SYMBIOSE
CROATIA 2004
1st - 10th August
ZAGREB ZADAR
Dear participant,

Welcome to SymBioSE 2004!

We have worked hard for the past two years to make this event possible and hope it will meet your expectations. We would like to offer you a warm welcome to our country and invite you to enjoy its natural and cultural beauties. Croatian SymBioSE team will be known as your Little helpers for the duration of the symposium. Feel free to ask us anything!

Preparing this symposium was not an easy task at all. Most of the invited lecturers are on vacation right now and were not able to join us. We thank all those who agreed to come and give a presentation or in any kind helped us to create the programme.

But after all, this is a student symposium and our first goal is to make friendships and contacts that can prove to be very valuable in our future life and professional careers. The spirit of the SymBioSE is all about making friends and discussing current biology and student matters “our way” and thus creating a better future for ourselves. We encourage you to continue discussions in the evening and share your ideas and opinions with fellow symbionts.

We wish you a rich and pleasant symposium with lots of dear memories of people and places you will take back home with you. Our team will do our best to help you make the most out of SymBioSE Croatia 2004!

The Croatian Symbionts
About SymBioSE

SymBioSE was founded in 1996 by the German student association. The basic idea was to connect all European biology students, allowing for the exchange of ideas, perspectives and experiences about student concerns.

This led to the first meeting in Berlin in 1997. After a successful start with 12 European nations it was continued as an annual event to be held in the different participating countries. Since then, every host country has built upon the initial framework and upgraded it with aspects of their own cultural background. Thusfar, this has resulted every time in a unique and enriching symposium.

Today, SymBioSE meetings have three major goals: to broaden the horizons of the participating students by excursions and lectures, to connect the people by discussions and cultural exchange and to inform everybody about current university matters.

The biological topics presented always rely upon the trends in research that complement both local institutions and their resources. Lectures are usually held at a local university, so the students gain a detailed insight into other university systems.

During round tables and national meetings representatives of the participating countries discuss the following issues: new developments within their parent universities, newly created or planned biological study programs, and the various ways of student collaboration.

Social events in the evenings further enhance contacts between the participants. This will allow everyone to create a personal network throughout Europe, thereby facilitating student exchanges and international work experience. All of this will promote a mutual understanding between countries through academic and cultural exchange while developing a different perspective on their own educational systems.

In general, SymBioSE is not a rigid organization with a hierarchical structure. SymBioSE is a symposium that takes place once a year and aims to connect European biology students through the year by personal contact. Therefore, it is open for every student and not limited to student representatives.
The programme will be updated every day. Possible changes within the programme will be printed out and put on the notice board so everybody can see it. Please pay attention to the notice board as some of the information will be very important.

Arrival and registration:
You will get symposium material on the registration desk. Please keep your nametag on so other participants can read your name.
Monday August 2

Opening ceremony will be held in the building of University of Zagreb.

9:30 Official opening by Croatian Symbiose team
10:30 Coffee break and welcome drink

13:00 lunch
14:00 free time/registration/informal National assembly session
16:00 Treasure hunt - tour of Zagreb historical and cultural sights

19:00 dinner
20:00 Official opening of the Symbiotic games
21:00 Party in the open/close to the dorm building

Tuesday August 3

10:00 Visit to the Ruder Bošković Institute/Visit to the Zagreb ZOO
You must be in front of the dorm building at 9:00. Depending on your interest, choose between these two options.

13:00 lunch

15:00 Citrus exocortis viroid variants M and S - another case of Dr. Jekyll and Mr. Hyde?
   Dr. Dijana Škorić, Biology Department, Faculty of Science, University of Zagreb

16:00 coffee break
16:15 Loggerhead turtles in the Adriatic Sea: present knowledge and conservation perspectives
   mr. sc. Bojan Lazar, Natural History Museum, Zagreb
17:15 Caulerpa - silent killer of the Adriatic biodiversity
   symbiont Vedran Nikolić
   Insight in the invasion of tropical green algae Caulerpa taxifolia and Caulerpa racemosa. Present state in the Adriatic Sea and overview of research in the past decade.

19:00 dinner
20:00 Symbiotic games
21:00 Party in the open

Wednesday August 4

9:30 Towards the 3-dimensional structure of human low density lipoproteins
   Dr. Marina Ilaakovac-Kveder,
11:00 **Transcription factors regulate lymphocyte development from stem cells**

Dr. Mariastefania Antica

9:30 - 12:00 If the subjects presented do not match your interest, you can visit the Botanical garden guided by Croatian symbionts.

Meeting in front of biology building at 9:30 or in front of the Botanical garden at 9:40

13:00 Lunch

15:00 Faculty presentations

16:45 **Workshop: Student exchanges and SymBioSE in symbiosis**

Symbionts Marcel Otten and Vedran Nikolić

At the last years' symposium in Oslo we came up with the idea of establishing a network (BioNet) with the goal of connecting student organisations or students interested in short exchange projects between two universities. We came up with the pilot exchange project. Listen to what we have done so far and discuss our ideas for the future development of the BioNet.

16:45 **Workshop: Science and Society**

Symbiont Jens Ådne Rekkedal Haga

I will describe certain features of science itself, indicate its current institutional structure, its relation to society at large and point out areas where biological sciences, and scientists, at present are pulled between different attractors. In this situation we need analytical models that makes us better understand concrete dilemmas as well as our own theoretical foundation. I will present a conceptual model that can serve this purpose. The model has the shape of a downward pointing cone. In the bottom of the model is our most fundamental value(s) and on top is our concrete world. The model is an empty framework and is thereby democratic - it must be filled in by the user who will not be given any directives; only aided in structuring her own thinking. We will use the model in the proceeding workshop and explore its properties as a heuristic, analytical tool.

**Workshop: Science and the demands of society**

Lennart Kiil, MSc, science journalist and director of Zensci.com

Thomas Hesselberg, MSc, PhD- Stud. Centre for Biomimetic and Natural Technologies. University of Bath.
In a time when funding for basic science gets more and more scarce, it becomes increasingly important for the scientist to step down from the ivory tower and relate his science to the surrounding society.

In this workshop we will discuss what the biologist can do, to ensure public awareness and understanding of his research. For the biologist working in medical related fields this is quite easily done, but for other biologist and especially for the classical naturalists it is not as simple. However, in this workshop we will explore two different possibilities:

1. To actively promote the interesting part of your research to the media.
2. To join the growing field of biomimetics that looks at concepts and functions in nature to give inspiration to innovative new technologies and design.

The first strategy is a general one, which aim to establish the inherent value of the knowledge research provides us with. The second strategy is based on providing justification through utility; that is, pointing to practical uses of the knowledge obtained through research. The strategies are not mutually exclusive; on the contrary, both should be pursued simultaneously for the best result. This is mainly true because the first aims primarily at the general public, whereas the second aims primarily at the industry. In both cases the press will do well as the main mediator, at least for now. The two organisers will provide a short introduction and give some illustrative examples, but the general idea is to discuss ways in which your own fields of expertise can meet the demands of society and make use of the presented strategies.

