

## Analysis of University Students' Perceptions Regarding the Use of Medicinal and Aromatic Plants within the Framework of Sustainable Forest Resources

### Sürdürülebilir Orman Kaynakları Çerçevesinde Tıbbi ve Aromatik Bitkilerin Kullanımına İlişkin Üniversite Öğrencilerinin Algılarının Analizi

Ceyhun AKYOL<sup>1\*</sup> , Sümeyye ÖZDEMİR<sup>2</sup> 

<sup>1</sup>Artvin Çoruh University, Arhavi Vocational School, Department of Hotel, Restaurant and Catering/Tourism and Hotel Management Pr., Arhavi, Artvin

<sup>2</sup>Recep Tayyip Erdoğan University, Graduate Education Institute, Department of Gastronomy and Culinary Arts, Rize

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\*Sorumlu yazar/Corresponding author

Ceyhun AKYOL

e-mail: ceyhunakyol@artvin.edu.tr

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#### Abstract

This study aims to examine perceptions of the use of medicinal and aromatic plants, which fall within the remit of sustainable forest resources, and determine whether these perceptions differ according to various demographic factors. Medicinal and aromatic plants are important among non-timber forest products and are strategically valuable in terms of sustainable natural resource management due to their ecological, economic and social dimensions. In this context, the attitudes of undergraduate and associate degree students receiving an applied education at Artvin Çoruh University towards medicinal and aromatic plants were evaluated using a quantitative research method. The study used a survey as a data collection tool. The obtained data were analysed using percentage and frequency distributions, the arithmetic mean, the standard deviation, the t-test and one-way analysis of variance. The findings suggest that participants generally view medicinal and aromatic plants as beneficial natural resources that bolster the immune system. However, it was determined that perceptions of their use differed in relation to certain variables. The results of the study reveal that perception and awareness of medicinal and aromatic plants are important components in terms of the sustainable use and management of these resources. In this respect, the research makes a unique contribution to literature on sustainable forest resources and non-timber forest products by focusing on the human dimension.

#### Öz

Bu çalışmanın amacı, sürdürülebilir orman kaynakları kapsamında değerlendirilen tıbbi ve aromatik bitkilerin kullanımına yönelik algıları incelemek ve bu algıların çeşitli demografik değişkenler açısından farklılık gösterip göstermediğini ortaya koymaktır. Tıbbi ve aromatik bitkiler, odun dışı orman ürünleri içerisinde önemli bir yere sahip olup; ekolojik, ekonomik ve sosyal boyutlarıyla sürdürülebilir doğal kaynak yönetimi açısından stratejik bir değer taşımaktadır. Bu bağlamda çalışmada, Artvin Çoruh Üniversitesi bünyesinde uygulamalı eğitim alan lisans ve ön lisans öğrencilerinin tıbbi ve aromatik bitkilere yönelik tutumları nicel araştırma yöntemi kullanılarak değerlendirilmiştir. Araştırmada veri toplama aracı olarak anket tekniğinden yararlanılmış; elde edilen veriler yüzde ve frekans dağılımları, aritmetik ortalama, standart sapma, t testi ve tek yönlü varyans analizi kullanılarak analiz edilmiştir. Bulgular, katılımcıların tıbbi ve aromatik bitkileri genel olarak faydalı ve bağışıklık sistemini destekleyici doğal kaynaklar olarak algıladıklarını göstermektedir. Bununla birlikte, kullanım algılarının bazı değişkenler açısından farklılık gösterdiği belirlenmiştir. Çalışma sonuçları, tıbbi ve aromatik bitkilere yönelik algı ve farkındalığın, bu kaynakların sürdürülebilir kullanımı ve yönetimi açısından önemli bir bileşen olduğunu ortaya koymaktadır. Bu yönüyle araştırma, sürdürülebilir orman kaynakları ve odun dışı orman ürünleri literatürüne insan boyutunu merkeze alan özgün bir katkı sunmaktadır.

## **INTRODUCTION**

Forests provide wood and other products, and they are also the natural habitat of a wide variety of medicinal and aromatic plants (MAPs). These plants hold a significant place within the framework of “sustainable forest resource management”, which plans for the balanced use of forest resources for future generations. MAPs play a critical role in ecosystem health and contribute to economic life and healthy living.

The sustainable use of MAPs is directly related to the protection of forest ecosystems. The balanced use of forest resources in line with “sustainable forest resource management” prevents the excessive harvesting of MAPs and ensures the preservation of biodiversity. Managing forest resources within a sustainable framework contributes to biodiversity conservation, economic and social development, and public health and well-being (URL-1). MAPs are significant contributor to products used in traditional medicine and the pharmaceutical industry. Strategically important for rural development and the local economy, the sustainable management of MAPs harvesting, consumption and use supports the balanced and efficient use of forest resources.

Due to their biologically active components, MAPs have many applications, particularly in the health sector, and are also important in the food and nutrition industries (Arslan et al., 2021). In both amateur and professional kitchens, where the variety of products used is growing daily, MAPs are considered dishes of unique value and health benefits when used in themed meals such as those incorporating edible flowers, black foods and purple foods (Şahin & Kılıç, 2009).

The growing interest in MAPs has made it a compelling subject, leading to its inclusion in university curricula as a new field of study for students of applied culinary arts. This growing interest is encouraging students in applied culinary fields to conduct research and undertake practical work in this area. In Türkiye, undergraduate and associate degree programmes and publications related to MAPs, particularly within Gastronomy and Culinary Arts (GCA) Departments, Nutrition and Dietetics Departments, and Culinary Arts Programmes, demonstrate the increasing popularity of MAPs within the education sector.

