

Exploration and Documentation of some weeds from the Paddy field of Nagbhid Tahsil

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Abstract

Rice (Paddy) is the staple food of India. Weeds are unwanted plant grown in paddy field, affecting the productivity. The present exploration was made in the paddy field of Nagbhid Tahsil of chandrapur district (Maharashtra State - India) to document the weed diversity. In present investigation, a total 58 weed plants were documented belonging to 16 different families. Among all the reported weed plants, the most dominant families were Poaceae, Asteraceae, Cyperaceae, Amaranthaceae, and Fabaceae.

Keywords: Weed, Paddy, Rice, Cyperaceae, Poaceae, India.

Introduction

Agriculture, commonly referred to as farming, has its origins in ancient history, spanning thousands of years. It serves as a fundamental pillar of civilization. Agriculture is a global practice, forming the backbone of numerous developing nations, such as India, where 70% of the labour force is engaged in agriculture-related sectors [1].

The advent of modern farming occurred in the 18th century, marked by significant transformations in agricultural methods over a brief period, resulting in substantial enhancements in crop yields and a more streamlined process. By the mid-19th century, technological advancements began to be integrated into agriculture. The introduction of the tractor was a pivotal moment, followed by innovations in irrigation, tillage, and harvesting equipment. These technological developments contributed to increased yields and improved the overall quality of agricultural produce [2].

Rice (*Oryza sativa* L.) belongs to the Poaceae family and serves as a fundamental food source for the global population. It is widely cultivated throughout the country. In the districts of Chadrapur, Gadchiroli, Bhandara, and Gondia within Maharashtra state, rice stands out as the most significant and extensively cultivated food crop, playing a vital role in ensuring food security and providing livelihoods for many individuals. Paddy serves as a raw material for the production of various industrial products like noodle, rice bran oil, rice husk, rice straw products, puffed rice starch. As a staple food, rice significantly impacts India's economy, thereby holding a central role in the formulation of agricultural policies [3,4,5].

Weeds are characterized as plants that are considered

unwanted or undesirable, growing among cultivated crops. They disrupt the primary crop by consuming land and water resources, thereby diminishing both the quantity and quality of rice production.

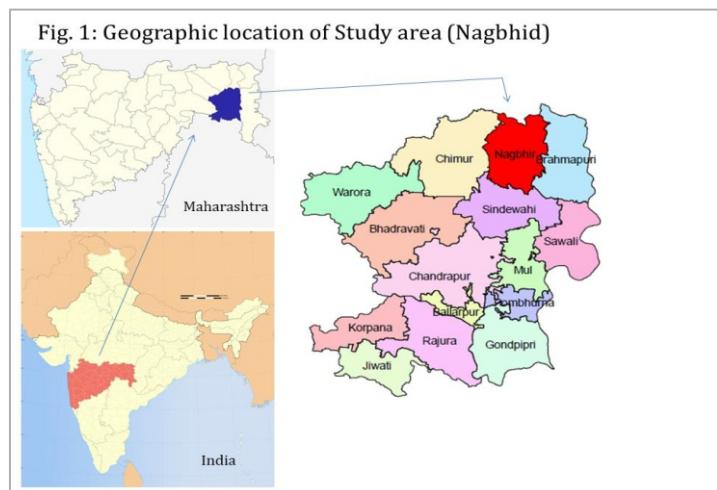
Weeds act as a formidable pest for rice, leading to significant yield losses in rice cultivation globally. The presence of weeds alongside paddy crops results in notably low agricultural output. They pose substantial obstacles to rice production due to their capacity to compete for carbon dioxide, space, water, moisture, sunlight, and essential nutrients. Weeds extract all the nutrients from the soil in which they thrive, leading to a decline in soil fertility and nutrient content. Among cereal crops, rice is a vital source of sustenance for more than half of the world's population [6].

