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THE HISTORICAL USE OF MEDICINAL PLANTS IN TRADITIONAL AND SCIENTIFIC MEDICINE

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SUMMARY

There is a strong connection between man and nature, ever since his first origins, the man discovered the benefits of the plant kingdom, which he used to feed himself, to heal and to survive. Following the use of eatable, medicinal and poisonous plants takes us into the distant past. The man's first knowledge about plants passed from generation to generation. The ancients Chinese, Egyptians, Indians, Greeks, Romans and the Old Slavs knew a large number of medicinal plants. That knowledge was carried over to other nations as well.

Thanks to its geographical location and climate condition, our country is abundant and very rich in variety of species of medicinal plants. In the Middle Ages, there were written many herbal manuals that described the use and procedures in healing with medicinal plants. Many plants were known by the oldest civilizations and they were used by the people for thousands of years. Moreover, today's science has confirmed their effectiveness in the treatment of different diseases.

Key words: *history - medicinal plants – traditional – scientific - monastic medicine - herbal manuals*

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Introduction

Bonum est, quod secundum naturam est

The people have always appreciated what was natural. All plants that traditional and official medicine considered curative or were used for that purpose are called medicinal plants. Their application begins in the distant past, because treatment with plants is as old as humanity itself. To survive in the nature, man demanded food. Besides, he used the plants in the diet, the man has encountered their medicinal properties. The knowledge of the healing effect of these plants came with the experience and lessons learned by empirical ways were transmitted from generation to generation. The use of medicinal plants in the treatment of human diseases that accompanied man throughout the history had great importance. There are testimonies from 5,000 years BC written on Sumerian clay plate in Nippur, in the Old Testament, in the Egyptian papyri, in the books of Greek physicians Hippocrates about 300 medicinal plants, and in the works of Roman writers Dioscarid, Pliny, Theophrastus, Galen and others (Kušan 1956, Šantić 1999b).

European plant healing traditional medicine is described in detail in the medieval and more recent plants manuals written in the context of the so-called monastic medicine. The effects of many plants that were used in the past, after thousands of years, were confirmed by scientific methods and many entered the official pharmacopoeia and are used to the present day (Kušan 1956, Bazala 1955, Videk 1960).

In the old writings, the treatment with different medicinal plants is described. For example, in the Bible (The Old Testament), written in 1200 BC, and also in the Indian holy books (Vedas) the numerous medicinal plants and different highly valuable spices are described. Ebers papyrus and other Egyptian papyri gave recipes on the use of medicinal plants referring to the culture of that time. Thanks to the legendary Emperor Shen Nung, the Chinese were the first who gave written guidelines of treatment and use of medicinal plants in 2838 BC. First European who spent 20 years in China (the XIII century) - Marco Polo, met Chinese customs and disease treatment methods. The fact that India had many different, highly valued, precious spices, dyes and medicinal plants opened up the possibility of their import and trade. For that reason, C. Columbus who was seeking a shorter route to India by boat Santa Maria discovered America in 1492 (Bazala 1955, Videk 1960, Parojčić et al. 2001, Vrgoč 1931).

Plants with toxic properties

A man driven by the instinct for self-preservation in search of edible and medicinal plants in nature encountered plants that have toxic properties. One of these plants is curare which the tribe of natives used for hunting or fighting each other. They dipped the blade of arrow in sap. When the arrow hit the animal it would lead to death by asphyxiation because the poison paralyzes the muscles, especially the muscles of breathing

(diaphragm and intercostal muscles). The full composition of curare has yet to be known. In its complex molecular structure, there are the seeds of Strihnos Nux vomica from the various types of Strophantus. Curare had been used for narcosis and some diagnostic procedures for a longer period (Bazala 1955, Vrgoč 1931).

Also, since ancient times natives had used coca leaves (coca Erythroxylom), a plant from which cocaine alkaloid had been obtained – a medicine for pain with analgetic-narcotic effect. It was used as a medicine in the physical and mental exhaustion. It was one of the reasons for Sigmund Freud (1856-1939) to require the introduction of the plant in the official medical therapy so it could be given to mentally exhausted and depressed patients. When it had been observed that after long use of cocaine patients became addictive, he dropped out of this application. Cocaine for medical purposes is rarely given (trigeminal neuralgia), but the plant has been used for a long time in Coke. Today, the smuggling of cocaine is spread around the world and it is the third or fourth most common drug after cannabis, ecstasy and amphetamines.

