

FAUNISTIC OBSERVATIONS IN BOTANICAL GARDENS  
OF SOFIA UNIVERSITY DURING STUDENT VOLUNTEER  
ACTIVITIES IN 2016

LINA PAUNOVA<sup>1\*</sup>, DIMITAR NENOV<sup>1</sup>, DIMITAR DIMITROV<sup>1</sup>,  
YANA YORDANOVA<sup>1</sup>, PLAMEN PETROV<sup>1</sup>, MARINA YORDANOVA<sup>1</sup>,  
DILYAN MINEV<sup>1</sup>, IVAYLO DEDOV<sup>2</sup>, ATANAS GROZDANOV<sup>1</sup>

*1 – Department of Zoology and anthropology, Faculty of Biology, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria*

*2 – Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Science, Sofia, Bulgaria*

*\* Corresponding author: skorecbf@gmail.com*

**Keywords:** conservation education, fauna, flora, university club, biodiversity

**Abstract:** Botanical gardens of Sofia University „St. Kliment Ohridski“ play an important role of „green islands“ for many wildlife species. The great floral biodiversity provides shelter and food resources to a significant number of vertebrates and invertebrates. The present research focuses on some of the species observed in the summer of 2016 during volunteer activities of students, organized by the Balkan Ecological Centre in University Botanical Gardens Balchik and Varna. The diverse faunistic information is related to the individual interests of the involved students and aims mainly to improve their ability to collect information in the field and to analyze it in the form of scientific publications. As a result of the work, 14 species of snails, 2 species of amphibians, 4 species of reptiles and 50 species of birds were identified in the gardens and their vicinity. Some additional information on species habitat preferences and other ecological characteristics was also gathered.

The present publication reveals the positive role of volunteers for collecting of scientific information and the importance of the University botanical gardens as providers of suitable territories for such activities.

## INTRODUCTION

Involving volunteers in scientific activities is discussed as a good tool for improving the quality of different researches, while at the same time helping more people to increase their personal knowledge for wildlife and nature conservation (Cohn, 2008). In 2016, the Balkan ecological centre provided opportunity to test this thesis, by organizing a variety of student activities in the Sofia University botanical gardens on the Black sea coast.

In this particular case, both of these gardens are strategically situated on the Via Pontica migration route, which offered the opportunity for observation of many bird species. In addition, a relatively large number of other animals was also identified, probably due to the variety of different microhabitats, presented in the sites. The important educational role of the botanical gardens could be seriously improved by increasing the knowledge of all species which can be found there. The volunteer initiatives of the Balkan Ecological Centre are therefore a useful tool to assist this process.

The present work aims to present the opportunities for combining of volunteer activities with scientific-based collection of faunistic information and the related benefits for the biology university students.

## MATERIALS AND METHODS

During the research, the following taxons were investigated:

### **Gastropoda:**

On the territory of The Botanical Garden in Balchik, Gastropods were gathered manually in the following habitats:

1. Open plain habitats – plain fields, surrounded by miniature buildings and alleys, which have some bush and tree-inhabiting species.
2. Plain fields enriched with additional species of plants, specific for the garden flora.
3. Forest habitats with specific tree and bush-inhabitant species, some of which have distinctive forest overlay.
4. Anthropogenic habitats – stone walls and brick structures.

The gastropods were assembled by hand as a dry material, and for the smaller species – as a soil sample. The snails were separated from the soil particles by a system of sieves with a wide variety of the sizes. The shells were gathered in hot and dry weather during daytime.

The species identification was based mostly on Damyanov and Likharev (1975). The scientific names were assigned based on the system of Dedov.

**Amphibia and Reptilia:**

The observation method was based on a random transects inside the researched areas. Most of the species were noted around small ponds, concrete buildings, brooks, and forest overlays.

For some individuals, additional information concerning size, age, sex, body temperature and behavioral specifics was gathered.

**Aves:**

The observations were made from randomly selected spots and transects. The research includes both of the University Botanic Gardens (Balchik and Varna) that were visited by the volunteers and also the area around them, so we were able to compare the two sites situated on Via Pontica. The birds were observed in their natural state by binoculars and spotting scopes, some species were recorded by their sounds and were documented in a field notebooks by the students. The observations were done during the day and night hours, and for the latter bird call recordings were used to provoke a specific behavioral reaction.

For documental and identification uses, most of the observed species were photographed with DSLR and compact cameras with telescopic lenses.

The classification is based on Collins Bird Guide (Svensson et al, 2010).

## RESULTS AND DISCUSSION

**Gastropoda:**

The presence of a great number of populations and endemites, introduce the garden as a key territory for those species of Gastropods and a place of preservation. There are fourteen different species of land snails identified from the samples (Table 1) and their locations are presented on figure 1. Some of the species are endemicfor Bulgaria Bulgaria (*Mentissela rebeli*) (figure 2) and the Balkans (*Zebrina varnensis*) as well as a relict from the Tertiary Period (*Pomatias elegans*) (figure 2). Also a species of Microgastropoda was described (*Vallonia costata*).