Paddy is a crucial crop in India. Reports indicate that India faces an annual loss of INR 1050 million due to weeds in paddy fields [7]. The impact of weed composition on paddy yield reduction ranges from 9% to 51%. The unchecked proliferation of weeds in paddy fields has been shown to decrease grain yield by 75.8%, 70.6%, and 62.6% in dry seeded, wet seeded and transplanted rice, respectively. A rigorous survey is essential in weed management programs to tackle existing weed issues in rice fields, and the information gathered from such surveys is critical for developing targeted research initiatives [8].

Keeping in mind all the aspects, the present study was undertaken to document the diversity of weeds present in the paddy field of Nagbhid tehsil from Chandrapur district of Maharashtra state (India).

Materials and Methods

Nagbhid taluka in Chandrapur district of Maharashtra state has been selected as the study area (Fig 1). Nagbhid is one of the richest talukas in terms of biodiversity among 15 talukas of Chandrapur district. Nagbhid is recognized for its combination of historical importance and robust agricultural foundation. Nagbhid is located at an elevation of about 210 meters (690 feet) above sea level. Nagbhid plays a vital role in the agricultural production of Maharashtra, utilizing its rich alluvial soil. The primary and most crucial crop is rice (paddy), with the taluka serving as a significant rice-producing region. An extensive survey of rice field was done in the month of July 2024 to April 2025 comprising both Kharif and Rabi crop seasons. Weed plants obtained in the paddy field were identified with the help of standard flora and available literature [9,10,11].



Result and Discussion

The present study depicted that a total 58 plant species were reported as weeds in the paddy field of Nagbhid tehsil which belongs to 16 different families of angiosperms (Table 1). Out of 58 plants, 60% weeds plants were Dicot (34 species) while 40% (23 species) were found to be Monocot (Fig. 2). Among all the reported weed plants, most dominant families were Poaceae, Asteraceae, Cyperaceae, Amaranthaceae, and Fabaceae (Fig. 3).

A total 14 plant species were recorded as weeds belonging to Poaceae (Gramineae) family, 10 plants species belongs to Asteraceae, 07 species belongs to Cyperaceae, 06 species belongs to Amaranthaceae and 04 species belongs to Fabaceae. Only 2 plant taxa were noted as weeds of Malvaceae and Convolvulaceae each. Other families like Oxalidaceae, Rubiaceae, Verbenaceae, Cleomaceae, Portulacaceae, Acanthaceae, and Onagraceae were reported with only one plant. *Cynodon*, *Echinochloa* and *Paspalum* were observed to be the most dominant genera among all the weeds (Table 1, Fig. 3, and Fig. 4).

Weeds represent significant obstacles to the yield and productivity of rice [12]. The adage, "One year's seeding means seven years' weeding," aptly illustrates the risks associated with allowing weeds to produce seeds. Research has shown that uncontrolled weeds can diminish production

by approximately 80% in direct-seeded rice, a figure that is considerably greater than that observed in transplanted rice systems. Recently, yield losses ranging from 14% to 100% have been documented for direct-seeded rice, while losses of 7% to 80% have been noted for transplanted rice [13, 14]. The dominant nature of the weed plant families like Poaceae, Asteraceae, Cyperaceae, Amaranthaceae, and Fabaceae in the paddy field was in agreement with the findings of a researcher [15] who worked on the weeds of paddy field from of Bilaspur District, Chattisgarh. Weeds are creating problem in paddy field resulting in economic losses to farmer. Similar findings were observed by the other researchers through their study [16, 17].

