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Identification of Weeds in Rice Crops (*Oryza sativa* L.) in the Wonco Rice Fields, Bungi Subdistrict, Baubau Town

Identifikasi Gulma Tanaman Padi (*Oryza sativa* L.)
di Area Persawahan Wonco, Kecamatan Bungi, Kota Baubau

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Abstract

Weeds are among the main factors hindering the growth and yield of rice crops in agricultural areas. The presence of uncontrolled weeds can compete with the main crop for resources, thereby significantly reducing productivity. This study aims to identify the morphological characteristics and weed types in rice (*Oryza sativa*) fields in the Wonco area. This study consisted of three stages: site observation, sampling and data collection, and identification. Data collection was conducted using an exploratory method, which involved surveying a 515 m² rice field plot. Weed sampling was performed four times at various stages of rice plant growth. Identification was performed qualitatively based on morphological characteristics and quantitatively by calculating the percentage of weed presence. The study identified 40 weed species classified into 31 genera, 21 families, and 3 major groups: grasses, sedges, and broadleaves. Based on the findings in the Wonco rice fields of Bungi Subdistrict, Baubau Town, it can be concluded that the identified weeds exhibit distinct morphological characteristics according to their groups and demonstrate high diversity, with different weed groups dominating at each stage of rice growth.

Article Information

Keywords: identification; rice plants; weeds

Kata kunci: gulma; identifikasi; tanaman padi

Gulma merupakan salah satu faktor utama yang menghambat pertumbuhan dan hasil produksi tanaman padi di wilayah pertanian. Keberadaan gulma yang tidak terkontrol dapat bersaing dengan tanaman utama dalam hal kebutuhan sumber daya, sehingga menurunkan produktivitas secara signifikan. Penelitian ini bertujuan untuk mengetahui ciri-ciri morfologi dan jenis-jenis gulma pada tanaman padi (Oryza sativa) di area persawahan Wonco. Penelitian ini terdiri dari 3 (tiga) tahap, yaitu observasi lokasi penelitian, pengambilan sampel dan pengumpulan data, serta tahap identifikasi. Pengumpulan data dilakukan dengan metode eksplorasi, yaitu menjelajahi petak sawah seluas 515 m². Pengambilan sampel gulma dilakukan sebanyak empat kali di berbagai fase pertumbuhan tanaman padi. Identifikasi dilakukan secara kualitatif berdasarkan ciri morfologi dan secara kuantitatif dengan menghitung persentase keberadaan gulma. Hasil penelitian ditemukan 40 jenis gulma yang tergolong dalam 31 genus, 21 famili, dan 3 golongan utama, yaitu grasses, sedges, dan broad leaves. Berdasarkan hasil penelitian pada area persawahan Wonco, Kecamatan Bungi, Kota Baubau, dapat disimpulkan bahwa gulma yang ditemukan memiliki karakter morfologi berbeda berdasarkan golongannya dan keanekaragaman yang cukup tinggi dengan dominansi golongan gulma yang berbeda pada setiap fase pertumbuhan padi.

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A. INTRODUCTION

Rice is an important staple food crop in nearly all regions of Indonesia, so its availability must always be ensured (Mergo et al., 2021). Rice production in Indonesia must increase due to the growing population (Dini et al., 2023). Southeast Sulawesi, particularly Baubau Town, has three districts with rice-growing areas, one of which is Bungi District, with a harvested area of 2,138 hectares and a production yield of 9,621 tons (Zarliani, 2020).

Rice productivity in Baubau Town remains relatively low (Zainuddin et al., 2018). The Central Statistics Agency (BPS) reported that in 2023, the harvested area in Baubau Town was 1,929.23 hectares with a production of 8,224.82 tons, resulting in a productivity of only 42.63 tons per hectare. This productivity remains below the national average of 49.99 tons per hectare (BPS, 2023). Rice productivity is influenced by several factors, one of which is the presence of weeds (Ramadhan et al., 2023). The losses caused by weeds worldwide are estimated at 15% and can reach 86% without weed control. According to Zarwazi et al. (2016), rice production can increase by up to 29.4% if weeds are properly controlled.