Also, the leaves of tobacco (Nicotiana tabacum) are of the same origin, consumers first used to chew it to suppress the hunger. Later, triturated tobacco leaf was used for snuffing and smoking and even for treatments. Its regular use can also lead to addiction (Vrgoč 1931, Wong 1973, Tartalja 1965).

Hemp (Cannabis sativa L.)

Hemp is one of the oldest cultivated plants on earth. In China, it had been used for different purposes 10 000 years ago. The dried herb is used as narcotic drug and its use for medical purposes has been increasing. Its content is a psychoactive substance tetrahydrocannabinol and various other cannabinoids, which are now in the center of medical research. The use of this plant leads to addiction. After the smoking, the euphoric state, relaxation and increased appetite occurs, but it has numerous side effects: eye redness, increased and irregular heart rhythms and a range of desirable and undesirable responses of the body (Bazala 1955, Videk 1960).

Poppy (Papaver samniferum religions. The album L.)

In the history of mankind poppy has played an important role. Information about the latest research indicates that the natives had grown white poppies, which yields opium, in the valley of the Nile River. Opium is obtained from the juice which is collected from envelopes of poppy heads, and not from the poppy seed that is used in the food industry. The exact origin of the poppy has not been established. While some write that it was used in the Neolithic period, the second claim that it began to grow in Mesopotamia and spread throughout the Mediterranean and the Middle East. The Sumerians used it 3400 years BC, and called it the plant of happiness. At the time of Alexander the Great (323-356, BC) Poppy had spread to India, Persia, China and other countries. Hippocrates (377-460, BC) knew its excellent narcotic and analgesic action and used it for cough, and for some gynecological problems. Poppy had entered the Greek mythology and it was named morphine after Morpheus the God of dreaming. Hypnotic properties of poppy were first discovered by the goddess Ceres so her statue had been decorated with poppy shells. Clearer description of the plant can be found in Theophrastus (300 BC) (Vrgoč 1931).

In 1806, a German pharmacist Serturner (Friedrich Wilhem Serturner) managed to isolate the first organic active substances from the plant and it was morphine. Shortly thereafter more alkaloids as strychnine, codeine, atropine, papaverine, scopolamine and others were isolated. Morphine was chemically synthesized in 1952.

Poppy is a plant that has a long history which is far from over. It remains a driver of the economy in many countries. Its main active ingredient is morphine with its beneficial effects to soothe the pain and discomfort and for a sound sleep and it became a rescue medicine for millions of patients. It carries a danger too and that is that after long use a dependence occurs when a person without daily intake of a certain amount cannot live. It is the strongest painkiller, cheap and efficient. It should be given to patients with myocardial infarction, before and after surgery and in severe pain caused by malignant process. Therefore, today there is no qualitative removal of symptoms in patients in palliative medicine without its application. There may be side effects: nausea, vomiting, constipation, bronchospasm and decrease blood pressure. Therefore, a minimum amount should be prescribed. Also some steps should be taken: abuse prevention, writing of duplicate prescriptions, maintaining records of narcotics and constant control of doctors. Because in addition to the benefits brought to humanity, morphine caused numerous wars and huge losses of human lives (Parojčić et al. 2001, Vrgoč 1931, Wong 1973, Tartalja 1965).

Hemlock (lat. Cicuta Conium maculatum L.)

There is a description from Greek literature about the action of poison that was used as a remedy in the therapeutic doses. Venom was obtained from hemlock plant that contained the alkaloid konin which was used for alleviation of pain, asthma, bronchitis, neuralgia, and was used as an aphrodisiac (Tartalja 1965).

