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Research article

Entrepreneurial potential of entomophagy tourism in Mopani District, Limpopo province, South Africa

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ABSTRACT

This study explores the entrepreneurial opportunities and challenges related to the development of entomophagy tourism focused on mopane worms in the Mopani District of Limpopo Province. The main objective is to identify both barriers and opportunities for integrating mopane worm consumption into sustainable tourism, thereby supporting local entrepreneurship and cultural preservation. Using a mixed-methods approach, the research includes quantitative surveys of 360 ecotourists and qualitative interviews with community members and tourism practitioners. Thematic analysis was employed to uncover significant socio-cultural and economic factors influencing this emerging sector. The findings reveal substantial potential for income generation, job creation, and the preservation of cultural heritage; however, these opportunities are tempered by negative perceptions, insufficient coordination, and limited collaboration among stakeholders. These insights highlight the need for enhanced marketing strategies, educational initiatives, policy support, community training, and inclusive partnerships. This study contributes by framing mopane worm consumption as an innovative tourism product that leverages indigenous ecological resources for sustainable rural development, while enriching the literature on sustainable and cultural tourism.

KEYWORDS

Entomophagy tourism; Mopani District; Sustainable tourism; entrepreneurship; ecotourism

Introduction

Entomophagy tourism refers to travel experiences that involve engaging with edible insect-based cuisine and associated cultural practices. This form of tourism has been widely embraced in regions where insect consumption is culturally embedded, including parts of Asia, Latin America, and Africa (Van Huis et al., 2013). In recent years, food-based experiences have emerged as a key strategy for attracting tourists, particularly in culturally rich destinations, as they offer immersive and sustainable tourism opportunities (Ramos-Elorduy, 2009; Jonson & Masa, 2023). However, South Africa has yet to fully integrate this concept into structured tourism offerings (Mkhize, 2023). Mopane worms, the larvae of the emperor moth (*Gonimbrasia belina*), serve as an important dietary and economic resource in Limpopo Province and hold considerable potential for the development of entomophagy-based tourism. Although these edible insects are commonly sold in informal markets and occasionally featured on urban menus, their inclusion in mainstream tourism remains fragmented (Mkhize, 2023). Existing studies indicate that incorporating distinctive local food products into tourism offerings can enhance destination attractiveness while generating income for local communities (Hanboonsong et al., 2013; Yusnita & Awang, 2019). The Mopani District, with its rich biodiversity and strong cultural ties to mopane worms, presents a valuable opportunity to pioneer entomophagy tourism (Hlongwane et al., 2021). Bridging this gap could position the region as a leader in ethically grounded and culturally immersive tourism, while simultaneously strengthening local economic resilience. Such integration may support local entrepreneurship, promote sustainable practices, and enhance community participation in tourism development (Kummitha et al., 2021). This study therefore explores the viability of structuring entomophagy as a sustainable business model that generates income for local communities and enriches ecotourism experiences. By examining both tourist interest and the perspectives

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of local stakeholders, the research identifies pathways through which entomophagy tourism can contribute to entrepreneurial development within the selected province.

This article is structured as follows. It begins with an introduction that defines entomophagy tourism and justifies the focus on the Mopani District by highlighting its cultural and ecological significance. The literature review follows, examining global trends in entomophagy tourism, its limited development in South Africa, and the entrepreneurial potential of integrating insect consumption into sustainable tourism. The potential for entomophagy tourism in Mopani is then discussed, with particular emphasis on its alignment with global best practices and the need for strategic development. A detailed overview of the Mopani District as the study area is presented thereafter, followed by the research methodology, which adopts a mixed-methods approach combining quantitative surveys of tourists with qualitative interviews with local stakeholders. The results section presents findings on tourists' openness to edible insects and community perspectives on the economic and cultural significance of mopane worms. This is followed by a discussion of the implications for tourism entrepreneurship, including challenges such as stigma and seasonality, as well as strategies for product adaptation and stakeholder collaboration. The article concludes by affirming the entrepreneurial viability of entomophagy tourism in Mopani and its potential to promote inclusive and sustainable local development, followed by a list of all referenced scholarly works.

