Studii şi Cercetări	Biologie	13	40 - 43	Universitatea din Bacău	Mai 2008

RAISING STARLINGS (*STURNUS VULGARIS* L.) IN CAPTIVITY: ETHOLOGICAL ASPECTS

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Keywords: *growing, begging at the hand, the coordinate ejection of cloacum content, fighting for territory, explorer flight*

INTRODUCTION

The project initiated upon the retrieval of some orphan starling (*Sturnus vulgaris* L.) chicks from the Copou Gardens of Iasi presupposes providing the nutritional, hydric, and thermal necessities for the birds, so that their development, started in the wild, may continue in captivity, in the situation of imprinting on man. The evaluation of the rearing, of the behaviour development, and the estimation of the appropriate release moment, which constitute the object of the research on the *Sturnus vulgaris* (L.) chicks during their feeding dependence on man, have been guided precisely by the principle of their imprinting on the latter. The particularity of the *Sturnus vulgaris* (L.) of being good imitators, as well as the manifestation of the gregarious instinct will complete the data of the chicks experiment at the moment when they will be able to fly.

MATERIAL AND METHODS

The determination of the species as *Sturnus vulgaris* (L.) was made on the basis of the voice, before the proper visual contact with the chicks in the nest, in the tree hollow. The possible presence of the parents in the neighbourhood was not communicated sonorously or visually to the observer. The age was estimated as under 10 days, as none of the feather types was identified as partially developed. The extraction of the chicks found alive from the deserted nest was made by enlarging the entry to the tree hole by means of an axe. The hematophagous parasites were manually removed from the surface of each of the four chicks' body, and the nest material was not retrieved, in order to avoid recontamination. The first food administered consisted of earthworms present in the humus substrate of the tree hollow, dislocated with the starling nest, and the next feedings for the day (11.05.2007) were based on soaked dog biscuits. The initial diet was gradually completed with raw and boiled egg yolk, chicken, chicken food, fruits, earthworms, and pieces of mouse meat.

As a substitute for nest lining there were used wool textile material, which ensured also thermal regulation, and the breeding cavity was reproduced by placing the chicks in a plastic bowl. During night sleep no food was provided, and the chicks were moved in a place sheltered from perturbing factors, namely in a store room.

For cleaning the nest lining I used a pair of tweezers, and another one for the chicks' feeding. I made them drink water by means of a syringe. The helpless stage over, I placed them in a cage provided with climbing perches, in which I introduced, for the first days, the nest-bowl as a guide-mark meant to help them get used to the new place and to relieve the stress. The cage served initially as a place for sleep between the meals, for hand feeding, for flight exercise, and for the display of ludic behaviour. Subsequently, the cage became the space in which exploratory behaviour manifested itself, the bathing place, the space in which relations of dominance and subordination were established among siblings, the space for flight, feeding, and singing. Not least, the cage fulfilled the function of protecting the birds from the dangers of the environment, among them the risk of straying and thus getting lost. In order to highlight begging behaviour, the stimulus employed was the mere sensory perception of man in the proximity of the cage, and for the sonorous and visual determination of such behaviour I have used as technical equipment a digital video camera, JVC GR-D270 MiniDV Camcorder w/25x Optical Zoom, (employed video tapes: SONY *dv* premium, DVM60, Mini DV, 60 LP:90). I have remarked the starlings' characteristic of being a good imitator on the occasion of a recording in front of the cage, when one of the subjects manifested itself by an imitative reply at the sound of the recording camera (20.05.2007). The imitating behaviour was also manifest in the memorisation of sounds emitted by captive *Corvus frugilegus* (L) juveniles, stimulated to beg at the hand in the proximity of the cage.In the situation of provisional release, which I experimented when the chicks were 21 days old, I used for the subjects' retrieval the feeding call, consisting in repeated whistles, as well as a twig which I held out to them to make them draw near, so that I might catch them one by one, on the terrace of the building used as study location.

RESULTS AND DISCUSSIONS

The experiment with the four *Sturnus vulgaris* (L.) subjects had as its object their achievement of self-sustenance conditions at the age of their release: feeding independence, group socialisation, and flight ability. These three goals have been reached, as the sample had been captured at a sufficiently tender age, benefited from suitable growing conditions, and had instincts that functioned satisfactorily.

The subjects accepted the locations destined for artificial rearing – first a plastic bowl, then a basket provided with a cover, and finally a cage –, as well as the caretaker as a parent. Since the first day of their retrieval in captivity, they performed successively the actions related to feeding, waste removal, and sleeping. Begging displayed characteristic sharp vocal sounds, the beak wide open and the neck stretched out considerably. The ejection of cloacal content involved pushing the latter with the posterior outside the „nest", and the sleeping posture was assumed by lying close against the substrate, their head reclining on their back.

