A Survey on Knowledge and Use of *Passiflora* Species in Cluj-Napoca, Romania

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Abstract

The present study aims the degree of the *Passiflora* genus knowledge on the population level in Cluj-Napoca, after imports of ornamental plants. The study was based on a short questionnaire with 8 questions, applied to a sample of randomly selected respondents. The results obtained demonstrated that *Passiflora*, although an exotic plant recently appeared in the local flower market, has been remarked and appreciated among the indigenous ornamental plants. From the data obtained, recommendations can be issued for introducing *Passiflora* genus in the assortment of flowering plants grown in Romania and to promote them among the local producers of ornamental plants in order to be marketed locally and nationally.

Keywords: passion flower, questionnaire, respondents, survey

Introduction

The etymology of *Passiflora* genus comes from the Latin “passio” which makes symbolic reference to the suffering of Jesus Christ and “flora” after Linnaeus’s choice. Symbolic association with “The Passion of Christ” was performed for the first time in 1529 by Spanish conquistadors (Dhawan *et al.*, 2004; Patel *et al.*, 2011).

The genus *Passiflora* includes more than 560 flowering species (Shrestha *et al.*, 2019) and is the most common of the *Passifloraceae* family, having the diversity center in South America (Bernacci *et al.*, 2015). Plants of this genus are known for their ornamental value, but also for their therapeutic properties and the bioactive compounds they contain (Ramirez *et al.*, 2019, Domínguez-Rodríguez *et al.*, 2019). Fruits are widely accepted as important component of a healthy diet and

adequate consumption could help to reduce a wide range of diseases (Thokchom *et al.*, 2017). *Passiflora* plants are herbaceous, shrubs and often volatile plants with alternating leaves, sometimes simple, entire, lobed and/or palmate, sometimes compound, imparipinnate (Gontijo, 2000).

The current trends of the flower market in Romania involve diversifying the assortment with exotic species. Thus, the present study aims to estimate the popularity degree and the knowledge of the uses of *Passifloraceae* in Romania as a result of imports of ornamental flowering plants.

Materials and methods

In order to estimate better the degree of knowledge and use of *Passiflora* plants in the population of Cluj-Napoca, a non-nominal questionnaire was designed. Two methods were

used to collect the data, namely applying the questionnaire in the online environment using the GoogleForms platform and through the personal approach of the respondent.

The questionnaire was applied to a sample of 273 randomly chosen persons. The participation of the respondents was anonymous and confidential.

The questionnaire was adapted according to the model used by Dan V. S. (2015), consisting of 9 short questions grouped into three parts. The time allowed for completing the questionnaire was 2-3 minutes. The answer variants fluctuated from a single answer, to multiple questions and open questions.

The first part of the questionnaire is represented by the first two questions. The questionnaire also contains a colorful, suggestive image with the most popular species among *Passifloraceae*, namely *Passiflora caerulea*.

The second part of the questionnaire contains four questions with direct reference to the popularity degree and uses of *Passiflora*.

The third part of the questionnaire contains questions that ask the demographic data of the respondents such as gender, age, educational level and an open question regarding the last form of education completed.

Questions were formulated in such a way to be understood even by people without specialized knowledge.

In the end, the data were interpreted cumulatively by means of graphs with the percentage results.

Results and discussions

The first question inquired based on the image presented: "Do you know the plant illustrated in the image bellow?". Of the total of 293 responses, 186 (63.5%) were affirmative, respectively 108 (36.9%) negative.

The first question was supplemented with a descriptive question, "If the answer is yes, what is its name?". 182 answers were obtained, of which 179 (98.4%) were considered correct. The answers considered "valid" were the following: "Passiflora" (here also included the answers of type "Pasiflora", "Passyflora" or "pasiflorae"), "*Passiflora caerulea*" (and "Passiflora caeruleae"), "*Passiflora incarnata*", "Passion flower", "Passion fruit", "Maracuya".

The second question "Have you ever heard of *Passiflora* (Passion Flower)?" accumulated a

total of 293 answers, of which 258 (88.1%) were affirmative, the respondents heard the name *Passiflora* (Flower of passion), respectively 35 (11.9%) of the answers stated that the respondents did not hear about *Passiflora*. Unexpectedly, the affirmative answers were higher compared to the 182 answers offered for the association of the plant in the image.

