ECONOMIC IMPORTANCE OF WEEDS
Weeds constitute a serious threat to cultivated lands and to the production of crops. They demand their share of nutrients from the soil and adversely affect the growth and yield of crop plants. "In order to eradicate the weed vegetation, vigorous control measures are necessary and these vary from the use of cultural operation and biological control to chemical methods" (Datta, 1969). Weed flora of rice-fields of Bengal have been studied by several workers (Prain, 1905; Chakrabarti, 1957; Paul and Bhattacharyya, 1959; Datta and Maiti, 1963; Mahapatra et al., 1965; Datta and Majumdar, 1966).

During cultural operations in a rice-field, many of the weeds are uprooted and thrown away. It would be of interest to find out whether these weeds could be utilised in any way for the benefit of human beings. The object of this work is to gather such information on the rice-field weeds and to show that most of these have economic importance. It may be noted here that Maiti (1968) has come across 48 medicinal plants used in indigenous systems of treatment, while making a survey of paddy fields of West Bengal. It would be evident from the present work that there are other uses of weeds besides the medicinal use.
MATERIAL AND METHOD

In a survey of rice-field weeds in Hooghly and Midnapore districts of West Bengal, 158 species were collected and preserved by the author. The economic value of these weeds has been screened in consultation with Watt (1889-99), Kirtikar and Basu (1918), Tadulingam and Venkatanarayana (1932), Biswas and Calder (1936), van Steenis (1948-58), Wealth of India (1948-69), Chopra, Bhadwar and Ghosh (1949, 1965), Chopra, Nayar and Chopra (1956), Gamble (1957), Bor (1960), Dastur (1962), Subramanyam (1962), Maheshwari and Singh (1965), Sculthorpe (1967) and Sharma (1971).

OBSERVATIONS

Aponogetonaceae

Aponogeton natans

(Subramanyam : 92; Wealth of India, I : 88)

The stoloniferous rootstock is edible.

Hydrocharitaceae

Hydrilla verticillata

(Biswas & Calder : 72; Flora Malesiana, V : 387; Sculthorpe : 521; Subramanyam : 55; Wealth of India, V : 145)

The plant is used as a fodder and may be utilized
as a green manure.

As good oxygen-generator, it is suitable for outdoor and indoor aquaria. It is consumed by some kinds of fish. **Ottelia alismoides**

(Flora Malesiana, V: 398; Sculthorpe: 520; Wealth of India, VII: 194)

For their excellent aroma, the leaves are used as a vegetable. The fruits are eaten by children.

When raised in aquaria, the plant serves as a fish-food.

The leaves are applied as a poultice on legs and arms during the attack of fever. In the Philippines, they are used to cure haemorrhoids. The plant has been claimed to possess rubefacient properties.

**Gramineae**

**Alloteropsis cimicina**

(Bor: 276)

The plant is grazed by cattle and hence can be considered a fodder-grass.

**Apluda mutica**

(Bor: 94; Maheshwari & Singh: 13)

The plant is used as a good fodder when young.
**Brachiaria reptans**

(Bor : 285)

The plant is good as a cattle-feed.

**Chloris inflata**

(Bor : 465; Wealth of India, II : 130)

The plant is not suitable for hay or silage, because the loss in weight when dry is tremendous. It is good as a fodder before flowering and is not relished by cattle in later stages.

**Chrysopogon aciculatus**

(Bor : 115; Chopra, Nayar & Chopra : 63; Maheshwari & Singh : 40; Wealth of India, II : 151)

The plant can withstand heavy grazing; it is eaten by cattle before flowering and is not relished in later stages.

The plant is suitable for lawns, provided it is kept mown frequently.

In Java, the culms are woven into cigarette cases and may also be used in the brush industry.
**Coix lachryma-jobi**

(Bor : 264; Chopra, Nayar & Chopra : 73; Dastur : 85; Kirtikar & Basu, II : 1363; Watt, II : 499; Wealth of India, II : 305)

The foliage can be turned into ensilage, but mature leaves and straw may be used for thatch. Dehulled caryopses (grains) can be fed to poultry.

The grains form a good substitute for rice due to high protein content. They are made into a beverage in Japan and are used by the Nagas for preparing a light beer called Dzu.

The root is administered in strangury and menstrual complaints by the Santals.

The grains are used by aboriginal races for ornamental purposes.

**Cynodon dactylon**

(Bor : 57; Chopra, Nayar & Chopra : 88; Kirtikar & Basu, II : 1376; Maheshwari & Singh : 54; Tadulingam & Venkatanarayana : 323; Watt, II : 679; Wealth of India, II : 421)

The plant is a valuable pasture-grass and can be fed green or made into hay. It can cause poisoning of livestock by the release of hydrocyanic acid during hot dry weather.
It is one of best grasses for turfs and lawns.

It serves as a good soil-binder and is commonly recommended for checking soil erosion.

A preparation of the plant is considered as a diuretic and is useful in the treatment of anasarca and dropsy. The expressed juice is astringent and used in hysteria, insanity, epilepsy, diarrhoea, dysentery, cuts and wounds.

_Dactyloctenium aegypticum_

(Bor : 58; Chopra, Nayar & Chopra : 89; Kirtikar & Basu, II : 1379; Maheshwari & Singh : 55; Watt, III : 236)

The plant forms a nutritious fodder-grass for cattle and is considered suitable for milk-producing and fattening. It can cause poisoning of livestock by the release of hydrocyanic acid during hot dry weather.

At times of scarcity, the grains are consumed by poor people.

The herbaceous parts are applied externally for the treatment of ulcers. A decoction of the seed is used to relieve pains in the kidney region. Parched grains are administered to women who suffer from stomach ache after child-birth.
Dichanthium annulatum

(Bor: 133; Maheshwari & Singh: 58; Wealth of India, III: 55)

It is a wild fodder-grass; it can be fed green, both before and during flowering time.

