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# Limits and potential of commercial exploration of Uça Crab on the northern coast of Paraná - Brazil

Adilson Anacleto (Corresponding author)

Administration Department, Associate Professor, Professor from the Interdisciplinary Postgraduate Program Society and Development – PPGSeD, Professor from Postgraduate Program in Coastal and Insular Environments - PALI. State University of Paraná, Paranaguá Campus, Paraná, Brazil.

E-mail: adilson.anacleto@unespar.edu.br

Aline Pereira de Souza

Administration Department, Scientific Initiation Researcher, State University of Paraná, Paranaguá, Brazil

Manoela Miranda

Administration Department, Scientific Initiation Researcher, State University of Paraná, Paranaguá, Brazil

Vitor Gabriel Costa Cella

Administration Department, Scientific Initiation Researcher, State University of Paraná, Paranaguá, Brazil

Yasmin Pinto de Oliveira

Administration Department, Scientific Initiation Researcher, State University of Paraná, Paranaguá, Brazil

**Abstract**

The uça crab is an important fishing resource in the economy of the northern coast of Paraná, however, no studies were found that reported the collectors' perception of the activity. In this context, this study aimed to organize a brief overview emphasizing the limits and potential of the commercial exploitation of the uça crab on the northern coast of Paraná. An exploratory survey was carried out between May and November 2024 with 32 collectors. The study revealed that all interviewees were men, the vast majority of whom were married or in a stable union (93.7%), with an average age of 48 years and had been working in crab collection since adolescence. The vast majority had low levels of education: 71.48% had not completed elementary school and a significant portion were illiterate (n = 25.44%). The average catch of 44 dozen crabs occurred in 5.9 hours per day of work in the mangrove swamp, and was repeated for 3.6 days per week, primarily from Tuesday to Friday so that trade could be easier on weekends. The average family income increased by 22.87% during the catching period. The positive factors reported were the extra financial income, high demand from buyers and the negligible cost of catching crabs, while the negative factors reported were the exhausting work, low sales price and the decrease in the quantity collected. Specifically for this group of workers, no specific health guidance programs or actions were found, nor is there any labor legislation to protect them. The precariousness of the activity has been "normalized" and the collectors remain invisible to the State. Finally, it is possible to consider that crab catching, although essential for the subsistence of many families, offers temporary income that is not enough to guarantee long-term economic security, and the change of scenery for the community itself is apparently a situation that is very difficult to reverse.

**Keywords:** Ethnoeconomics, Socioeconomics, *Ucides cordatus,* Mangrove, Crab Catcher
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## 1. Introduction

The first records of crustacean consumption on the coast of Paraná, especially the Uçá crab, Ucides cordatus (Linnaeus, 1763), date back to the colonial period, when this group of crustaceans was already described as one of the important resources in mangroves.

 

Paraná has 31 thousand hectares of mangroves, which are considered natural breeding grounds for the Uçá crab (PARANÁ, 2024). In simplified terms, mangroves can be described as the vegetation found in coastal ecosystems that form in estuarine and bay areas that provide the transition between the mainland and the sea. They have tidal flow, muddy soils and high salt levels. This type of vegetation is found between the sea and the coast and is the habitat of the Uçá crab, a blue-colored crustacean appreciated as a delicacy (PARANÁ, 2024; CORDEIRO et al., 2024). The capture can only occur after the so-called "closed season" period, which is a collection restriction that occurs every year to protect and guarantee the possibility of natural reproduction of the species, following the regulations of the legislation Ordinance 52/2003 of Ibama and Ordinance IAT nº 180/2002 (PARANÁ, 2024).

The species is ecologically important given that, according to Almeida (2024), it plays a fundamental role in the recycling of the mangrove because it feeds on the leaves, distributes nutrients in the soil when it makes its burrows, which are essential for the preservation of ecosystems, in addition to offering nutrients to other organisms in the food chain.

The species is socially important, as reported by Gonçalves et al (2022), as an important fishing resource that provides sustenance and serves as a food source for many socially vulnerable communities in coastal regions. The species also has economic relevance, according to the Department of Rural Economy of Paraná (DERAL, 2024), crab fishing has shown economic growth, with a turnover of just over R$7 million in Paraná in 2022, and in contrast, it generated R$9 million in 2023, with most of the trade generated on the northern coast of the state. Despite the economic relevance of the activity, the real scenario regarding extractivism in the northern region of the Paraná coast is unknown, as are the impacts caused in most small communities. Therefore, considering that understanding the scenario, based on the perception of people involved in collection and commercialization, this study aimed to organize a brief overview emphasizing what are the limits and potential of the commercial exploitation of the uça crab on the northern coast of Paraná.

