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ORIGINAL SCIENTIFIC PAPER

Attitudes on biodiversity and willingnes to support local breed conservation - the case of the Istrian donkey

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Abstract
The preservation of indigenous breeds that provide value to local culture, history and increases biodiversity. The paper aims to determine the association between attitudes on biodiversity and willingness to participate in the conservation of the Istrian donkey in order to preserve local biodiversity. Study presents the results of a survey conducted with Croatian students. Results show that the importance of the Istrian donkey for biodiversity conservation in Istria is well known among the students, but they are not too willing to participate in its conservation. They believe that the state should continue to play a significant role in this protection.

Key words: indigenous breeds, biodiversity, Istrian donkey

Introduction

Globalisation and the reckless use of natural resources have led to a decline in the biodiversity of many ecosystems. Therefore, this problem has become the focus of politics and human awareness in recent decades. Biodiversity is defined as the totality of genes, species and ecosystems that make up life on Earth and provide essential services to society (Ovaska and Soini, 2016). The indigenous breeds are an important part of biodiversity, and their conservation and breeding guarantee the preservation of cultural and historical values (Soini et al., 2019). Indigenous (syn. local, domestic, native, autochthonous) breeds are livestock breeds that originate from and are adapted to specific geographical regions and are used in regions for a long time where they are of economic, scientific and cultural importance (Rands et al., 2010). However, it has long been common practice to replace local breeds in favour of highly productive commercial breeds (Schäler et al., 2019), thus putting many indigenous breeds at risk of extinction (Biscarini et al., 2015). In order to preserve biodiversity, it is therefore necessary to involve policy makers and other stakeholders in the process of conserving native breeds (Ovaska et al., 2021).

Consumers can also play an important role in local breeds conservation, for example, through the concept of "conservation by eating" – a concept that explains that the meat of a local breed must be eaten to be able to conserve it (Menger and Hamm, 2021). In addition, consumers can financially support the preservation of local breeds or participate in promoting local breeds and their importance. Thus, the European Union (EU) supports farmers to continue breeding local breeds with the purpose to preserve their social, cultural, and environmental values (Bojkovski et al., 2015).

The Istrian donkey is an European donkey breed and one of the three Croatian autochthonous donkey breeds with Littoral Dinaric donkey and North Adriatic donkey. It is well adapted to the microclimatic conditions in Istria. The Istrian donkey preserves the local habitat by grazing the lower vegetation, contributing to its comparative advantage in this geographical

region. Nevertheless, the Istrian donkey is an endangered breed; in 2021, only 863 animals were registered (HAPIH, 2022).

This paper aims to determine the association between attitudes on biodiversity and willingness to participate in the conservation of the Istrian donkey in order to preserve local biodiversity. This preliminary research was conducted on a convienience sample of Croatian students.

Materials and methods

An online questionnaire has been developed. It included closed-ended questions on the socio-demographics of the respondents, their familiarity with the term biodiversity and attitudes towards biodiversity (Huang and Lin, 2014) and towards the Istrian donkey, as well as their willingness to participate in the Istrian donkey conservation. Before the attitude questions, the biodiversity definition was presented to familiarise all respondents with the concept. The survey was conducted from January to March 2022 on a convenience sample of students from various universities and polytechnics in Croatia recruited through social networks and email. A total of 193 respondents completed the questionnaire fully and correctly.

The collected responses were processed and analysed using the IBM SPSS Statistics 21. Descriptive statistics were used to describe the sample and respondents' attitudes, knowledge and the willingness to support Istrian donkey conservation to preserve the local biodiversity.

Factor and cluster analysis were used to explore differences between respondents in terms of their attitudes towards biodiversity and to create distinct segments. The Chi-square test was used to assess the possible association between segment membership and willingness to participate in the Istrian donkey conservation.

Results and discussion

Sample description

The sample was dominated by female respondents (71.5%) due to a self-selection bias. The respondents' age ranged between 18 and 33 years. More than half of the respondents (56.0%) grew up in cities, and 21.8% of respondents stated that they currently live in a rural area of Croatia. Only 8.3% of respondents come from Istria.

Attitude towards biodiversity

A large majority of respondents (90.7%) are familiar with the biodiversity concept, and they believe that each individual can contribute to solving the problem of biodiversity loss. Even 26.9% of respondents believe that the solution to the biodiversity problem should be left to experts, unlike in the study of Huang and Lin (2014) where only 2.0% of American students think that way. They do not agree with the principle that biodiversity should be sacrificed for economic growth, and they do not think that biodiversity concerns are exaggerated (Table 1). As many as 92.7% of respondents believe that biodiversity loss is a serious problem, with one third (32.1%) considering it a very serious problem. Furthermore, 4.7% of respondents state that they are committed to biodiversity protection and another 40.4% state that they would like to be even more committed to biodiversity protection. However, 40.9% of respondents say they are not involved in biodiversity protection because they do not know how they can contribute to solving the problem. Other studies also showed a positive students' attitude towards biodiversity but also their low willingness to get involved in environmental protection (Nisiforou and Charalambides, 2012).

In order to identify significantly different groups of students based on their attitudes towards biodiversity, a factor and cluster analysis were conducted. Responses to the statements listed

in Table 1 were used as input variables for a principal factor analysis with varimax rotation. The statement *Science and technology can solve all the problems of biodiversity* was excluded due to low factor loading. The analysis extracted 3 orthogonal factors explaining 52.5% of the variance. The first factor includes four variables associated with the oppinion that *development of society is more important than biodiversity conservation* and explains 22.6% of the variance. The second factor, that we can label "*Not my business"*, consists of two variables that explain 17.4% of the variance. Finally, the third factor, *prone to biodiversity conservation,* consists of three variables explaining 12.6% of the variance (Table 1).

