

BLACK-NAPED TERNS (*STERNA SUMATRANA* RAFFLES, 1822) MOBBING A GREY HERON (*ARDEA CINEREA* LINNAEUS, 1758)

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INTRODUCTION

The black-naped tern (*Sterna sumatrana*) is an uncommon resident bird of Singapore and its population is estimated at around 100 (Wang & Hails, 2007). The plumage of the bird is pure white except for the presence of a black band encircling the sides and back of the crown and extending a short distance to the front of the eye (Madoc, 1956). It breeds in a number of coastal rocky islets from May–August. Courtship involves flight displays and courtship feeding (Gochfeld & Burger, 1996).

The breeding area of these terns is Loyang Rock (also known as Squance Rock). This is a small rocky outcrop off the northern shore of Singapore Island. Although little terns (*Sterna albifrons*) have been reported to sometimes abandon their breeding site after one or a few seasons (Gochfeld & Burger, 1996), this is not the case with the black-naped terns. These birds have been nesting in this site continually for more than half a century (Subaraj, 2002).

The birds arrive well before May, laying, on the bare rock, one to two whitish to light buff eggs that are variously blotched (Wells, 1999). Incubation takes 21–23 days and the chicks are brooded for seven days (Gochfeld & Burger, 1996). By September, the birds move offshore to spend their time in the South China Sea. Much of the behaviour of the birds in this colony have been published (Guy, 2004).

This article provides an account of the mobbing of a grey heron (*Ardea cinerea*) when it intruded into the colony on 18 Apr.2008 and the use of projectile-vomiting by the defending black-naped terns.

OBSERVATIONS

On the morning of 18 Apr.2008, two of us (SHD & TKL) were among a group of photographers visiting Loyang Rock. The trip was made specifically to document the nesting activities of the birds. The photographers operated in the boat from distance of about 20 m from the colony. Hand-held, digital, single-lens, reflex (DSLR) cameras were used — SHD's camera was fitted with a 300 mm telephoto lens while TKL's, was fitted with a 500 mm lens. A 2× tele-converter was attached to each lens.

The colony was then at the height of its nesting activities. Eggs had been laid and many had hatched. Adults were either incubating the eggs or brooding the chicks. Others were busy flying in and out, foraging for food for the hungry chicks (Figs. 1–2).

At exactly 1110 hours, an adult grey heron suddenly appeared on the scene (Fig. 3). Its presence was immediately noticed and greeted with alarm calls. This attracted the attention of the entire colony, resulting in a cacophony of shrill calls that was almost deafening. One tern initially flew over to intercept the intruder (Fig. 4) that eventually landed on a nearby rock (Fig. 5). Nearly the entire adult population flew to mob the heron, leaving a handful of adults to look after the chicks.

A large heron in the midst of an active breeding colony would pose much danger to the eggs and chicks. Standing more than 90 cm tall and with a long neck and prominently large, pointed bill, it was a formidable intruder. Although herons normally take fish, they also eat amphibians, birds, crabs and other crustaceans, insects, molluscs, rodents, and snakes (Martinez-Vilalta & Motis, 1992).



Fig. 1. An adult black-naped tern (*Sterna sumatrana*) looking after its two eggs. (Photo by: Roger Deng).



Fig. 2. The arrival of an adult with fish to feed the hungry chicks. (Photo by: Roger Deng).



Fig. 3. The arrival of a large grey heron (*Ardea cinerea*) to the colony. (Photo by: Roger Deng).



Fig. 4. An adult black-naped tern flew towards the heron to intercept it. (Photo by: Roger Deng).



Fig. 5. The initial landing of the heron on a nearby rock. (Photo by: Roger Deng).



Fig. 6. Mobbing of heron by a lone tern. (Photo by: Lee Tiah Khee).

Black-naped terns may be a third the size of the grey heron, but they are extremely agile in flight. They also outnumbered the lone heron. They put up a spirited defense, mobbing the intruder from all sides, swooping low one after another. Terns are generally noisy birds and the disturbed colony of breeding birds made cries shrill enough to disorientate the intruder. The helpless heron could only flap its large pair of wings and probed its long pointed bill in the air, aiming at the terns (Figs. 6–8).

