

Short Note

Observation of an Adélie penguin pecking at a conspecific carcass: a case of intraspecific necrophagy?

EDOARDO CALIZZA¹, MARIA LETIZIA COSTANTINI² and LORETO ROSSI¹

¹Laboratory of Trophic Ecology, Department of Environmental Biology, Sapienza University of Rome, Via dei Sardi 70, 00185 Rome, Italy

²Department of Environmental Biology, Sapienza University of Rome, Via dei Sardi 70, 00185 Rome, Italy
edoardo.calizza@uniroma1.it

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Introduction

Adélie penguins (*Pygoscelis adeliae* Hombron & Jacquinet) are a key component of the Antarctic ecosystem (Ainley 2002). Their social, sexual and trophic habits have been investigated since the earliest Antarctic expeditions, extending our knowledge on the biology and ecology of this species (Levick 1915, Ainley 1978, 2002). Necrophilia has been shown to be a not anomalous sexual behaviour in Adélie penguins (Russell *et al.* 2012 and references therein). However, there are no reports documenting explicit feeding activity by Adélie penguins on dead conspecific carcasses. Necrophilia has been shown to be promoted by carcasses, or even models of dead penguins, reproducing female positioning during copulation, which is known to represent a potential sexual stimulus in other avian and non-avian species (Ainley 1978, Russell *et al.* 2012 and references therein). The Adélie penguin diet changes geographically, demonstrating the capacity of these penguins to adapt to changes in both quantity and quality of prey (Emslie *et al.* 1998, Ainley 2002). In two studies in the Ross Sea during 1964–65 (Emison 1968) and 1973–74 (Paulin 1975), the authors reported both penguin bone and egg fragments in penguin stomach contents. Such fragments were assumed to have been incidentally ingested within the colony area, and not to represent food items selected by penguins. Here, we describe the observation of presumed intraspecific necrophagy by an Adélie penguin on the carcass of a recently dead conspecific adult, not associated with sexually-related interactions, at Terra Nova Bay, Ross Sea, during spring 2013.

Field report

The observation took place at the Adélie Cove colony, in Terra Nova Bay, Ross Sea (74°46.07'S, 164°00.58'E). An Adélie penguin (specimen A) was observed pecking at the carcass of a conspecific adult (specimen B) (Fig. 1). Specifically, A was pecking at the internal part of the head of B (Fig. 1a & d), which was detached from the body and relatively intact compared to the rest of the carcass

(Fig. 1b), and vigorously shaking it, seemingly trying to detach and eat the remaining internal soft tissues. The carcass was supine and almost completely deprived of its internal soft tissues. The cloaca and the lower part of the body were absent, only the wings, bones, feet and the upper part of the chest were still present (Fig. 1c). Soft-tissue fragments were visible around the head of B, derived from the vigorous activity performed by A (Fig. 1b). The activity lasted approximately 11 minutes, alternating longer pecking phases (20–30 seconds each) with shorter vigilance phases (5–10 seconds each). During the observation, A did not interact with the body of B, focusing on the head, and no sexually-related behaviours were detected. After seven minutes another adult Adélie penguin tried to approach, but it was readily deterred by A and abandoned the observation site. At the end of the activity, A returned to its nest, where the presence of a mate was observed, but no laid eggs. Once in the nest, observation of A was continued for five minutes, without detecting anomalous behaviours.

Discussion

Necrophagous and/or cannibalistic feeding has been observed in the Antarctic Skuas (*Catharacta maccormicki* Saunders) and in colonial avian species (Stokes & Boersma 2000 and references therein), but it has not been observed in Adélie penguins. Levick (1915) reported that stray Adélie penguin chicks which left the nest could potentially fall victim to aggressive groups of non-paired penguins, which he named 'Hooligan cocks' ('a chick go astray it stands a good chance of losing its life at their hands', Levick 1915). However, he did not explicitly report cannibalism or necrophagy to be coupled with such aggressive behaviour. Although confirmation by stomach content analysis on specimen A was not possible, what we observed appeared to be an active and prolonged necrophagous feeding behaviour. Necrophilia is not uncommon in Adélie penguins; however, no sexual behaviours were detected during our observation. Ainley (1978) referred to three positive sexual responses by Adélie penguins exposed to a model of a dead penguin reproducing female positioning

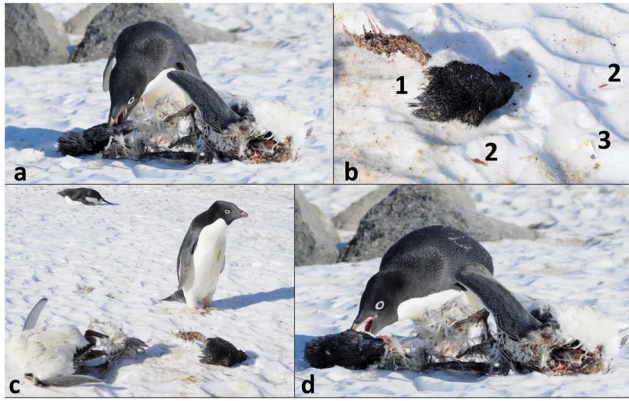


Fig. 1. An adult Adélie penguin seemingly feeding on a conspecific carcass (a. & d.). Head (1), tissue (2) and egg fragments (3) were observed near the carcass (b.). The head was detached from the body and was relatively intact with respect to the rest of the carcass (b. & c.). The carcass had been present for no more than seven days, as it was not present during a previous survey.

during copulation, which included: i) complete copulation, ii) mounting only (without semen deposition), and iii) solicitation only (bill vibration by male on model head). None of these behaviours were recorded during our observation. The carcass was supine, the opposite with respect to female positioning during copulation, and deprived of the cloaca. Moreover, Ainley (1978) reported that sexual interactions between male penguins and the model lasted approximately one minute, which is much less than the time spent by specimen A interacting with the head of specimen B, always ignoring the rest of the carcass. This leads us to exclude the possibility of sexually-related behaviours underlying the interaction. It must be noted that the penguin was interacting with the carcass prior to initiation of observation, therefore it cannot be certain that sexual behaviours did not precede the presumed feeding activity described. However, our report can be useful to compare to similar observations in the future, and to interpret apparently anomalous findings obtained by stomach content analysis, as those reported by Emison (1968) and Paulin (1975). In this case, the activity described was not coupled with other behavioural anomalies, and

cannot be ascribed as incidental for the observed Adélie penguin specimen. Moreover, Adélie penguins, as with other polar top-predators, are considered sensitive to climatic changes (Ainley 2002, Weimerskirch *et al.* 2003), therefore monitoring changes and anomalies in their feeding habits could provide important information to interpret tropho-functional effects of future environmental changes.

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Author contribution

E.C. performed the field observation. E.C, M.L.C and L.R. wrote the manuscript. L.R. coordinated the project supporting E.C. activity in Antarctica.

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