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Phenology and Behaviour of the Common Swift *Apus apus* in Israel (Holy Birds, or the Common Swifts of Jerusalem's Western Wall)

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The Wailing Wall in Jerusalem is all that remains of the Second Temple, destroyed by the Romans in 70AD. Only part of the western outer wall still exists, shoring up the Temple Mount, an artificially elevated plateau, comprising the Temple Area, the Temple having been the central building. This part of the Wall, or 'Kotel', remains an important place for Jewish worshippers, not only because it is near the holiest places, but also it is now holy itself. The Kotel is part of the Jewish Quarter of the Old City of Jerusalem. The El Aksa Mosque and the Dome of the Rock stand on the Temple's site on Temple Mount, which is under Islamic religious authority, known as Wakf.

The Temple area is an ideal habitat for certain bird species. The great Temple building was made of natural stone whose many crevices and holes offer birds many opportunities to build nests and hatch chicks. These apertures comprise a typical biotope for the Common Swift, which will use any suitable cavity, whether it evolved through erosion or was provided intentionally, if for other purposes. Here we are sure that Swifts have used the Temple for nesting since it was built.

The stones of the present Western Wall vary in type and quality. The builders clearly took great pains to use high-quality blocks in the lowest rows, but those higher up are often of indifferent standard. Although one cannot put a knife-blade between stones in the lower rows, near the top of the building, one can see many hollows that Swifts can exploit. Where the stonework was damaged during construction, Swifts can sometimes gain access to the inner part of the wall, which contains many cavities.

Common Swift *Apus apus* nesting cavities (See Photo on pp86-7).

Since 1967, the Western Wall has been under Jewish administration and has been subject to extensive restoration, and the space it faces has been transformed into a large plaza. This work

involved cleaning the stones in the Temple Wall and sealing some gaps with anachronistic concrete. In 2002 we noted the Common Swift using 85 holes.

There are two more such nest-sites in the neighbouring wall of the synagogue and another in the triangular stone ledge where the walls of the two buildings meet. Other bird species that use the cavities are; Jackdaws *Corvus monedula* (two cavities), Feral Pigeons *Columba livia* forma *domestica* (five cavities) and House Sparrows *Passer domesticus biblicus* (15 cavities, five being shared with Swifts).

We observed the study area from 14–27 April 2002, noting all the holes that Swifts entered and selectively recording the frequency of entry. As well as Common Swifts using cavities for breeding, unpaired birds may also occupy a cavity. The strong site-fidelity exhibited by the Common Swift means that breeding birds usually return yearly to the same site to breed, and take precedence over unpaired birds.

A total of 412 entries was recorded, the true number inevitably being much higher. Table 1 provides an estimate of entry frequency rather than an absolute count of the number entries. We assumed that the holes entered most were breeding places. It was easy to document parent birds feeding young throughout the day (proof being a full pouch, visible only at close range), but not homecoming non-breeders returning as darkness fell. We could note the entry of perhaps 10% of the large groups of birds returning to the evening roost.

Table 1: Frequency of entry by Common Swift into Western Wall cavities

Entries per cavity	No of holes
1–5	57
6–10	25
11–15	6

Many holes are about nine metres up the wall, between the 9th and 10th rows of stones, where there were 16 nesting sites. The southern part of the Wall holds the fewest sites, probably because so many cracks have been sealed here. Some holes are not perpendicular to the Wall surface, forcing the Swifts to enter obliquely. At one site, the birds flew straight into the cavity without touching down at the entrance. At four sites the Swifts had to make a 90° turn just before the entrance hole, but could fly into it without touching down at the entrance. We assumed that in these cases, the nest itself is deep in the stonework. Screening vegetation obscures two holes, and because a Swift's feet allow it only to cling, it cannot walk or hop round obstacles. Its limited manoeuvrability means that growing vegetation can make suitable nest holes inaccessible.

