Academician Boris Stefanov and his contributions to botany

On the occasion of the 110th anniversary of his birth

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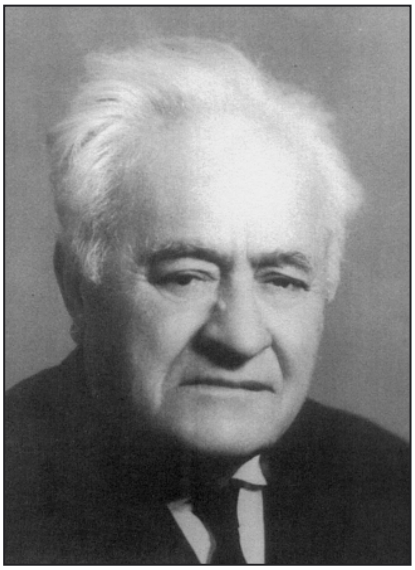
Abstract. Academician Boris Stefanov is one of the most prominent Bulgarian and Balkan botanists and forest biologists, a scholar of wide international renown, with contributions to the world science. The article focuses on some key moments in his biography and analyses his creative work in the field of botany, comprising over 100 books, monographs, studies, articles and communications in the field of floristics, taxonomy, phytocoenology, phytogeography, and paleobotany, as well as in the domain of anatomy and physiology of trees.

Key words: biography, Boris Stefanov, history of Bulgarian botany



Boris Stefanov Popov was born on 8th June 1894 in Sofia, into a large but poor family. His father was of Dalmatian extraction, a logger in the Belovo mountain divide during the construction of Baron Hirsch railway and volunteer in the Liberation War in 1877–1878. His mother was a Bulgarian from Sofia. She died at his childbirth and he was given out for adoption to the childless family of Stefan and Velika Popovs. His childhood and school years passed in poverty and need. A good and industrious man, his second father had no profession and often was unemployed. That is why, already since his school years Boris had worked during vacations at a string of meagrely paid jobs: a carrier of film rolls from one cinema to another, an errand-boy in a café and in a hotel, a teller in a public bath, etc. ("*Until school and afterwards, I was a very frail child, our diet was always very meagre and good food was put down on the table once in a blue moon.*"). In spite of the poverty and penury, his adopter managed to bring him up and give him the best possible education.

At the basic and junior high school Boris was a rather middling student and often got poor marks. However, he was an inquisitive child, loved to read, collected postal stamps and, when sitting at home, was always contriving something: a toy airplane engine out of an old watch, a film projection device (before even going to the cinema and having an inkling of its principles of work), etc. Botanist Ivan Neichev, his teacher in natural history at high school, was the one who awakened in him the interest in botany and herbaria of dried plants.

In 1911 Boris Stefanov graduated with good marks from the high school and the same autumn enrolled as a student in natural sciences at Sofia University. At the university he studied under Prof. Stefan Petkov (botany), Prof. Georgi Shishkov (zoology), Prof. Georgi Bonchev and Prof. Lazar Vankov (geology), Prof. Metodi Popov (anatomy and histology), Assitant Professors Nikola Arnaoudov (botany), Stefan Konsoulov (zoology), Iliya Stoyanov and Petar Bakalov (mineralogy and geology),

B. Stefanov (sitting in the middle of top row) with a group of fellow-students at a natural science outing in Kyustendil, June 1914.

and under some other of Bulgaria's first university professors in natural sciences.

During his university years, the middling school student Boris Stefanov showed profound interest in the subjects of study, attended regularly all lectures, spent many hours in the libraries, and never missed an instructive hiking in the Nature. In February 1914 he passed with very good marks his first university exam (according to the then obtaining practice, these were in fact examinations in several subjects, followed up at the end of the university course with another exam in another group of subjects) and in March of the same year was elected Chairman of the Students Society in Natural Sciences. It was then that he wrote his first (never published) scientific article: *A new method for determining the angle between the optical axes in optically biaxial minerals*.

In the summer of 1915 Boris Stefanov completed his university term and applied for his second university examination. However, the First World War broke out, mobilization started and examinations were postponed for unspecified time. The same autumn he enrolled as student at the Law Faculty and attended the lectures until next March when he was called to the barracks and sent to the School for Reserve NCOs in Knyazhevo. He was one of the top cadets at the School and after graduation volunteered for the Southern Front at the Aegean, where he served for two years as a Platoon and Company Commander. After the end of the war he resumed his studies at the Law Faculty and along with that intensively prepared for his second university examination. In June 1919 he passed successfully the university exam and got a diploma for completed higher education in natural sciences. From September till the end of December of the same year he worked on probation as teacher at the Second Male High School of Sofia, under botany teacher Boris Ahtarov, and since 1st January 1920 as curator at the Institute of Botany of the Physics and Mathematics Faculty with the St Kliment Ohridski University of Sofia. His employment at the Institute of Botany brought an end to his studies at the Law Faculty, where he had several attested terms.

The summer and autumn of 1919 were particularly important for the future career of Boris Stefanov. During these four or five months, along with N. Stojanov (Assistant Professor in Botany at the Physics and Mathematic Faculty), B. Ahtarov and Ivan Bouresh (zoologist, Director of the Royal Natural History Museum), Delcho Ilchev (zoologist, Head of the Royal Entomological Station), and Tsar Boris III he took part in several natural history expeditions in the Western Balkan Range, Rila Mts, Southwest Bulgaria etc. They brought to the fore his exceptional knowledge in botany, unusual for a person just out of his university-student and army-conscript years. His senior colleagues saw in him a promising young scholar and that was the reason to appoint him as curator at the Institute of Botany with the University after a short stint in school teaching. As a curator, Boris Stefanov helped N. Stojanov and N. Arnaudov conduct the practical classes in botany for students of medicine. In the autumn of 1921, after the Agronomy Faculty (which in 1924 was transformed into the Agronomy and Forestry Faculty) opened up, he was appointed Assistant Professor at the Farming Botany Department. He worked there until 1928, when he was elected regular Associate Professor in Dendrology at the Department of Private Forestry (in the period 1926–1928 he was part-time private Associate Professor at the same Department) and after that he definitely stayed with dendrologists. His winning round to the Department of Private Forestry and assignment of the dendrology course to him were credited to the Head of the Department, Prof. Todor

Dimitrov, the first professor in forestry with academic rank in Bulgaria and a man of broad vision and great services to forestry and higher education in forestry in Bulgaria.

In the meanwhile, in 1921 Boris Stefanov married Raina Stefanova, a teacher. Soon his son Stefan was born (1922), followed in a couple of years by his daughter Milka (1927). In the period 1924–1925 Stefanov was sent to specialise in London (the Botanical Garden in Kew), Berlin (the Botanical Garden and Museum of Botany in Dahlem) and Vienna (the Museum of Natural Sciences and Institute of Botany at the University). At the same time he worked intensively on his monograph dedicated to genus *Colchicum* and got acquainted with the works of botanists of world prominence: E. Warming, P. Gräbner, A. Grisebach, K. Raunkier, A. Schimper, I. Braun-Blanquet, I. Paczoski, O. Drude, A. Krzysztowicz, etc., who strongly influenced his future advancement into a botanist of great magnitude.

B. Stefanov (sitting at the top) as Second Lieutenant and Company Commander during World War One. Near Dedeagach (Alexandroupolis), June 1917.

In 1931 Boris Stefanov had become Extraordinary Professor in Dendrology, and in 1945 Regular Professor and Head of the Department of Private Forestry (subsequently renamed into the Department of Dendrology and Anatomy of Trees) with the Forestry Faculty of Sofia University (since 1953 the Higher Forestry Institute), the first Dean of the Forestry Faculty (1947–1948), the first Rector of the Higher Forestry Institute as well as since 1954–1967 the first director of Forestry Institute with the Bulgarian Academy of Sciences. In the long years of his research, teaching and organisational work he was repeatedly awarded some of the highest Government honours and distinctions.

At the 12th International Botanical Congress in Sankt-Peterburg (Leningrad) (1975) he was the only Balkan botanist awarded a special medal for his services to the advancement of botany.

Academician Prof. Boris Stefanov died on 12th December 1979, at the age of 85.

These concise and dry biographical data and chronology of a successful scientific and teaching career conceal many a difficult and dramatic moments that had put to the test the willpower and character of Boris Stefanov. In a strictly private plan, destiny seemed to be dealing him heavy blows all his life: the death of his mother at childbed, separation from his family, miserable childhood, the early death of his son, death of his wife, followed shortly by the tragic death in a car accident of his daughter, his pregnant granddaughter and her husband. Nor were things easy for him at the Agronomy and Forestry Institute. In the period from 1926 to 1945 he was the only Professor, Assistant Professor and laboratory technician in dendrology and anatomy of the tree. Many professors in forestry looked at him as a man with an "alien" specialty (natural scientist), last but not least owing to his fluent polemic pen, "difficult" character and purely human envy on their part. After the death of Prof. T. Dimitrov (1938), his nomination for Head of the Department of Private Forestry and for professorship at the Farming Botany Department after N. Stoyanov left for the Physics and Mathematics Faculty (1936) was turned down twice. There was also an organised attempt to put off his election as Academician in 1947. One should certainly possess a very strong character and nerves of steel so as to survive and go on working, to reach the summits of science and gain general recognition and respect. Yes, Boris Stefanov was a man with a "difficult" character, or more precisely, he was an extraordinary person. He measured the world and the people with his high criteria and that is why he was relentless and abrupt, and along with this lenient and generous, stranger to any pettiness and formalism. He could kill with his sharp tongue and unyielding logic, but was also forgiving and ready to make a joke: cleverly, overwhelmingly and wisely. He was an extremely interesting and unique interlocutor, although always

remaining somewhat aloof and awe-inspiring, even when he joked. He was truly an extraordinary person and it would be unfair to apply to him the criteria gauging the work and acts of the ordinary people.

As curator and Assistant Professor in botany (1921–1928), first at the Physics and Mathematics Faculty and then at the Agronomy and Forestry Faculty of Sofia University, Boris Stefanov taught the practical classes in botany to students in medicine, agronomists and foresters, and as Professor at the Agronomy and Forestry Faculty (subsequently the Higher Institute in Forestry) read lectures in dendrology, anatomy of the tree and forest ecology. He was the author of several textbooks and other manuals in these disciplines, very original in many respects and of a fine scientific quality, the first of their kind in Bulgaria and comprising the personal observations, investigations and ideas of their author. B. Stefanov's *Dendrology* (1934, 2nd and 3rd edition in 1953 and 1958 respectively, in co-authorship with A. Ganchev) has been for many years a vademecum to foresters, botanists, ecologists, etc. Mention deserves the fact that when he started the course in dendrology in 1926, he wrote down the entire course of lectures, up to 900 pages (!), merely in two months (!), demonstrating already then his daunting capacity for work, unattainable for many professors and scientific researchers.