Table 1. Factor analysis on attitudes towards biodiversity

Statements	Mean*	Std. Deviation	Factor 1	Factor 2	Factor 3
I think that each of us can make a significant contribution to addressing the issue of biodiversity loss.	4.16	0.889			(-)0,695
Nature should be left alone.	3.52	1.031		0.694	
I think it is necessary to maintain biodiversity even if it means sacrificing many goods.	3.26	0.980		0.708	
Almost all human activities disrupt biodiversity.	3.03	1.021		0.568	
Biodiversity conservation goals are a threat to further economic prosperity.	3.02	1.237	0.575		
Solving the problem of biodiversity should be left to experts.	2.98	1.011			0.729
Science and technology can solve all the problems of biodiversity.	2.87	0.904	NA	NA	NA
In order to increase economic growth, it is justified to ease the constraints that exist due to the conservation of biodiversity.	2.41	0.941	0,794		
The exploitation of natural resources for basic human needs must be developed even if it results in the loss of wildlife and wildlife populations.	1.99	0.951	0.722		
People worry too much about the problem of biodiversity.	1.85	0.848	0.554		

* 1- do not agree at all, … 5 – fully agree

The factor scores were used as input variables for the hierarchical cluster analysis. In the first step, the nearest neighbour method was used to exclude outliers. After excluding 5 respondents, the Ward method was performed, resulting in 3 clusters: **Conservationist** (50.5% of respondents): They are willing to sacrifice many things to preserve biodiversity and believe that each individual can preserve biodiversity through their actions. **Hesitant** (30.3% of respondents): Respondents in this cluster are committed to biodiversity conservation but are unwilling to sacrifice their comfort to achieve its goals. They tend to leave problem-solving to science but feel that people do not care enough about the problem of biodiversity. **Sceptical** (19.1% of respondents): They believe that an individual cannot contribute to solving the problem of biodiversity conservation and that people care too much about that problem. For them human needs are more important than biodiversity conservation, i.e. it is justified to ease the current limitations to humant activities due to biodiversity conservation purposes.

Willingness to preserve Istrian donkey

Most of the surveyed students (64.2%) have heard of the indigenous Istrian donkey, and 25.4% have seen it, while 36.8% are not sure if they have ever seen an Istrian donkey. The respondents value the role of the Istrian donkey in preserving biodiversity and tradition in Istria (Table 2).

Table 2. Respondents' attitude towards the Istrian donkey

Statements	Mean	Std. Deviation
It is necessary to work on the preservation of the Istrian donkey.	4.32	0.929
The Istrian donkey is the guardian of the Istrian tradition.	4.22	0.882
The Istrian donkey enriches the tourist offer of Istria.	4.18	0.968
The Istrian donkey is important for the preservation of Istria's biodiversity.	4.14	0.944
Istrian donkey meat products contribute to the attractiveness of Istria's gastronomic offer.	3.37	1.183
Istrian donkey meat products are easily available on the market.	2.49	0.913

Only 14.5% of the respondents are willing to financially support the conservation of the Istrian donkey, while the others are either not willing (44.1%) or not sure (41.5%). The surveyed students showed a slightly higher willingness to promote the Istrian donkey by spreading information about the donkey on social networks (32.6%) or by eating meat (24.9%). However, most respondents (almost 70.0%) believe that it is necessary to continue making state payments to farmers.

Table 3. Willingness of the respondents (%) to participate in the conservation of the Istrian donkey

Question	Yes	No	I am unsure
Would you financially help protect and preserve the Istrian donkey once a year?	14.5	44.0	41.5
Would you buy meat and meat products from the Istrian donkey and thus contribute to preserving the breed?	24.9	43.5	31.6
Would you promote the Istrian donkey and thus contribute to preserving the breed (e.g., share content about the Istrian donkey on social networks)?	32.6	37.3	30.1
Do you think that state payments for preserving the Istrian donkey should continue to be paid?	69.9	7.8	22.3

Chi-square tests were performed to explore the association between the students' assignment to the biodiversity attitude segments and their willingness to partticipate in the preservation of the Istrian donkey. The results revealed no significant association. This outcome suggests that despite having positive attitudes towards biodiversity and the Istrian donkey, students still do not perceive the importance of personal engagement in preserving the indigenous breeds. Additionaly, most of the respondents are not from Istria, and it is known from the literature (Cheng et al., 2021) that the willingness to participate in the conservation decreases with distance. It is therefore important to actively promote and educate the importance of local breeds and ways to preserve them among students and young people in general, and to involve them in activities that contribute to the preservation of local breeds as also suggested by Franzolin et al. (2021).

Conclusion

The results of the survey show that many students have a positive attitude towards biodiversity and its conservation, and that they can be split into three groups in terms of their attitude and behaviour: Conservationist, Hesitant and Sceptical, with the last group being the

least represented. Although the importance of the Istrian donkey for biodiversity conservation in Istria is well known among the students, they are not too willing to participate in its conservation, especially financially (less than one-fifth). However, they believe that the state should continue to play a role in this protection (more than three-fifths).The link between attitudes towards biodiversity and willingness to participate in the conservation of the Istrian donkey could not be demonstrated, implying that positive attitudes do not lead to proactive behaviour. These results should be tested on a larger, representative sample.

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