

Research Article

Antioxidant *Telange* Coffee Drink: Blue Brew, Better You

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Abstract: Step into the azure world called *Telange*, where coffee meets the celestial bloom of the butterfly pea flower. The melancholy of “Blue Brew” brings sensory alchemy, weaving together the aromatic emerald pandan leaves with medicinal nectar that screams modest sweetness, meliponini honey. Beyond the classic coffee beverage, *Telange* is a modern palate that integrates the ancient botanical wisdom with contemporary wellness. The innovative formulation offers extensive health benefits that address modern health concerns such as diabetes and hypertension, while retaining the classic flavors. Aligning with the aspirations of Malaysia’s National Agrofood Policy 2021–2030 and the Sustainable Development Goals (SDGs), *Tealang* transforms daily rituals into a vibrant, health-forward journey. *Telange* is not just a common coffee ritual, it is a strategic valorisation of culture and frontier in antioxidant game, it is an initial prototype proving that ‘blue brew’ is the new coffee crafted for ‘Better You’.

1. INTRODUCTION

The rising health and wellness awareness among customers has transformed the beverage industry worldwide and in Malaysia, particularly the development of functional beverages with nutritional and medicinal properties. Thus, functional beverages are chosen since consumers are becoming more attentive about substances that contribute to immunity, antioxidant consumption, mental well-being, and illness prevention (Singh et al., 2022). The demand for natural and plant-based drinks such as coffee has risen fast in Malaysia post the COVID-19 pandemic, which has had a substantial impact on consumer behaviour towards better food and drink consumption (Hussain et al., 2025). According to the Ministry of Health Malaysia statement, non-communicable diseases such as diabetes, obesity and hypertension are still on the rise among Malaysians and therefore encourage healthier choices with less refined sugar and natural ingredients (Ministry of Health Malaysia, 2023). Therefore, the relevance of novel drinks using native herbal ingredients and natural sweeteners is expanding in the Malaysian food innovation ecosystem. The combination of butterfly pea flower,

meliponini honey and pandan leaves in the coffee illustrates the growing tendency in Malaysia to incorporate traditional ingredients into modern functional drinks.

The flower of the Butterfly pea plant (*Clitoria ternatea*), better known as *bunga telang* in Malaysia, has gained considerable scientific interest due to its high levels of anthocyanins and antioxidants. The flower includes ternatins, naturally occurring blue pigments with antioxidant, anti-inflammatory, anti-diabetic and neuroprotective activities (Singh et al., 2022; Utami et al., 2023). Butterfly pea flower has been traditionally utilised in Southeast Asian nations such as Malaysia and Thailand in drinks, sweets and herbal treatments due to its bright colour and potential therapeutic properties (Mohamad Rizal et al., 2021). Recent research also showed that the butterfly pea flower drink had increased flavonoid and anthocyanin content that may improve antioxidant activity and general wellbeing (Utami et al., 2023). Moreover, the demand of consumers for drinks that are tinted using natural colourings has also increased due to the rising association of artificial food colourings with potential health issues (Singh et al., 2022). Hence, the addition of butterfly pea flower to coffee drink can improve the functional and nutritional properties of the drink and add aesthetic value.

Meliponini honey or *madu kelulut* as well-known as stingless bee honey has become one of the high value agrofood items in Malaysia due to its medicinal and commercial importance. Stingless bee honey includes significant amounts of phenolic compounds, flavonoids, vitamins, organic acids, and antimicrobial agents that confer antioxidant, antibacterial, and immune-boosting properties (Sujanto et al., 2021; Yusof et al., 2021). Meliponiculture in Malaysia has grown rapidly due to the increasing customer demand for natural health products and the government's assistance through the National Agrofood Policy 2021–2030 (NAP 2.0) (Ministry of Agriculture and Food Industries [MAFI], 2021). The growing market demand for premium honey products has made stingless bee rearing an essential economic activity among rural entrepreneurs (MAFI, 2021). Reports from the Department of Agriculture Malaysia said that meliponini honey is a natural sweetener alternative to refined sugar that is healthier with lower glycaemic effects and added bioactive compounds useful to human health (Yusof et al., 2021). Hence, the addition of meliponini honey into coffee drinks meets the current consumption patterns of health concerns, as well as encourages sustainable agrofood innovation in Malaysia.