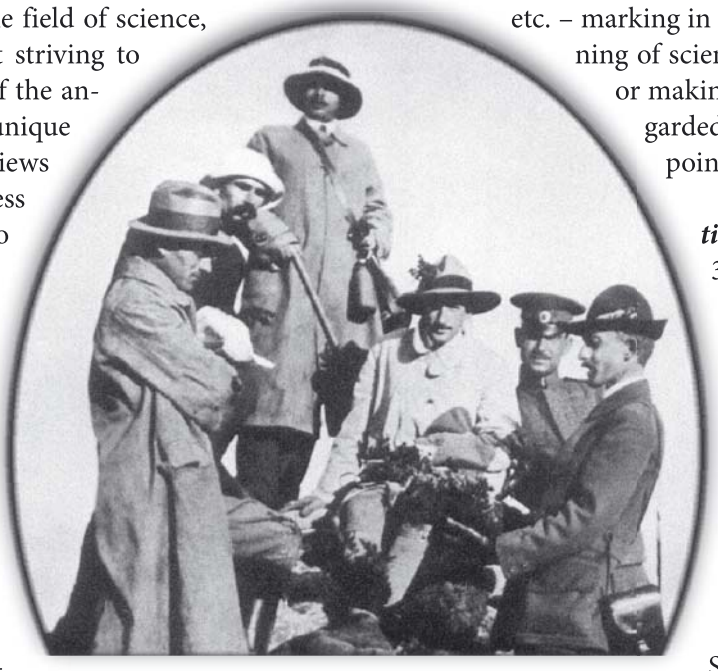
B. Stefanov, Assist. Prof., Department of Botany, Agronomy and Forestry Faculty, Sofia University, 1925.

As a lector, B. Stefanov did not show any great speaker's gift, he rather belonged to those professors who "read" their lectures in a flat and monotonous voice, without pathos and amusing departures. However, his textbooks and his lectures were full of insight and state-of-the-art scientific achievements and it was enough to lend an attentive ear so as to realise what a profound scientific erudition the lector had and how high was the scientific level of the material he was teaching. He was calm, patient and well-meaning to students during examinations, fair at evaluating their knowledge, without pettiness, honourable and behaving as a great man and scholar. Students were well aware of these qualities and hold him in high respect and admiration. He was one of the longest remembered professors and people felt proud that they had studied under him.

The rich scientific creative work of B. Stefanov comprises over 170 publications: books, monographs, studies, articles and communications, without which the present advancement of Bulgarian botany and forest biology would have been unimaginable. About 100 of these publications are on botanical or predominantly botanical matters, as conditional and subjective such a differentiation might seem in some of the cases. Already in his opening Associate Professor's lecture "*Forestry and botany*" (1928) he indicated his future road as teacher and scholar, followed by him unswervingly until the last days of his life: a rather difficult and overwhelming task for many people, but not for B. Stefanov. A more detailed familiarisation with his works can certainly arouse admiration and respect for the insight and comprehensiveness of his thought, for his original views and ideas, his extensive knowledge in various scientific fields, and for his literary erudition. It requires complete mobilisation of attention and a great intellectual effort to read his works, and although one might come across an occasional inexactness of detail in the text, or some of his conclusions and ideas might give rise to doubts or difference of opinion, one cannot but admit that they had been written by a scholar of great magnitude, who occasionally threw the reader in despair and stirred an inferiority complex in him. It is beyond any doubt that had B. Stefanov lived and worked in one of the great botanical centres in Europe – in London, Berlin or Vienna – or had at least all his major works been written in one of the popular languages of the West, had he been not so patently unwilling to travel abroad and take part in international congresses, symposia or conferences ("*I'd rather stay at home or in my study and write, read or think of what I have read*."), he would have joined the ranks of the leading names in European botany of his time. This does not mean in the least that B. Stefanov was unknown to the scien-

tific world. On the contrary, his works were often cited and had been held in the highest esteem by prominent scholars in botany. No one commencing now some serious studies of the Bulgarian and Balkan flora and vegetation, of some of the large plant genera and groups, such as *Quercus*, *Colchicum, Hypericum*, and *Coniferales*, or of the history of vegetation in Bulgaria, of ecological evolution of arboreal plants, etc., could manage to do this without reading his works.

A distinguishing feature of B. Stefanov as a scholar was his refusal to be a slave to names, authorities and popular theses in the field of science, as well as his consistent striving to probe into the essence of the analysed problems in his unique way, to hold his own views and opinion, to express his own thoughts, and to propose his own original theories and hypotheses ("*Among the other things, the scholar must have a creative imagination.").* In this respect he had no likes in Bulgarian botany and dendrology.



B. Stefanov (endmost left), Nikolai Stojanov, Boris Ahtarov, Tsar Boris III, and Dr Ivan Bouresh at a botanical outing in the Rila Mts, peak Belmeken, 6th September 1919.

In the following pages I shall try to analyse in brief the creative botanical work of B. Stefanov, being well aware how difficult and responsible that task is and never forgetting his words, "*My works could be assessed objectively only by a more clever person than me*." I am far from any such claims but still remain confident that in science as in art any significant achievement sooner or later will be duly allotted its true worth and recognised accordingly. I hope that this article is a step in this respect.

B. Stefanov embarked on his scientific career immediately after the end of World War One. Several years earlier another great name in Bulgarian botany, N. Stojanov, also commenced his career. As it was already mentioned above, close friendly and creative relations were established between N. Stojanov, B. Stefanov, B. Ahtarov, I. Bouresh and Tsar Boris III, encouraged by their common love for Bulgarian Nature and their enlighteners' zeal to study it, as well as by the wish to enrich the collections of the newly opened Botany Department with the Royal Natural Sciences Museum. Until then, with few exceptions, botanical studies in Bulgaria were confined only to the domain of floristics, because the rich and diverse flora of the country was still insufficiently studied and very strongly attracted the attention of botanists. Both N. Stojanov and B. Stefanov began their research work in the field of floristics, but soon expanded the range of their scientific interests to other spheres – taxonomy, phytocoenology, phytogeography, paleobotany, etc. – marking in many of them the beginning of scientific studies in Bulgaria, or making achievements to be regarded as ABC and a starting point for future researches.

In the field of ***floristics*** B. Stefanov left about 35 publications most of which, especially in the first 10–15 years, written in co-authorship with N. Stojanov. The main object of their floristic studies was the "new lands" added to Bulgaria after the end of the war: Mt Strandzha, Pirin Mts, the Valley of Strouma River, Eastern Rhodopes, Mt Belasitsa, Mt Slavyanka, but also the Black Sea Coast, the low calcareous mountains in West Bulgaria, Western Balkan Range, Central Rhodopes, etc. Much later, without setting himself any specific floristic tasks, B. Stefanov continued to publish articles and communications with interesting floristic data established by him during his numerous scientific tours of the country, thanks to his amazing ability to "grasp" everything new and interesting in the environment. ("*My power of observation has helped me fathom many secrets of Nature and see things that remain hidden and unfamiliar for many*."). The new to Bulgaria taxa reported by him independently or in co-authorship amounted to 228 (178 species, 44 varieties, 3 forms and 3 hybrids), of which only an insignificant number was eventually claimed as improperly reported for the country (Supplement 1). Of these, one species is new to Europe: *Scila bithynica*

Prof. B. Stefanov with forestry students at an outing in Mt Lyulin, May 1940.

while other 9 were new to the Balkan Peninsula: *Carex rupestris, C. pilulifera*, *Gentiana engadinensis, Ligularia glauca*, *Fagus orientalis*, *Ribes nigrum*, *Saussurea discolor*, *Sideritis taurica* (= *S. syriaca*), *Kobresia bellardii* (= *Kobresia myosuroides*).

Credit for the discovery, independently or in co-authorship usually with N. Stojanov), of 26 genera new to the flora of Bulgaria also goes to B. Stefanov: *Cachrys*, *Caluna*, *Cardamine*, *Centranthus*, *Centunculus* (*Anagalis*), *Claytonia* (*Montia*), *Epimedium*, *Erica*, *Frankenia*, *Glinus*, *Hedypnois*, *Hymenocarpus*, *Ilex*, *Isoëtes*, *Ligularia*, *Limosella*, *Lotononis*, *Lupinus*, *Mespilus*, *Osyris*, *Ramonda*, *Serapias*, *Sida* (*Malvella*), *Theligonum*, *Tillaea* (*Crassula*), *Trixago* (*Bellardia*).

The active early collaboration of N. Stojanov and B. Stefanov reached its peak in 1924–1925, with the publication of *Flora of Bulgaria*, which underwent three more editions with time, the last in 1964–1965, jointly with B. Kitanov. The emergence of the *Flora of Bulgaria*, preceded by several extensive articles summarizing the work of the two authors (*Grasses* (*Gramineae*) *in Bulgaria*, 1921; *Legumes* (*Papilionaceae*) *in Bulgaria*, 1922; and *List of plants occurring in Buglaria*, 1922), was a top accomplishment of Bulgarian botany that rendered a strong impetus to its further development. Until that time, plants occurring in Bulgaria were determined with the help of *Flora Bulgarica* and *Flora Bulgarica. Suplementum* I by J. Velenovský (essentially, rather extensive and generalising floristic contributions), *Flora of the Kingdom of Serbia* by J. Pančić, and *Flora of the Environments of Niš* by J. Petrović, as well as of *Flora Orientalis* by E. Boissier, *Spicillegium florae Rumelicae et Bithynicae* by A. Grisebach, and a couple of other works by foreign authors. That is why, in the publications of our first botanists (Stefan Georgiev, Ivan Urumov, Bozhimir Davidov, Andrey Toshev, etc.) one often encounters improperly determined and reported plants for the country. It was surprising how the young authors (N. Stojanov was 37 and B. Stefanov merely 26) managed to finish the book (amounting to 1367 pages!) merely in three years (!), while managing along with that to publish (independently or in co-authorship) another 15 articles (!), tour the country and collect enormous quantities of herbarium materials, and hold classes with students… ("*While we were writing the Flora, we often stayed in the lab until the morning, just taking a nap on the tables for a couple of hours. We were full of such godly vigour! Alas, this is the privilege of youth*!").

