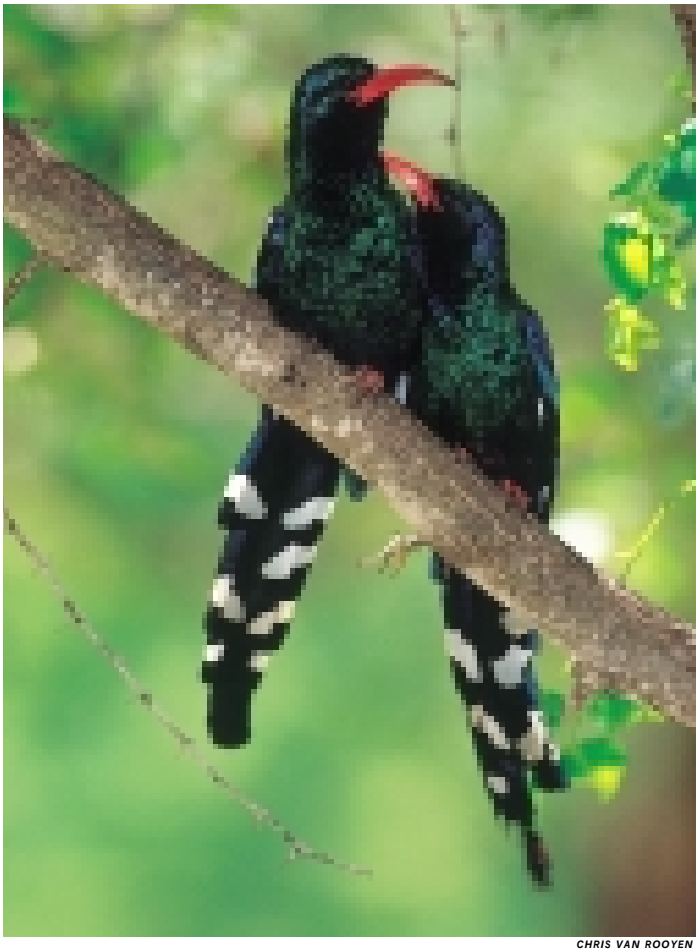
Co-operative breeding and competitive feeding?

Green (Red-billed) Wood-Hoopoes *Phoeniculus purpureus* live in groups, usually made up of closely related individuals. Within the group, only one pair breeds; the rest help to feed both the incubating female and her offspring. While this might appear to be a harmonious breeding situation, these birds forage in cohesive groups, creating the potential for competition between them for food. Male wood-hoopoes are about 10 per cent larger than females and have bills that average almost 40 per cent longer – there is no overlap between bill lengths of adult males and females.

Fitztitute doctoral student Andy Radford has recently been studying how these differences might influence competition among group members. Wood-hoopoes hunt along branches and trunks, mostly for insects. The larger-bodied males forage along wider branches than females, and spend much time probing under bark and in the broken-off ends of branches. Females, by contrast, spend most time pecking. The differences in foraging technique between the sexes are probably a result of differences in bill length and shape. Comparable differences between the sexes have been found in other birds, including woodpeckers and oystercatchers, and have been interpreted as a means of reducing competition for food. That these differences are linked to bill length in wood-hoopoes is supported by the foraging behaviour of juveniles. At fledging, the bills of juveniles of both sexes are approximately the same length as those of adult females, and juveniles all forage like females. By about six months of age, young males' bills are approaching adult dimensions, and they start to forage like adult males.



CHRIS VAN ROOYEN

Allopreening is one means by which dominance hierarchies are established and maintained within groups of wood-hoopoes.

Interestingly, birds within foraging groups are not randomly distributed. An individual is more likely to forage alongside a bird of the opposite sex than next to one of the same sex. They are also more aggressive to group members of the same sex: lone females, for example, do not change their foraging behaviour when approached by a male. This is strongly indicative of interference competition between birds of the same sex.

Differences in foraging behaviour are linked not only to sex, but also to social status. Within wood-hoopoe groups, there are well-defined dominance hierarchies among both males and females (and it is only the alpha male and alpha female that actually breed). When all group members forage together, dominant males spend more time probing into holes than do subordinates of the same sex. Dominants and subordinates do not differ in bill length, and it appears that dominants are able to exclude subordinates from prime feeding areas. It could be predicted that such competition would force subordinate birds to forage for longer to satisfy their daily food demands but, surprisingly, this does not happen. Rather, subordinates spend more time foraging away from the main group. When they are alone, they are able to catch more food than when they are foraging with the group. Although solo foraging almost certainly carries costs in terms of increased predation risk, it seems that this is counterbalanced by improved foraging performance (when they don't have to worry about dominants interfering with their foraging behaviour).

The apparently close-knit, co-operative lives of wood-hoopoes might thus be more tense than casual observation suggests. While it has been recognised for some time that there is competition within groups for the opportunity to breed, it seems that there is also competition for the opportunity to feed. This adds one more term to the complicated equation whose solution is the answer to why these birds are forced to live, or benefit from living, in groups. □

Visit the FitzPatrick website: http://www.fitzpatrick.uct.ac.za
Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch 7701, Cape Town, South Africa.
Tel. (021) 650 3290; fax (021) 650 3295; e-mail birds@botzoo.uct.ac.za