Students at university who intend to pursue careers in culinary arts, gastronomy, applied cuisine and nutrition must adopt a sensitive attitude towards these plants. To achieve this, students must first define their personal perspectives on these plants. This is because students' personal perspective, values and beliefs will influence their decisions and attitudes regarding their use in culinary applications, particularly when it comes to cooking, creating new products and so on. Students should increase their knowledge of the effects, dosage and frequency of use of these plants and find out how consumers use and consume them. Furthermore, as these plants are perceived as natural and safe, consumers and customers need to be informed about their potential toxic, allergenic and other adverse effects.

Although MAPs are widely used in Türkiye, there is a lack of research in this area. This study aims to address this gap by investigating the types of plants used, how frequently they are used, and the opinions of undergraduate and associate degree students in applied culinary arts programmes on this subject. This study aims to determine the use of MAPs and the views of undergraduate and associate degree students who will have future careers in applied culinary arts. It is believed that investigating the use of MAPs among these students, whose attitudes and opinions on the subject are to be obtained within the scope of the study, will contribute to the relevant literature. In recent years, MAPs has been used extensively in applied culinary arts, food and beverage consumption, health maintenance and disease treatment. This study will investigate the reasons for these uses, examine user opinions and post-use attitudes, conduct analyses and interpret the findings.

This study is unique in that it considers MAPs in relation to sustainable forest resources and non-timber forest products, focusing on how these resources are perceived. While the existing literature mainly discusses MAPs in terms of its ecological characteristics (Güçlü & Gürkök Tan, 2024; Karaşah, 2025), economic values (Boztaş et al., 2021; Çatak & Atalay, 2022) or production and harvesting processes (Mokhtarzadeh et al., 2023; Yılmaz & Gökdoğan, 2023), studies examining these resources through individual perceptions, attitudes and evaluations within the context of sustainable forestry remain limited. This research addresses this theoretical and empirical gap by analysing usage perceptions within a sustainability framework.

Furthermore, unlike previous research, this study focuses specifically on students receiving applied culinary training at a university specialising in medicinal and aromatic plants. Consequently, this study makes a valuable contribution to the literature by examining the links between sustainability awareness, educational background and perceptions of non-timber forest products, with a particular focus on medicinal and aromatic plants.

Furthermore, conducting the study with a sample group that interacts directly with natural resources and has received formal education in this field increases the capacity of the findings to inform future awareness-based forestry policies and educational strategies. In this respect, the research addresses human-nature interactions related to the MAPs at the perceptual level, providing an interdisciplinary, integrative and theoretically robust contribution to literature on sustainable forest resources.

## **CONCEPTUAL FRAMEWORK**

### **Medicinal and Aromatic Plants**

Throughout history, MAPs have been used in many areas, from traditional medicine to culinary culture. Around 5000 BC, the Hittites, Assyrians and Mesopotamians frequently used 250 different plants for medicinal purposes (Göktaş & Gidik, 2019). Various attempts have been made to identify and classify these plants. The most common are chemical classification and classification according to consumption/use type. According to chemical classification, plants fall into one of seven categories: those that produce volatile oils; those containing bitter substances; those containing glycosides; those containing saponins; those containing alkaloids; those containing flavonoids; and those containing tannins. According to their consumption and use, plants can be categorised as beverage plants, herbal tea plants, stimulant plants, spice plants, medicinal plants, perfume plants, gum and mucilage plants, resin plants, tannin plants, dye plants, madder plants, insecticide plants and beeswax plants (Eminağaoğlu & Akyıldırım Beğen, 2023).

The earliest examples of MAPs being used more widely were related to health. From ancient times to the present day, they have been used as functional foods with healing properties. These plants have frequently been used in public health practices and have been processed and used in various ways. In ancient times, people made attempts to record the medicinal properties of plants and herbal treatment recipes. In this respect, plants can be considered the first medicines used by humans. When added to food, plants are used not only to enhance flavour and aroma, but also to increase their usability as a functional food (Stefanaki & van Andel, 2021). Today, the health benefits of MAPs are frequently emphasised, and it plays an important role in protecting the body from external factors thanks to the active substances it contains (Dinç Girgin & Duman, 2025).

The use of MAPs is generally effective in the health sector and is increasing day by day. Used in health and culinary culture, MAPs have a presence in many fields, including cosmetics, the food industry, perfumery, medicine and phytotherapy (Acıbuca & Bostan Budak, 2018). The earliest written records of plants being used in food were discovered during excavations in ancient Egypt. Many plants, especially mint, are known to have been used in the mummification

process in Egypt around 2500 BC. It has been established that the corpses were preserved from decay thanks to the plant extracts used in the mummification process (Faydaoğlu & Sürücüoğlu, 2013).

MAPs are considered an alternative medicine and play an important role in maintaining health. Some of the plants used in the treatments evaluated in the survey were compiled from studies by Al-Maskari et al. (2012), Yılmaz & Çiftçi (2021), Özyurt et al. (2021), Şener & Hakgüder Taze (2022), Eminağaoğlu & Akyıldırım Beğen (2023), and Kaya (2024) (Table 1).