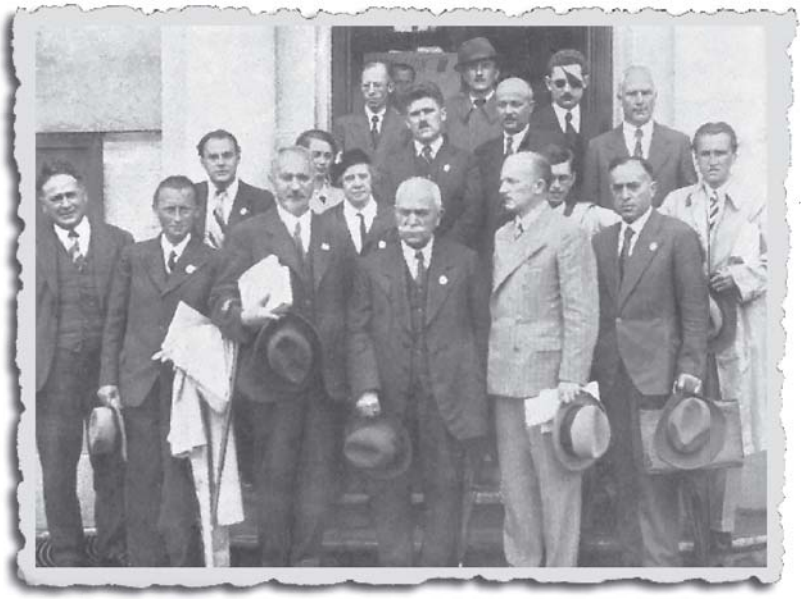
The *Flora of Bulgaria* was greeted happily by everybody with any interest in the Bulgarian and Balkan flora. The reviews of prominent European botanists, such as A. Hayek, W. Turrill, K. Krause, J. Mattfeld, etc. were more than positive. Irrespective of the multivolume *Flora of the Republic of Bulgaria* published in the last decades, which undoubtedly represents a new and higher stage in the taxonomic, floristic and chorological investigations of the country, the good old *Flora of Bulgaria* by Stojanov and Stefanov still holds its ground. It would be good to see a new edition of it, with the respective nomenclature, taxonomic and chorological corrections and addenda made by young florists and taxonomists. Very useful for florists was also the *Topographic Flora of Bulgaria* (1932, in co-authorship with D. Jordanov, in German) that has become long ago a bibliographic rarity. It illustrated the first attempts at florisitc regionalisation of Bulgaria, adopted in the multivolume *Flora of the Republic of Bulgaria*.

Special mention deserves B. Stefanov's extensive article *Historical review of studies into the flora of Bulgaria* (1930) in which he summarised the results of the earlier floristic studies in the country by foreign and Bulgarian authors, and concluded it by analysing the occurrence of various phytogeographical elements in Buglaria.

Early in the 1960s, B. Stefanov started to evince a marked interest in the bryoflora of Bulgaria, accumulated a large personal herbarium (with over 10 000

specimens) and published two bryological articles: an overview jointly with Slavcho Petrov (1962) and *A supplement to the bryological flora of Bulgaria* (1971), in which he reported 16 moss species new to the country (Supplement 1).

The rich herbarium of B. Stefanov, containing materials from all over Bulgaria collected in the course of 70 years, is stored now at the Agrarian University in Plovdiv (SOA). His most interesting plants are deposited there, including the types of new to science taxa. A considerably lesser number of plants collected by him are deposited in the herbarium collections of the Faculty of Biology of Sofia University (SO) and of the Institute of Botany with BAS (SOM). These herbarium materials, as well as the material collected together with N. Stojanov, were always of invaluable help in the floristic and taxonomic research, in the development of various *Floras*, monographs, dissertations, etc.



Prof. B. Stefanov (endmost left, front row) with participants from the Biological Section of the 4th Congress of Slavic Geographers and Ethnographers. Among them are Prof. N. Stojanov, Prof. Daki Jordanov, Dr B. Ahtarov, Prof. Karel Domin, Prof. František Novák, Prof. Josef Dostál, Prof. Ivo Horvat, Prof. Bogumil Pawlowski, etc., Sofia, 1936.

B. Stefanov also made a great contribution to ***taxonomy***. Independently or in co-authorship, he described four new to science genera (*Petkovia*, *Jasionella*, *Urumovia*, *Dimitrina*), 44 species, including some of the most interesting Bulgarian endemics: *Colchicum davidovii, Gypsophila tekirae*, *Hypericum setiferum*, *Centaurea parilica*, *Jasionella bulgarica*, *Scabiosa rhodopensis*, *Geum rhodopeum*, etc., 31 varieties, 4 forms and 2 hybrids that have mostly retained their taxonomic value ever since (Supplement 2). Stefanov also changed the taxonomic rank of a great number of taxa, or included them into new combinations.

Most of the new to science taxa had been described in the floristic publications of Stefanov, but along with them he published half a score of strictly taxonomic articles, in which he had developed single genera, sections or groups of species and had presented his theoretical views on the volume of species and the other taxonomic units, on the mechanisms of speciation and taxonomic methods, on phylogeny and evolution of the plant world.

Biological interpretation of the species (resting on reproductive isolation), genetic interpretation of speciation (caused by gene and chromosome mutations) and divergence of biological species (which implied recognition of the geographical, apomictic and aggregate species): all these concepts underlying now every contemporary taxonomic work had not been fully established and developed then. In the *Flora of Bulgaria* Stojanov and Stefanov showed themselves as typical representatives of the Central European Polytypic School (A. Engler, P. Ascherson, P. Gräbner, G. Hegi, etc.), according to which the species is a major taxonomic unit, in many cases comprising the smaller taxa (subsp., var., f.), differentiated between themselves by the degree of their morphological differences. With time, that view of both scholars underwent certain evolution in conformity with the fast development of taxonomy. N. Stojanov upheld the so-called dynamic line, according to which the species was regarded within a broader framework and included some smaller taxonomic units, whose subordination reflected the kinship ties existing between them. B. Stefanov regarded the species as a dynamic system of related individuals subjected to constant change in the course of their development and, owing to this, lacking a specified volume. In terms of this, the rank of a given taxon is of secondary importance. The main thing, according to him, was to cover the most important moments reached by a specified genus (he identified the taxonomic concept of genus with the concept of genetic group) and to establish the kinship ties between the species within the framework of subsection, section and subgenus. Stefanov regarded the so-called

Prof. B. Stefanov among colleague-professors from the Agronomy and Forestry Department of Sofia University.

"Linnaeus species" within more narrow boundaries and tended to describe the smaller endemic species, instead of considering them as units subjected to a species, which is regarded now by taxonomists as a more realistic approach.

As far as the mechanisms of speciation (or the form-differentiation process, according to his terminology) were concerned, contrary to most his contemporaries Stefanov rejected the role of hybridisation and mutations. According to him, these ways of form-differentiation were possible only by way of artificial selection, but not in the natural environment, where the characteristics obtained by means of hybridisation and mutations dissolved and got smoothed out by the population. In his opinion, form-differentiation was a phenomenon triggered out by changes in the environment and carried out under the control of natural selection.

Practically, Stefanov applied these ideas of his in all his taxonomic works and had presented them theoretically in great detail in the *Geographical distribution of Conifers and form-differentiation in the natural environment* (1940).

Again contrary to the opinion of most authors, who maintained that a new taxonomic unit originated in one or several isolated centres from single or a small number of individuals, followed by multiplication of these individuals and expansion of the area, Stefanov upheld the theory of spatial character of form-differentiation and integral origination of the areas, resting to one or another extent on the ideas of G. Saporta, Morion, H. Guppy, Cajander, G. E. Du Rietz, D. Rosa, and I. Paczoski. According to that theory, the new forms (taxonomic units) originated spatially on the entire surface of the area, and thus the area of each species outlined its true size along with the appearance of the species itself, while its present size should not be always regarded as a consequence of the movement or migration of species. These ideas had been theoretically presented best by Stefanov again in the *Geographical distribution of Conifers and form-differentiation in the natural environment* (1940), as well as in the *Monograph on genus Colchicum L.* (1926), dubbed by him as "*an offspring of an original idea of mine*." The essence of that idea was, in fact, that the path of generic differentiation forked out under the influence of a general specificity of the Mediterranean climate (two nearly equal climatic seasons: spring and autumn), and in one and same place within the entire primary area there existed conditions for appearance (from a general initial form) of species with almost simultaneously developing leaves and flowers, and of species with leaves developing after flowering. Subsequently, all other species derived by local differentiation out of these.

The *Monograph on genus Colchicum L.* was the first and only world monograph on a plant group written by a Bulgarian author. It is still recognised as one of the best taxonomic studies into that genus. Mention deserves the fact that it was included then in full in the second edition of A. Engler and K. Prantl's classic *Die natürlichen Pflanzenfamilien*. The principal method used in his taxonomic works by B. Stefanov was the morphological and geographical approach (the main taxonomic method in the first half of last century), but he often combined it with the ecological and occasionally with the anatomical method. It could be said that B. Stefanov was the first to apply the ecological method in taxonomy in Bulgaria. In its use he was guided by the following major principles: 1. the evolution and form-differentiation in a given group (section,

subgenus, genus) advances from the hygrophilous to xerophilous representatives; 2. the herbaceous representatives in the group are a secondary type; the evolution and form-differentiation in them advances from perennial hygrophytes to annual xerophytes. These major principles were particularly distinctly applied and developed theoretically in his extensive articles *A contribution to differentiation of species of genus Centaurea L., section Cyanus DC.* (1934, in co-authorship with T. Georgiev) and *Systematic and geographical study of the Mediterranean and Oriental representatives of genus Hypericum L.* (1932–1934).

Acad. B. Stefanov with his granddaughters Ralitsa and Boryana, his daughter Milka and his wife Raina, August 1960.

B. Stefanov also dwelt on some more global problems relating to phylogeny and evolution in the plant world. According to him, the evolutionary history of organisms could not be presented in the form of the so-called phylogenetic development, regarded by him as an imaginary process. Instead of seeing in the different genetic groups a system of phylogenetically appearing branches, originating from constant branching of one or several initial lines of development, he produced sufficient evidence of the polygenic character of evolution, of the existence of a great number of development lines which, although often very identical, had apparently appeared at random. Therefore, the different groups could not be arranged into a single phylogenetic development scheme, which did not exist at all, and the efforts of specialists in systematics should focus on identifying the natural volume of the groups and their distribution within a single system that would determine their relative place in the general scheme of the evolutionary history of organisms (*Geographical distribution of Conifers and form-differentiation in the natural environment*).