Weeds are unwanted wild plants that grow on farmland because they compete with crops for essential resources such as water, nutrients, sunlight, and growing space (Dinata et al., 2017; Umiyati & Widayat, 2017; Gultom et al., 2017). Weeds not only compete with crops, but can also serve as breeding grounds for pests and plant diseases (Saleh et al., 2020). In addition to environmental, genetic, and agricultural factors, weeds are one of the factors that hinder plant growth (Kilkoda et al., 2016; Ramadhan et al., 2023). The presence of weeds can cause stunted growth, yellowing leaves, and low yields (Purnamasari et al., 2017; Tampubolon et al., 2018). In addition, weeds can cause losses in the form of reduced crop yields due to competition between weeds and cultivated plants, as well as damage to the crop (Kastanja, 2015; Kilkoda et al., 2015; Hidayat & Racmadiyanti, 2017). Other researchers have extensively studied the types of rice-field weeds; for example, a study by Ikbal et al. (2016) reported that 26 weed species from 11 families were found in the rice fields of Tajuncu Village, Mata Oleo Subdistrict, Bombana Regency. This number is relatively high compared to other studies, such as the 13 weed species found in irrigated rice fields in Mulyorejo Subdistrict, Malang City (Az-zahro et al., 2022). Eleven weed species were identified in local East Kalimantan rice swamp fields in Rapak Lambur Village (Syaifudin et al., 2022).

Weeds are grouped into three categories: grasses, sedges, and broadleaves (Fitria et al., 2019; Isda et al., 2018). Some types of broadleaf weeds, such as *Ludwigia perennis* L., grass weeds such as *Echinochloa colona* L., and sedge weeds such as *Cyperus iria*, can release allelopathic compounds that can cause toxicity in the target crop (Kurniadie, 2016). Weeds in rice fields are a cause of declining rice production (Umiyati & Hg, 2023). One measure that can be taken to prevent potential crop yield losses in rice is weed control (Rahmadi et al., 2021). Weed control can be carried out in two ways: directly and indirectly (Suryaningsih & Surjadi, 2018). Direct control methods include weeding and the use of herbicides, while indirect control methods include soil preparation and cultivation techniques (Puspitasari et al., 2017; Rahmadi et al., 2017). Weed control should be based on the types of weeds that have been identified. According to Ramadhan et al. (2023), weed control tailored to the specific type of weed can have a significant impact on rice yields.

Based on initial observations, it was found that rice fields in the Wonco area use selective herbicides to suppress weed growth, which are applied before the rice planting phase. However, rice fields in the Wonco area also utilize an irrigation system, which allows for better water management. However, the flow of irrigation water can wash away herbicides, leading to reduced weed control effectiveness. This irrigation system has the potential to turn rice fields into a fertile habitat for weed growth (Sari, 2019). The irrigation system becomes a fertile habitat for weeds because it provides environmental conditions that are highly conducive to weed growth. The continuous flow of water maintains soil moisture, creating an ideal environment for various types of weeds to grow and thrive (Sari et al., 2022; Umiyati & Hg, 2023). In addition, irrigation water serves as an effective medium for spreading weed seeds or vegetative parts to various locations within rice fields, thereby rapidly expanding the spread of weeds.

Research on weeds in rice crops has been extensively conducted. However, the number of weed species identified in previous studies remains relatively small and thus does not yet provide a comprehensive picture of weed diversity. Furthermore, the classification of weeds such as grasses, sedges, and broadleaves has not been explained in detail in some studies. Sampling times have also generally not been based on the growth stages of rice plants, so changes in weed composition during each growth stage remain unclear. Furthermore, effective weed control strategies based on weed types are rarely discussed, and there is a lack of information regarding specific weed types, particularly in the Wonco rice fields; therefore, this study is important to be conducted. This study aims to identify the morphological characteristics and weed types found in rice crops in the Wonco rice-growing area.