**Table 1.** MAPs used in the treatment of some diseases

| <b>Disease Name</b>                                                                                                                   | <b>Plants Used in Treatment</b> |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Common Cold, Chills, and Cough                                                                                                        | Linden                          |
| Common Colds, Chills, Coughs, Stomach Aches, and Nausea                                                                               | Mint                            |
| Forgetfulness, Memory Loss, Fatigue During Menopause                                                                                  | Sage                            |
| Rheumatism, Fatigue, High Cholesterol                                                                                                 | Thyme                           |
| Hemorrhoids, Fatigue, High Cholesterol, Stomach Bleeding                                                                              | Rose Hip                        |
| Rheumatism, Indigestion, Stress, Depression and Anxiety, Sleep Disorders, Menopause                                                   | Anise                           |
| Stomach and Intestines Carminative, Appetite-stimulating, and Diuretic                                                                | Laurel                          |
| Rheumatism, Colds, Chills and Coughs, Indigestion, Stress, Depression and Anxiety, Sleep Disorders, Menopause                         | Chamomile                       |
| Common Cold, Chills, and Cough                                                                                                        | Mallow                          |
| Rheumatism, Weight Loss, Fatigue, High Cholesterol, Forgetfulness and Memory Impairment                                               | Rosemary                        |
| Antipyretic, Rheumatism, Cough, Foot Sweating, Wound and Burn Healing, Diuretic, Stomach and Abdominal Pain, Asthma                   | Terebinth                       |
| Cholesterol, Digestive Problems                                                                                                       | Carob                           |
| Stress, Depression, and Anxiety                                                                                                       | St. John's Worth                |
| Insomnia, Cough, Stomach and Intestinal Disorders                                                                                     | Poppy                           |
| Rheumatism, Stress, Depression, and Anxiety                                                                                           | Lavender                        |
| Liver and Stomach Inflammation, Heart Diseases                                                                                        | Basil                           |
| Indigestion, Constipation, Stress, Depression and Anxiety, Sleep Disorders, Weight Loss                                               | Fennel                          |
| Prostate and Liver Disorders                                                                                                          | Nettle                          |
| Indigestion, Hemorrhoids, Colds, Chills and Coughs, Forgetfulness and Memory Loss, Fatigue, High Cholesterol, Stomach Pain and Nausea | Ginger                          |
| Common Cold, Chills, and Cough                                                                                                        | Echinacea                       |

Medicinal plants are used to solve health problems in humans and animals, while aromatic plants are used to flavour and scent food. Medicinal plants contribute to human health by providing essential components obtained from their active substances. They serve as a means of improving health and preventing disease (Oğan & Cömert, 2022). Numerous studies and interdisciplinary approaches to identifying and introducing these plants support the creation of unique areas of application. MAPs have many applications, including solving health problems at home and in industries such as food production, pharmacy and chemistry (Çilgınoğlu et al., 2018).

MAPs are product groups that are both part of nature and cultivated (Aydın Can, 2025). From the perspective of students on applied culinary arts programmes, these plants are generally used to discover new dishes or enhance the flavour and aroma of existing products, as is the case for students in the GCA Department and the Culinary Arts Programme. Often, when enhancing the flavour of a dish, the search for a new aroma accompanies it. Sometimes MAPs are used to eliminate unwanted odours in a dish (e.g. adding bay leaves to meat and fish), or to enhance the aroma. Conversely, for students of the Nutrition and Dietetics Department receiving applied culinary arts training, plants that

are essential for an individual's nutritional regimen and are defined as having healing properties are of great importance.

## **Literature Review**

Research on MAPs draws on many different disciplines. Studies on this topic have become increasingly common in relevant literature, particularly in recent years. While the current literature largely addresses MAPs in terms of its ecological characteristics and economic value, studies examining these resources through the lens of individual usage perceptions are limited. Furthermore, research evaluating MAPs from the perspective of sustainable forest resources, particularly based on the perceptions of individuals who have received formal education in this field, is underrepresented in the literature. This clearly highlights the need for analyses that focus on the human dimension of this issue.

A study examining the relationship between pandemic-related MAPs use surveyed 407 people living in Kocaeli (Karakaş & Albayrak, 2025). The study compared pre- and post-pandemic consumer behaviour in order to assess MAPs demand. The analysis revealed significant increases in consumption of various plants and spices during the pandemic compared to the pre-pandemic period: saffron (19%), turmeric (18%), thyme (17%), rosemary (15%), sumac (13%), ginger (13%), artichoke (12%), chamomile (12%), bay leaf (11%) and fennel (11%).

A study conducted during the pandemic (Satıl & Aktaş, 2023) investigated levels of MAPs use among healthcare workers. A survey of 1,320 healthcare personnel revealed that 77% believed plants to be effective against COVID-19 and that 63% used plants with medicinal properties. The most popular plants were thyme (99%), citrus fruits (94%), and garlic (93%). Information about MAPs use was primarily acquired through social media (99%), and the vast majority (94%) stated that they obtained these plants from herbalists. Participants consumed the plants as infusions (99%) and raw (91%). Overall, 63% of those who used MAPs reported not contracting COVID-19.

Another study on this subject (Deniz Doğan & Kaya, 2023) examined how people use and perceive MAPs by surveying 1.427 individuals. The most frequently used MAPs was found to be mint (71%), followed by linden (66%) and ginger (60%). 77% of participants stated that MAPs were beneficial to health. The study also revealed that 43% of participants used MAPs on the recommendation of healthcare professionals. Similarly, 57% believed that they should be used as a preventive measure against disease and 38% thought that they were as effective as medication. Overall, the study concluded that, although the general public uses MAPs, they lack sufficient knowledge about them.

Another study on MAPs (Özkan & Deniz, 2021) examined the relationship between supply and demand by surveying 200 herbalists. It concluded that winter was the season with the highest sales (87%), with linden, ginger and sage being the most in demand. From a consumer perspective, plants that were beneficial for respiratory illnesses were found to be the most frequently purchased, with price being the most important factor when making a purchase.

A different study (Aygör & Çayır, 2020) examined the use of and opinions about MAPs among nursing students. Conducted with 257 students in their first to fourth years at a state university's Faculty of Health Sciences, the research revealed that students mostly used MAPs based on recommendations from family elders. The study concluded that raising public awareness of the importance of seeking reliable advice on access to and use of these plants is recommended.

A study was planned to determine the level of knowledge that students at a health vocational school had regarding the rational use of herbal products (Şentürk, 2020). It was found that all of the students had used herbal products at some

point in their lives. The top five most commonly recognised plants were mint (93.9%), linden (86%), sage (76.3%), thyme (63.2%), rose hip (71.1%) and chamomile (50%).

