ECOLOGICAL AND BEHAVIOURAL ASPECTS VIEWING THE NEST'S BUILDING FOR SOME WADERS SPECIES (SUBORD. *Charadrii*)

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Abstract. Our observations began in the 2001' spring until the 2004' spring in the middle part of the Prut River basin. We found five breeding species of waders: Vanellus vanellus, Charadrius dubius, Recurvirostra avosetta, Himantopus himantopus and Limosa limosa – the last species is given for first time like breeding species in this area. We describe some aspects concerning the ecology and the behaviour of these species during the breeding season.

Key words: *breeding species, wader, behavior, Prut river*

INTRODUCTION

Generally, the suitable breeding habitats for the waders are the small sandy and softy gravely beaches near the banks of lakes or ponds, the wetlands, the swampy grasslands and meadows with short vegetation (like *Juncus sp*. and *Carex sp*.), the salty lands or silt surfaces from the tail of some lakes.

The waders seem to have a lessen nest building behaviour (D. Radu, 1960), but some species use to arrange a place in order to delay the eggs. Usually, the waders' nest is very simple, near rudimentary.

We are done our study in the Romanian Prut River basin that could be considering like a prolongation of the Danube Delta by it positions, but also by the aspects of the habitats. These are various – from the floodplains and riverside meadow to dry forests; in the ponds' area, the reedbeds cover large surfaces. In this area, we found five breeding waders' species: *Charadrius dubius*, *Vanellus vanellus*, *Himantopus himantopus*, *Recurvirostra avosetta* and *Limosa limosa*. Between these, the most frequently breeding species is the Lapwing (*Vanellus vanellus*) and for the Black-tailed Godwit (*Limosa limosa*) was the first breeding presence in the eastern part of Romania.

METHODS

Our field observations began in the 1992's summer in near 60 observatory points along the Romanian Prut River, but the ethological aspects of the waders were follow during three years (2001 - 2004) in some points of the middle part of the Prut River basin – Letcani (flooding meadow), Belcesti (flooding meadow from the tail of the lake), Osoi (sandy beach near the banks of ponds), Vladeni (flooding meadow), Halceni (silt surfaces from the tail of lake and Miletin swampy) and Borsa (humid meadow), all of them in Iasi County.

The timetable of fieldworks depends on the season and the observatory point, varying between 4 - 7 days per week, 4 – 12 hours per day; for short time periods, we worked in the breeding colonies' area in order to take measures and to follow the breeding behaviour around the nest.

The most important method is the directly observation from fixed point, using or not the binoculars – we drew sketches of the breeding colonies and nourishment sites. We took photography and video images for some ethological aspects.

We use also the field investigation's methods, which include our observations, slowly movies in field and measures (we did measures of the nests and of the eggs), but also gathering information from the local community. This permitted us to identify the precisely position of the colonies where we followed the nests' form, size and place, the chicken's hatching and behaviour in nest. This was necessary in order to find the very simple waders' nest and the cryptic coloured eggs. After the positions identify, we used different mark signs for each nest that not modified the nearest in order to avoid the birds' stress.

For each nest, we noticed information about the building materials, the finding's date and the habitat, general aspect of the nest and the nearest (presence of food remains and eggs' shell). We did measures for the internal (useful space) and external nest's diameters and for the nest's depth also. We notice the number of eggs or chickens.

RESULTS AND DISCUSSIONS

We presents our observations viewing the nest's building behaviour, the nest's parameters and the breeding habitats for five waders breeding species recorded in the Romanian Prut River basin.

1. The Lapwing (*Vanellus vanellus*) has an arranged nest comparatively with other waders' species. The male occupy a breeding territory and start the mating activity in order to attract a female. First, the male choice the nest place and he bends his breast slowly to soil, showing to female the place of the future nest. After this, he starts the nest's building. The lapwing male use to arrange some small holes and the female will accept only one. Here, the male press the soil with his breast and performs a circular moving, right-left 45° movies; sometimes, he is using the legs in order to deepen the nest enough. This last moving in order to deepen the nest is not necessary when the soil is wet because the breast pressing and the circular movies assure a nest's enough depth. When the male finishes the nest's building, the female comes back and the pair begins the mating behaviour.