**IMPORTANT NOTE:**

Tomorrow we will be traveling to Zadar for the second part of the symposium. The excursion to National park Plitvice lakes will last for 4 hours and we will not have lunch. August 5th is also our national holiday and all the stores will be closed. This means you will have to buy all the necessary things TODAY as none of the stores will be open in Zadar too.

20:30 Symbiotic games
21:00 Country presentations

**Thursday August 5**

8:30 departure for Zadar
11:00 Excursion to National park Plitvice lakes. You will receive handouts with some information. Additional information will be provided in the guided tour and by the Croatian symbionts. Please respect the rules of behaviour in the protected area of the national park.
18:00 arriving to Zadar/free time until dinner
21:00 Symbiotic games

Friday August 6

9:30 Opening of the second part of SymBioSE 2005
prof.dr.sc. Esad Prohić, Science and Education Affairs Advisor to the President of Republic of Croatia
10:15 Analytical approach for integrating natural and social sciences in the sustainable coastal management
   dr. Anamarija Frankić, Virginia Institute for Marine Science

The health and sustainable use of coastal and sea resources are of critical importance given their role in food production, economic activity, genetic biodiversity and recreation. In addressing integrated coastal management it is essential to balance the need for economic development and the need for natural resources conservation within the same management plan. Therefore, integrated coastal management and sustainable development should include careful consideration of a multiplicity of parameters and their interactions. Planning for sustainable uses is a process that comprehensively and holistically analyses natural resources conditions, human uses and socio-economic aspects. Through effective research, monitoring and incentive programs that maintain ecosystem integrity and balance human values, economic development can be attained in an environmentally and socially sustainable manner. The proposed approach for sustainable use of coastal, marine and island resources is that 'the environment sets the limits for sustainable management and development'.

11:15 Bivalves in Mali Ston Bay - what do we know about them?
   Peharda Melita & Ivona Mladineo
Institute of Oceanography and Fisheries, Šetalište I. Meštrovića 63
Despite thousand year old oyster aquaculture tradition in the Mali Ston Bay (Adriatic Sea), very little
was known about bivalves living in this unique habitat. During past few years, intensive research efforts were devoted to it in order to estimate bivalve diversity and analyze spatial distribution of bivalves in this marine protected area. Further on, studies on the ecology of selected bivalve species were initiated including studies of their age and growth and their reproduction. Presentation will provide overview of the research projects taking place and present the results of some of them.

13:00 lunch
15:00 **Importance of Being a Snake**
   Doc. dr. sc. Zoran Tadić,
   Biology department, Faculty of Science, University of Zagreb

From time immemorial, snakes elicit various feelings in humans. To some they are symbols of evil, to some symbols of fertility, procreation and messengers from God. Being such legendary taxon, no wonder they are also subject of many scientific enquiries. Evolution has shaped snake body in peculiar way and, together with specific anatomy, they have evolved specific behaviour, physiology and ecology. In this presentation, we will see what exactly are the snakes and what do they do to survive in this world. And, of course, what do people do to prevent (and help!) them to survive.

17:00 **National assembly - main session**
SymBioSE is improved and enriched with every following symposium. National assemblies are very important because only through discussions we can make sure that all every step is taken care of to assure that SymBioSE will continue its mission.
Each country will have to delegate one or more people that will take part in the discussion and decision making. The conclusions will be made using the double majority voting system.
We have prepared few propositions regarding various SymBioSE matters.. Some of the topics will include possible introduction of different registration fees for different countries, fund raising etc. Today we will also have to choose the host country for SymBioSE 2006!

**Saturday August 7**

8:00 Excursion to Nature park Vransko lake
10:00 National assembly
11:00 Student presentations
15:00 Writing a scientific article
   Prof. Ana Marušić, Faculty of Medicine, Zagreb; editor of Croatian Medical Journal
16:00 Science in the mass media
   Ana Vadjić, HRT reporter
17:00 Workshop: Open access in scientific publishing
   symbiont Dubravka Pezić

Sunday August 8

Whole day excursion to National park Kornati. Please do not forget to bring sun block, hat and other accessories. The sun can be very dangerous to unprotected skin! We will take a boat to the islands and have lunch on board.

Monday August 9

9:30 Excursion to National park Paklenica
9:30 Bioinformatics
   dr. sc. Kristijan Vlahoviček, ICGEB, Trieste
10:45 Identifying war victims using DNA analysis
   dr. Gordan Lauc, Faculty of Pharmacy and Biochemistry, University of Zagreb
11:45 Workshop: Who is who? (linked to the lecture)

14:00 lunch
16:00 The Adriatic Dolphin Project and the proposed Lošinj Dolphin Reserve - Can habitat protection and economic development be compatible?

P. Mackelworth\(^1,2\), D. Holcer\(^1,3\), C. M. Fortuna\(^1,4\)

(1) Blue World Institute of Marine Research and Conservation, Kaštel 24, 51551 Veli Lošinj, Croatia, www.blue-world.org, adp@blue-world.org (2) Department of Geography, University College London, London. (3) Department of Zoology, Croatian Natural History Museum, Zagreb, Croatia. (4) Sea Mammal Research Unit, University of St. Andrews, St. Andrews, Scotland.

The Adriatic Dolphin Project (ADP) is the longest ongoing study on bottlenose dolphins in the Mediterranean. Application of data collected over the past 17 years, identifying critical habitats for dolphins, has resulted in the proposed Lošinj dolphin reserve
This proposal is unique in the fact that it will be both the first dedicated dolphin reserve within Europe, but outside the European Union, and the first dolphin reserve in the Adriatic sea. The Lošinj-Cres archipelago is also important for tourism in the context of Croatia as a whole. In 1987 this area accounted for 4.2% of Croatia’s total tourist population. Since the end of hostilities in the region this figure has significantly increased, hence the main threats to the dolphin population are fishing competition and disturbance by tourist boats. Public awareness activities have been aimed at the reduction of these two main stresses and the conservation of the marine habitat; therefore the establishment of the LDR is the next logical step in this process.

Although the primary focus of the proposal is dolphin conservation, the societal needs of the local people are regarded as an important aspect to be incorporated into the designation and management of the reserve. Support and cooperation from the local community can help limit conflict in areas of conservation, following the new paradigm of protected areas as promoted in Durban 2003. Raising the profile of cetaceans and their socio-economic worth in this area has shown that protection and the sustainable development of the economy can work when all groups are involved. As research in other areas of the Adriatic identifies critical habitats for other populations of flagship species, the designation and management techniques developed and tested in the LDR can be used as a best practise model for the creation of similar reserves throughout the region.

17:15 Presenting declaration of SymBioSE 2004
17:45 Presenting SymBioSE 2005
18:00 Closing ceremony
19:00 dinner
21:00 Closing of the Symbiotic games
                 Party on the beach

**Tuesday August 10**

Departure for Zagreb...
Thank you for participating SymBioSE 2004, we hope you enjoyed yourselves and we will see you again next year!
Until then, spread the word about SymBioSE, stay active and in contact!
Towards the 3-dimensional structure of human low density lipoproteins

Marina Kveder, Ruđer Bošković Institute, Bijenička 54, Zagreb; e-mail: kveder@irb.hr

Low density lipoproteins (LDLs) are the main cholesterol carriers in human plasma believed to be directly involved in the development of atherosclerosis. They exhibit structural complexity with the surface monolayer organization of mainly phospholipid molecules surrounding the hydrophobic core composed of apolar lipids. The LDL structure containing more than 3000 lipid molecules is stabilized by the amphipathic apolipoprotein B100 (apoB), one of the largest monomeric proteins known, consisting of 4536 amino acid residues. Various experimental approaches have been employed to elucidate the structure of the LDL particle which is of central importance in the understanding of its function but still the LDL structure at the atomic resolution has not been elucidated. In this presentation different biophysical methods will be presented in studying such a complex macromolecular assembly.