It is good for rough lawns.

Digiteria sanguinalis

(Bor: 304; Wealth of India, III: 2)

It is valued as a fodder-grass and can be used, green or dry, for cattle and horses.

Echinochloa colonum

(Bor: 308; Maheshwari & Singh: 62; Watt, VI(1A): 7; Wealth of India, III: 124)

A quick-growing fodder-grass, it is liked by cattle at all stages. Its nutritive value is increased when in grain.

At times of scarcity, the grains are consumed by poor people. In Java, the young shoots are eaten with food.

Eleusine indica

(Bor: 493; Chopra, Nayar & Chopra: 106; Maheshwari & Singh: 63; Watt, III: 241; Wealth of India, III: 166)

The plant is valued as a fodder-grass in North
America and Australia.

The leaves are said to be highly cyanogenic, especially when wilted.

The grains are eaten in times of scarcity.

In the Philippines, the culms are utilized for making hats.

**Eragrostis coarctata**

(Wealth of India, III : 183)

The plant is used as a fodder for cattle.

**E. diarrhena**

(Wealth of India, III : 183)

The plant is grazed by cattle.

**E. gangetica**

(Wealth of India, III : 183)

A valuable fodder-grass, the plant is fed both green or as a hay to cattle.

It is used for making brooms in some parts of Madhya Pradesh.

**E. tenella**

(Watt, III : 255; Wealth of India, III : 182)

The grass is fed either green or as a hay to cattle.

The grains are also considered nutritious.
E. unioloides

(Wealth of India, III : 183)
The grass is eaten by horses and cattle.

It is ploughed in as a green manure when growing profusely in rice-fields.

Eriochloa procera

(Wealth of India, III : 189)
The plant is good as a fodder for cattle.

Hemarthria compressa

(Bor : 161; Wealth of India, V : 31)
The plant is esteemed as a fodder-grass in Australia and Africa.

Imperata cylindrica

(Chopra, Nayar & Chopra : 140; Dastur : 128;
Maheshwari & Singh : 86; Watt, IV : 336;
Wealth of India, V : 169)

While tender and succulent shoots are palatable to livestock, the mature leaves are not relished by cattle and saw-like edges cause sores to the mouth of animals. The rhizomes are consumed by pigs.
The grass forms a mulch for some crops. It prevents the development of the sugarcane parasite, *Aeginetia indica*, in the Philippines. In Sumatra, tobacco fields become infested with the grass which harbour the bacterial organism, *Pseudomonas solanacearum*, and burning of the grass is considered a boon to the tobacco crop.

The grass is considered appropriate for reclaiming dry and desert regions. It acts as a soil-binder, being important for coastal sand-dunes, dams, embankments and river-banks.

In Malaya, a type of beer is prepared by fermenting the infusion of rhizomes. A sugar is also made from the rhizome after elimination of bitter constituents.

The flossy inflorescence is used to stuff pillows and cushions. The leaves constitute a durable thatch. The dried grass is used as a fuel in South China. In Uganda, it is used for firing pottery together with stems of elephant grass (*Pennisetum purpureum* Schum.). The grass is employed for plait work, for weaving into plates and baskets and for making brushes, cowry bags, mats and ropes. In India, it has been tried as a raw material for paper pulp.

When taken internally the fruiting spikes are considered a sedative in the Philippines. The seeds are considered
vulnerary, being used to stop bleeding. The rhizomes are used as a fumigant for piles in Cambodia as well as a tonic, antipyretic and restorative in China. A preparation from rootstock is administered in cases of gonorrhoea, diarrhoea and dysentery.

**Ischaemum rugosum**

(Maheshwari & Singh : 88; Watt, IV : 532; Wealth of India, V : 272)

The plant is considered a good fodder-grass for horses and cattle.

The grains are consumed by poor people in some parts of Madhya Pradesh.

**Leersia hexandra**

(Maheshwari & Singh : 95; Watt, IV : 620; Wealth of India, VI : 59)

The plant is highly prized as a fodder-grass in Australia; it can be fed either green or as a hay to horses and cattle.

**Leptochloa chinensis**

(Wall, IV : 630; Wealth of India, VI : 74)

The plant affords a good fodder-grass for cattle.

The grains are consumed as a famine food in East Africa.
Opismenus burmannii
(Maheshwari & Singh : 115; Watt, V : 489;
Wealth of India, VII : 99)
The plant is an excellent fodder-grass; it can be fed to cattle either green or as a hay.
It forms a good lawn-grass in areas of abundant rainfall.
A decoction of the grass is used in Java during pregnancy.

Oryza sativa var. sativa
(Not mentioned by other workers; the author's own observations).
The plant can be fed to cattle either green or as a hay.

Panicum austroasiaticum
(Wealth of India, VII : 230)
The plant affords a good forage for cattle.

P. psilopodium
(Wealth of India, VII : 231)
The plant forms an useful fodder-grass.
In Assam, the grains are used in preparing an alcoholic beverage.
The plant can be fed to cattle, either green or as a hay.

It serves as a good soil-binder.

The rhizome is given in abnormal menstruation.

P. trypheron

(Bor: 331; Wealth of India, VII : 231)

The plant is useful as a fodder-grass.

The grains resemble white Italian millet (Setaria italica) and is used as a famine food.

Paspalidium flavidum

(Watt, V : 9; Wealth of India, VII : 268)

The grass is considered useful as a fodder.

The grains are used in times of scarcity.

The roots and leaves are said to be highly cyanogenetic.

P. punctatum

(Wealth of India, VII : 26)

The plant is useful as a fodder-grass.
The grass is eaten when young and the straw forms a good cattle fodder.

