TABLE 1. Extracted lipids from uropygial glands in terns, as percent of gland weight.

| | |
|---|---|
| Bridled Tern (*Sterna anaethetus*) | 11.5, 13.2 |
| Caspian Tern (*S. caspia*) | 19.5, 21.8, 23.6 |
| Sooty Tern (*S. fuscata*) | 6.6, 7.2, 7.2, 9.2, 9.2 |
| Common Tern (*S. hirundo*) | 13.7, 15.2, 15.6 |
| Royal Tern (*S. maxima*) | 28.8 |
| Sandwich Tern (*S. sandvicensis*) | 13.8, 16.3 |

$\bar{x}$ *S. fuscata* = 7.9
$\bar{x}$ and SD other 5 tern species = 17.6 ± 5.3
$\bar{x}$ and SD waterbirds[1] = 26.5 ± 6.3

[1] *Pygoscelis adeliae, Anser albifrons, Chen caerulescens, Morus bassanus, Gavia immer, G. stellata, Mergus serrator, Anas fulvigula, Aix sponsa, Podilymbus podiceps.*

birds that typically swim and (b) the gland of Sooty Terns contains less fat material than do those of other terns studied here. This deficiency of uropygial oils in Sooty Terns is probably a major factor contributing to the species' putative waterlogging quality.

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# RING-BILLED GULLS FEEDING ON DATE FRUITS

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Gulls are well known as opportunistic feeders that forage in various ways in many different habitats. I report here on Ring-billed Gulls (*Larus delawarensis*) obtaining ripe fruit from date palms (*Phoenix dactylifera*), an activity apparently not reported previously (Elmer, Carpenter, and Klotz, F.A.O. Plant Prot. Bull. Part 1. 16(5):3–17, 1968; J. B. Carpenter, pers. comm.). Gulls have been known to eat cherries, blueberries, and strawberries (Cottam, Condor 37:170–171, 1935; Cottam, Condor 46:127–128, 1944; Greenhalgh, Condor 54:302–308, 1952) in some areas, and in Florida Ring-billed Gulls have been seen picking fruit from cabbage

FIGURE 1. Ring-billed Gulls feeding at a date palm near Calexico, California.

palmettos (*Sabal palmetto*) while on the wing (Cruickshank, Auk 67:237, 1950).

At 08:15 on 25 November 1978 I noted about 65 gulls in the vicinity of six date palms in an abandoned yard about 3.2 km north of Calexico, Imperial County, California. About 45 gulls were eating dates scattered on the ground beneath the palms while as many as 20 gulls—both adults and immatures—were taking the dates off the fruit stalks (Fig. 1). In the tree, birds fed in three ways. Some gulls alighted on the stalks and slowly walked along them to reach the dates. Others alighted on the leaf scars of the trunk and reached out to remove dates. Several gulls picked dates off the stalks while on the wing. No other species of gull was present during the observation period.

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# OYSTER PREDATION BY THE BLACK OYSTERCATCHER IN BRITISH COLUMBIA

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Some authors (Jewett et al. 1953, Guiguet 1955) have claimed that Black Oystercatchers *Haematopus bachmani* do not, in fact, eat oysters, but there is one recent report of the event (Campbell 1966). Campbell's (1966) description of the technique used by the Black Oystercatcher to open Pacific oysters (*Crassostrea gigas*) is similar to that described for the European Oystercatcher (*H. ostralegus*) to open native oysters (*Ostrea edulis*; Dewar 1922) and that for the American Oystercatcher (*H. palliatus*) to open Atlantic oysters (*C. virginica*; Tomkins 1947). This technique involves forcing the bill between the gaping valves of submerged oysters and prying them apart. We observed Black Oystercatchers using a different method of opening Pacific oysters. The purpose of our study was to determine the size of Pacific oysters selected and the method used by the Black Oystercatcher to open them.

## STUDY AREA AND METHODS

We watched two breeding pairs of Black Oystercatchers eating Pacific oysters between 28 April and 11 July 1978 on Mitlenatch Island, British Columbia (49°57'N, 125°W). The birds nested beside an approximately 1,000 $m^2$ oysterbed which was on a mud-gravel and sand-gravel substrate and which had a maximum oyster density of about 80/$m^2$ during ebbing and flooding tides.

We observed the birds through a spotting scope. We measured the time it took an oystercatcher's bill to penetrate a shell and begin removing the meat (opening time), and to remove and eat the oyster body (eating time). Later, we collected these oyster shells. We divided each valve into quadrants to determine where the shells were hammered. Holes on dividing lines were recorded in the quadrant where most of the hole lay. The volume of soft body parts of 57 oysters was determined by water displacement in a calibrated cylinder. Shell lengths in the oyster population were determined by measuring all of the live oysters found along two randomly chosen straight line transects through the oysterbed.

## RESULTS

When foraging, a Black Oystercatcher first tapped several oysters with its bill. After finding an apparently suitable oyster, the bird chipped a small hole through the valve, inserted its bill, and severed or paralyzed the adductor muscle. Some oysters that were hammered but abandoned had undamaged adductor muscles which were difficult for the oystercatcher to reach, owing to the irregularity of the shell's shape. Once the valves were parted the soft body of the oyster was extracted and occasionally washed before being eaten. A few oysters (6 out of 62) were eaten through the hammered hole, presumably because the bird could not part the valves. These oysters were not significantly smaller than the abandoned ones. A maximum of nine oysters was eaten by one bird in one hour.

Black Oystercatchers opened more unattached oysters (48 out of 59) than those that were attached to immovable rocks (2) or to other oysters (9). The majority of oysters (47 out of 62) were hammered and eaten out of water. We noted no preference for oysters that had been recently uncovered by an ebbing tide.

The mean diameter of 55 hammered holes was 1.7 cm. The shell of the oyster was penetrated in about 10 s. Eleven of the 60 hammered holes were made at the lip of the oyster valve while the remaining 49 did not reach the shell margin. Figure 1 shows the locations of 60 hammered holes in the right and left valves. The slight preference for the right valve (37 versus 23) resulted from the tendency of most oysters on Mitlenatch Island to lie on their left valves, as the oystercatchers always pecked at the upward-facing valve. The adduc-

TABLE 1. Eating and opening times for small (S), medium (M), and large (L) oysters by Black Oystercatchers.

| | Opening time (s) | | | Eating time (s)[a] | | |
|---|---|---|---|---|---|---|
| | S[b] | M | L | S | M | L |
| Mean | 92.8 | 118.7 | 130.3 | 85.1 | 87.1 | 170.7 |
| Range | 19.2–388.0 | 47.1–270.1 | 73.0–173.0 | 31.5–125.0 | 35.2–190.8 | 73.2–375.0 |
| S.D. | 94.8 | 70.1 | 51.4 | 41.1 | 42.4 | 134.8 |
| N | 13 | 10 | 5 | 12 | 10 | 5 |

[a] A significant difference exists between S and L, and M and L ($t$-test, $P < 0.05$).
[b] The lengths of small oysters were 9.0–10.9 cm, medium 11.0–12.9 cm, and large ≥13.0 cm.