In general, studies show that people believe that MAPs are important for health. In line with this, the attitudes and opinions of undergraduate and associate degree students on this subject were determined using quantitative methods via a survey. The fact that the sample group is constituted by Artvin Çoruh University (AÇU), a pioneer in the field of MAPs specialisation (URL-2), is expected to contribute to the experiential/active learning outcomes of the study, as are the students' awareness of this fact. As part of the study, students receiving applied culinary education take MAPs courses<sup>1</sup> as part of their curriculum. The establishment of the MAPs Application Centre (URL-3) and the launch of the MAPs Master's Programme with Thesis (URL-4) and the associate degree programme at the Şavşat Vocational School also indicate that the university is following current developments and educational activities related to MAPs (URL-5).

## **METHOD**

This study evaluates the attitudes of university students on applied culinary arts programmes towards the use of MAPs. Specifically, it investigates the attitudes of undergraduate and associate degree students in the GCA Department of the Tourism Faculty, the Nutrition and Dietetics Department of the Health Sciences Faculty, and the Hotel, Restaurant and Catering Services Department's Culinary Programme at the Artvin Vocational School of AÇU towards the use of MAPs. The results of this study are expected to inform the views of undergraduate and associate degree students in applied culinary arts programmes on the use of MAPs, and to contribute to the relevant literature. Although similar studies exist, the absence of any study targeting specifically students in applied culinary arts programmes at AÇU highlights the importance and originality of this study.

In line with the purpose of this research, the following questions are addressed:

- 1) What are the attitudes of undergraduate and associate degree students in applied culinary arts towards the use of MAPs?
- 2) Do undergraduate and associate degree students in applied culinary arts have different attitudes towards the use of MAPs according to:
  - a) Their gender;
  - b) Their age;
  - c) Their department/programme;
  - d) Their class;
  - e) The region in which their families live?
- 3) What is the frequency of MAPs use among undergraduate and associate degree students in applied culinary arts?

The SPSS 20 statistical data program was used to perform the following analyses on the data obtained from the surveys: percentages, frequency distributions, arithmetic mean, standard deviation, t-test and ANOVA tests. These analyses revealed participants' opinions on MAPs use and their thoughts on its use in practical kitchen activities. Additionally, any differences in the participating students' attitudes towards MAPs use were determined according to various variables (gender, age, department/programme, class, and region where the family lives), as well as the frequency of MAPs use

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<sup>1</sup> The Culinary Arts Programme at Artvin Vocational School of ACU offers the course 'Edible Endemic Plants', while the GCA Department of the Tourism Faculty offers the course 'Medicinal and Aromatic Plants' as part of the curriculum.

among the participants. The study aims to make a multifaceted and original contribution to the relevant literature by presenting the findings and outputs obtained through the planned steps.

### **The Population and Sample of the Study**

The study population consisted of undergraduate and associate degree students receiving an applied culinary education. The sample comprised first-, second- and third-year students from the Tourism Faculty's GCA Department at AÇU; first, second, third and fourth year students from the Nutrition and Dietetics Department at the Faculty of Health Sciences; and first and second year students from the Culinary Programme at the Hotel, Restaurant and Catering Services Department at Artvin Vocational School. The main reason for selecting students from AÇU is that they are involved in an educational process directly related to the sustainable use of natural resources and forest ecosystems. It is assumed that individuals who interact systematically with forest resources, particularly through practical courses and field studies, have the ability to recognise, categorise, and assess MAPs in this context. Within this framework, the student sample provides a more qualitative and analytical basis for examination of knowledge and awareness of the subject than individuals randomly selected from the general population.

Conversely, restricting the research universe to the student group enables the evaluation of perceptions and attitudes concerning the sustainable use of MAPs among individuals who are likely to play an active role in the management, planning and implementation of natural resources in future. In this respect, the sample selection is a deliberate, theoretically informed choice that aligns with the research objectives. Rather than weakening the study's external validity, this choice strengthens its potential to make a unique contribution to literature on non-timber forest products and sustainable forest resources by focusing on the human dimension.

As it was believed that the entire sample could be reached within the scope of the research, a full enumeration was conducted instead of a sampling method being used. A total of 379 students (GCA:107; Nutrition and Dietetics:212; Culinary Arts:60) who were continuing their education in the relevant departments and programmes during the 2023-2024 academic year voluntarily participated in the research and completed the survey.

### **Analysis of Research Data**

The study was structured as quantitative research, with a survey technique used for data collection. To determine students' opinions on their use of MAPs in the relevant departments and programmes, a scale previously used by Şentürk (2020) and Aygör and Çayır (2020) was adopted. The first part of the two-part survey form contains 12 statements on a 5-point Likert-type rating scale to measure participants' attitudes towards the use of MAPs. These statements were scored from negative to positive, ranging from “(1) Strongly Disagree” to “(5) Strongly Agree”. The second part of the survey included five questions about the participants' demographic characteristics. Prior to implementation, two experts in gastronomy and sustainable resource management reviewed the scale items to assess their appropriateness of content and linguistic clarity. Based on the experts' feedback, minor changes were made to the wording to improve comprehensibility.

### **Validity and Reliability**

To evaluate the reliability of the scale used in the study, Cronbach's Alpha coefficient was used. This is a widely preferred reliability measure in many scientific fields (Firmansyah et al., 2024).

**Table 2.** Reliability analysis

| Cronbach's Alpha (a) | Number of Items |
|----------------------|-----------------|
| 0.801                | 12              |

According to the literature, an acceptable Alpha value should be at least 0.7 (Büyüköztürk, 2015). Accordingly, the Cronbach's Alpha coefficient of 0.801 obtained in Table 2 reveals that the scale is "highly reliable" (Demir et al., 2018). In addition to the reliability analysis, the content validity was supported by expert review and an examination of previous studies that used the same scale structure.