It is used as a valuable manure for alkaline soils.

The grains, recommended as a diet for diabetic patients, are cooked like rice and used for making a kind of bread. But immature or newly-harvested grains are considered poisonous.

The husk is sometimes used as a fuel.

The plant is used as a cure for scorpion-bite.

**Perotis indica**

(Wealth of India, VII : 314)

The plant is reported to be a good fodder-grass and is liked by livestock at all stages.

**Saccharum spontaneum**

(Bor: 214; Chopra, Nayar & Chopra : 217; Dastur : 183; Maheshwari & Singh : 140; Watt, VI (2) : 11)

The plant is a favourite fodder-grass for buffaloes and is fed to elephants when young.
The grass is used as a sand-binder as well as a source of paper pulp and fuel.

It is considered aphrodisiac and laxative, being useful in strangury, phthisis, blood diseases, biliousness, vesical calculi, painful urination, burning sensations and in stimulating sexual passion.

**Setaria glauca**

(Bor: 361; Maheshwari & Singh : 145; Watt, VI(2) : 546)

The grass is used as a fodder.
The grains are eaten.

**Sporobolus diander**

(Maheshwari & Singh : 146)

The grass is used as a fodder.

**Urochloa helopus**

(Gamble, III : 1230)

The grass is used as a fodder.
The grains are consumed by poorer classes.

**Vetiveria zizanioides**

(Chopra, Nayar & Chopra : 254; Dastur : 219; Maheshwari & Singh : 165)

The grass is used in making board and paper. The dried
roots are woven into baskets, curtains, fans and mats. The roots also yield an essential oil which finds use in cosmetics, soaps, perfumery and flavouring sherbets.

A paste of the roots is used in swellings.

Cyperaceae

*Cyperus iria*

(Chopra, Nayar & Chopra : 88; Maheshwari & Singh : 54; Watt, II : 685)

The culms are used in making mats.

The plant is used as an astringent, stimulant, stomachic and tonic.

*C. kvlllinga*

(Chopra, Nayar & Chopra : 148; Kirtikar & Basu, II : 1353, Watt, IV : 569; Wealth of India, V : 331)

The sedge is fed to cattle, but is injurious when given in seedling stage.

The roots, stems and mutlets are said to be slightly cyanogenetic.

The plant is used for measles in Celebes and for diarrhoea in Malaya. It is given in cases of fistula,
tumours, pustules as well as intestinal and stomach complaints. The spikes are used as a poultice for gathered nails. The rhizome-decoction is demulcent, diuretic, refrigerant, sudorific and tonic. The root serves as an antidote to poison.

*C. rotundus*

(Dastur : 91; Kirtikar & Basu, II : 1355; Maheshwari & Singh : 54; Tadulingam & Venkatanarayana : 317; Watt, II : 686; Wealth of India, II : 424)

Dry tubers are used in perfumery and in making incense-sticks.

The tubers are considered astringent and is administered to people afflicted with bowel irritations and stomach disorders.

*C. tricaps*

(Chopra, Nayar & Chopra : 148, Kirtikar & Basu, II : 1353; Wealth of India, V : 332)

The root-decoction is used in diabetes and to relieve thirst in fevers.

**Fimbristylis annua**

(Wealth of India, IV : 41)

The stems are used for making mats.
The roots are considered as highly aromatic.

F. dichotoma

(Wealth of India, IV : 41)

The roots are used in dysentery by the Santals.

Scirpus articulatus

(Chopra, Nayar & Chopra : 224, Kirtikar & Basu, II : 1358; Sculthorpe : 520; Subramanyam : 106)

The plant is reported to be a purgative.

S. grossus

(Chopra, Nayar & Chopra : 224, Kirtikar & Basu, II : 1358; Sculthorpe : 520; Subramanyam : 106)

The roots are endowed with astringent properties and the powdered rhizomes are given for dyspepsia, dysentery and piles.
Araceae

Pistia stratiotes

(Chopra, Nayar & Chopra : 135; Kirtikar & Basu, II : 1330; Sculthorpe : 519; Subramanyam : 75; Wealth of India, VIII : 124)

The plants are used as a food for ducks, pigs, Ostriches and fishes.
The plants afford manure in South-East Asia and Tropical Africa.
The young leaves are cooked and consumed by the Chinese.
The leaves are used in haemorrhoids, dysentery, asthma, cough and skin diseases.

Commelinaceae

Commelina diffusa

(Chopra, Nayar & Chopra : 74; Wealth of India, II : 313)
The leaves serves both as a vegetable and fodder.
The bruished plants are applied for boils, burns and itches.
Cyanotis axillaris

(Chopra, Nayar & Chopra : 86; Kirtikar & Basu, II : 1309)

The plant is applied externally in cases of ascites and is a remedy for tympanites.

Murdannia malabarica

(Chopra, Nayar & Chopra : 18)

The plant is used in the treatment of leprosy.

Pontederiaceae

Eichhornia crassipes

(Biswas & Calder : 57; Flora Malesiana, IV : 259; Sculthorpe : 521; Sharma : 51; Subramanyam : 70; Tadulingam & Venkatanarayana : 307)

The plant has been used mainly as a fertilizer, mulch and compost; as a fodder, silage and food for pigs, horses, cattle, sheep and fish; as a raw material for paper, plastics, ink, upholstery, soap, etc; as a source for gases, proteins, potash, etc.
Polygonaceae

Polygonum hydropiper

(Chopra, Badhwar & Ghosh, II : 733; Chopra, Nayar & Chopra : 200; Kirtikar & Basu, II : 1077; Watt, VI (1B) : 318; Wealth of India, VIII : 198)

The plant can be used as a fish poison and to dye wool yellow.

