

# Cockle-opening by a Dabbling Duck, the Brown Teal

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**Abstract.**—Many birds feed on bivalve molluscs, but only oystercatchers (*Haematopus* spp.) are known to prise open the shells. Brown Teal (*Anas chlorotis*), a dabbling duck endemic to New Zealand, were observed opening Common Cockles (*Austrovenus stutchburyi*) on Great Barrier Island. The teal jackhammered into the open shells of feeding cockles and quickly scooped out the flesh. Despite having the bill morphology of a typical dabbling duck, they were adept at this feeding method. Received 31 October 2002, accepted 7 February 2003.

**Key words.**—*Anas chlorotis*, *Austrovenus stutchburyi*, Brown Teal, cockle, feeding techniques.

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While many birds, especially waterfowl and waders, feed on bivalve molluscs (del Hoyo *et al.* 1992, 1996; Stott and Olsen 1973), only oystercatchers are known to prise them open (Baker 1974; Norton-Griffiths 1967; Tuckwell and Nol 1997; Ward 1991). Large gulls (such as Herring Gulls *Larus argentatus* and Southern Black-backed Gull *L. dominicanus*) also feed on bivalve flesh, but they drop the bivalves onto a hard surface to crack them (Ward 1991; del Hoyo *et al.* 1996). Ducks that feed predominantly on bivalves usually swallow them whole, crushing the shell in the gizzard (Barnes and Thomas 1987; Klasing 1998). This note describes how Brown Teal (*Anas chlorotis*), a dabbling duck endemic to New Zealand, prise open Common Cockles (*Austrovenus stutchburyi*), an unexpected finding given their bill morphology.

Brown Teal are shy, largely nocturnal ducks, and relatively little is known of their feeding ecology. Most reports of these teal feeding are of birds in grazed pasture at night (Dumbell 1987; Gravatt 1966; McKenzie 1971; Weller 1974; Williams and Dumbell 1996), or in coastal areas, especially at low tide (Dumbell 1987; Gravatt 1966; McKenzie 1971; Oliver 1930; Weller 1974), where they were believed to feed on marine invertebrates including small mussels that were macerated and swallowed whole (Heather 1980).

Among the Anatidae, bill and tongue morphology usually relate to specific foraging behavior (Kehoe and Thomas 1987; Lagerquist and Ankney 1989). Brown Teal have very

well developed lamellae and a reduced nail on the bill tip, characteristics that are strongly associated with dabbling and suggest that the bill is not used for grasping (Delacour and Mayr 1945; Gravatt 1966). Indeed, Brown Teal are adept at dabbling, sucking water in through the bill tip, then pushing the water out through their lamellae, thus straining out any food particles in the water or substrate.

On several occasions in November 2001, Brown Teal on Great Barrier Island (36°18'S, 175°34'E), New Zealand, were observed opening cockles. Observations were made with a 20-45× spotting scope, binoculars, and the naked eye at distances of 3-100 m (the ducks were unusually confiding as they had become used to humans).

On 4 November at Akapoua Bay, two teal were swimming in shallow water in the mid-afternoon, near low tide. They appeared to be probing in sediment to feed, before bringing their heads up to swallow. When one was observed bringing a cockle up out of the sediment, we approached the pair more closely.

The female began walking along the waters' edge, dabbling in the sand then, presumably upon encountering a slightly open cockle, she would quickly move her bill up and down like a jackhammer into the open cockle (Fig. 1, above), and neatly disembowel it. (This action should not be confused with the "hammering" action of oystercatchers as they break through bivalve shells; Baker 1974). Occasionally the cockle flesh could be seen (Fig. 1, below), but usually it was quickly