The rich diversity of microhabitats and habitats assure that the garden has a significant number of gastropod individuals. The most common species is *Pomatias elegans*, which indicates that the soil of this region has higher levels of calcium carbonate. The species composition and the number of populations present the garden as a place far from anthropogenic impacts with preserved ecologically sanitary grounds. Snails from all ages were found during the research.



Fig. 1. UBG Balchik with location codes for the gastropods (marked with red and numbered from 1 to 6) and bird “hot spots” in the garden (marked with green) and in the neighboring territories (marked with green and star).



Fig. 2. *Mentissela rebeli* (left) and *Pomatias elegans* (right).

Table 1. List of gastropods that were found in the six locations (marked with red on Figure 1). The species with location codes 1 and 2 were collected by T. Lyubomirov, and the samples with location codes 3 to 6 were gathered by L. Paunova.

Location code	Superfamily	Family	Subfamily	Species
1	Helicoidea	Helicidae	Helicinae	<i>Cepaea (Austrotachea) vindobonensis</i>
1	Helicoidea	Helicidae	Helicinae	<i>Helix cf. lucorum</i>
1	Hygromioidea	Hygromiidae	Euomphaliini	<i>Monacha claus tralis</i>
1	Littorinoidea	Pomatiasidae		<i>Pomatias elegans</i>
1	Buliminoidea	Enidae	Eninae	<i>Zebrina detrital</i>
1	Buliminoidea	Enidae	Eninae	<i>Zebrina varnensis</i>
2	Helicoidea	Helicidae	Helicinae	<i>Cepaea (Austrotachea) vindobonensis</i>
2	Hygromioidea	Hygromiidae	Hygromiinae	<i>Cernuel la virgata</i>
2	Hygromioidea	Hygromiidae	Euomphaliini	<i>Monacha claus tralis</i>
3	Clausilioidea	Clausiliidae	Baleinae	<i>Mentissela cF rebeli</i>
3	Littorinoidea	Pomatiasidae		<i>Pomatias elegans</i>
3	Hygromioidea	Hygromiidae	Trichiinae	<i>Helicopsis cF striata</i>
3	Buliminoidea	Enidae	Chondrulinae	<i>Chondrula tridens</i>
3		Valloniidae	Valoniinae	<i>Vallonia costata</i>
4	Hygromioidea	Hygromiidae	Euomphaliini	<i>Monacha sp.</i>
4	Buliminoidea	Enidae	Chondrulinae	<i>Chondrula tridens</i>
4	Hygromioidea	Helicodontidae	Lindholmidae	<i>Lindholmia girva</i>
5	Buliminoidea	Enidae	Chondrulinae	<i>Mastus rossmaessleri</i>
5	Littorinoidea	Pomatiasidae		<i>Pomatias elegans</i>
5	Buliminoidea	Enidae	Chondrulinae	<i>Chondrula tridens</i>
6	Hygromioidea	Hygromiidae	Euomphaliini	<i>Monacha sp.</i>
6	Littorinoidea	Pomatiasidae		<i>Pomatias elegans</i>
6	Helicoidea	Helicidae	Helicinae	<i>Helix cf. lucorum</i>

### Amphibia and Reptilia:

In total two species of amphibians: European green toad (*Bufo viridis*) and marsh frog (*Pelophylax ridibundus*) and four species of reptiles - Greek tortoise (*Testudo graeca*), common wall lizard (*Podarcis muralis*), red-eared slider (*Trachemys scripta elegans*), and European pond turtle (*Emys orbicularis*), were observed and measured. The relatively low diversity could be explained with the short period of the research and the low activity of many species in summer season.

From previous field trips to the University Botanical Gardens Varna and Balchik the students have also observed: grass snake (*Natrix natrix*), dice snake (*Natrix tessellata*), European green lizard (*Lacerta viridis*), Kotschy's gecko (*Cyrtopodion kotschyi*), and European toad (*Bufo bufo*). All of the confirmed species were published in previous research from the area (Tzankov et al., 2014).

**Aves:**

The researched territories were divided in four groups (St. St. Constantine and Helena; University Botanical Garden Varna; University Botanical Garden Balchik; and Balchik seaside). A total of fifty species of birds were observed in those areas. Their presence or absence is presented in table 2 and some of the identified “hotspot” places in the area of UBG Balchik are presented on figure 1,

The most abundant species (found in all four locations) were: yellow-legged gull (*Larus michahellis*), common house martin (*Delichon urbicum*), barn swallow (*Hirundo rustica*), Eurasian magpie (*Pica pica*), and hooded crow (*Corvus cornix*).

Part of the least abundant species were identified only by sound, as is the case with the long-eared owl (*Asio otus*). Another part of them were provoked with sound recordings. Then they were observed and photographed, like the Eurasian scops owl (*Otus scops*).

Table 2. Bird species presence and absence during the research in the four areas.