Generally, the male is building the nest on the top of a small hillock surrounded by herbs or on a small dry area surrounded by low water, in flooding surfaces. Subsequently, the plant are growing around or inside the nest, camouflaging the nest, but also supplying the internal softy material in nest for the clutch and chicken. We never saw birds with herbs and other building materials in their bill going to the nest and we did not find this kind of materials inside the nests. Sometimes, the male can use the cow's traces to arrange the nest.

The nest's hole is not so deep and it form is more oval than circular. In the table 1, we present our measures on 82 lapwing nests following the external and internal (or useful space for the eggs delaying) diameters and the nests' depth.

Table no. 1 Measures' values of the nest's parameters for 82 nests of Lapwing (*Vanellus vanellus*) – in centimetres.

Number of nests	External diameter	Internal diameter	Depth
32	16	8	7
3	16	9	7
17	15	8	7
3	15	8	6
11	14	8	6
5	14	8	5
8	13	7	4
2	17	9	5
1	20	13	4

As we see, there are not so great differences recorded between the nests. The greater values of the nest's depth were finding in swampy and flooding breeding territories – the wet soils permitted to the male to perform a high depth for his nest only by pressing his breast to the ground. We notice that when the nests' diameters are larger, the depth is lower. This kind of large nests were find on dry surfaces and grassland areas where is more difficult for bird to build a deeply nest because the dry soil has a greater hardness.

Usually, the Lapwing is breeding on the swampy areas or nearest the ponds, on humid meadows, in open humid or flooding grasslands. The nest is arranged on the top of one small hillock surrounded by herbs and water. The Lapwings are territorial high fidelity birds, coming back in the native area (Laven, 1941, Heim, 1962, in Cramp and other, 1983).

In the study territory, we found nests of Lapwings on a flooding area behind Vladeni rail station, on the dry area from the old ponds without water in different years in Vladeni ponds and Larga Jijia ponds' perimeter, on the silt surfaces from the tail of Halceni Lake, on the Miletin swampy, on the humid meadow nearest Borsa swampy, on the flooding meadow from the tail of the Belcesti - Tansa Lake and on the flooding meadow from Letcani village.

The level of human pressure is very high in some breeding areas – for example, the flooding meadow from Letcani represents the grazing major point for the cattle from this village. For this reason, we cannot be sure that the breeding Lapwing pairs are the same yearly taking act of their high territorial fidelity or each year, other birds try to use this very suitable habitat.

2. The Little Ringed Plover - *Charadrius dubius* is regular breeding but has small effectives in the Prut River basin.

As we saw in field, this species has the simplest nest between the studied waders' species. The Little Ringed Plover *Charadrius dubius* arrange it nest on the sandy and softy gravely sites neighbouring a swampy area or along the river and lakes' banks, but also in open dry grasslands and on meadows. The male not use to make a small hole in order to built it nest but, usually, he arrange the nest using an existing split or

excavation from the terrain, without herbs. Sometimes, around the nest there are white small pieces of stone, with different forms – we did not saw the birds carrying these pieces of stone. So, we supposed that the birds seek the appropriate sites – we also found nests building near an enough larger stone. Very rare, we saw Little Ringed Plover's nests surrounded by herbs like in the case of other waders' species. In 2003' summer, on the tail of the Halceni Lake, we found nests of Little Ringed Plover arranged directly on the ground, very softly scratched with it claws and one nest on a small piece of plastic bag cached in the dry silt.

In Vladeni wetland territory, we recorded twelve nests of Little Ringed Plover during the whole study period. The parameters of these very simple nests cannot be measured.