The great Greek philosopher Socrates was sentenced to death and he was determined to drink a lethal dose of that poison. Since his students wrote each phase, we found exactly the mode of action of this poison. When he entered the executor of the sentence, carrying in his hand a chalice with the juice of hemlock, Socrates asked: "Tell me, my good man, what to do. You know it." He also asks, as if in front of him there was a doctor-

minister of the god Asclepius. A hangman fits like a doctor who instructs: "Drink and walk until you feel heaviness in the legs. Lie. Then the poison work. " Socrates' hands do not tremble, he does not change in the face. Calm and cheerful as always. The youngest student, who was next to him, could not hold back his tears, and covered the face with his robe. And the other started to cry. "What is wrong you strange people? - Says Socrates – a man should die with kind words. Please settle down. "

Hearing that students stop crying. Socrates begins to walk, as he was told. Sensing that his legs were heavy, he lies on his back . Then he is approached by the man who gave him the poison and as a doctor who examines patients legs.

"Do you feel" - he asks Socrates. "No," responds Socrates. Then the executioner begins to feel the thigh and moving his hands shows guys how cool is the body of their teacher. And Socrates also touches himself. "When it comes to the heart, it is the end"

Socrates issued last orders to students. Following the old custom, he ordered to bring the victim to Asclepius the god of doctors, drugs and poisons: "We owe Asclepius a rooster. Do not forget to hand it over. "These are the last words of Socrates. Another minute goes. His lips are motionless. Athenians have achieved what they wanted: they forced mouth that scolded them to hush forever. (Quoted by M. Iljin - E.Segal: As man became a giant).

How do wild animals discover medicinal plants?

Today many scientific papers suggest that ill animals seek remedies in nature. What plants they seek in the nature-their pharmacy, depends on their needs and the nature of the disease. The science which study this phenomenon is called zoopharmacognosis. The animals seek certain plants and use the leaves, bark, root, flower and fruit for preventive and curative purposes. Monitoring of which plants animals seek and eat in the course of illness, people used for discovering many valuable drugs. Some of these herbs in human medicine have been retained to this day. We will cite just a few examples.

Malaria is present in the world over 50,000 years. The first records of this contagious disease originate in ancient China 2,700 years BC. Moreover, that disease caused decline of the Roman Empire. Even in our region, malaria took some human lives, especially in the valley of the Neretva river. Even today, hundreds of thousands of deaths annually in the world are caused by this dangerous disease.

It is very interesting historical time and way of discovery of the first effective drug against malaria. Residents of Peru noted that the sick lame removed with their teeth the bark of cinchona trees and gnaw it (Cinchonae cortex) and recovered from the disease. This encouraged the people of South America to stripe the bark, then dried, milled and turned it into the powder and gave it as a food supplement to the sick people with a fever, especially malaria. The Jesuits noted benefits of bark Cinchona, which contained quinine and in 1640 they brought it to the Europe, first to Spain and then to Rome, where thousands of sick people were cured. Because of it world's trade grew, wars were led, borders were changed and quinine was saving the sick people. In 1820, in France, Joseph Pierre isolated and proved chemically active substance quinine as the first effective drug against malaria (Parojčić et al. 2001, Atanacković et al. 1970, Tucakov 1964).

And another example of monitoring pregnant African elephant indicated that the wildlife nature is pharmacy to the animals. By monitoring and careful observation of the African elephant, which was in high pregnancy, has contributed to an important discovery. Elephant went from their permanent residence, fresh water and food, to the plant 17 kilometers away.

When it came to the bush it chewed and swallowed the leaves and bark. It returned to the place of their departure and after three days, the labor came. It triggered instincts to seek certain plants (the family Borage). Today, pregnant women in Kenya, before birth, cook this plant for the purpose of enhancing labor and easier delivery.

Michel Huffman has been studying for 17 years the behavior of chimpanzees in which he observed they were eating bush Aspilie which removes parasites (worms) from their digestive tract. They eat the bark of the plant Vernonia that is biochemically demonstrated to have anti-parasitic and anti-bacterial properties. In Tanzania, people used the bush Aspilie against fever, and only ill chimpanzee eat it.

An Indian legend suggests that mongoose look and eat a plant "sarpagandha", as in the old Sanskrit language means a cure for snake, always before and after the fight with a cobra. Sarpagandha primarily grows on Himalaya, Burma, Ceylon and the Philippines. Humans used the leaves as an antidote and roots for the treatment of mental patients. It has attracted the attention of researchers, pharmacologists and doctors. Leonhard Rauwolf (1540-1596) from Augsburg met Europe with his journey to India and with the treatment with medicinal plants in the book "Eigentliche Description der Rasi" issued in 1582. Later, in honor of the first descriptor plant is named "Rauwolfia serpntina" and its products are named Serpasil. In 1931, the composition was prepared synthetically as ajmaline and reserpine, and the medicine has got the valuable cure, especially for cardiac and mental disorders and for the treatment of high blood pressure (Tartalja 1965, Tucakov 1964).