Species	St. St.			
	Balchik seaside	UBG Balchik	Constantine and Helena	UBG Varna
<i>Microcarbo pygmeus</i> (Pallas, 1773)	-	-	+	-
<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	-	-	+	+
<i>Egretta garzetta</i> (Linnaeus, 1766)	-	-	+	-
<i>Circus aeruginosus</i> (Linnaeus, 1758)	-	+	-	-
<i>Accipiter brevipes</i> (Severtzov, 1850)	-	+	-	-
<i>Chroicocephalus ridibundus</i> (Linnaeus, 1766)	+	+	+	-
<i>Larus melanocephalus</i> (Temminck, 1820)	+	-	-	-
<i>Larus michahelis</i> (Naumann, 1840)	+	+	+	+
<i>Thalasseus sandvicensis</i> (Latham, 1787)	-	-	+	-
<i>Sterna hirundo</i> (Linnaeus, 1758)	-	-	+	-
<i>Columba palumbus</i> (Linnaeus, 1758)	-	-	-	+
<i>Streptopelia decaocto</i> (Fřivaldszky, 1838)	-	+	-	-
<i>Streptopelia turtur</i> (Linnaeus, 1758)	-	-	+	-
<i>Dendrocopos major</i> (Linnaeus, 1758)	-	+	+	+
<i>Asio otus</i> (Linnaeus, 1758)	-	-	-	+
<i>Otus scops</i> (Linnaeus, 1758)	-	-	-	+
<i>Apus melba</i> (Linnaeus, 1758)	-	+	+	-
<i>Merops apiaster</i> (Linnaeus, 1758)	-	+	+	+
<i>Picus viridis</i> (Linnaeus, 1758)	-	+	-	+
<i>Dendrocopos minor</i> (Linnaeus, 1758)	-	-	-	+
<i>Junx torquilla</i> (Linnaeus, 1758)	-	-	+	-
<i>Riparia riparia</i> (Linnaeus, 1758)	-	+	-	-
<i>Delichon urbicum</i> (Linnaeus, 1758)	+	+	+	+
<i>Hirundo daurica</i> (Linnaeus, 1771)	-	+	-	-
<i>Hirundo rustica</i> (Linnaeus, 1758)	+	+	+	+
<i>Dendrocopos syriacus</i> (Hemprich & Ehrenberg, 1833)	-	-	-	+
<i>Motacilla alba</i> (Linnaeus, 1758)	+	+	+	-
<i>Erithacus rubecula</i> (Linnaeus, 1758)	-	+	-	+
<i>Turdus philomelos</i> (Brehm, 1831)	-	+	-	+
<i>Turdus merula</i> (Linnaeus, 1758)	-	+	-	+
<i>Sylvia curruca</i> (Linnaeus, 1758)	-	+	-	-
<i>Phylloscopus sibilatrix</i> (Bechstein, 1793)	-	-	+	-
<i>Phylloscopus trochilus</i> (Linnaeus, 1758)	-	-	-	+
<i>Ficedula parva</i> (Bechstein, 1792)	-	+	+	-
<i>Muscicapa striata</i> (Pall., 1764)	-	+	+	-
<i>Ficedula semitorquata</i> (Homeyer, 1885)	-	-	-	+
<i>Parus caeruleus</i> (Linnaeus, 1758)	-	+	+	+
<i>Parus major</i> (Linnaeus, 1758)	-	+	+	+
<i>Aegithalos caudatus</i> (Linnaeus, 1758)	-	-	-	+
<i>Lanius collurio</i> (Linnaeus, 1758)	-	-	+	-
<i>Pica pica</i> (Linnaeus, 1758)	+	+	+	+
<i>Garrulus glandarius</i> (Linnaeus, 1758)	-	+	+	+
<i>Corvus cornix</i> (Linnaeus, 1758)	+	+	+	+
<i>Oriolus oriolus</i> (Linnaeus, 1758)	-	+	-	+
<i>Passer domesticus</i> (Linnaeus, 1758)	-	+	+	+
<i>Passer montanus</i> (Linnaeus, 1758)	+	+	-	+
<i>Fringilla coelebs</i> (Linnaeus, 1758)	-	+	+	+
<i>Carduelis canabina</i> (Linnaeus, 1758)	-	+	-	-
<i>Chloris chloris</i> (Linnaeus, 1758)	-	+	-	-
<i>Carduelis carduelis</i> (Linnaeus, 1758)	-	+	-	+
<b>Total:</b>	<b>9</b>	<b>32</b>	<b>26</b>	<b>28</b>



## CONCLUSIONS

The student volunteer work can greatly benefit to the education and development of young researchers and improves the connection between the university lectures and field work. This also contributes to the work of the University Botanical Gardens and creates a university-student-work bond. The presented experiment demonstrated a lot of positive aspects from the improving of students' motivation to the increasing of the biodiversity knowledge in the investigated sites. These important effects could successfully multiply, if such activities become a tradition for the Sofia University educational process.

**Acknowledgements:** The present research was made with the support of the Balkan ecological centre, Botanical gardens of Sofia University, Faculty of biology, University of Sofia and student's club Skorec.

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