

## OPINION

**by Marijana Nedyalkova Perifanova-Nemska, professor, PhD, University of Food Technologies**

of materials presented for participation in the competition to occupy the academic position

**“Associate professor” at the Plovdiv University “Paisii Hilendarski”**

Field of higher education 4. Natural sciences, mathematics and informatics

Professional direction 4.2. Chemical sciences (Organic chemical technology)

In the competition for the academic position of "Associate Professor" announced in the State Gazette No. 96 of November 11, 2025 and on the website of the University of Plovdiv "Paisii Hilendarski" for the needs of the Department of Chemical Technology, Faculty of Chemistry, the following candidate has been admitted: Chief Assistant Professor Olga Tencheva Teneva, PhD, from the Department of Chemical Technology at the Faculty of Chemistry, Plovdiv University "Paisii Hilendarski".

### **1. General presentation of the procedure and the candidate**

By order No. ПД-22-56 /09.01.2026 of the Rector of Plovdiv University "Paisii Hilendarski" (PU), I have been appointed as a member of the scientific jury of a competition for the academic position of 'associate professor' at PU in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.2. Chemical Sciences (Organic Chemical Technology), announced for the needs of the Department of Chemical Technology, Faculty of Chemistry.

The presented set of materials on an electronic medium is in accordance with the Regulations for the Development of the Academic Staff of PU, and includes all necessary documents.

A total of 17 scientific works has been submitted for the competition – 16 publications and one book chapter, which do not repeat the materials used in previous procedures for the acquisition of the 'Doctor' (PhD) educational and scientific degree or for the occupation of the 'Chief Assistant Professor' academic position. All 16 publications are referenced and indexed in the Scopus and/or Web of Science databases. Five of the publications fall under indicator B4, published in journals with a Q1 quartile, and carry 125 points (where 100 points are required). Eleven publications under indicator Г7 (in journals with Q1, Q2, Q3, and Q4 quartiles) and one book chapter under indicator Г8 carry 235 points (where 200 points are required). All scientific publications are co-authored, with the candidate being the first author in 6 of them (35.3%).

The total number of citations across all publications (up to 2025) is 185, with 107 in the Scopus database and 78 in Web of Science. The citations specified for participation in the competition under indicator Д are 51 in number, all in Scopus and/or Web of Science. Total

number of points 102 with 50 required. The total number of points for all indicators is 512 with 400 required. Thus, the candidate exceeds all minimum national requirements.

## **2. General characteristics of the candidate's activities**

The candidate has a total of 11 years of teaching experience with a total of 4536 teaching hours compared to the minimum requirement of 1080, which were derived for the period from 2015 to 2025 with students of bachelor's and master's degrees. The candidate is the supervisor of diploma theses of 3 successfully defended bachelor's students and 2 others in the process of development. Ch. Assist. Prof. Dr. Olga Tencheva Teneva has developed new laboratory exercises, a curriculum, a lecture course in various disciplines. She develops tests for a written exam, updates curricula in some of the taught disciplines.

### Assessment of the candidate's scientific and applied scientific activities

Ch. Assist. Prof. Dr. Olga Tencheva Teneva, has participated in the following research projects: 5 national projects, 4 of which were funded by the Bulgarian National Science Fund – Ministry of Education and Science (as a participant), and 1 educational project under the Operational Programme "Science and Education for Smart Growth" for the creation of a joint Master's program in Intelligent Analytics' together with Sofia University "St. Kliment Ohridski" (as a team member) during 2021–2023. The candidate has also participated in 3 internal university projects, 2 of which were under Agricultural academy. She served as the Project leader for one project funded by the Scientific Research Fund of Plovdiv University "Paisii Hilendarski".

Ch. Assist. Prof. Dr. Olga Tencheva Teneva has participated in 24 national and international conferences. She is a member of the Organizing Committee of 6 conferences. She actively participates in the Candidate Student Campaigns to represent the Faculty of Chemistry and is a member of the Union of Scientists in Bulgaria. Furthermore, she is a member of the Ethics and Academic Integrity Commission at the Faculty of Chemistry.

Given the growing interest in non-traditional plant-based raw materials in recent years, there is a clear need for their comprehensive characterization to assess their potential applications in the food and pharmaceutical industries. The scientific literature currently lacks - or contains only limited - information on the lipid profiles and bioactive compound content of glyceride oils derived from the non-traditional sources investigated by the candidate. This gap provides a solid scientific basis for the research and evaluation of these oils, with the aim of revealing their potential as healthy and functional alternatives to traditional oilseed crops.