During the years, we found the Little Ringed Plover's nests at the beginning of June – at the 10th June 2001, on the small island from the EC3 pond at Larga Jijia; at the 12th June 2002, on the Miletin swampy; at the 4th June 2003, on the tail of Halceni Lake and at the 4th June 2004, on the Miletin swampy.
Every time, the pairs formed small breeding colonies, building their nests very close one by one, but keeping a small distance from the mixed breeding colonies formed by other waders breeding species in the same habitat. If there exists a breeding colony of Lapwings (*Vanellus vanellus*), the Little Ringed Plover (*Charadrius dubius*) avoid this colony, preferring to built it nest far away. We suppose that the frightened Little Ringed Plover use to keep a distance between himself and the very noisy, excited Lapwing. We notice the regular presence of Little Ringed Plover's nests in the neighbouring of the Avocet (*Recurvirostra avosetta*) breeding colony.

The absence of this species in numerous suitable habitats and the small number of the breeding population in the study area are the results of the high level of the human pressure in this area. We cannot exclude the influence of the meteorological conditions very changeable during the last years in the middle part of the Romanian Prut River basin that could determined a negative trend of the Little Ringed Plover breeding population in this territory.

3. The Black-winged Stilt (*Himantopus himantopus*) is one of the rare birds breeding species present in the Romanian Prut River basin. It is a regular breeding species, but we found it yearly in different sites of this region: in 2000 – 2001, in Vladeni wetland, on the small island from the EC3 pond at Larga Jijia; in 2001, we found it also on the flooding area behind Vladeni rail station; in 2002, on the tail of Halceni Lake and in Carja ponds area (Vaslui County); in 2003, once again on the flooding area behind Vladeni rail station, Balta Lata swampy (Botosani County) and Carja ponds area; in 2004, on the Miletin swampy and Carja ponds too.

The Black-winged Stilt prefers to arrange it nest close to the fresh water, swampy areas and flooding terrains. Usually, the birds built the nest on small hillocks and on vegetable materials surrounded by water, the access to the nest being difficult. On the flooding area behind Vladeni rail station, the nest was built on the humid or dry muddy surfaces, very close to the small pools or on a small mass of plants, like a pillow, surrounded by water. The general aspect is of one hole surrounded by herbs looking like a stratifying mass of plants.

The male of Black-winged Stilt (*Himantopus himantopus*) seek the favourable surface for nest's arrangement and show it to the female touching the soil with the beak. If she accepts the site, the female approaches to male, touching easy his flank. After this, the male press the soil or the vegetable mass with his breast till arrange a small excavation.

We measured nine Black-winged Stilt nests finding the following parameters: external diameter = 15 - 16 cm, internal diameter = 7 cm and the depth = 4.5 – 5 cm.

During the study period, we found the Black-winged Stilt's nests at the beginning of May, but also later, in June – for example, at the 7th May 2003 on the flooding area behind Vladeni rail station, respectively, at 4th June 2001 on the small island from the EC3 pond at Larga Jijia or at the 4th June 2004, on the Miletin swampy.

The Black-winged Stilt (*Himantopus himantopus*) is a very sensitive species, especially to the human pressure. The principal disturbing factors are: the grazing (sheeps, cows, horses), the presence of domestic birds that use the same territory to seek nourishment and the local community's custom to bring and eat the Black-winged Stilt's eggs. The presence of the flooding surfaces is a decisive factor for this species in the breeding season. We must mention also, it affinity to the presence of other waders breeding species, despite the fact that the Black-winged Stilt use to arrange it nest at the edge of waders breeding territory.

4. The Avocet (*Recurvirostra avosetta*) is another regular wader breeding species in the Romanian Prut River basin, starting from 2002; we recorded it like irregular breeding species in 1996 and 1999. In 2002, five pairs were breeding on the Miletin swampy. In 2003, fifteen Avocet pairs formed a breeding colony on the tail of Halceni Lake. In 2004, we found sixteen pairs on the Miletin swampy. In this area, the birds have very favourable breeding conditions, using the suitable breeding habitat and rich food resources from these not deepen waters.