B. METHOD

This study was conducted from February to June 2025 in the Wonco rice-growing area. The method used was the survey (exploratory) method, which involved surveying a rice field plot with an area of 515 m². The rice field plot consisted of four subplots, each with the following dimensions: Plot I (15 m × 10 m), Plot II (10 m × 10 m), Plot III (15 m × 11 m), and Plot IV (10 m × 10 m). Sampling was conducted four times: during the planting phase (14–15 days after sowing), during the vegetative phase (35–45 days after sowing), during the generative phase (60–67 days after sowing), and during the post-harvest phase (1 month after harvest). The weeds found were first cleaned of other debris and soil, then placed in plastic bags, sprayed with 70% alcohol, and sealed tightly to prevent air pockets. The morphological characteristics of the weeds were then identified at the Basic Natural Sciences Laboratory of Muhammadiyah Buton University. Weeds were identified based on their morphological traits and grouped into grass, sedges, and broadleaf weeds. After identification, the weeds were documented using a camera. The research data were analyzed qualitatively by describing the morphological characteristics of each weed species and quantitatively by calculating the percentage of broadleaf weeds, grasses, and sedges found in the Wonco rice fields.

Weed species identification was based on observations of morphological characteristics, including root type, lateral and adventitious roots, stem shape, nodes and internodes, leaf type, leaf arrangement, leaf apex, leaf base, leaf margin, leaf color, leaf venation, flower type, and flower position, with reference to identification guides such as Weed Identification (Naidu, 2012), Weeds of Rice in Asia (Caton et al., 2010), Flora (Steenis, 1988), and identification keys, and by comparing the results with those of previous studies.

C. RESULTS AND DISCUSSION

Based on the results of a study conducted in the rice fields of Wonco, Kampeonaho Village, Bungi Subdistrict, Baubau Town, 40 weed species were identified, classified into 31 genera, 21 families, and 13 orders. Each species was grouped into grasses, sedges, and broadleaves categories. The types of weeds identified during the study are listed in the following table:

Table 1. Results of the Identification of Weed Species Found in the Wonco Rice Fields

No	Order	Familia	Species	Stages of Weed Growth			
				Planting (14-15 DAP)	Vegetative (35-45 DAP)	Generative (60-67 DAP)	Post-harvest (1 WAH)
1	Poales	Poaceae	*Chloris barbata*	✓	✓	✓	✓
2			*Eragrotis acutiflora*	✓	✓	✓	✓
3			*Eleusine indica*	✓	✓	✓	✓
4			*Cenchrus purpureus*	×	✓	✓	✓
5			*Melinis repens*	×	✓	✓	✓
6			*Eragrotis nigra*	✓	✓	✓	✓
7			*Cenchrus echinatus*	×	✓	✓	✓
8			*Echinochloa crus-galli*	×	✓	✓	✓
9		Cyperaceae	*Fimbristylis littoralis*	✓	✓	✓	✓
10			*Cyperus esculentus*	✓	✓	✓	✓
11			*Fimbristylis dichotoma*	✓	✓	✓	✓
12			*Cyperus difformis*	✓	✓	✓	✓
13			*Cyperus alatus*	✓	✓	✓	✓
14			*Cyperus rotundus*	×	✓	✓	✓
15	Brassicales	Cleomaceae	*Cleome viscosa*	×	✓	✓	✓
16			*Cleome Rutidosperma*	×	✓	✓	✓
17	Malpighiales	Euphorbiaceae	*Euphorbia heterophylla*	×	✓	✓	✓
18			*Euphorbia prostrata*	✓	✓	✓	✓
19		Passifloraceae	*Passiflora foetida*	×	✓	✓	✓
20	Alismatales	Alismataceae	*Limnocharis flava*	×	✓	✓	✓
21	Commelinales	Pontederiaceae	*Monochoria vaginalis*	×	✓	✓	✓
22	Solanales	Convolvulaceae	*Ipomoea aquatica*	×	✓	✓	✓
23			*Ipomoea triloba*	×	✓	✓	✓
24		Menyanthaceae	*Nymphoides indica*	×	✓	✓	✓
25		Solanaceae	*Physalis angulata*	×	✓	✓	✓
26	Boraginales	Boraginaceae	*Heliotropium indicum*	✓	✓	✓	✓
27	Gentianales	Rubiaceae	*Spermacoce remota*	×	✓	✓	✓
28	Asterales	Asteraceae	*Cyanthillium cinereum*	×	✓	✓	✓
29			*Eclipta prostrata*	×	✓	✓	✓
30			*Ageratum conyzoides*	×	✓	✓	✓
31			*Emilia sonchifolia*	×	✓	✓	✓
32		Campanulaceae	*Hippobroma longiflora*	×	✓	✓	✓
33	Lamiales	Plantaginaceae	*Mecardonia procumbens*	✓	✓	✓	✓
34		Linderniaceae	*Bonnaya antipoda*	✓	✓	✓	✓
35	Caryophyllales	Amaranthaceae	*Amaranthus viridis*	×	✓	✓	✓
36		Polygonaceae	*Polygonum barbatum*	×	✓	✓	✓
37	Myrtales	Lythraceae	*Ammannia baccifera*	×	✓	✓	✓
38		Onagraceae	*Ludwigia hyssopifolia*	×	✓	✓	✓
39	Fabales	Fabaceae	*Uraria logopodioides*	×	✓	✓	✓
40			*Mimosa pudica*	×	✓	✓	✓