Literature review

Global entomophagy tourism trends

Entomophagy has formed part of human diets for centuries, with insects serving as a sustainable source of protein, vitamins, and minerals (Mkhize, 2023; Van Huis et al., 2013). In recent years, it has increasingly been incorporated into the tourism industry, particularly within ecotourism and cultural tourism frameworks (Mkhize, 2023). Culinary tourism, in particular, has been shown to attract visitors seeking authentic and immersive experiences by linking food traditions with cultural identity and local economies (Deroy et al., 2015). Globally, entomophagy tourism has been successfully integrated into both ecotourism and culinary tourism offerings, often serving as a cultural bridge that connects visitors with local traditions, ecosystems, and sustainable practices (Yen et al., 2013). These international models provide valuable insights into how insect-based food experiences can attract tourists, support rural economies, and preserve indigenous food knowledge. In Thailand, for example, deep-fried crickets, silkworm pupae, bamboo worms, and giant water bugs are staple foods in bustling night markets in cities such as Chiang Mai and Bangkok. Tourists are often drawn by the novelty and excitement of tasting these insects, frequently documenting their experiences on social media. These markets successfully combine local food heritage with contemporary tourism trends, contributing significantly to local incomes (Hanboonsong et al., 2013). Furthermore, the Thai government has supported insect farming as a sustainable industry, thereby reinforcing its role in both tourism and food security. In Mexico, the consumption of chapulines (grasshoppers), escamoles (ant larvae), and jumiles (stink bugs) is deeply rooted in pre-Hispanic traditions. These insects are commonly served in traditional dishes such as tacos and salsas, and are prominently featured in food festivals, restaurants, and cooking classes designed for international tourists. Ramos-Elorduy (2009) notes that insect consumption in Mexico is not only culturally significant but also an important source of protein for rural populations. Culinary tours in regions such as Oaxaca increasingly highlight edible insects, offering both gastronomic and educational experiences.

In Australia, Indigenous-led "bush tucker" tours offer immersive cultural experiences that introduce tourists to native edible plants and insects, including witchetty grubs, honey ants, and bogong moths. These tours educate visitors about Aboriginal ecological knowledge, traditional harvesting techniques, and the spiritual significance of native foods. According to Yen (2015), such initiatives contribute to cultural revitalisation while providing economic benefits to Indigenous communities, thereby representing strong examples of ethical and sustainable tourism. In Japan, insect-based cuisine is experiencing a revival in rural tourism destinations. In Nagano Prefecture, for instance, inago (rice-field grasshoppers) and hachi-no-ko (wasp larvae) are served in traditional ryokan inns and countryside restaurants. These foods are often presented as nostalgic, regional delicacies that reflect seasonal cycles and agricultural heritage. Tourists are encouraged to view them not merely as food, but as part of a broader cultural and lifestyle experience. In Europe, particularly in the Netherlands, modern food laboratories, pop-up restaurants, and culinary festivals have begun incorporating insect-based dishes into broader discussions on sustainability and alternative protein sources. Events such as the "Insect Experience" and various food technology expos attract tourists interested in future foods, climate-friendly diets, and gastronomic innovation (Van Huis et al., 2013). Even in the United States, where entomophagy is less culturally embedded, chefs and entrepreneurs have developed niche markets for products such as cricket tacos, mealworm burgers, and ant-infused cocktails (Deroy et al., 2015). Cities including San Francisco and New York have hosted insect-themed dining events,

while some insect farms now offer agri-tourism experiences that educate visitors about the environmental and nutritional benefits of insect protein (Shelomi, 2015). These global examples demonstrate that entomophagy tourism can be adapted to a wide range of cultural contexts and tourist motivations, including adventure, novelty, environmental consciousness, and heritage exploration. For South Africa, particularly Limpopo Province, the integration of mopane worms and other indigenous edible insects into guided culinary tours, cooking demonstrations, storytelling experiences, and cultural festivals presents a significant opportunity to attract both domestic and international tourists. Drawing on these international models, local communities can develop tourism offerings that are authentic, sustainable, and economically empowering (Dobermann et al., 2017).

