

**Observations on the breeding biology of the Swallow
Hirundo rustica transitiva in Gaza Strip, Palestine
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Hirundo rustica transitiva

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ABSTRACT

The breeding cycle of three pairs of the Swallow *Hirundo rustica transitiva* was studied in the Gaza Strip. The distribution, preferred habitats, breeding season, nesting habitats, nest construction, egg and egg-laying period, clutch size, incubation and nesting period, hatching and caring the young and some behavioural aspects are described.

Key words: Swallow, distribution, breeding cycle, development of young, Middle East.

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INTRODUCTION:

The Palestinian race of the Swallow *Hirundo rustica transitiva* is very common and widespread passage migrant and summer breeding visitor. Migrants are common throughout the Gaza Strip (GS) in autumn and winter with peaks in September and January respectively. The largest concentration being four to six hundreds over open cultivated country with settlements mainly near water bodies. The breeding population of the Palestinian race arrives from Egypt in late March and early April to breed in Palestine, Lebanon, Syria and north-west Jordan.

The aim of the present study is to provide information on the distribution, breeding biology and behavior of the Swallow in GS and to describe the development of the young which has not been studied previously in details (cf. Meinertzhagen 1954, Shirihai 1996, Al-Safadi 2006).

STUDY AREA AND METHODS:

Since 1996, frequent field visits have been paid to various areas of GS in order to study the avifauna, and throughout this period special attention was paid to clarify the status and distribution of the Palestinian Swallow. The main study was carried out in the Shega'eyah area at Gaza city. The Shega'eyah area is the eastern part of Gaza city and comprises different houses, workshops, gardens, parks, factories, cemetery ... etc. It includes the highest hill in GS which known as Al-Montar, about 90m a.s.l.

Three nests of the Palestinian Swallow were studied. The first nest in a lathe workshop found in the ground floor of a house of three floors, the second one found in neglected store of a farm, and the third nest was placed in a sheepfold of the ground floor of a house located near cement factory. The first and the second nests each with 5 eggs and the third one comprised 4 eggs. The first and the second nests were studied in April- May. 2004 and 2005 respectively, while the third nest was studied in June- July 2004. Each nest was visited every 2 days from hatching until nestlings were fully fledged and had left the nest. Observations on the behavior of the parents and chicks were made and records were kept on the air temperature, humidity, dimensions and weight of the eggs, and morphological changes and development of the young.

RESULTS:

Distribution and Numbers:

Apparently, in GS the swallow is one of the common passage migrant and autumn-winter visitor in large numbers, and breeder visitor in spring-summer in small numbers. Hundreds, up to six, can be counted in one spot located near water body such as in the estuary of wadi Gaza or in Beit lahia sewage lagoons, while less numbers seen in the agricultural areas.

Breeding Season:

Based on our field observations to the various regions of GS, the breeding season of the swallow, Palestinian race begins in March, when the birds form pairs and build nests and extends to late July, a period with daily air temperature 27-31C and maximum relative humidity 50-55%. The breeding season seems to coincide with a rich food supply, when the numbers of the flying insects increase remarkably. Second broods occur in late summer.

Nest:

In Gs usually the nest is solitary, built in pens, folds, workshops and stores and always in the towns and villages. As elsewhere, the birds build an open nest of mud and straw and placed on beams and ledges in farm buildings, workshops, sheepfolds and sheds. Unusual nests near concrete factory were built from cement, sand and gravels. The nest is nearly a deep cup lined with a thin layer of fine straw, grasses, feathers and sometimes few fine threads and radio tapes. Some swallow may use the previous year's nest.

Egg and Egg-laying:

The clutch size is 4-6 eggs, usually 4-5, laid at intervals of 4-5 days. Egg-laying starts in the second-half of April and extends to mid June. The eggs are rather pear-shape to oval, have a white ground colour, and are freckled with dark brown to light black and sometimes few purple spots. A total of 14 eggs from 3 nests was examined. The dimensions and weights are given in Table 1.

Table 1. Dimensions (mm) and weights (g) of the 14 eggs of three clutches of the swallow in shega'ayah area, Gaza city .

Egg	Nest1			Nest 2			Nest 3		
	Width	Height	Weight	Width	Height	Weight	Width	Height	weight
1	14.1	20.1	2.2	14.0	19.0	2.2	14.0	20.2	1.8
2	14.0	20.2	2.2	14.0	19.0	2.2	13.8	19.0	1.7
3	14.0	20.5	1.8	14.0	18.5	2.1	13.0	20.5	1.7
4	13.8	19.0	2.0	13.5	19.0	2.2	13.0	19.5	1.7
5	13.8	18.5	1.8	13.5	19.0	2.1	-	-	-
Average	13.9	19.7	2.0	13.8	18.9	2.16	13.7	19.9	1.73

Incubation:

Incubation was apparently continuous after the first egg was laid. Both parents incubate over about 17 days and the eggs hatch at intervals according to the time of laying. The adults carried the egg- shells away from the nest immediately after hatching of the young.

Development of the young:

I had the occasion between April to July to study in details three nests of the Palestinian swallow, the first and the second had 5 young in each, and the third with 4 young.

Hatching stage. Hatching of eggs occurred according to their laying order, which takes place over 3-4 days. The newly hatched young is nidicolous, blind, naked and unable to move. There is few bundles of gray-white down feathers of about 7-8mm, one bundle on each head side, shoulder and dorsal. The skin is fairly fleshy on the ventral parts and more darker on the dorsal. The young have white egg tooth, yellow gape and mouth cavity. Throughout the day, the young are fed at intervals by both parents. The young are able to raise their heads and open their mouths widely to encourage feeding. Average weight (A. wt.) 1.6g.

