

**U.D.K. 001.891:58(092)**



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### **SCIENTIFIC HERITAGE OF THE ACADEMICIAN FOMIN O.V.**

*This article presents a comparative analysis of natural geo-botanical areas, developed by Fomin O.V. (1925) with the modern ones (2007), classified his scientific publications by groups and geography distribution. It is spoken in details about the contribution of the researcher in editing and creating periodic scientific publications, creation and development of his scientific school, international cooperation, and scientific style and assessment activities of the scientist.*

*У статті здійснено порівняльний аналіз природних геоботанічних зон, розроблених О.В. Фоміним (1925 р.) з сучасними (2007 р.), класифіковано його наукові публікації за групами і географією поширення. Розглянуто внесок дослідника в редагування і створення періодичних наукових видань, формування й розвиток його наукової школи, наведено дані щодо міжнародної співпраці, наукового стилю та оцінок діяльності ученого.*

*В статье осуществлен сравнительный анализ природных геоботанических зон, разработанных А.В. Фоминым (1925 г.) по сравнению с современными (2007 г.), классифицированы его научные публикации за группами и географией распространения. Рассмотрен вклад исследователя в редактирование и создание периодических научных изданий, формирование и развитие его научной школы, приведены данные о международной деятельности, научном стиле и оценках наследия ученого.*

**Problem statement.** Science differs from the ordinary, artistic, symbolic and religious and mythical kinds of knowledge of animate and inanimate nature. It has its own characteristics and features. On the basis of literary analysis made in the monograph "The development of science and terminology in Ukraine: the path through the period (XVII – beginning of XXI century.)" it was emphasized essential

features that are inherent in scientific knowledge and make its structure. [14, p. 124–125].

Based on the structure of natural science, we used structurally integrated approach to the analysis of botanical field in late XIX – early XX century. Formation and development of the science of plants and fungi of the chronological period mentioned in previous studies were reviewed by a comprehensive analysis of the major structural components of botany: personalities and their achievements, methodological and financial support, publications, periodicals, terminology, academic institutions, expeditionary operations, research schools and natural science societies. In our opinion, this approach in the history of science can be particularly effective and complete for analysis of small chronological periods of time associated with the period of the life and work of the researcher. This paper deals with only a few scientific achievements of academician Fomin O.V.

Scientific achievements of the researcher were discussed in the papers written by: Zerov D.K., Bordzylovsky Y.I., Sytnyk K.M., Kondratyuk S.Y., Shevera M.V., Kapustyan V.V., Bazylevska N.A., Barbarych A.I., Dudka O.I., Harmasar V.H. and others [2; 4; 8; 12 – 13; 19; 20]. At the same time there are still not illuminated some aspects of scientific heritage of Fomin O.V., and therefore the proposed work is relevant.

*Comparative analysis of natural geo-botanical areas, proposed by  
Fomin O.V. (1925) with the modern ones (2007)*

The first botanical zoning of Ukrainian SSR was developed by Fomin O.V. This aspect of the scientific heritage of the academician in the history of science and biographics considered among the most important. We compared the geobotanical areas developed by the scientist with modern ones by comparison "Maps of botanical-geographical regions of Ukraine, acad. Fomin O.V." (1925) with "The National Atlas of Ukraine" (2007). For a comparative analysis was used the work by Fomin O.V. "A brief sketch of natural botanical-geographical regions of Ukraine" (1925) and other references [21; 18].

For the division of the territory of Ukraine into botanical-geographical areas Fomin O.V. used as a basis a scheme of the professor Tanfilyev H.I. from Novorossiysk University in Odessa. He studied the vegetation and soils of the tundra, wetlands, steppes and using research materials defended a doctorate thesis on "Tree line in the polar Russia from the research of timan samoyed" in 1912. He considered poor soil permeability a cause for bogging, and believed that the limit between forest and steppe is not determined by climate but soil composition [1, p. 609]. Tanfilyev H.I. identified two regions: the Northern Region of Russia (the strip of land and mixed forests) and the region of the Southern Russia (band of black earth).

Within these two areas Fomin O.V. allocated two botanical-geographical zones (mixed forests and steppes with black earth) and 1 subzone (forest steppe). To create his own classification he had based a number of factors including: a) the geological past of Ukraine; b) relief conditions; c) atmospheric conditions, mainly air rainfall, d) the characteristics of soils and e) the floristic composition of Ukraine. Areas on the "map of botanical-geographical regions of Ukraine" (1925) were divided into 8 districts: "1. Right-bank woodland; 2. Left-bank woodlands; 3. Right-bank forest-steppe; 4. Left-bank steppe; 5. Western area and southern European forests; 6. [the first word is written illegible on the map ] Meadow steppes; 7. Donetsk-Berdyansk-Mariupilsky district; 8. Area of Black Sea steppes".