Despite the long-standing tradition of consuming mopane worms in South Africa, entomophagy remains underdeveloped as a structured tourism product. Mopane worms, widely consumed for their high protein content, provide an important economic lifeline for rural communities (Hlongwane et al., 2021). However, structured tourism offerings, such as guided harvesting tours and culinary experiences, are largely absent, thereby limiting their potential to generate cultural and economic benefits within the tourism sector (Dzerefos et al., 2013). The development of entomophagy tourism aligns with several Sustainable Development Goals (SDGs), including SDG 12 (responsible consumption) and SDG 13 (climate action), as insect-based diets require significantly fewer resources than conventional livestock farming (FAO, 2020; Mkhize et al., 2024). Additionally, it contributes to SDGs 1, 2, 4, 8, and 17 by promoting job creation, food security, education, and sustainable entrepreneurship.

Entrepreneurship and entomophagy tourism

Entrepreneurship involves identifying, evaluating, and exploiting opportunities to create and manage ventures that generate value, often through innovation and calculated risk-taking (Chilli, 2018). It encompasses a range of activities, including opportunity recognition, resource mobilisation, and the development of new products, services, or markets (Peneder, 2009). Within the tourism context, entrepreneurship refers to identifying, evaluating, and exploiting opportunities in the tourism industry to develop innovative ventures that enhance visitor experiences and stimulate economic growth. It combines business acumen with creativity to support the development of sustainable tourism initiatives, such as ecotourism projects, boutique accommodation, and cultural heritage experiences (Mkhize & Ivanovic, 2020; Ramukumba, 2023). Tourism entrepreneurship that draws on local knowledge and cultural assets has been shown to improve community livelihoods while supporting sustainable business models (Chiutsi & Mudzengi, 2012). Tourism entrepreneurship has increasingly emerged as a transformative force for local economic empowerment, particularly in rural and marginalised regions. Studies across diverse contexts, from micro-tourism enterprises in Langkawi Island (Nordin et al., 2014) to Community-Based Tourism Enterprises (CBTEs) in Zimbabwe (Chiutsi & Mudzengi, 2012), demonstrate how tourism entrepreneurship can increase income levels, create employment opportunities, and improve living standards, while simultaneously promoting environmental stewardship. Community-based models further highlight the importance of training, mentorship, and market linkages in enabling marginalised groups to participate effectively in tourism ventures (Kummitha et al., 2021).

Potential for entomophagy tourism in Mopani district

In South Africa's Mopani District, entomophagy tourism presents a unique opportunity to align cultural preservation with economic resilience. Although mopane worms are widely sold through informal markets, the lack of integration into cohesive ecotourism offerings limits their broader commercial potential (Dzerefos et al., 2013). Evidence from comparable rural tourism contexts suggests that formalising indigenous food systems into structured tourism products can significantly enhance both income diversification and destination competitiveness (Scheyvens, 2007; Ashley & Roe, 2002). Drawing on examples such as Malaysia's homestay programmes (Yusnita & Awang, 2019) and India's community-based ecotourism initiatives (Kummitha et al., 2021), Mopani could develop structured entomophagy experiences, including guided harvesting tours, cooking workshops, and cultural storytelling activities, to diversify income streams and strengthen local participation. Addressing existing barriers, such as inadequate infrastructure and limited access to funding, will require the adoption of strategies similar to those implemented in Zimbabwe's CBTEs, where mentorship programmes, microfinance initiatives, and market linkages have empowered marginalised communities (Chiutsi & Mudzengi, 2012). Moreover, integrating local food heritage into tourism offerings has been shown to enhance authenticity and deepen tourist engagement, particularly when supported by effective destination marketing and stakeholder collaboration (Gössling & Hall, 2021). Embedding entomophagy tourism within SDG-aligned frameworks, including climate-smart practices (Mkhize et al., 2024) and biodiversity conservation (Van Huis et al., 2013), could further position Mopani as a leader in ethical and sustainable tourism. This approach aligns with global trends in which

environmentally conscious travellers increasingly prioritise sustainable and experiential tourism products (UNWTO, 2021). By fostering entrepreneurial capabilities and leveraging the district's rich biodiversity, entomophagy tourism has the potential to stimulate job creation, reduce rural–urban migration, and strengthen cultural identity, thereby transforming a traditional practice into a sustainable driver of community development (Dobermann et al., 2017; Hlongwane et al., 2021).