Phenology

In Jerusalem, Common Swifts mostly arrive in late February (Cornfeld 2001). In 2002, the first arrived at the Kotel on 19 February and in 2003 on 13 February (Cornfeld 2002, & *in litt.*). During our observation period, the chicks hatched and were brooded for about one week, when their eyes are still closed. The Swift population also includes non-breeders in two categories, those that occupy a nesting place and those that do not. All three groups exhibit different behavioural patterns. In the case of breeding birds, after brooding, the parents gather food continuously. Only when the weather is cold does one parent stay at the nest. The non-breeders serve as a 'reserve' for the breeding birds, their role being to replace drop-out breeders, or to reconnoitre for their own nesting places for the following year. Those non-breeders occupying a nest hole have to defend it; either they are not in breeding condition, or have secured a nest site too late to raise a brood. Common Swifts that do not occupy a nesting place will investigate every possible nesting site, whether occupied or vacant, in an attempt to supersede failed breeders or to drive out the current occupant. We did not see any such antagonistic behaviour, probably because the young had all hatched and it was too late to start a brood (Swifts leave their breeding areas punctually some 100 days after the arrival of the main body of migrants, a circumstance that so far seems common to all populations).

Common Swifts feed exclusively on airborne insects. In poor weather, such as very low temperatures, strong winds, or especially when it is raining, the insect supply temporarily diminishes,

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and non-breeders - particularly those that do not have a nesting place - quit the colonies to feed in areas with better weather conditions, returning to the colonial area once the weather improves. Consequently, breeding birds tend to have sole access to the reduced supply of food in the breeding area. Non-breeders that have secured a nesting place remain in possession of their nest-holes at night in order to defend them from competitors. Those without a nesting site spend the night on the wing.

The Wall floodlights illuminating the plaza stimulate the Swifts to very early departures from their nests, as we observed on nights when the sky was completely dark, departures beginning long before sunrise in mid-April at 0540 (sunrise on 14 April was at 0612) and the first sorties of the day being complete by 0630. Orientation at any hour is endogenous, the species remaining on the wing permanently except during the breeding season. Individual Swifts did not always remain in the colony area, numbers of birds in flight above the plaza varying greatly.

Direction of Flight

Throughout the day, when the breeding birds left the colony in search of food, they scattered in different directions. A summary of 30 observations of the initial headings selected (in 90° arcs) gives: North, 4; East, 2; South, 21 and West, 3. Several birds made radical course changes after some distance. A typical return heading pattern for non-breeders was: South, 24; West, 10 and Southeast, one.

However, the determination of return direction of breeders was largely confined to just the two seconds during which the birds were acquired visually, before they re-entered the nest sites. Only two returning breeders were observed over a longer period, coming from the North and East respectively. Common Swifts can enter nest-holes at 70 km/h (Arkel 1997). Where birds circled before entering the nest-holes, return direction was seldom confirmed. We noted only three instances of overflying, two involving singletons (S to N and ESE to ENE) and the third a flock of some 18 birds (WNW to ESE).

Flight patterns above the colony area varied, especially in front of nest sites. Orbits, over the Kotel plaza were mostly clockwise (occurring during 12 of 17 observations) Three observations noted anticlockwise orbits. There were two observations of conflicting clockwise and anticlockwise orbits. The velocity of the circling birds was noticeably lower than usual, possibly a collision-avoidance tactic.

The return in the afternoon

The daily timetable is flexible, but it is based on a clear and regular pattern of activity of leaving the colony in the morning to feed and returning in the late afternoon. The feeding parents have to take advantage of the daylight hours to collect as much food as possible for the young, while the non-breeders must be back at their nesting site to defend it against competitors. After the return, the non-breeders fly around the colony area. Table 2 gives the average and total numbers of Common Swifts above the Kotel Plaza:

On some days there were early assemblies of up to 15 birds, from 1500 onwards, over the Kotel Plaza. On only three days at this time did the skies remain empty, except for birds in transit and the feeding parents. The highest density of birds occurred around sunset, replicating Tel Aviv observations (Tigges 2003). Those non-breeders that have no nesting site climb to an altitude safe enough for aerial roosting. To sleep on the wing they orient themselves into the wind

Table 2: Numbers of Non-breeding Swifts above the Kotel Plaza in late Afternoon

Obs Times	Avg No of Birds	Max No Present
1500–1600	4	8
1600–1700	4	9
1700–1800	5	17
1800–1900	12	50
1900–1930	16	55
1930–1945	6	10

direction. This way they are able to stay as near as possible to their colony territories, by responding according to the oscillatory wind conditions. (Bäckman & Alerstam, 2002). The common phenomenon of non-breeders from several colonies assembling as dusk gathers to gain altitude in loudly-screaming flocks was noted twice directly above the Kotel Plaza, the flock comprising some 50 individuals in each case.