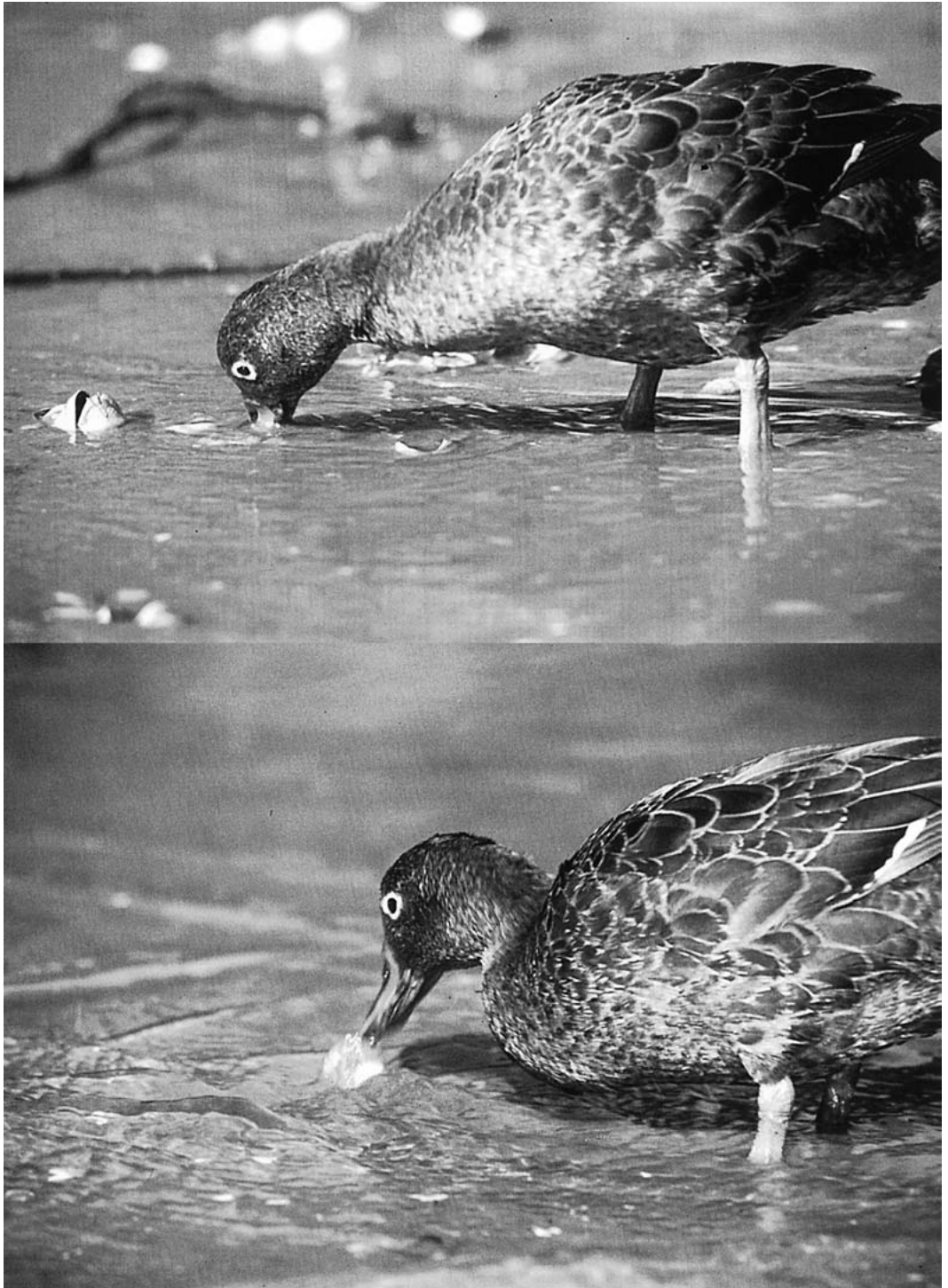


Fig. 1. (Above) Brown Teal with its head positioned vertically in order to 'jackhammer' open a cockle. (Below) Brown Teal removing the flesh from a cockle. Photos by P.F.B.

swallowed. She took around five seconds to remove and swallow the flesh of each cockle. She also dabbled in open cockle shells, and sometimes around floating seaweed, where she appeared to be eating small crabs.

Like the female, the male sometimes “jackhammered” cockles open while wading in shallow water, but he also moved slowly with his head immersed in water, digging with his bill and pushing his head back and forth, then raising his head back up to the surface. Three of his droppings were collected, all of which contained small pieces of white bivalve shell, although there were no shell fragments present in the surrounding sediment. It appears that the male was feeding both on the flesh of larger cockles and on whole, small bivalves, probably cockles, Pipi (*Amphidesma australis*) and Wedgeshells (*Macomona lillianiana*).

The following day, 5 November, teal were observed at Karaka Bay, shortly before low tide. Ten Brown Teal were feeding in sediment in the water or at the water’s edge. Several of these teal were extracting the flesh from cockles using the same technique as the Akapoua Bay birds. Some of the fecal samples collected from these birds contained small white shell fragments. Again, it appears that the teal were swallowing small bivalves whole, and opening the larger cockles.

On 18 November and 28 November, a female and her two ducklings (near fledging but still with down on the back, *ca.* nine weeks old) were observed feeding at Akapoua Bay. Both the female and ducklings were opening cockles, although the ducklings were less successful than their mother and one of the ducklings was seen pulling a cockle out of the water by its siphon. The three teal mostly fed in the sediment, but also dabbled briefly around seaweed and small rocks.

Twenty core samples (diameter 7.5 cm) taken on 28 November over an area of 70 × 30 m where the ducks had been feeding indicated a mean density of 376 cockles per m<sup>2</sup>, with an average shell length of 16.5 mm (range 4-27 mm).

Teal were never seen carrying cockles to harder sediment to open (which oystercatchers commonly do), probably reflecting the relatively small sizes of cockle present (which

are presumably easier to open than larger individuals) and the shape of the teal’s bill, which may not be well suited to jamming into cockles that are only slightly open.

Although many other duck species, including other *Anas* ducks (Grandy 1972; Kálás and Roalkvam 1983), have been observed eating bivalves, this is the first report of ducks opening bivalves to extract their flesh. Extracting bivalve flesh is usually regarded as a specialty of oystercatchers, which use their strong stout beaks to ‘stab’ into or ‘hammer’ their way through the shells (Baker 1974; Goss-Custard 1987; Goss-Custard and Durell 1987). Oystercatchers selectively prey on cockles which are feeding and have their shells open, stabbing their bills into the gap to sever the adductor muscle (Baker 1974; Hulscher 1976). Brown Teal use a stabbing method similar to this, which is rather unexpected given their bill shape. Despite having the bill morphology of a typical dabbling duck, their bills are effective at scooping out bivalve flesh. Our observations caution against making ecological inferences solely on the basis of bill morphology.

Brown Teal were once widespread throughout New Zealand and found in a wide variety of habitats (Worthy 2002). They are now an endangered species (BirdLife International 2000), restricted to a few sites in New Zealand, and not all of the remaining birds feed in intertidal sites. However, eating small bivalves is still common for Brown Teal from Great Barrier Island and is also known from at least one site in Northland (S. J. Moore, unpublished data). Although cockle opening by teal was only observed in two areas, it may have been more widespread in the past. Alternatively it may be that, like young oystercatchers (Norton-Griffiths 1967; Saffriel 1985), young teal learn specialized feeding techniques from their parents and that cockle-opening is a culturally transmitted technique unique to Brown Teal in a few areas.

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