The bruised leaves and seeds are used externally as a substitute for mustard poultice in indigenous medicine. The fresh plant is so toxic that animals would not touch it normally.

P. plebejum

(Chopra, Nayar & Chopra : 200; Kirtikar & Basu, II : 1074; Watt, VI (1B) : 319; Wealth of India, VIII : 201)

The plant is eaten by horses and is used as a vegetable. The root is given for bowel complaints and the powdered herb for pneumonia.
Amaranthaceae

*Achyranthes aspera*

(Chopra, Nayar & Chopra: 4; Dastur: 10; Flora Malesiana, IV: 88; Kirtikar & Basu, II: 1061; Tadulingam & Venkatanarayana: 267; Wealth of India, I: 24)

The plant can be utilised as a cheap green manure due to the rich potash content.

In the Moluccas, the young leaves are used as spinach.

The plant-decoction is useful in renal dropsies and is reputed to possess diuretic properties. The flowering spikes or seeds are used externally for insect-bites.

*Alternanthera sessilis*

(Chopra, Nayar & Chopra: 14, Flora Malesiana, IV: 92; Kirtikar & Basu, II: 1063; Wealth of India, I: 64)

The plant is used as a pot-herb, since the young shoots are nutritious and contains protein and iron as the main constituents. It is eaten in Ceylon by mothers to increase the flow of milk.

It is valued as a febrifuge, as a wash for the eyes, a cooling hair-wash, a remedy against intestinal cramps and a cure for snake-bite.
The plant is used as a vegetable. The leaves are emollient in scorpion-sting and the plant is useful in snake-bite.

**Amaranthus gracilis**

(Chopra, Nayar & Chopra: 15; Flora Malesiana, IV: 76; Tadulingam & Venkatanarayana: 265)

The plant is used as a vegetable. The leaves are emollient in scorpion-sting and the plant is useful in snake-bite.

**Celosia argentea**

(Chopra, Nayar & Chopra: 57; Flora Malesiana, IV: 73; Kirtikar & Basu, II: 1066; Tadulingam & Venkatanarayana: 257; Wealth of India, I: 113)

The plant is used as a pot-herb, since the leaves form a source of inferior vegetable. The seeds are used by the Chinese for adorning cakes. The seeds are considered useful in diarrhoea, blood diseases, mouth sores and for eye troubles.

**Digera alternifolia**

(Chopra, Nayar & Chopra: 96; Maheshwari & Singh: 58; Tadulingam & Venkatanarayana: 261; Watt, III: 112; Wealth of India, II: 59)

The plant is eaten by cattle. The tender shoots and inflorescences are used as a vegetable.
The flowers and seeds are considered efficacious for urinary discharges.

Aizoaceae

Glinus lotoides  
(Chopra, Nayar & Chopra: 168; Kirtikar & Basu, I: 614; Tadulingam & Venkatanarayana: 149; Watt, V: 255; Wealth of India, IV: 136)

The tender shoots are consumed as a pot-herb.

The dried plant is a helpful purgative in abdominal disorders and the juice is given internally to weak children.

G. oppositifolius  
(Chopra, Nayar & Chopra: 168; Flora Malesiana, IV: 270; Kirtikar & Basu, I: 615; Wealth of India, IV: 136)

The plant is reported to be aperient, antiseptic, stomachic and is useful in suppressed lochia. It is used for earache and is applied to itch and skin diseases.
The leaves and stems are eaten as a vegetable, but such consumption is accompanied by toxic effects like diarrhoea and paralysis.

The plant-decoction is a cure for rheumatism and is an antidote for alcoholic poison. The roots are reported to have irritant and cathartic properties, being used to induce abortion.

Portulacaceae

**Portulaca oleracea**

(Chopra, Nayar & Chopra : 202; Kirtikar & Basu, I : 135; Tadulingam & Venkatanarayana : 77; Watt, VI(1B) : 330; Wealth of India, VIII : 219)

The plant can be used as a food for pigs, cattle and sheep with caution.

The young shoots are eaten as a vegetable.
The plant juice has astringent and detergent properties. It can be used to relieve burning sensation and prickly heat. The seeds are effective in the diseases of bladder, kidney and lungs.

**Caryophyllaceae**

*P. prostratum*

*(Wealth of India, VIII : 189)*

The plant is used as a vegetable.

In Indo-China, an infusion of roasted leaves is given for coughs, following fever in measles.

**Nymphaeaceae**

*N. stellata*

*(Biswas & Calder : 10; Kirtikar & Basu, I : 72; Maheshwari & Singh : 112; Sculthorpe : 520; Wealth of India, VII : 72)*

The tender leaves, flower peduncles and rhizomes are edible. The seeds are eaten as a famine food.

A decoction of the flowers is given in heart palpitation. The seed-infusion is considered as an invigorating tonic. An
infusion of rhizomes is regarded as a diuretic and emollient and the powdered rhizome administered in cases of piles, dyspepsia and diarrhoea. The leaves are applied to erysipelas in Malagasy.

Papaveraceae

Argemone mexicana

(Chopra, Badhwar & Ghosh, I : 143; Chopra, Nayar & Chopra : 23; Dastur : 34; Flora Malesiana, V : 117; Kirtikar & Basu, I : 79; Maheshwari & Singh : 14; Tadulingam & Venkatanarayana : 63, Wealth of India, I : 143)

The plant is cultivated as an ornamental in Malaya. It is being used in Uttar Pradesh to reclaim 'usar' land.

The seed-oil serves as an illuminant and lubricant and is used in skin diseases for external application and as an aperient in West Indies.

