ABSTRACT E-BOOK

DR. MİRZA GÖKGÖL INTERNATIONAL PLANT GENETIC RESOURCES SYMPOSIUM

ORGANIZED BY AEGEAN AGRICULTURAL RESEARCH INSTITUTE

NOVEMBER 6-9, 2023, İZMİR, TÜRKİYE

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DR. MİRZA GÖKGÖL INTERNATIONAL PLANT GENETIC RESOURCES SYMPOSIUM

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PREFACE

Dear Scientists,

We are honored to invite you to the **Dr. Mirza GÖKGÖL International Plant Genetic Resources Symposium**, which will be hosted by the Aegean Agricultural Research Institute (ETAE) within the Ministry of Agriculture and Forestry of the Republic of Türkiye (TAGEM) in İzmir from November 6th to 9th, 2023.

The symposium aims to bring together scientists and experts from around the world working on plant genetic resources for food and agriculture, including local varieties, heirloom seeds, cultivated plant species, their wild relatives, and economically valuable wild species. The gathering will focus on topics such as collection, taxonomy, conservation, management, sustainable use, and evaluation of these plant genetic resources. The event will provide a platform for presenting scientific research, sharing knowledge and experiences, and strengthening collaborations.

Located in İzmir, the pearl of the Aegean region, known for its historical settlements, ancient cities, and rich biodiversity with numerous endemic and rare plants, the symposium promises a beautiful setting to foster meaningful discussions and interactions.

We look forward to meeting you at the Dr. Mirza GÖKGÖL International Plant Genetic Resources Symposium.

Dr. Ertuğrul ARDA

Symposium Chair

Manager of Aegaen Agricultural Research Institute

CONTENTS

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INVITED SPEAKERS' ABSTRACTS

Great Turkish Scientist Mirza Gökgöl and His Contributions to Plant Genetic Resources Studies

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Abstract: Mirza Hacızade Gökgöl (1897–1981) is one of the keystone actors of plant genetic resources and breeding science in Türkiye. Gökgöl carried out extensive collecting and breeding programs using plant genetic resources from all over Türkiye between 1925 and 1950. He is regarded as the pioneer of plant genetic resources studies in Türkiye. Mirza Hacızade was born as the first child of six in Ganja city of Azerbaijan, on 14 September 1897. His mother Meşedi Yaqut was a housewife and father Yousif Hacızade was a merchant. After graduating from Male High School of Ganja in May 1915, he studied Agriculture in Novoaleksandriysk Institute of Agriculture and Forestry between 1916-1917 in Krakov, Ukraine. While he was continuing his education, the Russian Revolution Movement had started. Due to the turmoil caused by revolution, he had to return Azerbaijan whose name was changed to Azerbaijan Democratic Republic (AZD). AZD selected 100 young men abroad for higher education in 1918. Mirza Hacızade was was one of them. For the beginning he studied at the Portici Agricultural High School in Naples, Italy, for 6 months and continued at the Landwirtschaftliche Hochschule (Higher Agricultural School) in Berlin. There he studied under supervision of well-known geneticist Erwin Baur (1875–1933) and the professor of agriculture Kurt Opitz (1877– 1958) from November 1920 until he graduates. He passed the diploma examination in June 1925 and completed his Ph.D. dissertation in December 1926. After the Soviet become fully effective in ADR, Azerbaijan was no more a safe place for the students abroad to return home. While Mirza continued his education in Berlin, problems began to arise in communication as well as in money transfer with Azerbaijan. After April 1920, the Turkish Republic took over his expenses during the rest of his education. While Dr. Hacızade was working with Dr. Baur in Berlin, the Turkish government offered him a position to establish a research station in Istanbul (1926). Then he moved to Türkiye and established the institute in Halkalı District of Istanbul, then the institute was transformed to Yeşilköy District in 1931. He has started collecting seed material after he settled in Türkiye. The Surname Law of the Republic of Türkiye, which was issued on 21 June 1934. With this law, all Turkish citizens were required to take a surname. Then Mirza Hacızade accepted the name “Gökgöl” as his surname on 17 December 1934. In an interview with his son Demir Gökgöl who was a well-known actor, he stated that his father got this name due to strong and persistent desire to his hometown and beautiful Göygöl (Blue Lake in Azerbaijan language) near Ganja City. Dr. Mirza Gökgöl collected thousands of seed material from all over Türkiye. Although he mainly centered on cereals, he also collected great amount of material from other plant groups and characterized them all in Yeşilköy Agricultural Research Station. After characterizing and evaluating thousands of accessions, he published his two volumes of books “Wheats of Türkiye”. In these books, all the material has been botanically identified and morphologically

evaluated. Among the evaluated material, he identified and published 256 new wheat varieties out of 18.000 accessions. Russian scientist Vavilov, who put forward the Origin Centers Theory, considered the abundance of morphological variation in an area as the main indication for the area to be a gene centre. Hence Vavilov presumed Anatolia as gene centre for diploid einkorn wheat, Ethiopia for tetraploid wheat, Afghanistan and Iran for hexaploid wheats. Based on the data derived from field studies, Gökgöl declared that the number of botanical varieties grown in Türkiye considerably exceeds the number grown in other regions of the World. Thus, Gökgöl concluded that, Anatolia and adjacent regions of Iran, Syria, Palestine and Southern Caucasus formed the centre of diversity and origin for diploid, tetraploid and hexaploid wheats. During his scientific career, Gökgöl published numerous papers and books on a large group of plants, but mostly concentrated on cereals. Of his 43 publications between 1930 and 1965, nine were written in German and one in French, and three were translation of Erwin Baur's books. After retirement in 1961, he continued his scientific career as a visiting professor in Istanbul and İzmir. He refused an offer to teach at the Göttingen University, but he lectured at eight German universities and maintained personal and professional relations with German scientists, especially colleagues from the Max-Planck-Institut für Züchtungsforschung (Max Planck Institute for Breeding Research) in Cologne. Mirza Gökgöl passed on 28 January 1981. His grave is in Karacaahmet Cemetery in Istanbul.

Keywords: Mirza Hacızade Gökgöl, Plant Genetic Resources, Türkiye'nin Buğdayları, Origin Centers Theory

Germplasm and Genomics Resources to Support Crop Breeding: the Case Study of Tetraploid Wheat

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Abstract: Crop wild relatives have recently gained importance as source of new variability to counteract the reduction of genetic diversity which is instead in action within the breeding gene pools. Nowadays characterizing, dissecting, and restoring useful genetic diversity is therefore of paramount importance. On this subject, the case study of durum wheat will be presented as its relatives and progenitors carry large untapped genetic variability which is being characterised and dissected by international collaborative initiatives. A specific focus on wild emmer and its relevance for resistance to wheat diseases will be provided, with examples of association mapping, fine mapping and tracking of alleles across the tetraploid history. Tetraploid wheat genomic resources have been released by international consortia. The reference wild emmer wheat genome (Zavitan) represented an important milestone for wheat genomics. Currently, an international initiative is ongoing to unveil the tetraploid pangenome, based on sequencing and annotation of representatives of wild emmer, domesticated emmer, *turgidum* and *turanicum* subspecies, *durum* wheat landraces and modern varieties.

Keywords: Tetraploid wheat, wild emmer, genetic diversity, pangenome.

Cure: PGR to heal drylands

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Abstract: The agricultural sector relies on the availability of natural resources, especially fossil fuels, soil, water, and plant and animal. Historically, the sector has been focusing more on increasing productivity at almost any cost. Facing current global challenges, such as population increase and malnutrition, climate change, soil degradation, continuing loss of arable lands and scarcity of natural resources, it is imperative for agricultural sector to focus on a more integrative approach. Agriculture has urgently to shift to more sustainable forms where production and nutritive value will be on primary focus, concurrently protecting the natural resources to ensure food security for the generations to come. In this context, the plant genetic resources (PGRs) being to total diversity holding a combination of alleles and various genes present in cultivated species and their wild relatives are available and hold a key role in adapting the agricultural system to the current challenges. By making the needed genetic diversity available for users, plant breeders will maximize their chances of increasing their capacity to respond to current and future challenges in agriculture. CURE, which stands for Conservation, Use, Research and Education, is the ICARDA genetic resources team making sure, working with partners in the region and beyond, that the gaps of genetic diversity are reduced by collecting and conserving *ex-situ* cereal and food legume crops and wild relatives, as well as forage and range species under optimal and cost efficient ways. The team encompasses an integrated approach to capture and exploit specific adaptive traits, starting from the implementation of collecting expeditions up to germplasm evaluation and use in pre-breeding employing pioneering techniques for efficient gene mining. This approach has allowed the development and distribution to the national agricultural research systems of many countries of unique germplasm with better adaptation to major biotic and abiotic stresses, being a prudent and sustainable strategy to ensure food and feed security.

Keywords: PGR, Gap, diversity, use, genomics.

Conservation of Crop Landraces and Their Importance for Agricultural Biodiversity

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Abstract: Crop landraces (LRs), also called as local varieties, farmers' varieties or traditional varieties, maintained by traditional farming systems, in farmer's fields, orchards or home gardens, have played a principal role in the history of crops, in crop improvement, agricultural production. They are extremely important for food security, rural development and the improvement of the socioeconomic status of farming communities and being potential source of basic genetic material for developing better adapted varieties. Farmers keep LRs *in situ* for number of reasons, such as culture, food preference, risk avoidance, local adaptation, and niche market opportunities. Local farmers saving a consciously selected proportion of seed for next cultivation over ages have enhanced the genetic pool of crops. LRs being subject to genetic modification through natural and human selection, adapted different agro-ecological condition and having many desirable attributes constitute a major portion of agricultural biodiversity and important component of cultural heritage. LR can be characterized as "dynamic population of a cultivated plant with historical origin, distinct identity, subject to farmer selection rather than formal crop improvement, genetically diverse, locally adapted, associated with local cultural, and/ or historic values and associated with traditional farming systems" (Camacho Villa *et al*. 2005). The replacement of enormous numbers of LRs by modern varieties in the last decades has caused the farming systems more vulnerable to abiotic and biotic stresses. So, conservation of LRs, *in situ* (on farm) and combined with *ex situ* is important for protection of agricultural biodiversity and to prevent genetic and cultural erosion of threatened LR diversity. Generate a LR database including LR inventory and traditional knowledge should be the first step for conservation of agrobiodiversity. So, necessary action should be taken in line with the principles of agrobiodiversity conservation and sustainable use for preventing the loss of LRs, increase added value of LR products and access to their propagation materials, promoting use, adoption and awareness of LRs, as well as use of participatory plant breeding approaches based on local seeds needs to be expanded.

Keywords: Landrace, *ex situ* conservation, *in situ* (on-farm) conservation, agricultural biodiversity, agrobiodiversity.

Genomic for Genebanks: Unlocking the Genetic Diversity of the Cimmyt Wheat Collection

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Abstract: Climate change and the rapidly growing human population trigger the demand to explore and unlock unutilized genetic resources for feeding future generations. In wheat, undomesticated wild species, crop wild relatives, and landraces represent sources of new variation for cultivar improvement. However, their resilience and adaptive capacity mechanisms remain largely untapped and poorly understood. In this study we aim to unlock and utilize novel genetic diversity held in genebanks, thought the largest crop genotyping effort using DArTseqTM technology in more than 80,000 genebank accessions. The analysis was divided into three biological categories: 4,206 wild relatives, 20,000 tetraploid and 60,000 hexaploid accessions. Our analysis has identified more than 300,000 filtered high-quality DArTseq-SNPs and SilicoDArT markers. All markers generated were aligned to three reference maps: the IWGSC RefSeq reference genome, the durum wheat genome (cv. Svevo), and the DArT consensus map. On average, 72% of the markers align uniquely on the reference genomes and 50% are linked to genes. The analysis reveals landraces with unexplored diversity and genetic footprints defined by regions under selection. This provides fertile ground to develop wheat varieties of the future by exploring specific gene or chromosome regions and identifying germplasm conserving allelic diversity missing in current breeding programs.

Keywords: Genomics, genebanks, molecular markers, wheat.

ORAL PRESENTATIONS

Azerbaijan Plant Genetic Resources (PGR) and Management System of PGR

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Abstract: Being one of the primary origins of some plants, Azerbaijan is rich in valuable species and varieties produced by traditional and scientific selection. The diversity of Azerbaijan's natural-historical and physical-geographical conditions has led to various plant cover formations. Approximately 5,000 species (159 families and 1117 genera) of higher plants are recorded in Azerbaijan, which represents about 65% of the floral diversity of Caucasus region, and 11% of the world's flora. Among these higher plants: more than 1500 are medicinal, 200 wild vegetables, about 800 aromatic and spice plans, and other valuable plants. The role and importance of this diversity are significant in cultural improvement and sustainable development as well as in providing food safety for Azerbaijani people. Therefore, collecting, researching, and protecting these plants and delivering them to future generations are the most crucial issues. One thousand two hundred twenty-seven species (53 families and 172 genera) in Azerbaijan Flora can be attributed to a crop wild ancestor (excluding ornamental and medicinal plants). Azerbaijan is the origin Center for most of this species. "Law of the Azerbaijan Republic on preservation and sustainable use of crop genetic resources" was adopted by the National Assembly. The Cabinet of Ministers approved the legal and regulatory documents and accepted the necessary rules to implement this law. Genetic Resources Institute (GRI) has been declared the National Coordinating Institute on PGR. "National Gene Bank" status of GRI's gene bank was approved and given the status of a Special Protected State Facility. The gene pool of the National Gene Bank was enriched, new national collections were created, and their state and personal provision was improved with international support. Over the last 10 years, more than 8,000 accessions were evaluated. More than 700 donor forms with valuable traits of agronomic importance, resistant to stress factors, were revealed and effectively used in breeding programs. In the last three years at GRI, 11 varieties created using PGR were released. Accumulated at all stages of activity on gathering, preservation and studying genetic resources, the information arrives in the Central Database of PGR.

Keywords: Azerbaijan plant genetic resources, management system of PGR,crop wild ancestor, National Gene Bank.

The Importance of Seed Gene Banks in Ex situ Conservation of Plant Genetic Resources and the National Seed Gene Bank

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Abstract: Plant genetic resources have an enormous contribution to make in addressing food and nutrition security, ensuring resilience of production systems, and coping with the impacts of climate change in the future. However, genetic resources are being lost at an increasingly alarming rate. With the erosion of these resources, mankind loses the potential to adapt to new socio-economic and environmental conditions.The *ex-situ* conservation of plant genetic resources for food and agriculture is a global concern and play a central role in food security in the future. It can be used with different methods, such as seed banks, field genebanks, *in vitro* preservation, pollen banks, and DNA banks. Currently, there are about 1750 gene banks in the world, maintaining millions of accessions to crops and their wild relatives. Nearly 7.4 million accessions are now conserved *ex-situ* in over 1750 facilities worldwide. The seed gene bank is one of the most widespread and valuable ex situ approaches to conservation. Seed banking has considerable advantages over other methods of *ex situ* conservation, such as ease of storage, economy of space, relatively low labor demands and, consequently, the capacity to maintain large samples at an economically viable cost.Türkiye is one of the pioneering countries that started to maintain genetic resources and has had considerable experience in ex situ conservation since 1960s. The National Seed Gene Bank was built in 1964 and carries out a scientific program for long-term preservation of germplasm with seeds under controlled conditions in accordance with the standards developed by the Food and Agriculture Organization of the United Nations. The facilities of the National Gene Bank at the Aegean Agricultural Research Institute for seed collection have been designed and well equipped for the needs of long-term and medium-term storage for both base and active collections, respectively. The National Gene Bank contains landraces, wild and weedy relatives, other wild species that are especially economically important (medicinal, aromatic, ornamental, etc.), and endemic plant species. The total number of accessions in the National Genebank collection is more than 55.000, with about 3.090 species.

Keywords: Plant genetic resources, *ex- situ* conservation, seed genebank, orthodox seeds, food security.

Determining Conservation Priorities for Crop Wild Relatives in the Context of Climate Change

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Abstract: The crop wild relatives are considered closely related plant species that grow in their natural habitats and can exchange genetic material with cultivated crops. It is expected that these wild relatives possess alleles that are no longer present in cultivated crops. Therefore, the crop wild relatives are widely recognized as a valuable resource in terms of beneficial traits and genetic diversity for both classical and modern breeding. The effects of climate change pose a threat to the future adaptability of the crop wild relatives as well as other living species. Addressing *in situ* and *ex situ* conservation strategies in an adaptive context to climate change plays a key role in global food security. This review aims to critically analyze to what extent the crop wild relatives are prioritized in conservation strategies and to examine how the effects of climate change are addressed within this framework. In order to determine strategies for the conservation of crop wild relatives, which were used in both *in situ* and *ex situ* conservation, current methods, as well as how species respond to climate change through geographic information systems, were analyzed. The importance of these strategies in terms of conserving genetic resources, utilizing them, and ensuring food security was discussed through examples of best practices. National and regional strategies for the conservation of crop wild relatives were examined, and studies addressing the effects of climate change among these were identified. The results of this literature review were then analyzed according to the publication date, and whenever possible, the most recent examples were cited. In cases where this was not possible, the best practice examples were considered. Methodologies suitable for determining strategies at the national, regional, and global levels were compiled, analyzed, and presented. Methodologies suitable for establishing strategies at national, regional, and global scales were compiled and analyzed to provide.In the face of global challenges such as climate change and biodiversity loss, there is a need for new and innovative strategies to conserve genetic resources and promote sustainable agriculture. The framework presented in this study and the analyzed examples can contribute to shaping agricultural and environmental policies at both the national and international levels.

Keywords: Plant genetic resources, landraces, *ex situ* conservation, agricultural biodiversity

Seed gene banks: legal, administrative and technical aspects

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Abstract: It is of crucial importance to conserve plant genetic resources (PGR), one of the fundamental elements of agricultural biodiversity, with *ex situ* method. Today over 1,750 genebanks and collections have been established worldwide, wherein 7.4 million accessions are maintained as *ex situ* collections in either seed banks, field genebanks, *in vitro* genebanks and/or cryogenebanks. Once seed arrives at gene bank via collection or donation then a complex process begins that includes regeneration, preservation, characterization, evaluation, documentation and distribution of germplasm. This process requires knowledge, expertise, experience and attention to details from researcher to worker. Genebanks can be considered as storehouses of genetic resources which have primary responsibility of conservation genetic diversity for future generations to cope with possible challenges. On the other hand, gene banks have many legal, administrative and technical aspects that need to be addressed national, regional and international level, such as due diligence, research, cooperation, coordination, evaluation and strategic planning. Türkiye provides necessary infrastructure, human resources and budgetary support for conservation of PGR in gene banks. Moreover, in the context of national agricultural research system conducted by GDAR and of international bodies responsible for biodiversity management there is still need for better understanding of the current status of PGR, strengthening scope and infrastructure of the genebanks. In this study, national/international legislations, organizational structures, technical guidelines were examined and several implementations were reviewed on seed genebanks. In this frame, instruments such as national, regional and global network constitution, Ad-Hoc exchange programs for technical experts, development of risk assessment and management programs, possible twinning cooperation among gene banks were also considered. Whether it is a simple road map or a comprehensive strategic action plan, it is recommended to prepare a national plan that includes items such as evaluation, analysis, research, prioritization, authority and responsibility determination.

Keywords: Seed gene bank, legislation, administrative, technical

The Uses of Digital Herbarium in Plant Diversity Research in Türkiye

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Abstract: Botanists, a section of the broad universe of researchers in Biology, are intensive users of herbaria. Presumably, all botanists use herbaria, with greater or lesser frequency and intensity, to develop their research. On the other hand, it will be demonstrated that, in addition to the uses of the herbarium in basic science, this institution has a crucial role in the knowledge and preservation of biodiversity and in improving species for commercial use. This study assesses the advantages and disadvantages of photo specimens (digital herbarium) documenting plant biodiversity in Türkiye. The methods need biological recording, specimen preparation, macro-mode capturing, and last-stage identification. Digital herbarium can be used to identify and collect plant biodiversity data. Furthermore, this method is simple, cheap, and relatively easy to conduct. The output is a catalog of plant species in specific areas, which provides a better understanding of plant identification and biodiversity, enhances conservation practices, and provides better long-term protection for Türkiye plant biodiversity.

Keywords: Türkiye, digital herbarium, plant diversity.

National Herbarium of Türkiye (TC)

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Abstract: National herbariums are plant museums that reference the plant materials of countries and try to represent the plant samples of the whole country. The National Herbarium (TC), which was founded as a section of the Turkish National Botanical Garden, began to systematized in 2019. In 2022, the herbarium joined the index herbariorum group with the abbreviation "TC". The plant materials in the National Herbarium consist of gift samples from various herbariums in Türkiye and samples collected during the TAGEM Research projects of the National Botanical Garden as well as plant samples collected by plant lovers, volunteers or researchers. Plant samples are represented by the group of spore-bearing and flowering plants. It is planned to preserve moss and mushroom samples in the future. Recently, herbarium studies continue with 2500 specimens. This number is increasing day by day. Samples are prepared in accordance with international rules and kept in cabinets. In addition, it is planned to share information nationally and internationally by scanning the samples and sharing certain information on the National Botanical and TAGEM herbarium websites.

Keywords: National Herbarium, National Botanical Garden Türkiye

Ali Nihat Gökyiğit Foundation Nezahat Gökyiğit Botanic Garden Herbarium of Türkiye: Past, Present and Future

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Abstract: Ali Nihat Gökyiğit Foundation (ANG) Nezahat Gökyiğit Botanic Garden Herbarium (NGBB), whose official acronym is NGBB, as registered in the index Herbariorum, is an institution devoted to the study of the Türkiye Flora. In addition to preserving well-documented voucher specimens representing the province's past and present legacy, NGBB's primary mission is to provide an accurate taxonomical, geographical, and historical representation of all native and naturalized plants in Türkiye. NGBB Herbarium was established in 2004 in a small two-room building next to the office building to document and record the plants grown at Nezahat Gökyiğit Botanik Bahçesi. In the following years, the scope of the herbarium expanded with the addition of specimens collected during our research expeditions to improve our collections. NGBB Herbarium contains approximately 20,000 plant specimens from Collections of Angiosperms, Gymnosperms, Ferns, Lichens, Cultivated Plants, Carpological and Spirit Specimens. As NGBB Herbarium, we established a virtual herbarium in 2020, within the scope of the Global Strategy for Plant Conservation (2011 – 2020). Objective I: "Plant diversity is well understood, documented, and recognized." As of 2022, our virtual herbarium has been put into service by transferring the data and images of the herbarium specimens in the NGBB Herbarium to the web environment. The wealth of information stored in our biological collection is available to systematists and can be used to analyze quantitative data in multiple traditional ways or via biodiversity informatics programs.

Keywords: NGBB, herbarium, plant conservation.

Türkiye's Herbarium-Based Brassicaceae Database

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Abstract: Brassicaceae, a significant angiosperm plant family with global distribution, has its origins in the Iran-Turanian phytogeographic region. Members of this family show adaptations to a range of temperate and subtropical climates, depending on the species. In particular, Brassicaceae plays a central role in global agriculture and includes many economically and industrially important oilseed, spice, vegetable and forage species. In Türkiye, the Brassicaceae family comprises 705 species distributed in 96 genera, of which 270 species are endemic, resulting in a total of 782 taxa. The primary objective of this study is to thoroughly examine the available herbarium records of Brassicaceae in Türkiye, compile a comprehensive database, and ultimately elucidate the species richness gradient of this family in the country. The herbarium records of the Brassicaceae family were taken from major herbariums in Türkiye such as AKDU (Akdeniz University Herbarium), ANK (Ankara University Faculty of Science Herbarium), GAZI (Gazi University Herbarium), HUB (Hacettepe University Herbarium), ISTE (Istanbul University Faculty of Pharmacy Herbarium), EGE (Ege University Faculty of Science Herbarium), NGBB (Nezahat Gökyiğit Botanical Garden Herbarium), and digital herbariums B (Berlin Botanical Garden and Botanical Museum), E (Royal Botanic Garden, Edinburgh), and W (Naturhistorisches Museum Wien), which have a large number of Turkish specimens. The resulting 19,112 records were digitised, the most representative tribes, genera and species were identified, and the provinces, habitats and altitudes with the highest sampling were analysed. Thus, a comparative analysis of the herbarium collections of the Brassicaceae in different herbaria has been carried out. The georeferencing of the specimens for the final biogeographical analyses is in progress.