Note : × = None, ✓= Some, DAP = The Day After Planting, WAH = The Week After the Harvest

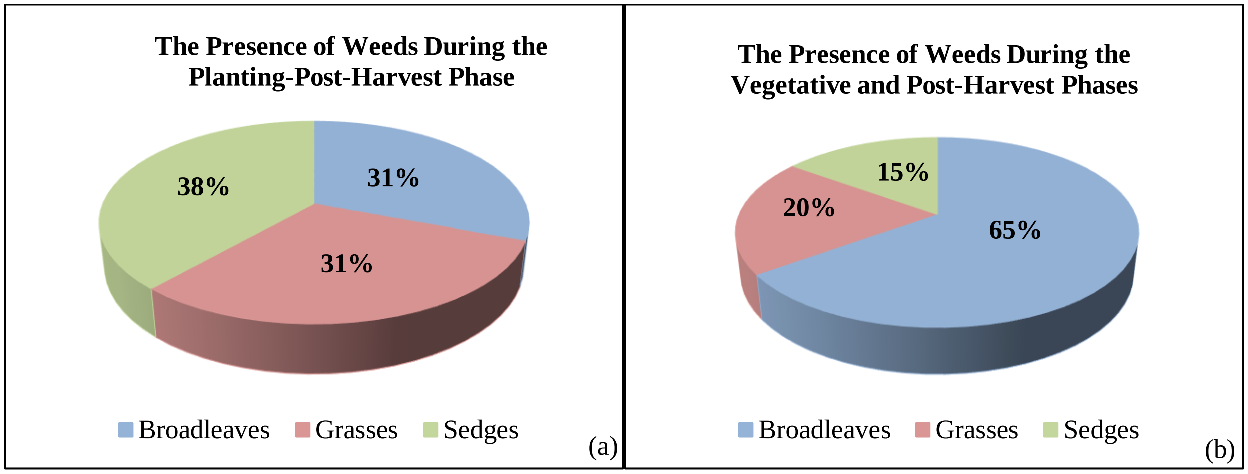

Figure 1. Diagram of Weed Prevalence

Table 2. Morphological Characteristics of Weeds

No	Species Name	Common name	Morphological Characteristics of Weeds			
			Root Type	Cylindrical Shape	Leaf Shape	Flower Type
1.	*Chloris barbata*	Rumput janggut	Fibrous	Round	Ribbon	Plural
2.	*Eragrostis acutiflora*	Rumput eragrostis halus	Fibrous	Round	Ribbon	Plural
3.	*Eleusine indica*	Rumput jampang	Fibrous	Round	Ribbon	Plural
4.	*Cenchrus purpureus*	Rumput belulang	Fibrous	Round	Ribbon	Plural
5.	*Melinis repens*	Rumput balibu	Fibrous	Round	Ribbon	Plural
6.	*Eragrostis nigra*	Rumput eragrostis hitam	Fibrous	Round	Ribbon	Plural
7.	*Cenchrus echinatus*	Rumput landak	Fibrous	Round	Ribbon	Plural
8.	*Echinochloa crus-galli*	Rumput jajagoan	Fibrous	Round	Ribbon	Plural
9.	*Fimbristylis littoralis*	Rusa-rusa kecil	Fibrous	Triangular	Needle	Plural
10.	*Cyperus esculentus*	Teki kucai	Fibrous	Triangular	Ribbon	Plural
11.	*Fimbristylis dichotoma*	Rusa-rusa	Fibrous	Triangular	Ribbon	Plural
12.	*Cyperus difformis*	Teki sawah	Fibrous	Triangular	Needle	Plural
13.	*Cyperus alatus*	Teki bersayap	Fibrous	Triangular	Ribbon	Plural
14.	*Cyperus rotundus*	Teki hitam	Fibrous	Triangular	Ribbon	Plural
15.	*Cleome viscosa*	Ketulasan	Taproot	Round	Oval	Singular
16.	*Euphorbia heterophylla*	Jarak ulung	Taproot	Round	Lanceolate	Plural
17.	*Cleome rutidosperma*	Ketulasan ungu	Taproot	Round	Oval	Singular
18.	*Limnocharis flava*	Genjer	Fibrous	Round	Oval	Singular
19.	*Monochoria vaginalis*	Eceng empang	Fibrous	Round	Cordate	Singular
20.	*Ipomoea aquatica*	Kangkung	Fibrous	Round	Arrow-shaped	Singular
21.	*Heliotropium indicum*	Kaki kuda	Fibrous	Round	Oval	Plural
22	*Spermacoce remota*	Ruku-ruku liar	Fibrous	Round	Lanceolate	Plural
23	*Cyanthillium cinereum*	Bandotan ungu	Fibrous	Round	Oval	Plural
24	*Hippobroma longiflora*	Bunga bintang	Fibrous	Round	Lanceolate	Singular
25	*Physalis angulata*	Ciplukan	Taproot	Round	Oval	Singular