Fig 2: Reported Plant taxa

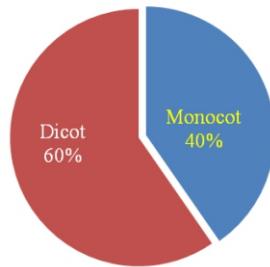


Table 1: Reported weeds in the Paddy field of Nagbhid Taluk

SN	Plant Taxa	Family	Common Name
1	<i>Achyranthes aspera</i> L.	Amaranthaceae	Aghada
2	<i>Acmella paniculata</i> Jansen	Asteraceae	Akalkara
3	<i>Ageratum conyzoides</i> L.	Asteraceae	Ghaneraosaadi
4	<i>Alternanthera paronychioides</i> A.St.-Hil.	Amaranthaceae	PaturBhaji
5	<i>Alternanthera sessilis</i> (L.) DC.	Amaranthaceae	Kanchari
6	<i>Alysicarpus monilifer</i> (L.) DC.	Fabaceae	Gorakhmundi
7	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Kante math
8	<i>Amaranthus viridis</i> L.	Amaranthaceae	Lahan math
9	<i>Bidens bipinnata</i> L.	Asteraceae	Spanish needles
10	<i>Bidens pilosa</i> L.	Asteraceae	Beggar Tick
11	<i>Blumea eriantha</i> DC	Asteraceae	Nimardi
12	<i>Brachiaria ramosa</i> (L.) Stapf	Poaceae	Brown top Millet
13	<i>Cassia tora</i> L.	Fabaceae	Takla
14	<i>Cassia uniflora</i> Mill.	Fabaceae	OneleafSenna
15	<i>Celosia argentea</i> L.	Amaranthaceae	Silver Cockscomb
16	<i>Cleome viscosa</i> L.	Cleomaceae	Pivalatilavan
17	<i>Commelinia benghalensis</i> L.	Commelinaceae	Kena
18	<i>Croton bonplandianus</i> L.	Euphorbiaceae	Ban tulsi
19	<i>Cyanotis axillaris</i> (L.) D.Don ex Sweet	Commelinaceae	Bechka
20	<i>Cyanthillium cinereum</i> (Linn.) H.Rob	Asteraceae	Sadodi
21	<i>Cynodon dactylon</i> L.	Poaceae	Dhurva
22	<i>Cyperus difformis</i> L.	Cyperaceae	Rice sedge
23	<i>Cyperus distans</i> L. F.	Cyperaceae	Slender Sedge
24	<i>Cyperus esculentus</i> L.	Cyperaceae	Barikmotha
25	<i>Cyperus iria</i> L.	Cyperaceae	Rice Flat Sedge
26	<i>Cyperus pilosus</i> Vahl.	Cyperaceae	Fuzzy flat sedge
27	<i>Cyperus rotundus</i> L.	Cyperaceae	Nut grass
28	<i>Cyperus sanguinolentus</i> Vahl.	Cyperaceae	Flat sedge
29	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Poaceae	Crowfoot Grass
30	<i>Desmodium triflorum</i> L.	Fabaceae	Ran-methi
31	<i>Digetaria ciliaris</i> Retz.	Poaceae	Tropical finger grass
32	<i>Digitaria sanguinalis</i> (L.) Scop.	Poaceae	Hairy crab grass
33	<i>Echinochloa colona</i> L.	Poaceae	Jungle rice
34	<i>Echinochloa crus-galli</i> L.	Poaceae	Barnyard grass
35	<i>Eclipta prostrata</i> (L.)	Asteraceae	Bhringaraj
36	<i>Eleusine indica</i> L.	Poaceae	Rannachani
37	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Dudhi
38	<i>Euphorbia prostrata</i> Aiton	Euphorbiaceae	Prostrate spurge
39	<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae	Gokshura
40	<i>Leptochloa chinensis</i> (L.) Nees	Poaceae	Asian sprangletop

41	<i>Ludwigia perennis</i> L.	Onagraceae	Paddy Clove
42	<i>Merremia aegyptia</i> (L.) Urb.	Convolvulaceae	Hairy Woodrose
43	<i>Merremia emarginata</i> (Burm. f.) Hallier f	Convolvulaceae	Undirkani
44	<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Pitpada
45	<i>Oryza rufipogon</i> Griff	Poaceae	Red Rice
46	<i>Oxalis corniculata</i> L.	Oxalidaceae	Ambushi
47	<i>Parthenium hysterophorus</i> L.	Asteraceae	Carrot grass
48	<i>Paspalidium flavidum</i> Retz.	Poaceae	Yellow water crown grass
49	<i>Paspalum conjugatum</i> Berg.	Poaceae	Buffalo grass
50	<i>Paspalum distichum</i> Auct.	Poaceae	Knot grass
51	<i>Paspalum scrobiculatum</i> L.	Poaceae	Hareek
52	<i>Phyla nodiflora</i> (L.) Greene	Verbenaceae	Goura Mundi
53	<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	Laalbhooiyavalai
54	<i>Portulaca oleracea</i> L.	Portulacaceae	Ghol
55	<i>Sida acuta</i> Burm. f.	Malvaceae	Bala
56	<i>Sida cordifolia</i> L.	Malvaceae	Heart-Leaf Sida
57	<i>Sphaeranthus indicus</i> L.	Asteraceae	Gorakhmundi
58	<i>Tridex procumbens</i> L.	Asteraceae	Kambarmodi