Pandan leaves scientifically known as *pandanus amaryllifolius* is one of the essential traditional ingredients that is frequently used in Malaysian food and drinks due to its unique aroma and therapeutic benefits. Bioactive substances present in pandan leaves such as alkaloids, flavonoids, polyphenols and essential oils may have antioxidant and relaxing benefits (Nor et al., 2022). Pandan leaves have historically been documented for their usage in herbal drinks and traditional medicine to relieve stress, improve digestion, and boost general wellness (Nor et al., 2022). Pandan is quite popular in the Malaysian food and drink industry because of its aroma that provides sensory satisfaction and cultural familiarity to the local customer. Aromatic herbs such as pandan are possible functional drinks because they improve the acceptance of flavour while keeping the authenticity of natural products (Rahman et al., 2024). Thus, the introduction of pandan leaves in coffee drinks could enhance the consumers' sensory experience, along with providing phytochemical benefits and cultural value.

The combination of coffee, butterfly pea flower, meliponini honey and pandan leaves as a single drink composition has received little attention in research although there is an increasing popularity of herbal and functional drink in Malaysia. The previous research mainly focused on the individual ingredients and did not investigate the combined sensory, nutritional and functional qualities of these additives in specialty coffee drinks (Singh et al., 2022; Sujanto et al., 2021). Thus, this work is important in that it contributes to the growing body of knowledge on functional drink innovation, natural food items, and sustainable agrofood development in Malaysia. In addition, the proposed drink formulation is aligned with the national goals, including the National Agrofood Policy

2021–2030, Sustainable Development Goals (SDGs), and Malaysia's wellness-oriented food innovation agenda (MAFI, 2021). The mix of coffee, butterfly pea flower, meliponini honey and pandan leaves offers a new Malaysian inspired functional drink combining traditional knowledge, health boosting ingredients and modern consumer demands between 2021 and 2026.

2. LITERATURE REVIEW

Coffee consumption has become increasingly embedded within Malaysian social norms and modern lifestyle practices, particularly among working adults, university students, and urban communities. In Malaysia, coffee is no longer viewed solely as a drink for energy stimulation, but also as part of social interaction, relaxation, work culture, and daily routines. The rapid growth of artisan cafes, specialty coffee chains, and trendy coffee outlets across Malaysia reflects the growing popularity of coffee consumption among Malaysians, especially Millennials and Generation Z consumers. Many individuals frequently consume coffee to cope with academic pressure, workload demands, and fast-paced lifestyles. Globally, coffee is recognised for its stimulatory effects and its ability to improve alertness, concentration, and productivity. However, excessive dependence on coffee consumption may contribute to several negative health implications. Heavy reliance on caffeine drinks can mask physical exhaustion and fatigue, potentially leading to chronic tiredness, sleep disturbances, anxiety, and physical dependence among regular consumers (Omoruyi et al., 2026).

With the increasing popularity of coffee culture in Malaysia, many of the commercially available coffee drinks contain excessive sugar, artificial flavourings, syrups, whipped cream and high in calorie additives that may indirectly contribute to obesity, diabetes, hypertension and other chronic health conditions. According to the National Health and Morbidity Survey (NHMS) 2023, the prevalence of overweight and obesity among Malaysian adults continues to increase, indicating unhealthy dietary and drink consumption patterns (Ministry of Health Malaysia, 2023). This situation is worrying because coffee is often related to productivity and pleasure, and when mixed with excessive sugar and caffeine consumption, it could be associated with unhealthy consumption. Moreover, young consumers who frequently consume high in caffeine and sugar loaded coffee drinks, may form lifestyle habits that prioritise short term energy boosts above long term wellness and balanced nutrition. Hence, there is an increasing demand for healthy coffee drink alternatives that may provide the same sensory enjoyment with functional and wellness benefits.