## FINDINGS

This section presents the demographic characteristics of the university students who participated in the study, as well as the distribution of their responses to statements regarding their use of MAPs. Furthermore, it evaluates whether there are significant differences in MAPs use according to various variables, such as gender, age, department/programme, class, and the region where the family lives.

### Demographic Findings

Table 3 shows the demographic characteristics of the students taking part in the study, such as gender, age, department/programme, year group, and where their family lives. As can be seen from the table, the vast majority of participants (79.9%) are female students, while male students constitute just 20.1% of the total sample. In terms of age distribution, 38.8% of students are aged 18-20, 52% are aged 21-23, and 9.2% are aged 24 and over. Findings relating to department/programme show that 15.8% of participants are enrolled in the Culinary Arts Programme, 28.2% in the GCA Department and 55.9% in the Nutrition and Dietetics Department.

**Table 3.** Findings regarding demographic characteristics

|                                            | Category                | n          | %          |
|--------------------------------------------|-------------------------|------------|------------|
| Gender                                     | Female                  | 303        | 79.9       |
|                                            | Male                    | 76         | 20.1       |
|                                            | <b>Total</b>            | <b>379</b> | <b>100</b> |
| Age                                        | 18-20 years old         | 147        | 38.8       |
|                                            | 21-23 years old         | 197        | 52         |
|                                            | 24 and over years old   | 35         | 9.2        |
|                                            | <b>Total</b>            | <b>379</b> | <b>100</b> |
| Department/Programme                       | GCA                     | 107        | 28.2       |
|                                            | Nutrition and Dietetics | 212        | 55.9       |
|                                            | Culinary Arts           | 60         | 15.8       |
|                                            | <b>Total</b>            | <b>379</b> | <b>100</b> |
| Class                                      | 1st grade               | 105        | 27.7       |
|                                            | 2nd grade               | 106        | 28         |
|                                            | 3rd grade               | 82         | 21.6       |
|                                            | 4th grade               | 86         | 22.7       |
|                                            | <b>Total</b>            | <b>379</b> | <b>100</b> |
| Geographical Region Where the Family Lives | Marmara                 | 56         | 14.8       |
|                                            | Black Sea               | 110        | 29         |
|                                            | Aegean                  | 23         | 6.1        |
|                                            | Mediterranean           | 44         | 11.6       |
|                                            | Central Anatolia        | 34         | 9          |
|                                            | Eastern Anatolia        | 66         | 17.4       |
|                                            | Southeastern Anatolia   | 46         | 12.1       |
|                                            | <b>Total</b>            | <b>379</b> | <b>100</b> |

Examining the distribution of participants by class level reveals that 27.7% of students are in their first year, 28% in their second, 21.6% in their third, and 22.7% in their fourth. It should be noted in this context that the Culinary Arts Programme consists of two classes and that the GCA Department does not yet have any fourth year students. Examining the distribution of participants based on the geographical regions where their families reside reveals that the Black Sea Region has the highest percentage, at 29%. This may be related to the university's location in this region.

Table 4 shows the percentage and frequency distributions of university students' views on the use of MAPs in culinary arts training, alongside the mean and standard deviation for the relevant statements.

**Table 4.** Students' perceptions regarding the use of MAPs

| Propositions                                                              | Strongly Disagree |      | Disagree |      | Neither Agree or Disagree |      | Agree |      | Strongly Agree |      | $\bar{x}$ | SD    |
|---------------------------------------------------------------------------|-------------------|------|----------|------|---------------------------|------|-------|------|----------------|------|-----------|-------|
|                                                                           | n                 | %    | n        | %    | n                         | %    | n     | %    | n              | %    |           |       |
|                                                                           |                   |      |          |      |                           |      |       |      |                |      |           |       |
| I think the MAPs are generally beneficial.                                | 18                | 4.7  | 23       | 6.1  | 62                        | 16.4 | 178   | 47   | 98             | 25.9 | 3.83      | 1.033 |
| In case of any illness, I prefer to use the MAPs first.                   | 22                | 5.8  | 68       | 17.9 | 129                       | 34   | 107   | 28.2 | 53             | 14   | 3.27      | 1.089 |
| MAPs can be used without the recommendation of healthcare personnel.      | 63                | 16.6 | 99       | 26.1 | 108                       | 28.5 | 76    | 20.1 | 33             | 8.7  | 2.78      | 1.196 |
| MAPs are just as effective as drug therapy.                               | 18                | 4.7  | 54       | 14.2 | 154                       | 40.6 | 108   | 28.5 | 45             | 11.9 | 3.28      | 1.007 |
| MAPs strengthens the immune system.                                       | 12                | 3.2  | 19       | 5    | 92                        | 24.3 | 171   | 45.1 | 85             | 22.4 | 3.79      | .954  |
| MAPs can be used for diseases that can be treated with medication.        | 20                | 5.3  | 43       | 11.3 | 144                       | 38   | 115   | 30.3 | 57             | 15   | 3.39      | 1.041 |
| I don't approve of using MAPs without conducting the necessary research.* | 113               | 29.8 | 73       | 19.3 | 119                       | 31.4 | 45    | 11.9 | 29             | 7.7  | 2.48      | 1.244 |
| I think using the MAPs will delay the necessary treatment process.        | 60                | 15.8 | 103      | 27.2 | 137                       | 36.1 | 52    | 13.7 | 27             | 7.1  | 2.69      | 1.111 |
| MAPs are effective way of increasing motivation while studying.           | 20                | 5.3  | 41       | 10.8 | 163                       | 43   | 112   | 29.6 | 43             | 11.3 | 3.31      | 0.988 |
| MAPs are effective in suppressing stress during exams.                    | 17                | 4.5  | 40       | 10.6 | 158                       | 41.7 | 112   | 29.6 | 52             | 13.7 | 3.37      | 0.996 |
| MAPs can be used as a relaxant in stressful situations.                   | 14                | 3.7  | 30       | 7.9  | 101                       | 26.6 | 171   | 45.1 | 63             | 16.6 | 3.63      | 0.974 |
| MAPs use has a positive effect on the adaptation process in any subject.  | 14                | 3.7  | 32       | 8.4  | 142                       | 37.5 | 133   | 35.1 | 58             | 15.3 | 3.50      | 0.974 |

\* A reverse coding process was performed. It was assumed that participants had a positive attitude towards negative propositions.