From the viewpoint of contemporary biological knowledge, the ideas of B. Stefanov on form-differentiation (speciation), chromosome theory of heredity (he rejected it) and phylogeny cannot be generally accepted, although they contain many true findings and rational moments. The reason for their present inconclusiveness is not only historical – i.e. was not only in the absence of sufficiently convincing evidence available then to science, on which he could rest that case – but also consists of his style and character as a scholar and researcher. His views on these and on many other botanical and general biological issues stood out, as was mentioned above, with original notions and new ideas. They did not conform to the authorities and the generally accepted theses, but were subjected to a scientific logic and inner confidence of his own. Occasionally wrong or unconfirmed by time, they still continue to amaze the specialists with the profundity and entirety of the author's thought, and with his predominantly exact inferences and proper insights.

To commemorate the respect and recognition of B. Stefanov's services to floristics and taxonomy, the genus *Stefanoffia* H. Woolff. was named after him, as well as the species *Campanula stefanoffii* Herm., *Hieracium stefanoffii* Zahn, and the varieties *Cytisus austriacus* L. var. *stefanoffii* Stoj., *Anthemis montana* L. var. *stefanoffii* Penzes, etc.

B. Stefanov made an important contribution to ***phytocoenology*.** His first publication *Notes on the vegetation of Western Thrace* (1921) belonged to that field, comprising the results from his researches during World War One in the region of Dedeagach (Alexandroupolis) and the lower reaches of Mesta River. That work was the first major contribution to the vegetation and flora of Western Thrace and was strongly telling of the potential of the young author. It contained the physical geographic characteristics of the region, description of the plant formations spread there and a list of identified plants, 90 species of which were new to that part of the Balkan Peninsula. The following year came out his collective work with N. Stojanov *Phytogeographical and floristic characteristics of the Pirin Mountains (*1922), in which the main

plant formations in that mountain, totally unknown botanically until then, were analysed concisely. Two years later B. Stefanov published an article on the forests in Mt Strandzha (*Forest formations in the north Mt Strandzha*, 1924): the most interesting mountain in Europe phytocoenologically and phytogeographically. The article was the first more detailed and systematic study into the forest vegetation of Mt Strandzha, although related only to its smaller, Bulgarian part. Contrary to the formerly obtaining ideas that vegetation in Mt Strandzha is Mediterranean in character, Stefanov definitely corroborated its Pontian type and maintained that Pontian vegetation was distributed in a modified way in Mt Strandzha, and even reached as far north as the eastern parts of the Balkan Range.

First of its kind in Bulgaria was his article *Materials for studying peat-bog vegetation in the Western Rhodopes (Mt Dospat)* (1931, in co-authorship with D. Jordanov) in which he analysed the peat-bog vegetation in that part of the country and its relation to the various types of peat-bog vegetation in Europe.

Special mention deserves B. Stefanov's extensive article *A contribution to the research and classification of oak forests in Bulgaria* (1943–1944): the first extensive and profound study into the origin, distribution, composition, ecological characteristics, and classification of oak forests in Bulgaria, of their contemporary status and the reasons for it, and the ways for their artificial regeneration. This was one of his most frequently cited articles in the phytocoenological literature that had become long ago a vademecum to each botanist and forester engaged in studying the oak forests of Bulgaria.

Another important article was *On specifying the methods for studying pasture and meadow vegetation* (1945–1946). In it Stefanov offered his own methodology for studying the meadows and pastures in Bulgaria and analysed the distribution, floristic composition, economic status, etc. of the various types of grassy communities.

The ***phytogeographical*** contributions of B. Stefanov claim a special place in his scientific work. His qualities as a botanist and scholar of great magnitude stand particularly out in them. These works relating not only to phytogeography of Bulgaria, but also dwelling on problems related to the origin, ecology and evolution of the plant world, amounting to 1500 pages altogether, have been often cited in the Bulgarian and foreign literature, have been greatly praised and have gained him the recognition of a number of prominent scholars (A. Krzysztowicz, I. Paczoski, L. Berg, etc.), thus establishing Stefanov as one of the greatest botanists in the Balkans.

An attempt at establishing parallel classification of climates and vegetation types (1930) is among the basic and earliest phytogeographical works of B. Stefanov. Proceeding from the long proven fact that physiology and biological characteristics of a given type of vegetation are closely interrelated with the respective climatic characteristics, he created his own vegetation-climatic classification in which the major climatic types and the respective vegetation types were genetically interrelated. That originally substantiated and differentiated climatic and vegetation classification of B. Stefanov rested on his ideas that contemporary geographical distribution of vegetation had resulted from a lengthy adaptive evolution, controlled exclusively by the environment and, in the first place, by the climatic conditions, while insular (oceanic) climate was essentially the most primordial environment in differentiation of terrestrial vegetation. As a primordial vegetation type, that insular vegetation, originally composed of evergreen hygrophytes with xeromorphic structure, had given a start to all vegetation types whose differentiation was triggered out by the adverse impact of draught and fluctuating low temperatures. Stefanov's ideas presented in that article were then embraced by the world famous Russian geographer and zoologist, L. Berg, who reproduced them later in his book *Climate and Life* (1947).

B. Stefanov expressed his major ideas about the evolution of vegetation in Bulgarian lands and generally in Europe in his book *Origin and development of the vegetation types in the Rhodopes* (1927) and subsequently furthered them in his next substantial phytogeographical works (*Phytogeographical elements in Bulgaria*, 1943; *Status and biological peculiarities of Bulgarian forest vegetation*, 1950; and *On the ecological evolution of the Thraco-Byzantine relict and endemic flora,* 1963, in co-authorship with B. Kitanov). These ideas of his were reduced to the following principal points: under the progressive continentalisation of climate the spatially homogeneous and ecologically hygrophilous Oligocene-Miocene vegetation of Europe (and of the entire temperate zone in the Northern Hemisphere) had differentiated into single, ecologically strongly different, but genetically close vegetation types, marked by him as microther-

mic, mesothermic and thermophilous vegetation. The kinship ties between these types had been preserved until our time and were easiest to trace out in the mountains of Southern Europe, where the richest relict centres were situated. These genetically close types, whose formation had started already in the Early Miocene, constitute the contemporary vegetation cover of Europe from North to South, as follows: the microtherms, or vegetation of Boreal Zone (the northernmost parts of Europe); the mesotherms, or the Central European zone; and the thermophytes, or the Mediterranean zone. The succession outlined in the distribution of vegetation from North to South had its analogue in vertical direction, most pronounced in the mountains of Southern Europe, where the main (basal) belt corresponded to the Mediterranean (thermophilous) zone, the mountain belt corresponded to the Central European (mesothermic) zone, and the alpine belt to the Boreal (microthermic) zone.

Continentalisation of climate, stepped up historically as a natural process by the many-sided anthropogenic activity, resulted in gradual transformation of the formerly strongly mixed hygrothermic forest formations consisting of a great number of species into poor and unvaried forest coenoses, whose end stage in Eastern Europe and particularly in Bulgaria was marked by unvaried oak forests, with a poor grassy soil cover, distinguished by a poor reproduction potential and slow regeneration, which invited the assumption that in our time they have acquired relict character. Or, to put it short, the ecological evolution of forest vegetation had advanced from the wet mixed forests, composed of a great number of species and with the greatest participation of ancient relict endemics, towards dry oak forests, composed of one or several oak species and further on towards gradual dying out of the forests and their replacement by the stony and rocky xerothermic terrains and the dry steppe meadows. As far as the coniferous vegetation was concerned, which in Stefanov's opinion was of a relict vegetation type, it was best preserved in Bulgaria in the Rilo-Rhodopean massif, i.e. in that part of the country, which had the highest, vastest and wettest mountain surface. In all other Bulgarian mountains the conifers were in the form of isolated plantations or single trees. This invited the conclusion that earlier they used to cover almost entirely the mountain relief of the country, including its lower parts.

These ideas of B. Stefanov gave rise to further thoughts about gradual replacement of the coniferous forests by deciduous (chiefly by beech and by the supplementary hornbeam, maple and ash-trees, including some oak species), stepped up historically to a great extent by the anthropogenic influence. This, in turn, determined the content of his practical recommendations for the use and management of forests and afforestation of barren places.

Emphasizing repeatedly the homogeneous character of the formerly Oligocene-Miocene vegetation of the entire Northern Hemisphere, B. Stefanov at the same time defended his ideas that its present composition (including in Bulgaria) did not result from migrations from North to South, or from migrations from South to North during the Glacial and Interglacial periods, as it was maintained by many other authors, but that it had to a great extent an autochtonous character, i.e. it had originated on the spot from the initial composition of contemporary vegetation, starting out as early as the Miocene. Its contemporary status of fragmentation and local differentiation resulted from geological and climatic changes.

Undoubtedly, the most significant work of B. Stefanov not only in the field of phytogeography, but in his overall botanic lifework was the hefty *Phytogeographical elements in Bulgaria* (1943), based on ample facts, with many lists, tables, maps, etc. In it, the author presented an original classification of his own of the vegetation types and of the phytogeographical elements in Bulgaria, as well as his own original phytogeographical regionalisation of the country.

Assuming that the territory of one phytogeographical area represented the centre of irradiation of the systematic units, species distributed in the Bulgarian flora Stefanov classified on the basis of their phytogeographical belonging, as follows:

1. Thermophytes of the Mediterranean Centre
2. Thermophytes of the South Continental Centre
3. Thermophytes of the North Continental Centre
4. Mesotherms and microtherms of the Sylvo-Boreal Centre
5. Thermophytes, mesotherms and microtherms of the Mountain Centre
6. Plants from other phytogeographical centres which penetrated into Bulgaria by secondary population movement.

In the plant cover of Bulgaria, the mountain elements, i.e. the plants from the Mountain Centre to which geographically the entire surface of the country belongs, were the prevailing phytogeographical group, and that element in the strength of its number of species was almost as important as the remaining phytogeographical groups taken together. That was convincing evidence in support of the fact that contemporary Bulgarian flora was to a great extent autochtonous in character. The high percentage of endemics in the composition of plants from the Mountain Centre, amounting to about 25 %, also supported that.

The author subdivided Bulgaria into the following phytogeographical regions:

1. Coastal Region
2. Danube Riverine Loess Region
3. High Plains of West Bulgaria
4. Phytogeographical centres in the Rila and Rhodopi Mts
    a. Thermal Belt in the Rila-Rhodopean Massif
    b. Mountain Centre in the Rila-Rhodopean Massif
5. Phytogeographical centres in the Bulgarian Balkan Range
6. Mountain surfaces in Southeast Bulgaria, each characterised with the above listed phytogeographical elements distributed in it.