The yellow juice, exuding from the plant when injured, is used externally in scabies and in ophthalmia. The bruised fresh root is effective against scorpion sting. The seeds are considered as a demulcent, emetic, expectorant, laxative and nauseant.
Capparidaceae

*Polanisia viscosa*

(Kirtikar & Basu, I : 98; Maheshwari & Singh : 44; Tadulingam & Venkatanarayana : 71; Watt, II : 370)

The seeds are used in curries.

The leaf-juice is applied to ear and forehead to relieve earache and headache respectively. In Indo-China, the whole plant is used for counter-irritation and blistering. The seeds are considered as carminative and anthelmintic and are also given in diarrhoea and fevers.

Droseraceae

*Drosera burmanni*

(Chopra, Badhwar & Ghosh, I : 375; Chopra, Nayar & Chopra : 101; Watt, III : 135; Wealth of India, III : 113)

The plant is not browsed by cattle, since it has powerful rubefacient properties on account of napthaquinone.

The plant yields an orange colour which is good for dyeing silk.

The leaves rapidly curdle milk and are used as blister in Kumaon.
Leguminosae

**Aeschynomene aspera**

(Biswas & Calder : 15; Dastur : 18; Maheshwari & Singh : 5; Subramanyam : 14; Wealth of India, I : 35)

The leaves are edible.

The pith-like stem of the plant is converted into sun-hats, toys, models, artificial flowers, swimming-belts, rafts, fishing-floats and as plugs for bottles.

The pith is used for embedding plant-parts for cutting free-hand sections in laboratory.

**A. indica**

(Dastur : 18; Maheshwari & Singh : 5; Wealth of India, I : 35)

The stem is not as soft as *Aeschynomene aspera* and is more cheaper. It is used for making sola hats and fishing-floats as well as for mainly making elephant pads and as supports by people for crossing rivers. The wood is employed as a fuel for firing pottery. Charcoal made from the plant is utilised for making fire-works and gun-powder.
Alysicarpus vaginalis

(Chopra, Nayar & Chopra; Wealth of India, I : 66)

The plant is a good forage legume in several countries of the tropics.

The root-decoction is reported to be used in Java for coughs.

Desmodium triflorum

(Chopra, Nayar & Chopra : 94; Kirtikar & Basu, I : 429; Maheshwari & Singh : 57; Watt, III : 84; Wealth of India, III : 43)

Highly suited for dry rocky soils, the plant is grown as a soil-binder. It is also useful for lawn or pasture. It has been tried as a cover-crop in rubber estates or as a green manure-crop in coconut plantations, but is not proper for tea plantations.

A paste of the bruished leaves is applied to itch and indolent sores. Fresh leaves are used as a galactagogue and for diarrhoea and also used for abscesses and wounds.
Sesbania aculeata

(Kirtikar & Basu, I : 418; Watt, VI(2) : 542)

The seeds are taken as a famine food.

The plant yields a useful fibre for cords, ropes and twines.

Smithia sensitiva

(Chopra, Nayar & Chopra : 229, Watt, VI(3) : 255)

The plant makes a good hay and cattle browse on it.

The leaves are used as a vegetable.

The plant is used as a lotion for headache.

Oxalidaceae

Biophytum sensitivum

(Kirtikar & Basu, I : 237; Wealth of India, I : 187)

The leaves are considered diuretic and are used to allay thirst in bilious fevers. The root-deduction is given in lithiasis and gonorrhoea. The powdered seeds are applied to wounds. The plant is said to be used for chest complaints and its ash for stomach ache.
As it is an acrid and poisonous plant, herbivorous animals do not browse upon it.

The fruits of this plant yield a purplish blue dye named turnsol.

The stems are used as a fuel and the bark form a strong and useful fibre.

The plant has corrosive, drastic and emetic properties. The leaves are regarded as a depurative. The ash of roots are administered to children in cases of cough. The seeds are utilised as a purgative.

*Croton bonplandianum*

(Tadulingam & Venkatanarayana : 297; Wealth of India, II : 383)

Since the plant is enriched with nitrogen and potash, it is good for composting.
The seed-oil is endowed with drying properties. The oil-cake can be used as a manure.

**Euphorbia hirta**

(Chopra, Nayar & Chopra: 113; Chopra, Badhwar & Ghosh, II: 784; Tadulingam & Venkatanarayana: 289; Wealth of India, III: 225)

The plant is used in gargles and as a poultice. It is useful in dysentery and colic, as a vermifuge and in diseases of the genito-urinary tract.

**E. parviflora**

(Chopra, Nayar & Chopra: 114; Chopra, Badhwar & Ghosh, II: 786; Kirtikar & Basu, II: 1121; Watt, III: 296; Wealth of India, III: 225)

Dry leaf-infusion of the plant, being weakly narcotic and astringent, is used in diarrhoea, dysentery, leucorrhoea and menorrhoea and is sometimes administered to children in cases of colic.
E. thymifolia

(Chopra, Nayar & Chopra : 114; Chopra, Badhwar & Ghosh, II : 787; Kirtikar & Basu, II : 1124;
Watt, III : 300; Wealth of India, III : 227)

Considered slightly aromatic, the dried leaves and seeds are astringent, anthelmintic, laxative and stimulant and are given to children in bowel complaints. The plant-juice serves as a cure for ringworm.

The plant yields a green essential oil with an irritating taste and a pungent smell and is used as a vermifuge for dogs and farm foxes, as a spray to keep off mosquitoes and flies, and in medicinal soaps for the treatment of erysipelas.