Medicinal Plants old Slavs

Old Slavs knew and used a large number of medicinal plants, partially because they inhabited huge spaces, and took some from neighboring nations, but much of it brought from their north homeland. About

their knowledge of the flora we learn from the writings of B. Sulek, H.Tartalja, J. Tucakova, F. Kusan and other writers. Their traveled a lot, constantly accompanied by diseases. They were convicted on nature searching for food, water and medicine in a green pharmacy. One of the particularly prized, fragrant, beautiful and healing plants was the linden (Tilia). They planted linden near the village and later their streets and alleys adorned planted linden trees as well. In Croatia, pennies are called linden. For a long time, it was a custom to plant a linden tree when man-child arrived. Linden has healing properties. The linden flower, leaf and fruit are used. Linden tea is used for cold, fever, has anti-inflammatory effects, causes sweating, relieves cough and has mild sedative effect. It should not be taken in large quantities.

Many plants are named the way the nature gave them a purpose in the treatment. Many of these names are saved as lungwort, heartwort, liverwort, valerian and others. The plant they used very early as well is Hops (Humulus lupulus L.). Hops was used for making beer. In the treatment, it was also used for sedation and better sleep (lupulin). In higher doses, it was used as opioid substance. So, the people who could not sleep used to filled the pillowcases with hops. Old Slavs knew the hellebore (Veratrum album L.) as well. "Hellebore" is an old Slavic word that means sadness, poison, grief and anger. In medical purposes, it was used as a laxative and anti-rheumatic substance. Also, they used this plant as an insecticide.

South Slavs from Mediterranean region, especially the Greeks, were characterized by great knowledge about medicinal plants. Medicinal plants and their use in the treatment were mentioned by Homer in the Iliad and the Odyssey. Many plants are named after legendary heroes. So, Inula named Helenijum after the beautiful Queen Helena, mythical person in the Trojan War. Achillea millefolium was named after the legendary hero Achilles who was advised by Aphrodite to treat his wounds with this plant. It is interesting that people named this plant (Achillea millefolim) “milfoil” due to it use by outlaws to treat their wounds in the fight with the Ottomans.

In today's Croatian territory first culture of olive trees and vines were taken from the Greeks and Romans. These plants were used as food and for medicinal purposes. Before the Croats, these areas were inhabited by Illyrian tribes who were perfectly familiar with medicinal plants. From them Croats took a lot of this knowledge, as well as from Romans, especially when these lands were conquered by the Romans. The most famous medicinal plant was Iris (Ilyrica) which is described by Dioscorides, Linne and Theophrastus. Dioscorides in his book "De Materia Medica" says that the highest quality has iris from the environment of the Adriatic Sea and its admiration testifies the name they gave to it - perunica by god Perun. At the time, the most famous Roman physician - pharmacist was Galen (120-200) who described some plants that Dioscorides did not mention as Uvae folium, which is still using as a urinary antiseptic and a mild diuretic (Vrgoč 1931, Tartalja 1965, Tucakov 1964).

An interesting finding was the use of herb digitalis (foxglove) (Digitalis purpurea from latin. Digitus meaning finger; digitale meaning thimble because its flowers are thimble-shaped) containing a cardiac glycoside. It is not known when was its first application. The literature described the English physician William Withering (1775) treating elderly patients with congestive heart failure, edematous legs and shortness of breath. After patient examination doctor told family members that the disease is incurable and that patient cannot be saved, but he would come in 10 days. When he came back, he was surprised, because the patient looked much better. Edema of legs disappeared, the functions of the heart and breathing improved. The patient was regularly drinking foxglove tea. William was 20 years studying the recipe and noticed that this plant increased the excretion of urine and strengthened the heartbeat. About 150 years after when its effect was fully investigated, digitalis was accepted and its benefits and side effects were scientifically explained. Digitalis along with opium and quinine makes a triad of drugs of plant origin that entered in all the pharmacopoeia of Europe and the World, which are still in uses.

