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Socio-Cultural Value and Marketing Chain of Edible Land Snails (Stylommatophora, Achatinidae) along the Kisangani–Ituri Road Axis (DR Congo)

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ABSTRACT

The socio-cultural value and marketing chain of edible land snails analyzes the dietary, cultural, and economic importance of land snails in Tshopo Province. The study was conducted along the Kisangani–Ituri road axis, specifically in the villages of Bandibu, Basokwambula, Babunjango, and Bafwaboli. Data were collected between April and June 2025 from 60 stakeholders (collectors, vendors, and consumers) using semi-structured questionnaires and direct observations.

The results show that 90% of respondents regularly consume snails, mainly of the genus *Achatina*, and that 95% are marketed fresh. Snails play a major role in food consumption, traditional pharmacopoeia, and ritual practices, with customary taboos varying among tribes (Lokele, Turumbu, Ngando, Rumbi, Mbole, and Topoke). Marketing is largely based on short supply chains, although longer circuits supply the urban market of Kisangani, generating higher incomes.

Edible land snails constitute an important resource for food security and local incomes. Their sustainable management requires an integrated approach that takes into account cultural, economic, and environmental dimensions.

Keywords: Land snail, Achatina, marketing, culture, Kisangani

INTRODUCTION

General context

Non-timber forest products (NTFPs) play an important role in the economy and livelihoods of rural and urban communities in the Democratic Republic of Congo (DRC). Among these resources, edible land snails are significant as a source of animal protein accessible to the majority of local populations (Gevaerts, 2007; Gambalemoke *et al.,* 2008). For many years, snail consumption has been part of the cultural and dietary practices of numerous tribes in the Congo Basin, where it is integrated into cultural ceremonies, traditional medicine practices, and social exchanges such as bride price (Pilsbry, 1919; Magnin & Martin, 2012).

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In the Kisangani region and along the Kisangani–Ituri road axis, land snails serve as a staple food for certain communities and are valued for their taste, seasonal availability, and presumed medicinal and mystical properties (Lebakwa, 2004; Oye, 2005; Arakayo, 2010; Lifoli, 2021). However, despite their socio-economic and cultural importance, the snail sector remains poorly studied, and their exploitation is not regulated under Congolese forestry legislation, unlike other NTFPs and in countries such as France, where collection is controlled (Fortier, 1999; Lifoli, 2020).

Problem Statement

Although land snails are widely consumed and integral to local traditions, few studies focus on their social representations, associated customary taboos, and the marketing chains that enable their circulation in rural and urban markets. This knowledge gap limits understanding of the interactions between cultural uses, diet, and the local economy and hinders the development of sustainable management strategies for this resource (Sodjinou et al., 2001; Marco et al., 2024).

Therefore, it is necessary to identify local communities' perceptions of edible snails, describe their dietary, medicinal, and cultural uses, and map the marketing chain to assess their contribution to the local economy and food security.

MATERIALS AND METHODS

Study Area

The study was conducted along the Kisangani–Ituri road axis, in the Tshopo Province (DRC). Four villages were targeted due to their involvement in the collection and consumption of edible land snails: Bandibu, Basokwambula, Babunjango, and Bafwaboli. This area features a forest and agroforestry landscape where snails are abundant and integrated into the dietary and cultural practices of local communities. The selected villages also provide a representative overview of the different tribes in the region (Lifoli, 2020).