Keywords: Brassicaceae, database, herbaria, Türkiye.

Genetic Potential of Grapevine in Türkiye

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Abstract: Vine and viticulture culture, which has been cultivated since ancient times, is one of the oldest cultivated fruit species in the world, holding an important place in the social and economic structure of Eastern and Western civilizations in every period. It was determined as a result of archaeological excavations that the origin of Anatolian viticulture dates back to 3500 B.C. Two of the 8 gene centers determined by Vavilov in the distribution of plant gene centers around the world (Near East and Mediterranean) intersect on the territory of Türkiye. Our country has a very rich vine genetic potential, both for wild vine (***Vitis vinifera*** ssp. ***sylvestris***) and cultivated vine (***Vitis vinifera*** ssp. ***sativa***), which means that Türkiye is the homeland of grapes and after completing their evolution in our country, they spread to other countries. suggests that they might be. Due to its geographical location, Türkiye has ecological conditions that can be considered ideal for the cultivation of table and wine grape varieties. On the basis of research in the field of viticulture, the protection of existing genetic resources and ensuring sustainability should be prioritized. Plant genetic resources are strategic resources for sustainable plant production and are critical to maintaining food security today and in the future. Studies have been carried out by many researchers from the past to the present regarding the identification of grapevine genetic resources available in our country. Studies on determining our grapevine genetic resources started with ampelographic studies and continued with the use of biochemical markers, and today they are continued with the use of DNA markers. In this review, our local grapevine genetic resources and their importance are mentioned.

Keywords: Vine, viticulture, genetic resource, Türkiye.

Characterization of Some Grape Genotypes in Tekirdağ Vineyard Field Gene Bank

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Abstract: Türkiye has many kinds of grape genotypes due to its location, Asia Minor, which is among the homelands of grapes. To protect this richness, "The Determination, Conservation and Identification of Turkish Vine Genetic Resources" project was started in 1965. Therefore, 1457 varieties/genotypes have been preserved in the vineyard field gene bank of Tekirdağ Viticulture Research Institute until now. A characterization study was carried out on Sömbeki, Eksenez, Selvikarası, Kınalı Üzüm and Çatalkarası (Çatal dimrit) in 2022. Characterization studies were conducted on 53 criteria selected from the OIV definition list. As a result, Kınalı Üzüm and Çatalkarası genotypes attracted attention in terms of leaf hairiness characteristics. OIV4 for Kınalı Üzüm and Çatalkarası are dense (7). OIV84 for Kınalı Üzüm is medium (5) and for Çatalkarası is low (3) while OIV86 for them was found to be low (3). It is also observed that they have more hairiness than other genotypes. Selvikarası has a functional female flower structure (OIV151) and other genotypes have a hermaphrodite structure. In terms of cluster density (OIV204), Çatalkarası (dense-7) is more dense than other genotypes. Sömbeki genotype had the highest value in seed length (OIV242), seed weight (OIV243), bunch weight (OIV502) and berry weight (OIV503).

Keywords: ***Vitis vinifera*** **L**., grapevine field gene bank, ampelography.

Vine Genetic Resources of Eastern Anatolia Region

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Abstract: Türkiye has an important place in terms of natural plant resources with its rich plant diversity. Grapevine, which is grown almost everywhere in our country, is an important part of this rich diversity. There is a wide range of varieties and types within the vine, showing different characteristics and rich in genetic diversity. Detecting, describing and using these varieties and types as genetic material is very important for the protection and sustainable use of Türkiye's plant diversity. Although significant progress has been made in the study of grape biodiversity in recent years, factors such as industrialization, rapid urbanization, and climate change are significantly threatening grape genetic resources. Within the scope of the "Eastern Anatolian Vineyard Genetic Resources Project" initiated by the Erzincan Horticultural Research Institute in 2006, survey, collection, and preservation studies were carried out in order to determine the diversity, protection and sustainable use of grapevine genotypes. As a result, 191 different grapevine types were identified and preserved in the Field Gene Bank. Additionally, ampelographic descriptions were made for 40 different genotypes. In this study, the ampelographic identification of 12 genotypes (Adesa, Korostol, Çayra, Turfanda, Tombul Üzüm, Siyah Mayhoş Üzüm, Siyah Tatlı Çekirdekli, Siyah Üzüm-G1, Siyah Üzüm-G2, Herci, Kara Gahet, and Hanım Göbeği) was carried out using a method that included 53 phenotypic, morphological, and pomological characters defined by the International Organization of Vine and Wine (OIV). In the 12 genotypes examined, the flower organs of the Turfanda genotype were determined as morphological hermaphrodite physiological female. The taste of grains of this genotype has been described as distinctive, fragrant and aromatic. On the other hand, when mature leaves were examined, the number of lobes of Korostol Grape, Siyah Grape-G2 and Siyah Tatlı Çekirdekli genotypes was determined to be five. Prostrate and erect hairiness density between main veins, and a density of prostrate and erect hairiness on the main veins were observed to be absent or less on the underside of the leaf. It can be said that there is a linear relationship between the main vein (N1) length and side vein (N2, N3) lengths of the genotypes examined. Additionally, it was determined that there was a significant positive relationship between economic characteristics such as panicle length, panicle width, grain length and grain width. As a result of the cluster analysis, it was observed that two main groups were formed.

Keywords: ***Vitis* spp.**, East-Anatolia, genetic resource, *ex-situ*, ampelography.

Research on Identification, Preservation and Identification of Vine Genetic Resources in Southeast Anatolia Region

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Abstract: The growing areas of vines, which are among the threatened plant groups in different regions, are determined, collected and preserved. In addition to the existing grapevine genetic collection, new grapevine genotypes are identified and included in this collection. It is the collection and preservation of materials to be used by Grapevine Genetic Resources breeding and other research programs in the Southeastern Anatolia Region. The GAP region has a wide and important potential both in terms of its ecological structure and traditional cultivation. While a total of 40 grape varieties and types belonging to the provinces of the region were preserved by the Pistachio Research Institute until 2010, this number was increased to 117 in 2015. In addition, 101 local grape varieties and types found in their genetic resources were identified with molecular marker techniques at Ankara University, Faculty of Agriculture, Department of Biotechnology. In the study carried out on 101 grape genotypes using 6 SSR (Simple Sequence Repeats) loci; In addition to allele data, genetic relationships between varieties, homonymous and synonymous statuses are defined according to provinces.In addition, the results of the study will be compared with the database of the National Collection later. The same genotype and homonymous cases were not found. A total of 3 synonym groups were detected among the genotypes Gevruk (19) - Atf (25), Gemre (20) - Skori (31) and Şekeri (37) - Çiloreş (46). When synonymous varieties were taken into account, it was determined that the same genotype was incorrectly named with different names. When the similarity rates other than synonymous varieties showing complete similarity are examined; highest similarity rate in genotypes; With 91.7%, Triyeşifi (17) - Reş Paizi (35), Deyvani (3) - Gevruk (19) - Atf (25), Ağ Üzümü (36) - Tuha-Mebi (48), Pelurik (42) - Mazrune (44)) was seen among the genotypes.

Keywords: Vine, grape variety and type, genetic source, collection vineyard.

Genetic Resources, Conservation, and Molecular Characterization of Grapevines in the Eastern Mediterranean Region

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Abstract:Türkiye has an important position in world viticulture and the origin of viticulture culture dates back to ancient times in our country. As with many fruit species, our country, which is one of the homelands of grapevine, has greatly increased its genetic resource richness thanks to viticulture activities carried out for thousands of years. The Eastern Mediterranean region is an important representative of this rich viticulture culture and, as emphasized in the project we are working on, preserving this richness will prevent the destruction of existing unique resources. The 125 different types and varieties of local grapes collected from Kahramanmaraş, Adana, Osmaniye, Hatay and Mersin provinces formed the basis of the project and contributed to the establishment of a regional grapevine variety vineyard. The main objective of the project is to identify and conserve regional grapevine genetic resources, to determine grape varieties and types by ampelographic and molecular identification, and to provide material for future breeding studies. When the results of molecular characterization to determine the degree of relatedness of the genotypes were examined, it was revealed that the genotypes were different from each other. In addition, when the SSR identification data obtained were compared with a total of 1119 grape varieties in the collection of Tekirdağ Viticulture Research Institute National Vineyard and Erzincan Garden Cultures Research Institute, it was determined that none of the 125 grape varieties showed 100% genetic similarity. It was revealed that there is a population containing genetically different varieties from the National Collection Vineyard. This project plays an important role in the sustainability and transmission of regional and national viticultural heritage to future generations.

Keywords: Grapevine, Genetic Resource, Eastern Mediterranean, Türkiye.

Morphological, Pomological and Biochemical Characteristics of Some Minor Fruits Grown in Türkiye

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Abstract: Türkiye is rich in plant population diversity. In addition to cultivated fruits, there are many spontaneously grown fruit species that are known by our producers but are not cultivated. Minor fruits are little-known fruit species found on scattered trees or in small natural populations in the geographies where they are distributed. With this study, the morphological, pomological and physicochemical composition of oleaster (***Elaeagnus angustifolia***), cornelian cherry (*Cornus mas* L.), and hawthorn (***Crataegus orientalis***, ***Crataegus monogyna***, ***Crataegus azarolus***, ***Crataegus pentagyna***) species growing in different regions of our country were determined. In addition, vegetative production studies were carried out on the genotypes of these species and they were protected in land gene banks.

Keywords: ***Elaeagnus angustifolia, Cornus mas* L, *Crataegus orientalis,*** minor fruits.

Collection, Preservation and Characterization of Pear (Pyrus spp.) Genetic Resources in the Southeastern Anatolia Region

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Abstract: This work; It was carried out with the aim of determining the morphological and pomological characteristics and chemical contents of pear types and ecotypes naturally distributed in our region, using UPOV definitions, preventing the disappearance of these types by protecting them in the institute fruit collection garden, and providing resources for breeding studies. The research started in 2021 and is still ongoing. In the survey studies carried out in Diyarbakır and Batmam provinces in 2021 and 2022, it was determined that there were no covered pear orchards and that there were individual pear trees in non-agricultural areas. In the study, 16 genotypes were marked in 2021 and 14 in 2022. Two years of data are shared here. The altitude at which the genotypes were found varied between 640-1210m. Among the morphological characteristics, tree habitus, tree growth strength, branching status, trunk length, trunk thickness, crown height and vegetative form were determined. Among the pomological characteristics, fruit weight is 18.15-190.28g, fruit length is 26.11-69.1mm, fruit width is 30.96-82.7mm, fruit flesh hardness is 1.2-13.17 kg/cm2, fruit shape index is 0. 75-0.89, fruit stem length was determined as 18.34-49.46 and stem thickness was determined as 2.05-4.85. In the research, kernel weight, number of kernels, kernel length, kernel house length and kernel house width were measured. In the genotypes, pH was determined as 3.03-5.35, TSS was 13.1-28% and acidity was 0.23-2.93. Eating quality and rustiness of the genotypes were also evaluated.

Keywords: Pear, morphological, pomological characteristics, genetic source.

Determination of Seed Oil Components in Pomegranate Clones

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Abstract: From pomegranate fruit; when producing products such as pomegranate syrup, pomegranate juice and pomegranate concentrate, which have high added value, most of the pulp produced consists of pomegranate seeds rather than the peel. Pomegranate seed is a multifunctional food supplement whose consumption has been increasing recently and contains fatty acids that are beneficial to human health. This study was carried out on clones of Zivzik Pomegranate, which is widely grown in Pirinçli, Kapılı, Sarıdana and Zivzik (Dişlinar) villages of Şirvan district of Siirt province. The contents of Palmitic acid, one of the saturated fatty acids, Punicic acid, one of the unsaturated fatty acids, Phenol 2.4 bis, one of the phenolic components found in the structure of the seed, Ethyl Isoalcholate, which has a sterol structure, and 1-Monoplasmid, also found in the seed, were investigated in the seed oil of 33 Zivzik Pomegranate clones. For this purpose, the fatty acid composition of pomegranate seed oil obtained by cold pressing method from the seeds of predetermined pomegranate clones was determined. Analyzes were performed on ISQ mass spectroscopy (Thermo Fisher Scientific, Austin, TX) and Trace 1310 Gas chromatography (GC-MS). The findings obtained show that the Punicic acid values in the seed oil of pomegranate clones are 72.31% to 43.85%, Palmitic acid values are 30.21% to 14.19%, Phenol 2.4bis values are 7.17% to 3.17%, 1-Monoplamitin values are 13.61% to 5.58% and Ethyl Isoalcholate values are 13.61% to 5.58%. It shows that it is between 7.33% and 4.01%.

Keywords: ***Punica granatum*** L., Zivzik, Punicic acid, Palmitic acid, Phenol 2.4bis.

Identification of Genetic Diversity in Walnut (Juglans regia) Population of Kaman (Kırşehir- Türkiye) by Means of Nut Characteristics

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Abstract: Walnut (***Juglans regia*** L.) has a wide genetic diversity throughout Türkiye to be useful in many ways. Kaman as a small district has a considerable reputation for its walnuts in the country. Walnut germplasm from the walnut population of Kaman District of Kırşehir Province which is located in the Central Anatolia Region of Türkiye was evaluated to identify the genetic diversity and to determine the elite walnuts for further studies by examining the nut characteristics. The diversity of population was identified from walnut samples obtained from orchard surveys, local bazaars with the support of local farmers' knowledge, and by examining the walnuts that participate to special walnut competitions at the annual walnut festival in 2007, 2008, 2009, 2013, 2018 and 2019 years. Totally 139 walnut samples, some of them have a local reputation, were examined and nut characteristics were determined. Walnuts from the region have a significant variation in nut weight and size, kernel weight, kernel percentage, kernel color, kernel plumpness, oil, and protein content and showed an explicit diversity in nut shape properties.

Keywords: Walnut, ***Juglans regia***, Kaman, germplasm, pomology.

Cultivars Registration Studies in Female Figs: Example of Divrek Kara and Sarı Zeybek Fig Cultivars Registration

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Abstract: The registration process provides official recognition of fig cultivars. It prevents the cultivars registered in accordance with the standards from mixing with other fig varieties. It ensures the transmission of this diversity to future generations. It facilitates the monitoring and conservation of genetic resources. In fruit growing, offering reliable, quality and certified fig varieties to producers and consumers through registration is important in increasing productivity and promoting sustainable agricultural practices. Due to its fruit yield and quality characteristics, Sarı Zeybek fig cultivar can be an alternative to the standard dried Sarılop fig cultivar; Divrek Kara fig cultivar, on the other hand, have been registered by the Fig Research Institute Directorate in 2019, as it can fill the demanded black dried fig gap in the market, in addition to its table properties. In this article, the registration process steps in fig are explained, cultivar registration information of Sarı Zeybek and Divrek Kara figs are given.

Keywords: Gene resource, ***Ficus carica*** L., registered cultivar.

Relations of Plant Genetic Resources and Plant Breeder Rights; Threats, Opportunities and Suggestions

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Abstract: One of the most crucial issues of plant breeder rights is the claim that PBR will harm the genetic resources, or create a monopoly on genetic resources. In this study the following was explained: the international legislations on plant genetic resources used in plant breeding, protecting them by obtaining breeder rights and the relationships of these legislations. Technical and legal measures that can be taken to protect the genetic resources' rights during the use and sharing in the plant breeding industry were suggested, and the contributions of this measure. The share of breeders' rights in the destruction of genetic resources, the possibility of genetic resources being directly subject to breeder rights, the chance of the breeding industry to be a stakeholder in the conservation of genetic resources activities has been evaluated together with literature, case studies and international practices. For to make the breeding industry a stakeholder in to conservation of genetic resources activities; Description of genetic resources should be made according to the needs of the plant breeding industry, specific genes or sequences should be identified, license fees that are collected from varieties containing these sequences should be in material transfers agreement, and the literature on applying the essentially derived varieties in favor of genetic resources should be developed was suggested.

Keywords: Plant breeding, breeding industry, plant breeders’ rights, genetic resources

Biodiversity and Distribution Area of Di- and Tetraploid Species of Triticum L. in Azerbaijan

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Abstract: Global climate change necessitates the development of source materials to facilitate the creation of new, adaptive varieties of cultivated plants. Consequently, collecting and examining intraspecific polymorphism and genetic potential for agrobiological traits, establishing trait collections, and acquiring new breeding source materials, genetic sources, and donors have become pressing priorities. In light of this, our research delves into the biodiversity and distribution of di- and tetraploid species of ***Triticum*** **L**. in Azerbaijan, drawing on existing literature and our investigations. We utilized the VIR determinant to analyze the material, leading to the identification of species, subspecies, and botanical varieties. Employing established methods, we conducted phenological observations and evaluations. Our findings reveal that, at various times in Azerbaijan, diploid species, including ***T. urartu*** **Thum. ex Gandil.**, ***T. boeoticum*** **Boiss.**, and ***T. monococcum*** **L**. have been identified. Notably, ***T. boeoticum*** stands out due to its extensive polymorphism. Among Azerbaijan's wild tetraploid wheat species, only *T. araraticum* Jakubz. is widespread and displays a broad range of intraspecific polymorphisms. Additionally, we have identified several cultural tetraploid species, including ***T. dicoccum*** **(Schrank) Schuebl.,** ***T. turgidum*** **L.,** ***T. durum*** **Desf.**, ***T. turanicum*** **Jakubz.,** ***T. polonicum*** **L.,** and ***T. cartlicum*** **Nevski**. These species are notable for their extensive intraspecific polymorphism, with ***T. durum, T. dicoccum, T. turgidum*** and ***T. polonicum*** standing out. In recent years, we have selected and established new collections from hybrid populations, focusing on ***T. dicoccum*** and ***T. polonicum***. The new genotypes belonging to these species exhibit significant variations in earing, growth habit, stress resistance, plant height, stem thickness, presence or absence of awns on the spike, color, shape of scales and awns, ear density, grain color, and shape, among other traits. By participating in programs focused on hybridization with these new genotypes, cultural tetraploid species can contribute to the enrichment of the durum wheat gene pool with novel translocations and gene blocks.

Keywords: Biodiversity, distribution area, ***Triticum***, di and tetraploid wheat species.

Assesment of Morphological Diversity of Landrace Karakılçık Durum Wheat (Triticum turgidum subsp. durum (Desf.) Husn.)

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Abstract: The current study determined morphological attributes of 60 landrace karakılçık durum wheat (***Triticum turgidum* subsp. *durum* (Desf.) Husn**.) populations collected from 12 provinces in Türkiye. The seeds of these populations were obtained from Türkiye Seed Gene Bank and their morphological features were determined according to 29 criteria of The International Union for the Protection of New Varieties of Plants (UPOV). The single spike was collected from each genotype and analyzed for morphological attributes according to UPOV criteria. Significant variation was noted among the tested genotypes for studied traits. Clustering analysis divided each block into different number of groups and each group had varying number of subgroups. Furthermore, the collected data were analyzed by Shannon-Weaver diversity index. The highest H' index values were noted for hairiness of uppermost node of culm (H'=1.00), plant height (H'=1.00), earing time (H'=1.00), the state of the pith in cross section of straw (H'=1.00), spike length (H'=1.00) and the distribution of awns (H'=1.00). The lowest H'index value was recorded for the hairiness on external surface of lower glume (H' =0.88). It is concluded that the rich diversity in morphological characteristics of karakılçık durum wheat genotypes collected from several provinces in Türkiye might be employed as a component in breeding programs.

Keywords: Biodiversity, genotypes, karakılçık wheat, landrace, UPOV.

Evaluation of Some Durum Wheat Genotypes of National and International Origin in terms of Yield and Quality Parameters

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Abstract: This study was carried out to identify with superior properties durum wheat lines in 2013-2014 and 2014-2015 growing season in Diyarbakır rainfed conditions. A total of 25 genotypes, including 5 standard varieties and 20 lines of National, CIMMYT and ICARDA origin, were used as material in the research. The experiment established as a randomized complete block design experiment with 3 replications and grain yield, thousand grain weight, hectoliter weight, protein content, grain color and SDS value were evaluated. According to the analyses of compound variance was observed significant differences between genotypes, years and genotype x year interaction in point of whole parameters. In the Biplot graphics displaying yield and stability position of genotypes, the genotype with the highest yield was line 3 and the most stable genotype was line 9. According to the two-year averages, promising genotypes in connection with both grain yield and quality characteristics were taken the region yield trials to be evaluated in the registration phase.

Keywords: Durum wheat, CIMMYT, ICARDA, yield and quality.

Characterization of Some Local Wheats In Terms of Morphological, Physiological and Quality Characteristics

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Abstract: This research was carried out with 4 replications according to the randomized complete block design in two different locations of the Eskişehir Transitional Zone Agricultural Research Institute Directorate in the 2021-2022 production season. The aim of this studyis to investigate the differences in morphological, physiological and quality characteristics between local wheat populations collected from different locations. 14 collected wheat populations (Uveyik, Gülümbür , Kaşıkçı Wheat, Karakılçık, Koca Wheat (durum), Habip , Water Cutting , Gülümür , Black Wheat, Çalıbasan , Horosan, Kobak , White Wheat White, Sünter bread) and 4 commercial varieties (Dumlupınar, Leventbey, Aksungur and Reis) were used as material. Genotypes were characterized in terms of their morphological, physiological and quality characteristics and the differences between them were determined. In the research, morphological characters: heading date, spike length, plant height, grains per spike number, physiological characters such as chlorophyll, plant temperature, Normalized difference vegetation index (NDVI) and quality characteristics such as protein, gluten, grain color, a thousand grain weight and dough properties were examined. As a result of the research, among the genotypes, the highest yield among the standard varieties was examined. The average yield was 506 kg da^{-1} in the Reis variety, and the highest yield average among local varieties was obtained from Kara Kılçık Van local wheat with 461 kg da^{-1}. The lowest yield was seen in Çalıbasan local wheat with 259 kg da^{-1}. The collected populations were investigated and observed in terms of morphological and physiological characteristics, and they were also evaluated in terms of technological quality characteristics.

Keywords: Local wheats, morphology, physiology, quality, characterization.

Evaluation of Some Barley Genotypes in terms of Yield and Quality Characteristics in Diyarbakır and Mardin Conditions

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Abstract: This study was conducted in four replications according to the randomized block trial design in the precipitation-based conditions of Diyarbakır and Mardin/Kızıltepe locations during the 2019-2020 growing season. In the experiment, 20 lines from ICARDA and Aegean Agricultural Research Institute and 5 standard varieties (Barış, Barbaros, Dara, Hevsel and Kendal) were used as material. Genotypes were evaluated in terms of grain yield, thousand kernel weight, test weight, protein and starch ratio characteristics. According to the results of the composite variance analysis, significant differences were found at the level of 1% in terms of all characteristics. Line 24, which stands out in terms of yield and quality characteristics, was submitted for registration as a variety candidate, and some superior lines were also taken into the crossing-block.

Keywords: Barley, yield, quality, ICARDA

The Use of Local Wheat Genetic Resources: A Rich yet Underutilized Source for Rust Resistance Breeding Studies

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Abstract: The limited access to essential food resources at the global level due to epidemics, global warming, climate change, and increasing population poses significant concerns regarding food security and food supply. Wheat is one of the most important crops in the world. Due to its nutritional value, wheat is the staple of many foods in the nutrition of human beings, especially in rural areas. Yellow rust caused by *Puccinia striiformis* f. sp. *tritici* and stem rust caused by *Puccinia graminis* f. sp. *tritici* are among the most significant biotic factors that limit wheat production, and cause severe crop losses in wheat cultivation areas around the world. Global warming and changes in climate affect yellow rust, stem rust disease, and their races. Regarding the rich biodiversity and the presence of traditional local varieties, Türkiye has significant potential regarding gene resources. Türkiye contains valuable genetic resources for different crops, particularly the Turkish wheat landraces can offer novel sources of resistance that have not been used or not yet characterized against many diseases. However, the characterization of the wheat landraces from the Turkish Seed Gene Bank and the National Seed Gene Bank against wheat rust diseases has not been made nor there is not any exact available data for rust resistance study on Turkish wheat landraces. In this study, we are determining the resistance of 2126 wheat genotypes obtained from the Turkish Seed Gene Bank against stripe and stem rust diseases at seedling and adult plant stages using conventional multipath type testing and high throughput molecular markers. Genome-wide association mapping and genetic studies of resistance in mapping populations will provide new insights into genetic diversity in Turkish bread and durum wheat landraces. In this study, novel sources of resistance will be identified, and characterized, and will be available to the national breeding programs for breeding purposes. All these studies performing in the Regional Cereal Rust Research Center which is located under the Aegean Agricultural Research Institute, İzmir, Türkiye.