As shown in Table 4, the statement that received the highest average participation rate (mean: 3.83) was "I think the MAPs are generally beneficial." The second highest average value was "MAPs strengthens the immune system." ( $\bar{x}$ : 3.79). Other statements with high average values were: "MAPs can be used as a relaxant in stressful situations." ( $\bar{x}$ : 3.63); "MAPs use has a positive effect on the adaptation process in any subject." ( $\bar{x}$ : 3.50); "MAPs can be used for diseases that can be treated with medication." ( $\bar{x}$ : 3.39); and "MAPs are effective in suppressing stress during exams." ( $\bar{x}$ : 3.37).

The statement that received the lowest average response rate ( $\bar{x}$ : 2.48) was "I do not approve of using MAPs without conducting the necessary research." The second lowest average ( $\bar{x}$  = 2.69) was observed in the statement "I think using MAPs will delay the necessary treatment process.", while the third lowest average ( $\bar{x}$  = 2.78) was found in the statement "MAPs can be used without the recommendation of healthcare personnel." The low mean scores observed in statements related to scientific research and treatment delays demonstrate participants' reluctance to use without control. However, they may still lack sufficient awareness of evidence-based consumption.

### Comparison of Perceptions Regarding the Use of MAPs Based on the Gender Variable

The results of the independent samples t-test conducted according to gender are presented in Table 5. The analysis revealed that male students' perceptions of MAPs use (mean: 3.31) were slightly higher than those of female students (mean: 3.27).

**Table 5.** Perceptions of MAPs usage differ based on gender

| Scale                    | Gender Range | Individuals | Mean | Std. Dev. | F     | Sig. (p) |
|--------------------------|--------------|-------------|------|-----------|-------|----------|
| Perception of MAPs Usage | Female       | 303         | 3.27 | 0.589     | 0.430 | 0.513    |
|                          | Male         | 76          | 3.31 | 0.595     |       |          |
|                          | Total        | 379         | 3.29 | 0.592     |       |          |

However, the significance level was found to be  $p=0.513>0.05$ , indicating that there is no statistically significant difference between the groups. Accordingly, the perceptions of MAPs usage among AÇU students receiving applied culinary training do not differ according to age.

### Comparison of Perceptions Regarding the Use of MAPs Based on the Age Variable

According to Table 6, which presents the results of the one-way ANOVA analysis conducted on the basis of age, students aged 18-20 have a higher perception of MAPs usage (mean: 3.31) than students in other age groups.

**Table 6.** Perceptions of MAPs usage differ based on age

| Scale                    | Age Range   | Individuals | Mean | Std. Dev. | F     | Sig. (p) |
|--------------------------|-------------|-------------|------|-----------|-------|----------|
| Perception of MAPs Usage | 18-20       | 147         | 3.31 | 0.563     | 1.120 | 0.327    |
|                          | 21-23       | 197         | 3.27 | 0.601     |       |          |
|                          | 24 and over | 35          | 3.15 | 0.629     |       |          |
|                          | Total       | 379         | 3.28 | 0.590     |       |          |

However, the significance level was found to be  $p=0.327>0.05$ , indicating that there is no statistically significant difference between the groups. Accordingly, the perceptions of MAPs usage among AÇU students receiving applied culinary training do not differ according to age.

### Comparison of Perceptions Regarding the Use of MAPs Based on the Department/Programme Variable

According to the one-way ANOVA test results presented in Table 7, when the department/programme of study variable is examined, it was determined that the perception of MAPs usage ( $\bar{x}$ : 3.47) of students studying in the GCA department is higher compared to students studying in other departments/programmes.

The significance level was found to be  $p=0.000<0.05$ , indicating a statistically significant difference between the groups. Therefore, students receiving applied culinary training at AÇU have different perceptions of MAPs usage according to their department/programme of study.

**Table 7.** Perceptions of MAPs usage differ based on department/programme

| Scale                          | Department/<br>Programme   | Individuals | Mean        | Std. Dev.    | F     | Sig. (p) | Post Hoc<br>Difference                    | Sig. (p) |
|--------------------------------|----------------------------|-------------|-------------|--------------|-------|----------|-------------------------------------------|----------|
| Perception<br>of MAPs<br>Usage | GCA                        | 107         | 3.47        | 0.586        | 7.862 | 0.000    | GCA with<br>Nutrition<br>and<br>Dietetics | 0.000    |
|                                | Nutrition and<br>Dietetics | 212         | 3.20        | 0.581        |       |          |                                           |          |
|                                | Culinary Arts              | 60          | 3.21        | 0.561        |       |          | GCA with<br>Culinary<br>Arts              | 0.019    |
|                                | <b>Total</b>               | <b>379</b>  | <b>3.28</b> | <b>0.590</b> |       |          |                                           |          |

As shown in Table 7, statistically significant differences were found in students' perceptions of the use of the MAPs according to their department/programme ( $p=0.000 < 0.05$ ;  $p=0.019 < 0.05$ ). The GCA, the Nutrition and Dietetics Department and the Culinary Arts Programme showed statistically significant differences from each other. Students in the GCA department had significantly different perceptions of MAPs use compared to those in the Nutrition and Dietetics Department and the Culinary Arts Programme.