Fig 3: Number of Plant species

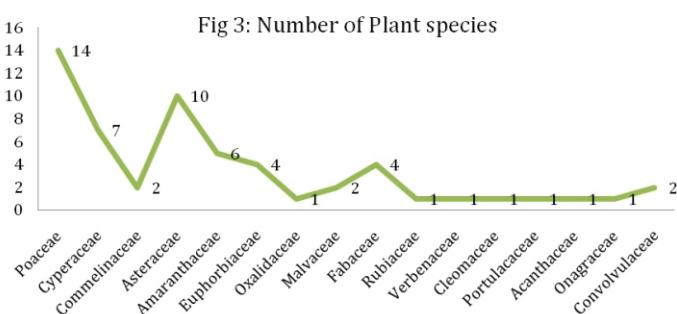
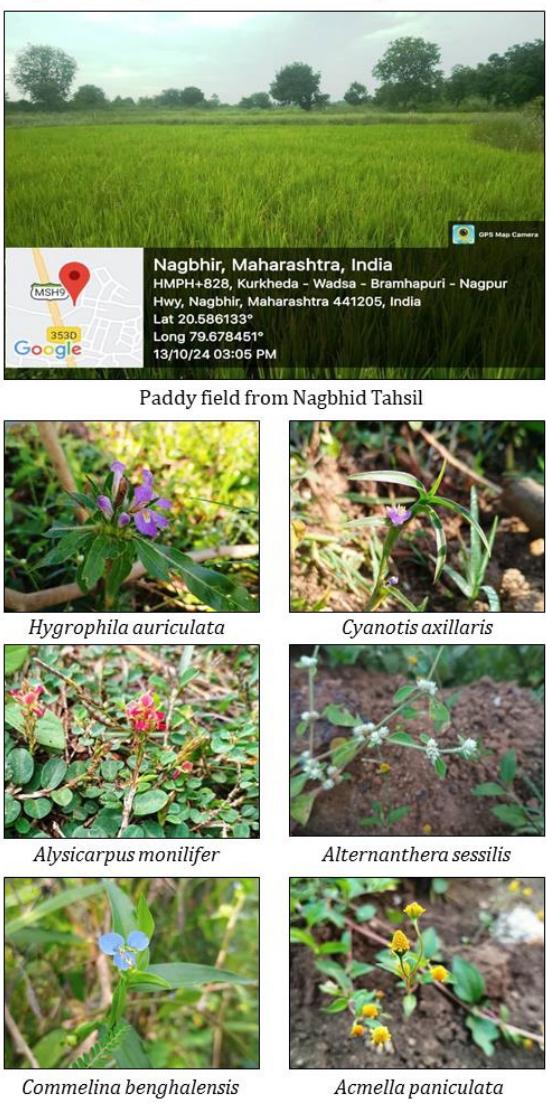


Fig. 4: Study area and some reported weeds



Conclusion

In the present study a total 58 weeds were reported from the paddy field belonging to 16 different families. The most dominant families were Poaceae, Asteraceae, Cyperaceae, Amaranthaceae, and Fabaceae. The species richness was observed of dicots while the Cyperaceae and Poaceae members of monocot were most abundant. The plants like *Alternanthera sessilis*, *Cynodon dactylon*, *Cyperus* spp., *Dactyloctenium aegyptium*, and *Echinochloa* spp. were most dominant. Special attention is needed to identify the diversity of weeds and systematic approaches to their management as weeds are one of the major threats to crop productivity.

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