Materials and methods

The Mopani District, located in the northeastern part of Limpopo Province, is among the poorest regions in South Africa (Mopani District Municipality, 2018). Its name is derived from the abundance of mopane trees, which provide the natural habitat for mopane worms. The district's rich biodiversity, combined with its strong cultural ties to entomophagy, makes it an ideal location for investigating the commercialisation of insect-based tourism. The region is one of the most prominent areas for mopane worm harvesting, with many households relying on these insects as a key source of both food and income (Mopani District Municipality, 2018). In addition, Limpopo Province is renowned for its ecotourism assets, including the Kruger National Park and several nature reserves, further strengthening its suitability as a study area. This study employed a concurrent mixed-methods approach, integrating qualitative and quantitative research methods to provide a comprehensive understanding of entomophagy tourism in the Mopani District. Mixed-methods research is widely used in tourism studies to capture both numerical trends and in-depth insights from key stakeholders (Creswell & Plano Clark, 2023). The quantitative component involved structured surveys to assess ecotourists' demographics, perceptions, and attitudes towards edible insects. The qualitative component comprised semi-structured interviews with key stakeholders, including community members, tourism officials, and ecotourism employees, to explore their perspectives on the opportunities and challenges associated with entomophagy in tourism (Yin, 2017). Ethical clearance for the study was obtained from NWU. All participants provided informed consent, and the data were anonymised, treated confidentially, and securely stored. A structured questionnaire was administered to 360 tourists between November 2021 and May 2022 at key tourism sites, including ecotourism lodges, nature reserves, and local tourism centres. The survey collected demographic information and assessed perceptions of responsible tourism, food preferences, and attitudes towards edible insects. A non-probability sampling method, specifically convenience sampling, was used to recruit participants who were actively engaged in tourism activities, ensuring accessibility and willingness to participate (Etikan et al., 2016). This approach is commonly applied in tourism research due to the practical accessibility of respondents in field settings (Veal, 2017). The sample size was determined using Bujang's (2021) formula to achieve a 95% confidence level with a 5% margin of error, thereby ensuring statistically robust insights into visitor perspectives.

A purposive (non-probability) sampling approach, also referred to as judgmental or selective sampling, was employed to select participants in the qualitative component, based on specific criteria relevant to the study objectives. This method enables the inclusion of individuals with the knowledge and experience necessary to provide meaningful insights into the research topic (Patton, 2015). Semi-structured interviews were conducted in June 2022 with a diverse group of key stakeholders, including community leaders, villagers, government tourism officials, and ecotourism employees (Creswell & Poth, 2018). This approach facilitated an in-depth exploration of the relationship between entomophagy and tourism, generating rich qualitative data on their interconnected dynamics. The interviews explored participants' perceptions of entomophagy, its role in tourism, and the associated opportunities and challenges. A total of eight interviews were conducted. While this may be considered a relatively small sample, data collection took place during the COVID-19 pandemic, which limited participant access. The sample comprised:

- One male community leader (66 years old) representing the local community
- Three female villagers (aged 37–56) actively involved in harvesting, consuming, and selling edible insects
- Four tourism employees, including two government officials and two ecotourism business representatives (three males and one female, aged 30–54)

This combined qualitative and quantitative sampling approach ensured a diverse range of perspectives, enabling a comprehensive analysis of entomophagy's role in the Mopani District.

Results

This section presents the findings from the quantitative survey of ecotourists and the qualitative interviews conducted with community members and tourism stakeholders in the Mopani District. The primary aim was to examine tourist attitudes towards edible insect-based culinary experiences, preferences for consumption

formats, and to align these insights with existing community practices and potential entrepreneurial opportunities.