Keywords: Wheat landraces, disease resistance, genetic resources, stem rust, yellow rust.

Dependence of Wheat and Alfalfa Productivity on Water Availability Under Global Climate Change

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Abstract*:* Wheat, which is strategically important for ensuring food security, and alfalfa, which is a high-quality fodder plant, are among the agricultural plants that need to be improved in cultivation technology from the aspect of irrigation. In the article, the dependence of the productivity of wheat and alfalfa plants on water supply in Mugan conditions of the republic was explained. The purpose of the research is to investigate the optimal water-soil-crop relations. In order to study the water supply of wheat and one-year alfalfa plants, the research work was carried out at the Mugan Reclamation Station located in Saatli district of "AzHveM" EIB. Studies on watering regimes of both plants were carried out in five variants with three repetitions each. In option I, irrigations are carried out at the lowest moisture content in the reference layer of the soil. It was carried out when it decreased to 75%; II; III; Irrigation norms set in IV options 15; 30; It was reduced by 45%, and in option V, irrigation was not carried out at all. As a result of the research, the following indicators were studied in the practice areas: (i) duration of irrigation, cycle and vegetation irrigation norms; (ii) plant height, development and productivity. During the research, phenological observations of the wheat plant were carried out in the experimental field. In the ripening phase, the height of 100 plants was measured across the diagonal of the cultivated area. Also, the density of plants in $1m^2$ from 3 locations was determined. In the flowering phase of alfalfa, the height of 100 plants was measured diagonally in each replication before harvesting from the experimental field. The productivity of the plants in the experimental areas was determined by two methods: biological and actual harvest. Biological fertility is greater than actual fertility. This difference varies between 0.37-1.57 sen/ha. The productivity difference between the variants was 2.07 sen/ha. Studies have shown that along with irrigation water, climate and groundwater depth affect the moisture dynamics of irrigated soils. During the vegetation period, the depth of groundwater was 0.4-1.4 m, which reduced the water demand of plants. Thus, if the irrigation water of the wheat plant is reduced by 15%, the yield is 4.36%; 4.66% when reduced by 30%; 8.93% when reduced by 45%; if it is not completely irrigated, it is 38.74% less. If the irrigation water of alfalfa plant is reduced by 15%, the productivity is 8.85%; 11.37% when reduced by 30%; 19.31% when reduced by 45%; if it is not completely irrigated, it is 24.46% less. The impact of irrigation water given with reduced rates on various options on the productivity of wheat and alfalfa plants was studied, and the "Crop-Water" dependence graph was drawn up.

Keywords: Global climate changes, wheat, alfalfa, water supply.

Evaluation and Utilization of Common Vetch (Vicia sativa L.) Populations Collected from Different Regions of Türkiye

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Abstract: The origin of common vetch, which has a wide distribution area in the world, is the Mediterranean, Western and Central Asia. Our country, with its rich flora, is the gene centre of many important plant species. Common vetch is an annual legume forage crop grown as a winter intercrop in cotton producing areas of the Aegean Region. Breeding project was initiated with the aim of developing high-yielding, disease-resistant forage plant varieties suitable for the ecological conditions and agricultural system of the Aegean Region in 1967. Within this framework, collection efforts were started in order to provide resources for breeding studies. Evaluation of the populations conserved in the National Gene Bank at the Aegean Agricultural Research Institute, in terms of agromorphological characters were examined in observation gardens and populations with high herbage and seed yields were included in the breeding program. To date, a significant part of the 900 materials collected from different regions of Türkiye until today were evaluated intensively in particularly the first years. The first outcome of the breeding studies was the Ürem 79 variety, which was registered in 1979. Breeding efforts continued with the registration of the Kubilay 82 variety in 1982, which is early and more stable and suitable for use as a winter inter-crop in cotton agriculture. Selçuk 99 and Cumhuriyet 99 varieties, which are early, fast grain filling and more determined, were registered in 1999. Hybridization studies started in the 2000s resulted in the development of the Alper variety in 2010 and the Doruk and Ürkmez varieties in 2013. Until now, 10 common vetch varieties have been included in the certification system by entering the National Variety List through breeding studies using pure line selection and hybridization methods. Contribution to the country's seed production has been made thanks to the varieties with high yields. that have a significant cultivation area with their suitability for our region and similar climatic conditions.

Keywords: Common vetch, ***Vicia sativa* L.,** collection, evaluation, utilization, breeding, forage crops genetic resources.

Evaluation and Utilization of Cocksfoot (Dactylis glomerata L.) Populations Collected from Different Regions of Türkiye

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Abstract: Cocksfoot ***(Dactylis glomerata*** L.), a perennial grass forage crops, is widely distributed in Southern and Central Europe, the Mediterranean, Anatolia and the Middle East. Harlan (1983) stated that cocksfoot species are an important forage crops in Europe and the Mediterranean gene centers, including Türkiye. The aim of this study is to evaluate and utilize 47 cocksfoot (***Dactylis glomerata*** L.) populations collected from different parts of Türkiye. 47 populations were planted to be evaluated as single plants in the experimental field of the Aegean Agricultural Research Institute in 2001. Characters studied were plant height (cm), growth type, green grass yield (g/plant), dry matter yield (g/plant), 50% time of inflorescence emergence and seed yield (g/plant) in the year of 2003 and 2004. Elite gardens were establihed by cloning 14 early single plants (ETAE DA 1) and 24 medium early single plants (ETAE DA 2) selected in terms of their development habit, flowering time and yield values. The two developed candidate varieties were included in regional yield trials with 3 standard varieties in İzmir and Adana locations for 3 years (2014, 2015, 2016). Dry matter yields were 428-537 kg/da and seed yields were 5.3-28.4 kg/da. The dry matter and seed yields of the developed genotypes were found to be statistically higher than the yields of standard varieties. In light of this data, variety registration applications for ETAE DA 1 and ETAE DA 2 variety candidates were made in 2019, and registration trials were completed as of 2023.

Keywords: Plant genetic resources, cocksfoot, ***Dactylis glomerata*** L., evaluation, utilization.

Evaluation and Utilization of Forage Pea (Pisum sativum spp. arvense L.) Populations Collected from Different Regions of Türkiye

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Abstract: Our country is very rich in plant diversity since it is located at the intersection of three plant geographies: Mediterranean, Europe-Siberia and Iran-Turan. Forage pea ***(Pisum sativum spp. arvense*** L.*)*, one of the annual legume forage plants grown for herbage and grain purposes, is distributed in a wide area from Europe to Central Asia. Within framework of breeding studies, 101 fodder pea populations collected from different regions of our country, obtained from the Aegean Agricultural Research Institute National Gene Bank, were evaluated for two years in the years of 2016-2017. Flowering time, herbage yield potential, spring development rates were examined and seed yields were obtained. In the light of the evaluated data, a source population was was established as a single plant from 28 prominent populations in order to develop early, medium/early varieties suitable for the Aegean Region, with high herbage yield potential and seed yield. Single plant selection was made by taking into account the flowering time (day) and seed yield (g/plant) criteria. Selected 23 lines were taken into preliminary yield trial with standard varieties. Yield trials were conducted for two years with 5 lines selected from preliminary yield trials and four standard varieties. The seed yield of our lines was 114-174 kg/da. The same or higher grain yield values were obtained than standard varieties. According to the yield results, a medium/early line with high seed yield was selected and a registration application was made. It is aimed to contribute to the agriculture of the region and the country, and therefore to the economy, with our variety candidate, whose registration trials are ongoing.

Keywords: Forage pea, ***Pisum sativum spp. arvense*** **L.**, evaluation, utilization, forage crops genetic resources.

Breeding of Evelik (Rumex crispus L.) and Kuzukulağı (Rumex tuberosus L.)

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Abstract: 182 plant species were identified in Erzincan and Erzurum province in order to identify plants consumed as vegetable within the scope of the project of "Identification of Wild Plant Species Used As Vegetable within Eastern Anatolia Region" . It was determined that evelik; ***Rumex crispus* L**. and kuzukulagı; ***Rumex tuberosus* L**. are intensionally consumed and have high potential in utilizing as vegetable. This project was planned to domesticate these species in order to put into service of country. For this purpose, as result of surveys have been do ne in Erzincan and Erzurum province, while 28 evelik with 21 kuzukulagi populations were indetified in Erzincan province, 15 evelik with 13 kuzuklagi populations were indetified in Erzurum province. Every single detail has been recorded to gathering form during the collection. Leaves belonged to populations and soil samples brought to analyze. While germination time based on days of stratification were 1-6 day in evelik and 2-7 day in kuzukulagi, germination rate based on days ofstratification were % 63-88 in evelik and %23-74 in kuzukulagi. Observation garden was created after sowing the seeds samples referred to populations. Both species referred to populations were characterized based on 22 features. According to cluster analysis, it was observed that while evelik created 5 group, kuzukulagi created 3 group. In order to this, self-pollination was made among kuzukulagi and evelik populations by choosing plants with some characteristics such as good plant development, quality leaves and high number of shoots. Later on, seeds samples were collected from the populations that were self-pollinated. Breeding is still being proceeded among observation gardens that were created by self-pollinated lines.

Keywords: Evelik (***Rumex crispus***) kuzukulağı, (***Rumex tuberosus***), Eastern Anatolia Region, wild plants, vegatable.

Agro-Morphological Characterization of some Chickpea (Cicer arietinum L.) Landraces

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Absract: Chickpea (***Cicer arietinum* L.**) is a cool season grain legume with high nutritive value. Türkiye is one of the origin centers of genetic diversity for chickpea and has a large number of chickpea germplasm collections from different geographical regions. The objective of the study was to characterize chickpea landraces agro-morphologically based on 13 different quantitative traits observed in a field experiment. In this study 327 chickpea accessions, were characterized morphologically. Chickpea landraces showed a wide range of yield and yield components. There was considerable variation in grain yield, pod number per plant, seed number per plant and canopy width. Canopy height and width ranged between 16-50 cm and 10-87.5 cm respectively, number of pods per plant ranged between 3-152, number of grain changed between 2-195. The mean of yield per plant was14.17 g and parcel yield was 128.9 g. The correlation coefficients indicated that there were significant and positive correlations between canopy height, canopy width, first pod length, number of basal primary branches, pod number per plant, grain number per plant, grain length and grain width and yield. Relationships among the different traits were evaluated by principal component analysis (PCA). The first four principal components explained 75.7% of the total variation. The PC1 explained 40.44 % of the total variation, while PC2, PC3 and PC4 have displayed variability of 19.17, 8.73, 7.38. The first principal component showed high positive loading for canopy height (0.349), canopy width (0.383), pod number per plant (0.382), grain number per plant (0.369) and seed yield per plant (0.362). PC2 enabled high positive loading for grain length (0.450) and grain width (0.444); PC3 showed high positive loading for apical tertiary branch number (0.643).

Keywords: Chickpea, genetic resources, landraces.

Sesame (Sesamum indicum L.) Genetic Resources Studies

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Abstract: This study encompasses evaluations conducted on selected sesame genotypes preserved within the scope of the Industrial Crops Genetic Resources project at the National Seed Gene Bank of the Aegean Agricultural Research Institute. Production/renewal and evaluation studies were carried out on 40 materials within the genotypes preserved in the National Seed Gene Bank in the year 2021. As a result of the study, data obtained for parameters such as days to 50% flowering, days to physiological maturity, thousand seed weight and plant height were subjected to cluster analysis and principal component analysis. Through these evaluations, it was determined that genotypes with differences among them could be used in future breeding efforts in line with the defined objectives.

Keywords: Sesame, clustering analysis, principal component analysis, industrial crops, national seed gene bank.

Tobacco Genetic Resource Studies in Türkiye

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Abstract: Turkish tobaccos are grouped into four main groups according to the geographical regions where they are grown: Aegean, Black Sea, Marmara and East-Southeast Anatolia Region. Türkiye's tobacco genetic resources show a high level of diversity in terms of both morphological and chemical characteristics. Tobacco seed samples at population and variety levels collected from Türkiye's tobacco growing regions are preserved in two sets as active and base collections in the National Seed Gene Bank within the Aegean Agricultural Research Institute. Tobacco Genetic Resource studies, which started in 1960's, aimed to develop tobacco varieties with high adaptability, resistance to diseases and pests, high yield and superior quality, and to put these developed varieties into production in their own regions. For this purpose, surveys and collections were carried out in tobacco production regions at different times. As a result of the breeding studies carried out on the collected materials, a total of 72 varieties, 20 for the Aegean Region, 17 for the Marmara Region, 14 for the Black Sea Region, and 21 for the East-Southeast Anatolia Region, were registered and made available to producers. During the period, periodic production/reproduction and characterization studies of Tobacco Genetic Resources were also carried out. In this context, a morphological characterization database was created on nearly 800 tobacco seed samples. Herbarium samples and catalogs were prepared for each region, and the National Gene Bank inventory was updated and passed on to future generations. As a result of these studies, the goals of introducing tobacco genetic resources and registered varieties, transferring them to future generations, producing information and creating resources for researchers and tobacco breeding programs have been achieved.

Keywords: Plant genetic resources, ***Nicotiana tabacum*** **L**., tobacco, conservation, collection.

Agromorphological and Chemical Characterization of Some Turkish Tobacco Populations

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Abstract: This study aims to identify gene resources that can be used in tobacco (***Nicotiana tabacum* L.**) plant breeding by characterizing the agromorphological and chemical characteristics of tobacco plant populations in Türkiye. In the research; 90 tobacco populations from different regions and 3 standard varieties obtained from the Gene Bank of the Aegean Agricultural Research Institute were used as research materials. The study was conducted in accordance with the augmented trial design. According to the research results: 50% flowering ranged from 52.78 to 126.44 days. The earliest flowering population was determined as TR 42080, and the latest flowering population was determined as TR 57493. Plant height ranged from 28.72 to 143.52 cm and the highest plant height was observed in the TR 49344 population. While the number of leaves varied between 12.9-46.4, the highest number of leaves was detected in the TR 50246 population. Dry leaf yield varies between 24.19-530.41 kg/da. The highest yield was recorded in TR 49276 and TR 49288 populations. Nicotine content varies between 0.44-2.89% and the lowest nicotine content was detected in the TR 42144 population and the highest nicotine content was detected in the TR 49231 population. While the reducing sugar rate varied between 3.13-13.69%, the highest reducing sugar rate was recorded in the TR 42523 population. The crude ash ratio was found between 12.82-37.76% and the lowest crude ash ratio was detected in the TR 42790 population. As a result, it has been understood that this wide variation in tobacco populations is due to the adaptation of tobacco to the climate, soil and growing conditions of the regions where they are grown.

Keywords: Tobacco, ***Nicotiana tabacum* L.**, characterization, augmented design.

Selection of Wild and Cultivated Locusts in the Mediterranean and Aegean Regions

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Abstract: In this study, it was aimed to select genotypes showing superior characteristics in terms of fruit and seed characteristics in cultivated and wild locusts distributed in the Mediterranean and Aegean Regions. In July and August 2022, which is the ripening period of carob, in Hatay (Denizgören Yayladağ, Samandağ), Adana (Kozan, Kadirli), Mersin (Tarsus, Silifke, Gülnar, Büyükeceli) and Antalya (Gazipaşa, Alanya, Manavgat, Serik, Kemer, Kumluca, Finike, Kaş, Demre), Muğla (Bodrum, Milas, Datça, Gökova, Marmaris, Köyceğiz, Dalaman, Seydikemer, Fethiye, Dalaman, Seydikemer, Fethiye) provinces and their surrounding locations were visited and 341 trees were sampled. For this purpose, fruit length, weight, width, thickness, number of seeds, total seed weight, seed yield and viscosity value of the gum in the seeds were taken into consideration. Among a total of 341 genotypes evaluated from carob locations in the Mediterranean and Aegean regions, promising individuals showing superior characteristics in terms of selection criteria were identified. According to the data obtained from the research, the fruit length, width, thickness, weight and flesh yield of the grafted genotypes selected from different locations were generally higher than the wild genotypes; on the other hand, the number of seeds, seed weight and seed yield of the wild genotypes were higher than the cultivated genotypes. The locations where the trees were located were revisited in order to obtain vaccination pencils from the superior genotypes determined in terms of fruit and seed characteristics. Grafting was carried out in April 2023 on the seedlings planted in March 2022 to be grafted in the trial area established in the Research Institute.

Keywords: Wild, cultivated, carob.

Distribution of Colchicum speciosum in Trabzon Province

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Abstract: ***Colchicum speciosum*** **Steven** belongs to the Colchicaceae family and is native to the Eastern Black Sea Region. Colchicum is used in the pharmaceutical industry due to the colchicine alkaloids contained in its corms and seeds. Colchicine is conservatively used for the treatment of gout, Behcet disease, and familial Mediterranean fever. This study has been carried out to determine the distribution areas of ***Colchicum speciosum***, an important medicinal aromatic plant, in Trabzon. To reach this purpose, field studies have been carried out, collecting samples of the plant during suitable vegetation periods between the years of 2015 and 2021 in Trabzon province. This study has been made using a full-field screening method. All field information about the taxon was recorded in the GIS database, and the distribution map of the taxon was created. It was determined that ***Colchicum speciosum*** has a wide distribution in the study area, from 349 to 2560 m. In the study area, the plant was identified at 192 different points and 16 different habitat types. The habitats where ***Colchicum speciosum*** is distributed are pasture-meadow areas, forest clearings, agricultural areas, hazelnut plantations, deciduous forests, coniferous forests dominated by ***Picea orientalis***, roadsides, stony areas, bush areas, beech forests, seasonal stream edges, and swamp-reed areas. Also, it has been observed that flowering time of the plant is between September and October.

Keywords: Medicinal plant, ***Colchicum speciosum***, Trabzon.

Ruscus Species Distributed in Türkiye

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Abstract: The four species of ***Ruscus*** (***R. aculeatus* L., *R. hypoglossum* L., *R. hypophyllum* L.** and ***R. colchicus***) are naturally grown in the flora of Türkiye. These species are mostly used as cut greens for cut flower arrangements and medicinal purposes as well as for cosmetic products other than outdoor plants in landscape architecture. *Ruscus* species are also called as geophyte due to the structure of their storage organs (rhizomes) which located under soil surface. The collection and cultivation studies were carried out to propagate and grow them under cultural conditions. Our main aims were to provide information about these species, which grow naturally in Türkiye's flora and unfortunately are uncontrollably collected from nature and put on the market, and to reveal their potential for evaluation as ornamental plants as well as to increase awareness about these valuable native species to protect our genetic resources. The distribution regions in nature, various morphological properties and different usage areas of four *Ruscus* species naturally grown in Türkiye are going to be given in detail.

Keywords: ***Ruscus*** *species*, geophyte, native plants, cut green, medicinal plant, genetic resources.

Determination of Some Morphological Characteristics of Boxwoods (Buxus sempervirens L.) Naturally Distributed in Bursa Province

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Abstract: Boxwoods are attractive ornamental plants in the form of evergreen shrubs or trees. Although the majority of natural boxwoods in our country are distributed in the Black Sea Region, they also have important distribution areas in the Marmara and Mediterranean Regions. In this research, the boxwood population of the region was defined by determining the vegetative characteristics of boxwoods growing naturally in Bursa province. In the research, the average plant height is 24-46 cm, plant width is 17.3-33.33 cm, main stem length is 5.47-14.33 cm, main stem diameter is 2.84-6.77 mm, main stem internode length is 6.44-17.84 mm, lateral branch length is 8.14-18.98 cm, side branch diameter 1.02-2.01 mm, side branch internode length 8.25-15.04 mm, lateral branch stem angle 40-55°, number of lateral branches 4.33-18.67, shoot length 5.90-10.14 cm, shoot diameter 0.68-1.10 mm, shoot internode length 8.09- It was measured between 18.17 mm, number of shoots 10-45, leaf length 1.94-3.82 cm, leaf width 1.22-1.92 cm, petiole length 0.30-0.46 mm and petiole diameter 0.32-0.65 mm. There is also a positive relationship between genotypes and plant height and between plant height and main stem length. Similarly, it has been determined that there is a positive relationship between main stem length and leaf width.

Keywords: ***Buxus sempervirens***, Bursa, morphological characteristics, natural plants, ornamental plants

The Effects of Vermicompost and Mycorrhiza Applications on Tuber Yield of Serapias vomeracea and Orchis sancta Salep Orchid Species in Greenhouse Conditions

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Abstract: Collecting salep orchids from nature causes the destruction of its flora. We investigated the effects of ecofriendly treatments such as vermicompost and mycorrhiza on tuber yield in Orchis sancta and Serapias vomeracea species. The seedlings of orchid species were planted in boxes in the controlled greenhouse conditions. Vermicompost (plant/5ml) and mycorrhizal fungi (***Gigaspora margarita*** and 8 ***Glomus*** genus, 125 ml/2 g) alone or together were applied to the young plants of two species. The treatments were applied in three replications with one month intervals. Tubers were harvested at the beginning of flowering (1st measurements) and at the end of flowering (2nd measurements) for two measurements. The number of tubers, tuber weight, tuber diameter, number of leaves, number of flowers, and plant height were measured in the study. The highest number of tubers were obtained from vermicompost and mycorrhiza+vermicompost applications with 2.57 in the first measurement. In the second measurements, mycorrhiza+vermicompost application gave the highest tuber number with 2.05. The highest tuber weights were obtained from mycorrhiza+vermicompost application for two measurements respectively as 8.04 g and 6.75 g. The highest tuber diameter was obtained from the vermicompost application with 16.35 mm in the first measurements and from the mycorrhiza+vermicompost application for the second measurements with 14.65 mm. Tuber diameter was higher in Orchis sancta with15.87 mm in the first measurement, and in Serapias vomeracea with 15.08 mm in the second measurement.

Keywords: ***Serapias vomeracea***, ***Orchis sancta***, vermicompost, mycorrhiza, salep orchids, tuber yield.

Effect of Rooting Medium on the Propagation of Vaccinium arctostaphylos with Hard Cuttings

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Abstract: ***Vaccinium arctostaphylos*** **L**. is a shrub belonging to the Ericaceae family that can grow up to 1-6 m and shed leaves in winter. It is one of the four ***Vaccinium*** species naturally distributed in the flora of our country. It is an important gene source in the Black Sea region. It is one of the important medicinal and aromatic plants in the Eastern Black Sea Region. Its parts, such as fruit, leaves, shoots, and roots, are used by local people in many different ways. In recent years, it has gained more importance with the increase in usage in areas such as the food, medicine, and cosmetics industries. It is important to determine the most suitable plant production methods for this species, which has a wide range of uses as a non-wood forest product. The aim of this study is to determine the effects of different rooting media on the rooting of hard cuttings of ***Vaccinium arctostaphylos***. Cuttings taken from the natural population in November, December, February, and March were rooted in perlite (1:1) and peat+perlite (2:1) media in the greenhouse environment. Rooting percentage (RP), rooting degree (RD), number of roots (NR), and root length (RL) were determined. All rooting values were higher in the peat and perlite environments compared to the perlite environment when all cutting times were evaluated. The average RP was 15.84% in perlite and 55.84% in peat+perlite; the average RD was determined to be 2.91 (1–5 scale) in perlite and 3.57 (1–5 scale) in peat+perlite. The average NR is 3.83 in perlite and 5.50 in peat+perlite; the average RL was determined to be 2.08 cm in perlite and 9.35 cm in peat+perlite.

Keywords: ***Vaccinium arctostaphylos*** **L**., cuttings, rooting medium.