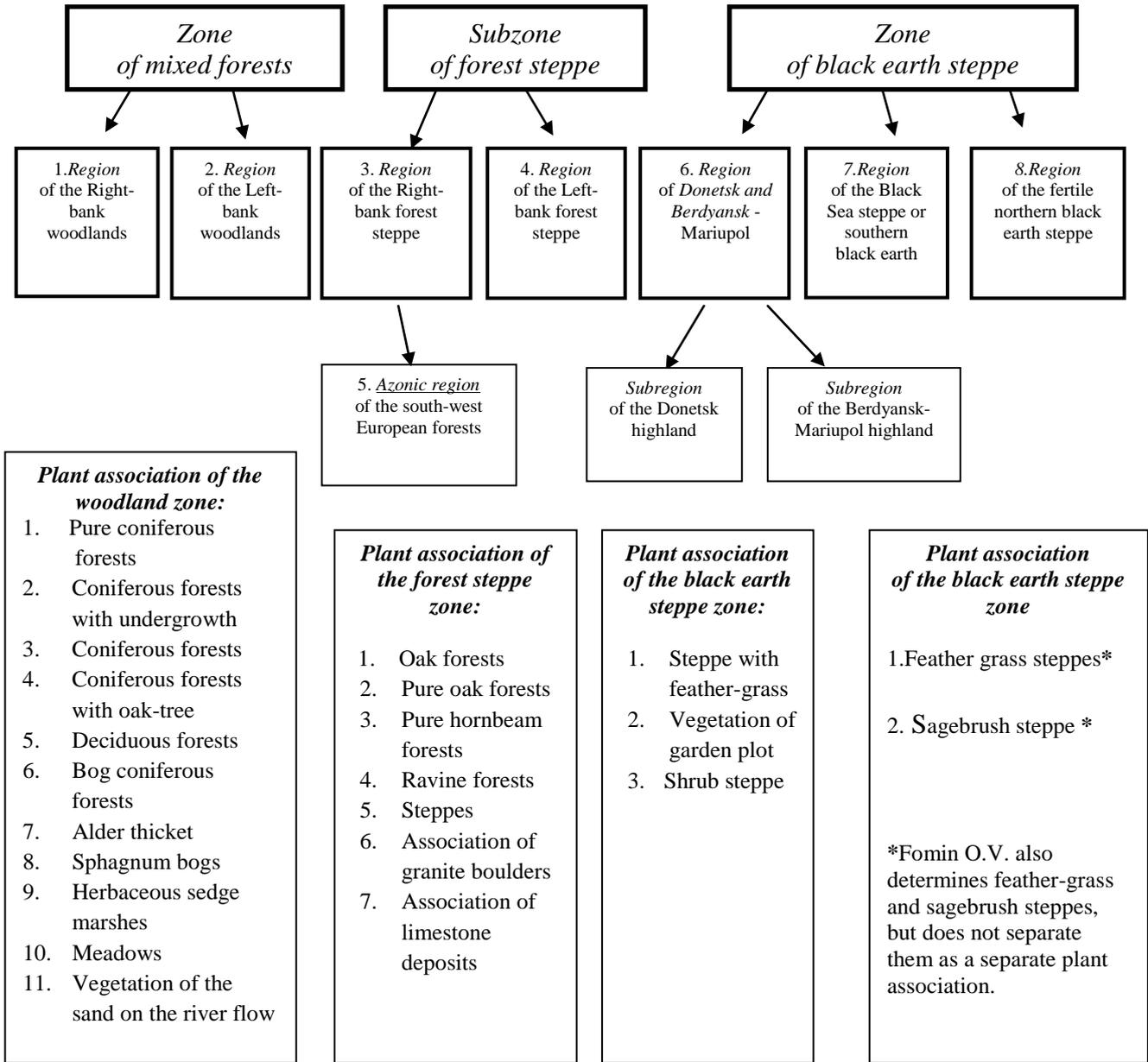
Between "the map ..." and "short essay ..." of Fomin O.V. we noticed some differences. The text of the sketch to forest subzone includes two main areas (left-bank and right-bank) while there are three of them on the map. After describing two regions and seven steppe plant associations it is a third identified azonic district: "To right-bank forest-steppe region in the south-west area adjacent south-west European azonic forests, which takes higher southwest of Podillya" [21, p. 11].

From our point of view geobotanic typology of a limited number of structural units (zone, subzone, district, subdistrict) has meant that in one area the author posted another area. Instead, thanks to the wide range of geo-botanical structural units (regions, subregions, zones, provinces, subprovinces, districts) in the "National Atlas of Ukraine" the problem in national zoning was removed.

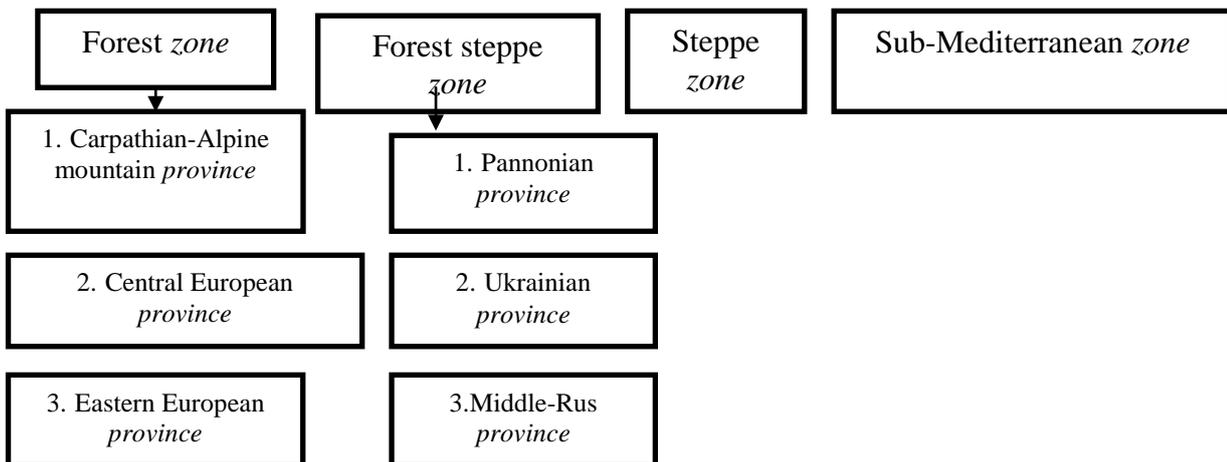
Fomin O.V. divided the black earth zone into two main areas: «By differentiation of the black earth and the character of the plants the region of the black earth steppe can be divided into two areas: the north – fertile black earth steppe and south – Black Sea region steppes or southern black earth region» [21, p. 12]. In the eastern part of the plain area of black earth steppe as Fomin O.V. states, from the southeast wedged Donetsk highland with Berdyansk-Mariupol one that it is also necessary to allocate a separate area [21, p. 13]. Researches of Kleopova Y.D. and Klokova M.V. prompted Fomin O.V. to think about the possible division of Donetsk and Berdyansk-Mariupilsky area into two subareas: Donetsk-Mariupol and Berdyansk hill. [21, p. 14]. This is stated in the "short essay ..." but on the "map ..." these two subareas are not indicated.