The main scientific and scientific - applied contributions of the candidate in the presented publications are precisely in the field of complex assessment of the chemical and lipid composition of non-traditional crops with the aim of revealing their potential for implementation in various industries such as food, cosmetics, pharmaceuticals, etc.

The main scientific and scientific - applied contributions in the presented publications can be briefly defined as follows:

- characterization of the overall chemical and lipid composition of various non-traditional plants, in order to establish the presence of biologically active components, and their application for food, pharmaceutical and other industrial purposes;

- expanding scientific information on the studied non-traditional plants, which can serve to prepare food products with improved functional properties and provide the basis for their use in bioproducts for non-food purposes;

- a database has been obtained that can serve as a reference base for future research and increase consumer awareness before using a given product.

Among the scientific contributions, I would note the following as the most significant:

The scientific contributions of the above publications are expressed in a comprehensive study of the chemical and lipid composition of a number of traditional and non-traditional vegetable oils and obtaining new data on fatty acid, sterol, tocopherol and phospholipid profile, as well as on physicochemical parameters, and markers for nutritional assessment (n-6/n-3, atherogenic and thrombogenic index) have been introduced.

A comprehensive study of the seeds and glyceride oil of the plant species *Amsonia tabernaemontana* Walt; of Chinese bladderwort (*Koelreuteria paniculata*), a comprehensive study of the flower buds and fruits of Indian lilac (*Lagerstroemia indica* L., variety "Hopi"), grown in Bulgaria. For the first time, an assessment of the health lipid indices (atherogenicity index, thrombogenicity index and hypocholesterolemic/hypercholesterolemic ratio) for oils from *L. Indica*, "Hopi", has been given, for which favorable values have been established, indicating a high potential of the oil for cardiovascular health.

The influence of different amounts of linseed oil in the diet of broilers on their growth, quality and fatty acid profile of meat has been established.

- For the first time, a study of the chemical composition and quantitative determination of the main macro- and micronutrients in the moss *Hypnum cupressiforme* has been carried out. Key lipid indices (atherogenicity index, thrombogenicity and hypocholesterolemic/hypercholesterolemic ratio, peroxidation indices and oxidation stability) have been calculated. The obtained values indicate favorable health characteristics and contribute to the scientific understanding of the biological activity of lipids in mosses. The ratio of n-6/n-3 fatty acids has been established and it is close to the recommended for a healthy diet, which is an important scientific result that connects the biochemistry of moss with nutritional standards.

- For the first time, a systematic study of the ultrafiltration of sweet buttermilk for ice cream production has been carried out. New data on the phospholipid composition of the waste after filtration have been obtained.

- The use of ultrafiltered sweet buttermilk as a substitute for emulsifiers/stabilizers in ice cream was investigated and new data were obtained on the content and profile of phospholipids in ice cream mixes. In ice creams with ultrafiltered buttermilk, it is shown that the structure and consistency are improved, but the taste and aroma are worsened by the high concentration of buttermilk.

- The morphological characteristics of seeds of two species of sainfoin (*Onobrychis viciifolia* and *Onobrychis transcaucasica*) were monitored and eight quantitative traits were established, with the greatest variability being shown by the width of the apical leaf lobe. New data on the chemical composition of the seeds were obtained.

- The chemical composition of the seeds of *Ailanthus altissima* was characterized - DNA-protective activity of the oil was demonstrated for the first time - it was established that the seed oil protects plasmid DNA (pUC19) from damage.

- A comparative study of the chemical and lipid composition of white and black quinoa (*Chenopodium quinoa* L.) was conducted for the first time.

- The chemical composition of the essential oil from the fruits of *Schizandra chinensis* cultivated in Bulgaria and the lipid fraction of the seeds was studied. It has been found that climatic conditions and extraction methods influence the amounts and profile of volatile compounds.

From the scientifically applied contributions, I would highlight the following:

- The results of the analysis of pine nuts help in the development of food products and supplements with high biological value.

- The oils isolated from the plant species *Centaurea thracica* are a valuable source of essential fatty acids, which makes them suitable for the development of functional foods and nutritional supplements. All the data obtained can serve as a reference base for future research on other species of the genus *Centaurea* and for the assessment of their nutritional and biological value.

- The seeds of the plant species *Centaurea benedicta* are a rich source of biologically active substances (essential fatty acids, sterols, phospholipids, tocopherols), which makes them promising for use as a new alternative source of phytonutrients, suitable for the development of food supplements and functional products.

- Due to the high content of linoleic acid,  $\beta$ -sitosterol and phospholipids, the seeds of *Amsonia tabernaemontana* are classified as a potential resource for the development of functional foods, cosmetic products and pharmaceutical additives.