Male choose the nest's site and look for the female. They are coming together and he indicates the site, sitting down on the ground. In this time, the female staying close touches him by her beak. After this, they sit down on the ground together for a very short time. The male starts to arrange the nest, pressing the humid soil with his breast or using an existing excavation. All this time, the female stay close, expecting the

nest's arrangement finish. Then, she sits down and, sometimes, delays the first egg. We notice that we met also eggs delayed on the ground without any nest arrangement. Sometimes, we found only one egg that was abandoned, but we found also more than one egg delayed out of a nest; these eggs were incubated. We suppose that the birds can copulate before forming a pair or can start the egg's delaying before the nest' arrangement. We met this situation only in the large breeding colonies, on small territory.

We found different situations. On the Miletin swampy, in 2002 and 2004, the nests were arranged on dry surfaces nearest small pools, which change to a real swampy aspect during the rainfalls' period, but the covering waters retires quickly. The birds are not line the nest with herbs, using for this the surrounded plants that are growing after the nest's arrangement – each time when the bird sit down on the clutch, she press these herbs. On the tail of Halceni Lake, the birds arranged their nests on the humid soil or in the splits formed due the soil's excessive drying. Almost always, we found the nests surrounded by herbs, forming a vegetable materials coronet around the nest, but we found also some nests surrounded by small stones. We supposed that the birds bring these stones to the nest or seek especially these sites to arrange it nest because on this territory, the stones are very rare – the waders' breeding area covers a surface resulted after the waters' retiring due the dryness. When the water's level is very high, the birds move the breeding colony on Miletin swampy.

The nest have circular aspect and 16 – 17 cm diameter, being the largest and the most circular nest between the recorded wader breeding species.

The nests of Avocet (*Recurvirostra avosetta*) were found in the second part of May and at the beginning of June; we did not found a second clutch for this species.

5. The Black-tailed Godwit (*Limosa limosa*) is another wader breeding species in the Romanian Prut River basin beginning from 2003, in Vladeni wetland area. During the previously years, the Black-tailed Godwit could tried to breed in this area – we saw birds with breeding behavioural display – but we found the first six nests at 29.04.2003, on the flooding area behind Vladeni rail station. During the first part of May 2003, we found another two nests on the meadow nearest Borsa swampy. This terrain is flooding during the spring but then, was very dry, so, the birds seeking for food along a nearest canal. In the same time, we found another two pairs breeding on the tail of Halceni Lake and also one on the flooding meadow from Letcani. In 2004's summer, at the beginning of June (4.06.2004), we met three breeding pairs of *Limosa limosa* on the Miletin swampy, in a mixed micro-colony formed by all the five wader breeding species recorded in the Romanian Prut River basin.

On the flooding area behind Vladeni rail station, the nests were arranged very close each by one, forming a group (figure 1), near and not so far from the small breeding colony of Lapwing (*Vanellus vanellus*). We can mention the inter-specifically relations appears very rare because, usually, the birds are not involved together in the enemies' drive away. This kind of collaboration appears only if birds belonged to the both species are threatened by a common enemy in the same time.