Based on the synthesis of the material from "A brief sketch ..." and "Map ..." we have developed an integrated graphics circuit of natural botanical-geographical zones of Ukraine after Fomin O.V., which are not included in this work. The text material from the "National Atlas ..." [18, p. 196 – 198] was the basis for graphically-schematic representation of the structure and hierarchy of geobotanical units. Created schemes made possible more precise comparative analysis of changing perceptions of geobotanical zone in the first quarter of the twentieth – and early twenty-first century and avoid inaccuracies in the work [4, p. 137].

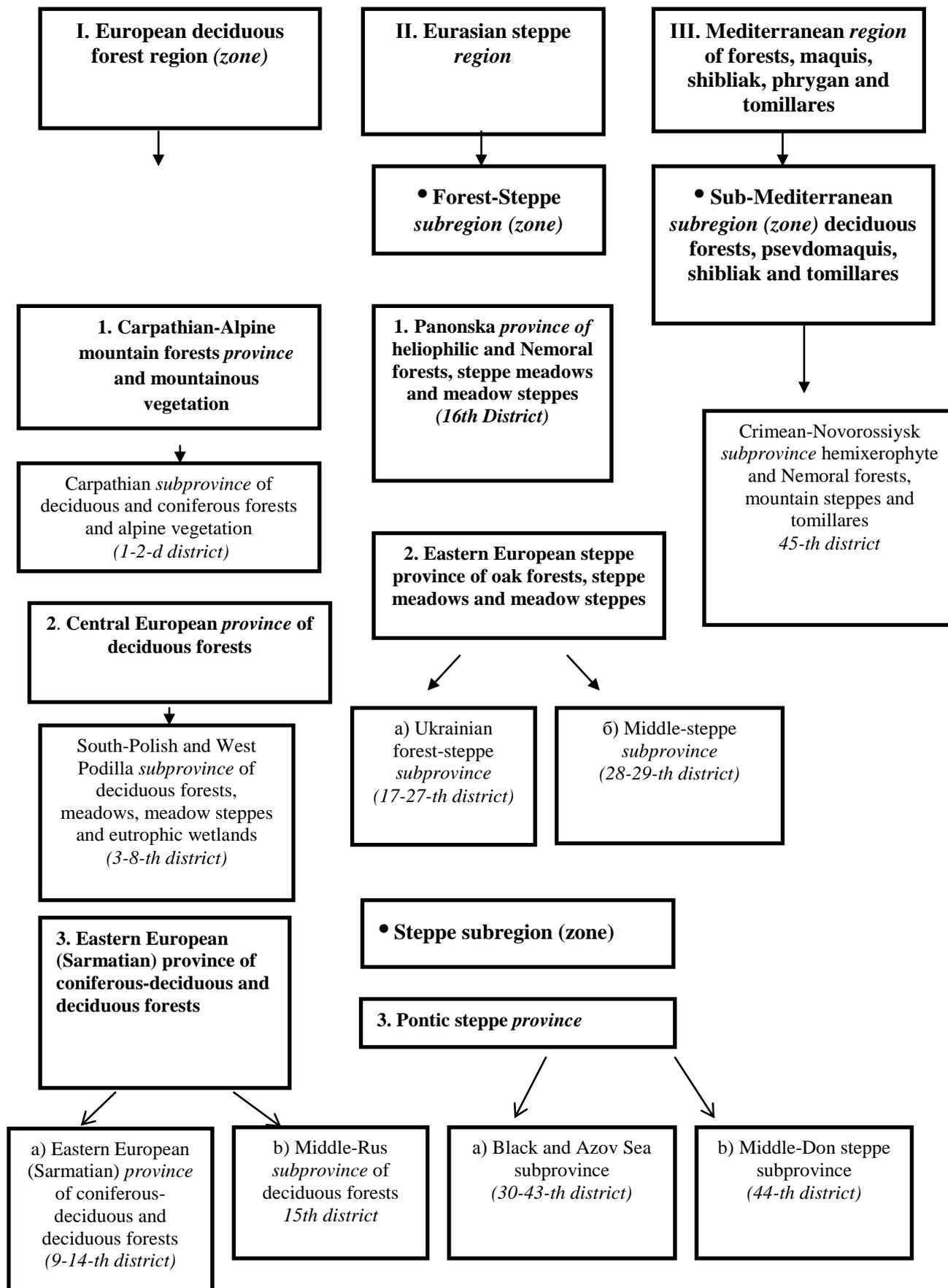
Natural botanical-geographical zones of Ukraine after Fomin O.V. (1925)



Geobotanical zones of Ukraine (according to National Atlas of Ukraine (2007))



Geobotanical regions of Ukraine  
(according to the National Atlas of Ukraine, 2007 p.)