Cristescu Bogdan
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Here is the abstract of my work on pitfall trapping done in autumn 2003 in English deciduous woodlands.

The work was included in my dissertation for Bsc. Conservation and Land Management.

Abstract

The most widespread method of sampling surface-active arthropods, particularly Carabidae is pitfall trapping with single traps. However, this technique has a large number of biases and alternatives are needed for more accurate sampling and for studies of population density. Three sampling techniques, two involving traditional single traps simple and single traps with crossing and one involving an innovative design of enclosure with pitfalls traps inside are presented and assessed. The main
advantages of the enclosure are that it is active for a longer period of time than single, dry traps and is influenced very little by sudden changes in weather. It also proved more efficient at catching a larger number of Coleoptera families, Carabidae species and individuals than the two methods involving single traps. However, a small number of species were caught exclusively with single traps, therefore a combination of methods is recommended for sampling a site for both short and long-term studies. For short-term studies, capture-mark-recapture is not an efficient method for estimating density of Carabidae.

Programmed cell death is a mechanism successfully controlling life duration of cells in different tissues, but also is the basis for elimination of potentially harmful and virus-infected cells. It is well accepted that the process includes participation of a variety of proteins, responsible for the phagocytosis of the dying cell by another cell. Such a role has already been described for Clq, CRP and natural antibodies (which are mostly IgM and rarely IgG) where the last two can act either independently or with the help of Clq. Clq is the first subcomponent of the classical complement system. It is a versatile recognition protein that binds to a great variety of immune and non-immune ligands. The participation of Clq ensures efficient phagocytosis of the apoptotic bodies without complement activation and thus sustains an anti-inflammatory immune response. Without participation of Clq in the phagocytosis pro-inflammatory TNF-α is secreted and engulfed self-antigens can be presented to T-cells, leading to autoimmune response. Therefore, studies related to the role of Clq and the nature of interactions with its ligands are topical and could bring more understanding on the process of waste material clear-

Interaction of Clq with CRP and natural antibodies - a possible factor in the clearance of apoptotic cells

NELLY OLOVA, LUBKA ROUMENINA, MICHAELA GADJEVA, ALEXANDRA ZLATAROVA, IVANKA TSACHEVA, MICHAELA KOJOUHAROVA
Sofia University, Faculty of Biology, Department of Biochemistry
ance from the organism and hence the generation or, hopefully, the treatment of autoimmune diseases.

In the present study we investigated the interaction of Clq with CRP, immunoglobulins from classes G and M and apoptotic cells. As a model system for the globular domain of Clq we used recombinant globular fragments of its A, B and C chains.

Our results highlight the importance of charged amino acid residues in IgG/IgM and CRP binding. We determined the role of the B chain globular fragment for the CRP, IgG and IgM recognition. The binding site of CRP is most likely different from the IgG binding site. The IgM binding sites on Clq involve all three chains and differ from the binding site for IgG, although overlapping is probable. Hydrophobic interactions are also involved in ghB - IgG, ghB - IgM and ghB - CRP binding. Our results also indicate that Clq interacts with apoptotic cells through the globular parts of its three chains.

The obtained results strongly support our hypothesis that the C-terminal regions of all three Clq polypeptide chains form structurally independent modules and they participate in the formation of several ligand-binding sites. These findings could contribute to further understanding of the role of Clq in the process of clearance of apoptotic cells from the organism.

**Citrus exocortis viroid variants M and S - another case of Dr. Jekyll and Mr. Hyde?**

Dr. Dijana Škorić, Biology Department, Faculty of Science, University of Zagreb

Viroids are noncoding, circular, single-stranded RNAs of 246-401 nucleotides able to replicate autonomously only in some plant species. These minimal RNA genomes, despite their limited size, can induce serious plant diseases. Although the information concerning the viroid physical and chemical properties is detailed and extensive, the molecular mechanisms of viroid-plant interactions have only recently been dealt with. Citrus exocortis viroid (CEVd) is the oldest known and the most severe viroid of citrus. It is the only one of six citrus viroids that also infects Gynura aurantiaca herbaceous host that often serves as a reservoir plant for CEVd in the greenhouse conditions. An unusual shoot displaying extremely mild symptoms was detected on a CEVd-infected Gynura plant exhibit-
iting the usual severe CEVd-symptoms. The variants CEVd-S and CEVd-M were isolated from tissue displaying severe and mild symptoms, respectively. They differed only in five nucleotides within the viroid pathogenic domain. The variants remained stable when propagated by rooted cuttings or from successive plants inoculated with tissue extracts or transcripts from cDNA clones. CEVd-S consistently induced very severe reaction in *Gynura* throughout a range of environmental conditions. CEVd-M-induced symptoms varied greatly, from asymptomatic to the severe *Gynura* reaction when grown at 40°C. This “Dr. Jekyll and Mr. Hyde” host response was confined only to *Gynura aurantiaca*. The differential response could not be correlated with any changes in sequence or the conformation of the CEVd-M viroid variant, as predicted by molecular modelling. The variable symptom expression induced by the CEVd-M variant seemed to be associated with a specific temperature-sensitive response of *Gynura aurantiaca*. Other possible mechanisms of differential response for this pathogen-host interaction will also be discussed.

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**EVALUATION OF THE GENOTOXIC ACTIVITY OF ANTITUMORAL DRUGS BY THE ALKALINE SINGLE CELL GEL ELECTROPHORESIS TECHNIQUE (COMET ASSAY) IN TUMORAL CELLS**

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**Purpose:** This study aimed to investigate DNA damage induced by chemotherapeutic drugs, by comet assay in primary cell cultures from tumor biopsies. The performance and sensitivity of manual microscopic analysis versus computerized image analysis were compared.

**Methods:** Eight primary cell cultures were initiated from breast and ovarian malignant tumors treated with anti-tumor drugs: doxorubicin, taxoter, gemzar, 5-
fluorouracil (for mammary carcinoma) and taxol, carboplatin, doxorubicin, topotecan (for ovarian carcinoma).

The response of primary tumoral cells in the form of heterogeneous cells population was compared with two cell lines (HeLa - human cervical carcinoma, MLS - human ovarian carcinoma).

**Results and conclusions:** A high inter-individual variability of DNA damages in the response to chemotherapeutic agents, but no correlation with clinical stage, pathological parameters and cell degree of differentiation were found.

A putative activation of cell state in two multi drug resistant tumors conferred them protection against drugs-induced DNA damage.

In determining necrotic and apoptotic cells more sensitive and less time consuming was the manual microscopic analysis comparative with computerized analysis.