Quantitative results

Tourists generally demonstrated a strong openness to culinary exploration, particularly within culturally immersive contexts. As shown in Table 1, most respondents expressed interest in trying local cultural foods as well as foods from different regions. They also indicated a degree of comfort with trying unfamiliar foods in social settings, such as dinner events. These findings suggest a robust foundation for introducing insect-based tasting experiences within a socio-cultural framework.

Table 1: Tourists' attitude towards novel and local foods

Item	Mean
I enjoy trying local cultural foods	4.38
I enjoy trying food from different regions	3.62
I like trying unfamiliar food in a social setting	3.72
I do not trust unfamiliar food	2.49
I feel anxious about eating food I am not familiar with	2.68

Although there was a general willingness to try new foods, some respondents expressed reservations. Indicators of food neophobia were evident, with mean scores of 2.49 and 2.68 reflecting mistrust and discomfort, respectively. This aligns with Yen (2015), who found that while adventure-oriented tourists are generally open to novel foods, unfamiliar formats or strong visual cues can trigger psychological resistance. Table 2 presents tourists' perceptions of edible insects measured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Overall, respondents held moderately positive perceptions. They agreed that insects are nutritious (M = 3.31) and environmentally sustainable (M = 3.38). Support for promoting edible insect consumption was also moderate (M = 3.47), while trust in health-related endorsements was relatively high (M = 3.70). However, some degree of cultural stigma persists. The statement "eating insects is disgusting" yielded a mean score of 2.83, while the belief that insect consumption is only acceptable in conditions of starvation scored 2.25. These perceptions reflect concerns highlighted by Meyer-Rochow (2020) regarding persistent associations of disgust and perceived unnaturalness as barriers to entomophagy.

Table 2: Visitor perception of edible insects

Perception Statement	Mean Score (1–5)
Insects are nutritious	3.31
Insects are environmentally sustainable	3.38
Support for promoting edible insect consumption	3.47
Trust in endorsements from health organisations	3.70
Eating insects is disgusting	2.83
Eating insects is only acceptable in starvation situations	2.25

When asked about their willingness to participate in insect tasting experiences, 68% of respondents indicated that they would "definitely" participate. Among those unwilling, the primary reasons included religious or cultural dietary restrictions (22%), perceived disgust or psychological discomfort (41%), and concerns related to food safety and hygiene (37%). These findings highlight the importance of carefully designing tasting experiences that prioritise hygiene, transparency, and cultural sensitivity (Mkhize-Simelane et al., 2024). In terms of prior exposure, only 21% of respondents had previously consumed whole insects, while 33% had tried processed insect-based products such as protein bars or flour-based foods. Among the 46% who had never consumed insect-based foods, the main reasons cited were lack of awareness (39%), limited access or opportunity (34%), and general discomfort with the concept (27%). These findings indicate a clear opportunity for both consumer education and product innovation. Van Huis (2015) argues that integrating insects into familiar food formats can reduce rejection and accelerate acceptance, particularly when the visual identity of insects is minimised. To further examine consumer preferences, participants were asked to rank different insect types based on their willingness to try them using a five-point Likert scale (1 = least willing; 5 = most willing). As shown in Table 3, crickets were the most preferred (M = 4.2), followed by ants (M = 3.9). This aligns with existing literature that identifies crickets as a "gateway insect" due to their mild flavour and frequent use in processed food products (Yen, 2009; Hartmann & Siegrist, 2017).