Phyllanthus fraternus

(Chopra, Nayar & Chopra : 191; Kirtikar & Basu,
II : 1143; Tadulingam & Venkatanarayana : 295;
Wealth of India, VII : 34)

The milky juice is applied to offensive sores. The roots are used for treating camels suffering from digestive troubles. The fresh root is a suitable remedy for jaundice. The leaves are stomachic and an infusion of young shoots are given in dysentery and stem-juice mixed with oil is given in opthalmia.
The plant is reported to have antiseptic properties. The leaf-juice is used in eye diseases in the Philippines. The root has an external application for mammary abscess. The fresh leaves bruised and mixed with butter milk is a cure for children's itch. The seeds mixed with sugar is effective against gonorrhoea.

**P. uncinata**

(Chopra, Nayar & Chopra : 191; Chopra, Badhwar & Ghosh, II : 799; Kirtikar & Basu, II : 1142; Watt, VI(1A) : 224; Wealth of India, VIII : 36)

The plant is a fish-poison and the leaves are consumed by cattle.

Medicinally, the plant is used in gonorrhoea and other genito-urinary troubles. The root is given to sleepless children.
Tiliaceae

Corchorus aestuans

(Chopra, Nayar & Chopra : 76; Wealth of India, II : 326)

Wild species of the plant are used for fibre extraction.

The seeds are used in pneumonia and are regarded as a stomachic.

Malvaceae

Sida acuta

(Chopra, Nayar & Chopra : 226; Kirtikar & Basu, I : 170; Maheshwari & Singh : 146)

The stem yields a kind of fibre useful in making twines and ropes.

Considered as an astringent, cooling and tonic, the roots are used in urinary and nervous diseases as well as disorders of bile and blood.

S. rhomboidea

(Chopra, Badhwar & Ghosh, I : 206; Chopra, Nayar & Chopra : 227; Kirtikar & Basu, I : 172; Watt, VI(2) : 681)

The stem yields a good fibre.
In Europe, the plant is used in rheumatism and pulmonary tuberculosis. The leaves are applied on swellings. The stem-mucilage is used as a demulcent and emollient. The plant is a cure for snake-bite.

Sterculiaceae

*Melochia corchorifolia*

(Chopra, Nayar & Chopra : 164; Maheshwari & Singh : 104; Watt, V : 226; Wealth of India, VI : 333)

The leaves are used in soup and consumed as a vegetable.

The stem yields a strong fibre for making fishing lines and for tying bundles of rice plants. The stems are also used for horizontal ties in hut roofs.

The leaves are used for swellings and sores of the abdomen. A decoction of leaves and roots are given in cases of dysentery. The stem and leaves, boiled in oil, are applied as a relief from bites of water-snakes.
Lythraceae

*Ammannia baccifera*

(Chopra, Badhwar & Ghosh, I : 391; Chopra, Nayar & Chopra : 15; Kirtikar & Basu, I : 564; Wealth of India, I : 68)

The plant is highly acrid and emits a strong muriatic odour.

The fresh leaves are applied as a rubifacient in skin diseases. The plant juice is given internally in cases of spleen enlargement.

Onagraceae

*Ludwigia adscendens*

(Sculthorpe : 520; Subramanyam : 19; Wealth of India, V : 311)

The plant is applied in poultice or as a paste for ulcers and skin diseases.

*L. perennis*

(Wealth of India, VI : 117)

The Mundas boil the plant in oil and apply it externally on the body for reducing fever.
Umbelliferae

Centella asiatica

(Chopra, Badhwar & Ghosh, I : 435; Flora Malesiana, IV : 117; Kirtikar & Basu, I : 618, Maheshwari & Singh : 37; Watt, IV : 312; Wealth of India, II : 116)

The leaves are used raw or steamed and eaten with rice in Malaysia. Fresh leaves consumed everyday are regarded as having the property of prolonging life.

When leaves are used as a fodder, they increase the secretion of milk in cows.

The plant is stated to bear insecticidal properties and is an useful cover-crop in rubber and tea plantations.

The plant is considered alterative, diuretic and tonic, being used to cure madness and as an antidote against cholera. In India and Malagasy, an infusion of the plant is used in the treatment of leprosy.

Seseli indicum

(Chopra, Nayar & Chopra : 226; Kirtikar & Basu, I : 626; Maheshwari & Singh : 145; Watt, VI(2) : 545)

The fruits are considered a stomachic and stimulant, being used to expel round-worms.
The seeds are reported to be a carminative and are used as a medicine for cattle.

**Gentianaceae**

_Centaurium roxburghii_

(Chopra, Nayar & Chopra: 58; Kirtikar & Basu, II: 846)

The plant is considered powerfully bitter and is used by the Santals in fever. It is a substitute for Chiretta (Swertia chirata Buch.-Ham).

**Nymphoides cristatum**

(Maheshwari & Singh: 113; Watt, IV: 641; Wealth of India, VI: 114)

The leaves, stems and fruits are consumed after boiling or in curry.

The plant is a substitute for chiretta in jaundice and fevers. The seeds are said to be anthelmintic. The leaves and stalks are pulverised with oil and applied to insect-bites and ulcers; a decoction is used as a wash for parasitic skin affections.
Apocynaceae

Lochnera pusilla

(Kirtikar & Basu, II : 783; Watt, VI (4) : 243)

The plant is reported to cause poisoning of cattle.

In cases of lumbago, a decoction of the dried plant, boiled in oil, is rubbed on the loins.

Convolvulaceae

Ipomoea aquatica

(Biswas & Calder : 36; Chopra, Nayar & Chopra : 142;
Flora Malesiana, IV : 473; Kirtikar & Basu, II : 880;
Maheshwari & Singh : 37; Sculthorpe : 520; Subramanyam : 27; Watt, IV : 477; Wealth of India, V : 237)

The young terminal shoots are used as a vegetable.
The roots are eaten as a famine food.

As a green fodder the plant is relished by pigs and cattle. It is also utilised as a fish-food.