South Slavs use a plant with similar action called Hawthorn (Crataegus monogyna). The white hawthorn is also cardiotonic, because it contains cardiac glycosides and it is used for paroxysmal tachycardia, atherosclerosis and high blood pressure and has no side effects. The leaves, flowers and fruit of that plant are used. The Paracelsus (1493-1541) and his introduction of chemical drugs in therapy, decreased interest in use of medicinal plants. Chemical analysis and study of medicinal plants had a significant role in the systematization of plants. The first systematization of plants, which is used today, was set in 1735 by Swedish botanist Carl von Linne (Vrgoč 1931, Wong 1973, Tartalja 1965, Atanacković et al. 1970, Tucakov 1964).

The Roman emperor Charlemagne (742-814) described the 100 medicinal plants that were cultivated in the botanical gardens of the monastery. In some monasteries, in addition to organized treatment, there were hospital rooms as well. The most important medicinal plant was the sage, which was called saving plant (salvare - means to save, cure) and the other as: chamomile, thyme, marshmallow, several types of mint, wormwood, mosquitoes, nettle, poppy, centaury, basil, St. John's wort, roses, lilies and other (Peros 1963, Šantić 1999a).

Monastery medicine

In the areas populated by South Slavs, Franciscans performed first organized treatment in the framework of the so-called monastic medicine. In 1271, in the Mala

Braća monastery in Dubrovnik, the first pharmacy was opened. The physician Stjepan Barbieri worked there. Priests of numerous monasteries build their skills and knowledge about medicinal plants and the ways of treating based on the famous Salerns Medical School, which was the mother of all medical schools in Europe. There was, thanks to leaning father Emerik Pavić (1716-1780), the first printed medical book in the Croatian language "Flos medicinae" (Cvit likarije) sive scholae Salernitanae de conservanda bona valetudine pracepta metrica". There was also a large number of herbal manuals, which served as manuals. Among the first the herbal manuals from father Luka Vladimirović (1775) and father Mate Nikolic stored in Kreševo monastery under numbers 29 and 87. They were written in Latin and probably served him personally and other Franciscans who knew to read the Latin (Šantić 1999a, Ribičić 2004). Also, there were Mostar herbal manuals (1843), from father Mihovil Sučić (1846) and herbal manuals from 1856, written in Široki Brijeg and many others.

Their knowledge and skills Franciscans applied to all patients regardless of religion or nationality they belonged. They treated even the high representatives of the Ottoman ruler. For example, two Franciscans treated Ali Pasha Rizvanbegović. The Franciscans who, among other things, dealed with the medical treatment can be classified into two groups. The first includes folk or traditional Franciscans, and in other qualified physicians with a medical degree. The first professional doctor in Bosnia Argentina (Bosna srebrna) was father Mate Nikolić (1775-1844). Today his name holds the hospital in Nova Bila. The first surgeon in Bosnia and Herzegovina was father Mijo Sučić (1820-1868). The doctor who first defended dissertation at the University of Vienna and was promoted to Doctor of Medical Sciences was father Peter Marešević, born in 1820 in Kreševo. Since the arrival of the Franciscans in these areas (13 century), they gave a huge contribution in the cultural, health and educational activities (Grmek & Budak 1996, Pharmacopoea Jugoslavica 1933, Ribičić 2004, Pavić 1980, Šarić-Kundalić et al. 2011).

Conclusion

In the history, the use of medicinal plants in the human health and the cure of the diseases, which he was constantly followed, had an extremely important role. Today, the interest in the plant medicine is still very actual. From the experiential knowledge of the ancient people, the verified, best and most effective medicines should be used.