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**Identifying war victims using DNA analysis**

The development of biochemistry and molecular biology, and progress in new methods of DNA analysis has lead to its more practical usage. Besides its growing significance as a modern diagnostic method, DNA analysis has become a method for establishing identity in forensic medicine and criminology. In contrast with traditional investigation methods, which are subject to many mistakes, DNA analysis is very reliable and can establish the origin of a certain biological sample (blood, hair, semen) with great accuracy. In the process of identification of Croatia war victims, 3,429 bodies have been exhumated by April 2004., of which 2,871 have been positively identified. Somewhat 20% of all identifications have been based upon DNA analysis, and that percentage is increasing every day.

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*dr. Gordan Lauc, Faculty of Pharmacy and Biochemistry, University of Zagreb*
National park
Plitvice Lakes

The natural attributes of the Plitvice Lakes National Park, uniqueness and sensibility of that phenomenon, deserve a full attention of the visitors. Recreational aspect of stay and the amazement up, separated by travertine barriers for which the period of the last ten thousand years was crucial, and which were ruled by ecological relations similar to those of today - suitable for travertine depositing and for the origin of the lakes - are the basic phenomenon of the National Park.

Travertine forming plants, algae and mosses have been and still are playing an important role in their creation, thus making a very sensitive biodynamic system.

Transitive type of climate between coastal and continental with microclimatic diversities makes summer pleasant and sunny, while on the other side winter is relatively long, harsh and snowrich. There are large forestry complexes in the Park area, of which some sections are protected as a special
reserve of forestry vegetation due to its primeval characteristics (Corkova uvala virgin forest). Diversity of places and living conditions makes possible for numerous species of plants and animals in watery and terrestrial areas of the Park to develop with no disturbancy. 

It should be stressed that all fundamental things that do determine the Park, make a very fragile structural and functional complex, sensitive to natural changes and to incautious human actions. UNESCO has declared it with all rights as the World’s natural inheritance.

**NATURE CREATES WATERFALLS**

In the Plitvice Lakes National Park, barriers between the lakes over which are falling magnificent waterfalls and the small falls, have been created in a special, natural way. Under certain physical / chemical and biological conditions, calcium carbonate (CaCO₃) is being extracted from the water, and then is being deposited on the bottom of the lake, and on the submerged items. It also creates underwater thresholds and barriers which are elevating above the water growing constantly in height and width. The barriers are chalky creations, which are hard, porous and fragile limestone, full of remains of microscopic mosses and petrified water mosses that are growing up at the falls. That kind of creation is called sedra, travertine, tufa, bigar, vapneni macak.

Travertine which is formed and created by plants, is called plant-formed travertine. The famous explorer of travertine creating process at the Plitvice Lakes, I. Pevalek, wrote in 1926: “The essence of the Plitvice Lakes is in travertine and in travertine-forming plants, namely algae and mosses. Immense number of waterfalls, various barriers between the lakes and the unique caves have all been created by travertine-forming plants.”

Permanent and continuous creation of plant-formed travertine at the Plitvice Lakes is the fundamental phenomenon of the National Park and condition for their existence.

**HOW IS TRAVERTINE BEING CREATED?**

At Plitvice Lakes due to the special qualities of karst base (limestone, dolomite), the water of the Plitvice Lakes is rich of dissolved calcium carbonate which is present in form of calcium bicarbonate Ca(HCO₃)². To explain the chemistry - water of the Plitvice Lakes is “super-saturated” with this chemical compound. It comes to that when rainwater, while going through superficial
soil-stratum, absorbs carbon dioxide (CO2), thus creating carbonic acid (H2CO3) which dissolves limestone and dolomite - thereby the water becomes significantly mineralized, super-saturated with calcium and magnesium-bicarbonate. When it breaks through on the surface, at the rapids and specially at the travertine barriers, the water splashes and thereby the chemical balance is being disturbed, calcium carbonate is being secreted in the form of microcrystals that are being deposited.

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\text{Ca(HCO}_3\text{)}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{CaCO}_3 \text{ (travertine)}
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The super saturation of water by calcium salts is the basic condition for travertine creation. Besides, the water has to be clean, must not contain increased concentration of organic substances which are the serious obstacle for the unique process of travertine creation at the Plitvice Lakes, (proved by SRDOC and associates in 1958). Down the Korana river from the Korana bridge, travertine creation ends quite quickly, inspite the supersaturation with calcium bicarbonate, because of the increasement of concentration of the organic substance in the water.

The presence of water-algae and some mosses is also a condition for travertine creation at the Plitvice Lakes, particularly as a factor that forms chalky secretions. Those water plants are giving form to the created travertine, and the Plitvice Lakes waterfalls can thank mosses for their feature, and depending on various species, we could also differ various biological types of travertine. Let's have a look at mosses on the travertine barriers over which water is falling down. Young shoots of mosses are green and soft, they are mostly without travertine, the ones from the last year are already forming travertine while the old shoots are of yellow color, completely covered and petrified, thus being the famous sight of the Plitvice Lakes - the plant-formed travertine. Recent researches have proved that millions of algae and bacteria living on the mosses shoots, are secreting mucus that is adhered to by the first microcrystals of calcite. Very quick, the other microcrystals are going to be deposited on that, thus creating the travertine. This process goes far back in geological past, but only under the conditions of warm and humid climate, similar to those of today. 2000 years ago, during the last cooling which effected Europe, travertine was not created at the Plitvice Lakes. Yet today travertine is being created much faster during the summer, than in the winter.
FISHES AND CRUSTACEANS
There are only few fish species living in the Plitvice Lake's water. It is still unexplained issue as to whether they have been living in this space for ancient time, or were they inhabited there in the last hundreds of years. The major number of researches on ichthyofauna of the Plitvice Lakes was conducted in the thirties and fifties (Rossler 1929; Taler 1958).

The Plitvice Lakes and their tributaries have all the main characteristics of typical trout mountain water. Therefore, today in those waters, trout are finding the optimal living conditions. Brown trout (Salmo truta) is one of the aboriginal inhabitants of these lakes, and it comes in two forms: Salmo trutta fario L. and Salmo trutta lacrustis L. Local people can recognize which trout is from which lake and which from tributaries, based on colour composition and the body shape. An interesting fact is that trout from Kozjak differ from trout from the Upper Lakes in anatomic characteristics too, for example in number of gastric and gill prolongation, side line, and in number of gills. Samples of Salmo trutta fario L. from the Plitvice Lakes have large, exclusively red spots that are particularly visible during the spawning period. Lake trout, Salmo trutta lacrustis L. is covered by black spots, and can gain more than 10 kg of weight.

The living conditions are not the same in all the lakes for trout. Already in 1929, Rossler established, that Proscansko lake had a lot of plankton species of crustaceans, which are food for trout. Small basins, connecting channels and small streams, are as well giving various possibilities for this fish species. Trout fry is better in certain lakes because some trout can go from there into tributaries, while there is no such possibilities from the other lakes. Therefore, they are forced to spawn at the places where lakes overflow, above the falls and on the similar spots where water more or less runs. The whole area of the Plitvice Lakes is an exceptional example of trout differentiation caused by isolation and various living conditions in the lakes.