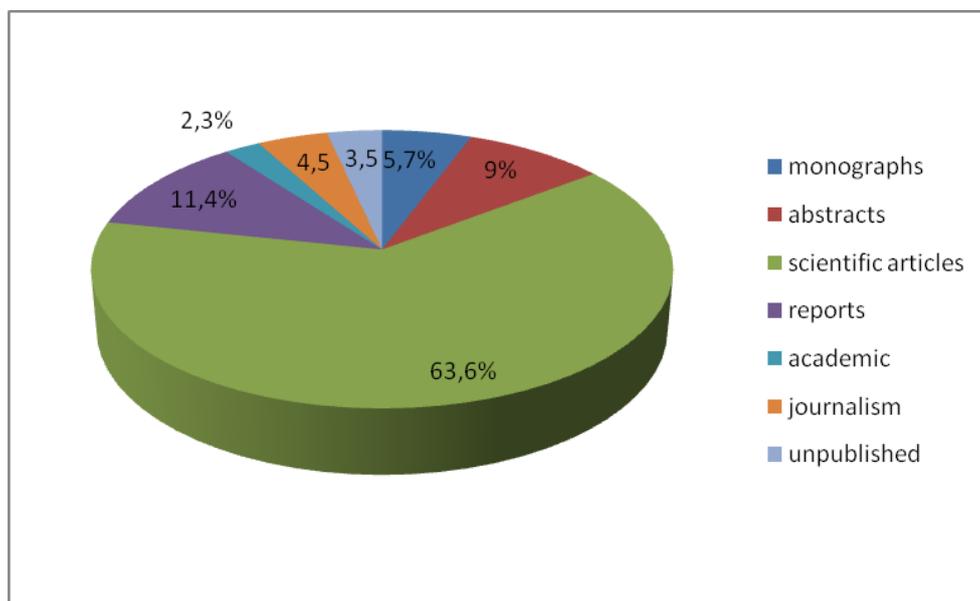


### Scientific publications by Fomin O.V.

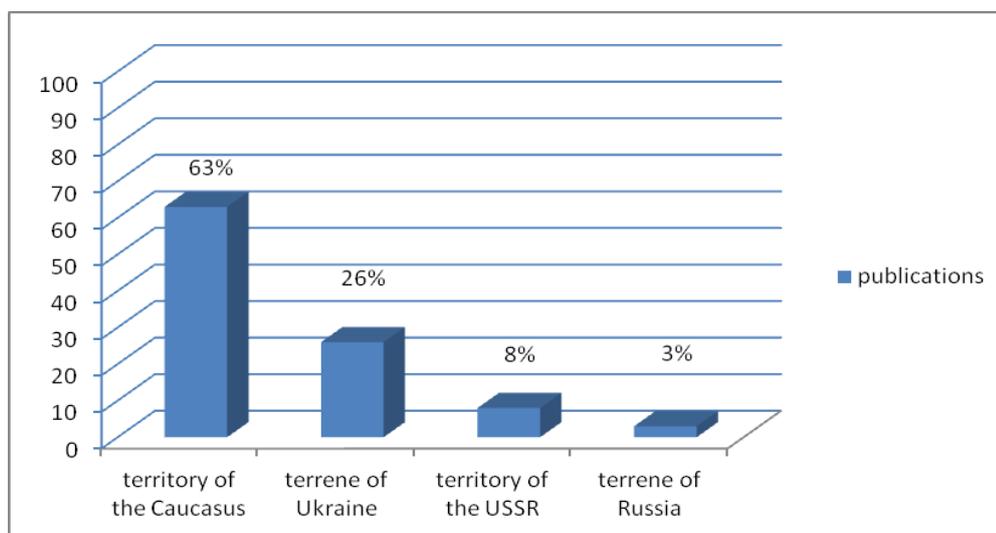
Publications – are the necessary part of science, an important means of transmission and acquisition of knowledge. In a letter to Fomin O.V. on November 6, 1933 a future academician of AS of USSR Wysotsky H.M. wrote: "So far, apparently nothing is done in publishing conference materials about the Dnieper reconstruction (held in Kyiv in March) and two of my reports are still not published. And it is very non-productive to pursue science without the possibility to be published" [15].