Table 3: Willingness to try different insect types

Insect type	Mean score
Crickets	4.2
Ants	3.9
Locusts	3.6
Mopane worm	3.1
Stink bug	2.8

Notably, mopane worms, despite their cultural significance in Limpopo Province, ranked fourth (M = 3.1). This suggests a disconnect between local cultural importance and tourist acceptance. Hesitation may stem

from their size, texture, and visual appearance when served whole. As noted by Dzerefos et al. (2013) and Van Huis et al. (2013), while mopane worms are vital for food security and livelihoods, their wider adoption in tourism contexts may require product adaptation, such as incorporation into sauces, stews, or processed forms. Stink bugs were the least preferred (M = 2.8), likely due to their strong sensory characteristics and negative associations linked to their name. Existing literature indicates that insects with strong odours or unfamiliar naming conventions tend to be less acceptable unless rebranded or modified in presentation (Gahukar, 2020). These findings underscore the importance of product design and presentation in entomophagy tourism. Crickets and ants may serve as "entry-point" insects for tourists, while mopane worms may require strategic adaptation to reduce visual and sensory barriers. Similarly, stink bugs may benefit from rebranding or limited use in culinary applications. With respect to preparation methods, Table 4 indicates a clear preference for integrated or less visually identifiable formats. Insect flour was the most preferred option (M = 4.5), followed by chopped (M = 4.0) and pureed forms (M = 3.8). Whole insects received the lowest preference score (M = 2.7).

Table 4: preferred preparation methods for insects

Preparation method	Mean Score (1-5)
Insect flour	4.5
Chopped into small pieces	4.0
Blended into puree	3.8
Cooked with other ingredients	3.5
Whole insects prepared alone	2.7

These findings are consistent with Schösler et al. (2012), who found that consumers are more likely to accept insects when incorporated into familiar or disguised food formats. To further explore this preference, respondents were asked about their tolerance for insect flour inclusion in common food products such as bread, pasta, muffins, and sauces. The aim was to determine whether acceptance increases when visual cues are eliminated.

Table 5: Acceptable insert flour inclusion rates

Insert flour inclusion	% of respondents
0% total rejection	12%
Up to 5%	34%
5-10%	32%
10-25%	14%
25% or more	8%

As shown in Table 5, a majority of respondents (66%) were willing to accept insect flour in small quantities (up to 10%). A smaller segment (14%) was open to moderate inclusion levels (10–25%), while only 8% accepted high inclusion levels (25% or more). Notably, 12% of respondents rejected insect flour entirely, indicating persistent psychological or cultural resistance even when insects are disguised. Overall, while tourists demonstrated a promising openness to entomophagy, their preferences clearly indicate the need for product adaptation. Integrated formats, such as insect flour or finely processed ingredients, are more acceptable than whole insects. Culturally significant species, such as mopane worms, may require strategic presentation and rebranding to enhance acceptance among international tourists. These findings provide a valuable foundation for aligning local practices with tourist expectations, thereby positioning entomophagy as a viable and sustainable tourism product

Qualitative results

The section below presents the results of the interviews conducted. In examining the potential of entomophagy tourism in South Africa's Mopani District, it was essential to understand the role of local community engagement and entrepreneurship in shaping this emerging sector. The study aimed to explore the economic contributions of selling edible insects, the types of insects traded, the demographics of buyers, and community perceptions of prospects. Through interviews with villagers, community leaders, and tourism stakeholders, a detailed understanding emerged of how deeply entomophagy is embedded in local livelihoods and how it may be developed as a sustainable tourism product. The interviews revealed that the sale of mopane worms, in particular, is more than a seasonal activity and serves as a vital source of income for many rural households. Community members emphasised that this income supports basic needs such as food, education, and housing. One participant explained, "Yes, people are already making money from selling those edible insects, and with that money, they feed themselves, take their children to school, and buy materials to build their houses." This finding is consistent with Dzerefos et al. (2013), who documented the economic importance of mopane worms in southern Africa, particularly in rural communities with limited access to formal employment. Despite its importance, this livelihood strategy faces several challenges. The seasonal availability of insects, particularly mopane worms, leads to fluctuations in supply, which in turn affects pricing. As one villager noted, "If there is a lot, then a container that we use to sell them

in becomes a bit cheaper because they are widely available." This observation reflects findings by Stack et al. (2003) and Thomas (2013), who highlighted the seasonal and labour-intensive nature of insect harvesting and its impact on income stability and resource sustainability.