The plant is regarded as wholesome for females suffering from nervous and general debility. In Burma, the plant juice is used as an emetic in cases of arsenical or opium poisoning. The dried juice is also endowed with
purgative properties. In Cambodia, the plant is applied as a poultice in febrile delirium. The buds are used for ringworm and the plant for piles.

Merremia emarginata

(Flora Malesiana, IV : 444; Kirtikar & Basu, II : 879; Wealth of India, VI : 347)

The plant is consumed as a pot-herb.

The plant is regarded as an alterative and deobstruent.

In the Philippines, the decoction of tops and leaves are sometimes employed as a diuretic. The plant-juice is dropped into ear to cure sores. In Java, the plant is used for coughs. It is also used in neuralgia and rheumatism.

Hydrophyllaceae

Hydrolea zeylanica

(Chopra, Nayar & Chopra : 137; Flora Malesiana, IV : 207; Kirtikar & Basu, II : 855; Sculthorpe : 520; Subramanyam : 27; Watt, IV : 315; Wealth of India, V : 147)

The young leafy tops of the plant are edible.

Since the leaves possess cleaning and antiseptic properties, they are applied as a poultice on neglected and callous ulcers.
Boraginaeae

*Coldenia procumbens*  
(Watt, II: 503; Wealth of India, II: 307)

The fresh leaves are applied on rheumatic swellings. The plant is used externally for causing suppuration of boils.

*Heliotropium indicum*  
(Chopra, Badhwar & Ghosh, I: 597; Chopra, Nayar & Chopra: 131; Kirtikar & Basu, II: 865; Tadulingam & Venkatanarayana: 200; Watt, IV: 215; Wealth of India, V: 29)

The leaves impart an impermanent black colour. The stems and leaves contain tannin and probably an alkaloidal principle.

The plant is astringent and bitter and possess diuretic, emollient and vulnerary properties. It is used locally for gum boils, sores, ulcers, wounds etc. The leaf-decoction is used in urticaria and fevers, the root-decoction in fevers and coughs and fruits-decoction in asthma, leprosy and other diseases. In small doses, the flowers are emmenagogue and in large doses abortifacient.
H. ovalifolium

(Wealth of India, V : 30)

The plant is reported to be poisonous and causes vomiting and diarrhoea. It is used as an external application for syphilitic ulcers in Africa and is sometimes administered internally.

Verbenaeeae

Phyla nodiflora

(Chopra, Nayar & Chopra : 155; Kirtikar & Basu, II : 987; Watt, V : 78; Wealth of India, VI : 142)

In Ceylon, the leaves are eaten. In the Philippines, an infusion of the leaves is taken as tea.

The plants possess diuretic, cooling and febrifuge properties. An infusion of leaves and tender stalks are given to women after delivery and to children suffering from indigestion. In Bombay, the plant is used as a demulcent in cases of gonorrhoea. A poultice or paste made from the plant is applied as a suppurant for boils, chronic indolent ulcers and swollen cervical glands.
Labiatae

Leucas cephalotes

(Chopra, Nayar & Chopra : 153; Chopra, Badhwar & Ghosh, II : 709; Kirtikar & Basu, II : 1044;
Maheshwari & Singh : 96; Watt, IV : 633; Wealth of India, VI : 79)

The leaves are eaten as a pot-herb.

The seeds are used as an auxiliary in dye extraction from *Rubia sikkimensis* Kurz and yield an oil for illumination purposes.

The plant is pungent to taste and is stated to be anthelmintic, antiseptic, diaphoretic, insecticidal, laxative and stimulant. The flowers are used for coughs and colds. The fresh juice is applied externally in some localities.

Scrophulariaceae

Bacopa monnieri

(Biswas & Calder : 30; Chopra, Nayar & Chopra : 32; Kirtikar & Basu, II : 930; Sculthorpe : 520;
Watt, IV : 226; Wealth of India, I : 143)

The whole plant is employed in indigenous medicine as a nerve tonic, being a cure for hysteria, insanity and
epilepsy. In Pondichery, the plant is considered as an aphrodisiac. In Ceylon, it is given in fevers. The leaves and stems are used in snake-bite.

**Limnophila indica**

(Chopra, Nayar & Chopra : 154; Kirtikar & Basu, II : 930; Maheshwari & Singh : 96; Sculthorpe : 520; Subramanyam : 30; Wealth of India VI : 116)

The leaves are eaten as a pot-herb.

The plant has an agreeable odour, suggestive of oil of lemon or camphor and thus endowed with antiseptic carminative properties. In the Philippines, an infusion of leaves is given for dyspepsia and dysentery. The plant-juice is rubbed over the body in pestilent fevers. A liniment made from the plant is used in elephantitis.

**Lindernia cordifolia**

(Wealth of India, VI : 118)

The plant is a cure for gonorrhoea. It is employed as a substitute for *L. crustacea* in Malaya.

**L. crustacea**

(Wealth of India, VI : 118)

The plant is said to possess a bitter principle. In Indo-China, it is used for dysentery and bilious
affections. It is used as a poultice for boils.

Acanthaceae

**Hygrophila auriculata**

(Chopra, Nayar & Chopra : 29; Kirtikar & Basu, II : 955; Maheshwari & Singh : 16; Sculthorpe : 520; Subramanyam : 39; Tadulingam & Venkatanarayana : 237; Watt, IV : 317; Wealth of India, I : 133)

The roots, leaves and seeds are considered as a diuretic in the Indian medicine. They have been used for anasarca, dropsy, rheumatism, jaundice and diseases of the urino-genital tract.

**Justicia quinqueangularis**

(Wealth of India, V : 313)

The leaves are consumed as a pot-herb.