To cater to these issues, functional coffee drinks with natural and antioxidant-rich ingredients are gaining significant importance in the Malaysian food and beverage business. The inclusion of butterfly pea flower (*Clitoria ternatea*), meliponini honey (stingless bee honey) and pandan leaves (*Pandanus amaryllifolius*) in coffee may aid to combine energy enhancement with relaxation and overall wellness. These components are known to possess antioxidant, antibacterial, anti-inflammatory and therapeutic qualities which may also enhance the health advantages while maintaining the sensory enjoyment of coffee drinking (Singh et al., 2022; Sujanto et al., 2021; Nor et al., 2022). However, there is limited research reported on the combination of these traditional Malaysian constituents in a single formulation of functional coffee beverage. Hence, the creation of *Telange* coffee drink is essential to address contemporary Malaysian lifestyle trends, health issues and the rising consumer desire for healthier and wellness oriented coffee drinks that are aligned with sustainable food innovation and modern consumption patterns.

Research on butterfly pea flowers highlights its rich phytochemical composition, including anthocyanins and flavonoids, which contribute to significant antioxidant and neuroprotective potential

(Fernandez et al., 2025; Raut & Mote, 2026). These secondary metabolites are historically known to promote cognitive performance and reduce systems linked with inflammation (Santosa, 2023; Yanti & Susanti, 2025). Moreover, butterfly pea flower is commonly used in ayurvedic therapy, proven for its efficiency in reducing stress and help with sleep disorders (Zaki et al., 2023). Recent research also highlights the possibility of butterfly pea flower extracts that decrease anxiety-related symptoms and improve mental health (Kumar, 2023; Widowati et al., 2022). Furthermore, the addition of pandan leaves serves as the balancing agent in creating aromatic compounds that enhance the sedative-hypnotic environment to the user (Nukitram et al., 2026), (Gejalakshmi & Harikrishnan, 2025). Complementary to the butterfly pea flowers and pandan leaves, the existence of melaponini honey that serves as a natural prebiotic and sweetener helps in improving gut health, leading to greater recovery during sleep (Bagoliya, 2025; Uppalwar, 2025).

Conclusively, the harmonious blend of active ingredients leverages the therapeutic potential that may improve the quality of life, honoring the traditional wellness practices (Pathaw et al., 2022). In this manner, *telange* coffee bridges the gap between classic coffee culture and the therapeutic utility of butterfly flower pea as a health-promoting agent (Tonge1, 2026; Zahara, 2022). The formulation provides a contemporary approach to functional beverages that is aligned with the current consumer demand that focuses on plant-based and natural solutions.

3. METHODOLOGY

This study employed an experimental formulation approach to develop *Telange* drink which integrates coffee, butterfly pea flower (*Clitoria ternatea*), Meliponini honey (stingless bee honey), and pandan leaves (*Pandanus amaryllifolius*). The formulation process was conducted to evaluate the drink's potential as an antioxidant rich functional coffee aligned with current healthy lifestyle consumption trends in Malaysia. The study focused on the preparation process, ingredient formulation as well as sensory observation. The selected ingredients were chosen based on their documented antioxidant, antimicrobial, and wellness-promoting properties reported in previous studies (Singh et al., 2022; Sujanto et al., 2021; Nor et al., 2022). The preparation and formulation procedures were conducted under hygienic and controlled conditions to ensure consistency in taste, aroma, colour, and drink quality.

3.1 Materials

The materials used in this study consisted of roasted coffee powder, dried butterfly pea flowers (*Clitoria ternatea*), fresh pandan leaves (*Pandanus amaryllifolius*), Meliponini honey (stingless bee honey), and distilled water. All ingredients were obtained from local suppliers in Malaysia to ensure freshness and product authenticity. The butterfly pea flowers and pandan leaves were cleaned thoroughly before use to maintain food safety and hygiene standards. The ingredients used in the formulation process are listed below:

- 1 tablespoon coffee powder
- 5–7 dried butterfly pea flowers (*Clitoria ternatea*)
- 1–2 pandan leaves (*Pandanus amaryllifolius*)
- 1 tablespoon Meliponini honey
- 200–250 ml hot water