Swifts seen scattering about and circling the colony in the late afternoon and the evening predominantly were non-breeders. Because the fledglings have to reach a weight of about 55 grams, the parent birds have a full schedule in their search for insects and feeding their young, which were two to three weeks old at that time. The feeding task leaves no time for the parents to join non-breeders in social flights; they have no need to look for nesting sites to begin to mark out territory. The flights of parent birds always were purposeful, although the initial courses selected were not always the same.

Influence of weather

The only unequivocal effect of weather conditions related to variations in the size of the groups observed at the same time in the afternoons: these fell into three size classes, 0–13, 15–35 (on 5 days) and 40–60 (4 days) birds respectively. However, Table 3 suggests that low temperature, rain and wind together reduce the numbers of birds; non-breeders largely were absent, but the sample size of such observations is low. The effect of low temperature and wind in dry conditions is less clear-cut.

Table 3: Maximum numbers of Swifts seen in the Western Wall colony in various morning and afternoon weather conditions. (*The median of all the highest daily counts was 25 individuals, in both mornings and afternoons.*)

Date	Av Wind Speed (m/s)	Max Wind Speed (m/s)	Wind Dir'n (°)	Max /min Temp (°C)	Rainfall am (mm)	Rainfall pm (mm)	Max birds seen* (am)	Max birds seen* (pm)
14	2.6	6.8	090	28.6/17.7	0	0	30	40
15	2.8	6.7	270	28.4/23.5	0	0	13	35
16	3.4	8.3	290	29.0/20.4	0	0	25	25
17	6.0	10.2	290	21.6/14.0	0	0	20	22
18	4.3	9.7	290	17.2/10.1	0	0	No count	No count
19	4.9	8.4	280	17.2/10.2	0	9	No count	25
20	6.0	9.3	280	14.9/8.9	2.2	0	No count	13
21	5.3	8.5	280	13.8/9.3	3.6	0	0	8
22	4.6	7.4	300	16.5/9.9	0	0	10	22
23	1.6	3.8	110	21.0/9.3	0	0	50	60
24	4.5	9.4	280	23.6/13.3	0	0	30	20
25	4.8	7.6	290	18.7/10.9	0	0	No count	40
26	2.9	7.7	300	17.3/9.8	0	9	30	1
27	5.8	10.3	300	16.8/8.8	0	0	No count	No count

* Maximum counts refer to the maximum seen at one time in any hour; am=0600–1200, pm=1200–last light.

Colonial areas

In the mornings and in the evenings, the Common Swifts flew around the colony territory, which comprises a core and a fringe (Tigges 2003). All colony members, breeders and non-breeders alike, use all the colonial territory, possession being indicated by irregular sorties by screaming groups. The fringes of colony territories also accommodate Swifts from neighbouring colonies. The consequence, as at the Western Wall colony, is that 'strangers' very seldom entered the territory, usually overflying it at quite a high altitude. Common Swift colony boundaries often coincide with clear-cut topographical features, such as a line of houses or streets. The Western Wall colony core boundary comprised the City wall to the south, the Ha Kotel Road to the west, to the north touching Ha Shalsholet and in the east being the Western Wall itself. In the southeast, it follows the crown of the Wall of the Temple Mount in a dog-leg that includes the Southern Wall. The Western Wall Swifts never took the short cut over the Temple Mount.

Other neighbouring colonies were around the Sidna-Omar-Mosque, around Yehuda Halevi - Batei Makhase and probably above the Temple Mount, where we could not gain access.