While mopane worms dominate the local edible insect market due to the abundance of mopane trees, other species such as termites, stink bugs, and locusts are also harvested and sold, although less frequently. Their availability depends largely on seasonal environmental conditions, which limit opportunities for year-round commercialisation. However, as Van Huis et al. (2013) suggest, this biodiversity presents an untapped opportunity for culinary diversification within ecotourism, particularly if supported by structured harvesting and preservation practices. Understanding consumer demographics further highlights the potential for targeted marketing strategies. The study found that both international and domestic tourists purchase edible insects, although their motivations and levels of interest differ. International tourists, particularly those from Asian countries, were identified as the most consistent consumers. As one community leader noted, "We also get international tourists who buy some of our insects, and most of them come from China and Japan; these are the top buyers." This finding aligns with global patterns of entomophagy, where countries such as China and Japan already demonstrate fewer cultural barriers to insect consumption (Yen et al., 2013). Domestically, tourists from Gauteng, Limpopo, and the Western Cape were also identified as frequent consumers, often motivated by curiosity or a desire for authentic cultural experiences. This was supported by a tourism employee who stated, "Most of our tourists come from within South Africa, with our biggest feeders being Johannesburg and Cape Town." These findings are consistent with cultural tourism literature, which highlights a growing demand for immersive and experience-based travel (Sogari et al., 2018). Tourism stakeholders agreed that greater efforts are needed to promote edible insects as both a local delicacy and a sustainable food source. Participants recommended that mopane worms and other edible insects be integrated into tourism offerings such as cultural food festivals, cooking competitions, and tasting activities included in guided tours. One community leader suggested, "The best way will be to incorporate them with ecotourism. Instead of offering tourists typical everyday food like chicken, tourists could be given mopane worms." This perspective supports the work of Hlongwane et al. (2021), who emphasised the role of culturally significant food experiences in enhancing tourism appeal and community participation.

Preparation methods were also identified as an important factor in influencing tourist acceptance. Simple and flavourful cooking methods, such as frying mopane worms with onions and tomatoes, were frequently mentioned as effective ways to introduce new consumers to entomophagy. This highlights the importance of sensory appeal and presentation in food tourism, as noted by Ros Baró et al. (2022), who argue that taste and visual presentation play a key role in shaping consumer perceptions. Despite existing demand, community members and tourism stakeholders expressed mixed views regarding the future of entomophagy tourism. Some participants were optimistic, suggesting that improved marketing and education could increase acceptance and demand. One tourism employee stated, "This indicates that there already is a market, just that it needs to be marketed more." Others, however, raised concerns about persistent cultural stigma. The perception that eating insects is associated with poverty remains a significant barrier, as reflected in the comment, "Entomophagy is seen as the food of the poor, and people do not want to participate in it." This perception is widely documented, with Western-influenced cultural values contributing to the marginalisation of traditional food practices (DeFoliart, 1999; Meyer Rochow, 2020). Most participants agreed that repositioning edible insects as gourmet and environmentally responsible cuisine could improve their acceptance. Such a shift aligns with global efforts to promote entomophagy within sustainability discussions, particularly in relation to environmental conservation, resource efficiency, and reduced environmental impact compared to conventional livestock production (FAO, 2020; Gahukar, 2016). The dual potential of entomophagy as both an economic resource and a sustainable tourism product positions it as a promising yet underdeveloped opportunity. Overall, the findings indicate that the sale and promotion of edible insects already play a meaningful role in rural livelihoods in the Mopani District. This practice is well positioned to make a greater contribution to local tourism and economic development. However, achieving this will require targeted strategies to address cultural perceptions, improve supply stability through better preservation methods, and incorporate edible insects into tourism experiences that celebrate local identity and environmental sustainability. With appropriate strategic support, entomophagy has the potential to evolve from a niche tradition into an inclusive and sustainable component of ecotourism in South Africa.

