

Chapter 6

Pollinators and medicinal values of *Wedelia chinensis*

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Abstract

Wedelia chinensis, an essential medicinal plant, is an important constituent in the traditional medication systems in Ayurveda. Nowadays, people have forgotten these medicinal plants and the youth cannot identify the plants also, therefore, no attention is paid to these medicinal plants and they are gradually becoming extinct. However, there is a need to take necessary action to conserve the population of medicinal plants and a way to achieve the goal may be through protecting the population of pollinators of medicinal plants. Plants and animals are interdependent for their survival. By knowing and protecting the population of pollinators, the declining population of medicinal plants could be improved. Keeping this in mind, the pollinators of *W. chinensis* were documented through literature studies and field surveys in CDA-13, Cuttack, Odisha near the Mahanadi River in August 2024. The results revealed that 7 insects including 5 butterflies, a bee, and a thrip were the pollinators of *W. chinensis* gathered from direct field observations and literature surveys. The present study concluded that plant-animal interactions may be small or big, have an enormous effect on the ecological balance and survival of all organisms on the earth's surface.

Keywords: Faunal species, insects, conservation, medicinal plants, pollination ecology

Introduction

Medicinal plants play an important role in human healthcare systems. They are harvested from the wild and some plants are cultivated. About 21% of medicinal plants are at risk globally (Tali *et al.*, 2015). In the current situation of health care section, proper address and conservation of medicinal plants is the most important work for the present and future (Sharma *et al.*, 2024). Even though they are the most crucial stuff of life, their pollination ecology is less studied (Devi *et al.*, 2024). For the long-term survival of any medicinal plant, pollinators are necessary. Most medicinal plants depend on faunal species for their pollination. Therefore, documentation of pollinators of medicinal plants is essential (Guchhait *et al.*, 2023; Saradar *et al.*, 2024). Keeping this in mind, the pollinators of *Wedelia chinensis* were documented during the floral diversity study near the Mahanadi River area in CDA-13, Cuttack, Odisha in August 2024. The study highlights the importance of protecting pollinators while conserving native medicinal plants. *W. chinensis* is commonly called “Bhringraj” extensively used in Ayurveda (Darah *et al.*, 2013). It possesses anti-hepatotoxic and anti-inflammatory effects. In rural areas, the leaf paste is applied to wounds for quick healing. Fresh juice from the leaves of *W. chinensis* is used to treat skin problems, dermatitis, eczema, acne, cough, headache, hair loss, digestive and nervous system disorders, etc. (Meena *et al.*, 2011).

Morphology of *Wedelia chinensis*

W. chinensis is a procumbent or ascending herb with stems creeping below, strigose, or glabrate. Leaves subsessile or shortly petiolate, oblanceolate or lanceolate-oblong, subentire or crenate or with large serratures, sparsely strigose both sides. Heads 1-2 cm diameter at the ends of long peduncles from upper leaf axils. Involucre is campanulate; bracts broadly oblong, spreading above, appressed hispid. Ligules about 8, 3-toothed or 3-lobed. Corolla lobes of disc florets ciliolate. Pappus a denticulate membranous cap (Saxena and Brahmam, 1995; Figure 1).

Methodology

During the floral diversity study near the Mahanadi River areas, insects were sighted flocking around the flowers of *W. chinensis* in CDA Sector-13, Cuttack, Odisha in

August 2024. The sighted insects on *W. chinensis* were documented. The senior author identified the insects with the help of available literature (Kehimkar, 2016) and online platforms like Zookeys (<https://zookeys.pensoft.net/article/86413/>), Vermont Atlas of Life (<https://val.vtcostudies.org/projects/vtbees/augochloropsis-metallica/>), <http://www.phuketnaturetours.com/Pages/index.php>, etc. Extensive literature surveys were done to list the frequently visiting pollinators of *W. chinensis*.

Observations

In the present study, several insects, especially bees and butterflies were observed flocking around the flowers of *W. chinensis*, perched on the flowers, and sucking on the nectar from the flowers. These pollinators get dusted with pollen grains while sucking nectar and go by pollinating the plants playing a major role in ecosystem balance. It was observed that 6 insects were sucking nectar from *W. chinensis* flowers and 1 insect belonging to the order Thysanoptera and family Thripidae was the pollinator of *W. chinensis* flowers from the literature study (Table 1). Out of the 6 observed insects, 5 insects were butterflies belonging to the order Lepidoptera and one was a bee belonging to the order Hymenoptera and family Apidae. Among the five Lepidopteran butterflies, 2 butterflies belonged to the family Pieridae, and 1 butterfly each belonged to the family Hesperidae, Lycaenidae, and Nymphalidae.

Table 1: Insects pollinating *Wedelia chinensis* flowers

Scientific name	Common name	Order	Family	Source
<i>Acraea terpsicore</i>	Tawny coster butterfly	Lepidoptera	Nymphalidae	Present study
<i>Ampittia dioscorides</i> (Figure 2)	Bush hopper butterfly	Lepidoptera	Hesperidae	Present study
<i>Cepora nerissa</i>	Common gull butterfly	Lepidoptera	Pieridae	Present study

<i>Ceratina compacta</i> (Figure 3)	Small carpenter bee	Hymenoptera	Apidae	Present study
<i>Eurema hecabe</i>	Common grass yellow butterfly	Lepidoptera	Pieridae	Present study
<i>Microcephalothrips abdominalis</i>	Thrips	Thysanoptera	Thripidae	Varatharajan <i>et al.</i> , 2016
<i>Pseudozizeeria maha</i> (Figure 4)	Pale grass blue butterfly	Lepidoptera	Lycaenidae	Present study



Figure 1: Flower of *Wedelia chinensis*



Figure 2: Bush hopper butterfly sucking nectar from the flowers of *Wedelia chinensis*



Figure 3: Small carpenter bee on flowers of *Wedelia chinensis*



Figure 4: Pale grass blue butterfly sucking nectar from *Wedelia chinensis* flowers

Conclusion

From the present study, it was concluded that pollination is a crucial step in the life cycle of medicinal plants. Pollinators like small faunal species carry out this process seamlessly. As medicinal plants are essential for human healthcare systems, their population has to be maintained which may be possible by seeing to the population of pollinators. The declining population of pollinators thereby has a tremendous effect on the diversity and richness of the medicinal plants. The rapidly changing climatic conditions, grazing, widespread invasive plants, etc. are the main factors responsible for the decline in the population of medicinal plants from the nearby environment. Therefore, it is necessary to take immediate action to conserve the medicinal plant population by protecting the population of pollinators and the first step would be the removal of invasive plants from the environment.

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