

DO ROCKHOPPER PENGUINS *EUDYPTES CHRYSOCOME* FEED THEIR
CHICKS PENGUIN MILK?

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Duroselle & Tollu (1977) claim that at Amsterdam Island in the southern Indian Ocean Rockhopper Penguins *Eudyptes chrysocome moseleyi* must be able to feed their chicks on 'penguin milk'. The purpose of this note is to cast extreme doubt on their claim.

Only one species, the Emperor Penguin *Aptenodytes forsteri*, is known to feed its chicks 'penguin milk'. In this species, each partner undergoes long fasts during the breeding season (Le Maho 1977). The female after a 40 - 50 day fast ashore, lays the single egg and then returns to sea to feed. The male remains fasting ashore incubating the egg for some 65 days through the Antarctic winter. Normally the female returns with food shortly before the chick hatches and the chick receives regurgitated sea-food from the start. However, if the chick hatches before the female has returned, the male, even after its long fast, is capable of feeding the chick an oesophageal secretion of 'penguin milk' (Prévost & Vilter 1963), and can so sustain the chick for some days until the female returns (Le Maho 1977).

Although all penguins are capable of prolonged fasts when moulting few undertake long fasts during the breeding season. After the Emperor Penguin, the longest fasts during breeding are undertaken by *Eudyptes* penguins. In the Rockhopper Penguin, and in most *Eudyptes* penguins (Warham 1975), males arrive at the breeding colonies first and remain at their nest site for some four to five weeks (this and following information, Warham 1963, pers. obs.). There they are joined by the female. After about two weeks of courtship, the female lays the clutch. Shortly after the eggs have been laid the male returns to sea to feed. Males return some 12 - 14 days later and relieve the female. After relieving the female, the male undertakes the rest of incubation and remains ashore brooding and guarding the chick for the first three weeks of its life. After this five week fast, the males again go to sea and do not return with food for the chick until the latter is 30 or more days old (Williams 1980).

Duroselle & Tollu (1977) claim that at Amsterdam Island female Rockhopper Penguins did not return after their initial incubation fast until two weeks after the chicks had hatched. They conclude from this that in the interim the chicks must have been sustained

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by the male parent and that, as the latter had remained fasting, male Rockhopper Penguins must, like Emperor Penguins, be capable of feeding their chicks on 'penguin milk'.

At Marion Island in the southern Indian Ocean, daily weighing of nominate *chrysocome* chicks showed that all were fed within five days of hatching (Williams 1980). This food comprised fresh crustaceans brought by the female parent. There was no evidence of male feeding and chicks which did not obtain fresh material lost weight and died. At Gough Island in the southern Atlantic Ocean *E.c. moseleyi* chicks received meals, consisting predominantly of crustaceans (Williams & Laycock in press), within three days of hatching (pers.obs.). Available data therefore in no way support Duroselle & Tollu's (1977) findings. Indeed, were it not for the frequent and large meals brought by the female Rockhopper Penguin, chicks would be unable to sustain the necessary rate of growth through the three week period when they are guarded by the male.

Duroselle & Tollu (1977) present no data in support of their novel claim and it is clear from the phrasing of their remarks that they did not check to see if the males were actually feeding the chicks but merely assumed that this was so from the apparent absence of the female parents. The key to their argument is therefore the late return of the females.

It is not clear in their statements how the return of the females was established. They state that the males return *vers* 24 September to relieve the females and take the second incubation-guard shift. The females would then have to have two weeks at sea before hatching took place *a eu lieu* 7 October (Duroselle & Tollu 1977). When male Rockhopper Penguins go to sea after their initial fast, they must not only regain condition after the four to five weeks without food, but must also accumulate sufficient reserves to sustain them through a further five week fast. Duroselle & Tollu (1977) remark that the males spend three weeks at sea but their own generalized dates for the completion of the clutch (10 September) and the return of the males (24 September) indicate that only two weeks suffice. After their initial laying to incubation fast, females do not undertake another fast and therefore, as they do not need to accumulate large reserves, should not need to spend as long at sea. They need only regain condition to the extent that they can make repeated trips between the colony and the feeding grounds where, in addition to collecting food for the chick, they can consume food for their own needs. This would suggest that the two weeks between their relief by the male and the hatching of the eggs would be quite adequate for the females to regain condition and so be available to feed the chicks when or soon after they hatch. Why the females should require four weeks before they return to feed the chicks Duroselle & Tollu (1977) make no endeavour to explain. It is plausible to suppose that the female penguins were in fact returning and feeding their chicks but that they did not observe them, possibly because they did not make observations in the afternoon and evening when most females return with food.

Duroselle & Tollu's (1977) generalized dates, mistakes in their own reckoning, failure to give methods and to reply to correspondence all suggest that their observations are unsound, as

has been suggested elsewhere (Williams in press). I therefore recommend that, until further observations have been carried out on the feeding of Rockhopper Penguin chicks at Amsterdam Island, it is advisable to treat Duroselle and Tollu's claim, that the chicks there are fed on penguin milk, with extreme caution.

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Crowned Cormorant *Phalacrocorax coronatus* with downy young
Photographed by C.J. Uys