Except the brown trout, a species of pijor (Phoxinus phoxinus) is present in a
large number. The male of this fish gets a beautiful red abdomen in spring. This fish is the most loved food of big trout. Man, intending to enrich this area, has brought into the water of Plitvice, species of jezerska zlatoovcica (*Salvelinus alpinus*) - fish of prey from North America, as well as Californian trout (*Oncorhynchus mykiss*) which have been raised in the Park for years, and nowadays is increasing in number in a natural way. A carp species have been recently noticed in the lake, such as klen (*Leuciscus cephalus*) and crvenperka (*Scardinius erythrophthalmus*). These species are, by the way characteristic of low-land watercourses, so that their presence is a consequence of both climatic changes and man’s influence on these areas. The river crab (*Astacus astacus*) was once exported to the choosy west European market. Diseases, exaggerated catch and the other factors have decreased the number of this species in the lakes. It is still today a common inhabitant of certain waters.

**AMPHIBIA**

Amphibia is quite numerous group of vertebrates present in the Plitvice Lakes National Park with twelve species. Fire salamander (*Salamandra salamandra*) is the most frequent type of salamanders that can be seen in springtime on the walkways and roads. Water newts are present in pools and swamps which do not contain fishes. Very frequent is a mountain newt (*Triturus alpestris*), and ordinary newt (*Triturus vulgaris*). You can see two types of frogs: meadow type (*Rana temporaria*) and forestry species (*Rana dalmatina*), when only walking through a dewy grass. Should the weather be nice, croaking of tree toad (*Hyla arborea*) could be heard. Taking into consideration the ability of adjustment to environment, this species is difficult to be noticed. The biggest frog of this area is European toad (*Bufo bufo*), which is easy to find in the forests and in damp park sections where it hides during the day, in small rodent holes. Zuti mukac (*Bombina variegata*) can be found in large number in swamps and pools along the paths. It cries nasally.
REPTILES
Reptiles are represented in relatively small number of species in the Plitvice Lakes National Park. Long winters and thick snow cover are decreasing the number of this group of vertebrates. Lizard (Lacerta vivipara) is the only reptile that lives on the top of the mountains and far, in the north of Europe, but it can be seen in the Park. The Plitvice Lakes area is the southern edge of their living space. In certain living areas exposed to sun, it is easy to see obicni zelembac (Lacerta viridis), which is the biggest lizard of our country. Beside almost all the Park waters, a common one is snake species “ribarica” (Natrix tessellata) which is exclusively fed by fishes catching them by diving in or from the shore. It often provokes people’s fear, due to external similarities with a poisonous snake (Vipera berus).
Some of the ringed snakes (Natrix natrix) could be found in some overgrown sections. Common adder is rather rare kind in these areas. Quite frequent species is horned viper (Vipera ammodytes) which can be seen particularly in spring, at the places exposed to sun. In the lake, beside reeds and thick water vegetation, some of the turtles (Emys orbicularis) could be found as well.

BIRDS
There are about 140 bird species found in the Plitvice Lakes area, and more than seventy of them are building their nests there. Should you come into the heart of the Park and walk along the Black and White river, you would certainly see quite frequent mountain wagtail (Motacilla cinerea). It is also easy to notice a blackbird (Cinclus cinclus) just next to the water. By its piercing voice it usually calls a female, or kicks out intruders of the same species that entered its territory. While blackbird disappears under the water, or when like some experienced diver walks on the bottom of the river bed, the only thing you can notice is a white spot on its chest. Due to disappearance of clean mountain water streams, this bird species has become exceptionally rare. The Plitvice Lakes area is probably the only place in Croatia which contains 50 to 60 pairs of these birds.
Should you go deeper, into hundreds of years old beech forest, you will hear knocking produced by beaks of various woodpeckers. Almost all kinds of woodpeckers are residing in this National Park. Ornithologists have established that biological value of forest could be estimated based on the number of woodpeckers that have lived there. As particularly important and rare, we should mention mountain woodpecker (*Picoides leucotos*) and black woodpecker (*Dryocopus martius*). In the silence of the Park, you can often hear a wood grouse (*Tetrao urogalus*). This bird is mostly staying in hidden spots. In the past times, wood grouse used to live in almost all European forests, while today it is pushed into certain well preserved areas. An interesting fact is that black stork (*Ciconia nigra*) builds its nest in quiet forestry areas of the Park, but as a rule it is done in lowland forests. These species have found the necessary living space in the Plitvice Lakes Park.

Variety of titmice (*Parus*) is absolutely miraculous. Except the usual species that can easily be found in our gardens, along the rivers and in the Park forests there are living marsh titmouse (*Palus palustris*) and mountain titmouse (*Parus montanus*). In the Park space, we can also find kratkokljuni puzavac (*Certhia familiaris*) and dugokljuni puzavac (*Certhia Bachydactyla*).

Every season of the year brings new species into the Park. In winter, when forestry ground is covered by thick snow, a flock of krstokljuni omorikas (*Loxia curvirostra*) looks for cone seeds. These wanderers are often guests of the Park, building their nests already in February.

Nocturnal birds of prey are owls. Out of rare species, in the Park there live mountain owl (*Strix uralensis*) and owl (*Bubo bubo*) - which is our biggest owl, while forestry owl (*Strix aluco*) and long eared owl (*Asio otus*) are frequent. All kinds of owls live in the Park. It may be interesting to stress that little owl (*Glaucidium passerinum*) known as the smallest European owl, lives here.
Although the water surfaces are considerable, waterfowl are not the main attraction of this Park, but in winter during the migration period, many species from northern areas of Europe and from high mountain areas, take a break at these Lakes. Flocks of wild ducks (Anas platyrhynchos) are frequent. Occasionally, duck "glavata" (Aythia ferina) lands there, as well as some of lonely common heron (Ardea cinerea), black throated diver (Gavia arctica) or some other waterfowl, adorning the water mirror of the most beautiful European karst lakes. While wandering around or looking for food, a very rare species can be found here, such as grey eagle (Aquila chrysaetos), falcon (Falco subbuteo) and peregrine falcon (Falco peregrinus).

**MAMMALS**
While birds arouse our interest every time when we visit the Park, various species of mammals are hard to be seen. At first light, or in twilight, there is a big possibility for you to see some of the big mammals. Bear (Ursus arctos), wolf (Canis lupus), fox (Canis vulpes), lynx (Lynx lynx), badger (Meles meles) and pine marten (Martes martes) are very frequent inhabitants of these forests. An otter (Lutra lutra), a jeopardized species used to come to the water of some creeks for years, but now it is not certain as to whether this species still lives there or not.

There are over 50 mammal species registered in this Park, some of which
are only about ten centimetres long, while some of them are considered to be among the biggest mammals in Europe. The park is bristling with life at night. A dormouse (*Myoxus glis*) comes out from hidden places, eats beechmast, but also the food left over by some visitors who do not behave. Until recently this small animal was considered to be a specialty for local people in autumn season. Small dormouse (*Muscardinus avellanarius*) and mountain dormouse (*Dryomys nitedula*) which live here, are far too difficult to be noticed.