26	*Mecardonia procumbens*	Rumput mikar	Fibrous	Round	Oval	Singular
27	*Nymphoides indica*	Teratai	Fibrous	Round	Cordate	Singular
28	*Amaranthus viridis*	Bayam liar	Taproot	Round	Oval	Plural
29	*Ammannia baccifera*	Rumput bebek liar	Taproot	Round	Lanceolate	Plural
30	*Euphorbia prostrata*	Jarak cina kecil	Fibrous	Round	Oval	Plural
31	*Bonnaya antipoda*	Rumput genit	Fibrous	Round	Lanceolate	Singular
32	*Eclipta prostrata*	Urang-aring	Fibrous	Round	Oval	Singular
33	*Mimosa pudica*	Putri malu	Taproot	Round	Lanceolate	Plural
34	*Ludwigia hyssopifolia*	Akar kucing	Fibrous	Round	Lanceolate	Singular
35	*Ageratum conyzoides*	Bandotan	Fibrous	Round	Oval	Plural
36	*Emilia sonchifolia*	Tempuyung merah	Fibrous	Round	Lanceolate	Plural
37	*Uraria logopodioides*	Cekur manis	Taproot	Round	Oval	Plural
38	*Passiflora foetida*	Markisa hutan	Fibrous	Round	Oval	Singular
39	*Polygonum barbatum*	Antanan rawa	Fibrous	Round	oval	Plural
40	*Ipomoea triloba*	Kangkung liar	Fibrous	Round	Oval	Singular

A study of rice weeds in the Wonco area (Table 1) identified 40 weed species belonging to various orders and families. The most common weeds belong to the order Poales, particularly the families Poaceae and Cyperaceae. The Poaceae family comprises 8 species, such as *Chloris barbata*, *Eleusine indica*, and *Echinochloa crus-galli*, while the Cyperaceae family comprises 6 species, such as *Fimbristylis littoralis* and *Cyperus rotundus*. The dominance of these two families indicates that grasses and sedges are highly adaptable to the rice field environment. Ecologically, weed dominance in the Wonco rice fields is influenced by several environmental factors. The irrigation system used keeps the soil constantly moist to the point of being waterlogged, which greatly supports the growth of hydrophytic and semi-aquatic weeds, particularly those from the Poaceae and Cyperaceae families. Additionally, the continuous availability of water plays a role in accelerating weed seed germination and aids in the dispersal of propagules via water flow.

Weeds in rice crops can grow throughout the entire cultivation cycle, from the planting phase (1–15 DAP), the vegetative phase (16–54 DAP), and the generative phase (55–110 DAP), through to the post-harvest phase (BPS, 2023). Based on the research results (Figure 1 (a)), the percentage of weed presence during the planting to post-harvest phases shows a relatively high presence of sedges at 38%, while grasses and broadleaves account for 31%. Meanwhile, the weeds dominating the field from the vegetative phase through the post-harvest phase (Figure 1(b)) belong to the broadleaf group, accounting for 65%, followed by the grass group at 20%, and finally the sedge group at 15%. Based on their growth phases, the majority of weeds were found during the vegetative, generative, and post-harvest phases. This indicates that once rice enters the active growth phase, field conditions become increasingly conducive to weed growth, due to the availability of water, light, and nutrients.