Blacksea Region Fruit Genetic Resources Field Genebank

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Abstract: Due to its geographical and ecological structure, Anatolia is the homeland and growing area of many fruit species and has a great genetic diversity and richness. This diversity and richness is disappearing day by day due to environmental and other pressures. For this reason, it is necessary to preserve and characterize the fruit genetical resources we have for the continuity of agricultural development. For this reason and purpose, in 2004, in the Blacksea Agricultural Research Institute (BARI) was started fruit genetic resources researches on persimmon and cherry laurel. Since 2006, strawberry tree, cherry-sour cherry-mahalep, apple, chestnut and finally hazelnut (in 2018) have been added to the studies. This study covers between 2018 and 2022 the period of Blacksea Region fruit genetic resources research. The study was carried out on persimmon (***Diospyros sp.***), strawberry tree (***Arbutus sp***.), cherry (***Prunus avium***), sour cherry (***Prunus cerasus***), mahalep (***Prunus mahaleb***), chestnut (***Castanea sp***.), apple (***Malus sp***.), cherry laurel (***Prunus laurocerasus***) and hazelnut (***Corylus sp***.) species. Of these, persimmon and arbutus are the species for which BARI is primarily responsible. Cherry, sour cherry, mahleb, chestnut and apple cultivation is regional. Black berry and hazelnut are species that have reserve parcels in the BARI land gene bank. The study on these species continued primarily by identifying the different genotypes existing in the flora of the Blacksea region, propagating them, preserving them in the field gene bank and characterizing them. Thus, the number of materials preserved in the field gene bank for the species under research is 774.

Keywords: Fruit, biodiversity, conservation, characterization.

Fruit Genetic Resources

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Abstract: Anatolia is gene center of fruit species (apple, pear, quince, cherry, cherries, plums, almonds, walnuts, hazelnuts, pistachios, chestnuts, grapes and pomegranate) that widely cultivated and for some of the fruit species genetic diversity center. Diversty of fruit genetic resources are exposed erosion due to using of culture varieties widespread, vaccination practices of wild and local varieties, forestry practices and urbanization. This diversity's conservation and transmission to future generations, fruit genetic resources, survey, collection, on-site (in situ) and field gene banks (ex situ) conservation and evaluation has been carried out with General Directorate of Agricultural Research and Policies (TAGEM) co-ordinated by the Research Institutes. This studies has been carried out Aegean Agricultural Research Institute (AARI) since 1964. Between 1964-1994, the program was coordinated by AARI. AARI and other research institutes and stations's fruit genetic resources documentation and procedures are carried out by Department of Plant Genetic Resources Department in AARI. Institutes which work about fruit genetic resources as a part of TAGEM is classified housing first, second degree and for some species local housing are determined and coordination of institutions responsible is formed. AARI is housing first institute for plums, cherries, almonds, chestnuts, pomegranates and quinces and housing second institute for peach. As a part of AARI fruit genetic resources, as a result of surveys, collection, and introduction which carried out since 1964, 3177 sample were identified and recorded. These samples were sent to some of the other institutes under the coordination. Missions were carried out within the scope of this research project is responsible for the conservation of species, conservation of the materials carried out field gene banks and new survey, collecting programme. Field gene banks from existing and new evaluation studies carried out in some cases.

Keywords: Plant genetic resources, fruit genetic resources, survey, collection, conservation.

Collection, Preservation and Characterization of Eastern Anatolian Fruit Genetic Resources

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Abstract: Our country has an important position in terms of both biological and genetic diversity since it is located on two plant gene centers and three main flora centers. It is necessary to benefit from this unique plant diversity of Türkiye. However, this diversity is threatened by various factors (construction, industrialization, fire, etc.). Preservation of this great diversity, which is resources for plant breeding programs, is essential. The aim of this project to collection, preservation and evaluation of wild fruit species, regional or cultivated varieties from Eastern Anatolian Region. Therefore, this project fırst started in 1994. It was carried out under the name of ‘‘Collection, Conservation, Characterization and Evaluation of Eastern Anatolian Fruit Genetic Resources” at Erzincan Horticultural Research Institute. Project studies were conducted between 2016 and 2020 in Erzincan, Erzurum, Ardahan, Artvin, Van, Sivas, Bayburt and Bingöl provinces. During surveys, 16 mulberries, 32 apples, 11 pears, 11 quince, 5 plums, 2 peach, 3 apricot, 2 sour cherry, 1 sweet cherry and 19 almond genotypes were identified. Grafting materials for each identified genotype were collected, grafted, and following year they were transfered in collection gradens. The mulberry collection garden was established in 6x6 m distance, the rosehip collection garden was established in 2x2 m distance, and the other gardens for other species were planted in a spacing of 5x4 m with 3 trees/genotype. Collection, preservation, and evaluation of fruit genetic resources are continuing within the scope of this research project.

Keywords: Genetic-source, fruit, East-Anatolia, old condition-preservation.

Genetic Diversity of Some Local Fruits Grown in Lake Van Basin

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Abstract: In the light of the developments in genetic science, local varieties that can be a source of genes in breeding studies are becoming more and more important day by day. It is known that local genotypes can be an important source for the development of varieties with superior characteristics in plant breeding. In the Lake Van basin, there are many local fruit varieties such as apple, pear, plum, apricot, grape and walnut with good qualities that have been cultivated for many years. Researches on walnut trees around Lake Van have revealed that there is an enormous genetic diversity and that there are superior types in terms of disease and pest resistance, fruit yield and quality than many standard varieties. In addition, some walnut genotypes have come to the forefront in terms of resistance to late spring frosts. Mellaki, Limon, Hirmi Bank, Ankara and some summer local pear types grown in the Van Lake basin are preferred by consumers in the region with their taste and appearance. In the studies carried out on pears in the region, it was revealed that many local types, which were not subjected to irrigation, fertilization and several cultural applications, showed very strong growth and disease resistance, and healthy populations can be used in breeding studies. Many local apple types in the region are an important genetic resource in breeding studies with their fruit size, dry matter content and unique colors. On the other hand, it is known that Van province was an important vineyard center in the past. Erciş grape is the most cultivated local types in the region. However, for various reasons, many local fruit varieties have been lost over time. In Van province, 6 apple, 2 pear, 1 apricot, 3 plum and 1 grape, which are among the local types that can be candidates for use in breeding studies, have been taken under protection with the "Conservation and Reproduction of Local Varieties" project. It is thought that promising fruit genotypes in the Lake Van basin have a very important potential in breeding studies.

Keywords: Local fruit varieties, apple, pear, walnut, grape.

Olive Land Gene Bank: Trabzon and Artvin Survey

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Abstract: Olive is one of the oldest and most important cultivated indigenous plants of the Mediterranean basin. Türkiye is one of the homelands of olives and has a wide varition in both wild and cultivated forms. In order to safeguard this great genetic resource, many efforts have been devoted to the collection and protection olive genetic resources. In order not to lose the olive genetic population due to the fact that the Çoruh Valley is under the dam, a survey study was carried out in Trabzon and Artvin provinces between 2009 and 2013 and 14 new olive genotypes were determined. These genotypes were planted and protected at the Olive Research Institute. Using 18 characters in the olive variety identification methodology, 14 genotypes was characterised and agro-morphological characteristics of 14 genotypes were presented in this study. 8 of the genotypes were collected from Trabzon and 6 from Artvin. In terms of fruit shape; There were 7 genotypes in round fruit shape, 5 genotypes in oval fruit shape and 2 genotypes in elongated fruit shape. The weights of 40 fruits varied between 186.18g and 118.89g. The largest fruit was genotype number 14, collected from Artvin and the smallest fruit was genotype number 4, collected from Trabzon Akçaabat. While there is no nipple formation in the fruits of 12 genotypes, there is nipple formation in the fruits of 2 genotypes. In terms of seed weight, 6 genotypes were in the very large group, 2 genotypes were in the medium group and 6 genotypes were in the large group. While the nucleus of 9 genotypes had a mucro, the nucleus of 5 genotypes was found without a mucro. The number of fruits per kg varied between 205 and 335.The findings support the diversity of the Turkish olive gene pool and the importance of the collection, conservation and use of olive genetic resources for future breeding programs.

Keywords: Olive, colleciton, characterization, survey, genotype.

Evaluation of Quince Genetic Resources in the Aegean Region in Terms of Resistance to Fire Blight Disease

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Abstract: Evaluation of plant genetic resources in terms of developing varieties and lines that are resistant to biotic and abiotic stress factors is the most important and fundamental step in creating high-variation populations and breeding studies. In this context, this study aimed to evaluate quince genotypes in terms of resistance to fire blight, which is the most devastating disease in pome fruit species, through surveys conducted in the Aegean Region. For this purpose, survey forms were sent to a total of 29 districts in the provinces of Denizli, İzmir and Manisa, and surveys were carried out in 13 districts where the disease is commonly seen. Biased sampling method was used to determine genetic resources, and genotypes tolerant to fire blight disease were determined by observing them for 2 years under natural epidemic conditions. In addition to disease resistance, general, topographic, pomological and morphological characteristics of the genotypes were examined. In the survey studies, taking into account the differences in harvest dates and fruit characteristics, a total of 11 quince genotypes, 7 from Denizli and 4 from Manisa, were determined to be disease tolerant with a disease rate of 0-12%. It was determined that the genotypes mainly developed as wild and/or local types in sandy-clay gardens, and their frequency in the region was mostly a single plant. The tree ages of the genotypes were found to be between 8-60 years, tree height was 2.5-8 m, and tree trunk diameter was 15-120 cm. Leaf blade length, width and stem length values differed within the limits of 5.60-10.86 cm, 4.46-8.08 cm, and 4.50-22.20 mm, respectively. It was determined that the variation range in terms of average fruit width and length was 6.50-12.13 cm and 5.60-13.75 cm, and the average fruit weight was in the range of 109-975 g. With this study, it was determined that the quince genotypes distributed in the Aegean Region showed significant variation and that these genotypes, which were determined to be tolerant to fire blight that naturally occurs in the field conditions, were important enough to be used in breeding studies and were included in the Türkiye Quince Genetic Resources and taken under protection.

Keywords: Fruit genetic resources, ***Cydonia oblonga*** **Mill**, ***Erwinia amylovora*** **Burrill**, selection breeding, morphological characteristics, pomological characteristics.

What We Have Learnt from Schrenkiella parvula: A Unique Model Halophyte from Lake Tuz, Türkiye

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Abstract: ***Schrenkiella parvula*** is an extreme halophyte that resides around Lake Tuz, Türkiye. Up to this date it has garnered attention of researchers due to its small genome, 90% genome sequence similarity to Arabidopsis, its short life cycle and its ability to grow up to 600 mM NaCl. ***S. parvula*** deploys various strategies to tolerate highly saline environment. The aim of the talk is to elaborate unique tolerance and adaptive mechanisms of ***S. parvula*** under salinity and will combine three different studies conducted in our laboratory. First, chloroplastic reactive oxygen species (ROS) defensive mechanisms of ***S. parvula*** was investigated under salt stress. For this, activities of various antioxidant enzymes and gene expression analysis of alternative electron sinks in chloroplastic electron transport chain was conducted and results implicate that ***S. parvula*** utilizes plastid terminal oxidases and other means of electron transport such as NADPH thioredoxin reductases to dissipate electron load and transfer reducing power to thioredoxin system. Following this, reactive carbonyl species (RCS) metabolism, which are products of lipid peroxidation was compared in ***S. parvula*** and ***Arabidopsis thaliana*** and it was demonstrated that response of ***A. thaliana*** H_2O_2 scavenging enzymes was stronger to RCS treatment when compared to ***S. parvula*** and NADPH oxidase mediated ROS signalling was downregulated in ***A. thaliana***, while it was maintained in ***S. parvula*** in response to RCS. Finally, a new strategy for root growth elongation under mild salt stress was elucidated. Salt-induced root elongation was due to epidermal cell elongation, but meristem size and meristematic DNA replication were reduced and the expression of genes related to auxin response and biosynthesis was also reduced. Overall, ***S. parvula*** is an important genetic resource for better understanding of plant salt stress tolerance.

Keywords: Arabidopsis related model species, halophyte, Lake Tuz, salt stress**,** ***Schrenkiella parvula.***

How does Sampling Method Affect the Quality and Quantity of DNA Extracted from Maize Seeds?

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Abstract: DNA isolation is one of the fundamental steps in various molecular analyses. The quantity and purity of the obtained DNA in this step are crucial considerations for studies utilizing molecular analyses. Research conducted in maize genetic studies has demonstrated that molecular analyses can be performed on tissue samples taken from the endosperm part of the seed, yielding reliable results. However, there are still divergent recommendations regarding the number and method of seed sampling for maize populations showing genetic diversity through open pollination. This study aims i) to compare the quantity and quality of DNA isolated from seed tissue samples depending on the number of samples and ii) to monitor the viability status in the sampled seeds. Eleven local maize landraces and two standard lines (B73 and Mo17) were employed as materials in the study. A total of 30 seed samples per genotype were examined by forming 4 subgroups for each genotype as single, 10, 20 and 30 seeds using the chipping technique. DNA isolation was performed on these samples using the CTAB method. The DNA contents and purities of the samples were determined using a Nano-Drop device. According to the research findings, the DNA quantities of the samples ranged from 2.2 ng to 1243 ng. Purity values ranged between 1.41 and 2.03 (A260/A280). Although the DNA purity obtained from single seed samples was lower than the other groups, the bulked samples showed similarity in terms of DNA purity. The germination rates of the sampled seeds ranged from 55% to 100%. It was determined that this sampling method might have risk in small-seeded populations. DNA samples obtained from the study will undergo genetic similarity analyses based on SSR markers, and the results will be shared with researchers working in this field..

Keywords: Molecular analysis, seed cutting, chipping, ***Zea mays***.

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Comparison of Chromosome Staining Methods for Karyotyping in Haploid and Diploid Maize Plants

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Abstract: *In vivo* doubled haploid technique is one of the methods employed in maize breeding studies for the development of homozygous lines. Various analysis techniques are utilized to distinguish between the haploid and diploid plants obtained using in vivo haploid technique.The aim of this study was to compare different chromosome staining methods to determine the ploidy level of samples obtained by in vivo doubled haploid technique. Haploid and diploid maize seeds obtained from the hybridization of two different donors (B73, HyaxB73) and an inducer (CIM2GTAIL-P2) were used in the study. Different pretreatments (Cold water, Carnoy, Colchicine, Colchicine, and control) and two staining methods (Acetocarmin, Feulgen) were compared in six combinations to determine ploidy levels in root meristems of germinated seeds. The treatments were; no pretreatment + Acetocarmine (T1), no pretreatment + Feulgen (T2), Cold water + Carnoy + 1N HCL + Acetocarmine (T3), Cold water + Carnoy + 1N HCL + Feulgen (T4), Colchicine + Carnoy + 1N HCL + Acetocarmine (T5), Colchicine + Carnoy + 1N HCL +Feulgen (T6). A total of 120 seed samples obtained from two donor materials were germinated, and root tip samples were collected. In these samples, the Aceto-Carmine and Feulgen staining methods were applied, resulting in a total of 6 different treatments. Digital images of the prepared slides were recorded, and karyotype analyses were conducted using ImageJ software. According to the study results, the application of 1N HCL was identified as a critical step for Feulgen staining. Among the tested combinations in the study, the most successful results were obtained from T3 and T4. After karyotype analysis based the image analyses of this treatment, it was found that the long arm to short arm ratios in haploid samples ranged from 1.86 to 2.57, while in diploid samples, they ranged from 1.5 to 3.42. It was detected that the chromosomes of haploid and diploid samples have different morphometric characteristics. All chromosomes of haploid samples were metacentric, while diploids had metacentric, sub-metacentric and sub-telocentric chromosomes. It was concluded that the pretreatment method has a significant effect on the quality of digital images used in karyotype analyses.

Keywords: Ploidy, Pretreatment, Feulgen, Acetocarmine, Zea mays.

Note: This work was supported by Çanakkale Onsekiz Mart University The Scientific Research Coordination Unit, Project number: FHD-2022-4204.

Genomic Data Suggests A New Taxonomical Concept for Heldreichia bupleurifolia Boiss.

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Abstract: ***Heldreichia bupleurifolia*** Boiss. is the only species within the monotypic genus Heldreichia Boiss., and its range extends across the Taurus Mountains and the Anatolian Diagonal Mountains (also known as the Taurus Way) except for a single location in Lebanon. Individuals of the genus form clones in mobile rocky terrains through their perennial and underground vegetative shoots. They occur at various altitudes ranging from 1280 to 3000 m in Anatolia and the majority of their populations can be found above 2000 m. The genus Heldreichia, which was recently placed in the Biscutelleae tribe within the family, is currently represented by six intraspecific taxa (comprising five subspecies and one variety). In the Central and Western Taurus Mountains, specific populations exhibit a notable similarity in the basal leaf shape, a crucial distinguishing characteristic in the taxonomy of ***Heldreichia***. Defining the subspecies boundaries is complicated due to this similarity. Moreover, the distribution data concerning the genus in the literature is sometimes problematic with inaccuracies. Together with fieldwork conducted to address taxonomic complexities and update erroneous distribution data specific to the genus, our studies, utilizing high-resolution genomic data (including SNPs obtained from next-generation RADSeq data and sequences from numerous loci) and numerical taxonomic methods, have generally divided the intraspecific taxa of the Heldreichia genus into four groups. ***H. bupleurifolia*** subsp malatyana is the only taxon that exhibits significant taxonomic distinctions from the others, while the remaining taxa group together based on their geographic distribution rather than morphological characteristics. Consequently, a new taxonomic framework should be adopted for this genus. The study conducted provides support for the hypothesis aimed at elucidating the intricacies among Heldreichia taxa, which are attributed to the historical migration and amalgamation of populations from high mountains to valleys during glacial periods, followed by periods of isolation during interglacial periods.

Keywords: ***Heldreichia bupleurifolia***, RADSeq, phylogeny.

Determination of Genetic Kinship Relationships Between Some Poppy Genotypes

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Abstract: This study was conducted in the trial areas of Eskişehir Transition Zone Agricultural Research Institute Directorate during the 2022-2023 planting season. The aim of the research is to reveal the morphological and technological characterization of poppy genotypes and to determine the variation and family relationships between genotypes. Trial material consisting of 146 lines, 25 farmer populations and 6 standard varieties that were advanced in terms of morphine and other alkaloids (thebaine, codeine, noscapine) developed within the scope of the national poppy breeding project were planted in accordance with the Augmented trial pattern. In the study; Evaluations were made in terms of plant height, number of branches, capsule width, capsule length, capsule index, morphine rate (%), codeine rate (%), thebaine rate (%), noscapine rate (%). Cluster analysis was carried out to reveal the structure and genetic relationships of the material in terms of the agronomic and technological characteristics examined. In line with the findings, genotypes were divided into a total of 13 clusters. Cluster no 2 had the most genotypes (41genotypes), and Cluster no 3 had the least genotypes (1genotype). 5 standard varieties, 30 advanced lines and 6 farmer populations used in the research were included in Cluster no 2. Apart from this, it was determined that 116 advanced poppy lines were distributed in all clusters. It was determined that the genotypes consisting of farmer populations were distributed into 7 clusters. When the results were examined in terms of chemical characters, the highest rates of Morphine (1.912%), Codeine (1.44%), Thebaine (1.33%) and Noscapin (1.02%) were in clusters 12, 3, 11 and 12, respectively. When the data are examined in terms of agronomic characters, Highest Plant Height (126 cm), Number of Branches (7.13), Capsule Length (4.86 cm), Capsule Width (5.35 cm) and Capsule İndex (1.37) were found in clusters 9, 10, 1 and 6, respectively. According to the results, it was determined that the 3 groups of materials used in the study (advanced lines and farmer population, standard varieties) were genetically different from each other in terms of the characters considered.

Keywords: ***Opium poppy****,* genetic relationships, cluster analysis.

Genomic and Morphometric Analyses of Phyllolepidium cyclocarpum (Boiss.) L. Cecchi

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Abstract: The primary objective of this study is to test whether the western populations of ***Phyllolepidium cyclocarpum*** **(Boiss) L. Cecchi**, which has a distribution along the Anatolian Diagonal and the Taurus Mountains, differ morphologically from the eastern populations along the same geographical range. Additionally, due to the substantial geographic seperation between these two population groups, the study aims to determine if they represent a separate taxon. For this purpose, 27 locations were sampled. Based on 12-variable quantitative data, Principal Component Analysis (PCA) was evaluated for all individuals in order to solve systematic problems among ***P. cyclocarpum*** populations. Nevertheless, no distinct clustering was observed among individuals within the P. cyclocarpum populations. To sum up, based on the morphological analysis, although he general habitus of the plants of the east-west populations of this species appears to be different, there is no clear differentiation among the groups, and their distribution remains heterogeneous. Next generation RADSeq data were used to test genomic differentiation between populations. For these analyses, 140 individuals from 15 populations were included and PCA was performed with PCAngsd using molecular data obtained by scanning single nucleotide polymorphism (SNP) across the genome. As a result; the eastern and western population groups of this species were separated from each other despite the morphological analysis. In this way, the western population group was clearly grouped and the possibility that the western populations correspond to a new sub-taxon was also formed. In order to obtain RAD loci to represent each individual whose DNA was obtained for use in phylogenetic analyses; raw DNA data were parsed with bash scripts, then aligned to the ***Arabidopsis thaliana*** reference genome and edited in the snakeRAD workflow program. snakeRAD is a Snakemake workflow program that can be repeated, divides many large jobs into small parts and basically uses many bioinformatics tools for purposeful processing of raw sequence data. As a result of the analysis, an average of 9,000 loci were obtained for each individual. Using the procedure, four distinct subsets of 50 loci were created from these loci across the genome. Locus fasta files were run with the GAMMA model in the BEAST tool. In agreement with the PCA results, east-west divergence between populations was also obtained in phylogenetic analyses performed with random loci.

Keywords: ***Phyllolepidium cyclocarpum***, phylogeny, RAD-Seq, Anatolia

Effect of Genetic Structure on Heavy Metal Accumulation Potential of Plants

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Abstract: Air pollution has increased significantly in the last century due to anthropogenic factors and has become a major global problem. Heavy metals in particular are pollutants whose concentrations in the atmosphere are constantly increasing and pose a serious threat to human health. The most effective method for monitoring and reducing the concentrations of heavy metals, which can be toxic, carcinogenic and fatal to humans even at low concentrations, especially in the air, is the use of plants. Therefore, many studies are being carried out to determine the most suitable biomonitors to monitor and reduce the change in the concentration of each heavy metal in the air. However, the relationship between the genetic structure and the potential of plants to accumulate heavy metals is ignored in these studies. However, it is thought that the heavy metal accumulation potential of individuals of the same species with different genetic structures may be quite different. In this study, the clonal variation of vanadium concentration, one of the most dangerous heavy metals for human and environmental health, was determined in larch seed orchard. As a result of the study, it was calculated that V concentration varied greatly on a clonal basis, with more than 14-fold difference between the lowest (215.5 ppb) and highest (3076.9 ppb) concentrations. This result reveals that genetic structure is more important than species selection in biomonitor selection. It is thought that the results of the study will make significant contributions to future studies on monitoring and reducing heavy metal pollution in the air.

Keywords: Heavy metal, genetic structure, biomonitor, Vanadium.

Use of GBS Technology in Gene Bank Collections; a Review

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Abstract: According to recent research, it is claimed that there are 500,000 land plant species (angiosperms, gymnosperms, ferns, etc.) on Earth. Such a rich plant diversity and genetic resources need to be protected and preserved for future generations. Conducting various identification studies that will reveal the genetic potential of these samples, whose importance is indisputable, is very important in determining the current situation in gene banks. Morphology-based characterization data, traditionally obtained by gene banks based on phenotypic characteristics, are quite common, but are not sufficient. Because these data include highly heritable traits measured with low precision in a single environment, often overlooking variation in gene bank samples. In recent years, as New Generation Sequencing (NGS) technologies have become more accessible, such DNA sequencing technologies have begun to be used to characterize samples stored in gene banks and determine genomic diversity. A new approach of NGS protocol known as GBS (Genotyping by Sequencing) has become an a time- and cost- effective alternative molecular chracterization method for accessions stored in gene bank. The basic principle of this method based on high-throughput NGS of the genomic fragments resulting from digested the genome of each individual in the population with restriction enzymes. This modern technique providing high-throughput sequences for plant genotyping is used for describing and scoring SNPs in large populations that have high polymorphism and large genome. Due to such advantageous features, it has been used for population genetic characterization, identification of same accessions (duplications) within and between gene banks, intraspecific genomic diversity and genome-wide association study (GWAS).

Keywords: GBS, gene bank, molecular characterization.

