Korta rapporter – *Short communications*

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Indication of an interspecies "spill-over" reaction in Common Swift *Apus apus*

Mellanartsreaktion tolkad som "överspillshandling" hos tornseglare Apus apus

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Common Swifts *Apus apus* are extremely well adapted to an airborne life. This makes them vulnerable to accidental contacts with the ground. If not able to fly, they succumb. In this respect, they are a parallel to a very different animal taxon, the cetaceans (whales, dolphins and porpoises) which also live in a fluid and non-supporting element, water. If not able to swim, they succumb. Due to this lethal threat, to sink, an epimeletic (Greek: care-giving) behaviour (Scott 1958) has evolved within cetaceans (e.g. Caldwell & Caldwell 1966, Norris & Dohl 1980). Sometimes, such behaviour occurs across species borders (Caldwell & Caldwell 1980). However, rather than being an interspecies care-giving, it is seen as a spill-over of an intraspecific pattern and is therefore termed a "spill-over" reaction (Norris & Dohl 1980).

In a recent paper (Tenow et al. 2008), we hypothesised that some behaviour in airborne Common Swift directed toward Swift fledglings is epimeletic. This similarity should have been due to basically similar challenges exerted by the environments of cetaceans and Swifts, the water and the air. Over evolutional time, therefore, care-giving by adults in such situations should have been favoured. An identical behaviour in different animal taxa in two different elements was seen as behavioural convergence.

Caldwell & Caldwell (1966) discriminated between three types of epimeletic behaviour in cetaceans directed by adults to adults, (i) "standing by" which is to remain in, or approach, the area of a distressed species member but without rendering assistance, (ii) "excitement" includes approaching an injured comrade and showing hyper-excitability or distress, and (iii) "supporting behaviour" is when one or more animals support an injured individual in body contact at the surface.

In Tenow et al. (2008), seven observations supposedly falling within either "standing by", "excitement" or "supporting" behaviour were described. An eighth observation concerned an interspecies behaviour. New information necessitates a new description of this latter behaviour, which is the focus of this short communication. As a consequence some conclusions that were drawn in the discussion section of the previous paper are re-evaluated here. The observations were made at a summer house named "Rian" and neighbouring buildings situated on an "islet" surrounded by open area at Frösåker, Västerås commune (59° 32' N, 16° 44' E) in central Sweden (for details, see Tenow et al. 2008).

New information and description

In Tenow et al. (2008), we described how a Common Swift at day-time in early autumn made several fly-ins toward a perching and soliciting newfledged House Martin *Delichon urbicum* before it finally left. Depending on the Swift's age, interpretations of its behaviour will differ. If a migrating yearling, it may have intended to hang up and rest (Holmgren 2004) in contrast to an adult. Photos were taken of the House Martin and the Swift and it was stated that we did not manage to document the meeting of the two birds (Tenow et al. 2008). This statement was incorrect. After the publishing of that paper, it turned out that the Swift and the young House Martin were in fact caught together in one colour photo (Figure 1) in a sequence of

Figure 1. Fly-in of a Common Swift toward a perching young House Martin. The Swift is circled.
En tornseglare flyger in mot en sittande ung hussvala. Tornseglaren är inom ringen.

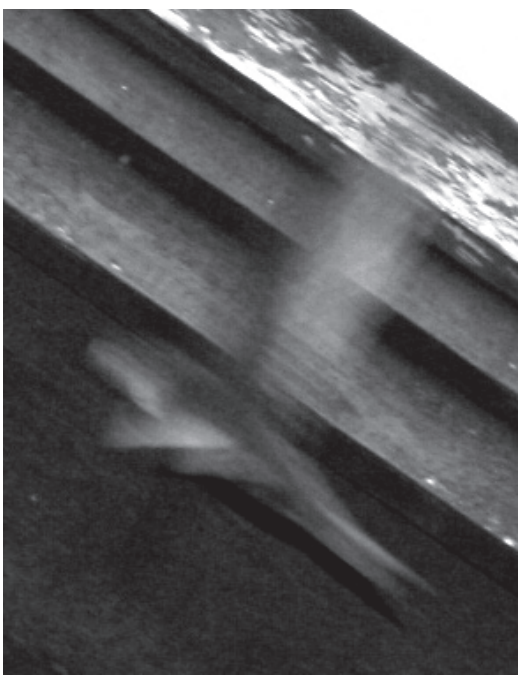

Figure 2 A. The Common Swift (Figure 1) in enlargement.
Tornseglaren (Figur 1) i förstoring.

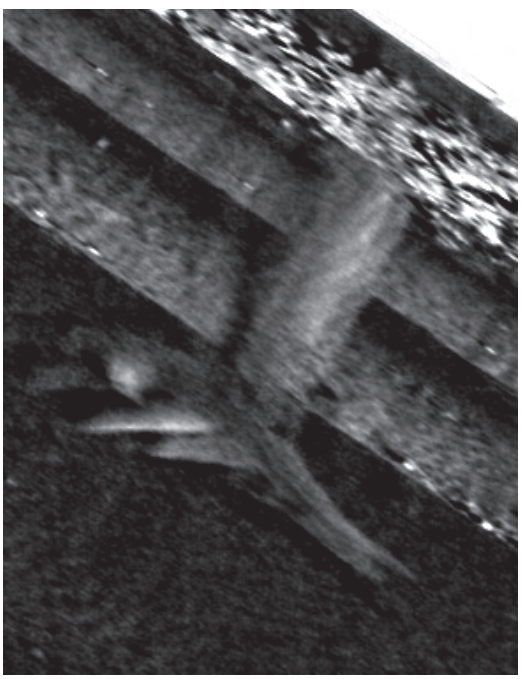

Figure 2 B. Image of the Common Swift as analysed (see text) from the original photo (Figure 2 A).
Bild av tornseglaren som resultat av analys (se text) av originalfotot (Figur 2 A).

eight. In the photo (Figure 1), the Swift comes from the right and follows the edge of the roof. It is slightly tilted for a swing to the left toward the young House Martin.

