



Mini Review of *Bidens aurea* (Asteraceae): Botanical Description, Global Distribution, Traditional Uses, Use as a Tea and Phytochemical Properties

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Bidens aurea, a species within the Asteraceae family, is a perennial herbaceous plant known for its vibrant yellow flowers and adaptability to diverse environments. This review compiles existing knowledge on the plant's botanical characteristics, natural habitat, and global distribution. It also highlights the traditional uses of *Bidens aurea* in various cultures, with particular attention to its role as a herbal tea in Spain. Furthermore, the article delves into the phytochemical properties of the plant, revealing its rich content of essential nutrients and antioxidants, including nitrogen, phosphorus, potassium, and a variety of enzymatic and non-enzymatic antioxidants. The review emphasizes the potential nutritional, medicinal, and environmental value of *Bidens aurea* and suggests directions for future research. In conclusion, *Bidens aurea* is a remarkable plant with significant potential in various fields, including traditional medicine, nutrition, and environmental sustainability. Its rich phytochemical profile, including essential nutrients and antioxidants, underscores its value as a herbal remedy and dietary supplement. The successful cultivation of *Bidens aurea* in Egypt illustrates its adaptability to different climates and agricultural conditions, paving the way for its broader use in both local and global markets.

Keywords: *Bidens aurea*, Asteraceae, Antioxidants, Nutritional value, Medicinal plants

1. Introduction

Bidens aurea, a member of the Asteraceae family, is an herbaceous perennial plant recognized for its bright yellow flowers and adaptability to diverse environments. Native to the Americas, this species has not only spread across continents but has also found significant cultural and medicinal value in various regions, particularly in Europe and the Americas. Its widespread distribution and versatility have led to its use in traditional medicine, ornamental horticulture, and as a natural remedy in various cultures (De-Azevedo-Bringel *et al.* 2017).

In Spain, *Bidens aurea* is particularly valued for its use as a herbal tea, a tradition that reflects the plant's integration into local customs and its perceived health benefits. The plant's rich phytochemical profile, which includes a variety of antioxidants and essential nutrients, has attracted scientific interest, highlighting its potential in both medicinal and nutritional applications. Despite its widespread use, there is still much to be explored regarding the full scope of its chemical composition and the mechanisms behind its therapeutic effects (De-Santayana *et al.* 2005).

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This review aims to provide a comprehensive overview of *Bidens aurea*, focusing on its botanical characteristics, natural habitat, and global distribution. Additionally, it will explore the traditional uses of the plant, with a particular emphasis on its role as a herbal tea in Spain, and examine its phytochemical properties, including its content of antioxidants and essential nutrients. By consolidating existing knowledge and identifying areas for future research, this review seeks to highlight the potential of *Bidens aurea* as a valuable resource in various fields, including medicine, nutrition, and environmental science. **Botanical Description and Global Distribution:**

Lizarazu *et al.* (2024) stated that the genus *Bidens* *L.* encompasses approximately 280 species distributed globally across tropical and temperate regions. Notable species include *B. aurea* (Aiton) Sherff., *B. andicola* Kunth var. *andicola*, *B. andicola* var. *heterophylla* Kuntze, *B. cynapiifolia* Kunth, *B. exigua* Sherff, *B. gardneri* Baker, *B. herzogii* (Sherff) D. J. N. Hind, *B. mandonii* (Sherff) Cabrera, and *B. pilosa* L..

Bidens aurea is a herbaceous perennial plant characterized by its striking yellow flowers and lanceolate leaves (Fig 1). It thrives in moist environments such as wetlands, riverbanks, and marshes, where it can form dense stands. Originally native to regions in North and South America, *Bidens aurea* has been introduced to various parts of the world, including Europe and Asia. In these regions, it is often cultivated for its ornamental value and utilized in traditional medicine. The plant's ability to adapt to a wide range of environmental conditions has facilitated its spread, making it a subject of interest in studies related to plant ecology and invasive species (**Ibrahim *et al.* 2022**).

Bidens aurea, commonly known as golden tickseed, belongs to the Asteraceae family, which includes many well-known plants such as Helianthus (sunflowers) and Chrysanthemum. Unlike these more commonly cultivated species, *Bidens aurea* is often valued for its medicinal properties, particularly in traditional medicine. The plant is rich in bioactive compounds such as flavonoids, phenolic acids, and terpenoids, which contribute to its potent antioxidant activity. When compared to other members of the Asteraceae family, *Bidens aurea* demonstrates a higher concentration of these antioxidants, making it a valuable candidate for the prevention of oxidative stress-related diseases. Additionally, it contains essential vitamins such as vitamin C, which supports

immune function, and minerals like potassium and calcium, beneficial for cardiovascular health and bone strength. These attributes place *Bidens aurea* alongside other nutritionally significant plants in its family, such as Chrysanthemum morifolium, but with a more prominent antioxidant profile. The plant's unique combination of vitamins, antioxidants, and minerals positions it as a promising natural source of health benefits (**De-Santayana *et al.* 2005**).

2. Traditional Uses of *Bidens aurea*

The traditional uses of *Bidens aurea* are diverse and culturally significant. In Spain, the plant is especially renowned for its use as a herbal tea. This tea is appreciated not only for its pleasant taste but also for its presumed health benefits, which are attributed to the plant's rich phytochemical content. Historically, *Bidens aurea* has been used in various traditional medicine practices across the Americas to treat ailments such as respiratory infections, digestive disorders, and skin conditions. The widespread use of *Bidens aurea* in traditional medicine highlights its cultural and medicinal importance (**Palmer, 2004**).