During the planting phase, the number of weeds found was relatively lower than in other phases; only a few species appeared, such as *Chloris barbata, Eragrostis acutiflora, Fimbristylis littoralis, Cyperus esculentus, Heliotropium indicum, Mecardonia procumbens*, and *Bonnaya antipoda*. Weeds that appear from the planting phase through to post-harvest are due to their long life cycles and high competitive ability against the main crop (Lestari et al., 2024). Some weeds are perennials or well-adapted annuals, enabling them to survive from the time of planting, grow alongside crops, and even remain alive after harvest. Furthermore, these weeds are highly competitive in absorbing water, nutrients, light, and growing space, allowing them to persist even as environmental conditions change due to agricultural activities. Several weed species, such as *Chloris barbata, Eragrostis acutiflora, Eleusine indica, Eragrostis nigra, Fimbristylis littoralis, Cyperus esculentus, Cyperus difformis, Cyperus alatus, Heliotropium indicum, Mecardonia procumbens*, and *Bonnaya antipoda*, are found in all growth stages of rice. This indicates that these species possess high adaptability, wide dispersal capacity, and good tolerance to changes in rice field environmental conditions.

Weeds that emerge from the vegetative phase through the post-harvest period may be due to slower life cycle characteristics or growth requirements that are only met during that phase; some weeds have seed dormancy that is only broken when specific conditions are met, such as the presence of certain light levels, temperature changes, or stable moisture levels (Rizkyma *et al*., 2023). The application of NPK fertilizer at the end of the growing season is one of the triggers for the proliferation of weeds entering the vegetative phase (Egiditya & Sebayang, 2023). The use of NPK fertilizer on rice crops can affect weed growth and prolong the presence of weeds. According Saylendra et al. (2024), weeds tend to emerge and grow from the vegetative phase through to the post-harvest period due to the availability of space, light, moisture, and nutrients, as well as the lack of competition or control during the later stages.

During the post-harvest phase, broadleaf weeds heavily dominate farmland, making it a potential host for pests and diseases. Weeds can reproduce via seeds; furthermore, they possess a very high regenerative capacity and are difficult to eradicate because they reproduce vegetatively through rhizomes and stolons, thereby increasing the weed seed bank for the following season (Prasetyo *et al.*, 2023). Some types of weeds reproduce via rhizomes—underground stems that spread and can produce new shoots from each node—such as *Cyperus alatus* and *Nymphoides indica*, as well as weeds with rhizomes in the form of small tubers, such as *Cyperus rotundus.* According to Al-Snafi (2016), Couch grass has creeping rhizomes that form tubers capable of storing nutrients and producing new rhizomes. In addition, some weeds spread via stolons—creeping stems that grow above ground and produce roots and new shoots from each node—such as *Ipomoea aquatica*. This is supported by Latumahina (2022), who notes that rhizomes and stolons are stems that serve for vegetative reproduction, but differ in their location and shape. Rhizomes grow underground; they are thick and segmented and store food reserves. Stolons grow above or near the soil surface; they are slender and long, and produce new shoots at their nodes.

Broadleaf weeds generally grow rapidly and are highly competitive when vying with the main crop for light and nutrients (Adams et al., 2023). Broadleaf weeds can be controlled by applying selective post-harvest herbicides such as 2,4-D or MCPA at the recommended dosage (Purnamasari, 2015). Weeds in the grass family generally have strong root systems and can grow rapidly, especially in open, unmaintained areas (Bayyinah et al., 2023). These weeds can be managed by using organic or plastic mulch to suppress weed growth by reducing light penetration to the soil surface, and by using pre-planting herbicides such as glyphosate to control grass weeds before planting. (Mahmud & Mukkhlis, 2019; Rivai et al., 2017).