The third question asked "Have you ever had or did *Passiflora* plant at home/at work/etc.?" was mainly addressed to the respondents of the first two questions and recorded a total of 258 answers. Of the respondents, 95 (36.8%) stated that they have ever had a *Passiflora* plant, 130 (50.4%) mentioned that they never had this species, and 33 (12.8%) do not know if they had ever. Those who responded that "I do not know" if they have ever had *Passiflora* are associated with those who do not recognize the plant, or are not interested in plants.

The fourth question referring to the knowledge degree of *Passiflora* plants, presented a series of five statements in which the respondents checked one of the variants: "Yes", "No" or "I don't know" highlighted in the respective column of Table 1.

- The statement "*Passiflora* is a flowering plant" received 193 (74.8%) answers "Yes" (correct answer).

- The statement "*Passiflora* is a medicinal plant" received 102 (39.5%) answers "Yes" (correct answer), where it is noted that there are connoisseurs respectively consumers of *passiflora* as a medicinal plant, but it is not sufficiently known in Romania.

- The statement "*Passiflora* produces edible fruits" obtained 162 (62.8%) answers "Yes" (correct answer), where it was founded that the respondents known, have consumed the passion fruit or have heard of it, but at the local level it is not enough recognizable within the studied population.

- The statement "*Passiflora* is used for interior decoration" obtained 181 (70.2%) answers "Yes" (correct answer). Seeing that a tropical climate plant, in Romania *Passiflora* resists over winter only in protected spaces, which makes it an interior decorative plant. Analyzing the answers received, an often large number of respondents answered correctly, "Yes", perhaps by associating it with its demands on temperature.

Table 1. Centralized answers from the questionnaire of *Passiflora* knowledge

Answer versions	Total answers	Yes (Right answer)		No (Wrong answer)		I do not know	
		No.	%	No.	%	No.	%
Question 1	293	186	63.5	108	36.9		
Plant's name	182	179	98.4	3	1.6		
Question 2	293	258	88.1	35	11.9		
Question 3	258	95	36.8	130	50.4	33	12.8
Question 4							
4.1.	258	193	74.8	12	4.7	53	20.5
4.2.	258	102	39.5	58	22.5	98	38
4.3.	258	162	62.8	35	13.6	61	23.6
4.4.	258	181	70.2	28	11.2	48	18.6
4.5.	258	98	38	72	27.9	88	34.1
Question 5							
White	258	209	81.0	49	19.0		
Yellow	258	25	9.7	133	51.6		
Blue	258	193	74.8	65	25.2		
Mauve	258	208	80.6	50	19.4		
Orange	258	32	12.4	226	87.6		
Pink	258	69	26.7	189	73.3		
Red	258	76	29.5	182	70.5		
Question 6							
Flower shop	258	156	60.5	102	39.5		
Garden Center	258	133	51.6	125	48.4		
Supermarket	258	112	43.4	146	56.6		
DIY Store	258	61	23.6	197	76.4		
Online shop	258	195	75.6	63	24.4		
Question 7	293						
Male		60	23.3				
Female		198	76.7				
Question 8	293						
Under 20 years		7	2.4				
21-25 years		52	17.7				
26-35 years		83	28.3				
36-45 years		72	24.6				
46-55 years		44	15.0				
56-65 years		21	7.2				
Over 66 years		14	4.8				
Question 9	293						
Secondary school		3	1.0				
High School		94	32.1				
Post - High School		8	2.7				
Bachelor's level		95	32.4				
Master degree		82	28.0				
Doctorate		9	3.1				
Postgraduate studies		2	0.7				

• The statement “*Passiflora* is a garden plant” was appreciated with 72 (27.9%) answers “No” (correct answer), it is likely that the respondents have seen *passiflora* used for the decoration of gardens or terraces, but in winter it must be protected in the vast majority of areas, which makes this plant not to be classified as a “garden plant” under the climatic conditions in Romania.

