MAINTENANCE BEHAVIOUR
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Some aspects of maintenance behaviour of the Redwattled Lapwing were studied. All observations were made on wild birds. Observations on chicks were made in captivity. The behavioural patterns associated with preening, bathing, cleaning, shaking, wing drying, stretching, resting and sleeping were categorised as maintenance behaviour following Armstrong (1950), Dilger (1960), Meyerriecks (1960), Maxwell and Putnam (1968), and McAllister and Maxwell (1971). Mckinney (1965) classified movements associated with shaking, stretching, cleaning, oiling and nibbling preening, washing and bathing in Anatidae as comfort movements.

1. PREENING

Preening was the most frequent maintenance activity observed in the Redwattled Lapwing during interludes between feeding, nest relief, after copulation, and periods of resting. All regions of the body accessible to beak were preened except head and upper neck. The feathers were stroked and nibbled during preening. Preening of breast (Photograph 49), abdominal, back and rump regions, and wing coverts was
done primarily by nibbling while primaries, secondaries and rectrices (Photograph 51) were stroked.

For preening the breast and belly regions, the head was bowed towards the respective region. Preening of wing was done from inside (Photograph 50) as well as outside, for which the wing was slightly extended and head bent backwards. For stroking the rectrices, the neck was turned backwards to one side, with head tilted at an angle, tail was spread and turned on its axis to one side (Photograph 51). In all preening activities of the Redwattled Lapwing, the body was kept horizontal and tail was not lowered, except during breast preening where tail was slightly lowered. Ten Cate (1985) observed that horizontal body posture during preening is an adaptation in waders and ducks, as due to their habitat, lowering of wings or tail, thereby touching substrate, will lead to wet or dirty feathers and will possibly damage delicate tips of wings and tail. During the breeding season, copulation was always followed by tail and belly preening in male, and tail preening in female. Preening movements in the chicks appeared 2-3 days after hatching. Due to poor coordination, young chicks usually toppled over when they attempted to preen. Initially, only breast and outer wing regions were preened; preening developed gradually as the chicks grew older.
Photograph 49: Breast preening.

Photograph 50: Preening of the inner side of wing.
Photograph 51: Preening of rectrices.

Photograph 52: Bathing.
Preening helps in the care of plumage, removal of ectoparasites, and to rearrange the feathers that might get displaced during various activities as, for example, after copulation. Other reported functions of preening have been advertisement (Sodhi and Khera, 1984) and courtship displays (Mckinney, 1965; Edwards, 1982). Preening as displacement activity has been reported in the breeding Avocet, Recurvirostra avosetta, Little Ringed Plover, Charadrius dubius, Kentish Plover, Charadrius alexandrinus, (Simmons, 1961), Common Tern, Sterna hirundo, and Sandwich Tern, Sterna sandvichensis (Iersel and Bol, 1958).

2. BATHING

For bathing (Photograph 52), the Redwattled Lapwing waded into a shallow pool, sat in water and then it dipped its head and body alternately into water and performed body shaking movements. The wing were kept slightly elevated during bathing. On a few occasions, the birds were observed to perform breast preening during bathing.

3. CLEANING

Some cleaning movements observed in the Redwattled Lapwings were:

(i) Scratch: The bird scratched its head, neck and
beak by dropping one wing and bringing up the corresponding leg over the shoulder to the head region (Photograph 53). This method of scratching has been termed indirect scratching (Simmons, 1957 and 1961; McFarland, 1981). The head was rotated and turned, for scratching different regions of head and beak. The scratching was most of the times associated with preening but could also be observed as an independent maintenance activity. McKinney (1965) observed that scratching served to remove irritation caused by ectoparasites, loose feathers and cleaning. In the Redwattled Lapwing, scratching also helped to clean the bill. The chicks also scratched by indirect method. Although very young chicks could not bring up their leg over the shoulder for scratching, the wing was always lowered prior to scratching.