There is a lot of small animals staying at the spring of the Black river and on numerous places similar to that one. For example: mountain shrew (*Sorex alpinus*), marsh shrew (*Neomys anomalus*). Forest shrew (*sorex araneus*) is frequent in deciduous forests. Out of a vole family in the deciduous forests, the largest number belongs to the type rida voluharica (*Clethrionomys glareolus*). Poljska voluharica (*Microtus arvalis*) resids in meadows. This small mammal is the main food for numerous birds of prey and predators too. They live in high colonies. This is a very numerous species in certain years, which is estimated by a number of corridors that are visible on wet ground during snow melting. Less known than poljska voluharica is subterranean vole (*Microtus subteraneus*) of more delicate skin and small eye.

Dinaric vole (*Dinaromys bogdanovi*) - endemic species of Dinaric karst, an example of the Tertiary period, lives at the mountain crests, on stony base in the larger Park area. This species has adjusted to life in rocky fissures. Their settlements are built in a karst caves and holes. A hedgehog (*Erinaceus concolor*) moves almost over all the places at night. Riches of bat species was known for a long time, but has not been completely researched. It is known that bats, which usually live in various living conditions (holes, cavities, under the tree bark...), are also staying there. In some less frequently visited caves, big colonies of these mammals are spending their hibernation period. About 15 species of these small, characteristically useful fliers which are the only one of mammal kinds that have conquered the air and have control over the space at night, which birds are controlling by day live there.
Lake Vrana near Pakostane/Biograd was proclaimed a Nature Park in 1999. This is a natural phenomenon in the Dalmatian karst and with its 30 square kilometres and 12.5 kilometres length is the largest natural lake in Croatia. The lake is in some parts is no less than 800 meters away from the sea. It is nothing else but gift of nature to the traveller - this experience of sea and lake; greenish and azure colours, whilst driving down the Adriatic highway.

Apart from its obvious beauty, this lake is an interesting phenomenon, because of its geological and hydrological characteristics. The first thing that impresses you is its size. Usually in the Mediterranean karst (geological term) where water is scarce, there it is, large lake that is 5.5 kilometres long and 1.5 kilometres wide. Total of 5.75 square km. The water is drinkable and of the highest quality and it is used on the entire island, with little need for filtering or purification. Because of this, tough, access to the lake is strictly forbidden and scrupulously controlled. Lake is on average 72 m deep - 61 m under the sea level - and its height above sea level varies between 9 and 13 m depending on the time of the year. The most interesting thing, though, is that even with the increased consumption of water, due to tourism, the new waterway etc. the level of the lake has risen. The only explanation is that it is connected to the karst system somewhere on the continent and gets it’s water supply from there. Divers have discovered an entrance to a tunnel, which may prove that theory, but only further scientific measurements and research are likely to be able to explain this phenomenon.

The surface temperature in summer is 25C deg. and 6C deg. at the bottom. In the winter temperatures on the surface and at the bottom are the same 4C deg.

The ornithological reserve in the northwestern part of the lake is a bird watcher’s paradise. This swampy area is the nesting ground of the only heron colony on the Adriatic coast.
National park Kornati

In the central part of croatian Adriatic Sea, about 15 Nm to the west from Sibenik town, 7 Nm to the southwest from Murter, or 15 Nm to the south from Zadar town, there is amazing group of islands, islets and reefs (about 150 in total) named Kornati archipelago. Beauty and singularity of the archipelago moved authorities in 1980 to proclaim a bigger part of that area national park. Since then certain modifications of its borders were made, so that nowadays Kornati National Park occupies the area of about 220 km² (54,000 acres). There are 89 islands, islets and reefs within the area of Kornati National Park, what makes it the most indented group of islands in the Mediterranean. The land part of Kornati National Park covers less than 1/4 of its total area, but the values of its landscapes, the “crowns” (cliffs) on the islands facing the open sea, and interesting relief structures, make this part of Kornati National Park unique. Besides, the Kornati submarine area, whose biocenosis are considered to be the richest in the Adriatic Sea, and also the magnificent geomorphology of the sea bed attracts divers from all over Europe to come and enjoy in unforgettable submarine adventures.

National park Paklenica

The national park Paklenica spreads on the area of 96 km², from the eastern coast of the Adriatic Sea to the highest peaks of the Velebit Mountains (Vaganski Vrh (1757 m) and Sveto Brdo (1753 m)). The treasure of Paklenica are the numerous natural wonders and phenomena. And that is about why the entire area was proclaimed a national park since 1949. This region is simple and unusual in its connection between the sea and the mountains; rich in beeches and black pine forests, with amazing deep canyons that cut vertically into the Velebit ridge, karst formations and numerous caves and pits.
Zadar was first mentioned in a Greek inscription speaking about the people of Zadar (the Jadasinei) as the leading enemies of the Greek colonists in the Adriatic. Taken over by the Romans, Zadar got the characters of a city. It became the Roman colony during the Second Triumvirate. It did not have a significant role among the Roman administration in Dalmatia, although the archaeological finds tell us about a significant growth of economy and culture. From the beginning of 7th century when Salona was destroyed till 1918 it was the capital of Dalmatia. In the early centuries of Croatian history Zadar acknowledged and was well linked with the Croatian sovereigns. The deeds of gift were given to its monasteries by the kings Petar Kresimir IV and Zvonimir. After the short termed Venetian administration at the end of 11th century Zadar acknowledged the sovereignty of Croatian - Hungarian king Koloman in 1105.

At the end of his life (26th June 1116) in spite of the citizen’s resistance, the Venetians took it over. Their administration lasted throughout three unsuccessful citizen’s uprising in 1159, 1164 and 1170 till 1181. The town was developing economically and culturally. The citizens of Zadar continued to recognize the sovereignty of Croatian - Hungarian kings up to 1202 when
the Venetians using French Knights on their way to the fourth Crusade took it over, destroyed the city and expelled the citizens. Soon the people came back and with the help of Domald the Duke of Omis expelled the Venetians, but owing to the political situation they had to sign the peace and accept the Venetian administration in 1205. Between 1242 and 1247 they were fighting against the Venetians again, but they had to surrender under the worst conditions. In 1311 they rebelled again and with the help of Croatian Ban Pavao Subic they got better political conditions two years later. In 1343 there was a new uprising against Venice. The siege of the town lasted 16 months before the Venetians finally took it over. Their administration did not last long, as Zadar rebelled again in the autumn of 1357 and accepted Croatian-Hungarian king Ludovic's army. Although Zadar recognized the sovereignty of Croatian-Hungarian kings, it lived almost independently, developing trade, seamanship, culture and art. Due to unsettled political situation in Croatia and Hungary, recognizing first the sovereignty of king Sigismund then of Ladislav of Naples, Venice succeeded in taking over the town buying it for 100,000 ducats from Ladislav. They had to build two fortresses inside the town - Kastel and Citadel.

In the course of time due to the general impoverishment and the growing Turkish danger, Venetian government became very strong. Bulwark and forts built in 16th century held the old Croatian town in which well known Croatian poets and writers - P. Zoranic, B. Krnarutic, J. Barakovic - lived and worked in 16th and 17th century. The town was changed. It was no longer an urban commune "townstate", but it was the centre of military and civilian administration of Venetian Republic, as well as later on under the French and Austrian administration. During the French administration (1806-1812), the first Croatian newspaper "King's Dalmatian" was started, and between 1844 and 1849 the literary magazine "Dalmatian Dawn" was published. During 19th and the beginning of 20th C. Zadar was
a political and cultural centre of the Croats in Dalmatia, although the cultural image of the town itself was determined by the Italian civil servants serving French or Austrian administration and by Italianized aristocracy and Italy-oriented middle class.