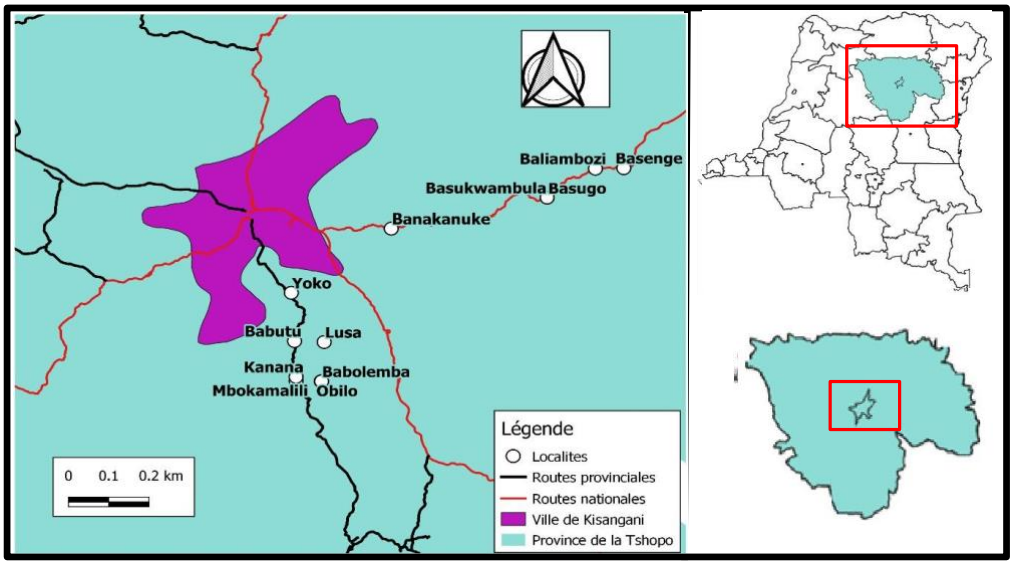


Fig. 1: Location of the study area

Population and Sampling

The study population included three categories of actors in the edible land snail sector: collectors, sellers, and consumers. A sample of 60 individuals was selected using the occasional

method, also known as convenience sampling. This technique involves interviewing available and accessible individuals who can provide the required information on snail uses, social perceptions, and marketing (Luhahi, 1998; Lifoli, 2020).

Data Collection

Data were collected between April and June 2025 using two main approaches:

1. Semi-structured questionnaires: Targeted at collectors, sellers, and consumers, these questionnaires covered the following aspects: knowledge of snail species, collection techniques, preparation methods and uses, social perceptions, customary prohibitions, prices and profit margins, as well as challenges encountered in the value chain.
2. Direct observations:Field visits allowed documentation of collection techniques, preservation methods, and culinary or ritual practices related to snails. This approach was essential for supplementing and validating the information provided by respondents (Sodjinou et al., 2001; Marco et al., 2024).

Data Analysis

The data analysis combined both qualitative and quantitative approaches:

Qualitative data were used to describe the dietary, medicinal, and cultural uses of snails, as well as their social perceptions and customary prohibitions.

Quantitative data were processed as frequencies and percentages, allowing the assessment of the proportion of consumers, the distribution of collection techniques, marketing channels, and the income generated at each level of the value chain. These analyses provided an overall view of the socio-economic and cultural dynamics of edible land snails along the Kisangani–Ituri axis (Lifoli, 2020; Gambalemoke et al., 2008).

RESULTS

1. Collection Techniques and Condition of Snails

Communities along the Kisangani–Ituri axis use several techniques to collect edible land snails, adapted to the season, snail size, and local traditions. The main methods include:

Natural baits: using crushed papaya leaves, palm nut pulp, or food wrappers (such as chikwangue) to attract snails to collection areas.

Manual collection: snails are gathered directly from tree trunks, fallen leaves, or with the help of flashlights at night.

Habitat observation: some communities, such as the Bafwamboli, prefer searching in humid and shaded areas where snails are naturally more abundant.

Regarding snail condition, 95% of snails are sold fresh, while only 5% are smoked or dried for long-term preservation. Snail availability varies seasonally: the rainy season corresponds to peak abundance, whereas the dry season leads to scarcity, mainly due to local deforestation and intensive harvesting. The main causes of scarcity reported by collectors, sellers, and consumers include destruction of natural habitats, overharvesting, and unfavorable climatic conditions.

2. Social Perceptions and Cultural Uses

Edible land snails have significant socio-cultural value. Respondents perceive this resource as:

- A source of traditional food, but also a symbolic good linked to ritual ceremonies;
- A mystical element, used in rituals to repel evil spirits or attract good luck. Snail excrement or shells are sometimes burned and scattered in fields to protect crops;

- A dowry attribute, where some families require the delivery of snails as part of the marital payment, especially among the Topoke and Lokele tribes.

These perceptions vary by tribe and village. Among the Ngando and Rumbi, snails are considered sacred and forbidden in certain contexts, whereas among the Turumbu and Lokele, they are primarily regarded as a prestigious dish and a symbol of prosperity.

3. Food Consumption and Preparation Methods

The consumption of snails is widespread, with 90% of respondents reporting that they eat them regularly. The most preferred species are *Achatina sp*., particularly large-sized individuals, vernacularly called "Abese."

The most common preparation methods are:

1. Boiling to facilitate meat extraction.
2. Vegetal salt sauce (Makali), favored for its traditional flavor.
3. In papillote (cooked in a parchment parcel) or mixed with cassava leaves.
4. Frying or tomato sauce, less common but adopted by some urban families.

Culinary practices vary by tribe. The Lokele consume very small snails without removing the shell, whereas the Turumbu remove the last two whorls to eliminate impurities.