Day 1. The young still resemble the newly-hatched ones; they are still blind, naked and have egg teeth. On handling they discharge their faeces. A. wt. 2.9g.

Day 3. They more or less looks like the first- day young with paler gapes and mouths and blackish skin. A. wt. 5.5g.

Day 5. By the fifth day, the nestlings have opened their eyes. The bundles of down feathers are still found. The dorsal skin becomes more blackish. On removal , they grab the nest with their claws. It is worth mentioning that the

feather of the wings and the tail have began to emerge in the fourth day.

A. wt. 10g .

Day 7. The skin colour is more black. The sheath colour is black-bluish and their length on primaries, secondaries and tail is 10 mm, 8mm, and 6mm respectively. A developing strand of feathers (blackish) on the mid-line of head, neck and dorsal is clearly visible. Another developing strand on throat (grayish), mid-ventral neck (blackish) is seen which branch and extending on each side (pale brown-sandy) of the body. The down feather bundles are now very light. When the parents approach, the young stand erect, extending their necks and open their mouths widely. A. wt. 14. 6g.

Day 9. The first signs of the emergence of the outermost four primarres (black) from their black- bluish sheath (22mm), followed by secondaries (17mm) and also the outermost 3 of each side of tail feathers (11mm). A continuous developing of feathers on mid-line of head, neck and dorsal and extending back to tail. The side strips now reached in front of the vent. Light blackish feathers on back, rump, thigh and tibia are now clearly visible. The red greater primary and secondary coverts are now reach to 12 mm and 8-9 mm respectively. At this age it is not easy to remove the young from their nest because they cling on to the nest containers. A. wt. 16.9g.

Day 11. The general appearance is much as on day 9. The feathers are now longer and denser. The largest primary length is 30 mm, the secondary 23 mm and the tail 13 mm. The first signs of the emergence of the secondaries (black) from their black-bluish sheaths. Feathers colour of head, neck, dorsal, back and rump is black , pale brown on breast sides and flanks. The gape is still yellowish and the down feathers on the head are still exist. On handling the chicks produce sounds. A. wt. 17. 5g.

Day 13. The terminal tips of the primaries, secondaries and tail feathers are now fully apparent. The largest primary is 40, secondary 30mm, and tail is 20mm. Feathers of under wing coverts, breast sides and tail coverts are pale brown, white-pale brown on abdomen. Throat feathers began to change to pale brown. A. wt. 19. 8g.

Day 15. The young are more or less resemble age 13. The largest primary is 44 mm, secondary 33mm and tail 21mm. A. wt. 18.2g.

Day 17. Generally, the young are almost completely feathered, with plumage similar to that of the adults although somewhat duller and lack feathers on front the vent. Anterior head is more flattened dorso-ventrally; gape white –yellowish; frontal head grayish , breast , abdomen , tail coverts and under wing coverts is pale brown; head, dorsal and tail is black . The largest primary is 48mm, secondary 38mm and tail 22mm. The young is

distinguished by the appearance of the blue- black crescent band on the anterior of the breast, the dark brown chin and throat, and pale reddish-buff under parts. The wings, at this age, reached to the base of the tail. The young are easily walk on the ground and produce sounds replying on their parents. A. wt. 20. 2g.

Day 19. The nestlings are now acquired full juvenile plumage almost similar to that of the adult, i. e. red throat, deep shining blue back, but the young still lacking the forcked tail . the largest primary 60mm, secondary 46mm and tail 25mm. The young able to walk, jump and fly for short distances .The wings now reach to the half of the tail .A. wt. 20g.

Day 21. By the day 21 of age the juvenile acquired full adult appearance with the exception of lacking the forcked tail. Indeed, the young swallow are skilled flyers as soon as left the nest. So, many were escaping from our hands during handling A. wt. 20g.

DISCUSSION:

As a result of the frequent field visits which had paid to the various regions of GS in order to clarify the status of the avifauna, some detail records, in this field, are now available (Al-Safadi 1977, 1999, 2001,2002, 2003, 2004,2006).

Swallow is one of 35 breeding bird species in GS and classified in the group of breeding summer visitor which included 4 bird species (Al-Safadi 2006). Doubtless, swallow is a tame bird, build his nests in buildings, but on the approach of a human being to the nest , the parents' made a shuttle flying near and around the intruder and producing many sounds . On the other hand, the parents' behaviour differed during the study of their young, they stop flying, perching and still watched in a miserable state and occasionally sent calls which encourage their young to produce replying calls .

The growth period of the young, which located within 3 weeks, may considered into three stages. In the first seven days growth was very rapid, varying from 23% to 45% per day. From the ninth day to the thirteen day the rate of growth, though steady, decreased greatly to 2%-8% per day. In the third stage, beginning from fifteen day, the rate of growth fluctuated within narrow limits. It is worth to mentioning that the short growth period is a normal case in defenceless birds of most garden and woodland birds (Ardley 1987).

It is noticed that the first brood is usually occurred in April-May, while the second one in June - July and the weight of eggs and subsequently the young of the first brood is larger than that of the second brood. This may

attributed to the improved food supply of flying insects which increased remarkably in April – May than that in June- July.

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