The fifth question concerned the level of knowledge of *Passiflora* flowers chromatics. The question was asked as follows: “If you know the flowers of *Passiflora*, choose the right colors for the flowers of these plants”. Eight chromatic variants have been specified, all being correct variants, highlighted in the respective column of Table 1. It is likely that the answers to this question will be influenced by the color of the flowers presented in

the image (*Passiflora caerulea*). Thus, the variant "White" obtained 209 (81.0%) answers "Yes", the variant "Yellow" obtained 25 (9.7%) answers "Yes", the variant "Blue" obtained 193 (74.8%) answers "Yes", variant "Mauve" obtained 208 (80.6%) answers "Yes", variant "Orange" obtained 32 (12.4%) answers "Yes". The "Yellow" and "Orange" variants are found at *Passiflora* species from the spontaneous flora of tropical forests, which determined a lower rate of affirmative answers. The variant "Pink" obtained 69 (26.7%) answers "Yes", the variant "Red" obtained 76 (29.5%) answers "Yes", the variant "Burgundy" obtained 52 (20.2%) answers "Yes".

The sixth question referring to the place where *Passiflora* is marketed and the answers were presented in the respective column of Table 1. 156 (60.5%) respondents answered that they saw *Passiflora* in a flower shop; 133 (51.6%) in a Garden Center; 112 (43.4%) in the Supermarket and 195 (75.6%) stated that they saw *Passiflora* in an online store.

Regarding the gender of the respondents, the highest percentage was represented by the female (76.7%), the male gender representing only 23.3% of the total respondents.

Regarding the distribution of respondents by age groups the answers were presented in the respective column of Table 1. It appears that the largest number of respondents, 83 (28.3%), are part of the range of 26-35 years, followed closely by respondents aged 36-45 years (24.6%).

The analysis of responses about the last form of graduate education, the answers were presented in the respective column of Table 1. A maximum number of 95 respondents graduated a college, at the bachelor's level, followed closely by 94 respondents who graduated high school.

In his research, Dan (2018), further the application of the knowledge questionnaire on *Clematis* species, reached the following conclusions: „*Clematis* are ornamental plants relatively known to us - about 50% of the people surveyed know these plants; the shrubs or evergreen species are not known or very little known and the cultivation of the *Clematis* in pots is very little known in the native landscape space”.

Studies were also conducted to follow the degree of knowledge and usefulness of certain medicinal plants in various area. Gakuubi and Wanzala (2012) applied a study based on

questionnaire into nomadic communities in Africa, in which they determined and analyzed the degree of knowledge and use of plants in the ethno-veterinary field in Ameru. The results showed that in the *Fabaceae* family (16.67%) exists most plants used for preparation of ethnoveterinary treatments, followed by *Solanaceae* (12.5%), *Asteraceae* and *Euphorbiaceae* (each containing 8.33%), *Lamiaceae* (6.25%), *Apocynaceae* and *Boraginaceae* each represented by a single species of plant.

Prakash et al. (2006) evaluated the degree of knowledge using a questionnaire on the therapeutic effects for the species *Lobelia*, *Vitex*, *Asparagus*, *Leucas*, *Hibiscus* and *Ocimum*. The results showed that the indigenous people of Sringeri Taluk, India depend on these plants to treat skin diseases, itching and measles, being essential for modern medicine in those places.

Conclusion

Concerning the survey based on the questionnaire regarding the degree of *Passiflora* knowledge locally, and the analysis of centralized data obtained, the following conclusions are drawn:

Passiflora is an ornamental plant well known in the analyzed population, 63.5% of the total respondents said that they known the plant. Although the medicinal properties of the *Passiflora* plant are quite promoted, a relatively small percentage of respondents are aware of this. In contrast, over 60% of the respondents know that the fruit of *Passiflora* is edible.

These high percentages highlight the fact that *Passiflora* plants are noted and arouse curiosity among people, due to its special flowers and the multiple possibilities of use and decoration that the respondents largely know.

Regarding the commercialization of *Passiflora* in Romania, there are affirmative answers for each type of commercial unit analyzed, with high percentage about online stores and flower shops, which indicates imports of these plants made on a large scale.

It is recommended to introduce *Passiflora* genus in the assortment of flowering plants grown in Romania and to promote them among the local producers of ornamental plants in order to be marketed locally and nationally.

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