Eliciting probing in a non–probing wader species, the Common Sandpiper

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Swennen, C. & Saeho, S. 1993. Eliciting probing in a non–probing wader species, the Common Sandpiper. *Wader Study Group Bull.* 70: 31–32

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Common Sandpipers *Actitis hypoleucos* use a wide variety of feeding habitats during the non–breeding season. They occur along the sea–shore, but also in hyper–saline, brackish, and freshwater areas. Feeding substrates may vary as widely as rock, pebbles, shells, sand, and clay. Usually their feeding area is without any vegetation, but they also forage in mangrove and rain forests. They apparently avoid the central parts of homogeneous areas. The most prominent characteristic of the feeding habitat of the Common Sandpiper is that they are situated near border lines (Swennen & Howes in prep.).

Shorebirds feed either by pecking their prey from the surface of the substrate on which they forage or by catching hidden prey by probing into the substrate. Plovers locate their prey by eye and peck. Most other shorebirds not only peck but also probe. They often direct their probes to visual clues, but blind feeding often occurs via "sewing" movements of the bill up and down into the sediment while progressing slowly (Van der Baan *et al.* 1958). Although Common Sandpipers would be expected to probe, field observations of the first author revealed only pecks.

The question arises whether the Common Sandpiper is able to locate and catch its prey by probing. In the absence of field observations of probing, appropriate experiments are called for. We have tried to ask the bird directly if it could probe.

OUR BIRD, ITS HOUSING AND THE EXPERIMENTS

A wintering adult Common Sandpiper was caught on a saltmarsh in southern Thailand in October 1992. We kept the bird in a cage at the campus of the Prince of Songkla University in Pattani for nearly two weeks. The cage was about 4 m long, 1 m wide and 1 high. The concrete floor of the cage was partly covered by a thin layer of mud. The bird could bath in a low tray in the back part of the cage. A thin trickle of tap water continuously filled the tray. The overflow kept the surface of the water clean, imperative for a dry plumage in captive birds (Swennen 1977). It also kept about 90% of the slightly sloping floor permanently inundated with a layer of up to 20 mm water.

We filled two glass jars (diameter 10 cm, height 5 cm) with wet, washed and sieved fine sand (grain size < 1 mm). They were placed against a larger round tray (diameter of about 50 cm) of the same height filled with wet mud. We placed this "feeding area" at the opposite end of the cage in front of the seat of the observer. The surrounding shallow water prevented ants from removing the food of the bird. The foods offered were: pieces of shrimp (fresh, boiled fresh, and boiled dried), live polychaetes (mainly *Dendronereis* spp. and some other worms in sand tubes), pellets used for feeding cultured shrimps and pellets used for raising chickens.

In the first place, we tried to ask the bird which foods it preferred. We did that by a series of tests in which we repeatedly offered the bird a choice between two types of food. We removed all food from the cage a few hours before we started a series of tests. We presented the food on top of the wet sand in the glass jars and we changed the position of the jars between successive tests. The bird came tail wagging to the large tray, jumped on it and pecked a piece of food from a glass jar. If the bird swallowed it, we scored this as a choice. Sometimes the bird also took immediately the piece of food from the other jar in the same test. The latter was not recorded as a choice.

We do not give the results in detail, because they are part of a wider study. Readers who are interested in

the statistical aspects of choice experiments are referred to Van der Meer (1992). The experiments clearly indicated that the bird preferred the pellets made for feeding shrimps above all others, and that the pellets made for feeding chickens scored lowest. The bird even ignored them when we gave it no other foods than these chicken pellets for some hours. The shrimps scored second. The bird appeared not to discriminate among the three types of shrimps. The explanation may be that the possible initial differences may have been masked by bacterial growth. The rotting process was strongly supported by the wet surroundings and the ambient temperature of 28° to 30°C. To our surprise the live polychaetes scored lower than the somewhat rotten shrimps. When given alone, the bird ate some polychaetes, but not very eagerly.

In view of the results we decided to continue the study with pieces of shrimp and the preferred pellets. In a series of tests, we offered the bird the choice between food on the surface and food on the surface but slightly covered with sand. The bird always took the food that was not covered.

In the next series the choice was between food on the surface but covered with sand and food totally hidden below the smoothed surface of the sand. The bird invariably took the covered food that was visible as a bulge on the surface of the sand and therefore easily detectable by eye.

In the next series of tests the food items were 1–3 cm below the surface, which we smoothed before placing the glass in the cage. The bird did not hesitate and started probing. It took the hidden pellets and pieces of shrimp out of the sand by probing. When we buried the foods deeper, the Common Sandpiper probed up to the nostrils and brought the food to the surface from that depth. We got the impression that the bird probed after a number of more or less random pecks. The probes were certainly not randomly distributed over the sand area, but concentrated at the place where the food was hidden. Did the bird feel that something was hidden underneath? This seemed hardly possible in the solid sand. Therefore we tried to ask the bird if perhaps it used its taste for locating its hidden food.

We cleaned the glass jars and filled them again with washed fine sand. The sand of one jar was wetted with tap water from a bottle with a few pieces of shrimp on the bottom. The sand in the other jar was wetted with water from a bottle with only pure tap water. The jars were marked on the side invisible to the bird and we changed their positions between tests. We noted the number of probes and the total time spent on each jar.

In the first tests, the bird probed more in the sand wetted by water that had been in contact with shrimp meat than in the control (32 against 6 times). However, the scores became nearly equal in the later tests. Then, the bird gave up probing for food, so that we are not sure if its taste is as well developed for finding prey as in *Calidris* species (Gerritsen *et al.* 1983).

DISCUSSION

It was clear that we had made two serious mistakes in designing the last series of tests.

1. We had given the bird the same glasses each time instead of preparing new ones for each test.

2. To keep a bird collaborative, tests in which it cannot find food must be alternated with ones in which it finds real food items.

We had, however, no time for further experiments. The time had arrived to thank the sandpiper and set it free. When we grabbed the bird, we were happy to feel that its breast muscles were round. It flew directly to a pool in the salt marsh in an apparently perfect condition. We conclude that the Common Sandpiper, like other Scolopacidae and many other shorebirds, is quite able to find its food by probing. However, this species normally uses a habitat niche which other shorebirds largely neglect. In this habitat, the density of suitable small and hidden prey animals is usually low. In such a situation, hunting by eye is a better option than probing.

ACKNOWLEDGEMENTS

We wish to thank Mr. Nukul Ruttanadakul for his interest and help in organising the experiments, and Mr. Theunis Piersma for his advice about the publication of this report.

REFERENCES

Gerritsen, A.F.C., Van Heezik, Y.M. & Swennen, C. 1983. Chemoreception in two further *Calidris* species (*C. maritima* and *C. canutus*) with a comparison of the relative importance of chemoreception in *Calidris* species. *Neth. Journ. Zool.* 33: 485–496.

Swennen, C. 1977. Laboratory research on sea-birds. Report on a practical investigation into the possibility of keeping sea-birds for research purposes. Publ. Neth. Inst. for Sea Research, Texel. 44pp.

Van der Baan, G., Blok, A., Nijhoff, P. & Swennen, C. 1958. Een inleidend onderzoek naar de betrekkingen tussen wadvogels en bodemfauna. Vogelwerkgroep N.J.N., 's-Graveland. 28 pp.

Van der Meer, J. 1992. Statistical analysis of the dichotomous preference test. *Anim. Beh.* 44: 1101–1106.