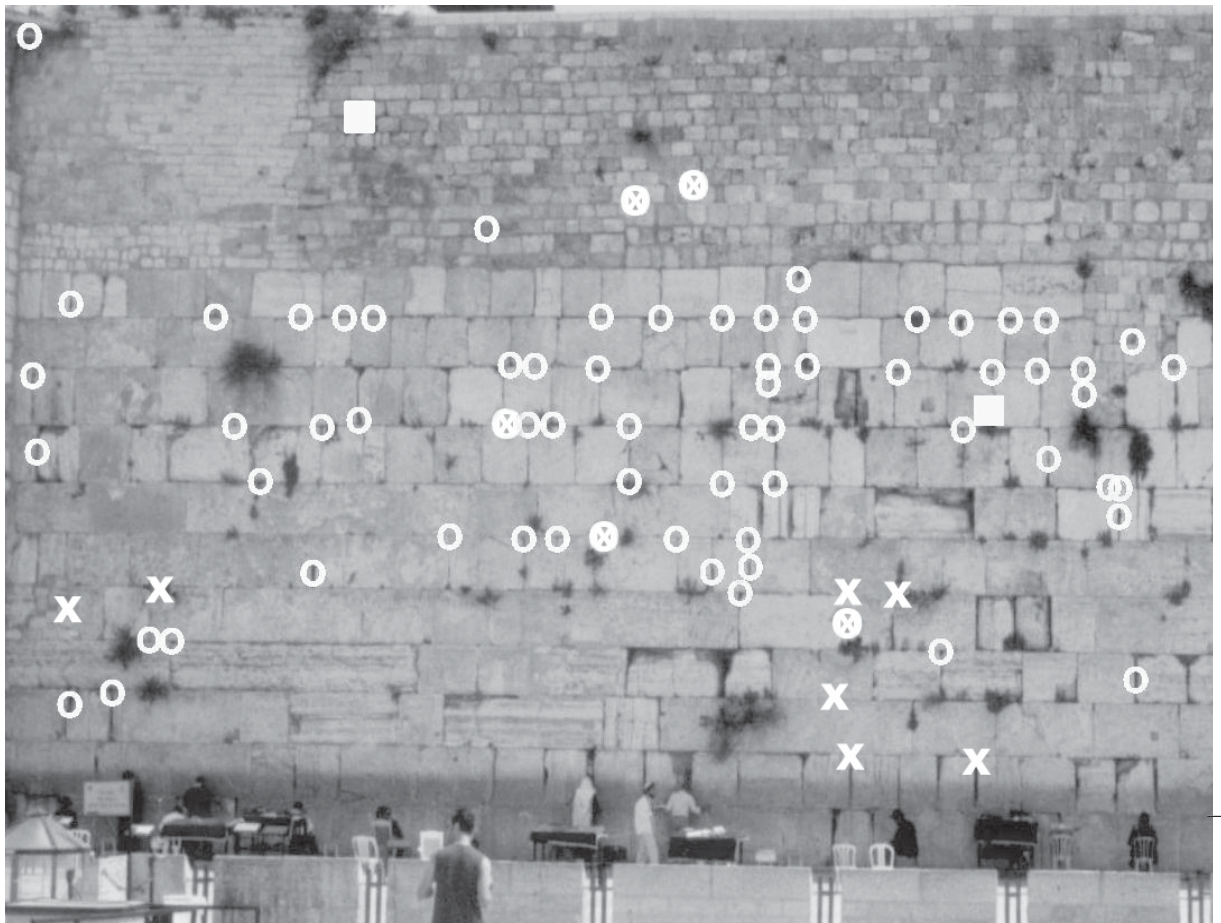


Plate 1. Most of the actual and likely nesting sites in the Western Wall. The Common Swift *Apus apus* used 88 holes in 2002 (two holes are out of shot to the left). Species usage is indicated thus: White circle = Common Swift, white X = House Sparrow *Passer domesticus*, white square = Jackdaw *Corvus monedula* and white filled circle = Feral Pigeon *Columba livia* forma *domestica*. Note that some holes are shared by more than one species.

Censusing the colony

The Western Wall colony contained about 115 Common Swifts, and we estimate from our analysis of the nest-entry frequency that this total included some 30 breeding pairs in the Kotel. About 20 to 30 non-breeding individuals owned a nesting place, as estimated from the numbers of birds that flew into the colony most often. Perhaps another 20 to 40 were non-breeders without a nest site; these birds lived in the colony territory only when the weather was suitable.