In addition to the physical mobbing and shrill cries, there was another weapon that these birds used, especially under conditions of severe threat — they discharged a viscous-like substance on the intruder. This was not noticed in the field but in subsequent examination of images. Fig. 9 shows streams of droplets discharged by three of the four mobbing terns. In Fig. 10, the stream of discharge is clearly seen as white droplets and a single white droplet can be faintly discerned emerging from the tern's bill on close examination.

All these were apparently too much for the intruding heron and in about five minutes it flew off the rock, followed by the noisy terns (Figs. 11–12).

This was obviously a time when the adult terns were most protective of their broods and extremely aggressive towards intruders. Gochfeld & Burger (1996) reported that adults mob predators, making a plover-like, “ungulate” display with upright posture, and spread wings. However, this was not a defence on the ground but an aerial mobbing of a much larger intruder.



Fig. 7. Three terns arriving to mob the heron. (Photo by: Roger Deng).



Fig. 8. As the terns flew in close, the heron flapped its wings and probed the air with its bill. (Photo by: Lee Tiah Khee).



Fig. 9. Three of the four terns aiming a stream of discharge each at the heron. (Photo by: Roger Deng).



Fig. 10. A close-up look at the discharge by one angry tern. (Photo by: Lee Tiah Khee).



Fig. 11. Departing heron followed closely by two terns. (Photo by: Lee Tiah Khee).



Fig. 12. A group of terns escorting the heron off the colony. (Photo by: Roger Deng).

DISCUSSION

Hérons regularly plunder nests of birds to eat their eggs and chicks. The black-crowned night heron (*Nycticorax nycticorax*) has been reported to consume the eggs and chicks of terns and other birds such as ibises and even other herons, as does the Pacific reef egret (*Egretta sacra*) (Martinez-Vilalta & Motis, 1992).

It is well known that nesting birds, especially those with young, either distract intruders away from their nests, or else attack them directly. Mobbing is a common strategy. Smaller birds have been known to mob larger birds, including raptors, and terns are no exception. In fact, intermediate-sized, and some smaller terns regularly mob and aerial attack, intruding predators. They repeatedly swoop low overhead, one after the other, often striking the bill, and sometimes even killing predators (Gochfeld & Burger, 1996). Additionally, although terns are rarely aggressive during incubation, they become aggressive after the eggs are hatched and remain so until the chicks fledge (Palestis, 2005).

Oil-spitting, or projectile-vomiting, as it is also termed, can be a formidable defence mechanism. Besides shocking a predator with this foul-smelling substance (Caro, 2005), the oil is particularly difficult to remove from the feathers (Warham, 1977). Birds contaminated with the oil will have their flying ability curtailed, in addition to losing the water repellency of their feathers.

Spitting oil on intruders is common among the procellariiform birds. These true seabirds include albatrosses, petrels, fulmars, shearwaters and storm-petrels. These birds regurgitate stomach oil that is made up of fatty acids, fatty alcohols, glyceryl and wax esters (Warham, 1996) that are derived mainly from their food (Clarke & Prince, 1976; Imber, 1976).

Fulmars oil-spit to defend their nest sites against other species as well as their own congeners in contrast to diurnal petrels that only repel predators this way (Carboneras, 1992). These birds can squirt oil 1–2 m, with some accuracy, making several discharges one after another (Warham, 1977). On the other hand, gulls, herons, and vultures vomit unpleasant substances in self-defence against predators (Podulka, 2004).

Among birds, the most well-known example is the aggressive dive-bombing of raptors and crows by the fieldfare (*Turdus pilaris*). What this thrush does is to fly up to or behind the predator and just before reaching it, suddenly swerve upwards. At that exact moment the fieldfare discharges a stream of faeces (Collar, 2005). The sticky faecal matter similarly clogs up the feathers of the predator and make flying difficult.

ACKNOWLEDGEMENTS

We wish to thank Haniman Boniran and “Shunden” for fruitful discussions, and “Hai-Ren” kindly alerted us to the fieldfare’s use of faecal discharge as a defense mechanism.

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