Discussion, and implications

The findings from both the quantitative and qualitative phases highlight the promising yet underutilised entrepreneurial potential of entomophagy tourism in the Mopani District. The results indicate notable tourist interest and strong community involvement in the harvesting and sale of edible insects, particularly mopane worms, demonstrating the feasibility of developing a culturally grounded tourism niche. This underscores

the need for further research on effective development approaches, as well as the exploration of public and private partnerships to support growth. From a demand-side perspective, tourists expressed a clear preference for novel and culturally immersive food experiences, revealing a strong opportunity for entomophagy tourism. The integration of edible insects into culinary tourism can function as both an educational and gastronomic attraction through traditional dishes and cultural storytelling, supported by targeted marketing strategies. This approach aligns with key Sustainable Development Goals, including Zero Hunger, Responsible Consumption and Production, and Life on Land. Despite growing awareness of environmental and nutritional benefits, psychological and cultural barriers remain significant. Tourists expressed reluctance to consume insect-based foods due to feelings of disgust and discomfort, consistent with findings by Meyer Rochow (2020) and Tan et al. (2016). Qualitative findings further revealed the persistence of stigma, with entomophagy often associated with poverty. This reflects the "cultural politics of food" described by Bell and Valentine (1997) and highlights the need for strategies aimed at shifting perceptions. Culinary format emerged as a critical factor influencing acceptance, with tourists showing a clear preference for processed forms such as insect flour (M = 4.5) over whole insects (M = 2.7). This supports existing research by Schösler et al. (2012) and Hartmann and Siegrist (2017), which suggests that familiarity enhances consumer acceptance. These findings indicate that product innovation should prioritise familiar formats, while mopane worms may require rebranding and culinary refinement, supported by marketing and educational initiatives. From a supply side perspective, local communities are actively engaged in harvesting and selling edible insects, contributing to household income (Dzerefos et al., 2013; Stack et al., 2003). However, income remains inconsistent due to seasonality, limited storage capacity, and the absence of formal markets. This highlights the need for investment in preservation technologies and improved market access to support more stable livelihoods. Entomophagy tourism presents a transformative opportunity through curated experiences such as tasting events, harvesting excursions, and festivals. However, fragmented efforts and limited institutional support continue to act as barriers to development (Mottiar et al., 2018). While domestic tourists demonstrate interest, international visitors, particularly from Asian countries, represent more consistent demand (Yen et al., 2013). This suggests strong potential for positioning the Mopani District as a niche culinary tourism destination.

Conclusion

This study highlights a critical need for stakeholder collaboration if entomophagy tourism is to develop successfully. Coordinated efforts among community members, tourism businesses, local authorities, and food safety regulators are essential. The absence of regulatory standards for insect harvesting and sales not only constrains sector growth but also presents potential health risks. As noted in the abstract, addressing these gaps through inclusive governance will be essential in transforming entomophagy from an informal livelihood activity into a structured tourism economy. This study makes three key contributions to the growing body of literature on sustainable tourism and alternative food systems. First, it expands the geographical scope of entomophagy research by examining its integration into ecotourism in Limpopo Province, thereby addressing a notable gap in existing studies, which have largely focused on Asia, Europe, and Latin America. Second, by using a mixed-methods approach that combines surveys of ecotourists with interviews involving community members and stakeholders, the study provides a dual perspective on both demand and supply dynamics. This approach offers a deeper understanding of tourists' willingness to engage with insect-based culinary experiences, as well as local capacity for entrepreneurial participation. Third, the study provides practical insights to inform tourism development and policy formulation, including strategies related to product presentation, cultural reframing, and alignment with successful international models of insect-based tourism. These contributions enhance academic understanding while also offering practical pathways for developing entomophagy as a culturally grounded, economically inclusive, and environmentally sustainable tourism product. The findings confirm that entomophagy tourism in the Mopani District holds considerable entrepreneurial potential. It can contribute to income generation, support cultural preservation, and promote sustainable consumption practices. However, the success of this initiative will depend on effectively aligning community practices with tourist expectations, adapting local products through innovative approaches, and fostering collaboration among multiple stakeholders to formalise and strengthen the sector. If developed responsibly, entomophagy tourism could position Mopani as a national leader in sustainable and heritage-based tourism, while also serving as a model that can be replicated in other regions across Africa.

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