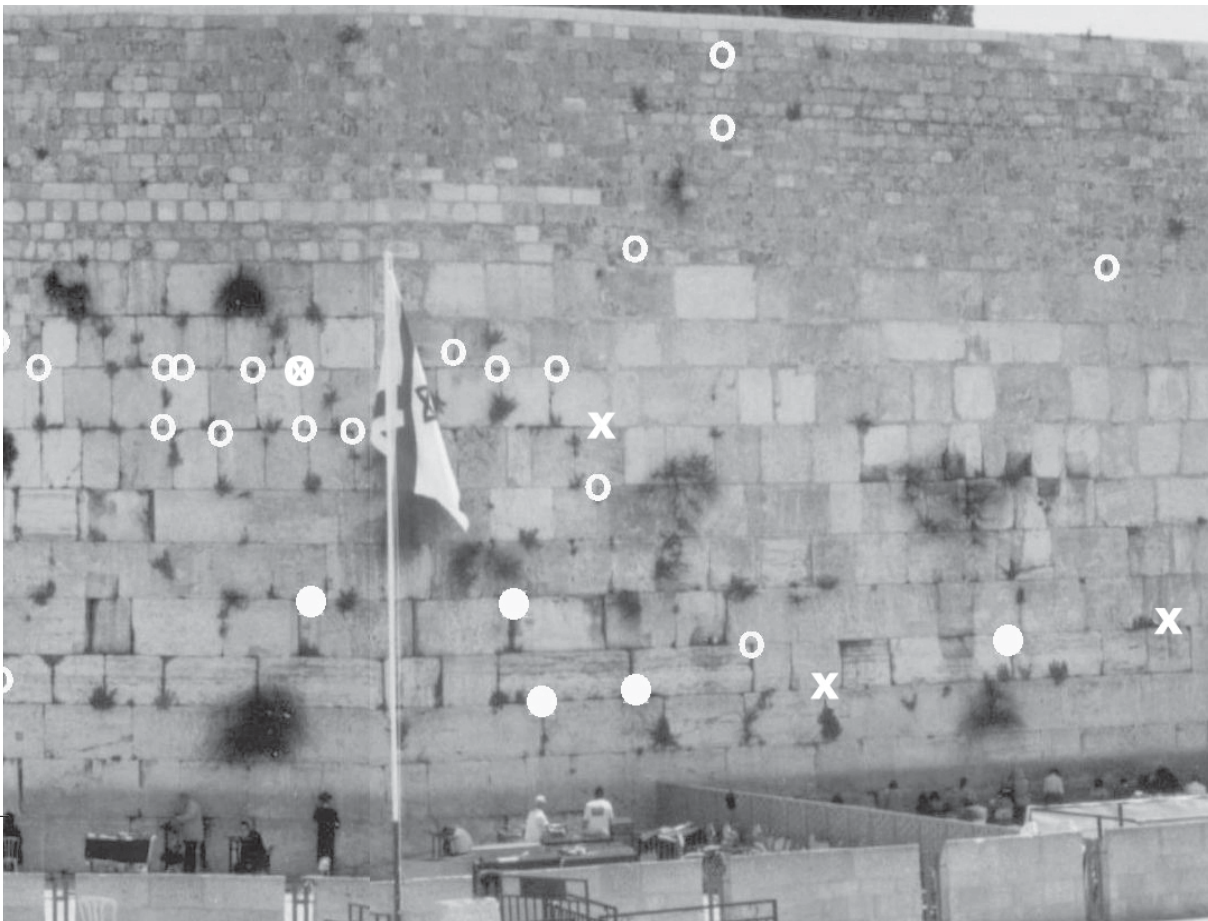
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* Professor Mendelssohn died on 19 November 2002.

ADDENDA

Some 2004 data. The first three Common Swifts were seen in Jerusalem on 26 February, coming out of nest holes in the Western Wall. By the 28th, there were six. On 01 March, some 20 were circling above the Western Wall plaza, as others were seen outside the Old City of Jerusalem (Y. Cornfeld, pers. comm.). In



Zichron Yaakov the first few had arrived by 26 February (M. Adar, pers.comm.) and in Ramat Aviv on 28th; none were seen on 29th, but a few were noted the next day (01 March) (A. Geron pers. comm.). Tigges saw one in Tel Aviv late on 29 February, and at least 15 the next morning. First arrivals in the solitary standing house colony (Tigges, 2003) appeared 01 Mar: six were present 3rd (25 were in a neighbouring colony) and 14 the next day (still 25 nearby), repeating the circumstances of 2000.

First 2005 data. The first Common Swifts arrived at the Wailing Wall colony on 18 February and in Tel Aviv on 19th.

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