Today, many medicinal plants are used for the extraction of active ingredients as: rauwolfa, digitalis, cinchona, opium, poppy and others. In recent decades, thousands active substances are isolated, among them, several hundred different alkaloids are already used in the treatment of patients. Lately, many pharmaceutical companies around the world are investing enormous resources in research of active ingredients that can be found in plants that have been used in traditional medicine in the past times. For example, "Merk" invested millions of dollars in a project that was being implemented in Costa Rica. Also, "Pfizer" spends 2 million dollars per year to maintain the botanical garden of New York to study pharmacological potential of North American flora. In recent years, the region of Dalmatia and Herzegovina were planted with about one billion fragrant plants dwarf everlast (smilje, lat. Helichrysum arenarium). There is increasing interest in the pharmaceutical industry of Germany, France and America fort this plant. Today, about 250 pharmaceutical companies worldwide are involved in the study of medicinal plants in the scientific laboratories. Following the application of medicinal plants and Greco-Roman medicine through preserved old pharmacopoeia and herbal manuals can provide useful guidelines for the research. This may result and could help in some new discoveries. Also, when accidental or intentionally poisoning occurs, our knowledge about plant medicine may be helpful.

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Contribution of individual authors:

Žarko Šantić conceived of the presented idea, wrote the manuscript contributed to the final version of the manuscript, and supervised the project.

Nikolina Pravdić collected data, wrote the manuscript and contributed to the final version of the manuscript.

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References

1. *Atanacković D, Cerkovnikov E, Rill M: Attachment of the History of Therapeutic Chemistry: Malaria and Antimalarias (Prilog povijesti terapeutske kemije: Malarija i antimalarici). Far Glas 1970; 7-8:323-32*
2. *Bazala V: Medications and poisons important for cultural and medical history (Lijekovi i otrovi važni za kulturnu i medicinsku povijest). Farm Glas 1955; 7-8:383-96*
3. *Grmek MD, Budak A: Scientific, national and unofficial medicine (Znanstvena, narodna i neslužbena medicina). In: Introduction to medicine. Third, revised and supplemented edition, Nakladni zavod Globus, Zagreb, 1996; 20-23*
4. *Kušan F: Medicinal and other useful herbs (Ljekovito i drugo korisno bilje), Poljoprivredni nakladni zavod, Zagreb, 1956*
5. *Parojčić D, Stupar D, Kovačević N: Opium in the therapy of ancient civilizations (Opijumski mak u terapiji drevnih civilizacija). Arh farm 2001; 1-2:153-62*
6. *Pavić E: Flos medicinae sive scholae salernitanae de conservanda bona valetudine praecepta metrica. Reprint, Split, 1980*

7. *Peros, R: Contribution to the study of the history of chamomile (Matricaria chamomilla) and similar species (Prilog proučavanju povijesti kamilice (Matricaria chamomilla) i slične vrste). Farma Glas 1963; 11:451-56*
8. *Pharmacopoea Jugoslavica 1933. Apotekarska komora Kraljevine Jugoslavije, Beograd, 1934*
9. *Ribičić A: Arboretum Kačićeva samostana. Vlastita naklada, Zaostrog, 2004*
10. *Šantić Ž: Kreševo herbar from franciscan Mate Nikolić (Kreševska Ljekaruša fra Mate Nikolića). Mostariensia 1999a; 10:91-108*
11. *Šantić Ž: Peoples Medicine on the territory of Herzegovina. In Šantić, Ž., Health and healing secrets. Third edition, Logotip, Široki Brijeg, 1999b; 176-205*
12. *Šarić-Kundalić B, Dobeš C, Klatte- Asselmeyer V, Saukel J: Etnobotanical survey of traditionally used plants in human therapy of east, nort and north-east Bosnia and Herzegovina. J Etnofarmacol 2011; 133:1051-76*
13. *Tartalja H: A brief overview of pharmacy history (Kratak pregled povijesti farmacije). Fourth edition, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb, 1965; 26-63*
14. *Tucakov J: Pharmacognosy, second editinon. Zavod za izdavanje udžbenika Socijalističke republike Srbije, Beograd, 1964*
15. *Videk V: Medicinal herbs of Yugoslavia (Ljekovito bilje Jugoslavije), Poljoprivredni nakladni zavod, Zagreb 1960*
16. *Vrgoč A: Guidance on pharmacognosy (Uputa u farmakognoziju). Tiskara Dragutina Spallera u Samoboru, Zagreb, 1931*
17. *Wong M: Contribution a l Histire de la Pharmacie anciennechinose. Proceedings of the International Symposium held on the occasion of the celebration of the 700th anniversary of the Pharmacy Symposium in Trogir. Institute for the History of Natural, Mathematical and Medical Sciences and Arts, Zagreb, 1973; 243-65*

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