## 2. Methodology

The descriptive exploratory research took place on the northern coast of Paraná, as it is the region of the species' natural habitat and also the largest representation in the collection and commercialization of the species (Oliveira & Fávaro, 2013; BORGES et al., 2017; DERAL, 2024).

The criteria for participation in the research were that the participant be of legal age, that he/she only engaged in the activity of catching crabs during the permitted period, that he/she complied with the legislation of extracting only male individuals with a carapace size of seven centimeters, and that he/she had been involved in the collection and capture of crabs for more than 5 years.

The research was carried out between May and November 2024. Initially, people were identified in the communities, based on this information, and the interviews began and each person was asked to indicate other collectors in a self-generated sampling process. All participants were informed about the objectives of the research, as well as about their rights to anonymity in accordance with the ethical guidelines established by Resolution No. 510/2016 of the National Health Council. Data collection began only after consent was obtained.

Interviews with 32 collectors were conducted in fishing communities, following a previously prepared semi-structured script. Initially, socioeconomic data were collected, followed by information on the capture system, sales systems, sales prices and destination of production, with an average duration of 40 minutes per participant.

The analysis of the main factors was performed as proposed by Negrelle et al. (2012), using a cross-impact matrix, with the set of reports cross-referenced with each other. The matrix, as proposed by Negrelle et al. (2012), uses percentage values from 0 to 100 for each opinion expressed by the interviewees collectively in relation to the other opinions expressed. Each item is analyzed in relation to the influence exerted on the different types of activities related to leadership in the associations, thus, the higher the index, the greater the relevance of the item.

The impact matrix generated a relevance index that can be obtained by the equation:

$$IR = \frac{FA \times FB \times 100}{\Sigma SF}$$

Where, IR = Relevance Index of the situation evaluated;

Fa = Indices of influence received;

Fb = Indices of influence provoked;

 

∑SF = Sum of the indices (Fax Fb) of all the questions analyzed.

After the completion of the primary data collection, strictly following the proposal by Anacleto et al. (2024), interpretative analysis was adopted and, through the data triangulation technique, between the researchers' observations and the similar responses obtained from the fishermen.

## 3. Results

The extraction of uça crabs on the coast of Paraná occurs after the closed season for the reproduction of the species, always from December to March, and this is precisely when the greatest demand occurs due to the presence of tourists who consume them during the summer period.

The collection was carried out in the seven municipalities that make up the coast of Paraná and is classified as a family multiactivity activity, that is, it is not considered the main income activity for families.

The study revealed that all of the interviewees were men, those who were married or in a stable union represented 93.7% and had an average age of 48 years and a range between 36 and 60 years, and had been working in the collection of crabs since adolescence.

The collection of uça crabs generally occurs in places far from homes, on average 3.5 km away. This distance requires having boats available to carry out the work activity. Most of the boats used (75.0%) are powered by manual power (oars), and another portion of the interviewees (25.0%) stated that they use boats powered by low-power engines with a maximum of 22 hp. Small boats facilitate capture because they depend on the tide flow to access the mangrove areas where the capture takes place.

The level of education of crab collectors on the coast of Paraná reveals important socioeconomic and cultural characteristics of this group, given that among the Uça crab collectors, the vast majority had low levels of education, with only a minority (n=3.12%) having completed high school, and a significant portion were illiterate (n=25.44%) or had not yet completed elementary school (71.48%).

The average number of people per family was 4.4 people, with an average of one person dedicated to the activity. The capture was done by bracing, which is the action of inserting the arm into the holes (burrows) of the crabs in the mud and removing them using force. In this system, the animals are collected in a more intact form and have a higher commercial value.

The capture of an average of 44 dozen in 5.9 hours per day of work in the mangrove, repeated for 3.6 days per week, primarily from Tuesday to Friday so that trade is easier on weekends.

The trade system is varied, however, the majority of the interviewees (n=62.4%) worked with sales using the order system, going out to capture with the aim of selling at retail, however some of these (n=66%) also sell to wholesalers who act as middlemen.

The monthly income of crab collectors outside the fishing season was on average R$1,934.00 per month, a situation considered insufficient by Brazilian survival standards, which indicates that this group of people perform low-paying or informal work activities, which keeps their earnings low. In this context, the collection activity was relevant given that during the period the increase in average family income occurred in the order of 22.87%. It is important to highlight that for a small percentage of interviewees (n=6.12%) this percentage was above 30%, and the variation in the percentages of income increase may be associated with the quantity of crabs captured, access to better equipment, accumulated experience and collection location.