Zadar has had strength and courage to withstand all the temptations through its past, and has faced the 20th century with the identity that belongs to it, as a Croatian town. It was possible to keep that identity thanks to the Croatian people who never gave up their language and culture. Zadar had once again, like it had in the Middle Ages, to survive another siege in 1991 when it was brutally attacked by Serbian para-military forces helped by the Yugoslav army. The town was being attacked and distroyed until the summer of 1995 when the Croatian army finally liberated it. The people of Zadar, once again, have started to renew and rebuild their town. Today Zadar is a modern economic, political and cultural centre for the region, a town which during the last decade has developed its tourist, agricultural and fishing industries more and more.

CULTURAL HERITAGE

Zadar dating from the ancient times is very rich and valuable. There are few towns with such a variety of monuments, architecture, art and literature. There are remains of the monumental antique architecture together with a few early Christian buildings and the most valuable Middle Ages monuments in Croatia. The high level of cultural creativity is witness to this, and confirmation are the Roman columns and portals, Romanesque churches, Renaissance and Baroque palaces, as well as treasure from archaeological findings, goldsmiths works, and pieces of art from Renaissance painters, magnificent valuable reliquaries, coffins (especially the silver coffin reliquary of Sv. Sime (Saint Simon) and crosses.

Zadars most famous monument, and wellknown monumental early Medieval building in Croatia, is the pre-Romanesque Church of Sv. Donat (Saint Donat) from the 9th century. This is followed by the Church of Sv. Krsevan (Saint Chrysogonus), a wonderful Romanesque building, a three domed basilica with three apses. Saint Chrysogonus is one of the most important of the four patron saints, symbols of Medieval Zadar. Zadars Cathedral of Sv. Stosija (Saint Anastasia) was originally an old Christian
basilica on the remains of which a new Romanesque church was built in the 12th century. The Church of Sv. Marija (Saint Mary), with its bell-tower, is a valuable national monument - its walls have separated the convent, and the lives of its Benedictine nuns, for over 900 years. The bell-tower of the cathedral is the most beautiful, and the original is a variation of a Romanesque bell-tower, the so-called “Lombard” type.

All these cultural monuments and many others, have kept the most valuable and artistic written documents from Medieval and Renaissance periods. Also in Zadar, the paintings of Carpaccio, Palma Mladega, Lotha and many other local and foreign painters can be found. Gold reliquaries, processional crosses, busts, coffins and stone and wooden sculptures are confirmation of the high level of artistic craft and are available today to any visitor who wishes to see them. “The Permanent Exhibition of Church Art”, in a specially designed space, is a chronological window on these preserved treasures. There are also the Archeological Museum, Folk Museum, archives, libraries, all conserve an invaluable treasure, which are the best witnesses to this important cultural heritage. It was in Zadar that the first law journal on Balkans was published - “Pravdonosa” and Zadar is connected with the founding of the first Faculty of Medicine in Croatia. It has taken a lot of patriotism to preserve the true identity of the people from the numerous armies and conquerors attacking from the land and sea. (In 1177 the people of Zadar greeted Pope Alexander III with hymns in the Croatian language.) The town of Zadar, which has its own money and banks during Medieval times had also its own writers, artists, churches and palaces - it is a town of monumental heritage and international importance.

Zadar is an important cultural centre where many numerous and important cultural events take place, from the Musical Evenings in the Church of Saint Donat, world famous Renaissance music, to international exhibitions, photographic presentations on the theme “Man and the Sea” (Covjek i more). It is a town of music and song, the pop-group “Riva” were winners of the 1989 Eurovision Song Contest.
Rudjer Boskovic Institute (RBI) is the largest Croatian research centre in sciences and science applications. In the multi-disciplinary environment of the Institute more than 500 academic staff and graduate students work on problems in experimental and theoretical physics, chemistry and physics of materials, organic and physical chemistry, biochemistry, molecular biology and medicine, environmental and marine research and computer science and electronics. Within Croatia, RBI is a national institution dedicated to research, higher education and provision of support to the academic community, to state and local governments and to technology-based industry. Within the European Union, RBI forms a part of the European Research Area. Worldwide, RBI collaborates with many research institutions and universities upholding the same values and vision.

The Botanical Garden was founded in 1889 and Professor Heinz is considered its founder. The first works on the land started in 1891, and the first planting was done in 1892. The garden was designed and constructed in the landscape style, with free-standing clumps of trees and winding paths, with only the flower beds having strictly symmetrical lines. As well as the glasshouses, the garden has the following buildings: the director’s or administrative building, in Art Nouveau style, the one-time gardener’s lodge; the building of the Botanical Institute (the one-time Physiological Laboratory); the old exhibition pavilion (a valuable and authentic item of pavilion architecture of 1891); a public lavatory (an example of a small municipal structure from the end of the 19th century); the old storeroom (also from the end of the 19th century); the Water Company boiler room building (built in the 1930s); the drinking water fountain; a porch for students; and a small gazebo, acquired as a gift to mark the first cente-
nary. Because of its great educational, cultural, historical and tourist values, as well as its overall importance for the city of Zagreb and the Republic of Croatia, the Botanical Garden of the Faculty of Science has been since 1971 statutorily protected as a monument of nature and culture (as monument of horticultural architecture).

**ZOOLOŠKI VRT GRADA ZAGREBA**
*(Zagreb Zoo)*

Maksimirski perivoj bb
www.zoo.hr

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**Symbiotic games**

We will try to give the SymBioSE a flare of competition. Each country will choose a team that will have only one goal: to win and secure the eternal glory for their homeland! The country team will have a difficult task to earn points through 10 different crazy games. You will receive detailed instructions at the registration desk. Prepare for Rumble in the sea, Twin football, Drinking marathon, The snail race and other games!
### Important telephone numbers:

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<td>Andrea Obarđani</td>
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<td>Hrvoje Čižmek</td>
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<td>Tajana Uzelac</td>
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<td>091 5075 559</td>
</tr>
<tr>
<td>Tina Perica</td>
<td>091 7647 344</td>
</tr>
</tbody>
</table>

You can call us any time you want. You can also send us an SMS message, these are all cell phone numbers.

### Money

One **kuna** equals one hundred **lipa** (1 kn (HRK) = 100 lp). Foreign currencies can be exchanged almost on every corner: in banks, exchange offices (recommended), post offices and most tourist agencies and hotels. Banking hours are from 8 a.m. to 8 p.m. from Monday to Friday. On Saturdays banks are open until 1 p.m. Credit cards are used widely in Croatia (Europcard/Mastercard, Visa, Diners, American Express...).