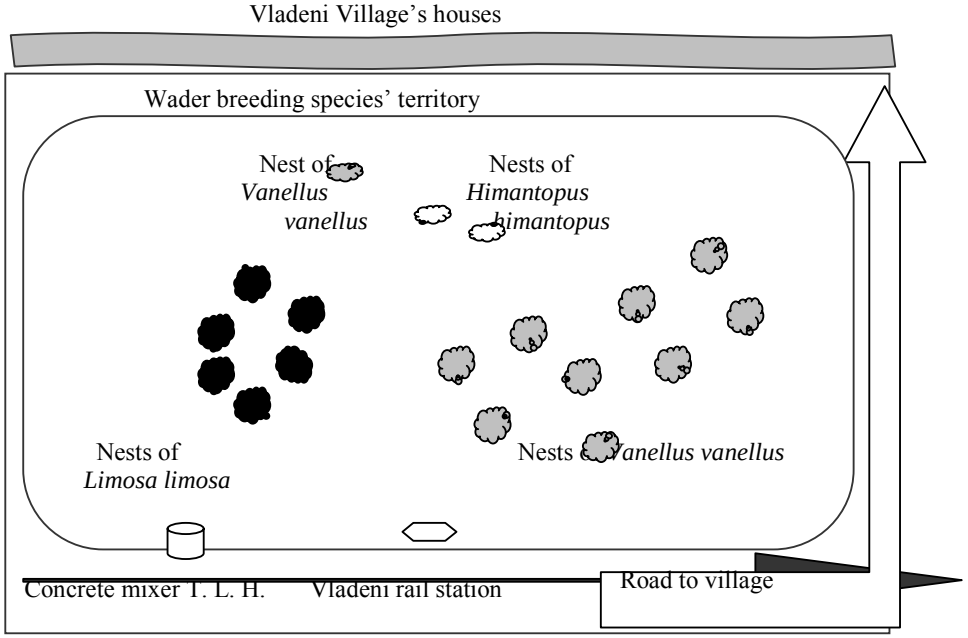

Figure no. 1 Scheme of waders breeding colony on the flooding area behind Vladeni rail station (original)

The male builds the nest, assures the incubation and the clutch's protection. He use to press the soil with his breast in order to deep the nest's site, in a place with few herbs. The nest is building on the ground, in a small pit, using dry vegetal materials pressed forming a blanket kindly, surrounded by high and dense herbs.

We recorded and measured the parameters of fourteen nests; as we see in the table 2, the differences are very small.

Table no. 2 Measures' values of the nest's parameters
for 14 nests of Black-tailed Godwit (*Limosa limosa*) - in centimetres.

Number of nests	Diameter	Depth
4	14.5	8
3	14.5	7.5
3	15.2	7.5
2	14.2	7 – 7.2
2	13.5	6.5

The Black-tailed Godwit (*Limosa limosa*) use to breed in habitats like the open lands nearest aquatic surfaces, the humid meadows, the humid grasslands and the flooding areas near the swamps. The majority of nests were founded on the small on the top of a small hillock surrounded by herbs in a grassland area or on a swampy area in flooding territories, given a good protection to the clutch and chickens.

The Black-tailed Godwit (*Limosa limosa*) is a very sensitive species to the changes of his breeding territory, indifferent of their kind or amplitude. The climate factors have a strong influence on the breeding season because the high temperatures and the absence of rainfalls determine a great value of the evaporation and the swampy areas' drying. The birds loose the nourishment territory and leave the area seeking for new suitable breeding habitats.

CONCLUSIONS

- In the Romanian Prut River basin, we found five breeding waders' species: *Charadrius dubius*, *Vanellus vanellus*, *Himantopus himantopus*, *Recurvirostra avosetta* and *Limosa limosa*.
- Usually, the waders' nest is very simple - near rudimentary - and the male take care about the nest's arrangement.
- The Lapwing (*Vanellus vanellus*) has an arranged nest comparatively with other waders' species, the males using it during the mating display.
- The Little Ringed Plover (*Charadrius dubius*) has the simplest nest between the studied waders' species.
- The Black-winged Stilt (*Himantopus himantopus*) built the nest on small hillocks and on vegetable materials surrounded by water, the access to the nest being difficult.
- The Avocet (*Recurvirostra avosetta*) has the largest and the most circular nest between the recorded wader breeding species.
- The Black-tailed Godwit (*Limosa limosa*) build the nest on the ground, in a small pit, using dry vegetal materials pressed forming a blanket kindly, surrounded by high and dense herbs.
- The suitable breeding habitats for the waders are the small sandy and softy gravely beaches near the banks of lakes or ponds, the wetlands, the swampy grasslands and meadows with short vegetation (like *Juncus sp*. and *Carex sp*.), the salty lands or silt surfaces from the tail of some lakes.
- All these species are sensitive to the human pressure and the climate changes.

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