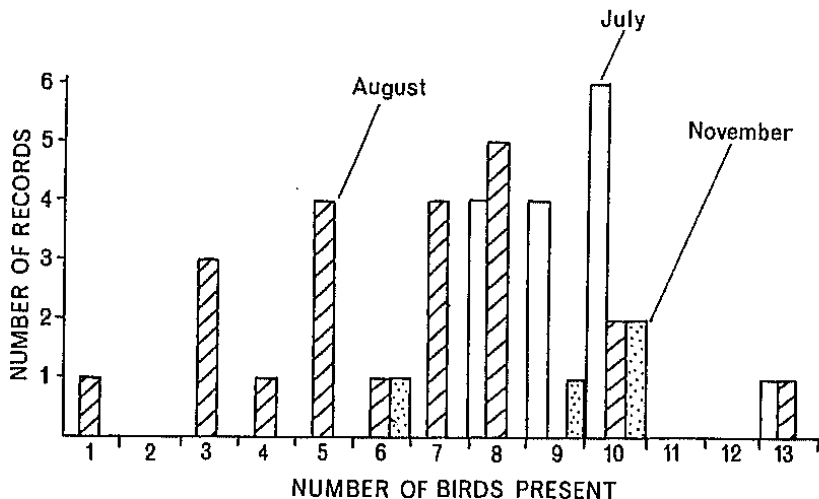


Figure 1. Size of Prionops plumata groups observed at Mole National Park, Ghana, in July, August and November 1975.

### Territory

Flocks were highly mobile, ranging over a large area of savanna. Although 18 birds were colour-ringed, it was not possible to plot the ranges of individual groups. It is certain, however, that considerable overlap of ranges occurred, as recorded by Vernon (1966). A meeting between groups was seen only once and involved behaviour never seen in other contexts. A group of ten and one of eight were perched in adjacent trees, in silence, and single birds made continual swooping and diving attacks on members of the other group. Group members were huddled together on a single branch, remaining much closer than was seen on other occasions. The incident ended when the larger group suddenly flew off in a tight flock, followed immediately by the departure of the other group. This interaction suggests that territories are defended on occasion, but much overlap is tolerated.

### Behaviour within groups

On most occasions the birds were foraging, typically within the low and middle parts of the trees, although they descended to feed on the ground where the grass had been cleared. The only food items clearly seen were large caterpillars, extracted from crevices in bark, particularly of the shea butter tree *Butyrospermum paradoxum*, in which a high proportion of foraging time was spent. Adult birds frequently presented food to juveniles, usually preceded by wing-shivering by the young bird. Birds in full adult plumage were seen trying to grab food being offered to juveniles. The frequency of feeding juveniles appeared to decline through the study, and none was recorded during November.

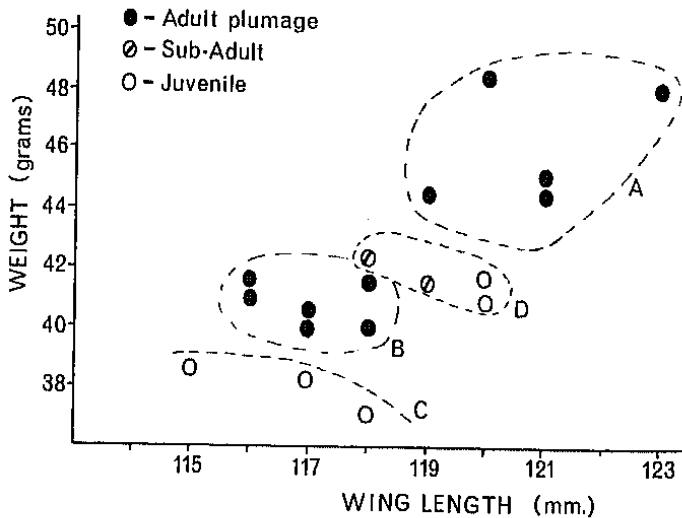


Figure 2. Composition of *Prionops plumata* population at Mole National Park, Ghana, in July 1975 (sample of 18 birds).

The species has a distinctive call, a chatter made by the whole flock. This seems to be uttered immediately after a flock movement has been initiated by one of the birds, and doubtless maintains cohesion of the flock. Bill-snapping was seen in situations where it might constitute alarm and/or threat (e.g. during the territorial dispute described above, and on the approach of humans). During November the groups were less vocal than in July and August, and calling was confined to single birds in the group.

P. plumata is one of very few savanna species which remained active during the middle of the day at Mole - flocks were equally mobile and Vocal at all times of day. It has been suggested by Harwin (1959) that groups follow the same route each day, and the Mole birds seemed to confirm that, as they regularly appeared at a particular spot at the same time of day. The route is not invariable, however, and may change substantially after several days.

#### Interactions with other bird species

Vernon (1966) notes cases from Rhodesia in which P. plumata groups mobbed predators, and formed part of mixed-species insectivorous flocks. They apparently join mixed flocks in Malawi (P.G.H.Evans pers. comm.) and in some areas of West Africa (Mackworth-Praed & Grant 1973), but at Mole they were notable for almost total absence of association with other birds. They were one of the few insectivorous savanna species which did not join mixed flocks (Greig-Smith in prep.), and only once were seen in the vicinity of another species (the wood-hoopoe Phoeniculus purpureus) without aggression. On one occasion a group was attacked by a roller Coracias abyssinica, and once a group was attended by a drongo Dicrurus adsimilis, which appeared to benefit by feeding on the insects flushed by the moving flock of helmet-shrikes. They gave the impression of trying to evade the drongo, and ceased feeding when it joined them.