The increase in family income during the weeks of crab capture reveals the significant economic impact of this activity on the lives of the collectors, and according to reports, in many circumstances, it can mean the difference between covering basic expenses and having a small surplus for extra needs, such as home repairs or meeting other urgent needs.

The scenario related to the extraction of Uça crab revealed that issues associated with income generation and high demand from buyers were the main factors that boosted extraction in the region (Table 1).

 

Table 1. Positive factors of Uça crab extraction on the coast of Paraná according to the interviewees.

| Classification | Positive factors | IR |
|---|---|---|
| 1 | Extra financial income | 36,2 |
| 2 | High demand from buyers | 19,9 |
| 3 | Insignificant cost for capture | 9,01 |
| 4 | Possibility of reconciling capture with other income-generating activities | 8,72 |
| 5 | Guaranteed sale | 7,03 |
| 6 | No need for processing | 5,05 |
| 7 | Price increase due to the summer season | 5,05 |
| 8 | Quality production | 4,96 |
| 9 | Family food | 3,00 |
| 10 | No need for equipment | 1,08 |

*IR = Relevance index

The scenario regarding the negative factors of the activity revealed that the physical effort required in the work activity associated with the low sales price were the greatest limitations of the activity (Table 2).

Table 2. Negative factors of Uça crab extraction on the coast of Paraná according to the interviewees.

| Classification | Negative factors | IR |
|---|---|---|
| 1 | Exhausting work | 32,1 |
| 2 | Low sales price | 26,0 |
| 3 | Decrease in the quantity collected | 10,6 |
| 4 | Decrease in the size of the crabs | 7,89 |
| 5 | Work accidents | 6,70 |
| 6 | Only seasonal activity | 5,11 |
| 7 | Unhealthy due to humidity | 4,28 |
| 8 | Difficulty in transportation to the city's shops | 3,42 |
| 9 | Profession undervalued in the community | 2,02 |
| 10 | Informality of the activity | 1,88 |

*IR = Relevance index

## 4. Discussion

Crab collection on the coast of Paraná must be analyzed under two broad factors. The first refers to the regional culture in relation to the consumption of the species. The opening of the capture season in the region can be classified as an inclusive event, where people from all economic classes are involved. The opening of the “crab walk” becomes a reason for family groups, friends and even for socializing. The trip to the mangrove areas is planned, as well as the meeting after collecting the crustaceans. Anacleto and Michaliszyn Filho (2024) report that cultural activities are essential to coastal communities on the coast of Paraná, because these events are where conversations, information exchanges and various types of social and interpersonal relationships, combinations of work activities and community organization take place. The “crab walk” is organized and everyone has a role in the work, from children to men who did the heaviest work, which invariably combines with music and moments of joy and fun. The second factor that should be considered in this study is that despite the relevance of the tradition and culture associated with the Uça crab on the coast of Paraná, there is a strong social issue that is practically invisible to society. The economic impact of crab capture is positive, given the fact that little or

 

minimal investment is made in obtaining income. However, despite the positive factors, it is also important to consider that the activity was classified by the majority of interviewees as exhausting, unhealthy, and that it is not uncommon for work accidents to occur due to the inhospitable nature of the work site. A similar situation is also described by Rosa and Matos (2010), who reveal that for decades, crab extractors in Brazil have been informal workers, without protection and labor guarantees. They are exposed to various risks and accidents with boats, fishing gear, drowning, in addition to being exposed to high radiation and climate variations such as intense sun, humidity, salinity, wind, and a large number of insects that hurt the skin. The compromised working conditions similar to those on the coast of Paraná were also observed by Passos et al. (2024), who reported that the Uça crab collection activity presents all types of occupational risks related to physical, chemical, biological, ergonomic and mechanical issues in other regions of Brazil. In addition to constant injuries and accidents, there are records of more than 60 occupational diseases already identified in this work activity, the most common being repetitive strain injuries and skin cancer due to sun exposure. According to Passos et al. (2024), health problems occur largely because collectors perform their work activities almost always barefoot or with inadequate protection on their feet, old shirts and jackets, and it is not uncommon to apply diesel or kerosene to their bodies to protect themselves from the action of insects, products considered unsuitable for the proposed practice.