Current Situations, Threats and Conservation Strategies of Anatolian Phoenix theophrasti (Datça Date) Populations

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Abstract: ***Phoenix theophrasti*** (Datça date), which is a Tertiary remnant and which we determined as the study material, was described by W. Greuter from the island of Crete in 1967. The status of their population in Türkiye was not known until the 1980s. Genetically, the Datça date is the closest wild relative of the ***Phoenix dactylifera*** (date palm), which we consume as food and is traded around the world today. The main subject of the study is to determine the current status and risk factors of this palm species, which is a relic in our country and geography, and to develop conservation strategies. In this study, the number of individuals of the species within the context of populations was tried to be determined by field studies and remote sensing methods. In addition, existing threat factors on the populations of the species were determined through field studies and interviews with local people during these studies. As a result of the study, it was determined that the species was represented by a total of 307 individuals in 5 different populations (from south to north, Antalya-Finike, Antalya-Patara, Muğla-Datça/Hurmalıbük, Muğla-Datça/Eksere, Muğla-Bodrum/Göltürkbükü) and the populations were mapped. Additionally, in this study, a new locality in İzmir-Seferihisar was recorded as the sixth distribution point of the species. The most important pressures on the species' populations can be listed as tourism activities, habitat losses due to second housing pressure, forestry activities and Palm Red Beetle (***Rhynchophorus ferrugineus***) damage. In order to carry the species' populations into the future, their populations should be protected and the number of individuals should be increased through rapid in-situ, ex-situ and regeneration studies. In addition, awareness of the use of the species in local governments of the coastal Aegean and Mediterranean regions, in landscaping and in the gardens of local people should be increased, and studies should be supported with national and international project resources.

Keywords: *Phoenix,* Arecaceae, palm, conservation.

Locations of Asparagus Genetic Resources in Türkiye

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Abstract: Asparagus genus, which has nearly 300 species in the world, has 10 species registered in Türkiye. In addition, there are species that require confirmation and whose registration is incomplete. 3 of the 10 species are endemic. The species are distributed from Edirne to Hakkari. Very few studies have been conducted on the genetic resources of garden asparagus and other asparagus species in Türkiye. In fact, there is also a problem in the world. In the 14th International Asparagus Symposium held in 2017, this issue was mentioned and it was stated that studies on this subject should be increased and species should be collected and protected. The project titled "Collection, Conservation and Characterization of Asparagus (***Asparagus* spp**) Genotypes in Türkiye" is being carried out at Yalova Atatürk Horticultural Cultures Central Research Institute. In this context, the locations in Türkiye that are mentioned in the literature and where they can be found have been scanned and the literature has been updated. New locations were also found during the survey. In this study, information about the species and their locations will be given.

Keywords: Endemic, Asparagus, location.

Morphology, Population Size, Distribution Area, Number of Individuals and IUCN Category of Locally Endemic Peucedanum guvenianum Yıldırım & Duman (Apiaceae)

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Abstract: ***Peucedanum guvenianum*** **Yıldırım & Duman** is a member of the Apiaceae family, which can grow up to 2 metres in length, and can be found in the maquis at altitudes of 230-270 metres in the region between Seferihisar, Menderes and Gümüldür in İzmir Province. The plant was described to the scientific world in 2017. This species is related to ***Peucedanum ruthenicum***, ***P. longifolium***, and ***P. vourinense*** and was known from a single locality. In the protologue article, it is emphasised that the species is distributed in an area of 7.5 km2 with approximately 500 individuals. The threat factors mentioned in the article by the authors of the ***P. guvenianum*** and the factors identified in the preliminary studies carried out by us are as follows; physical damage to the plant by humans, destruction as a result of being crushed by sheeps during overgrazing, high destruction as a result of the fires in the area and a predatory caterpillar (pre-adult period of a day butterfly named *Papilio machoon*) feeds on the fruits and seeds of the plant. For these reasons, this local endemic species is under serious threat. However, in the protologue article, it is listed as Critically Endangered by the authors according to the IUCN (2016) threat category and in detail (CR) B2ab (iii,v). However, immediately after the discovery of the species, a very large forest fire broke out at the type locality and almost the entire area was damaged by fire. On the other hand, as a positive development, in the master's thesis titled "Flora of the Region between İzmir province, Menderes, Seferihisar and Özdere" completed in 2020, a very large population of ***P. guvenianum*** was discovered around Karacadağ summit, which is within the borders of Menderes. Within the scope of the TÜBİTAK 2209 project which was carried out by us between 01.06.2021 and 01.06.2022, population studies on ***P. guvenianum*** were carried out and as a result of the study, it was determined that the distribution area of ***P. guvenianum*** is 1.96 km^2 in total, it has three different populations in total and there are approximately 9014 individuals in these populations. In the light of all these data, when evaluated according to IUCN (2023), the final threat category of the species in this study was recommended as "VU D1,D2".

Keywords: ***Peucadanum guveanianum***, population size, distribution area, IUCN categorys.

A Research on Conservation of Rare and Endemic Plant Species of Hatay Province

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Abstract: This study aimed to determine the current status of threatened, rare and endemic plant species distributed in Hatay province and to conserve them. As a result of the field studies carried out between 2020 and 2022, the current status of 20 plant taxa was determined, their herbarium samples were prepared and seed samples were collected. Herbarium and seed samples were transported to Republic of Türkiye Ministry of Agriculture and Forestry Aegean Agricultural Research Institute for conservation. It was observed that 10 of these plants are narrowly distributed (local) endemic species. These are ***Acantholimon laxiflorum***, ***Noccaea ali-atahanii***, ***Centaurea arifolia***, ***Centaurea doddsii***, ***Centaurea foliosa***, ***Centaurea ptosimopappa***, ***Dorycnium amani***, ***Salvia sericeotomentosa* var. *hatayica***, ***Salvia sericeotomentosa*** var. *sericeotomentosa* and ***Scorzonera pacis***. The threat categories of these endemic species are determined as follows: two CR, four EN, one VU and three DD. The other 10 taxa; ***Gonocytisus pterocladus***, *Helichrysum sanguineum*, *Hypericum russeggeri*, ***Origanum laevigatum***, ***Petrorhagia syriaca***, ***Salvia aramiensis***, ***Salvia cassia***, ***Salvia viscosa***, ***Thymus eigii***, ***Verbascum antiochium***, are rare species that are distributed only in Hatay province and its surrounding. Among these taxa, 8 are in the category VU and 2 DD. It was observed that there are human-induced negative effects on plants due to reasons such as habitat destruction to create new farmland, overharvesting, mining, overgrazing, road and building construction. Among these species, ***Noccaea ali-atahanii*** Güzel, Özü Doğru & Kayıkçı, which was discovered in 2018 and spreads very close to settlements and in a very narrow area, in urgent need of conservation.

Keywords: Endemic, rare, conservation, flora, Hatay.

Flora of Asi Tepe (Demirci), Manisa province

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Abstract: Türkiye is one of the crucial countries in the world in terms of biodiversity. Of the 37 flora regions in the world, three important flora regions intersect in Türkiye. Türkiye is in a location where Europe-Siberia, Iran-Turan and Mediterranean phytogeographic regions meet. Türkiye is located at the intersection of these three phytogeographic regions, providing a rich floristic diversity. This richness of Türkiye's flora is mainly due to; It can be explained by factors such as having many climate types, various habitat areas and different plant geography regions, geological and geomorphological diversity, rich water resources and high altitude differences.

In this study, we determined the flora of Asi Tepe in the Demirci district of Manisa province. Between 2019 and 2023, 18 field studies were conducted in the study area. As a result of these field studies, a total of 1263 plant specimens were collected. As a result of the study, a total of 431 taxa belonging to 61 families and 228 genera were identified. The number of endemic taxa detected in the study area is 31, and the rate of endemism is 7.2%. According to the phytogeographic regions, 120 of the taxa are Mediterranean elements, 25 are Iran-Turan elements, 23 are Euro-Siberian elements, and 5 are Black Sea elements. At the same time, the families with the most taxa in the research area are Asteraceae Martinov, Fabaceae Lindl., Caryophyllacae Juss., Poaceae Barnhart, Lamiaceae Juss. and Brassicaceae Burnett, the genera with the most taxa are ***Trifolium*** L., ***Vicia*** L., ***Alyssum*** L., ***Medicago*** L., ***Veronica*** L. and ***Bromus*** L.

Keywords: Asi Tepe, flora, Manisa, systematic botany, Türkiye

Taxonomic Revision of the Holosteum (Caryophyllaceae) Distributed in Türkiye

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Abstract: Genus *Holosteum* L. (Caryophyllaceae Juss.) is generally distributed in Eurasia and North Africa. It is characterized by its annual life form, umbellate inflorescence and herbaceous habitus. It is represented by a total of 9 taxa in 4 species worldwide. *Holosteum* is represented by a total of 4 taxa in 3 species, according to the literature in Türkiye, and a total of 4 taxa in 2 species, according to the most current literature in the world.

This study was carried out within the 17th volume of Illustrated Flora of Türkiye. It is seen that *H. tenerrimum* Boiss., which was initially in the species category according to its current taxonomic status in Türkiye, is defined as a subspecies of *H. umbellatum* L. according to the existing literature. However, *H. umbellatum* subsp. *tenerrimum* (Boiss.) Greuter & Burdet is easily distinguished from *H. umbellatum* L. subsp. *umbellatum* by its twice larger corolla and twice the number of stamens. For this reason, in this study, it was raised to the species status again and treated as *H. tenerrimum*. Also, it is seen that *H. umbellatum* var. *glutinosum* (M.Bieb.) Gay, accepted as the variety of *H. umbellatum* in Türkiye, has been re-elevated to the subspecies category as *H. umbellatum* subsp. *glutinosum* (M.Bieb.) Nyman. Although the taxonomic status of *H. glutinosum* M.Bieb. is quite complicated, it has been concluded that it should have species status with its number of stamens, its larger fruit than all other taxa, its light green stem and leaves, and its dense glandular hairs. *H. liniflorum* Fisch. & C.A.Mey., the synonym of *H. glutinosum* for many years, has changed its status as a subspecies of *H. glutinosum* in 2020. During this study, *H. glutinosum* subsp. *liniflorum* Fateryga samples from Ankara and Rize were examined, and it was concluded that the description made with its taxonomic position, large and pink flowers, and rather rigid and long-stemmed habitat was consistent. Although it is synonymous with the current taxonomy, it was decided to revive *H. glutinosum* subsp. *liniflorum*, considering the variation range of other *H. glutinosum* samples examined. As a result, the genus *Holosteum* in Türkiye is currently represented by a total of 5 taxa in 4 species.

Keywords: *Holosteum*, Caryopphyllaceae, revision, taxonomy, Türkiye

Agromorphological Characterization of Çaltı Domestic Garlic

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Abstract: This study was conducted between 2020-2021 in Yalova conditions with the aim of determining the agromorphological characteristics of the locally produced Çaltı garlic genotype. In the study, Taşköprü 56 garlic varieties were used as control. When the agromorphological characteristics of Çaltı garlic are evaluated; it was determined that the green parts of the plants were quite dense and showed upright growth. The average leaf length of plants with moderate waxiness was 37.80 cm, and the plant height from the soil level was determined as 63.30 cm. The width of the slightly concave leaves was 19.70 mm. Plants with high anthocyanin density in the pseudostem have a thickness of 10.35 mm in this region. The most obvious feature of this genotype is the formation of a flower stalk on the pseudostem and the large size of the bulbet formed on the flower stalk. The flower stalk length is 10.35 cm on average and the weight of the bulbet was 0.80 g on average. The average weight of the ellipse-oval heads is 39.90 g, the head diameter is 50.28 and the head height is 41.14 cm. The average number of cloves in the heads of Çaltı garlic, which has tight heads, was 9.80 and the clove weight was 3.41 g. Eight different sulfur compounds were detected in the essential oil of Çaltı garlic, including diallyl disulphide (37.99%), sulfide allyl methyl (17.22%) and disulfide methyl 2-propenyl (17.62). With the data obtained at the end of the study, Çaltı garlic received a geographical indication.

Keywords: Garlic, ***Allium sativum*** **L**., Agro Morphological characterization, Local variety, Sulfur component

Vegetable Genetic Resources of Türkiye

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Abstract: Türkiye is a diversity center and micro gene center for many cultivated plant species. Our vegetable genetic resources are under threat of extinction for many reasons like other plant species. The "Vegetable Genetic Resources Research Project" has been carried out in our institute since 1978 to against this threat. In this project, studies are carried out on the collection, regeneration, characterization, evaluation and conservation of vegetable genetic resources of our country. These studies make significant contributions to the sustainable use of vegetable genetic resources and their transfer to next generations.

Keywords: Vegetable genetic resources, regeneration, conservation, characterization, National Gene Bank.

Agromorphological Characterization of Turkish Tomato Germplasm

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Abstract: Tomato (***Solanum lycopersicum*** L.), a vegetable crop of the *Solanaceae* family is produced in large quantities throughout the world. The tomato isn't native to Türkiye but it is possible to see its wide variability in there. In this study, data recorded through the characterization of 170 tomato accessions initially collected from 60 different provinces of Türkiye, between 1973-2011, and conserved in the Aegean Agricultural Research Institute National Gene Bank, and 10 checks, using 30 agromorphologic traits, were investigated. The minimum, maximum, average values and frequency percentages of the these characters were determined. This study has showed that there is wide diversity in the tomato accessions. This diversity is especially a great resource for improving new tomato variety.

Keywords: Tomato, ***Solanum lycopersicum*** L., genetic resources, morphological characterisation, diversity, germplasm.

Research Project of Eastern Anatolia Region Vegetable Genetic Resources

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Abstract: Our region has a rich potential in view of vegetable genetic resources like our country. Since in our region, vegetable production have been made with seeds which growers acquired themselves, it caused local varieties and populations from point of view of many characters to form. However instead of regional varieties and populations, trade varieties has been begun to be preferred recently. So unless our genetic resources are not preserved, it seems to be inevitable that they will be lost. For this reason different projects were conducted in our region. In the scope of this project which is a continuation of the projects conducted in the region; the genetic materials (692 vegetable seeds) were collected by being screened places where vegetables are grown in Sivas, Bayburt, Gümüşhane, Kars and Ardahan provinces in between 2016 and 2018. The preserving of the collected genetic materials have been provided by sending to 'The National Gene Bank' and 'Türkiye Seed Gene Bank'. The morphological characterizations of collected 58 pepper types and 48 tomato types were conducted by utilizing the criterions of UPOV and IPGRI, which are related with this species. As a result of characterization studies; it has been measured that the fruit weights (17.23-478.74 g), the fruit meat thickness (2.47-8.07 mm) and the number of seed houses (2-12 pieces) of tomatoes genotypes, and the fruit weights (2.85-97.71 g), the fruit meat thickness (1.24-5.44 mm) and the fruit length (3.31-21.65 cm) of pepper genotypes. It has been indicated that this changes of characteristic of them depend on genotypes. In addition, as a result of cluster analysis; 46 tomato genotypes divided into 2 main 5 subgroups and pepper genotypes formed 2 main 6 subgroups. As a result of the evaluations, it has been indicated that the collected 3 tomato genotypes could significantly considered as breeding material.

Keywords: Genetic resources collection, tomatoes, ***Lycopersicon esculentum*** **L.**, peppers, ***Capsicum annuum*** L., characterization.

Assessment and Use of Apricot Genetic Resources

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Abstract: Plant genetic resource are important in terms of preserving the characteristics they have had from past to present, allowing the development of new varieties as a result of various breeding studies, having a large gene pool for genetic diversity due to the allelic richness they contain, and carrying the characteristics of different ecological environments. It is important to protect genetic resources in order to reduce the negative situations that may arise as a result of the increasing world population, increasing food needs, agricultural work, urbanization and industrialization, destruction of forests, and the rapid development of the tourism sector. Türkiye is in a special position in terms of plant genetic resources. Due to the fact that apricot cultivation has been propagated by seeds for many years, extensive genetic resources have been created in Anatolia. In 1974, the Apricot Gene Resources Parcel was created at Malatya Fruit Research Institute and 285 important local and foreign apricot varieties and types in our country were collected in this parcel. The genetic resources available in our institute are used as material in many breeding studies (development of new varieties, high yield, resistance to late spring frosts and diseases, etc.). Apricot fruit and seeds are frequently used in many areas, especially in the food industry. Apricot fruit, which is generally consumed dry or fresh, has been processed into different products within the scope of projects carried out in our institute in recent years. Vinegar, apricot powder, pickle and sustainable products have been developed from apricot fruit. In addition, some important varieties in the genetic resources parcel were evaluated in terms of their suitability for jam and marmalade. Apricot seed milk, coffee and gluten-free biscuits are produced from apricot seeds.

Keywords: Apricot, genetic resources, genetic diversity

Use of Variation in Plant Genetic Resources in Plant Breeding: A Case Study on Medicinal and Aromatic Plants

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Abstract: A significant part of the production materials used in plant production are based on plant genetic resources. Variation in genetic materials is an important source in determining individuals to be selected for breeding purposes. Rich plant genetic resources are used in the cultivation and breeding of medicinal and aromatic plants. The species and taxon diversity of Türkiye's flora creates a wide range for breeding studies on medicinal and aromatic plants. Variation is very important in selecting individuals with desired characteristics in plant breeding. Many different species of important medicinal and spice plants containing essential oils are naturally distributed in our country. In medicinal and aromatic plants, quality criteria are as important as agronomic characters in selecting individuals with the desired characteristics from the variation. In particular, chemotypic variation as well as agronomic variation within the same population is an issue that should be taken into consideration. While evaluating the sources of inter- and intra-population variation in our breeding studies, selection was made based on agronomic and chemotypic characteristics. The main criterion that creates chemotypic variation is the chemical composition of the essential oil. The chemotypic variation that occurs in terms of the main components of essential oils appeals to many different areas depending on the intended use. As a result of the breeding work we have done considering this situation, so far we have registered 1 oregano (***Origanum onites* L.**), 1 golden thistle (***Scolymus hispanicus* L.**), 1 mountain tea (***Sideritis perfoliata* L**.), 1 Anatolian sage (***Salvia fruticosa* Mill**.), 1 common sage (***Salvia officinalis* L**.), 1 lemon balm (***Melissa officinalis* L.**) and 1 purple coneflower (***Echinacea purpurea* L.**) have been registered as varieties. Registration applications have been made for 2 salep orchids (***Orchis sancta* L**., ***Serapias vomeracea* Burm.f. Briq**.) and 1 anise (***Pimpinella anisum* L**.). laurel (***Laurus nobilis* L**.), black elderberry (***Sambucus nigra* L**.), oregano species (***Origanum* spp**.), madder (***Rubia tinctorum* L.**), indigo species (***Isatis* spp**.), chasteberry (***Vites agnus castus* L**.) and yarrow (***Achillea millefolium* L.**) breeding work on continues.

Keywords: PGS, variation, breeding, medicinal plants.

Use of Our Plant Genetic Resources in Agricultural Production: Sideritis Breeding Study

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Abstract: Medicinal and aromatic plants have been the focus of the world in recent years. As the demand for medicinal and aromatic plants increases, the demand for products derived from these plants also increases. With the propagation, breeding, processing, and transformation of raw plants into medicinal and aromatic plant-market-demanding products, the relevant industrial areas are increasing day by day in all countries. Its rich biodiversity makes Türkiye an important gene source for many plant species. In Türkiye, there are a total of 45 genera, 565 species, and 765 taxa belonging to the Lamiaceae family, one of the largest flowering plant families in the world with 224 genera and roughly 5,600 species. The Sideritis genus, which belongs to the Lamiaceae family and contains more than 150 species, is widespread, notably in the Mediterranean basin, and comprises 55 taxa, 36 of which are endemic to our country. Türkiye is recognized as one of the two gene centers for the genus Sideritis because of this high endemism rate. This case study aims to develop standard synthetic varieties that can be used in cultural production by evaluating the natural populations of three commercially valuable Sideritis species. For this purpose, firstly, the distribution areas of the species to be studied were researched and the locations for collection were determined, then field studies were carried out in these locations and seed collection was carried out in appropriate periods. The gene pools that are absolutely necessary for the breeding program to be implemented with these collected seeds have been created for each species. In our country, as in the rest of the world, the demand for medicinal and aromatic plants is met through cultural production and collection from nature. Due to the increasing demand, the amount of plants collected from nature is also increasing, and this puts pressure on the collected plants. To reduce this pressure, it is necessary to start cultural production of intensively collected species. This study aims to reduce the collection pressure on Sideritis species, which are collected intensively from nature due to their commercial value, to prevent gene erosion, and to provide raw materials to the relevant industry.

Keywords: ***Sideritis congesta, Sideritis stricta, Sideritis condensata***, synthetic variety breeding, mountain tea.

Effect of Different Harvest Times on Turmeric Yield and Quality

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Abstract: Turmeric (***Curcuma longa*** L.), a member of the Zingiberaceae family, has been used as a natural colorant, sweetener, insect repellent, etc. in the food, cosmetics and textile industries for centuries. It is used as. Recently, it has gained value as a functional food worldwide due to its medicinal properties. Studies have shown that turmeric, which is widely distributed in tropical and subtropical regions of the world, especially in Asian countries, has adapted to Türkiye. This study was carried out to determine the most suitable harvest date for subtropical regions such as Türkiye. In the study, quality criteria such as antioxidant, phenolic and flonovoid substances, curcumin rate, essential oil rate and components, as well as yield, were determined in rhizomes harvested in 5 different periods. While the fresh rhizome weight varied between 193.33-644.00 g/plant, the curcumin rate varied between 1.07-1.72%.

Keywords: Tropics, spice, harvest, quality.

The effect of different drying processes on the biochemical properties of Anatolian sage (Salvia fruticosa Mill.)

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Abstract: Anatolian sage (***Salvia fruticosa*** **Mill.**) is a medicinal and aromatic plant species belongs to the Lamiaceae family and is widely used in traditional folk medicine in Türkiye. These plants are an excellent source of bioactive compounds such as flavonoids, phenolics, carotenoids, and essential oils. Drying is the most common and fundamental method for post-harvest preservation of medicinal plants. However, the bioactive compounds of medicinal plants are affected by drying methods and conditions. This study aimed to investigate the effect of different drying treatments on the chemical properties of Anatolian sage. The samples were dried with different drying processes including oven (at 45, 55 and 65°C), shade, and sun drying. Color measurements (L*, a*, b*, C* and hue angle), total phenolic, total flavonoid and total chlorophyll contents, antioxidant activity, essential oil yield and composition analyses were made in the dried samples. The highest essential oil yields were obtained by oven-drying at 45°C (3.98%) followed by, oven drying at 55°C (3.47%) and sun drying (2.99%). 1,8 cineole (37.42-50.47%) and camphor (19.13-24.65%) were the major components in all the essential oils. The DPPH radical scavenging activity (2.22 mg/mg), total phenolic (38.85 mg GAE/g), total flavonoid (30.28 mg CE/g), and total chlorophyll (53.41 mg/g) contents were found higher in oven drying samples at 45°C. It was concluded that drying methods significantly affected the antioxidant properties and essential oil composition of Anatolian sage.

Keywords: Anatolian sage, drying, antioxidant, essential oil.

Pomological Characteristics of Black Myrtle (Myrtus communis L.) Genotypes Obtained by Hybrid Breeding

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Abstract: Myrtus (***Myrtus communis* L.**) is densely found natural areas which have Mediterranean climate in our country. Myrtus fruits are used in different food formulations and as ingredients in foods besides edible consumption. Myrtus fruits has two forms as black and white coloured. White coloured fruits are more consumed as edible. Black coloured fruits have lower edible consumption because of its little fruits, multi seeds and hardly formed. Although, antioxidant activities of these fruits are quite higher. The aim of this study is to develop myrtle variety candidates which have higher antioxidant activity and black fruit from F_1 genotypes obtained with crossbreeding. In the project, two aged 2976 F_1 genotypes obtained from previous studies were used as plant material. Fruit color, fruit size, number of seeds and number of fruits per plant were evaluated as selection criteria. During the selection, firstly, the phonological characteristics of the F_1 genotypes obtained and the pomological measurements of the fruits were made. Afterwards, F_1 genotypes were evaluated according to the weighing classification method, taking into account fruit weight (mg/fruit), number of seeds (piece/fruit) and number of fruits per plant (piece/plant). At the end of the evaluation, the variety candidates with the highest scores were determined. Field and laboratory studies were carried out at the Batı Akdeniz Agricultural Research Institute, Aksu location. Pomological measurements of the remaining 54 genotypes after selection were made. When its pomological properties are examined; fruit weight between 0.45 and 1.28 g/fruit; fruit width 9.14- 14.06 mm; fruit length 10.64-15.54 mm; The number of seeds in the fruit is 10.00-18.80; 0.06-0.29 g/fruit of total seed weight; 0.08-0.35% of core ratio; It was determined that the number of fruits per plant was 90-3418 pieces/plant.