#### Prionops caniceps

A group of seven P. caniceps was observed on two occasions at Ife, and showed several differences from P. plumata. The group kept within the tree canopy, at heights of 10 to 20 metres, forming a looser flock than P. plumata. They moved much less rapidly through the area and made less frequent vocalisations. These consisted of bill-snaps, whistles, and a loud explosive chack-ack. Calls did not appear to be correlated with movement of the group in the way that they are in P. plumata. Foraging behaviour was quite different - the diet appeared to consist of winged insects, captured during fluttering forays away from a perch, not searched for on bark and foliage. The observed capture rate was much higher than ever seen in P. plumata. Several other bird species in the vicinity of the group were ignored.

#### DISCUSSION

It is clear that all of the activities of the helmet-shrikes are carried out in highly integrated social groups. Explanations for flocking fall into three categories - an anti-predator device, an aid to foraging, or the satisfaction of a general gregarious tendency (see discussion in Morse 1970). Although both of the first two effects may be operating, the requirements of co-operative breeding and the disinclination of P. plumata to join mixed flocks suggest that their sociability is connected primarily with the breeding system.

Both species show adaptations for promoting the cohesion of flocks, particularly necessary for highly mobile species such as P. plumata. The plumage is conspicuous, incorporating patches of white on dark colours, displayed in flight; and the vocalisations are loud, frequent and distinctive. It is likely that the constant movement of P. plumata improves cohesion, since following reactions are known to be of major importance in flocking (Moynihan 1960).

The high level of social interaction which must occur in groups was not investigated, but is likely to involve communication via the erectile crests and brightly-coloured eye wattles of the adults, which distinguish them from the dusky juveniles.

The differences in behaviour between the two species can be attributed to the habitats they occupy, and differences in feeding ecology. The louder calls and less conspicuous plumage of P. caniceps reflect low visibility in forest, while the looser flocking habit is appropriate to the species' lower mobility. The higher rate of prey capture by P. caniceps suggests that they may be able to satisfy their foraging requirements within a smaller area than P. plumata. Therefore they would not need to adopt the wandering habits of the latter, nor develop such extreme adaptations for cohesive flocking. The mobility of P. plumata may be due to causes other than a low density of available prey. There is a general pattern among birds at Mole to be wide-ranging in savanna, and sedentary in forest (Greig-Smith, in prep.). This probably constitutes an adaptation to the annually-burnt savanna environment, which becomes locally untenable during the dry season.

In many co-operative breeding systems, offspring remain with their natal group to assist with raising the young of the following year (Fry 1972, Grimes 1976), but at some point at least one sex must disperse to join other groups. The break-up of P. plumata groups in August probably indicates such a dispersal of immatures, followed by their acceptance into neighbouring groups by November. The extensive overlap of ranges of groups probably helps this exchange. There was no evidence to support the alternative explanation for the break-up of groups proposed by Vernon (1966), that there is a disbanding of composite flocks formed for migration. The observations made do not provide information on which sections of the population (Fig. 2) are involved in dispersal. Theoretically either or both sexes might move, during their first or subsequent years. It does appear, however, that dispersal closely coincides with or follows the end of juvenile-feeding by the adults, marking the attainment of foraging independence.

The reasons for avoidance of other bird species are obscure, although the absence of P. plumata from mixed flocks is unsurprising, since the helmet-shrikes may be expected to accrue whatever advantages are to be gained by flocking from their own single-species flocks.

## ACKNOWLEDGEMENTS

I am grateful to Dr E.O.Asibey and the staff of the Ghana Game and Wildlife Department for the provision of facilities at Mole National Park, and to Prof. and Mrs W.W.Sanford for their kind hospitality at Ife. The work in Ghana was financed by grants from the Royal Society, the Carnegie Trust, and Aberdeen University to the second Aberdeen University Ghana Expedition.

## REFERENCES

- Bannerman, D.A. (1933-1951) The Birds of West and Equatorial Africa. 8 vols. Oliver & Boyd, Edinburgh.
- Elgood, J.H., Fry, C.H. & Dowsett, R.J. (1973) African migrants in Nigeria. *Ibis* 115: 1-45, 375-411.
- Fry, C.H. (1972) The social organisation of bee-eaters and co-operative breeding in hot-climate birds. *Ibis* 114: 1-14.
- Grimes, L.G. (1976) The occurrence of co-operative breeding behaviour in African birds. *Ostrich* 46: 1-15.
- Harwin, R.M. (1959) Observation from a Bulawayo garden. *Ostrich* 30: 97.
- Mackworth-Praed, C.W. & Grant, C.H.B. (1970, 1973) African Handbook of Birds. Ser. 3 Birds of West and Central Africa. 2 vols. Longmans, London.
- Morse, D.H. (1970) Ecological aspects of some mixed-species foraging flocks of birds. *Ecol. Monogr.* 40: 119-168.
- Moynihán, M. (1960) Some adaptations which help to promote gregariousness. *Proc. 12 Int. Orn. Congr.* 523-541.
- Vernon, C.J. (1966) Observations on the winter behaviour of the white helmet-shrike, Prionops plumata. *Ostrich* 37: 3-5.

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