Certain analysis of the works of Fomin O.V. was made by Bordzylovsky Y.I., Sytnyk K.M., Kondratyuk S.Y., Kapustyan V.V., Shevera M.V., Virchenko V.M., Harmasar V.H. and others [2;19 ; 13 – 14 ; 4 ]. In the articles [2, p. 22 – 25; 13, p. 616] it was observed that Oleksandr Vasylyovych is the author of 88 (eighty eight) scientific papers, while the paper [12, p. 10] states 90 (ninety) scientific publications of the scientist. In consideration of his scientific works we noticed that the article "The role of searching the high-mountain vegetation of the Caucasus (speech, declared on 26 September 1911 on solemn annual speech-day of Tiflis high women studies)" published in the newspaper "Caucasus" (1911), another – " Five hectares on the Black Sea coast " – in the journal "Socialist Kyiv" (1934). The said newspaper and magazine belong to publicistic editions. Therefore, avoiding duplication and compilations, we performed calculations on the structure of the publications of Fomin O.V. based on a territorial and stylistic basis and presented the results in charts.

### Ratio of the publications by Fomin O.V. according to stylistic approach



### Ratio of the scientific publications by Fomin O.V. on a territorial basis



As the source was taken the work list by Fomin O.V. according to Bordzylovsky Y.I. [2, p. 22 – 25]. It turned out that the scientific articles dominated in the structure of the scientific publications (63, 6%), reports on scientific activities of the Tiflis Botanical Garden, a report on phytogeographical tours and trip abroad in 1910 along with the selection work in research institutions abroad (11, 4%), abstracts of works by «Tanfilyev H.I., Hrynevetsky B.B., Alekseyenko F.A., Sosnovsky D.I.,

Borovykov H., Mishchenko N., Sapegina F., Shmidt R.H» (9%) [2, p. 22 – 23].

The educational and research publications ( 2.3%) by Fomin O.V. are not numerous. This group may include "Key to plants of the Crimea and the Caucasus" ( vol. 1 – 1909, vol. 2 – 1911) which was used in the scientific and educational processes. Only 3.5 % are unpublished works or works that were published after the death of the scientist. Despite a modest place in the overall structure of scientific publications the offspring of fundamental organizational and research works by Fomin O.V. is "Flora of the USSR" (1936 – 1965 years) estimated as a scientific feat [19 , p. 150 – 151 ]. This is the case when major work started a multi founder of scientific school and his students completed it. In periodic publicistic media researcher published 4.5 % of his works.

Studying the titles of the researcher` works we identified their vegetability of different territories or republics of the USSR. It was found that most of the works are devoted to the Caucasus flora (63 %). The plant life in Ukraine was studied in 26% of the works, other territories of the USSR, such as Asia Minor and the Caucasus – 8 % and 3% of territory of Russia. However, some of the works "Key to plants of the Crimea and the Caucasus" (1909), "Systematic Crimean-Caucasian species and subspecies of the kind Pinus ... " (1914), "Review of the Crimean-Caucasian juniper species (with one table)" (1927), "Gemnospermae of the Caucasus and Crimea. Gymnospermen des Kaukasus undder Krim» (1928) touch thorns of different modern countries.

#### *Editing and creating periodic scientific publications*

Scientific achievements and botanical journals, edited by Fomin O.V. in the early twentieth century, made him famous in Ukraine as well as in Europe and beyond. Since 1903 he edited the journal "Proceedings of the Tiflis Botanical Garden", and in 1905 he founded another journal – "Tiflis Botanical Garden Journal" («Moniteur du Jardin botanique de Tiflis»).

In this journal Fomin O.V. has published a number of papers: "Notes and observation about some plants of the Caucasus" (1903), "Critical notes and