3.2 Preparation of Telange Drink

The preparation process began with washing the butterfly pea flowers and pandan leaves thoroughly to remove impurities. The pandan leaves were then cut into smaller pieces to enhance aroma extraction. Approximately 200–250 ml of water was boiled before adding the butterfly pea flowers and pandan leaves into the hot water. The mixture was simmered for approximately 10–15 minutes until the water turned blue and produced a distinctive aromatic fragrance. Separately, the coffee powder was brewed using hot water to achieve flavour consistency. The butterfly pea flower and pandan extract were filtered to remove residues before being mixed evenly with the brewed coffee.

Meliponini honey was added after the drink cooled slightly to preserve its bioactive compounds and antioxidant properties. The mixture was stirred gently until the honey dissolved completely. The drink was then served either hot or cold according to consumer preference. Garnishing using butterfly pea flowers or pandan leaves was optional to improve presentation and sensory appeal. The overall formulation process aimed to combine traditional Malaysian herbal ingredients with modern functional drink innovation.

3.3 Sensory Observation and Functional Evaluation

The developed drink was evaluated through observational and descriptive sensory analysis. Several sensory attributes including colour, aroma, taste, sweetness, and overall acceptability were observed during the preparation process. The butterfly pea flower contributed natural blue pigmentation and antioxidant properties, while pandan leaves enhanced aroma and sensory satisfaction. Meliponini honey functioned as a natural sweetener alternative compared to refined sugar, contributing additional nutritional and antimicrobial benefits. The preparation method and ingredient selection were developed based on previous studies related to herbal functional and rich with an antioxidant drinks between 2021 and 2026 (Singh et al., 2022; Utami et al., 2023). The methodology also supports Malaysia's National Agrofood Policy 2021–2030 and the increasing demand for sustainable and wellness oriented drink innovation.

4. FINDINGS

Based on the method used in producing the *Telange* drink for antioxidants, immunity relaxation and wellness, below is the example of commercial product to be launched:



Figure 1: Commercial packaging for Telange Coffe

5. DISCUSSION

The integration of butterfly pea flower, meliponini honey and pandan leaves into coffee-based drinks addresses the rising consumer demand for healthy drinks that promote systemic well-being (Sulaiman et al., 2023). While coffee alone is globally recognised for its stimulatory effects, heavy reliance on it can mitigate potential negative effects, including chronic fatigue, by masking exhaustion and leading to physical dependence (Omoruyi et al., 2026). Hence, the integration of the plant-based ingredient will help harmonise energy with wellness, providing essential antioxidants to support calming qualities (Rajendra, 2025). Ultimately, this innovation aims to provide a blueprint for creating healthy drinks that resonate with health-conscious heavy drinkers, leading to the discovery of a new market segment that values botanical ingredients as part of natural remedies alongside classic sensory profiles.

Telange coffee can help address health issues often associated with diabetes, obesity, and hypertension, offering a new coffee experience that enhances drink functionality. Since *Telange* coffee is relatively new to the market and still in the prototype stage, there is extensive scope for future research in this field. This development underscores the potential to incorporate natural ingredients to enhance functionality that focuses on wellness for the modern consumer. Furthermore, empirical research is needed to assess the chemical stability of these bioactive compounds to improve efficacy and long-term storage viability, fostering greater customer loyalty by reinforcing the authenticity of a wellness narrative. This study poses several limitations. The literature encompassed in this review is constrained in scope, design, sample size, and population diversity. This study also included a prototype of the *Telange* coffee, which has lower statistical power, as well as non-reviewed articles.

6. CONCLUSION

Conclusively, *Telange* coffee can be seen as part of a strategic valorisation that promotes sustainable consumption patterns and the development of functional, high-value, health-forward drink products. The synthesis between butterfly pea, pandan and melapoinin creates a unique, wellness-oriented coffee profile that harmonises traditional botanical benefits with recent consumer health trends. The final product can be seen as the pioneer in elevating antioxidant capacity, providing a meaningful experience in a new daily coffee ritual.

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