Keywords: ***Myrtus communis***, crossbreeding, variety development.

The Effects of Different Storage Conditions and Storage Period on the Quality Parameters of Some Medicinal and Aromatic Plants Oils

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Abstract : Essential oils extracted from medicinal plants are used in pharmaceutical industry, cosmetic and food industry, sanitation industry and the other industries. Great numbers of studies showed that essential oils obtained from medicinal and aromatic plants have antioxidant, antifungal, antimicrobial activities due to including chemical constituents. Some studies showed that essential oils components have changed in time during storage. It is thought that the changes in compositions are important due to very important effects of essential oil components. It is thought that determining the optimum storage conditions to reduce these changes to minimum levels will be beneficial for both producers and consumers. In this study, effects of different storage conditions on quality parameters of some essential oils were investigated. In this study different temperature storage conditions were realized and 2 storage processes were applied individually like storage at atmospheric conditions and a storage condition that passing nitrogen gas from the essential oil samples. Some quality parameters were analyzed like essential oil components, refractive index and optical activity in essential oils. At the end of the project, there are changes in the contents of the oils during the storage. The best storage condition was selected as storage at refrigerator. It is thought that this study contains significant values for determining the expiration date of the oils. In this study, some oils expiration dates were determined by using the Turkish Standarts Institute's limit values. But, some oils haven't any standard values. Because of this situation, some oils expiration dates were not determined but these oils showed significant differences in terms of oil contents. Due to these reasons, the standards of the the herbal oils which are frequently used should be prepared.

Keywords: Medicinal aromatic plants, essential oil, storage conditions, quality parameters.

Local Products and Cultural Research in Culinary Culture – Menemen Municipality Example

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Abstract: Localism which is a prominent concept in recent years in the nutrition trends published by FAO (Food and Agriculture Organization of the United Nations) every year, has the meaning of supporting businesses that produce locally and therefore offer access to fresh food. On the other hand it makes possible to approach the subject from the culinary context. From this perspective, a small part of the local values in the name of culinary culture in Menemen is being explained with the data based on the oral history study method conducted in Menemen villages. Civilization has continued uninterruptedly for thousands of years in our district, whose historical past dates back to 6000 years, as revealed by archaeological excavations. The Mycenaean, Minyas, Hittite, Hellenic, Roman and Byzantine cultures that passed through our geography starting from the Early Bronze Age left behind a significant amount of their cultural and life heritage as they left our lands. Hosting immigrants in the early 20th century gave rise to the immigration cuisine, which we describe İzmir cuisine today and emphasize as cultural mosaic. In Menemen, which also has a very rich endemic vegetation, it has been seen that all products obtained from the soil have a culinary equivalent. To put it numerically, a total of 500 different food names were reached from food and beverage types in 9 categories by interviewing a total of 225 people in 35 villages.

Keywords: localism, culinary culture, endemic vegetation.

Agro-morphological Characterization of Some Origanum spp. Populations

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Abstract: Collection, conservation and evaluation of genetic resources studies started by Aegean Agricultural Research Institue (AARI) in 1979 and have been continuing until today. In some collected materials, which have economic importance, agronomy, adaptation and breeding activities were carried out and among these -candidate varieties- have been developed as well. The purpose of this research is to agro-morphologic characterization of 211 sample of ***Origanum*** populations that preserved in National Gene Bank in İzmir. In order to do this, plant height, plant growth habit, stem pubescence, ratio of leaf length/width, variability of populations, color of leaf, shape of leaf, margin of leaf, color of flowers were determined. The result showed that, 17.51% of the populations were erect, 65.53% semi-erect and 16.94% prostrate. In terms of stem pubescence,14.69% are smooth, 28.81% are slightly hairy, 30.51% are hairy and 25.99 % are dense. The leaf width/length ratio of the populations was measured to be between 0.5-1.2 cm. As a result of studies on leaf morphology, 4% of the leaf upper surface color was yellow green, 66% was green, 7% was dark green, 13% was bluish green, and 10% was other. 37% of the leaf margins of the plants were entire, 57% were slight dentate, 5% were medium dentate and 1% were toothed hairy (1). Devoloping stage of oregano starts in second years so, second year of plant height, green herb yield, drog herb yield and drog leaf herb of oregano are very important. Mean of plant height changed between 29.2-72.0 cm, yield of green herb measured and ranged from 80.8 to 590.0 g plant^{-1}, drog herb ranged from 51.4 to 250.0 g plant^{-1}, drog leaf herb ranged from 41.6 to 140.0 g plant^{-1}.

Keywords: ***Origanum***, gene bank, conservation, characterization

Ornamental Plants Genetic Resources Researches in Türkiye

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Abstract: The flora of Türkiye which is the biggest part of our biological diversity contains many plants that can be used as ornamental plants. Considering this rich biodiversity of flora and being homeland of a lot of species, it is very important bringing out new ornamental plants, developing and using them. Particularly with bulbs, rhizomes, tubers hundreds of species of ornamental plants also take place among our endemic plants. In this study, it is aimed to determine the genetic resources that can be used as ornamental plants, collecting, conserving and defining species. For the purposes of a new use of genetic stock for future breeding programs it will be considered to determine the species which have economic importance and can be used as ornamental plants. With this aim survey studies, collection of vegetative materials have been carried out, seeds and herbarium samples were be collected and conserved for the purpose of *ex situ* conservation. On the other hand, the seeds of some ornamental plants in the National Seed Gene Bank were germinated and repropagated for the purpose of renewing. During the production renewal studies, the characterization of some plants was made in terms of features such as plant height, plant diameter, stem diameter, number of flowers, flower diameter, flower stem length, flower stem diameter, leaf diameter, leaf length and number of leaves.

Keywords: Plant genetics resources, survey, collection, conservetion, ornamental plants.

The Effects of Biological Diversity on Chemical Composition and Functional Properties of Bee Pollen

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Abstract: Pollen grain is the male reproductive cell of flowering plants. Nectar is a sugar-rich secretion produced by flowers that attracts pollinating animals such as insects and birds. Bees collect flower pollen and nectar from nature and use it both to feed larvae and young bees and to pollinate plants. Bees collect the pollen and nectar from flowers into pellets in baskets on their hind legs, moisten them with their saliva to hold them together and form bee pollen. In short, bee pollen is a blend of flower pollen collected by honeybees, bee secretions, enzymes, nectar, honey and beeswax. Since pollen is the only food source for bees, it is one of the rare foods that contains all the components necessary for a living creature to survive. It contains 10-40% protein, 1-13% fat, 13-55% carbohydrate, 0.3-20% dietary fiber and 2-6% ash). In addition to its nutritional properties, it is defined as a functional and theropathic food due to its essential amino acids, saturated and unsaturated fatty acids, high reducing sugar concentration, Zn, Cu, Fe, high K/Na ratio and phenolic substances however, these nutritional content and functional properties vary depending on many factors such as the type of bee, the flora from which it is obtained, the season in which the pollen is collected, and climatic conditions. In particular, the plant species from which the bee pollen is obtained is the most fundamental feature affecting the quality parameters of bee pollen. In this study, the differences in the contents of bee pollen obtained from different flora (moisture, ash, protein, fat, crude fiber, total mineral, carbohydrate, sugar, pH, water activity) will be revealed in the light of the literature and the functional (antimicrobial, anticarcinogenic, antioxidant) properties will be compared with each other and the effects of biodiversity on these properties of bee pollen will be discussed.

Keywords: bee pollen, biodiversity, functional properties.

The Role of the Bumblebee in Pollination in Greenhouse Production Systems

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Abstract: Bumblebees are taxonomically classified in the family Apidae belonging to the class Insects, order Hymenoptera. Bumblebees, which have approximately 250 species, are used as pollinator insects especially in cultivated plants. In our country, the demand for Bombus terrestris bees is constantly increasing in the Mediterranean and Aegean regions where greenhouse cultivation is intensively practiced. Bombus terrestris, Bombus lucorum, Bombus ignitus and Bombus occidentalis are the main bumblebee species in commercial cultivation. In the world, Bombus terrestris bees have come to the forefront in commercial breeding due to their potential for mass colony formation. In this direction, bumblebee breeding activities continue in our Aegean Agricultural Research Institute Beekeeping Center. The cultivation of vegetables, fruits and ornamental plants in low and high greenhouses by eliminating the negative effects of climatic factors and ensuring the formation of suitable environmental conditions is generally called greenhouse cultivation. Improvements in the quantity and quality of the fruits obtained from the plants pollinated by bumblebees used in greenhouses for natural pollination, an increase in the size of the fruits and the number of tied seeds are observed. Bumblebees are widely used in greenhouse fruit and vegetable cultivation due to their characteristic features. In our country, especially bumblebees are frequently used in tomato plant, which is considered to be profitable and intensively cultivated. In addition, it also contributes to the pollination of fruits such as peppers, eggplants, strawberries and melons under cover and almonds, plums and cherries in open areas. Bumblebees, which are used for pollination in greenhouse cultivation, are important in terms of the reduction in the labor force spent on the one hand and the marketability of the products produced at home and abroad on the other hand. The benefits they provide in terms of quality and quantity in the quality of the products also make an important contribution to human nutrition. In this study, the positive effects of bumblebees on fruit set and quality characteristics of agricultural products will be discussed with current research.

Keywords: Bumblebees, pollination, greenhouse.

Recording Traditional Knowledge Associated with Plant Genetic Resources

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Abstract: The dependence of human on biodiversity from several aspects gives rise to accumulation of information related with genetic resources and leads to the acquisition of it as a knowledge in the end. Traditional knowledge (TK) associated with genetic resources (GR) particularly when biotechnology is involved provides a significant key for research and development (R&D) activities inducing product development in different sectors, such as food, agriculture, medicine, pharmaceuticals, cosmetics, chemistry and defence. The high diversity of GRs, especially the plant biodiversity in Türkiye is expected to have resulted in an extensive amount of associated TK. Hence, "The Project of Recording Traditional Knowledge Associated with Biological Diversity" which is the “first and only” project countrywide in this regard was initiated in 2017 to contribute to the identification, storage and conservation of TK associated with GR and its transfer to next generations together with the economic development of the country through intellectual property (IP) process and R&D as well. In this project, 86% of the data collected from 66 provinces are related with TK associated plant GR, which are divided into health, nutrition, industry, agriculture and livestock and other TK categories. It is believed that by recording TK associated with GR; genetic resources and associated traditional knowledge under national jurisdiction will be able to be utilized in the best possible way for sustainable use of biodiversity, and public good.

Keywords: Genetic resources, traditional knowledge associated with genetic resources, biodiversity, biological diversity, conservation.

Usage Situations and Identification of Wild Plant Species Consumed as Vegatable in Gümüşhane and Bayburt Provinces

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Abstract: This study was carried out to specify the plant species consumed as vegetables by local people living in districts and villages of Gümüşhane and Bayburt provinces to determine our cultural richness based on the usage types of these species by aiming to hand down the next generations in 2020-2021. It was determined that 121 taxa belonging to 29 families are used as vegetables in the research area. It was found that determined plant species belong to Asteraceae, Lamiaceae, Polyogonoceae, Apiceae, Amaranthaceae and Fabaceae families. While it was determined that parts of these plants, such as root, stem, shoot, flower, branch, leaf, seed and tuber, were consumed as vegetables, it was also revealed that consuming habits may differ from region to region. These plants are consumed as fresh, dried, in brine, frozen, processed by pickles or preserved as canned food. Moreover, it was ascertained that they are consumed as raw (salad), food, wrap, soup, pastry, pickles, jams and some of them as spices for taste and smell, and additionally as tea for therapeutic purposes. All plants were recorded by their local names, locations, and parts with their usage patterns. The herbarium was prepared and later identified by Prof. Dr. Ali Kandemir, Department of Biology, Faculty of Science, Erzincan Binali Yildirim University. Herbarium specimens and seed samples were sent to the Seed Gene Bank of Türkiye (ANKARA) and the National Gene Bank (İZMİR) with the aim of conservation.

Keywords: Gümüşhane, Bayburt, vegetable, wild plants, types of consuming.

The Story of Buckwheat in Türkiye

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Abstract: Buckwheat (***Fagopyrum esculentum***, ***Fagopyrum tataricum***) is an annual plant belonging to the Polyganeceae family, which is produced in many countries of the world, its importance and prevalence are increasing day by day, and it has a place in international trade. The main areas of use are; It is used in human nutrition (grain, flour in gluten-free diet), animal nutrition, bee nutrition as honey plant, green manure and soil conditioner, diet plant and medicinal plant (routine production). Studies on buckwheat started in 2006 at Bahri Dağdaş International Agricultural Research Institute and are being carried out within the scope of "Buckwheat Improvement Project" supported by TAGEM in 2010. The aim of buckwheat breeding is primarily to obtain varieties with high seed yield and routine ratio. Variety development studies in the project started with 220 (41 Fagopyrum tataricum, 179 Fagopyrum esculentum) ecotypes obtained from the USDA. Within the project, two of common buckwheat (Fagopyrum esculentum) lines (BDKB 100-2 and BDKB 102-5) were registered in 2014 with the names "GUNES" and "AKTAS". In addition, as a preliminary study within the scope of the project, studies have started to determine the ratios of phenolic (rutin, quercetin, etc.) components in *Fagopyrum tataricum* and *Fagopyrum esculentum* lines. In the "Buckwheat Breeding Project", it is aimed to determine the ratio of phenolic (rutin, quercetin, etc.) components in different periods and parts of the plant, as well as the seed yield in existing varieties and prominent common and Tatar buckwheat lines. In the project, firstly, preliminary yield and yield studies will be carried out for these targets, and the lines coming to the registration stage will be determined, and common and Tatar buckwheat cultivars with high grain yield and routine content will be developed.

Keywords: Buckwheat, breeding, cultivar.

The Rich Culinary Heritage of Serik (Antalya): Edible Plants

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Abstract: In this study, an ethnobotanical research was conducted to identify plants that naturally present in the Serik region of Antalya-Türkiye, which are consumed as food by the local population and hold a traditional significance in their lives. For this purpose, fieldwork was carried out in sixty six neighborhoods of Serik between February 2017 and July 2022.. Throughout the research, 136 informants were interviewed (semi-open), and a survey was conducted with a total of 1,837 primary and high school students to collect ethnobotanical data. Within the scope of the fieldwork conducted in the area, 159 taxa from 118 genera and 43 families that are used as food in the region were identified. Out of the plant taxa for which ethnobotanical use was determined as a result of the research, 149 are naturally occurring in the region, while 10 are cultivated. Among the taxa used as food, 109 taxa are consumed raw or cooked, 28 taxa are consumed as tea, 19 taxa are used as spices, and 3 taxa are used for coffee. Seven of the taxa identified are endemic. These are *Onopordum boissierianum*, *Origanum minutiflorum*, *Origanum saccatum*, *Sideritis arguta*, *Sideritis argyrea*, *Sideritis condensata*, *Sideritis erythrantha* subsp. *erythrantha*.

Keywords: Ethnobotany, Serik, edible plants, food, culinary herbs.

Morphological Character Comparison of Crithmum maritimum L. (Apiaceae) Populations with Different Substrate Characteristics in İzmir Province

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Abstract: A significant part of the world's agriculturally productive lands is becoming unusable due to salinity. The increase in soil salinity and water deficiency is an important problem in the world, especially in agricultural areas. In addition to the labor and capital spent on improving such areas, the use of salt-tolerant crops can be an important alternative. With the increasing population, the tendency towards halophyte agriculture is increasing due to various effects such as climate and the cost and decrease of water resources. Since ***Crithmum maritimum*** species is a consumable food (pickles, salad, pizza, etc.) in our country and other countries of the world, investigating the effects of soil properties on the morphological characteristics of the species is important in terms of adding value to its economic use and increasing productivity with correct cultivation techniques. This study is a preliminary study to determine the agronomic characteristics before transferring to the field. A clearer understanding of the effects of different substrate properties on plant characters in terms of species will pave the way for cultivation studies. In this context, measurements and field studies were carried out among the populations of ***C. maritimum*** species in İzmir province, located in 4 different substrates (Urla, Çeşme, Dikili, Seferihisar), each with different components, based on 16 characters (plant width, height, height, number of leaf lobes, etc.). In each population, 20 different individuals selected by ensuring a distance of 5 meters were examined, and the arithmetic averages of the measurements were calculated and analyzed. As a result of the comparative analysis, the Dikili population, which spreads on andesite rocks consisting of extrusive magmatic rocks, has the highest average values in terms of plant general width and height, number of lobes in the leaf and petiole length. The Seferihisar population, which spreads on sedimentary sandstone-claystone mixed rocky slopes, showed the highest average values in terms of leaf length, number of flowers in the umbelula, umbel width and peduncle length. The Urla population, which spreads on the limestone bedrock, showed the lowest average values in terms of basic morphological characters. In the light of these data, it can be concluded that different substrates provide advantages for the better development of different characters for ***C. maritimum*** species. For this reason, culture studies should be carried out by selecting the population showing the most ideal character traits through experiments in the field environment.

Keywords: Population, morphology, substrate, agronomic, character.

Biopiracy Threat on Plant Genetic Resources

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Abstract: The most significant challenge associated with population growth in the world is the increase in needs in the same direction. This situation compels nations towards intense production, industrial competition, races to secure priority in patents, and most importantly, races to claim ownership on natural resources facing the threat of depletion. In our current era, this development race is achieved not only direct occupation of a country's territory but also obtaining natural resources, patent rights, and ultimately achieving economic dependence on imports. Countries, especially rich in plant genetic resources like Türkiye, are exposed to biopiracy, which involves the unauthorized export of biological resources for various purposes. In the context of combating biopiracy, between 2007 and 2023, 20 out of 86 cases identified in Türkiye are directly related with the plant genetic resources, and these resources are used in research and development studies, especially for food, agriculture, health and industrial purposes. As genetic material, any trait carried by genes - such as disease resistance or adaptation to different conditions like temperature, drought, humidity - can be transferred to other organisms, resulting in new varieties with desired traits. The idea that genetic resources are being utilized by the country that take possession of them, rather than the country of origin, leads to a violation of intellectual property rights, which results in a loss of national income. In Türkiye, biopiracy combating activities are conducted by General Directorate of Nature Conservation and National Parks. In this context, The Project of Combating Biopiracy was carried out for the first time in Türkiye between 2013 and 2015. These efforts aim to prevent the exploitation of biodiversity via biopiracy and, at the same time, ensure that the economic, social, scientific, technological, medical, commercial, and cultural potential benefits derived from genetic resources under national juristiction. In conclusion, it is of paramount importance for the protection of national interests to develop the necessary legislative framework, as well as plans and programs for the rational use of genetic resources of Türkiye.

Keywords: Biodiversity, genetic resources, biopiracy.

Palaeoflora of Bursa-Orhaneli (NW Anatolia): Characterization and Identification Based on the Leaf Morphology

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Abstract: Miocene sedimentary deposits of Western Anatolia are formed in lacustrine depositional settings and most of these sediments contain lignites. This study is based on detailed palaeobotanical investigations of the coal-bearing sediments of the Orhaneli Basin (Türkiye) are rich in well-preserved plant macro- and micro-fossils. Macrofossils including leaves, seeds, fruits and cones were collected from the Burmu formation that contains the main lignite seam at the bottom and lacustrine marls in the upper layers. We aim to reconstruct the overall Miocene vegetation and the palaeoclimate of the Burmu formation. Since 2018, a total of 2098 macrofossils were collected and documented in the palaeobotany collection of Ege University Botanical Garden and Herbarium Researches & Aplication Center. Based on the identified samplesfrom Orhaneli basin, we show that the macroflora comprising 21 families (1 magnoliid, 56 monocots, 1917 eudicots). The dominant Angiospermae taxa are Lauraceae and Fagaceae, while the Gymnospermae taxa mainly consist of Cupressaceae and Pinaceae. Besides several varieties of oak, Daphnogene polymorpha was dominant in the broad-leaved evergreen forests of Orhaneli. Mean annual temperature is calculated based on the Leaf Margin Analysis as 18-22°C. The macro flora elements clearly indicate that during the Miocene in the Orhaneli Basin, river-fed marshes and riparian forests thrived while mixed forest was present in the surroundings of the basin. Furthermore, the initial LMA analysis of the macro flora indicates warm temperate to subtropical climate conditions. Our reconstructions so far fit well in the general picture of climatic conditions in the eastern Mediterranean during the Miocene.

Keywords: Palaeobotany, macro flora, burmu, lignite, fossil leaf.

Podocarpium podocarpum (A. Braun) Herendeen, A New Record From Early Miocene of Türkiye (Soma Basin, W. Türkiye)

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Abstract: ***Podocarpium podocarpum*** (A. Braun) Herendeen is an extinct Fabaceae member which was commonly known with former name ***Podogonium knorrii*** since Heer (1857). ***Podocarpium podocarpum*** represented by fossil legume fruits, leaflets and flowers that reported in the Neogene from China and localities in Europe. The form taxa ***Tricolporopollenites wackersdorfensis*** Thiele-Pfeiffer proved to be pollens of ***P. podocarpum***. Fossil records show that ***P. podocarpium*** originated in Eastern Asia and migrated to central and southertn Europe during Oligo-Miocene. According to fossil records it is a relatively common species from Oligocene to Miocene in China and Europe. However it is very rare in the Eastern Mediterranean region. Only one macrofossil record exists from Middle Miocene of Chios (Velitzelos, 2014) and one pollen record of ***T. wackersdorfensis*** exists from Middle Miocene of Yatagan Basin (Western Türkiye). Fossilized legume fruit is the main material for this study. This specimen was collected from Soma coal mine basin located in Manisa province (Western Türkiye). Study material was identified and is currently being stored in Ege University Research and Application Center of Botanical Garden and Herbarium. In this study the first macrofossil of ***P. podocarpum*** from Early Miocene of Türkiye (Soma basin) is introduced. This is a new first macro fossil record of *P. podocarpum* from Early Miocene of Türkiye. Description: Legume fruit, tardily dehiscent, single seeded, valves 9 mm long, 3 mm wide, elliptical, apex acute, base acute, valve surface damaged, venation not clear.

Keywords: Paleobotany, ***Podocarpium podocarpum***, ***Tricolporopollenites wackersdorfensis***.

Determination of Genetic Diversity in Scots Pine (Pinus sylvestris L.) Seed Orchard in Terms of Mg and Mn Element Contents

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Abstract: One of the most basic ways to increase productivity in forestry works is tree breeding. With breeding studies, it is possible to increase the growth rate of forests and to grow individuals resistant to biotic and abiotic pests. For this purpose, determining forests' genetic diversity is of great importance. In addition, genetic diversity is very important for species to adapt to global warming and rapidly changing environment conditions. Seed orchards are one of the important breeding facilities established within the scope of tree breeding studies. Therefore, the most important issue in seed orchards is the protection of genetic diversity. Because genetic diversity is the insurance of the species against possible future risks, for this reason, many studies have been conducted to determine genetic diversity in seed orchards. However, most of the studies were conducted using morphological characters. In this study, genetic diversity in the seed orchard was evaluated by looking at needle element concentrations. In this study, a total of 240 trees from 8 rameters of 30 clones were randomly sampled in Taşköprü Tekçam Sarıçam seed orchard. Magnesium (Mg), a macronutrient, and manganese (Mn), a micronutrient, which play a role in carbon fixation in plants and are used in chlorophyll production, were studied. Samples were taken from last year's needles of the trees and subjected to washing in the laboratory, followed by two different drying processes. Then, the samples were sent to the laboratory and firstly prepared by melting method and then element concentrations were determined by ICP-OES device. The data obtained were evaluated by analysis of variance and Duncan test with the help of SPSS package program and genetic diversity between and within clones was tried to be determined depending on element concentrations. Significant differences were detected between clones in terms of the studied elements at the $p<0.05$ probability level.