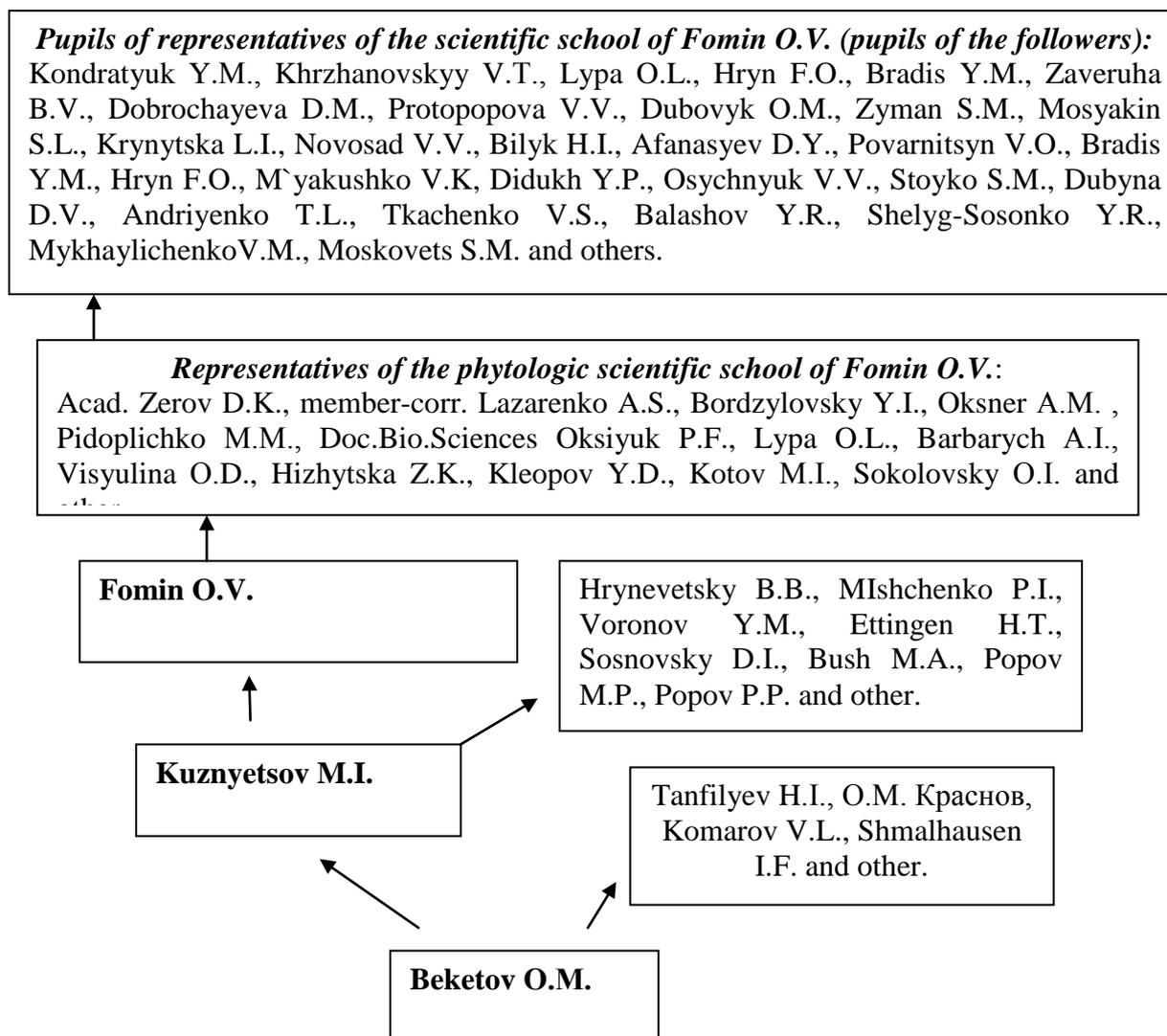
observation regarding some plants of the Caucasus" (1903), "Two new kinds Campanula in the Caucasus. Deux especes nouvelles du genre Campanula du Caucase", "A new kind Fritiliaria in the Caucasus" (1905 ), "Blossoming of lotus Nelumbo nucifera Garth. in the pool in the Caucasian Dep. of the Tiflis Botanical Garden" (1905 ), "Saline fields and adherent formations in the East and South Caucasus" (1906) and others. At the same time Fomin O.V., Kuznetsov M.I. and Bush N.A. carried drafting the Edition "Flora caucasica critica", which for 7 years (1910 – 1917 ) came out forty five times [2, p. 20; 12, p. 10].

Permanent botanical publishing agency "Journal of Kiev Botanical Garden" was founded by Fomin O.V. in 1923 – 1924 years. Publications of "Newsletter ..." were of great importance for the promotion of plant science and coordination of botanical research in Ukraine. In every issue except scientific articles have been posted rubrics "Chronicle of the Garden" and "Scientific Chronicle", which published reports of scientific research and production activities. Within the lifetime of Fomin O.V. were published seventeen of his editions and organized publications interchange. This significantly updated the library stock of the Botanical Garden, and later the Institute [12, p. 10].

#### Scientific School of Fomin O.V.

Scientific School of Fomin O.V. has been already considered in the work of botanists and historians of science. Prior to consideration of the issue joined: Sytnyk K.M., Kondratiuk S.Y., Kapustyan V.V., Shevera M.V., Virchenko V.M., Harmasar V.H. and others [4; 13; 19]. We focused on the origins, formation and development of "scientific family" of Fomin O.V., based on the approach of Harmasar V.H. and Sytnyk K.M. [4; 19]. and presented it as a simplified model of "family tree research school".

Origins, establishment and development of the scientific school of  
academician Fomin O.V.



Sound evaluation of the activity of the scientific school of Fomin O.V. performed a NASU Academician Sytnyk K.M. He noted that its representatives have developed the idea of the founder and made critical-systematic analysis of many genus and families of plants. They discovered and described new to science species of vascular plants (Klokov M.V. – 500, Bordzylovsky Y.I. – 67, other botanists – from a few to 50), developed the basic principles of phytoscience, identified one of the major natural ways of phytobiotic quantizing – namely geographical ecotype formation, installed endemic and subendemic features of species, revealed

regularities and specific natural species of bioquantizing and phylogenetic relationships between taxon of different ranks of the organization.

Direct and indirect followers of the Scientific School of Fomin O.V. mid- XX – early XXI century performed successfully and continue to research synanthropic plant life, autofitosozology, ecological and floristic complex of the regional plant life of Ukraine, mineral resources of wild species, possibilities and ways of their rational use, restoration and protection [19, p. 150].

#### International Cooperation

Informative from the point of view of international cooperation Fomin O.V. is his letter written on the letterhead of the Botanical Museum of Ukrainian Academy of Sciences, and sent to the head of the Commission for Relations with foreign academician HUAS Krylov M.M. in 1929. It is published in the electronic exhibition of the Institute of Archival Studies "Oleksandr Vasylyovych Fomin (14.05.1869 – 16.10.1935)" [20].