The head scratching methods in birds have taxonomic significance and one method is used by all members of the same family (Simmons, 1957). Simmons (1961) also observed head scratching as displacement activity in the breeding Avocets and Little Ringed Plovers. The lowering of wing during indirect scratching may serve the bird to keep better balance either by lowering the centre of gravity (Simmons, 1961) or by placing the wing bow on the perch as a support for
Photograph 53: Indirect head scratching by the bird on left. The bird on right is in resting posture.

Photograph 54: Shoulder rubbing.
the body (Ten Cate, 1985).

(ii) **Shoulder rubbing**: During this activity, the bird turned its neck to one side, and vigorously rubbed the lateral side of its head on the outer side of wings near shoulder region (Photograph 54). The body and tail were kept in a horizontal plane. Shoulder rubbing was observed as an independent activity as well as in association with preening and bathing. This movement probably served to clean the eye, as has also been observed by Simmons (1961).

4. **SHAKING**

The following shaking movements were observed:

(i) **Body shake**: The bird assumed a horizontal posture, loosened the wings and vigorously moved the body along the antero-posterior axis (Photograph 55). This was followed by one jerky, rotating movement of the head. Body shake was observed after preening, bathing and copulation. McKinney (1965) suggested functions of body shaking to be the removal of water drops from bird's feathers and rearrangement of feathers when these have been disordered.

(ii) **Wing shake**: The Redwattled Lapwing withdrew its neck, loosened the wings and shook them with short vibrating motion (Photograph 56). Usually the wing
shake was observed after the preening of wings. The wing shake also followed bathing and subsequent preening. This movement helped to dry as well as rearrange the wing feathers.

(iii) **Head shake**: The head and bill were shaken laterally by movements of the neck. The head shake occurred independently or in association with preening and after feeding. The chicks also performed head shake.

McKinney (1965) suggested that head shake removed water, dirt, food particles or loose feathers from the surface of bill.

(iv) **Tail wag**: In this movement, the tail was shaken from side to side a number of times. The rectrices were not fanned during this movement. In general the tail wag in the Redwattled Lapwing was observed during preening. The tail wag always followed copulation, defection and bathing.

McKinney (1965) observed that the tail wag of male in Antidae probably helped to return the penis to its usual position in the cloacal cavity after copulation. Other functions of tail wag are: removal of water from tail, rearrangement of misplaced rectrices and
Photograph 55: Body shake.

Photograph 56: Wing shake.
tail coverts, and reinversion of cloacal lips after defecation (McKinney, 1965).

5. STRETCHING

Wing-and-leg-stretch and both-wings-stretch were the two stretching movements observed in the Redwattled Lapwing.

(i) Wing-and-leg-stretch: In this movement the bird, while maintaining a horizontal body posture and retracted neck, shifted weight on one leg and extended its wing backwards (Photograph 57). The leg of the same side was also extended beneath the stretched wing. After stretching, the leg and wing were withdrawn simultaneously.

(ii) Both-wings-stretch: For both-wings-stretch, the neck was extended forward and upwards, the wings were bent at carpals and raised upwards (Photograph 58).

Both types of stretching activities were performed primarily after periods of rest. Stretching probably helps to stimulate the flow of blood in the limbs thus preparing the muscles for future activity (Kortlandt, 1940 as quoted by McKinney, 1965).

6. RESTING AND SLEEPING

In all resting postures of the Redwattled
Photograph 57: Wing-and-leg-stretch.

Photograph 58: Both-wings-stretch by the bird in the rear. The bird in the foreground is in resting posture.
Lapwing, the neck was withdrawn. The birds rested while standing on both legs (Photograph 58), on one leg (Photograph 60), on tarsi (Photograph 61) and sitting (Photograph 62). In one variant of resting in standing posture, the bird while keeping the carpal joints bent and near the body, extended the primaries downwards (Photograph 59). The primaries in this position never touched ground.

The Redwattled lapwings closed their eyes in all the resting postures.

Th chicks rested on tarsi and sitting but closed their eyes in sitting posture only.
Photograph 59: A bird resting while standing with primaries extended downwards.

Photograph 60: The bird in the foreground resting on one leg.
Photograph 61: The bird in the foreground resting on tarsi.

Photograph 62: A pair resting: Sitting posture.