

Why do plovers have a stereotyped behaviour?

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Amongst intertidally foraging shorebirds, the plovers (Charadriidae) form a morphologically and behaviourally distinct group. They have proportionally large eyes, which may provide greater acuity in detecting small prey both by day and night (Pienkowski 1983); they are obligate visual foragers; and they move in a characteristic stop-run-search manner. In contrast, the other major groups of shorebirds - the Scolopacidae - have evolved longer bills for probing and are able to forage tactilely as well as visually due to the abundance and distribution of sensory cells (Herbst corpuscles) in their bills (Bolze 1968 in Pienkowski 1981).

The implications of these differences in foraging methods between plovers and scolopacids have been discussed in terms of their diet and geographic distribution (e.g. Pienkowski 1979; Evans 1979), but no attempt has been made to explain why plovers should always use a staccato run-stop-search method of foraging. Unlike plovers, scolopacids tend to walk continuously whilst foraging, whether searching for prey by visual or tactile means. Thus the run-stop-search method cannot be associated simply with visual foraging.

During a study of the foraging behaviour of Grey Plovers *Pluvialis squatarola* at several locations in the southern hemisphere, I made some interesting observations which pointed to the reason for this peculiar behaviour. Firstly, the diets of Grey Plovers varied considerably between and within sites, ranging from small polychaete worms to large crabs and mudprawns, illustrating that the run-stop-search method was not a behaviour adaptation to the capture of a certain type of prey. Moreover scolopacid species foraging visually for the same species did not stop to search, except at night (Turpie & Hockey 1993).

Grey Plovers at the Zwartkops Estuary, South Africa, foraging on large mudprawns *Upogebia africana* which make themselves available to predation by visual foragers by crawling out of their burrows during low tide as a parasite-induced behaviour. These surface prawns were highly visible even to a human observer and in most instances it could be seen when a Grey Plover had sighted such a prawn from its sudden high-speed dash directly towards the prawn. When the sighted prawn was at some distance from the bird, the subsequent dash was always made in several bursts, and the very brief stops along the way appeared to be in order to visually relocate the prey.

The same behaviour was observed in Crab Plovers *Dromas ardeola* and Greater Sand Plovers *Charadrius leschenaultii* when running to capture large crabs at Mida Creek in Kenya - although Crab Plovers are not true plovers, they are physically similar (with large eyes and stout bills) and use the same run-stop-search foraging technique. All three of these species frequently run towards prey with their head held sideways, using monocular vision.

In the light of these observations, I suggest that plovers, whilst they are moving, are less able to see their prey than when they are stationary. They may use monocular vision in an attempt to improve visual acuity, although this would impair their ability to judge the distance to their prey. Such visual limitations would explain the necessity of their particular run-stop-search method of foraging, whereby plovers have to stop moving in order to recognise and locate their prey before running in the direction in which it was sighted. In the absence of morphological or physiological evidence, however, this suggestion is merely speculative.

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