The letter states that: "In accordance with your attitude on 18.12.29 I have the honour to inform you that I carried out the exchange of my works with the following individuals: **Germany:** Berlin-Dallam: Prof. Dr. *A. Engler*; Prof. Dr. *L. Diels*; Prof. Dr. *R. Pilger*; Prof. Dr. *P. Graebner*; Prof. Dr. *M. Burra* [written illegibly]; Prof. Dr. *K. Krause*; Mushin, Bayern: *Dr. S. Ruoff*; Prof. Dr. *K. Rabna* [written illegibly]; Prof. Dr. *K. Goebel*; [written illegibly] *H. Gams*; Lubek: *Dr. Georg Eberle*; **Austria:** Wien: Prof. Dr. *R. Ritter von Wettstein*; Prof. Dr. *K. Ronniger*; **Hungary:** Budapest: Prof. Dr. *I. Kummerle*; Prof. Dr. *A. Boros*; **Sweden:** Stockholm: *Dr. S. Birger*; Prof. Dr. *Gunnas Samuelson*; Prof. Dr. *Eric Hulten*; **France:** Paris: Prof. Dr. *H. Lacomte*; Prof. Dr. *P. Allorge* ; Montpellier : Prof. Dr. *Iosias Braun Blanquet*; Prof. Dr. *Ch. Flanault*; **Switzerland:** Zurich : Prof. Dr. *M. Rikli*; Prof. Dr. *E. Rubel*; *Dr. H. Broskmanr-Iorosh*; Lausanne Prof. Dr. *E. Wilezen*; Geneva: *Dr. G. Brauner*; **England:** London: *Dr. A.W. Hill* Royal Botanic Garden; *Dr. A. Renole* British Museum; Prof. Dr. *A. G. Tansley* Oxford [20].

We calculated a number of foreign scholars with whom Fomin O.V. supported scientific ties in 1929, which was presented by 30 foreign scientists from 7

countries. Exchange of scientific work took place with researchers of botanical industry in Germany (11 people), Austria (2), Hungary (2), Sweden (3), France (4), Switzerland (5) England (3). We found a positive correlation between achievements of foreign scientists and botanists of the late XIX – early XX century, which we reviewed earlier and those which Fomin O.V. stated in his letter. In both cases, the leaders of botanical field were the representatives of Germany.

#### *Scientific Style of Fomin O.V.*

Scientific terms and concepts are different from other by the definitive factor (each term is matched with a clear definition which focuses on the appropriate term) and should be precise and unambiguous. The analyzed report "Vegetation of Polessye" gives rise to characterize Fomin O.V. as a scholar that avoids ambiguity in the statements and definitions. Thus, pending natural botanical-geographical regions of Ukraine, he carefully draws the boundaries of Polissya region "Forest line serves the south line of Polessye and is conducted from the Hill [written illegibly] in Vladimir-Volynskiy, Lutsk, Rovno then to railway Chudovo, and to Zhitomir and Kiev" [6] and thus emphasizes their ability to practise in the field of terminology.

Scientific reflection is an essential element of scientific knowledge. A striking example of critical self-evaluation is a letter of a future corresponding member of USSR Academy of Sciences Bordzylovsky Y.I. of March 14, 1930 to Fomin O.V. The colleague explained his refusal with such arguments: "Highly-regarded and dear Aleksandr Vasilevich! Besides the motives I stated re the peer-reviewing the thesis of Poltoratskaya, there is another significant one. I do not consider myself sufficiently competent in the subject of the family Rhamnaceae. I processed my material regarding this family in 1908 and since then I absolutely forgot everything concerning Kavkazskikh [written illegibly] ... In order to deal with the reviewing Poltoratskaya`s paper, I will have to get acquainted anew with all literature on the fam. Rhamnaceae, and for this there should be spare time which I absolutely do not have" [16].

Fomin O.V. managed to formulate opinions and provide clear definitions. Specifically the report made by him at the meeting of the Great Dnieper, the term

Polissya he considered as "space, occupied by marshy forests, located in a triangle the peaks of which are denoted above the Dnieper in Brest-Litovsk, Kiev and Mogilev" [16]. Characteristic of his style of presentation of the scientific material made Ukrainian botanist, a member of the Academy of Sciences of the USSR Bordzylovsky Y.I. in the "Review of work of the academician Fomin O.V.". In particular, he said: "He wrote an extremely clear, simple, beautiful language. He was able to express in a few words a lot, and with extreme accurateness. Such telling but brief works are: "Notes on Armenia Plant life", "The vegetation of the outskirts of Manglis" [2, p. 21].

However, he used the national terminology that emerged from research usage and today it is considered as scientifically obsolete or dialect. But the history of terminology proves uncommon cases of rotation of folk and scientific terms, particularly systemic [14, p. 276 – 298]. With the help of etymological dictionaries [7; 17, p. 282] we have tried to explain the meaning of the used by Fomin O.V.[21] terms and concepts: *pure pin forests* "coniferous forests", *landscape area* "territory area", *black soil* "black earth", *lupak* "shist, split uncut stone", *saga* "hollow between sand accumulation", etc.

Rapid progress in natural-scientific research can take place if there is sufficient methodological and material basis. Experimentalists penetrate the mystery of life and living organisms' activity using laboratory instruments, equipment and proper development of research methods. Describing scientific papers of Levytsky L.M. Fomin O.V. paid attention to its experimentation abilities: "He mastered within bounds the research methodology as well as the microscope techniques which had an impact on good medication production by him. The scientist was awarded a golden medal of the Warsaw University" [3].