A much later published book by B. Stefanov, *Cultigen plants and cultigen vegetation in Bulgaria* (1962, in co-authorship with B. Kitanov) was a continuation of *Phytogeographical elements in Bulgaria*. In that book he dwelt on a number of interesting questions related to the essence and origin of anthropophytes, and especially of the anthropophytes in Bulgaria (systematic review, irradiation, secondary and cultigen phytocoenoses, Bulgaria as a secondary centre of cultigen form-differentiation and acclimatisation, etc.). The book rested on the idea that most anthropophytes proper (the so called weeds and simples) were cultivated in ancient times by man for a variety of needs (some weeds have been cultivated ever since) and subsequently abandoned, or at least they were used (formerly and now) without certainty whether they were cultivated. That thesis contradicted the thesis of spontaneous emergence of the anthropophytes and their use as a source material for cultivated plants. Such understanding of the problem presumed that weeds and simples existed prior to man's creating any conditions for them, i.e. prior to the dawn of economic activity and the movement of peoples, which could hardly be accepted as probable.

B. Stefanov had interesting and original ideas on the essence of relict plants and relict element in the Bulgarian flora, developed in more detail in his articles *Remarks upon the relict distribution of plants* (1936) and *On the ecological evolution of the Thraco-Byzantine relict and endemic flora* (1963, in co-authorship with B. Kitanov). Stefanov rejected the then popular *Age and Area* theory of J. Willis (1923), according to which the older a species was, the broader was its area. He also rejected the theory of N. Stojanov (1930) that in the life of species, as in the life of the individual, there were three stages (phases) of development: emergence, progression and regression. According to Stojanov, relicts were plants in regression or in the degenerative phase of development, that is why in another of his articles (1934) he called them perishing plants.

According to Stefanov, relicts were often systematically well differentiated species, with a more primordial structure and physiological organisation, strongly specialised according to environmental conditions and a limited range of adaptability. In other words, from the viewpoint of ecological evolution, relicts were paleomorphic plants of low vitality that limited their ability to compete with the ecologically more adaptable and more vital species. The idea that relicts were organisms in a degenerative phase of development could not be true, because each organism was basically characterised by an ability to invariably retain its vitality as long as it was able to adapt very sharply. Thus a species either got localised only in some of its habitats as a relict, or it became extinct.

In his phytogeographical works B. Stefanov dwelt to one or another extent on a number of other problems, which in his time and even now had strongly attracted the attention of botanists and often gave rise to lively disputes and discussions. Such were the problems related to endemism (Bulgarian and Balkan), distribution and origin in the Bulgarian lands of the steppe, Mediterranean and Submediterranean flora and vegetation, vegetation on calcareous terrains, etc.

From the viewpoint of endemically localised areas, Stefanov regarded the Balkan Peninsula as an independently differentiated phytogeographical unit, in which Bulgaria fell under the influence of four endemic centres, namely: Serbo-Illyrian, Greco-Macedonian,

Aegean-Rhodopean, and Thraco-Byzantine. For the first time in Bulgaria (1943) he reviewed thoroughly the Bulgarian endemics, pointing out their relation to each of the centres and their belonging to one or another type of endemism: stable (conservative, paleoendemism), or variable (polymorphic, neoendemism). Mention deserves the fact that analysing not only the endemics but relicts, anthropophytes, phytogeographical elements, etc. too, B. Stefanov always attached complete lists of the respective plants, instead of only using several typical examples, as most authors did.

Stefanov opposed the idea upheld by many authors that prior to glaciations Pontian flora and vegetation was spread over the entire Mediterranean region. The character of the contemporary Mediterranean flora (its great abundance of old and well differentiated systematic units and a great number of endemic genera and species, etc.) suggested that it was differentiated in ancient times, prior to glaciations, while the present northern borderline of the region was set by the area of olives and some other evergreen xerophytes. Localisation of a number of Mediterranean species in specific habitats in South and North Bulgaria, according to Stefanov, indicated that emergence of the Mediterranean element in Bulgaria was connected to two temporally different historical phases. In one of these the Mediterranean element was outlined as part of the primordial composition of the plant cover, while in the other as an element that had penetrated historically into the country by secondary movement of the areas of some species. Initial centres of that penetration were East Macedonia and Southern Thrace, which were geographically most closely connected with the territory of Bulgaria.

As far as the origin, distribution and naming of the Submediterranean flora and vegetation in Bulgaria were concerned, B. Stefanov entertained the following opinion: prior to glaciation, the mesophilous flora and vegetation, which had remained almost unchanged in the Pontian region, was spread uninterruptedly from the westernmost part of Europe to the present Pontian region, including in the Bulgarian lands. Later on, in the transitional zone between the Mediterranean and Temperate Europe, as a consequence of the insetting climatic changes, the mesophilous flora and vegetation was replaced by subsclerophilous, called by N. Stojanov (1922) and most other authors "Submediterranean". In principle, Stefanov also accepted that name, but along with this thought it more proper to call the East European Submediterranean Zone "Continental Mediterranean", and the Western Zone "Atlantic Mediterranean", because these two concepts more truly corresponded to the status of the flora and vegetation in the basal (main) belt of Bulgaria (*Forest formations in the north Mt Strandzha*, 1924).

One of the hottest discussed questions in Bulgaria already in the first decades of the last century was related to steppe vegetation: were there in Bulgaria natural steppe areas, where were they spread, where they originated from, was there steppe vegetation in Bulgaria during some phase of the Pleistocene, etc. Stefanov took an active part in these disputes, on which we need not dwell here, except for pointing out that, contrary to most other authors, he rejected the theory that during some phases of the Pleistocene steppe vegetation was distributed in Bulgaria. He regarded as improbable the standpoint that the dry meadow communities (i.e. the steppe regions) emerged in later times from the expansion of species of the South Russian steppes. He produced evidence that besides the species that had migrated from the South Russian steppes, among the plants on terrains covered with steppe vegetation in Bulgaria there were plants obviously residual from an ancient, gradually disappearing flora that had emerged directly from the primordial composition of contemporary vegetation in the Bulgarian lands (*Phytogeographical elements in Bulgaria,* 1943)

Stefanov upheld a similar idea about the origin of the flora and vegetation on calcareous terrains in Bulgaria. In his opinion, calcareous terrains were not only a refuge for xerotherms in a period unfavourable for them, as many authors maintained, but were also a primary source, onto which the xerotherms had occasionally extended their areas later on. Penetration and localisation of xerotherms on calcareous terrains in Bulgaria had taken place historically with the participation of man (*Forest formations in the north Mt Strandzha*, 1924; *Origin and development of the vegetation types in the Rhodopes*, 1927).

Stefanov also founded the ***morphological*** and ***anatomical*** line of studies into arboreal plants in Bulgaria. Some of his studies were carried out to resolve taxonomic (for instance, *Notes systématiques sur le Pine Leucoderme*, 1932) or organogenetic (for instance, *Über das morphologische Wesen der Phyllokladien bei Asparagus L.*, 1932) tasks, but usually he sought to find morphological and anatomic evidence in support of

his theories on form-differentiation or ecological evolution of arboreal plants (*An attempt at establishing parallel classification of climates and vegetation types*, 1930; *Geographical distribution of Conifers and form-differentiation in the natural environment*, 1940; *Über das Wesen und die Morphogenie des fruchtbildenden Organs bei den Samenpflanzen*, 1936; *Über die parallelen Beziehung in der Entwicklung des Leitungs – und Blattsystems unter Berücksichtigung der ökologischen Entwicklung der Landvegetation*, 1937; etc.). That morphological and anatomic evidence gave him sufficient grounds to maintain that the evolution of terrestrial plants had followed a line of adaptation to the drying out of atmosphere and, considering the fact that it was the conducting system that was the main structural factor, adaptation in fact took place, above all, through formation of the conducting system, followed further by formation of the tracheids and vessels. Parallel to development and sophistication of the conducting elements, leaf organs developed and got more sophisticated. There was a parallel dependence between the degree of development of the conducting system and phylogeny of a given vegetation group. Hence, he came to the conclusion about the relict character of conifers, which with their more primitive conducting system showed that they had completed their evolution already in the Paleozoic.

Stefanov's articles mentioned by us, which occasionally showed closeness of ideas with I. Baily and his school (F. Frost, W. Tupper, V. Cheadle) known for their works into the phylogenetic anatomy of arboreal plants, were held in high esteem by many prominent scholars of that time and brought him recognition as one of the leading specialists in these difficult theoretical fields of botany, in which few had the erudition and potential to analyse and generalise the enormous volume of facts from different natural scientific branches.

B. Stefanov was the initiator of the ***physiological*** line of study of arboreal plants in Bulgaria and founder of the Bulgarian school in that field. The main problems which incited his interest in these studies, conducted mainly by analysing transpiration, were related to the drought resistance of arboreal plants. The inferences he came to were that drought and continental climate were best resisted by those tree species which transpired most intensively, had highly conductive timber, a deep root system, and manifested drought resistance (*Studies of the fluctuations of water content in the leaves and twigs of some arboreal plants*, 1931; *On the water budget of arboreal plants*,1930, in co-authorship with Y. Stoichkov; *Studien über den Zustand und die Schwankungen des Wassergehaltes in den Blättern und Zweigen einiger Holzpflanzen*, 1931).

I would like to emphasise again that the anatomical, morphological and physiological studies of B. Stefanov, including the use of already known facts from anatomy and physiology, mainly had a strategic purpose: looking for evidence in support of his ideas and theories about the origin, phylogeny and ecological evolution of arboreal plants, elucidation of the essence of relicts, etc. The main inferences from these studies could be summarised as follows: 1. Evergreen sclerophilous hygrophytes were the primordial vegetation type, they were the starting evolutionary type for all remaining vegetation types; 2. The tracheid conducting system of conifers, i.e. their architectonic (structurally physiological) xeromorphism, determined them as a more primitive type of terrestrial plants, which biologically and ecologically belonged to the hygrophytes and not to the xerophytes and hence were bonded to more humid climatic conditions; 3. Herbaceous plants were a later evolutionary development, owing to their best developed conducting system. On these grounds B. Stefanov made some strictly practical recommendations related to the regeneration of forests in Bulgaria, creation of new afforested terrains, etc.

Subsequently, in the period 1955–1970, B. Stefanov in co-authorship with young colleagues published a string of articles in the field of physiology, generally dedicated to drought resistance of arboreal plants and mainly of practical forestry orientation.

B. Stefanov was one of the founders of ***paleobotanical*** studies in Bulgaria. In 1928 he published his article *Über einige recente und fossile Eichenarten in Bulgarien*, in which he analysed the kinship ties between some recent and fossil species of genus *Quercus*. Except for some earlier publications of the Austrian geologist F. Toula (1878, 1889) and of the Bulgarian geologist K. Krustev (again in 1928), comprising some paleobotanical data, the above-mentioned article by B. Stefanov should be regarded as the first paleobotanical article in Bulgaria.