4. Medicinal and Ritual Uses

Snails and their shells have multiple medicinal uses:

- Calcined shell powder is used to heal burns, treat fractures, dental caries, and certain digestive disorders.
- Snail extract is used in some communities to reduce stuttering in children.

For rituals, snails are used to:

- Ward off evil spirits during traditional ceremonies.
- Protect crops by scattering shells or excrement in the fields.

These uses are more prevalent among the Topoke and Lokele, while among the Ngando and Rumbi, snails are primarily symbolic and associated with specific prohibitions.

5. Customary Prohibitions According to Tribes

Food and customary prohibitions have been reported and vary according to the tribes. Among the Lokele and Turumbu, the prohibitions mainly concern pregnant women and those with condylomas, due to fears of negative health effects. The Ngando and Rumbi forbid the consumption of snail flesh because of its symbolic resemblance to the female genital organ, which is interpreted as a form of cannibalism. These results indicate that snail consumption is strongly influenced by the cultural beliefs specific to each tribe, as presented in the table below.

Table 1: Customary Prohibitions by Tribe

Tribes	Customary prohibitions	Social perceptions
Lokele & Turumbu	Prohibition for pregnant women	Birth of a drooling baby
	Prohibition for women with condyloma	Eating the head causes the multiplication of the condyloma
Ngando & Rumbi	Prohibition of consuming the flesh	Resemblance to the female genital organ (a form of cannibalism
	Prohibition from traveling when encountering a snail on the way	Bad luck
	Prohibition from touching a trap where snails are located	

Mbole	Prohibition of consuming the flesh	Resemblance to the female genital organ (a form of cannibalism)
	Prohibition from touching the fields or fruit trees where snail shells are attached	Fetish: bad luck (elephantiasis, lightning…)
Topoke	Do not use the farm work machete to cut a snail shell	Bad luck: poor crop yield
	Prohibition for pregnant women	Dystocic labor
		Drooling baby
	Do not use the farm work machete to cut a snail shell	Bad luck: poor crop yield
	Do not touch the fruit tree where the snail shell is attached	Fetish: bad luck (elephantiasis, lightning…)

The table above shows that snail consumption is strongly influenced by the cultural beliefs specific to each tribe.

6. Marketing chain and income

The marketing of snails occurs through three main channels:

- ✓ Short channel (predominant): collector → local consumer. The price is about 1,500 CF for 4 or 5 large snails (0.51 USD). The majority of the collected snails are intended for personal consumption.
- ✓ Intermediate channel: collector → retailer → consumer. Retailers buy the snails to resell them the same day or the next day, generating an average margin of 33%.
- ✓ Long channel: collector → wholesaler → urban market (Kisangani). The final selling price reaches 5,000 CF for 4 snails (1.7 USD), representing the highest contribution to local income, as shown in the figure below.
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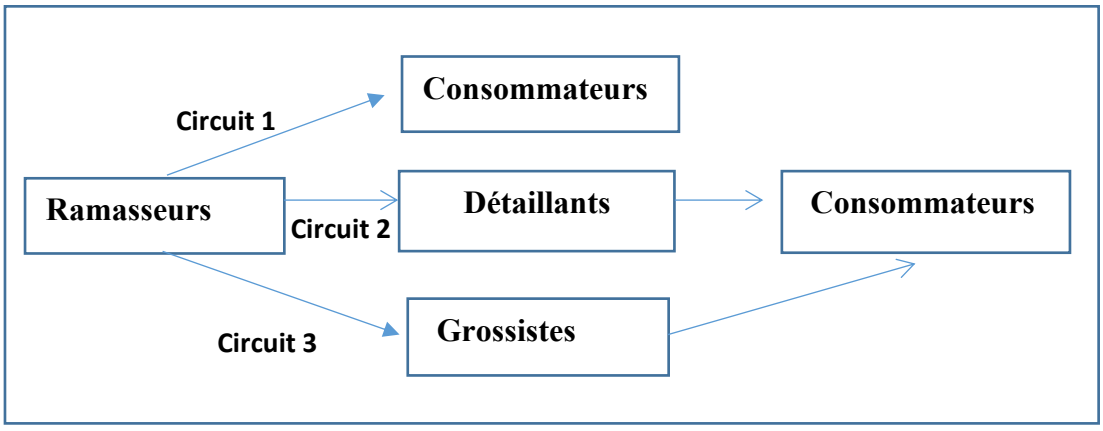


Fig. 2: Marketing channels of edible land snails

The sector is informal and unregulated, but it contributes significantly to household income, especially during the rainy season. The villages of Bandibu and Babunjango show the most active short supply chains, while Bafwamboli and Basokwambula supply the urban market to a greater extent.