Appreciation and credibility of scientific results of Fomin O.V. is due to a comprehensive approach to the scientific study of the flora. He studied plant objects through the analysis of herbarium material studies in vivo and in culture. Triple vector approaches made successful the installation process of attributes that are dependent on heredity or were influenced by the environment. In the book

"Pteridophyta of plant life in the Caucasus" he used a new principle in the classification of ferns. A new approach was based on the study of shell sculpture of spores, to the feature which until then the pteridographers devoted no due cognisance. In addition to studying the external morphological characteristics of plants Fomin O.V. took into account the peculiarities of the anatomical structure of leaves. Particularly in "To the taxonomy of the Crimean-Caucasian species and subspecies of the genus *Pinus*" he gave the table to determine the species on the anatomical structure of the needles [2, p. 19].

Brevity and clarity of scientific style characterize the maturity of the scientist. They facilitate the formation of ideas and make effective transfer of information in the scientific and educational processes. Fomin O.V. showed a negative attitude toward "fuzzy articles". In a review about research paper of Levytsky L.M. on January 14, 1918, he wrote: "the author knows [written illegibly] how to use short and clear phrases to form the content of the reviewed by him works about single-celled organisms..." [3].

Fomin O.V. successfully combined academic and abstract imagery in scientific style. This can be seen in his performance Polissya: "This space by its shape reminds a basin with numerous rivers flowing off its edges, and joining the river Prypyat and causing heavy spring floods [6]. He uses scientific and very vivid analytical terms or phrases such as – *glacier tongue* «a part of the glacier valley that lies below the snowline where glacial mass decreases due to melting" etc [21, p. 9].

Epistolary heritage of botanists of the late XIX – early XX century confirms the importance of the moral requirements for a scientific position of the scientific ethnos. In the letter of Navashyn S.H. to Fomin O.V. on December 30, 1916 reflected the highest examples of scientific ethics of a scholar: "The stricter you react to Persidsky, the better. Our grief that such individuals as Persydsky and Kazanovsky join the science being indifferent to it, and move in direction of the least resistance. Field of science must be aristocratic and irreproachably ethic; the opposite elements should be ruthlessly persecuted ..." [9, p. 35 – 36].

### *Evaluation of research activity of Fomin O.V.*

The first president of the USSR Academy of Sciences Academician Vernadsky V.I. highly respected Fomin O.V. His letters and diary excerpts from the period 1929 – 1934 in the original and Ukrainian translation were published by Shevera M.V. [8]. They reflect some aspects of scientific, organizational creativity of the scientist. In particular, the study of the chemical composition of plants, scientists have conducted joint research on biological experimental station near Kyiv in 1919. In his diaries Vernadsky V.I. recalled: "Oldish village remained a dear memory . Walk in the forest and an excursion to the Desna with Fomin O.V. gave me perception of wildlife..." [8, p. 6]. Joint collaboration in the Commission on the development of the draft law for the creation of the Ukrainian Academy of Sciences allowed the head of the commission Vernadsky V.I. to notice characteristics of organizational vigour in Fomin O.V. In the diaries he gave a concise description: "Fomin is tougher in verdicts ..." [8, p. 5].

In a letter dated July 25, 1929 Vernadsky V.I. applied for authoritative advice and assistance from Fomin O.V. on selection of tools and assistants for research: "... 2 years already have been taking advantage of the Ukrainian Academy as well as working in Kiev, such a possibility would have been very important to me. What do you think and advise me? It looks like this year will be spent on working here in Kiev as well" [8, p. 16]. In another letter dated July 4, 1930, he wrote Fomin O.V.: "I appeal to you to support my application to Ukraini [an] Acad [amy] of my work. I am writing this in an official statement to you and to the Academy (which send separately). It is written in Russian, as I am afraid that will not be able to write in Ukrainian correctly with no amendments" [8 , p.19 ]. Navashyn S.H. had a particular confidence in Fomin O.V. so often asked him to get his salary: "I appeal to you with a humble request to get the money and send them by mail for that in advance, please accept my sincere appreciation" [10, p. 20 – 21].

The authorities of botanical science of USSR Academy of Sciences acad. Navashyn S.H. (opened by double fertilization in angiosperms and chalasogamy in single-cover plants , first discovered the satellites of chromosomes and indicated the

characteristic for each type of morphology of chromosomes), professor Kuznetsov M.I. (initiator of works with geographical mapping of the Soviet Union, the author of polyphyllous system of flowering plants) highly appreciated the scientific achievements of Fomin O.V. Their expertise in the field of botany and common chronological period of scientific work forms the basis for the most objective rating of the scientist-taxonomist. Specifically, in a letter to Fomin O.V. on March 21, 1914, Navashyn S.H. announced: "Kuznetsov I.N. just writes that you are the best expert in these species, and here we are exploring the structure and division of cell nucleus and come to a conclusion that all these species are brand new or inconstant" [11, p. 6–7].

The famous botanist, plant physiologist, member of National Academy of Sciences of Ukraine (since 1974 Vice-President of the NASU), Honorary Director of the Institute of Botany named after Kholodny M.H. NAS of Ukraine Sytnyk K.M. noted that nowadays the whole world knows botanical works of Fomin O.V. in morphology, systematics, floristics of lower and higher plants: "This phenomenal researcher and a talented organizer of science has managed in twenties of the XX century to determine for hundreds of years forward research areas in floristry of vascular and spore plants" and his general botanical school established high authority of national phytology [19, p. 150].

Thus, scientific and organizational contributions of Fomin O.V. into the development of botanical science in the arena of Ukraine in the second half of XIX – early XX century occupy a special place in the formation of the field of botany and history of science.

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