The gregarious aspect of the starlings' behaviour was watched starting with the subjects' release, at the age of 21 days, in the natural environment, in the company of conspecific adults. The subjects' flight crossed paths with that of their wild fellows, as a consequence of voice attraction in the feeding call. Visual and auditory location of the subjects evinced the behavioural pattern of following the adults in the crowns of the trees in the proximity of the building in which the subjects grew up.

The starlings' disturbance by the captive *Corvus frugilegus* (L.) juveniles, in the first moments of the release, determined the former's negative behaviour; consequently the return to the cage failed to be noticed. Without the possibility of getting their own food and because there was no feeding by conspecific adults, the only solution to retrieve them was to capture them again and place them back in the cage.

The moment I chose for putting this plan into practice was sunset, given the chicks' vulnerability at twilight, when the conspecifics are absent and the chicks feel therefore a greater need for protection. During the day, the operation of the group's capturing was doomed to failure, as a number of jackdaws started giving alarm cries, perceiving my presence as a threat, and, during the feeding of the bolder ones by means of a pair of tweezers, the witness *Sturnus vulgaris* (*L.*) grown-ups also gave the alarm.

Autonomous feeding and drinking, as well as flight safety, evaluated in the course of the following five days, communicated to the observer the reaching of the experiment's goal, namely the retrieval of the starling chicks to captivity, a reason to proceed to their definitive release.

The goal pursued in this experiment was the experiencing of a situation which might furnish data on the positive aspect of the relationship subjects-experimenter. The latter emerges from the fact that feeding at the hand took place with no difficulty in the circumstances of captivity, suggesting the harmony instituted between the adoptive parent and the group, satisfied in its growing-up needs. The effort of adjustment to the limited captivity space was suggested by this affective relationship established between the experimenter and the investigated subjects, during the whole course of the experiment. Taming was not an objective in this research, this being the reason why the affective interaction with the subjects was not cultivated so far as to harm instinct and thus to render doubtful their chance of managing on their own in the free condition.

The raising at the hand of the *Sturnus vulgaris* (L.) chicks

- 11.05.2007: at 13:50 I began the artificial experiment of looking after one-week old subjects, performing their cleaning and feeding by means of tweezers, every one or two hours; for thermic protection were used knitted wool patches; one of the subjects required the cleaning of the left eye, as it had been affected by a chip from the felling of the nest-hollow tree; the numerous fleas and their dejections existent at the level of under-wing teguments and in the patagial folds also presupposed manual intervention; I remarked the external and behavioural aspects of the starling chicks: the thin, whitish down on their backs, and the wing feathers and those on the ventral part were still undeveloped, the hardly discernible and weakly co-ordinated locomotion, including backward motion; after feeding I registered a peeping made with their beak half-open, denoting that they felt comfortable, and the habit of huddling together for their sleep, under the covering woolen material;
- 12.05.2007: at the age of 8 days, the brown feathers tips in the wings and tail are sticking out, and new feather tips cover the head and the lower part of the neck; among the observed behaviours there are: the elimination of dejections over the brim of the nest-bowl, preening – individual at this stage, the absence of social preening at this point;
- 13.05.2007: at the age of 9 days, brown feathers have emerged on the back and the wings; they can eat small earth worms placed by means of tweezers close to their beaks; they lean against the nest-bowl walls for sleep;
- 14.05.2007: at 10 days, the whole body, the dorsal and ventral part, is covered with yet uncompletely formed feathers; a better movement co-ordination is evinced: they perform for the first time short jumps and wing beatings as flight exercises; they

display the capacity to use their legs when they stretch and when they scratch themselves; they perform begging at the hand with their chest thrust forward; they emit two main kinds of sounds: a sharp, frequently repeated one, used for food begging, and another one, continuous, monotone, used in man's absence, with a lower tonality by comparison with the begging sound proper (more frequent in the morning, when they maintain sonorous contact);