Alves and Nishida (2003) also report that this group of people live on the margins of the formal economy, are extremely poor and little recognized and suffer strong disintegration due to the increasing degradation of mangroves. Although it was not the subject of this study, there were several reports from interviewees that indicated that in recent decades crabs have been decreasing in quantity and size. Passos et al. (2024) also reported that environmental degradation and sewage contamination, lack of basic sanitation, chemical and agrotoxic pollution, result in an alarming scenario that threatens the natural resources on which fishermen are dependent. Specifically regarding the Paraná coast, Gonçalves et al (2022) reported that in the middle of the last decade, the density of the mangrove crab in the mangroves on the northern coast of Paraná had an adequate population. However, they reported that low percentages of individuals with the minimum size allowed for capture were found, a situation also reported by the extractors interviewed in this research. According to Gonçalves et al (2022), constant monitoring actions are urgently needed to protect not only the species but also the socioeconomic activity in the region.

The predominance of low levels of education reported in this research among the majority of crab extractors on the Paraná coast reveals a complex socioeconomic reality in which many workers enter the job market influenced by the need to increase their contribution to family income.

The low levels of education observed in other studies related to the Paraná coast (Anacleto et al. 2016) limit the prospects for professional development and impose dependence on informal activities, including seasonal ones such as crab capture.

Low education is a systemic situation and, in general, children of people with low education have greater difficulty in overcoming these limitations when compared to people from families with high levels of education, although there are individuals or groups who manage to overcome this situation. Anacleto et al. (2016) report that low education levels, combined with other factors such as age, lead to greater difficulties in finding jobs in the formal job market with good pay on the coast of Paraná, which drives the large number of informal activities observed in the region. Similar social conditions were also observed on the coast of Paraná by Anacleto et al. (2024), and this group of people, due to their vulnerability, has suppressed the exercise of citizenship and, without authorization or recognition from the competent institutions, has embarked on an activity that can have consequences for them, and given that there are no other alternatives, and faced with the need to fight for survival, they continue to work despite so many difficulties. Specifically for this group of workers, no specific health guidance programs or actions were found, nor is there any labor legislation to protect them, the precariousness of the activity has been "normalized" and the collectors remain invisible to the State.

Similar to what has already been reported by several studies for other groups associated with sea fishing on the coast of Paraná, in the short or medium term the situation of Uça crab collectors tends to remain as it is, without protective legislation, without assistance from the government and at the mercy of more organized groups such as retail traders who impose prices on the production generated, in a similar way to what has already been reported by Anacleto et al. (2024), this group of people also has precarious access to the market, insufficient human capital, insufficient productive capital, weak government institutions and weak bargaining power arising from the lack of collective organization and the lack of strengthening of the social fabric, and this results in difficulties in accessing development resources for improving production and trade, and, by not accessing development resources for improving production and trade, they are unable to improve their quality of life and

 

remain impoverished and socially vulnerable.

Finally, it is possible to consider that crab capture, although essential for the subsistence of many families, offers temporary income that is not sufficient to guarantee long-term economic security and the change of scenario for the community itself, apparently a situation that is very difficult to reverse.

Just like the report of the situation previously described, there is also a recurring discourse that without class organization little or no problem will be solved, and the group of collectors will continue to be at the mercy of exploitation by stronger or more organized economic groups, without assistance and in social vulnerability, and organization can be pointed out as the only possible way to break the perverse cycle of poverty as described by Negrelle et al. (2012) Anacleto et al. (2024).

## 5. Final considerations

The study revealed that all interviewees were men, the vast majority of whom were married or in a stable relationship (93.7%), with an average age of 48 years, and had been involved in crab harvesting since adolescence. The vast majority had low levels of education (71.48% had not completed elementary school) and a significant portion were illiterate (n=25.44%).

The average catch of 44 dozen crabs occurred in 5.9 hours per day of work in the mangrove, repeated for 3.6 days per week, primarily from Tuesday to Friday so that trading would be easier on weekends, and the increase in average family income occurred in the order of 22.87% during the harvest period.

The positive factors reported were the extra financial income, high demand from buyers and the negligible cost of capture, and the negative factors reported were the exhausting work, low sales price and the decrease in the quantity collected.

Specifically for this group of workers, no specific health guidance programs or actions were found, nor is there any labor legislation to protect them. The precariousness of the activity has been “normalized” and the collectors remain invisible to the State.

Finally, it is possible to consider that crab capture, although essential for the subsistence of many families, offers temporary income that is not sufficient to guarantee long-term economic security, and the change in scenario for the community itself is apparently a situation that is very difficult to reverse.

Although it was not the subject of this study, there were several reports from interviewees indicating that in recent decades the crabs have been decreasing in quantity and size. Therefore, it is recommended that new studies on the subject be carried out to assess the levels of this situation.

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