Keywords: Seed orchard, genetic diversity, needle, element, carbon.

Reflection of Türkiye Honey Bee Genetic Diversity and the Floral Richness on Beekeeping

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Abstract: Türkiye ranks among the top three in the world with over 8.5 million colonies and around 100 thousand tons of honey production. In Türkiye, five different bee races are mentioned: ***Apis mellifera anatolia***, ***Apis mellifera caucasica***, ***Apis mellifera carnica***, ***Apis mellifera syrica***, ***Api mellifera meda***. The registered Trakya Bee, Hatay Bee, Muğla Bee, Gökçeada Bee, Yığılca Bee are important ecotypes. Efe Bee is the genotype that registered as a result of breeding by the Aegean Agricultural Research Institute. Türkiye has the potential to produce many bee products with genetic diversity that develops depending on climatic conditions and geography. As a result of rich floral resources, over 40 types of monoflora honey and very rich plateau honey are produced. Despite all this, regional modeling with changing climate conditions, genetic structure and floral resources is deemed necessary for the future of beekeeping.

Keywords: ***Apis mellifera anatolica***, Efe bee, honey bee,

Adaptation of Some Endemic Salvia Species to Tissue Culture

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Abstract: ***Salvia*** is the second-largest genus of the Lamiaceae family in Türkiye. It comprises 106 taxa (99 species, 8 subspecies, and 6 varieties), of which 58 are endemic to Türkiye. Also, 42 endemic taxa are categorized under various levels of threat. It is important to conserve these endemic taxa to prevent their extinction. Plant tissue culture methods are an important biotechnological technique for the propagation and conservation of endangered species. This study observed the possibilities of in vitro propagation of four endemic ***Salvia*** species (***Salvia halophila, Salvia blepharochlaena, Salvia longipedicellata, Salvia aytachii***). Shoot tips and nodal explants of Salvia species were collected from the field in May, and explants were initially rinsed under running water in the laboratory. Then, the explants transferred to a laminar airflow cabin were surface-sterilized by shaking them in 70% Ethanol for 5 minutes, 20% NaClO for 5 minutes, and 25% H_2O_2 for 5 minutes, respectively. After each treatment, the explants were rinsed with sterile distilled water. The sterilized explants were dried in a laminar airflow cabin and then cultured on MS (Murashige and Skoog) basal medium without plant growth regulators. ***Salvia longipedicellata*** has a 50% success rate in producing sterile plants with shoot formation, ***Salvia halophila*** at 29%, and ***Salvia aytachii*** at 12.5%. ***Salvia blepharochlaena*** exhibited signs of contamination, and shoot formation did not occur. Observations of plant height, plant with, number of nodes, number of leaves, and percentage of branching were recorded in the 7^{th} week for the developed plants. Among the species, ***Salvia halophila*** exhibited the highest percentage of branching at 71%, and *Salvia halophila* also had the tallest plant height (6 cm) and widest plant width (4 cm).

Keywords: ***Salvia***, sage, tissue culture, adaptation.

Comparative Leaf Morphology of Cultivated Laurel (Laurus nobilis L.) Populations in Türkiye

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Abstract: Laurel (***Laurus nobilis*** L.) is a perennial evergreen dioecious tree that is distributed in areas close to the coastline in countries bordering the Mediterranean. It grows naturally on the Mediterranean coasts of Asia, Europe and Africa. In our country; It is an important forest plant that spreads partly to the inner parts of these regions, especially the Mediterranean, Aegean, Marmara and Black Sea coasts, generally at altitudes between 0-500 m, and in extreme cases up to 1000 m. What makes the bay plant important is its leaves and the essential oil obtained from the plant. Türkiye ranks first in the world in bay leaf production and export with a share of 90%. Almost all of the laurel leaves processed and exported in Türkiye are obtained by controlled and permitted cutting of laurel populations within the forest borders. There are different quality classes in the bay leaves that are subject to export. The most important factors determining quality classes are leaf dimensions, surface waviness, edge serration and leaf thickness. In recent years, the decrease in productivity in laurel cutting areas due to ecological reasons has brought the cultivation of laurel plants to the agenda. Following the cultivation work, laurel breeding work was started. In our study, laurel saplings were obtained by germinating fruit samples taken from laurel populations in 100 different locations in the Mediterranean, Aegean, Marmara and Black Sea Regions, and their leaf morphologies were examined by planting them in the field. As a result of the evaluation, it was observed that there were significant differences between and within populations in terms of leaf morphology in laurel trees. Leaf length and width, leaf edge serration, leaf surface waviness and leaf thickness, which are the most important criteria in the quality classification of bay leaves, were measured. As a result of measurements and observations made on a total of 2800 single plants, it was determined that the leaf length was between 3-15 cm and the leaf width was between 1-7 cm. It was determined that there was no edge serration in 92% of the leaf samples and no surface waviness in 94%. Leaf thickness varied between 0.3-0.8 mm. Additionally, it was observed that 7 plants had yellow-green ruffled colored leaves.

Keywords: Laurel, population, leaf morphology.

POSTER PRESENTATIONS

Determination of Raisin Properties of Pembe Misket Local Grape Variety

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Abstract: This study aims to determine the raisin properties of the Pembe Misket local grape variety. Pembe Misket is a small berry-sized, pink-coloured, seeded and muscat-flavored grape variety that is obtained from "Aegean Region Genetic Resources Vineyards" of Viticulture Research Institute, Manisa. Grapes were monitored until harvest maturity and harvested at 22.6 °Brix. Grape samples were dried on a concrete layer under the sun with dipped (% 5 K_2CO_3+%1 olive oil solution) and non-dipped pretreatments. Physical and physicochemical analyses were performed on both fresh grapes and raisins to put forth the alteration during the drying process and also to determine the raisin properties of a new product. The moisture content of raisins were chaged between 11.2 and 12.4%. Berry size was found 152 and 165 pieces/100 g, for dipped and non-dipped pretreatments, respectively. The drying yield of grapes was also calculated as 25.5 and 25.8%. Total phenolic contents of fresh grape, dipped and non-dipped raisins were determined 2423.7, 4111.8 and 3419.4 mg GAE/kg, respectively. Additionally, total monomeric anthocyanin contents were found much more in dipped raisins compared to non-dipped samples. It can be understood from these results dipping pretreatment preserved biochemical properties and is suitable for Pembe Misket raisin production. Similar to biochemical properties, colour values were protected with dipping pretreatment. As a result, some physical and biochemical properties and suitability for raisin production of the Pembe Misket grape variety were determined and this variety can be used as an alternative grape variety for raisins with its characteristic physical features and flavour.

Keywords: *Pembe Misket, vine genetic resources, raisin, biochemical characteristics*

Effect of extraction conditions on phenolic content and antioxidant capacity of vine leaves

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Abstract: Vine leaves have been commonly used for stuffed grape leaves (dolma) being a traditional meal for Türkiye and Middle Eastern Countries as fresh and canned for years. Sultani Çekirdeksiz leaf is one of the most leaf used for this purpose. Its leaf is thin, green-yellow and has an acidic flavour. Grape leaves are also an important source of bioactive compounds. This study aims to determine the effects of extraction conditions on phenolic content and antioxidant properties of vine leaves. Sultani Çekirdeksiz leaves were used as material in the current study. Harvested vine leaves were washed and dried at first. Then, they were homogenized at 7200 rpm by 4x15 sec cycle where paused 3 sec each cycle. 10 ml 80% acetone was added to 1.5 g homogenized sample and the obtained mixture was subjected to extraction at ultrasonic and water baths. Sonication conditions were 50 and 100% amplitude and 7, 14 and 21 minutes. The water bath conditions were set 25, 45 and 65°C and 30 and 60 minutes at 150 rpm. After treatments, samples were centrifuged at 2000 rpm for 5 min and supernatant were separated, this procedure was in 3 repetitions. Acetone was evaporated at 40°C 500 mmHg 60 rpm by using a rotary evaporator. The obtained extract was dissolved in methanol and stored at -18°C until analysed. Total phenolic content (TP), total flavonoid (TF), radical scavenging activity (RSA) and ABTS Trolox equivalent antioxidant activity (TEAC) were determined in the samples. Amplitude & time interaction in ultrasonication treatment was statistically significant for TP and TEAC ($p \leq 0.05$). On the other hand, temperature & time interaction in heating treatment was statistically significant for TF, TP, and RSA values ($p \leq 0.05$). As a result; it was found that ultrasonication and heating treatments considerably affected the extraction of polyphenols from vine leaves.

Keywords: Gape leaf, polyphenol, extraction, antioxidant.

Determination of Seed Germination Performance of Apricot Varieties and Genotypes

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Abstract: This study was carried out between 2014 and 2015 to determine the possibilities of using some of the apricot varieties and genotypes preserved in the national apricot genetic resources parcel of Malatya Apricot Research Institute Directorate as seed rootstocks. This study has been planned as two groups in apricot varieties and genotypes seeds used in the experiment, which are stratification during 42 days at +4 °C and directly seeding without stratification. In the first group, stratification at +4 °C after implementations of nitric acid (HNO_3) and hot water to the seeds; in the second group, directly seeding without stratification after implementations of sulphuric acid (H_2SO_4) and hot water to the seeds. In the experiment, 3 repetitions and 15 seeds in each repetition have been used for each implementations and control group. According to the research results; it was determined that the highest germination rate was carried out in Zerdali variety (96.67%) by using hot water application with 42 days stratification and direct seeding with hot water implementation and the lowest germination rate was carried out in Proyma İzmir variety (33.33%) by using direct seeding control implementation.

Keywords: Genetic resources, rootstock, apricot, seed, germination.

Some Characteristics of the Lands Where Anatolian Sage (Salvia fruticosa Mill.) Species are Distributed

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Abstract: Anatolian sage (***Salvia fruticosa*** MILL.) is widely used in many sectors such as food, cosmetics, and pharmaceuticals. The type and the ratio of components in an essential oil species are important criteria to determine the usage area. This species in Türkiye are mostly collected from natüre. Its natural distribution areas have many different ecological characteristics. This study aimed to determine the physical and chemical properties of the soils where sage species are distributed. For this purpose, soil samples were taken from 9 different populations where the species is distributed. It was determined that all soil samples were slightly alkaline and their lime content varied between 0.80% and 46.90%. Additionally, the lowest organic matter content was determined as 2.90% and the highest organic matter content was 6.60%. Available P contents of the soil samples varied between 13.00-127.00 ppm, exchangeable Mg contents varied between 190.00 ppm and 686.00 ppm, exchangeable K contents varied between 210.00 ppm and 2138.00 ppm, and exchangeable Ca contents varied between 3919.00 ppm and 9935.00 ppm.

Keywords: ***Salvia fructicosa***, natural, ecology, diversity.

Detection of Oil Yield of Türkiye National Botanical Garden Lavandula X Intermedia Plant in Different Development Periods

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Abstract: Lavender is a valuable and perennial medicinal and aromatic plant from the *Lamiaceae* family. It is generally grown for its essential oil, but also contains polar compounds such as polyphenols and coumarins. Results obtained from the studies carried out; The chemical contents of the lavender plant show that it depends on the geographical origin, species, varieties, climatic conditions, harvest time, development periods and extraction method. ***Lavandula x intermedia*** lavender plant grown as a culture species within our institution; Oil extractions were made from samples collected during and after flowering. According to the results obtained; 35-37 grams of lavender collected in the first week of September were hydrodistilled in the Phytochemistry Laboratory with a Clevenger type apparatus for approximately 3-4 hours. After this process, lavender oil was obtained with a yield of 6.5%. The flowering stem of the lavender collected in our institution in the last week of October was separated from its branches and extracted with the same amount, time and method. The lavender oil yield obtained was around 2.13%. It was determined that the ratio of the oil yield obtained during the flowering period to the oil yield at the end of flowering was 3 times higher. In the studies to be carried out in the newly activated Phytochemistry laboratories in the Turkish National Botanical Garden, the volatile components of our medicinal and aromatic plants such as lavender obtained after hydrodistillation will be determined using Gas Chromatography-Mass Spectrometry (GC-MS).

Keywords: ***Lavandula x intermedia***, hydrodistillation, essential oil.

A Numerical Taxonomic Study for the Noccaea aucheri Species Complex

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Abstract: The genus ***Pseudosempervivum* (Boiss.) Grossh**., represented by three species (***P. sempervivum* (Boiss. & Balansa) Pobed**., ***P. aucheri* (Boiss.) Pobed.** and ***P. sintenisii*** (**Hausskn. ex Bornm**.) **Pobed**.) and one suspicious record (***P. venustum* (Schischk.) Pobed)** given under the genus Cochlearia L. in the first volume of the Flora of Türkiye, and the number of the species has been increased to 6 with the addition of 2 new species ***P. amanum* (Contandr. & Quézel) AlShehbaz, Mutlu & Dönmez and P. gurulkanii (Yild.) Mutlu & Al-Shehbaz & Dönmez** which is accepted in Türkiye Plants List of Vascular Plants. ***Pseudosempervivum*** is endemic to the serpentine regions of Türkiye, and a taxonomically complex genus with both molecular and morphologically. As a result of several studies aimed at resolving these complexities, three species (N**.** ***aucheri, N. mummenhoffiana*** and ***N. sempervivum***) have recently been reclassified under the genus ***Noccaea* Moench**. This treatment is referred to as the ***N. aucheri*** Species Complex. The plant samples used in the study were collected from localities obtained from the Flora of Türkiye and relevant herbaria as well as from regions with serpentine bedrock in Türkiye where the species could potentially be found. Furthermore, during visits to various herbaria, samples were examined and measured. Among the data collected for a total of 132 individuals subjected to morphological examinations and measurements, those with missing characteristics were excluded from the analyses. The final data set, consisting of individuals without missing character data, comprises a total of 65 individuals from 30 populations. Populations displaying discrepancies in geographical and morphological data were subjected to thorough examination. The data obtained revealed that individuals from the ***Noccaea aucheri*** Species Complex, collected from their respective type localities, did not align with the previously described morphological diagnostic traits for these species. Our findings, based on morphological data, support the hypothesis that the three species in question should be regarded as a single polymorphic species.

Keywords: ***Pseudosempervivum, Noccaea aucheri***, morphology, numerical taxonomy.

Effect of Growing Degree Days on Flowering of Oregano Accessions

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Abstract: Growing degree days (GDD) or heat units are used to estimate the development of crops, including vegetables, herbs and medicinal plants during the growing season. The study was conducted in 2012-2019, using the plant material of 44 oregano (***Origanum vulgare* L. ssp. *vulgare***) accessions from the *ex situ* collection of aromatic and medicinal plants (N 56º39´45.3´´; E 23º45´15.2), located at the Latvia University of Life Sciences and Technologies. In the *ex situ* collection, oregano accessions differ by phenological phases. The research aimed to evaluate the influence of GDD on the date of beginning of flowering (recorded when 50% of inflorescences have flower buds) as well as on the date of full flowering (recorded when 50% of flowers are completely open) for oregano accessions during years. For GDD, 5 ºC as base temperature were used. The meteorological conditions in all experimental years were different, but in all cases – non optimal for oregano growing and biomass creation. Results of the eight experimental years confirmed that for beginning of flowering the minimal number of GDD (443.90) was accumulated in 2017 for 6 of 44 accessions, but the highest (860.90) – in 2012 for 17 of 44 accessions. For full flowering, the minimal number of GDD (610.80) was accumulated in 2015 for 20 of 44 accessions, but the highest (1057.30) – in 2019 for 14 of 44 accessions. By accessions, GDD were significantly different. For mostly of accessions, early full flowering (before 15th July) was observed.

Keywords: Oregano, growing degree days, flowering.

Review of the Effect Of Honeys With Different Botanical Diversity on Functional Properties

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Abstract: According to the Honey Directive No. 2001/110/EC, which came entry into force after being published in the Official Journal of the European Union on 20 December 2001, honey; she described it as a natural sweet substance to which honey bees collect plant nectar and add their own secretions. Honeys that are predominantly composed of a single plant species are called monofloral, while honeys that consist of more than one plant species are called polyfloral. Honeys produced in the world and in our country are named in two different ways, either by their botanical origin (citrus, chestnut, thyme, etc.) or by the name of the region where they are produced (Anzer honey, Kars honey, Manuka honey, etc.). Due to the rich floral diversity of honey, the properties of honey from one region are not similar to those from another region. For this reason, many functional properties of honey obtained from different botanical origins, such as total phenolic content, antioxidant activity, antimicrobial activity, mineral content, colors, taste, smell, organoleptic properties, changing significantly. The aim of this review is to examine the effect of differences in botanical diversity on the functional properties of honey.

Keywords: Honey, functional properties, botanical origin.

A Research on Some Wheat Landraces Conservation in the Aegean Agricultural Research Institute Seed Gene Bank

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Abstract: This research was conducted at the Menemen location of the Aegean Agricultural Research Institute between 2019-2023. Aim of the study; It is to regenerations of seeds that have not been regeneration for a long time in the Aegean Agricultural Research Institute National Seed Gene Bank. 673 land races collected from different regions of Türkiye were used in the research. In addition to the regeneration study of the land races collected from different altitudes ranging from 0-2460 meters, observations of characteristics such as heading days, yellow rust reaction and plant height were taken. The majority of the material showed a medium susceptible reaction in terms of yellow rust. In the study, the average height of the material was 125 cm. The tallest genotype was observed to be 180 cm tall. It was observed that heading days for the material changed between 100-150 days.

Keywords: Landrace, regeneration, conservation.

Ampelographic Characteristics of Some Local Grape Varieties Grown in the Aegean Region

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Abstract: In this study, the ampelographic values of 22 local grape genotypes originating from the Aegean Region Provinces were determined within the scope of the "Collection, Identification and Conservation of Turkish Vine Genetic Resources Manisa" project carried out by the Manisa Viticulture Research Institute Directorate. According to OIV descriptors 2009, 52 ampelographic features were determined. The ampelographic characters examined were; It consists of 4 phenological characters, 7 in the young shoot, 1 in the flower, 25 in the mature leaf, 5 in the cluster and 10 in the grain. According to the evaluations, all of the genotypes were found to have a hermaphrodite flower structure. In terms of cluster density, it was observed that 4 of them were very dense, 5 were dense, 11 were medium and 2 were loose. It was observed that 14 of them were green-yellow, 1 was rose colored, 1 was gray, 5 were dark red-violet, and 1 was blue-black. Evaluation methods of genotypes and resistance/tolerance situations are being determined through different studies.

Keywords: Ampelography, genetic resources, grape cultivar.

The Importance of Dormancy and Its Classes in Terms of Seed Gene Banks

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Abstract:.Germination tests are carried out in accordance with the rules of the International Seed Testing Association (ISTA, 2018) to determine the viability of the seeds arriving at the Gene Banks before they are stored. If there is insufficient information about the species for germination, the optimal temperature and probability of dormancy can be estimated from seed structure, habitat information and climate data. Seed dormancy is defined as the process until the germination of a viable seed is completed, even if there are suitable conditions for germination (Finch-Savage and Leubner-Metzger, 2006). The reasons for dormancy are the hard seed coat, the immaturity of the embryo, substances that inhibit germination, light, temperature and the impermeability of the seed coat to water. Baskin and Baskin (2004) stated that dormancy can be measured by the absence of germination and dormancy in seed plants; classified it under five groups: physiological dormancy, morphological dormancy, morphophysiological dormancy, physical dormancy and combined dormancy. Important effects of dormancy for seed sustainability; It prevents the seeds from germinating at the same time, extends the storage life of the seed, and ensures that the seed remains alive in the soil for several years. Although dormancy is a beneficial adaptation for the seed, it is a complex process that requires a long time to end dormancy and initiate germination and is limited by the suitability of environmental factors. In gene banks, evaluation of germination studies depends on accurately recording the geographical environment where the seed was collected and the storage conditions. Failure to adequately consider seed dormancy can lead to seed waste and failure in germination (Merritt and Dixon, 2011). Therefore, accurate determination of dormancy classes is critically important for the effective use of seeds in order to preserve genetic resources in gene banks.

Keywords: Seed, germination, dormancy, dormancy classes.

Conservation, Evaluation and Morphological Characterization of Fig (Ficus carica L.) Genetic Resources in the Southeastern Anatolia Region

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Abstract: This study was conducted at GAP UTAEM between 2017-2020. Some morphological and pomological fruit characteristics of 13 female fig types, previously collected in the GAP Region (Adıyaman, Diyarbakır, Şanlıurfa, Mardin, Gaziantep, Kilis, Siirt, Batman and Şırnak) and planted in the GAP UTAEM land, were examined. Characterization studies of selected fig types and varieties were carried out according to the criteria in IPGR 2003.

Keywords: Fig, Southeastern Anatolia Region, fruit genetic resources.

Conservation, Evaluation and Morphological Characterization of Almond (Amygdalus communis L.) Genetic Resources in the Southeastern Anatolia Region

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Abstract: Within the scope of this study, 18 almond genotypes were determined by land surveys in the provinces of the GAP Region (Adıyaman, Diyarbakır, Şanlıurfa, Mardin, Gaziantep, Kilis, Siirt, Batman and Şırnak) between 2017 and 2020. Fruit samples were taken from the determined genotypes and pomological analyzes were performed. Characterization studies of the determined genotypes were carried out by taking into account the descriptor published in IPGR (1985). In terms of shelled fruit weight, type 02-BSN–41 produced the largest fruits. Type 56-AY–15 was found to be the highest in terms of kernel weight. Type 47-MB-96 was found to have the highest internal efficiency.

Keywords: Almond, Southeastern Anatolia Region, fruit genetic resources

Comparison of Haploid Induction Rates of Different Inducer Lines Crossed with Donor Materials in Maize

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Abstract: The utilization of the in vivo doubled haploid technique in maize breeding studies is becoming increasingly widespread. The application of this technique relies critically on the inducer lines and their ability to generate haploid seeds on donor materials. The donor materials possess seed structures and genetic characteristics. In this study, 10 donor materials were used in induction crossing with 3 inducer lines. The donor materials and inducer lines were included in field trials during the summer cultivation season of 2022, and induction crosses were created through controlled pollination method. Seed classification in the harvested samples was performed according to the Navajo color marker. A total of 14577 seeds were examined in the study, and 662 seeds were identified as haploid. Two of the donor materials (DON2, DON10) did not exhibit or low anthocyanin pigmentation in any of the induction crosses. Among the remaining eight donor materials, HIR (haploid induction rate) values were determined by comparing the putative haploid seeds to the number of total seeds. HIR values for donors ranged from 1.29% to 8.54% However, it was noteworthy that there was considerable variation in the level of anthocyanin pigmentation in donor materials. Among the inducer lines used in the study, the CIM2GTAIL-P2 line proved to have the highest potential for haploid seed production.

Keywords: Doubled haploid, homozygosity, Navajo, *Zea mays*.

Note: This study was produced under TÜBİTAK Project No. 221N269 titled "Development of a New System for Haploid Detection and Discrimination in Maize (NHISS-Maize)." This work was also supported by Çanakkale Onsekiz Mart University The Scientific Research Coordination Unit, Project number: FYL-2022-4232". Additionally, the study was prepared based on a section of Nebahat Yüksel's MSc thesis.

Effect of Plant Volatile Components on Honeybee Flower Visitation

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Abstract: Floral scents are pleasant and attractive scents naturally emitted by flowers. These scents are created by the combination of different components in flowers, and the most common are volatile organic compounds, terpenes, esters, phenolic compounds, aldehydes and ketones, alcohol and acids. Volatile odors found in plants are the chemical compounds produced by plants to protect themselves or to promote the pollination process. These odors can have various effects on insects. For example, some plant volatiles simulate unpleasant or harmful conditions for insects, and some plants use their odor to attract and trap insects. Some plants attract insects by providing odors to encourage pollination to achieve pollination. Insects use morphological and olfactory tips to search for food. Honeybees, on the other hand, visit plants depending on whether the volatile scents of the plants attract them. The unique scents of plant flowers attract honeybees to collect nectar from the flowers and at the same time contribute to the reproduction process, that is, pollination, by carrying their pollen. In addition, honey bees learn different plant scents and store this information in their memories. In this way, they can return to the flowers of the same plants. However, some negative situations can negatively affect plant volatile odors. Pesticides, air pollution, chemical pollutants, climate change, humidity levels, CO_2 levels, diseases affecting plants, soil salinity, soil mineral content, soil pH levels, harmful insects or other organisms that damage the plant, the genetic diversity of plants and interactions between plants are negative factors.These negative issues should be given importance for the continuation of pollination and therefore biodiversity. It is also an important issue to determine the plant characteristics that affect bee visits and to conduct studies on breeds or species that improved for these characteristics in order to increase product diversity.