In the next couple of years, in co-authorship with N. Stojanov and D. Jordanov, he published three extensive paleobotanical articles, which actually marked the beginning of paleobotanical research in Bulgaria,

and particularly of studies into the Pliocene flora and vegetation (*Beitrag zur Kenntnis der Pliozänflora der Ebene von Sofia* (*Fossile Pflanzenreste aus den Ablagerungen bei Kurilo*, 1929, in co-authorship with N. Stojanov; *Additional materials for studying the fossil flora of Pliocene formations at Kourilo village*, 1935 and *Studies upon the Pliocene flora of the Sofia Plain* (*Bulgaria*), 1935 in co-authorship with D. Jordanov).

In these articles for the first time were reported over 200 fossil Pliocene species (204 tree and shrub and four herbaceous species) in Bulgaria, accompanied with the following major theoretical conclusions: 1. The contemporary species composition of the flora of Southeastern Europe, including in Bulgaria, had formed chiefly during the Pliocene; 2. The overall image of vegetation in the Upper Pliocene resembled the contemporary vegetation and was composed of deciduous oaks as a prevailing arboreal element in the low and foremountainous parts of the country; 3. The climatic conditions during the Upper Pliocene resembled the contemporary conditions: rather dry continental climate that led to the emergence of a new type of forest communities composed of few in number xerophilous species.

Special mention deserves another article by B. Stefanov (in co-authorship with D. Jordanov), *On a fossil remain of Trichomanes sp. in the Pliocene deposits at Podgoumer village, Sofia district* (1932), reporting for the first time in the world practice a fossil find of a fern belonging to family *Hymenophyllaceae*.

The above-cited articles represented at their time the most comprehensive and thorough paleobotanical studies into the Pliocene flora and vegetation in the Balkan Peninsula, which explained the interest evinced in them and their frequent citing in literature.

Although many of the fundamental works of B. Stefanov contained inferences and recommendations of applied scientific character, he also worked on strictly ***applied botanical*** problems. Such were his articles *The grassy fodder resources of Bulgaria and the capacities for producing grassy fodder from local species* (1948), *Results of the studies into some perennial grass plants, with estimation of their use in the crop rotation, fodder production and land management* (1955), *On the use of perennial grass plants Elymus arenarius L. and Tripsacum dactyloides L. in the land management works* (1959).

B. Stefanov showed interest in making ***scientific knowledge popular***. He had written about 70 popular science publications: books, articles, communications, and other materials. Most of them related to the problems of Bulgarian forests (afforestation, planting and grassing, scientific and practical tasks in the domain of Bulgarian forestry, etc.). The rest of his popular science publications were of botanical or predominantly botanical content. Some of them were dedicated to interesting biological phenomena in plants (*Underground flowering*, 1932; *Sexual instinct of insects in service of cross pollination*, 1932; *Low winter temperatures and geographical peculiarities of the plant cover*, 1940, etc.); others to theoretical problems relating to the origin of plants (*Origin of terrestrial plants,* 1933), the struggle for survival (*Reasoning on the struggle for survival*, 1953), the forests and civilization (*Importance of forests for the material culture and future of civilization*, 1942); third to the life and work of prominent scholars (*Academician Prof. Dr Doncho Kostov 1897–1949*, 1952, 1960; *Studies of J. Pančić into the flora of Bulgaria*, 1967, in co-authorship with B. Kitanov); fourth to specific plants with valuable economic and decorative properties (*Alraun and ginseng*, 1937; *Black currants*, 1940; *Tea: a new culture in Bulgaria*, 1952), etc. Particularly interesting was his popular science book *Strange forms in plants. Adaptation and development* (1969) intended, according to the author, "*to aid any reader with attitude for reasoning in judging himself the power of Nature in modeling the plant organisms in full conformity with environmental conditions*," which represented one of the best accomplishments in this literary genre.

B. Stefanov did not like to talk about himself, nor did he enjoy any clamour around his personality. He was stranger to any ostentation and self-assertion. ("*A man is measured by what he leaves in this world. The rest are merely frills on his biography*"). He was completely engrossed in his science and served it honestly, selflessly and enthusiastically. He was a true scholar, one of the greatest names in the history of Bulgarian botany and forest biology. His scientific lifework goes far beyond the frontiers of Bulgaria and had long ago won him the recognition of a botanist of European magnitude, with whom should be familiar any author aspiring to study the Bulgarian and Balkan flora and vegetation, or questions pertaining to the domain of anatomy, physiology and ecological evolution of arboreal plants.

Supplement 1

New taxa for the Bulgarian flora discovered by acad. B. Stefanov (independently or in co-authorship)

[In brackets is current nomenclature and taxonomic status accepted in *Flora Reipublicae Popularis Bulgaricae* (1962-1995), *Flora of Bulgaria* (**Stojanov, Stefanov & Kitanov** 1966-1967) and *Flora Europaea* (1964-1980)].

Bryophyta

[**Stefanov, B.** 1971. Ergänzung zur Bryologischen flora Bulgariens. – Gorskost. Nauka, **8**(4):3-5 (in Bulgarian)]:

Amlystegium kochii Schimp. [= *Leptodictyum humile* (P. Beauv) Ochyra]
Bryum torquescens Bruch ex De Not
B. kunzei Hornsch.
B. pendulum (Hornsch.) Schimp. [= *B. algovicum* Sendtn. ex Müll. Hal.]
Calliergon trifarium (Web. & Mohr) Kindb. [= *Pseudocalliergon trifarium* (Fweber & D. Mohr.) Loeske]
Campylopus fragilis (Brid.) Bruch & Schimp.*
Cynodontium torquescens Limpr. [= *C. tenellum* (Bruch & Schimp.) Limpr.]*
Dicranodontium asperulum (Mitt.) Broth.*
D. uncinatum (Harw.) A. Jaeger.*
Driptodon atratus (Miel. & Hornsch.) Limpr. [= *Grimmia atrata* Miel. & Hornsch.]*
Grimmia sphaerica Schimp. [= *G. flaccida* (De Not) Lindb.; *G. anodon* Bruch & Schimp.]
Oreoweisia serrulata (Funk) De Not [= *O. torquescens* (Brid.) Wijk & Margad.]*
Philonotis capillaris Lindb.*
P. rigida Brid.
Rhynchostegiella pallidirostris (Brid.) Loeske [*Eurhynchium pumilum* (Wilson) Schimp.]
Zygodon forsteri (With.) Mitt.

Lycopodiophyta – Magnoliophyta

[The number after the species name corresponds to the number of the publication in the bibliography of acad. B. Stefanov (**Sakareva, B**. 1971)].

Aethionema buxbaumii (Fisch. ex Hornem.) DC., **10** [= *A. arabicum* (L.) Andrz.]
Aira capillaris Host var. *ambigua* (De Not.) Asch., **7**
Allium cyrilli Ten., **7**
A. oleraceum L., **10**
Alopecurus laguriformis Schur, **42***
Amaranthus albus L., **5**
Anemone narcissiflora L. var. *oligantha* Huter ex A. Kern., **7** [= *A. narcissiflora* var. *monantha* DC.]
A. pavonina Lam. var. *purpureo-violacea* (Boiss.) Halácsy, **7**
A. pavonina var. *typica*, **7** [= *A. pavonina* var. *purpureo-violacea* (Boiss.) Halácsy]
A. slavica (Reuss) Hayek, **27***
Arenaria graeca (Boiss.) Halácsy, **7** [= *A. filicaulis* Fenzl subsp. *graeca* (Boiss.) McNeill]
A. rigida M. Bieb., **5**
Asperula involucrata Wahlenb., **128**
Asplenium fissum Kit. ex Willd., **30**
A. lepidum C. Presl., **30**
A. ruta-muraria L. var. *microphyllum* Wallr., **10**
A. ruta-muraria var. *pseudogermanicum* Heufl., **10**
A. trichomanes L. var. *microphyllum* Milde, **10**
A. viride Huds. var. *inciso-crenatum* Milde, **10****
Astragalus alopecuroides L., **7***
A. australis (L.) Lam., **7**
Astragalus testiculatus Pall., **7***
Athyrium filix-femina (L.) Roth var. *dentatum* Döll., **10****
A. filix-femina var. *fissidens* Milde, **10**
A. filix-femina var. *multidentatum* Döll., **10**
Brachypodium sanctum Janka, **10** [= *Festucopsis sancta* (Janka) Melderis]
Bromus maximus Desf., **128**
• *Cachrys alpina* M. Bieb., **5**
• *Caluna vulgaris* L., **5**
Campanula transsilvanica Schur ex Andrae, **42**
C. versicolor Andrews, **74**
• *Cardamine pratensis* L. var. *dentata* Schult., **7** [= *C. palustris* L.]
Carex acuta L. var. *prolixa* Fr., **9****
C. ericetorum Pollich var. *approximata* (All.) K. Richt., **30**
C. extensa Gooden., **27**
C. nitida Host, **49** [= *C. liparocarpos* Gaudin]