- Based on the studies of the oils from flower buds and fruits of Indian lilac *L. indica*, variety "Hopi", it was found that it can be considered as a new plant raw material with potential for use in

the production of functional foods and food supplements., opens up opportunities for the development of new phytopreparations, natural antioxidants and emulsifiers (phospholipids)

- A practical and applicable scheme for enrichment of broiler meat with n-3 fatty acids by controlled inclusion of 1.5% and 3% linseed oil in the ration has been developed. This improves the nutritional value of chicken meat.

- It has been established that the moss *Hypnum cupressiforme*, in addition to its traditional role as bioindicators of pollution, can be used as an alternative source of bioactive substances (sterols, tocopherols, phospholipids, essential fatty acids), which in turn are of key importance in the development of food supplements and functional foods. In addition, the moss can find application in the pharmaceutical industry, which is based on the high content of  $\alpha$ -tocopherol and phospholipids and suggests possibilities for creating preparations with antioxidant, anti-inflammatory and cardioprotective effects. The low values of the atherogenicity, thrombogenicity and hypocholesterolemic/hypercholesterolemic indices indicate that moss lipids may have a hypocholesterolemic effect and reduce the risk of atherosclerosis and thrombosis. The high fiber content emphasizes the applicability of moss as a functional ingredient for improving digestion, metabolism and prevention of metabolic diseases.

- *K. paniculata* and *Ailanthus altissima* seed oils have been identified as a potential source of healthy nutrients due to the high content of monounsaturated acids,  $\beta$ -sitosterol and vitamin E ( $\alpha$ -,  $\beta$ -,  $\gamma$ -tocopherol), which determines the possibility of its use as a natural preservative, biologically active ingredient in cosmetics and supporting component in pharmaceutical formulas as a valuable component in the development of functional foods and products for a healthy lifestyle.

- Due to the high content of  $\gamma$ -tocopherol and phytosterols, quinoa oils are considered promising functional foods and food supplements with biologically active properties.

- Ultrafiltered buttermilk can successfully replace synthetic emulsifiers and stabilizers, thus meeting consumer demand for natural products. Its use improves aeration and melting stability, which is key to the quality and storage of ice cream. Ultrafiltered buttermilk is a valuable source of phospholipids and proteins, which allows enriching the product with bioactive substances and contributes to increasing its functional value.

- It has been proven that differential scanning calorimetry can be used as a reliable tool for identification and control of the authenticity of oil mixtures, i.e. for detecting counterfeits, for establishing the exact percentage of sesame or rapeseed oil in the mixtures. The applicability of UV-Vis spectroscopy for monitoring oxidation has been evaluated, as the UV absorption of conjugated dienes and trienes correlates with the composition of the mixtures, providing a rapid and non-destructive method for monitoring the freshness and quality of oils in industrial practice. All the data obtained are useful for oil blending technologies in the food industry and practical guidelines for extending the shelf life are given, as it has been found that mixtures with a higher proportion of sesame oil have lower peroxide values, which provides better oxidation stability.

These data find application in the production of foods with an extended shelf life and for use in cold and thermal processing technologies.

### **3. Critical remarks and recommendations**

I have no critical remarks.

I know Ch. Assist. Prof. Dr. Olga Tencheva Teneva since she joined the Department of Chemical Technology. Even then, she stood out as an ambitious, assertive researcher. Responsible, executive person, communicative, bold in her dreams.

I recommend that the candidate continue with the same enthusiasm her scientific and teaching activities and participate in the creation of a textbook in some of the disciplines taught.

### **4. CONCLUSION**

The documents and materials presented by the Ch. Assist. Prof. Dr. Olga Tencheva Teneva meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the LDASRB and the relevant Regulations for the Development of the Academic Staff of PU "Paisii Hilendarski".

The candidate in the competition has submitted a sufficient number of scientific papers. The candidate's scientific and teaching qualifications are unquestionable.

The achievements of the Ch. Assist. Prof. Dr. Olga Tencheva Teneva results in the educational and scientific research activities fully correspond to the minimum national and specific requirements of the Faculty of Chemistry of the "Paisii Hilendarski" PU, adopted in connection with the Regulations of the PU for the application of LDASRB.

After familiarizing myself with the materials and scientific works presented in the competition and analyzing their significance, I find it reasonable to give my positive assessment and to recommend to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Chemistry for the selection of Ch. Assist. Prof. Dr. Olga Tencheva Teneva at the academic position of "associate professor" at PU "Paisii Hilendarski" in field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.2. Chemical Sciences (Organic Chemical Technology).

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Prepared the opinion: .....

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