- 15.05.2007: at 11 days, the dark brown dorsal plumage and the light grey ventral one covers the whole body; they evince the capacity for thermal regulation, for movement through jumps; they scratch themselves energetically; they have their eyes wide open; they frequently drop from their beak the food administered by means of tweezers; food ingestion requires more perseverance on the part of the caretaker; they were found uncovered in the morning, at feeding time, with the excrements laid on the woolen textile cover; temperamental differences begin to emerge: while three of the subjects keep together, leaning against one another, the fourth is seeking for isolation;
- 16.05.2007: at 12 days, they spread the dejections uncovered in mucus sacks; their voice is like that of juveniles; wing quivering is for the first time evinced for begging;
- 17.05.2007: at 13 days, given the plurality of well co-ordinated movements, I moved them in a cage so that they might have more space; ludic manifestations appear for the first time among the siblings; they can go out and back into the nest-bowl; they perch on a sprig placed for them in the cage; one of the four chicks has its temples uncovered with feathers, continues to be solitary and seeks for escape; they can sleep afoot, grouped in a corner of the cage, without however leaning their head on the wing, so that their beak sometimes touches the floor;
- 18.05.2007: at 14 days, they spend an extended time outside the „nest", they still move through jumps, and climb the perches in the cage;
- 19.05.2007: at 15 days, they fly around the cage for exercise, resting on perches or clinging to the wire mesh of the cage walls; they can now lean their head on the wing when sleeping;
- 20.05.2007: at 16 days, they display the capacity to sleep on a perch, as well as the habit of taking refuge in the most sheltered corner of the cage (which they started using beginning with 17.05.2007) at the slightest disturbing noise and at any abrupt gesture made by man unwittingly; the plumage is almost completely developed, the oral mucous memebrane, yellow initially, is now tending towards pink; movements are as energetic as those of fledglings: preening, wing exercises, scratching, bathing, walking; legs, tail, and wing tip feathers are smudged with dejections, but otherwise the body is clean and neat;
- 21.05.2007: at 17 days, two of the four chicks, the more developed ones, are almost the size of fledglings and dispute the place on the perch with their siblings; one of them has already developed the subalar plumage, performs bathing competently, and perceives what is going on around him, even when he reposes on the perch; the other big chick tries to reach to a green-leafed branch behind the wire mesh wall of the cage, where I had placed it for them; at a signal, they all seek the refuge corner used since the day they were introduced in the cage (17.05.2007); they spatter excrements from the perches, an action which is equivalent to the one obtained in nature outside the entrance to the nest; the most developed of the chicks sleeps on the perch; for hand-feeding, the others climb the perch too, but they usually sleep on the floor;
- 22.05.2007: at 18 days, the big chick evinces the following behaviours in their most complex form: the ludic one, the one related to flight exercise, and the one related to interaction with the caretaker, sleeping less in comparison with his siblings.
- 23.05.2007: at 19 days, one of the juveniles, assisted by the caretaker, explores the space around the cage, after which he returns to join the others inside (8:30); it starts singing at about 13:20, something prefigured in the previous days, but insufficiently developed; another subject demonstrates its capacity for imitation of the voice of some rook chicks raised at the hand, and, on the other hand, it reproduces the noise of the video-camera used to film the whole group, on 20.05.2007;
- 24.05.2007: at 20 days, the juveniles begin to direct themselves precipitatedly towards the wire mesh wall of the cage, seeking a space for escape; they sing, play, and intimidate one another, for the first time they wipe their beak against the sprig placed in the cage; social and individual preening occurs; all four of them now sleep on the same perch;
- 25.05.2007: at 21 days, the juveniles had achieved sustained flight; accordingly, I released them, but, since they had not reached feeding autonomy yet, and would not return to the cage, I had to lure them back with food given by means of tweezers, capture them and lock them back in the cage;
- 28.05.2007: at 24 days, the starlings begin to eat from the cage floor and bathe individually, by splashing water on their chests; they have powerful tarsi, a robust appearance, narrowed cere, and the egg-tooth still persisting on the culmen;
- 30.05.2007: at 26 days, they begin to feed themselves on concentrated chicken food, made

available for them in a feeder made of a rectangular plastic bottle, with openings on all sides, attached to the cage ceiling by means of a piece of wire; they continue to beg for food and water, and are frightened when touched by hand;
- 31.05.2007: at 27 days, they almost don't require hand feeding any more; they open their beak at the hand less insistently, withdrawing it; two of them flew to their freedom first; the others two hours later, after a bathing; the experiment was closed.

ABSTRACT

The present study proposes to review the habits of the starling (*Sturnus vulgaris* L.) in captivity; it presents the situation of some orphan chicks retrieved from the Copou Gardens in Iasi, and concludes with the latter's being released, subsequent to their acquisition of autonomous feeding behaviour.

The article refers to the rearing and nursing of the *Sturnus vulgaris* (L.) subjects in captivity, covering the whole period, from nest extraction until release, and discusses the adaptability to life in periodical contact with man, suggesting the positive aspect of the relationship subjects-experimenter.

CONCLUSIONS

The four captive *Sturnus vulgaris* (L.) exemplars constituted the study material for the following relations:
- man–starling juvenile, based on protection, food, shelter from danger, and field of development for the natural instincts;
- starling juvenile–sibling, of the type of sibling interaction for mutual warming, social or individual preening, intimidating, food calling and co-operation, bathing, drinking, escape;
- starling juvenile–conspecific adult, of the type of begging (without the food transfer taken charge of by the latter actually occuring), calling, following;
- starling juvenile–*Corvus frugilegus* (L.) juvenile: initially exploration, subsequently avoidance starling juvenile–human intervention in disagreement with the behavioural plan (hand capture): avoidance, panic, and the emission of alarm cries.

The release of the four starling juveniles could not be put into practice until dependence on the caretaker was observed to have diminished. This took the form of: walking instead of jumping, the huddling of the siblings in a cage corner replaced by taking flight for refuge on the perch, autonomous feeding and drinking, intensification of singing.

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