C. pilulifera L., **49***
C. rigida Gooden var. *dacica* (Heuff.) Kük., **31** [= C. *dacica* Heuff.]
C. rupestris All., **30**
Carum daucoides Boiss., **7** [= *Stefanoffia daucoides* (Boiss.) H. Wolff]
Celsia bugulifolia (Lam.) Jaub. & Spach, **6** [= *Verbascum bugulifolium* Lam.]
Celsia bugulifolia x *Verbascum phoeniceum* L., **11**
•*Centunculus minimus* L., **5** [= *Anagallis minima* (L.) E. H. L. Krause]
Cerastium speciosum (Boiss.) Hauskn., **7** [= *C. banaticim* (Rochel) Heuff. subsp. *speciosum* (Boiss.) Jalas]
Cicer montbretii Jaub. & Spach, **5**
Circea alpina L., **87**
Cistus salvifolius L., **5**
•*Claytonia sibirica* L., **94**
Corydalis angustifolia (M. Bieb.) DC., **7***
Crataegus orientalis Pall. ex M. Bieb., **10** [= *C. laciniata* Ucria]
Crepis bithynica Boiss., **30**
C. foetida L. var. *radiata* Sibth. & Sm., **5****
C. succisifolia (All.) Tausch, **31** [= *C. mollis* (Jacq.) Asch.]
Convolvulus holosericeus M. Bieb., **49**
C. tenuissimus Sibth. & Sm., **31** [= *C. althaeoides* L. var. *pedatus* Choisy; *C. althaeoides* subsp. *tenuissimus* (Sibth. & Sm.) Stace]
Crucianella latifolia L., **15**
Cuscuta epilinum Weihe, **27**
C. suaveolens Ten., **27***
Cystopteris fragilis (L.) Bernh. var. *acutidentata* Döll., **10**
C. fragilis var. *cynapifolia* (Hoffm.) K. Koch, **10**
Daphne glandulosa Bertol., **7** [= *D. oleoides* Schreb. var. *glandulosa* (Bertol.) Keissl.]
Daucus maximus Desf., **5** [= *D. carota* L. subsp. *maximus* (Desf.) Pall.]
Dianthus pelviformis Heuff. var. *leucolepis* (Petrović) Asch. & Graebn., **7**
Draba carinthiaca Hoppe, **10**
•*Epimedium pubigerum* (DC.) Morren & Decne, **7**
Equisetum hyemale L. var. *rabenchorstii* Milde, **30****
E. palustre L. f. *simplicissimum* A. Br., **27****
Eragrostis minor Host var. *suaveolens* A. K. Becker ex Claus, **7**
•*Erica arborea* L., **7**
E. verticillata Forssk.***
Erodium botrys (Cav.) Bertol., **10***
E. hoefftianum C. A. Mey., **42**
E. hoefftianum var. *neilreichii* (Janka) Hayek, **42** [= *E. hoefftianum* subsp. *neilreichii* (Janka) P. H. Davis]
Euphorbia apios L. var. *lamprocarpa* Boiss., **7***
E. thyrsiflora Griseb., **7** [= *E. agraria* M. Bieb. var. *thyrsiflora* (Griseb.) Hayek]
E. peplus L., **20**
Euphrasia christii Favrat, **7***
E. minima Jacq. ex DC. var. *flava* Gremli, **10** [= *E. minima*]
Fagus orientalis Lipsky, **5**
Festuca lachenalii (C. C. Gmel.) Spenn. var. *mutica* Asch. & Graebn., **7***
•*Frankenia pulverulenta* L., **5**
Fraxinus coriariifolia Scheele, **5** [= *F. oxycarpa* M. Bieb. ex Willd. var. *coriariifolia* (Scheele) Stef.; *F. excelsior* L. subsp. *coriariifolia* (Scheele) R. P. Murray]
Galium degenii Bald. ex Degen, **7***
G. plebeium Boiss. & Heldr., **7** [= *G. anisophyllon* Vill. var. *plebeium* (Boiss. & Heldr.) Boiss.]
Gentiana engadinensis (Wettst.) Braun-Blanq. & Samuels, **39** [= *Gentianella engadinensis* (Wettst.) Holub]
Genista anatolica Boiss., **15**
G. germanica L. var. *inermis* Koch ex Mert. & Koch, **39**
Geranium bohemicum L., **5**
G. brutium Gasp., **7**
G. caeruleatum Schur, **31**
G. pratense L., **5**
Geum pyrenaicum Mill., **7***
Gladiolus palustris Gaud., **7**
•*Glinus lotoides* L., **31**
Gymnadenia conopsea (L.) R. Br. var. *densiflora* (Wahlenb.) Soó***
Haplophyllum balcanicum Vandás, **42**
•*Hedypnois polymorpha* DC., **11** [= *H. cretica* (L.) Dum.-Cours.; *H. rhagadioloides* (L.) F. W. Schmidt]
Hedysarum grandiflorum Pall., **128**
Heleocharis schoenoides (L.) Host, **10** [*Crypsis schoenoides* (L.) Lam.]
Heracleum spondylum L. var. *verbosianum* K. Malý, **59***
Holosteum umbellatum L. var. *glutinosum* (M. Bieb.) Gürke, **15** [= *H. umbellatum* var. *glandulosum* Vis.]
Hutchinsia procumbens (L.) Desv., **27** [= *Hornungia procumbens* (L.) Hayek; *Hymenolobus procumbens* (L.) Nutt.]
•*Hymenocarpus circinatus* (L.) Savi, **7**
Hyoscyamus albus L., **15**
Hypericum androsaemum L., **7**
H. calycinum L., **42**

H. olympicum L. var. *minus* Chaub. & Bory., **10**
Iberis saxatalis L., **10**
•*Ilex aquifolium* L., **5**
•*Isoetes lacustris* L., **7**
Juncus ranarius Songeon & E. P. Perrier, **27**
J. tenageia L. f., **27**
Kobresia bellardii (All.) Degl. ex Loisel., **30** [= *Kobresia myosuroides* (Vill.) Fiori; *Elyna bellardii* (All.) W. Koch]
Knautia degenii Borbás, **5***
Lathyrus hierosolymitanus Boiss., **15***
Lens lenticila (Schreb.) Alef., **7** [= *L. ervoides* (Brign.) Grande]
Lepidium sativum L., **87**
•*Ligularia glauca* (L.) O. Hoffm., **7**
Lilium cattaniae (Vis.) Vis., **5** [= L. *martagon* var. *cattaniae* Vis.]
•*Limosella aquatica* L.***
Linaria commutata Bernh. ex Rchb., **5** [= *Kickxia commutata* (Bernh. ex Rchb.) Fritsch]
L. genistifolia (L.) Mill. var. *confertiflora* Boiss., **10** [= *L. genistifolia* subsp. *confertiflora* (Boiss.) P. H. Davis]
L. sieberi Rchb., **5** [= *Kickxia elatine* (L.) Dumort. subsp. *crinita* (Mabille) Greuter]
L. simplex (Willd.) DC., **5**
Listera cordata (L.) R. Br., **5**
Lolium subulatum Vis., **49** [= *L. loliaceum* (Bory & Chaub.) Hand-Mazz.]
•*Lotononis genistoides* (Fenzl) Benth., **15**
•*Lupinus termis* Forssk., **11***
Malabaila aurea (Sm.) Boiss., **15**
Malcolmia confusa Boiss., **5** [= *Maresia nana* (DC.) Batt.]
Malva alcea L., **20**
M. erecta C. Presl, **7** [= *M. sylvestris* L.]
Melampyrum scardicum Wettst. var. *wettsteinii* (Ronniger) Hayek, **30** [= *M. scardicum* subsp. *wettsteinii* Ronniger]
•*Mespilus germanica* L., **5**
Moenchia quaternella Ehrh., **7** [= *M. erecta* (L.) P. Gaertn.]
Mulgedium plumeri (L.) DC., **10** [= *Cicerbita plumeri* (L.) Kirschl.]
Nephrodium filix-mas (L.) Rich. var. *crenatum* Milde, **10**
N. filix-mas var. *dorsolobatum* Moor**, **10**
Nigella arvensis L. var. *divaricata* (Beaupre) Boiss., **7**
Oenanthe tenuifolia Boiss. & Orph., **5**
Orchis provincialis Balb., **7**
Ornithogalum arcuatum Steven, **10***
O. wiedemannii Boiss., **7***
•*Osyris alba* L., **5**
Pedicularis scardica Beck, **7** [= *P. petiolaris* Ten.]
Petasites glabratus (Maly) Borbás, **30** [= *P. kablikianus* Tausch ex Bercht.]
Peucedanum ostruthium (L.) Koch***
Plantago altissima L., **74**
Poa caesia Sm., **7***
P. laxa Haenke var. *riphaea* Asch. & Graebn., **7***
P. nemoralis L. var. *fallax* Hayek, **7**
Polygala amara L. var. *amarella* (Crantz) Stoj. & Stef., **30** [= *P. amarella* Crantz]
P. murbeckii Degen, **42** [= *P. supina* Schreb. subsp. *murbeckii* (Degen) Graebn.]
Polypodium vulgare L. var. *acutum* Woll., **10****
P. vulgare var. *rostratum* Milde, **10****
Polystichum angulare (Kit. ex Willd.) C. Presl. f. *hastulata* (Ten.) Kuntze, **10** [= *P. setiferum* (Forssk.) Woyn. f. *hastulata* (Ten.) Kuntze]
P. angulare f. *microlobum* Warnst., **10** [= *P. setiferum* f. *microlobum* (Warnst.) Hayek]
P. villarsii Bellardi, **30** [= *Dryopteris villarii* (Bellardi) Woyn. ex Schinz & Thell.]
Potentilla montenegrina Pant., **7**
Pyrus amygdaliformis Vill. x *P. communis* L., **42**
P. eleagrifolia Pall., **42**
•*Ramonda serbica* Pančić, **68**
Ranunculus chaerophyllos L., **7***
Rhamnus fallax Boiss., **7** [= *R. alpinus* L. subsp. *fallax* (Boiss.) Maire & Petitm.]
Ribes nigrum L., **39**
Rosa recondita Puget var. *exodenophylla* Borbás, **27****
Rumex arifolius All., **20**
R. scutatus L., **30**
Sagina apetala Ard., **15**
S. nodosa (L.) Fenzl, **15**
Salix incana Schrank x *S. silesiaca* Willd., **42**
Salvia forskaohlei L., **5**
S. officinalis L., **7**
Saxifraga carpathica Rchb., **5**
Saussurea discolor (Willd.) DC., **10**
Schoenus nigricans L., **7**
Scilla bithynica Boiss., **7**
Scirpus michelianus L., **31**]= *Dichostylis michelianus* (L.) Nees]
S. triqueter L., **7** [= *Schoenoplectus triqueter* (L.) Palla]
•*Serapias longipetala* (Ten.) Pollini, **11** [= *S. vomeracea* (Burm.) Briq.]
Scolymus maculatus L., **15**

Scorzonera austriaca Willd. var. *crispa* M. Bieb., **20**** [= *S. austriaca* subsp. *crispa* (M. Bieb.) Nyman]
• *Sida scherardiana* (L.) Benth., **15** [= *Malvella scherardiana* (L.) Jaub. & Spach]
Sideritis taurica Stephan ex Willd., **7** [= *S. syriaca* L.]
Silene flavescens Waldst. & Kit. var. *thessalonica* (Boiss. & Heldr.) Boiss., **15**
S. nutans L., **138**
Sorbus chamaemespilus (L.) Crantz, **31**
Stachys haussknechtii (Uechtr. ex Hausskn.) Hayek, **138** [= *Betonica haussknechtii* Uechtr. ex Hausskn.]
S. thracica Dav., **128**
Stellaria graminea L. var. *macropetala* O. Kuntze, **94** [= *S. graminea* var. *grandiflora* Peterm.]
Teesdalia lepidium DC., **5** [= *T. coronopifolia* (J. P. Bergeret) Thell.]
Teucrium cordifolium Čelak., **5** [= *T. lamifolium* D'Urv.]
• *Theligonium cynocrambe* L., **5**
• *Tillaea muscosa* L., **5** [= *Crassula tillaea* Lest.-Garl.]
Trachystemon creticum (Willd.) G. Don, **138***
Trifolium ligusticum Balb. ex Loisel., **5**
T. spumosum L., **5**
Trirticum speltoides (Tausch) Godr., **15** [= *Aegilops speltoides* Tausch]
• *Trixago apula* Stev., **11** [= *Bellardia trixago* (L.) All.]
Tunica stricta (Ledeb.) Fisch. & C. A. Mey., **39** [= *Petrorhagia alpina* (Hablitz) P. W. Ball & Heywood]
Typha angustata Bory & Chaub., **31** [= *T. angustifolia* L. var. *angustata* (Bory & Chaub.) Jordanov; *T. domingensis* (Pers.) Steud.]
Utricularia minor L., **10**
Valerianella discoidea (L.) Loisel., **20**
Vaccinium arctostaphylos L., **11**
Verbascum adamovicii Velen., **74**
V. dieckianum Borbás & Degen, **74**
V. xanthophoeniceum Griseb., **20**
Vicia hybrida L., **7**
Viola fragrans Sieber, **7***
V. gracilis Sibth. & Sm., **10**
V. palustris L., **39**
Vitex agnus-castus L., **128**

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* Improperly reported species for the country.