Keywords: Honeybee, biodiversity, floral scents, plant volatile componenets, pollination.

An Edible Mushroom Species: Sparassis crispa (Wulfen) Fr.

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Abstract: This study aims to review existing research on ***Sparassis crispa*** *(Wulfen) Fr* which is an edible mushroom with various medicinal properties. ***Sparassis crispa*** is a member of Sparassidaceae family and known as cauliflower mushroom because of its shape. *S. crispa* is found at the base of conifer trunks and often pines from September to December. It is fairly common in temperate regions of the northern hemisphere. According to the "Checklist of Macrofungi of Türkiye", this mushroom is also distributed in Türkiye in the provinces of Ankara, Artvin, Aydın, Bolu, Erzurum and Kastamonu. Within the framework of the "Researches on Mushroom Genetic Resources Project" that is carried out by Aegean Agricultural Research Institute in cooperation with Yalova Atatürk Horticultural Central Research Institute, ***Sparassis crispa*** mushroom samples were collected from Aydın province both for preparation of fungarium material and mushroom isolates. Mushroom isolates were conserved at – 80 °C for current and future generations. Through face-to-face interviews with collectors from the region, it is observed that this mushroom known as "Çam göbeği mantarı" in Aydın, is gathered from the wild and consumed by local people**.** It is very popular in the region because of its flavour and taste. Although local people are willing to cultivate and commercialize this mushroom, they lack its cultivation technique. In literature, it is stated that this mushroom is a good source of beta-glucans and its cultivation as a functional food has great importance. Therefore, in addition to its conservation studies, future research should be conducted to clarify medicinal and cultivation potential of ***Sparassis crispa*** isolates of Türkiye. These researches will enhance the utilization of mushroom genetic resources for food and agriculture.

Keywords: Macrofungi, genetic resources, conservation, utilization, cultivation.

The Severity of Fungal Diseases on Leaves of Origanum vulgare L. in Ex situ Collection

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Abstract: During cultivation, many fungal species infect aromatic and medicinal plants. For oregano (*Origanum* sp.), fungal diseases negatively affect both the quantity and quality of raw material. The aim of the present research was to clarify the development of fungal diseases on oregano leaves. Studies were carried out in 2012-2020, using plant material of ***Origanum vulgare*** L. ssp. *vulgare* from the *ex situ* collection of aromatic and medicinal plants` genetic resources (N 56º39´45.3´´; E 23º45´15.2´´). Each year, the development of leaf diseases was assessed seven times during the vegetation period, by visually determining the severity of the diseases. The severity of diseases on leaves was evaluated in points 0–4, where: 0 – a plant has no infected leaves; 4 – 96% to 100% infected leaves. The meteorological conditions in all experimental years differed considerably. During investigations, only at the 1st year of cultivation (2012 and 2016 years respectively) the plants did not show any symptoms of diseases caused by fungi (0 points) per vegetation period. In 2020, at the 5th year of cultivation, 4 points were detected at the stage of seed ripening. The severity of fungal diseases differed significantly during years. Visual disease symptoms on oregano leaves influence the reducing of the amount of 'Herba Origani' yield till 85%. That is why oregano cultivation in the same field for more than three years would not be recommended.

Keywords: Fungal diseases, oregano, quality.

A Case Study on Conservation and Awareness of Plant Genetic Resources: Expo 2021 Hatay Plant Museum

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Abstract: Expo 2021 Hatay Plant Museum has been established in order to exhibit Hatay and Türkiye's plant richness and to promote, give training and raise awareness on various subject about plants. The Plant Museum project covers the process of field studies, culture studies, collection creation, construction project, museum garden construction, thematic areas creation, interactive information screens creation, website construction, guidance service, creation and implementation of activities and educational programs. The Plant Museum has become an original area with its collections (live plant collection, seed collection, herbarium), design areas (plant library, natural life department, wetland department, geological periods department, plant-insect relationship department, aromatherapy department, seed department, leaf department), digital promotion and information screens, workshop, conference hall, restaurant and natural plant garden. Expo 2021 Hatay Plant Museum is the first and unique plant museum of our country in its current scope and concept. The Plant Museum hosted tens of thousands of visitors between April 1, 2022 and October 29, 2022, when Expo 2021 Hatay was held. Dozens of events and training activities were carried out in order to emphasize the unique roles of plants in human life, to recognize, love and protect them, and to benefit from their economic potential when necessary. After Expo 2021 Hatay, activities continued where they left off in line with the objectives. The museum, which was damaged in the earthquake disaster of February 6, 2023, will continue its activities after the repairs are completed.

Keywords: Plant, biodiversity, promotion, museum, Hatay.

Studies of Barley (Hordeum ssp.) Genetic Resources in Aegean Agricultural Research Institute

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Abstract: In this study, multiplication and regeneration of National Seed Gene Bank of Aegean Agricultural Research Institute's Barley ***(Hordeum ssp.)*** accessions that are obtained from different collection programmes and different times are aimed. The other purpose of this study is to determine the barley landraces that can be used for ongoing barley breeding programmes and to use them in crossings and other barley breeding methods. This part of the project was carried out between 2018-2023 growing seasons at the Menemen location of the Aegean Agricultural Research Institute within the scope of the 'Grain Genetic Resources Project'. Barley landraces were planted in 2018, 2019, 2020, 2021, 2022 as 57, 0, 248, 106 and 150 materials, respectively.

Keywords: Barley, landraces, multiplication, regeneration, breeding.

'Eco Consciousness to Biodiversity; A Green Way' with Innovative Approach Models, Tübitak 4004 Nature Education and Science Schools Project

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Abstract: Education is essential for sustainable, equitable use and conservation of biological diversity. Balanced, sustainable use and conservation of biodiversity by raising awareness for future generations is of great importance. One of the main objectives of this project was to provide students with the right information about biodiversity and genetic resources with ecological awareness and thus to develop an understanding that conservation is very important for the future of our planet. The project titled "Eco Consciousness to Biodiversity: A Green Road" was carried out by the Scientific and Technological Research Council of Türkiye (TÜBİTAK), which contributes to science in many fields, within the scope of the 4004-Nature Education and Science Schools Support Programme. This project was carried out for 4 days between 15-18 November 2022 with the participation of 10th grade students studying in secondary schools affiliated to İzmir Directorate of National Education and the guidance teachers accompanying them. The target audience learnt about the mission of the Department of Biodiversity and Genetic Resources and the National Seed Gene Bank through the integration of innovative approach models such as drama, painting, music and design into practical training. They participated in activities such as the journey of the seed to the gene bank, ecosystem observation, herbarium preparation, fungarium examination, observation hive with honey bees, which are effective in pollination in biodiversity. The "Plant Biodiversity and Sustainability Awareness Scale" was used to measure the impact of the project on the participants. In addition, the questions answered were compared at the beginning and at the end and evaluated as pre-test and post-test in the determined scoring scale. As a result, enlightening future generations, who realise the importance of our plant genetic resources, with data suitable for the technological age should be among the most successful works we can do for this universe.

Keywords: Genetic Resources, Tübitak 4004, eco consciousness. awareness, innovative approaches.

New Locality Record and New Danger Category Proposal for Arabis lycia Endemic to Antalya Province, Known from Only Two Localities

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Abstract: ***Arabis lycia*** **Parolly & P.Hein (Brassicaceae)** was first collected in Antalya Bakırlı Mountain in 1992 by P. Hein during his studies on the high mountain rock flora and vegetation of the Anatolian Taurus Mountains. Hein took it as the site-ecological variant of *Arabis aubrietioides* Boiss., which is among the most important rock plants of the Anatolian high mountain rock vegetation in terms of phytosociology, due to its similar morphological features and ecology. Then, *Arabis* samples were collected from the same area during field studies in the Taurus Mountains until 1999. According to Parolly's approach, 'Flora of Türkiye' was insufficient to describe the collected samples. It was observed that there were significant differences between ***Arabis*** samples collected between 1992-1999 and *A. aub*rietioides Boiss. It turned out that the collected samples did not match any known *Arabis* species. As a result those specimens described as a new species.

The holotype was first collected in 1992 from 2400 m on Bakırlı Mountain, the eastern flank of Bakır Tepe, in Antalya, Bey Dağları. According to the doctoral thesis titled "Revision of Türkiye's ***Arabis*** **L**. (Brassicaceae) genus" prepared by Birol Mutlu in 2002, no specimens were found in the 2 field studies carried out at the type locality during the studies. The plant, which can spread between 2100-2400 m on Bakırlı Mountain, could not be found in the area and it was thought that the specimen had extinct. During the flora and vegetation studies of Bakırlı Mountain conducted by Eren, Gökçeoğlu and Paolly in 2004, the third record of the *A. lycia* endemic from the type area was given. A new location of *A. lycia*, which has an extremely small type population, was reported in the study titled Contributions to the Flora of Türkiye published by Eren and Parolly in 2006. The sample was collected in 2004 in Antalya, Bey Dağları, Çalbalı Mountain, at an altitude of 2000-2150 m, on limestone rocks. The new IUCN category of ***A. lycia***'s was determined as "CR B1ab(i,v); B2ab(i,v); C". By the limited distribution of the species, *A. lycia* is here evaluated as “Endangered” (EN) B2ab (i,ii) according to the IUCN (2016) criteria.

Keywords: ***Arabis***, Brassicaceae, endemic, new locality.

A Case Study on Inventory of Landraces in the Thrace Region and Their Ex Situ Conservation: From Thrace to the Future

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Abstract: Plant genetic resources for food and agriculture comprise landraces, modern cultivars, wild relatives, and other wild plant species. Considering the impact of threats such as genetic erosion and climate change, plant genetic resources have gained increasing importance for food security. The systematic collection of landraces in gene banks should be based on specific priorities and strategies, extending collection efforts beyond gene centers to encompass environmental areas and regions where erosion is believed to be prevalent and beneficial mutations can be selected. With this aim in mind, a collection program was conducted within the framework of the three-year "Investigation of Agro-Biodiversity in the Thrace Region" protocol, conducted in collaboration between the Trakya Development Agency and the Field Crops Central Research Institute, 837 samples were collected from 22 districts and 73 villages in the Tekirdağ, Edirne, and Kırklareli provinces. The collected seeds were conserved in the Türkiye Seed Gene Bank, and the information gathered through landrace survey forms was documented in the documentation system. It was determined that landraces are predominantly cultivated by farmers who continue to maintain their own seeds, mainly for household consumption, and to a lesser extent, for local markets. Due to the demographic structure of the region, some old European varieties and those brought from Anatolia are being maintained as secondary landrace. This paper provides a methodological contribution to gene bank studies by explaining the methods employed before, during, and after the collection program. Additionally, it offers information about the current state of agricultural biodiversity in the region and the local varieties that continue to be conserved by farmers. Serving as an example of inter-institutional collaboration, this study makes a significant contribution to the conservation of local varieties and their transmission to future generations.

Keywords: Plant genetic resources, landraces, *ex situ* conservation, agricultural biodiversity

Effectiveness of Honey Bees in Benefiting from the Pollen of Rhododendron luteum Sweet Plant, Spreading in the Natural Flora of Ordu Province

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Abstract: Rhododendrons, which belong to the Ericaceae family of the seed plants class of the plant kingdom, are woody or deciduous plants, mostly in shrub form. Yellow-flowered rhododendron (***Rhododendron luteum* S**.), purple-flowered rhododendron (***Rhododendron ponticum* L**.), white-flowered rhododendron (***Rhododendron ungernii* T**.), Caucasian rhododendron (***Rhododendron caucasicum* P.**), pink-flowered rhododendron (***Rhododendron simirnovii* T.**) are the main rhododendron species that are widely distributed in the Black Sea region of Türkiye. Yellow-flowered rhododendron has a very wide distribution area in the Eastern Black Sea Region and naturally spreads at different altitudes between 100 and 2300 m above sea level. The flowers of the *Rhododendron luteum* plants are yellow in color and have a pungent odor, and bloom in April and July. The nectar and pollen of rhododendron species with a long flowering period contain phenolic compounds, mineral substances and Grayanotoxin compounds in diterpene structure. This study was carried out in the Korgan district of Ordu province, at an altitude of 1500 m, with 5 honey bee colonies with the Korgan local bee ecotype. Pollen traps in the colonies were activated for 8 hours, once a week, and pollen collection was carried out. In the same period, reference preparations were prepared by taking samples from the anthers of the yellow rhododendron (***Rhododendron luteum***) flower. Both pollen preparations were examined microscopically to determine the pollen collection preference of honey bees. Additionally, some morphological and quality characteristics were determined through measurements and analyses. When the meteorological data of Kumru District, which is closest to the Korgan plateau where the study was conducted, are evaluated, it was observed that during this period, daytime temperature and wind speed did not negatively affect the pollen collection activities of the bees, but the number of rainy days constituted almost 2/3 of the total day. Yellow rhododendron pollen was found at minor levels in the pollen collected from traps in honey bee colonies during a 20-day flowering period in the Korgan oba. The protein content of the pollen of the ***Rhododendron luteum*** plant collected from the traps was determined as 24.04%. With this study, it was determined that rhododendron plant pollen has a high protein content. This study needs to be supported by scientific research on the possibilities of using rhododendron pollen as human food.

Keywords: ***Apis mellifera* L.,** rhododendron, Korgan, pollen, protein.

Resistance at Plants

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Abstract: Plant diseases cause large losses in agricultural products every year and thus the quality of the products and yield decreases. Even though various chemicals are used to prevent plant diseases. 'Plant-pathogen' relationships have great importance in controlling pathogens. Plants have many defense mechanisms to protect themselves from pathogens. Although these defense mechanisms work for some pathogens, but sometimes ineffective for some pathogens. As a result, diseases occur. In order to effectively stop pathogen attack, plants use inducible defense responses activated by pathogen attack, as well as the physical and chemical inhibitors present in their structures. Methods that increase plant resistance and support healthy plant development are very important in preventing plant diseases. It is expected that these methods will reduce resistance on pesticides. In plant tissue, stimulation of the plant's naturel resistance causes defense signals to be carried systemically to healthy tissues. This provides long-term resistance to pathogens in the plant. This resilience is known as systemic acquired resilience (SAR). In Induced systemic resistance (ISR) mechanism, a non-pathogenic stimulus stimulates the plant to neutralize pathogens, such as phytoalexin, plant cell enhancers, etc. warns about its production.

Keywords: Induced systemic resistance (ISR), resistance, systemic acquired resistance (SAR).

The Use of Plant Extracts Produced Using Biotechnological Methods in Cosmetics

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Abstract: Plants have been used for centuries by various cultures for their therapeutic properties, and the knowledge of plant extracts has been passed down through generations. Plant extracts are concentrated solutions obtained from various parts of plants, including leaves, flowers, stems, roots, and seeds. These extracts are rich in biologically active compounds such as alkaloids, flavonoids, terpenoids, and phenolic compounds, which have medicinal, nutritional, and cosmetic applications. Conventional extraction techniques utilize organic solvents with a high solvent volume and longer extraction times for extracts rich in biologically active compounds. This method has the advantage of being well-known and industrially scaled up for collecting biologically active molecules. NPROC natural products produce active mixtures using conventional extraction processes. According to experiences of R&D and Quality, NPROC natural products have developed cosmetic mixtures based on biologically active compounds. These active mixtures are DANPROC^{TM} (Anti-Dandruff Complex) and RUSCOBIEN^{TM} (Anti-Aging Complex). The activity and effectiveness of the active mixture are analyzed by the third party laboratory partner (SFA Arge Özel Sağlık Limited Şti) following standard procedures such as ExKine Total Protein Extraction Kit method, TS EN ISO 2l l49, TS EN ISO 22718, TS EN ISO 22717, TS EN ISO l 621,2, TS EN ISO 18416, TS EN ISO 21l50. The test results indicate that DANPROC significantly inhibits yeasts with dandruff properties, while also not harming the skin microbiota, as shown by the microbiological tests. RUSCOBIEN prolonged the lifespan of *C. elegans* by more than 30 days, demonstrating its anti-aging properties compared to the control group.

Keywords: Active mixture, conventional extraction, cosmetics, plant.

DNA Barcoding of the Genus Stachys Sect. Stachys and Setifolia in Türkiye Based on cpDNA matK gene

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Abstract*:* ***Stachys*** L., among the largest genera of Lamiaceae, includes approximately 370 species (435 taxa) and has a subcosmopolitan distribution. In Türkiye, ***Stachys*** is the largest genus in the family based on the taxa number, with 121 taxa and 91 species, 60 (52.1%) of these taxa are endemic to Türkiye. The genus which is one of medically importance genus in Lamiaceae is commonly known as deliçay, çayçe, kabaçay, hacıosmanotu, tüylüçay in Türkiye. DNAs have been extracted using plant DNA isolation kit. The samples of good concentration and purity have been selected and matK gene have been amplify using universal primers. The PCR products have sent to a special company for sequencing. The sequencing results were editing using Bioedit software. Among the examined ***Stachys*** species, the length of the matK gene ranges from 950 to 100 base pairs. Accumulated mutations (indel, transition, transversion) in the matK region were examined in detail.

Keywords: DNA, *Stachys*, *Setifolia* Lamiaceae, matK.

Characterization of Aksaray Native Walnut (Juglans regia) Population and Determination of Superior Trees

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Abstract: Aksaray province in Türkiye has numerous walnut trees and a continental climate. The walnut population in the central district of Aksaray province has not been studied yet. Approximately 2,500 trees were surveyed in the 2019 year to reveal the general characteristics of the population and to determine superior trees. Among the population, 78 walnut trees from different locations were examined in detail according to important walnut characteristics such as yield, disease resistance, nut and kernel quality, and kernel color. UPOV characteristics and Walnut Descriptors were used for the characterization of the population. Mean values of 10.81 g in nut weight, 5.15 g in kernel weight, 1.51 mm in shell thickness, and %47.68 in kernel percentage were determined in the population. 17% of the trees in the population have shown values in a range of 13.56-15.43 g, 13% in a range of 11.69-13.55 g, 42% in a range of 9.82-11.68 g, and 17% in a range of 7.95-9.81 for nut weight. For kernel percentage, 3% of the genotypes have values between 60.00%-67.91%, 21% 52.09%-59.99%, 54% 44.19%-52.09%, 19% 36.28%-44.18%, 4% 23.38%-36.28%. 6.41% of genotypes in the population have very easy, 53.85% easy, and 32.05% moderate ease of kernel removal character. The variation in nut shape in the population was not found wide. Broad elliptic (46.15%) and elliptic (23.08%) forms were found common for nut shape in longitudinal section through suture (UPOV AD:9), and for nut shape in longitudinal section perpendicular to suture (UPOV AD:10) broad elliptic (47.44) and ovate (25.64) forms were found common. Kernel colors were mainly found at medium (47.44%) and light (38.46%) colors in the population. Kernel plumpness was determined mainly in moderate (%44.87) degree and plump (37.18%). By applying the Weight Ranked Method and some additional criteria for election, 8 trees were determined as superior.

Keywords: ***Juglans regia***, Aksaray, UPOV, genotype, pomology.

Studies on the Determination of Melon Genetic Resources in Türkiye and Their Resistance to Fusarium Wilt Using Molecular Markers

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Abstract: Melon (***Cucumis melo* L.**) is an important vegetable species from the *Cucurbitaceae* family that is grown economically in the world and in Türkiye. Although the origin center of melon is not certain, it is reported to be Africa. Türkiye, Iran, India, Afghanistan and China are secondary gene centers located in the Asian continent. Türkiye has a rich biological diversity due to its geographical location at the intersection of different gene centers. In Türkiye, which is the secondary gene center of melon, there are many local varieties with favorable characteristics. In our country, which ranks second in melon production in the world after China, there are many diseases and pests that affect melon production. Fusarium Wilt is one of the important fungal diseases affecting melon cultivation. Genes associated with resistance to Fusarium Wilt have been reported. *Fom1* and *Fom2* single dominant resistance genes related to resistance are used in molecular identification studies. In the study, 44 local genotypes were examined molecularly for resistance using CAPS and SCAR markers.

Keywords: Melon, Fom1, Fom2, marker, genetic resources.

The vascular plant diversity of İzmir (Türkiye) province

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Abstract: This study was conducted to determine the vascular plant diversity inventory, habitats, priority taxa for conservation, ecosystem diversity of the study area, European Nature Information System (EUNIS) habitat types and diversity index values of the field for İzmir province. In addition, threats to biodiversity were determined in this study with monitoring plans at species, habitat, ecosystem and regional levels. The quadrature system divides İzmir province into 111 equal squares on the map. Between 2017 and 2018, 105 separate field studies were carried out in 111 square areas determined within the province of İzmir. As a result of these field studies, a total of 8800 vascular plant specimens were gathered and identified. As a result of field and literature research, 2188 vascular plant taxa belonging to 121 families were detected in İzmir province. The number of endemic taxa detected is 177, and the endemism rate is 8.3%. ***Petrorhagia armerioides*** (Ser.) P.W.Ball & Heywood, listed as Data Deficient (DD) in the Red Book of Plants of Türkiye, has been found for the first time since it was described. At the same time, the species, a new taxon record for İzmir, was re-detected during this study. Following detailed studies, a new record was given for İzmir and the "Endangered" (EN) B2a category was recommended as the IUCN category. This study has also been published. In addition, two suspicious species from the genera *Allium* L. and *Campanula* L. were encountered during the studies. After the examinations, it was concluded that they were new species, and they were introduced to the scientific world. These species were identified as *Allium İzmirense* Pirhan and ***Campanula phitosiana*** Yıldırım & Şentürk and included in the list. As a result, a significant contribution has been made to ensuring the effective conservation and sustainable use of biological diversity.

Keywords: Biodiversity, conservation, flora, İzmir, systematic botany, taxonomy, Türkiye.

Current Status of Salep Orchids and Cultivated Studies in Türkiye

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Abstract: Türkiye has one of the most important gene centers in the world in terms of plant biodiversity. It has also very rich orchid species. In Türkiye Flora, there are 273 orchid taxons belonging to 26 genes. Orchid species naturally grow at altitudes ranging from sea level to 2000 meters, in Türkiye. The species from which "salep" is obtained are distributed in forests, mountainous terrain, grasslands, and pastures. They typically prefer limestone-rich soils. In Türkiye, there are approximately 40 theses on salep, and there are 12 ongoing TAGEM (Turkish Agricultural and Forestry Research General Directorate) projects, some of which related to these theses. The most of these studies focus on the food properties of salep, while others focus on in-vitro propagation techniques and taxonomic studies. In addition, in recent years, there are some studies carried out about propagation from seeds under ex-vivo conditions. In field conditions, tuber propagation is common in Samsun Kızılırmak Basin and Aydın Büyük Menderes Basin, in Türkiye. In both regions, the propagation process are managed through farmer organizations. The common aspects of these regions are that they are delta lands and have alluvial soils and are ecologically similar. Based on the results obtained from the research, it is essential to carry out detailed studies on propagation techniques regarding the cultivation of salep orchids. As a result, considering the commercial value of these species, which are prohibited from being collected from nature, there is a need for future studies in this topic.

Keywords: Salep, Orchid, Türkiye.

Forage Crops Genetic Resources

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Abstract: The nutritional problem arising from population growth and global warming has necessitated crop diversity in agriculture. A wide genetic resource found in the natural flora is needed to develop a variety that is high-yielding and resistant to stress factors and diseases. It is of great importance to collect, protect, evaluate and preserve genetic resources that are in danger of disappearing and to transfer them to future generations. Within the scope of the 'Forage Plants Genetic Resources project', which started in 1978, 7,848 population belonging to different genera were collected from different regions of Türkiye. Multiplication and regeneration studies were carried out on 11,824 seed samples. Evaluation and utilization studies on genetic material conserved at National Gene Bank stiuated at Aegean Agricultural Research Institute within the framework of forage crop breeding programs have also continued. Varieties belonging to of different species have been developed and contributed to the country's economy.

Keywords: Forage crops genetic resources, collection, regeneration, evaluation, utilization.

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