Edible land snails represent a resource that is simultaneously nutritional, cultural, and economic, with their management and commercialization closely linked to tribal practices and local market dynamics.

DISCUSSION

Collection techniques and snail availability

The results of this study show that the collection techniques for edible land snails along the Kisangani–Ituri axis are primarily based on manual harvesting and the use of natural baits, notably crushed papaya leaves and palm nut pulp. These practices are similar to those observed in the Yangambi landscape (Lifoli, 2020) and reflect the communities' adaptation to local ecological conditions. Unlike some regions in West Africa, where digging and trapping are more common (Sodjinou et al., 2001), the populations studied favor simple, low-cost, and accessible techniques. The seasonal scarcity reported by respondents is mainly attributed to forest habitat degradation and increasing collection pressure, confirming the close link between resource availability and environmental dynamics (Gambalemoke et al., 2008).

Social representations and cultural uses

Edible land snails occupy an important place in the social representation systems of the communities along the Kisangani–Ituri axis. The results reveal that this resource is perceived simultaneously as food, a cultural good, and a symbolic object. These findings support the observations of Magnin and Martin (2012), who highlighted that snails actively participate in the cultural and symbolic constructions of human societies. The association of snails with rituals, bride price, and mystical practices—particularly among the Topoke and Lokele—demonstrates that their value extends far beyond mere nutrition. These representations strongly influence usage and help maintain traditional practices deeply rooted in tribal identities.

Food consumption and culinary practices

The high proportion of snail consumers observed in this study confirms the significant role of this resource in local food security, especially in a context where animal proteins are increasingly expensive and inaccessible (Gambalemoke et al., 2008). The marked preference for species of the genus *Achatina* is also reported in other studies in the DRC and Central Africa (Arakayo, 2010; Lifoli, 2020). The identified preparation methods, notably vegetable salt sauce (Makali) and cooking en "liboké", reflect a diversity of culinary practices closely linked to local traditions, as also documented by Mbétid (2006) and Sodjinou et al. (2001).

Medicinal and ritual uses

The medicinal uses of snails and their shells reported in this study confirm their importance in traditional pharmacopoeia. The use of calcined shell powder for healing burns, treating fractures, and certain digestive ailments aligns with observations made in Benin and Central Africa (Sodjinou et al., 2001; Marco et al., 2024). These practices rely on endogenous knowledge passed down through generations and highlight the therapeutic value of snails within local communities. Ritual uses, in turn, reinforce the mystical dimension of this resource, often associated with protection against evil spirits or the fertility of crops.

Customary taboos and tribal differentiation

The dietary and customary taboos identified vary considerably between tribes and reflect distinct belief systems. Taboos concerning pregnant women among the Lokele, Turumbu, and Topoke reflect the perception of snails as potentially harmful to human reproduction, while the symbolic association of snail flesh with the female genital organ among the Ngando, Rumbi, and Mbole reveals an anthropomorphic and moral interpretation of food. Such dietary taboos have also been documented in other African societies, where food choices are strongly governed by social and symbolic norms (Magnin & Martin, 2012).

Marketing chain and economic contribution

The marketing chain of edible land snails along the Kisangani–Ituri axis is dominated by short supply chains, directly linking collectors to consumers. This structure is characteristic of non-timber forest products (NTFPs) in the DRC, where informality and self-consumption prevail (Lifoli, 2020). However, the existence of longer chains supplying urban markets in Kisangani demonstrates the economic potential of this resource. Despite relatively low unit revenues at the local level, snail sales provide an important supplementary income, especially for rural households during the rainy season. The lack of specific regulations on the collection and marketing of snails, unlike in some European countries (Fortier, 1999), poses challenges for sustainable management.

CONCLUSION

This study highlights the socio-cultural, nutritional, and economic importance of edible land snails along the Kisangani–Ituri road axis in the Democratic Republic of Congo. The results show that snails, mainly of the genus Achatina, play a significant role in the diets of local communities.

Beyond their nutritional value, snails are associated with complex social representations that vary among tribes. They are used in traditional medicine, ritual and symbolic practices, and are subject to customary taboos that strongly influence their consumption and exploitation.

The analysis of the marketing chain reveals a sector dominated by short supply chains, generating low local income, despite higher economic potential in urban markets.

Therefore, sustainable management of edible land snails requires an integrated approach that considers cultural, economic, and environmental dimensions, in order to strengthen food security, local incomes, and biodiversity conservation in the Kisangani–Ituri region.

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