Sedges typically have underground bulbs or rhizomes, making them harder to eradicate and causing them to often regrow even after the above-ground parts have been cut (Sabtu et al., 2023). The application of systemic herbicides such as halosulfuron or imazamox is recommended before the planting phase, as they can reach the underground parts of weeds; this issue can also be addressed by periodically draining the field to reduce soil moisture that promotes sedge growth (Chauhan & Mahajan, 2022). The use of the Integrated Weed Management (IWM) approach, which combines mechanical, chemical, and biological methods, is the most effective strategy for preventing the dominance and growth of these three weed groups, thereby supporting optimal growth of the main crop (MacLaren et al., 2020).

Weeds exhibit distinct morphological characteristics of leaves and stems among the grasses, broadleaves, and sedges (Table 2). This is consistent with the findings reported by (Tustiyani et al., 2019), who noted that the differences among grasses, broadleaves, and sedges can be clearly distinguished by examining the shape of their leaves and stems. According to Steenis (1988), characteristic features of grass weeds generally include ribbon-shaped leaves with parallel veins and jointed stems, whereas sedge weeds have triangular stems and ribbon-like leaves but without distinct stem joints. Broadleaf weeds have round, branching stems that grow upright, climbing, or creeping, and have leaves of various shapes, with palmate or pinnate venation, and both simple and compound leaf types (Liana et al., 2020; Murtilaksono et al., 2024). Some weeds, such as *Passiflora foetida* L., *Ipomoea triloba* L. It has simple leaves, cordate in shape with pointed tips and palmate venation, as well as a trailing stem. In addition, some broadleaf weeds have compound leaves with both erect and trailing stems, such as *Cleome viscosa* L. and *Cleome rutidosperma* DC., with compound, palmately lobed leaves bearing three leaflets, and *Uraria lagopodioides* (L.), which has odd-pinnate compound leaves with three leaflets, and *Mimosa pudica* (L.), which has bipinnate compound leaves.

The types of weeds found at the study site have several different root types depending on their group; for example, the grasses and sedges groups have fibrous roots, while in the broadleaves group, some have fibrous roots and others have taproots, for example, in *Heliotropium indicum* L. and *Physalis angulata* L. According to Nainggolan & Sebayang (2023), the root systems of weeds vary greatly depending on the species and their habitat, ranging from fibrous roots and taproots to creeping rhizomes. This is supported by the statement (Ramlan et al., 2019), which notes that weeds possess adaptive root types such as fibrous roots that dominate in grass-type weeds, taproots commonly found in broadleaf weeds, as well as rhizomes and stolons in certain weed species that grow creeping along the soil surface. This variation in root systems provides weeds with a competitive advantage in absorbing water and expanding their growth area through vegetative propagation.

In addition to morphological characteristics such as stems, leaves, and roots, the flowers of weeds are highly varied and exhibit distinctive features within each group. The flowers of grasses have a characteristic form consisting of compound flowers arranged in panicles, spikes, or spikelets. These flowers are small, inconspicuous, and typically range in color from greenish to brownish. Grass flowers lack true sepals and petals. Meanwhile, flowers in the sedge group are also compound, small, and inconspicuous, ranging in color from greenish, yellowish, or brownish. Sedge flowers are arranged in spikes or terminal umbels. Sedge flowers also lack true sepals and petals. On the other hand, broadleaf weeds have more conspicuous flowers, brightly colored, with varied shapes. Flowers on broadleaves include both solitary and compound flowers. These flowers possess true sepals and petals. This aligns with what Aji (2022), noted that the differences in flowers among grass, sedge, and broadleaf weeds lie in the structure and position of the flowers on the plants. Grass weeds have flowers arranged in panicles or spikes, while sedge weeds have flowers arranged in corymbs or umbels. Broadleaf weeds have diverse flowers, located in leaf axils and at the tips of stems, and often have striking colors.

D. CONCLUSION

The weeds found in the Wonco rice fields consist of 40 weed species classified into 31 genera, 21 families, and 13 orders. Each species is grouped into the grasses, sedges, and broadleaves, with different morphological characteristics based on its group; for example, the grasses have fibrous roots with round stems, narrow leaves, and small compound flowers arranged in spikes or panicles, without true sepals and petals. The sedge group has fibrous roots, some of which are equipped with tubers, triangular stems, and narrow, elongated, ribbon-like leaves, as well as small, inconspicuous flowers arranged in spikelets. The broadleaf group has fibrous and taproots, leaves that are either simple or compound, broad leaves of various shapes, and flowers with true sepals and petals, including both compound and solitary flowers.

E. REFERENCES

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