### Comparison of Perceptions Regarding the Use of MAPs Based on the Class Variable

The results of the one-way ANOVA test, conducted according to the participants' class, are presented in Table 8. The analysis revealed that second-year students had a higher perception of MAPs usage (mean: 3.31) than students in other classes.

**Table 8.** Perceptions of MAPs usage differ based on class

| Scale                       | Class        | Individuals | Mean        | Std. Dev.    | t     | Significance (p) |
|-----------------------------|--------------|-------------|-------------|--------------|-------|------------------|
| Perception of<br>MAPs Usage | 1st grade    | 105         | 3.28        | 0.539        | 0.386 | 0.763            |
|                             | 2nd grade    | 106         | 3.31        | 0.633        |       |                  |
|                             | 3rd grade    | 82          | 3.29        | 0.692        |       |                  |
|                             | 4th grade    | 86          | 3.22        | 0.483        |       |                  |
|                             | <b>Total</b> | <b>379</b>  | <b>3.28</b> | <b>0.590</b> |       |                  |

However, the significance level was found to be  $p=0.763>0.05$ , indicating that the difference between the groups is not statistically significant. Therefore, the perceptions of MAPs usage among students receiving applied culinary training at AÇU do not differ according to class.

### Comparison of Perceptions Regarding The use of MAPs Based on the Geographic Region in Which Families Live

The results of the one-way ANOVA test, conducted according to the geographical region in which participants' families reside, are presented in Table 9. The analysis revealed that students whose families live in the Southeastern Anatolia Region (mean: 3.36) and the Eastern Anatolia Region (mean: 3.34) had a higher perception of MAPs use compared to students whose families live in other geographical regions.

**Table 9.** The perception of MAPs usage differs according to the geographical region where the family lives

| Scale                           | Geographical Region   | Individuals | Mean        | Std. Dev.    | t     | Significance (p) |
|---------------------------------|-----------------------|-------------|-------------|--------------|-------|------------------|
| <b>Perception of MAPs Usage</b> | Marmara               | 56          | 3.25        | 0.684        | 0.389 | 0.886            |
|                                 | Black Sea             | 110         | 3.25        | 0.575        |       |                  |
|                                 | Aegean                | 23          | 3.27        | 0.506        |       |                  |
|                                 | Mediterranean         | 44          | 3.23        | 0.666        |       |                  |
|                                 | Central Anatolia      | 34          | 3.25        | 0.516        |       |                  |
|                                 | Eastern Anatolia      | 66          | 3.34        | 0.588        |       |                  |
|                                 | Southeastern Anatolia | 46          | 3.36        | 0.535        |       |                  |
|                                 | <b>Total</b>          | <b>379</b>  | <b>3.28</b> | <b>0.590</b> |       |                  |

As shown in Table 9, there is no statistically significant difference in students' perceptions of MAPs use according to the geographical region in which their families live ( $p=0.886>0.05$ ). It has therefore been determined that students' perceptions of MAPs use do not differ according to geographical region.

### Dispersion of MAPs Used

Table 10 presents the dispersion information regarding the MAPs used by the participants in this study.

**Table 10.** Dispersion of MAPs used

|             | Plant            | n*  | %    |
|-------------|------------------|-----|------|
| <b>MAPs</b> | Linden           | 317 | 83.6 |
|             | Mint             | 310 | 81.8 |
|             | Sage             | 192 | 50.7 |
|             | Thyme            | 259 | 68.3 |
|             | Rose Hip         | 240 | 63.3 |
|             | Anise            | 54  | 14.2 |
|             | Laurel           | 140 | 36.9 |
|             | Chamomile        | 210 | 55.4 |
|             | Mallow           | 42  | 11.1 |
|             | Rosemary         | 173 | 45.6 |
|             | Terebinth        | 94  | 24.8 |
|             | Carob            | 129 | 34.0 |
|             | St. John's Worth | 118 | 31.1 |
|             | Poppy            | 124 | 32.7 |
|             | Lavender         | 110 | 29.0 |
|             | Basil            | 134 | 35.4 |
|             | Fennel           | 131 | 34.6 |
|             | Nettle           | 153 | 40.4 |
|             | Ginger           | 202 | 53.3 |
|             | Echinacea        | 23  | 6.10 |
|             | Nutmeg           | 3   | 0.80 |
|             | Carnation        | 3   | 0.80 |
|             | Cinnamon         | 3   | 0.80 |

\* Multiple options have been selected.

Examining the frequency with which the participants used MAPs revealed that linden (83.6%), mint (81.8%), thyme (68.3%) and rose hip (63.3%) were the most popular. These were followed by chamomile (55.4%), ginger (53.3%) and sage (50.7%).

## **CONCLUSION AND DISCUSSION**

MAPs are natural resources with healing properties that have been used since ancient times. While these plants are used in many areas, understanding the reasons for their use is equally important. People need to understand the benefits, active ingredients, flavour and aroma of the plants they use. Studies and relevant literature show that the types of plants used can be similar or different. These studies also indicate that individuals use MAPs at different times.

This research examined how individuals perceive the use of MAPs within the context of sustainable forest resources, focusing on a sample of university students receiving an applied culinary education. The findings reveal that participants generally view MAPs positively; they perceive these plants as natural resources that support the immune system, reduce stress and improve overall health. These results demonstrate that young adults understand MAPs not only as an element based on traditional knowledge, but also as a functional, complementary health support tool.

In terms of both its intended use and its innovative and original value, MAPs can contribute to students' applied culinary education in product development, enhancing food flavour and revealing health benefits. The primary objective of this study is to evaluate the use of MAPs and students' attitudes towards it. The research conducted on the uses of MAPs within the scope of this study is expected to contribute to AÇU, the university from which the sample was taken and which specialises in MAPs. In this context, identifying the uses of MAPs among students of applied culinary education and determining the most popular plant are important for raising awareness.