3. Use of *Bidens aurea* as a Tea

In Spain, *Bidens aurea* has been traditionally used to prepare a herbal tea, known for its unique flavor and potential health benefits. This tea, often consumed for its soothing properties, is believed to help in alleviating digestive issues, reducing inflammation, and providing antioxidant support. The preparation and consumption of *Bidens aurea* tea are deeply rooted in local traditions, with the plant being harvested from the wild or cultivated in gardens. The tea's popularity in Spain and its potential health benefits warrant further investigation into its chemical composition and therapeutic properties (Fig 1) (**ElGhamry *et al.* 2024**).

4. Phytochemical Composition and Antioxidant Properties

Phytochemical analysis of *Bidens aurea* has revealed a notable concentration of essential nutrients and bioactive compounds. The plant contains approximately 4% nitrogen, 0.36% phosphorus, and 4.2% potassium. Additionally, *Bidens aurea* is rich in enzymatic antioxidants such as catalase and peroxidase, as well as non-enzymatic antioxidants like proline, flavonoids, and phenolics (**De-Azevedo-Bringel *et al.* 2017**). These compounds are known for their ability to scavenge free radicals and reduce

oxidative stress, contributing to the plant's potential health benefits. The presence of these antioxidants suggests that *Bidens aurea* may play a role in preventing diseases associated with oxidative damage, thereby enhancing its nutritional and medicinal value (Ibrahim *et al.* 2022).

5. Nutritional, Medicinal and Environmental Significance

The phytochemical richness of *Bidens aurea* enhances its value as a nutritional and medicinal plant. The high antioxidant content, in particular, suggests that the plant could be utilized in the development of natural health products aimed at combating oxidative stress-related conditions. Furthermore, the adaptability of *Bidens aurea* to various environmental conditions makes it an important species for ecological restoration efforts, especially in areas susceptible to erosion or habitat degradation. The plant's dual role in nutrition and ecology highlights its potential for sustainable applications in agriculture and conservation (Lizarazu *et al.* 2024).

6. Cultivation Potential of *Bidens aurea* in Egypt

The cultivation of *Bidens aurea* in Egypt presents a promising opportunity due to the country's diverse climatic conditions and agricultural practices (Fig 1). Known for its resilience and adaptability, *Bidens aurea* thrives in various environments, including wetlands and well-drained soils, which are abundant in several regions of Egypt. Its ability to tolerate a range of soil types and environmental conditions makes it suitable for cultivation in both rural and urban settings (ElGhamry *et al.* 2024).

In recent years, *Bidens aurea* has been successfully cultivated in experimental plots in Egypt (Fig 1), where it has demonstrated robust growth and flowering. The cultivation process is relatively straightforward, as the plant requires moderate water and can flourish in sunny locations, making it an ideal candidate for Egyptian agriculture. Additionally, its fast growth rate and ability to produce seeds rapidly allow for efficient propagation and expansion (ElGhamry *et al.* 2024).

The introduction of *Bidens aurea* into Egyptian agricultural systems not only contributes to biodiversity but also provides economic opportunities. The plant can be utilized as a source of herbal tea, appealing to both local consumers and potential export markets. Moreover, its rich phytochemical profile enhances its value as a medicinal plant, aligning with the growing demand for natural and herbal remedies.

Furthermore, cultivating *Bidens aurea* can play a significant role in soil health and environmental sustainability. The plant's deep-rooting system helps prevent soil erosion and can improve soil structure, contributing to healthier ecosystems. As Egypt continues to face challenges related to climate change and water scarcity, the cultivation of resilient plants like *Bidens aurea* can be a strategic approach to enhancing agricultural sustainability (ElGhamry *et al.* 2024).

In summary, the successful cultivation of *Bidens aurea* in Egypt not only highlights its adaptability and value but also underscores its potential contributions to local agriculture, health, and environmental sustainability.



Fig 1. Different stages for the *Bidens aurea* (Asteraceae) during this survey (Taken by authors)

The method of planting is cuttings, and the most appropriate planting date in Egypt is in the winter months (November and December).

7. Conclusion and Recommendations

In conclusion, *Bidens aurea* is a remarkable plant with significant potential in various fields, including traditional medicine, nutrition, and environmental sustainability. Its rich phytochemical profile, including essential nutrients and antioxidants, underscores its value as a herbal remedy and dietary supplement. The successful cultivation of *Bidens aurea* in Egypt illustrates its adaptability to different climates and agricultural conditions, paving the way for its broader use in both local and global markets.

Given the increasing interest in natural products and sustainable agriculture, further research is essential to fully understand the therapeutic properties of *Bidens aurea*. Future studies should focus on the following areas:

- **Phytochemical analysis:** Detailed investigations into the specific bioactive compounds present in *Bidens aurea* can provide insights into its health benefits and potential applications in medicine and nutrition.
- **Agricultural practices:** Research on optimized cultivation techniques, including irrigation, fertilization, and pest management, can enhance the yield and quality of *Bidens aurea* while promoting sustainable agricultural practices.
- **Market development:** Exploring market opportunities for *Bidens aurea*, particularly in the herbal tea sector, can facilitate its commercialization and provide economic benefits to local farmers.
- **Ecological impact:** Studies on the ecological role of *Bidens aurea* in promoting biodiversity and preventing soil erosion can highlight its importance in conservation efforts and sustainable land management.
- **Public awareness and education:** Raising awareness about the health benefits and uses of *Bidens aurea* can encourage its incorporation into dietary practices and support its cultivation among local communities.

By pursuing these research directions, the potential of *Bidens aurea* can be harnessed to improve health outcomes, support sustainable agricultural practices, and contribute to environmental conservation efforts.

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