** Taxa included in some editions of *Flora of Bulgaria* by Stojanov & Stefanov (1924-1925, 1933, 1948), with subsequently no mention of their current taxonomic status.

*** **Stefanov, B. & Bunkov, M.** 1971. Floristic notes on some plants with rare distribution in Buglaria. – Gorskost. Naouka, **8**(5): 96-97 (in Bulgarian).

• new genus for the country.

Supplement 2

New taxa described by acad. B. Stefanov (independently or in co-authorship)

[The number after the species name corresponds to the number of the publication in the bibliography of acad. B. Stefanov (**Sakareva, B.** 1971);
In brackets is current nomenclature and taxonomic status accepted in *Flora Reipublicae Popularis Bulgaricae* (1962-1995), *Flora of Bulgaria* (**Stojanov, Stefanov & Kitanov** 1966-1967) or *Flora Europaea* (1964-1980)].

Agropyrum pectiniforme Roem. & Schult. var. *durum* Stef., **96** [= *A. brandzae* Panțu & Solacolu var. *durum* (Stef.) Kitan.]
Arabis bellidifolia Jacq. var. *ciliolata* Stef., **128** [= A. *jacquinii* Beck]
Asyneuma kelleriana Stef., **59**
Celsia roripifolia Halácsy x *Verbascum austriacum* Schott ex Roem. & Schult., **15***
C. roripifolia x *Verbascum phoeniceum* L., **20***
C. rupicola Hayek & Siehe var. *ardica* Stoj. & Stef., **10** [= *Verbascum rupestre* (Dav.) I. K. Fergus.]
Centaurea albofimbriata Stef. & T. Georgiev, **45** [= *C. triumfettii* All. var. *perinensis* (Degen, Urum. & Wagner) Stoj. & Acht.]
C. cyanomorpha Stef. & T. Georgiev, **45** [= C. *depressa* M. Bieb.]

C. parilica Stoj. & Stef., **10**
C. parilica var. *incaenensis* Stoj. & Stef., **10**
C. pseudoaxillaris Stef. & T. Georgiev, **45**
C. subdepressa Stef. & T. Georgiev, **45**
C. triumfettii All. var. *euxina* Stef. & T. Georgiev, **45****
Centranthus longiflorus Steven var. *kellererii* Stoj., Stef. & T. Georgiev, **27**; *Centhranthus kellererii* (Stoj., Stef. & T. Georgiev) Stoj. & Stef., **57** [= *C. longiflorus* subsp. *kellererii* (Stoj., Stef. & T. Georgiev) I. Richardson]
Cerastium banaticum (Rochel) Heuff. var. *leonthopodium* Stoj. & Stef., **10** [= *C. decalvans* Schloss. & Vuk. subsp. *histrio* (Correns) Stoj. & Stef.]
Chondrilla mattfeldii Stoj. & Stef., **17** [= *C. urumoffii* Degen]
Colchicum borisii Stef., **19** [= *C. autumnale* L.]
C. davidovii Stef., **22**
C. hirsutum Stef.**, **19**
Crepis grandiflora (All.) Tausch. var. *macedonica* Stoj. & Stef., **18**
Dianthus simulans Stoj. & Stef., **55** [= *D. gracilis* Sibth. & Sm. subsp. *simulans* (Stoj. & Stef.) Stoj. & Acht.]
• *Dimitrina micrantha* Stef. & Bunkov***
Eranthis hiemalis (L.) Salisb. subsp. *bulgaricus* Stef., **74**; *E. bulgaricus* (Stef.) Stef., **128**
Galium pedunculatum Stoj. & Stef., **55** [= *G. demissum* Boiss. subsp. *demissum*]
Galium pedunculatum var. *abbreviatum* Stef., **59** [= *G. demissum* subsp. *demissum*]
Geranium macrorrhizum L. var. *kellereri* Stef. & Jordanov, **131**
Geum rhodopeum Stoj. & Stef., **10**
Gymnadenia borisii Stoj., Stef. & T. Georgiev, **27** [= *Nigritella nigra* (L.) Rchb. f. x *Gymnadenia frivaldskyana* Hampe]
Gypsophila tekirae Stef., **32**
Hypericum inodorum Mill. var. *glandulosum* Stef., **43**
H. inodorum var. *integrisepalum* Stef., **43****
H. nabelekii Stef., **43****
H. olympicum L. var. *latifolium* Stef., **43****
H. olympicum var. *prostratum* Stef., **43****
H. olympicum var. *stenophyllum* Stef., **43****
H. olympicum var. *viride* Stef., **43****
H. ovalifolium Stef., **43****
H. pseudotenellum Vandás f. *robustum* Stef., **42** [= *H. rochelii* Griseb. & Schenk subsp. *pseudotenellum* (Vandás) Jordanov & Kožuharov]
H. setiferum Stef., **42**
Iberis thracica Stef., **32** [= *I. pruitii* Tineo]
Jasione montana L. var. *jankae* Neilr. f. *prostrata* Stoj. & Stef., **20** [= *J. dentata* (DC.) Halácsy]
Jasione bulgarica Stoj. & Stef., **3**; •*Jasionella bulgarica* (Stoj. & Stef.) Stoj. & Stef., **64**
Lamium garganicum L. var. *molle* (Boiss. & Orph.) Briq. f. *sofiana* Stoj. & Stef., **20**
Linum flavum L. var. *penevi* Stef., **128** [= L. *flavum* subsp. *sparsiflorum* (Stoj.) Petrova]
Melilotus physocarpa Stef., **32**
• *Petkovia orphanidea* (Boiss.) Stef., **64** (comb. et st. n.)
Phleum montanum C. Koch var. *glabrum* Stoj. & Stef., **10** [= *P. montanum* var. *sacarense* Velen.]
Poa borisii Stef., **38** [= *P. alpina* L. f. *divaricata* Schur]
Polygala major Jacq. var. *minor* Stef., **138** [= *P. vulgaris* L.]
P. stojanovii Stef., **32** [= *P. vulgaris*]
P. stojanovii var. *sublignosa* Stef., **32** [= *P. vulgaris*]
Prunella vulgaris L. var. *parviflora* Stef., **138**
Quercus thracica Stef. & Nedjalkov, **108**
Scabiosa rhodopensis Stoj. & Stef., **16**
Scutellaria alpina L. var. *hirtula* Stef., **74** [= *S. alpina*]
Sedum acre L. var. *microphyllum* Stef., **84** [= *S. acre* f. *microphyllum* (Stef.) Stoj., Stef. & Kitan. comb. inval.]
S. stefco Stef., **79**
S. kostovii Stef., **84**
S. kostovii var. *monocarpum* Stef., **84**
S. tschernokolevii Stef., **133**
S. tuberiferum Stoj. & Stef., **60**
S. zollikoferi F. Herm. & Stef., **63**
Silene flavescens Waldst. & Kit. var. *glabra* Stoj. & Stef., **15**
Symphyandra wanneri (Rochel) Heuff. f. *pumila* Stef., **74**
S. wanneri f. *hirsuta* Stef., **74**
Trifolium agrarium L. var. *pallidum* Stef. & Jordanov, **39** [= *T. aureum* Pollich var. *aureum*]
T. pratense L. var. *stranskii* Stoj. & Stef., **18**
Tulipa orphanidea Boiss. ex Heldr. var. *pontica* Stoj. & Stef., **7** [= *T. thracica* Dav. var. *thracica*]
• *Urumovia foliosa* (Cav.) Stef., **64** [= *Jasione foliosa* Cav., comb. n.]
Valeriana officinalis L. var. *alpestris* Stef., **74**
Verbascum blattaria L. var. *megalantha* Stef., **138**
V. juruk Stef., **138**
V. minutiflorum Stef., **133**
V. ponticum Stef., **11** [= *V. lagurus* Fisch. & C. A. Mey. subsp. *ponticum* (Stef.) Kožuharov]
V. belasitzae Stoj. & Stef., **18** [= *V. adamovicii* Velen. var. *belasitzae* (Stoj. & Stef.) Murb.]

V. pseudonobile Stoj. & Stef., **13** [= *V. nobile* Velen.]
V. pumilum Stoj. & Sef., **10** [= *V. adamovicii* Velen. var. *belasitzae* (Stoj. & Stef.) Murb.]
V. viridissimum Stoj. & Stef., **15**
V. zollikoferi Stef., **74** [= *V. urumoffii* Stoj. & Acht.]
Veronica scutellata L. var. *villosa* Stef. & Jordanov, **39**
V. turrilliana Stoj. & Stef., **12**
Vicia cordata Wulfen ex Hoppe var. *microsperma* Stef., **138** [= *V. cordata*]
V. inciseformis Stef., **138** [= *V. incisa* M. Bieb.]
V. orbelica Stoj. & Stef., **3** [= *V. abbreviata* Fisch. ex Spreng. subsp. *orbelica* (Stoj. & Stef.) Kuzmanov]

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* Hybrids described on the basis of materials in the former botanical garden of the Agronomy and Forestry Department, Sofia University St Kliment Ohridski.

** Taxa described on the basis of materials outside Europe. No reference has been made about the present nomenclature and taxonomic status.

*** **Stefanov, B. & Bunkov, M.** 1978. About the plant *Danae racemosa* (Med.) Moench and some other *Liliaceae* species. – Gorskost. Naouka, **15**(1): 79-87 (in Bulgarian).

• new genus for the science.