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The research findings suggest that, although participants have a generally positive attitude towards MAPs use, there are certain shortcomings with regard to informed and evidence-based use. The relatively low level of agreement with statements concerning delaying treatment and using it without the recommendation of healthcare professionals suggests that students did not take an entirely uncontrolled approach. However, the low average score for the statement that using MAPs without necessary scientific research is inappropriate suggests that awareness of the importance of scientific verification and evidence-based evaluation has not been sufficiently internalised. This is significant because it reveals that a positive perception is not necessarily supported by critical thinking and rational decision-making. This finding suggests that students may associate natural products with safety and harmlessness, reducing the perceived need for scientific verification. This could lead to unconscious consumption and improper dosage practices, particularly among young consumers.

Analyses of demographic variables revealed no statistically significant differences in perceptions of the use of treatment, MAPs based on gender, age, grade level and geographical region. This finding suggests that perception levels are distributed relatively homogeneously within the sample. However, the significant difference detected based on department/programme of study suggests that disciplinary background may influence perceptual structure. The higher

perception level among GCA students can be attributed to the programme's practical course content, level of interaction with local produce, and focus on gastronomic use of plant-based materials. This result is consistent with theoretical approaches that highlight the relationship between professional identity formation and attitudes towards natural resources.

The identification of linden, mint, thyme and rose hip as the most frequently used MPAs among participants reflects traditional usage patterns in Türkiye. This suggests that cultural transmission processes are ongoing among younger generations and that the use of MPAs are not merely a matter of individual health preferences, but also reflects a sociocultural practice. In this context, MAPs can be considered an ecological and social capital value, representing cultural continuity.

From a sustainable forest management perspective, the high level of positive perception of MAPs is significant. However, if this potential is not channelled in line with sustainability principles, negative consequences such as indiscriminate harvesting, overuse and increased pressure on the ecosystem may arise. Therefore, positive perception alone is not a sufficient indicator; it must be supported by awareness of sustainable use, environmental responsibility and scientific knowledge.

Overall, the study reveals that, although the MPAs sector has a strong positive image among the student sample, there are aspects that require improvement in terms of scientific validation, conscious consumption and sustainability awareness. In this respect, the research makes an empirical contribution to the literature on non-timber forest products based on perceptions, and emphasises the necessity of systematically addressing the human dimension in sustainable natural resource management.

Conversely, students from the GCA Department (which provides applied culinary education), the Nutrition and Dietetics Department, and the Culinary Arts Programme at AÇU will raise awareness of these fields among readers and other relevant stakeholders by including information about the institution and its departments/programmes in relevant literature as a result of this research conducted for students of these programmes. It is thought that this will make the university and its departments/programmes more desirable and is expected to have a positive impact on potential collaborations with relevant stakeholders regarding MAPs.

The findings suggest that perception and awareness are crucial for the sustainable management and responsible use of medicinal and aromatic plants. Accordingly, integrating sustainability-oriented educational practices into applied culinary arts curricula could help to raise environmental awareness and encourage conscious consumption behaviours among future professionals.

## **SUGGESTIONS**

Overall, the research findings reveal a strong trend towards a positive perception of MAPs. However, it is clear that this perception needs to be supported holistically by sustainability principles, evidence-based knowledge production and conscious consumption behaviours. Therefore, a positive attitude alone is not enough; it must be combined with ecological responsibility, scientific rigour and ethical usage practices at both the individual and institutional levels.

Based on the findings and observations obtained from the study, a number of recommendations have been developed. These recommendations aim to contribute systematically to the theoretical literature, the field of application and future research in line with the study's findings.

- *Sustainable Curriculum Structuring*: In departments and programmes such as GCA, Nutrition and Dietetics, and Culinary Arts, the curriculum on MAPs should not only focus on usage but also be structured to include topics such as biodiversity, harvesting methods, consumption aspects, and ecological balance. In this context, modules themed "sustainable non-timber forest products" can be integrated into the curriculum and content.

- *Educational Programmes that Contribute to Scientific Awareness*: Informative training programmes should be organised for university students to raise awareness of the importance of adhering to the usage conditions, potential side effects and dosage limitations of MAPs. Educational seminars, informative panels and practical workshops should be organised on this topic. This will create a positive perception of MAPs and encourage conscious and responsible use of the products.

- *University-Local Producer Collaboration*: Collaboration models can be established between universities and local producers. These models can support sustainable production and provide students with practical experience in this field. This process will also enable us to support local producers.

- *Contribution to Policy and Planning Processes*: The findings suggest that young people view MAPs positively. This has significant societal implications for policymakers, entrepreneurs and researchers. Policymakers would benefit from prioritising MAPs in their sustainable forest management plans, while entrepreneurs could incorporate it into their training and awareness-raising activities. Researchers could also focus their youth-oriented studies on MAPs.

- *Investigating Causal Relationships*: Research on this topic can develop explanatory models that address perception, attitude, behavioural intention and actual behaviour within a holistic framework. Causal relationships between these variables can be tested using structural equation modelling, an advanced statistical technique. The results obtained will strengthen the conceptual framework.

- *Emphasis on Sustainable Forest Management*: This study primarily examines the relationship between the use of MAPs and sustainable forest management from a perceptual standpoint. Studies addressing MAPs from an interdisciplinary perspective and incorporating ecological sustainability, resource management and community-based conservation approaches will help to fill the relevant theoretical gap. This will result in the literature on non-timber forest products becoming more inclusive of studies addressing the human dimension.

Theoretical and practical studies developed within the framework created based on these findings and recommendations will contribute to a more systematic, measurable, and interdisciplinary approach to addressing the human dimension in sustainable natural resource management. This will enable the relationships between perception, attitude, and behaviour to be explained through more holistic models, thereby strengthening the social foundations of sustainability policies.

## **INFORMATION**

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