In Figure 2 A, the Swift in the photo is seen enlarged. A whitish throat patch is obvious and the colour of the bird is dark brownish (Figure 1), not blackish as in young birds (Chantler 2000), against the intermediary background. No whitish front of the head as in young birds is seen. The throat patch seems extended, and in further magnification (not shown), a gentle bulge downward and forward of the throat patch becomes obvious. When hunting food for their young, adult Swifts collect aerial plankton (small insects and spiders drifting in the air) in their throat pouch and glue them together into a bolus by saliva (Bromhall 1980). This bolus is then offered to the chicks. The extended and bulging throat patch seen in the photo indicates such a food bolus in the pouch. However, the blurred picture of the moving Swift opens these interpretations to question.

The photograph was exposed for 1/200 s and a flash was triggered at the beginning of exposure. To overcome the blurring of the Swift in the photo, the Lucy-Richardson deconvolution algorithm was used (Hanisch et al. 1997). This algorithm attempts to find an image that, when distorted by the assumed blur model, yields the given image. The blur model has two parameters: the direction and the distance of motion during exposure. Both may be estimated from streaks in the image.

The result of the deconvolution algorithm (Figure 2 B) is sharper than the original photo (Figure 2 A) and with changes in details. The greyish "snout" extending forward from the head of the Swift has disappeared and one can see that the bird keeps its head horizontally so that the head is shown in profile. One can count most of the primaries of the right wing and a pointed tail tip is visible. However, most importantly, the result clearly shows that the throat patch is extended downward and forward. A preliminary analysis, assuming the flash as the only exposure gave in essence the same result (not shown). The only interpretation of the extended patch that we can conceive of is that the Swift in fact carried a large food bolus in its throat pouch. By that, as indicated here, the patch often becomes furrowed where feather rows separate due to extension (cf. pictures on www.commonswift.org/images.html). This interpretation would mean that the Swift was an adult individual because Swift yearlings lack the capacity to form boluses.

In great magnification (not shown) one can see that the young House Martin looked in the direction toward the flying-in Swift, however, without begging. Thus, the two birds may have focussed on each other. Now and then an adult House Martin flew in and fed the fledgling. On other photos (not shown) in the sequence, the young bird either looks straight forward or begs to the left with open beak and shivering wings, probably toward an approaching adult House Martin.

New conclusions

When the breeding season ends and the feeding of chicks has ceased, the (sublingual) salivary glands of adults rapidly regress (cf. Johnston 1958, Nguyên Quang et al. 2006). Conclusively, the adult Swift on the photo, with a bolus in its throat pouch, cannot have been a migrating individual but rather one that still resided in the area with a delayed brood somewhere around the Rian "islet".

The weather in the area during the fly-ins of the Swift was windy with intermittent rain (Swedish Meteorological and Hydrological Institute) and therefore not favourable for insect or air plankton catching although an adult, despite that, may find suitable weather-protected hunting sites (cf. Leidgren 1985). However, up to noon that day there should have been a rather normal weather (SMHI) for an adult to collect food for its young (cf. adults feeding the young House Martin during the fly-ins of the Swift).

We propose that the Swift heard the continuously calling young House Martin from a distance. Why did the adult Swift approach the young House Martin repeatedly instead of hurrying to feed its young? A Swift just passing on its way to the nest should not have been attracted by a soliciting House Martin. Sometimes Swift fledglings leave the nest when the parents are absent (Perrins 2002). Hence, if the young had departed recently, this parent may have returned to the nest with a food bolus only to find the nest deserted. Then, the parent Swift had three options to handle the bolus, to swallow it, eject it or leave the nest with an intact bolus and with its urge to feed its young not satisfied. An urge to feed may be ambiguous. It may be to get rid of the bolus as well as to deliver it to the offspring. What we know with reasonable certainty is that the Swift approaching the Martin carried a bolus. For the rest, we can only discuss some possible explanations to its behaviour. These may be aggression, a need to hang up and rest, curiosity, an urge to get rid of the bolus or even an impulse to feed the young House Mar-

tin. The latter is seen here as misdirected parental care (cf. Tenow et al. 2008).

Aggression outside the breeding season seems not likely (Tenow et al. 2008). Similarly, inanition and therefore a need to rest is unlikely (Tenow et al. 2008; also above). The remaining explanations seem all applicable. Common for them is a behaviour directed across the species border, for example photographic evidence of a Blackbird *Turdus merula* feeding a soliciting young Fieldfare *T. pilaris* (Ekman & Åkeby 2009). Therefore, the most probable answer is that the Swift's behaviour was a "spill-over" reaction (see Introduction).

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Sammanfattning

Tidigare beskrevs hur en tornseglare gör anflygningar mot en ljudligt tiggande hussvaleunge (Tenow et al. 2008). Beroende på tornseglarens ålder kan beteendet tolkas olika. Här åldersbestäms seglaren fotografiskt med teknik för analys av bilder med rörelseoskärpa. Fågeln visade sig ha strupen utspänd av en matboll som endast äldre tornseglare kan forma för att ge sina ungar. Vi antar att den funnit ungarna utflugna. Med driften att leverera matbollen oförlöst (eller av nyfikenhet) reagerade den över en artgräns, en "överspills"-reaktion.

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