### VAT - Tax return for foreign citizens

Tourists making purchases in Croatia (apart from petroleum derivates) which exceed 500 kuna per bill may reclaim VAT (PDV). When purchasing, ask the salesperson for form PDV - P, which they should fill and stamp. On leaving Croatia the receipt has to be verified by the Croatia Custom Service. A PDV refund in kuna can be obtained within six months either at the same shop where the goods were purchased (in this case the tax is refunded immediately), or by posting the verified receipt back to the shop together with the account number into which the refund should be paid. In this case the refund is dealt with within 15 days of receipt of the claim.
Example prices
Coffee 5 - 10 kn (depending on the location and type of the coffee)
Beer 10+ (depending on the type and the size of the beer)
Soft drinks 10 - 12 kn
Pizza 25+ kn
Hamburgers 12+ kn
Bread 5 kn
Milk 5 kn
Pack of cigarettes 10+ kn
Newspaper 6 kn
Postcard 2+ kn
Disco 15+ kn

Working hours
Shops and department stores are open from 8 a.m. to 8 p.m. and on Saturdays from 8 a.m. to 1 or 2 p.m. A small number of stores are closed between noon and 4 p.m. Many stores are open on Sundays, too, and many stores, especially in the summer, are open 24 hours. Public services and companies usually work from 8, 30 a.m. to 4, 30 p.m. from Monday to Friday.

Warning! 5th August is a public holiday - Homeland Gratitude Day and many shops and public services are closed, or the working hours are the same as on Sundays.

Dictionary of some frequently used words and expressions

ENGLISH:
hi, hello, by
good morning
good afternoon
good evening
goodbye
thank you
please
excuse me
sorry

CROATIAN:
bok, bog, zdravo
dobro jutro
dobar dan
dobra večer
doviđenja
hvala
molim
oprostite, ispričavam se
oprosti, žao mi je
to help
yes/no
maybe
How do you do?
I am.../My name is...
Do you have....?
I need...
Where is...?
What's the time?
How much is it?
student dormitory
post office
bank
exchange office
bus/bus stop
train
tram
airplane
boat
chemist's
hospital
doctor
dentist
telephone
store, shop
money
change money
embassy
price
sale
bill
to pay
cash
credit cards
expensive/cheap
to eat
to drink

pomoći
da/ne
možda
Drago mi je.
Ja sam.../Moje ime je...
Imate li...?
Trebam...
Gdje je...?
Koliko je sati?
Pošto je?, Koliko košta?
studentski dom
pošta
banka
mjenjačnica
autobus/autobusna stanica
vlak
tramvaj
avion
brod
ljekarna, apoteka
bolnica, ambulanta
doktor
zubar
telefon/telefonska govornica
dućan
novac
promijeniti novac
ambasada
cijena
rasprodaja
račun
platiti
gotovina
kreditne kartice
skupo/jeftino
jesti
piti
red wine/white wine
crno vino/bijelo vino
red wine + water
bevanda
red wine + cola
bambus
beer
pivo
water
voda
juice
sok
entrance/exit
ulaz/izlaz
open/closed
otvoreno/zatvoreno
left/right
lijevo/desno
forbidden
zabranjeno
cautions
oprez, pazi
sea
more
shore
obala
island
otok
street
ulica
square
trg
Good luck!
Sretno!
Cheers!
Živjeli! U zdravlje!
Plaesant journey!
Sretan put!

Numbers
1      jedan
2      dva
3      tri
4      četiri
5      pet
6      šest
7      sedam
8      osam
9      devet
10     deset
11     jedanaest
12     dvanaest...
1. prvi
2. drugi
3. treći...
4. četvrsti
36
Pronunciation
Croatian: As in English:

\begin{align*}
a & \quad \text{arm} & \quad lj & \quad l+j \\
c & \quad t+s & \quad nj & \quad n+j \\
č, č & \quad \text{cheese} & \quad o & \quad \text{walk} \\
dž, đ & \quad \text{jump} & \quad s & \quad \text{smile} \\
e & \quad \text{wet} & \quad š & \quad \text{she} \\
g & \quad \text{game} & \quad u & \quad \text{moon} \\
h & \quad \text{help} & \quad z & \quad \text{zebra} \\
i & \quad \text{see} & \quad ž & \quad \text{vision} \\
j & \quad \text{you} & \quad & \\
\end{align*}

SymBioSE Croatia organising team:
Buga Berković - head of organising team and Big brain
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We thank all the lecturers and people who helped making the programme.
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We thank all those who helped us to organise SymBioSE. You helped us a lot.

President of Republic of Croatia

University of Zagrebu, Faculty of Science, Biology department.

Ministry of science education and sport

Grad Zadar
Grad Zagreb

Zagreb Tourist Board

Croatian National Tourist Board

Ruđer Bošković Institute

CROATIA AIRLINES

BADEL 1862

Zadarska županija

ZAGREB
Schedule

Sunday, August 1st

Arrival - registration at students' home
"Cvjetno naselje"
19:00 - 21:00 - dinner

Monday, August 2nd

7:00 - 9:00 - breakfast
9:00 - 10:00 - official opening and introductory lectures
(University Rectorate)
10:00 - 11:00 - coffee break
11:00 - 13:00 - lunch
14:00 - 17:00 - free afternoon for sightseeing
17:00 - 19:00 - dinner
18:00 - 20:00 - treasure hunt (City centre)
20:00 - ... - party!!!

Tuesday, August 3rd

7:00 - 9:00 - breakfast (Cvjetno naselje)
9:00 - 13:00 - visit to Rudjer Boskovic Institute
OR visit to Zagreb Zoo
13:00 - 14:00 - lunch
14:00 - 19:00 - lectures
(Department of Biology)
19:00 - 20:00 - dinner
20:00 - 22:00 - country presentation

Wednesday, August 4th

7:00 - 9:00 - breakfast
9:00 - 13:00 - lectures OR visit to Zagreb Botanical Garden
13:00 - 14:00 - lunch
14:00 - 17:00 - workshops
17:00 - 19:00 - lectures-national assembly
19:00 - ... - free time

Thursday, August 5th

7:00 - 9:00 - breakfast
9:00 - trip to Zadar + visit to National Park "Paklenica"
18:00 - on the road to Zadar
~20:00 - dinner, free time

Friday, August 6th

7:00 - 9:00 - breakfast
9:00 - 10:00 - opening of the second part
10:00 - 13:00 - lectures + workshop
13:00 - 14:00 - lunch
14:00 - 19:00 - lectures/sightseeing
19:00 - 20:00 - dinner
20:00 - ... - fun in the city

Saturday, August 7th

7:00 - 9:00 - breakfast
9:00 - 13:00 - visit to Nature Park "Vrana"
OR lectures
13:00 - 14:00 - lunch
14:00 - 19:00 - student presentations
19:00 - 20:00 - dinner
20:00 - ... - national assembly/party

Sunday, August 8th

7:00 - 9:00 - breakfast
9:00 - 19:00 - boat excursion to National Park "Kornat"
19:00 - 20:00 - dinner
20:00 - ... - night on the beach

Monday, August 9th

7:00 - 9:00 - breakfast
9:00 - 13:00 - visit to National Park "Paklenica"
OR lectures
13:00 - 14:00 - lunch
14:00 - 17:00 - free time (beach)
17:00 - 19:00 - summing SymbioSE 2004, presenting SymbioSE 2005
Finland; closing session
19:00 - 20:00 - dinner
20:00 - ... - farewell party

Tuesday, August 10th

7:00 - 10:00 - breakfast, cleaning, packing
10:00 - departure for Zagreb
~14:00 - arrival to Zagreb