**Rungia pectinata**

(Chopra, Nayar & Chopra : 217; Kirtikar & Basu, II : 981; Watt, VI (1B) : 592)

The leaf-juice is considered to be aperient and cooling, being given to children suffering from small-pox. The bruised leaves are applied to contusions to relieve pain and diminish swelling.
Rubiaceae

Borreria articulata

(Chopra, Nayar & Chopra: 39; Wealth of India, I: 187)

The leaves are consumed in times of scarcity and seeds used as a substitute for coffee.

The root-decoction is employed as an alterative. The seeds are considered stimulant.

Dentella repens

(Chopra, Nayar & Chopra: 93, Wealth of India, III: 35)

In Malaya, the plant is used as a poultice for sores.

Oldenlandia corymbosa

(Chopra, Nayar & Chopra: 180; Kirtikar & Basu, I: 665; Subramanyam: 6; Watt, V: 480)

The plant is given in cases of fever, jaundice and diseases of liver.

O. heynei

(Chopra, Nayar & Chopra: 180)

The plant is a remedy for snake-bite. The leaves are used in the treatment of fever, asthma and rheumatism.
Campanulaceae

**Lobelia alsinoides**

(Watt, V: 87; Wealth of India, VI: 161)

In Chotanagpur, the leaves are used as a pot-herb. They are consumed in times of scarcity in Bombay.

**Sphenoclea zeylanica**

(Flora Malesiana, IV: 27)

In Java, young plants and tips of older plants are steamed and eaten with rice. However, they have a slightly bitter taste.

Compositae

**Eclipta prostrata**

(Chopra, Nayar & Chopra: 104; Kirtikar & Basu, I: 686; Tadulingam & Venkatanarayana: 173;
Watt, III: 201; Wealth of India, III: 127)

In some parts of India, the leaves are used in chutneys and in Java as a vegetable.

The plant is used in tattooing the skin bluish black. The leaf-juice, boiled in coconut or sesamum oil, is used for anointing the head to render the hair luxuriant.
The plant is a tonic and deobstruent, being used in skin diseases and hepatic and spleen enlargements. In combination with aromatics, the plant-juice is given in cases of catarrhal jaundice. The leaf-juice, mixed with honey, is a specific for catarrh in infants. The fresh plant is rubbed on gums to toothache and applied with a little oil for relieving headache and with sesame oil in elephantiasis. The leaf is a remedy for scorpion-sting. The root is given to relieve scalding of the urine.

*Enhydra fluctuans*

(Biswas & Calder: 22; Chopra, Nayar & Chopra: 107; Kirtikar & Basu, I: 685; Watt, III: 244; Wealth of India, III: 173)

The leaves are used as a vegetable or in salad.

The leaves are stated to be antibilious, demulcent and laxative, being used in skin, liver and nervous diseases.

*Gnaphalium indicum*

(Wealth of India, IV: 157)

In Bihar, the leaves are eaten as a pot-herb.
Grangea madraspatana

(Chopra, Nayar & Chopra : 127; Kirtikar & Basu, I : 675; Tadulingam & Venkatanarayana : 161; Wealth of India, IV : 252)

The leaves are considered as an antispasmodic, deobsturent and stomachic. They are used in the treatment of ear ache and irregular menses as well as in antiseptic and anodyne fomentations.

Xanthium strumarium

(Chopra, Badhwar & Ghosh, I : 502; Chopra, Nayar & Chopra : 259; Kirtikar & Basu, I : 683; Tadulingam & Venkatanarayana : 165; Watt, VI(4) : 318)

The plant is reported to be poisonous to cattle and pigs in Australia and America.

The flowering tops and two leaves immediately below, boiled in 'Khar' water, are eaten as a pot-herb by the people of Assam.

The leaves serve as the source of a yellow dye. The seeds yield an oil for illumination purposes.
The fruit is used medicinally, being considered demulcent, diaphoretic, sedative, sudorific and sialagogue. It is given in small-pox. In South India, the prickly involucre is applied to the ear or tied in a bunch to the ear-ring to cure hemicrania.

DISCUSSION

In this work, 125 species of weeds have been included. The species which have been ignored or which have no economic significance are Digitaria stricta, Cyperus difformis, C. haspan, C. niveus, C. squarrosus, C. umbellatus, Eleocharis caribaea, Eleocharis barbata, E. dipsacea, E. ferruginea, Scirpus pauciflorus, S. supinus, Eriocaulon odoratum, E. sieboldianum, Bergia aspera, Ammannia multiflora, Rotala densiflora, R. indica, Myriophyllum indicum, M. tuberculatum, M. nitida, M. alinae, Evolvulus nummularius, Centranthera tranquebarica, Limnophila sessiliflora, Lindernia ciliata, Scoparia dulcis, Utricularia flexuosa, U. inflexa var. stellaris, Hemigraphis hirta, Hydrophila difformis, H. polysperma, Oldenlandia nudicaulis and Gnaphalium pulvinatum. As they grow in rice-fields and have the potentiality to survive, it is highly desirable that research work should be undertaken on them in order to find out their utility.
Most of the weeds have valuable medicinal properties, e.g. Cynodon dactylon, Dactyloctenium aegypticum, Imperata cylindrica, Vetiveria zizanioides, Cyperus rotundus, Scirpus articulatus, Pistia stratiotes, Cyanotis axillaris, Polygonum hydropiper, Achyranthes aspera, Trianthema portulacastrum, Nymphaea stellata, Alysicarpus vaginalis, Corchorus aspera, Sida acuta, S. rhomboidea, Centella asiatica, Centaurium roxburghii, Bacopa monnieri, Oldenlandia corymbosa, Eclipta prostrata, Enhydra fluctuans etc. However, Eleusine indica, Paspalidium flavidum, Cyperus kyllinga, Drosera burmannii, Chrozophora rotteri, Phyllanthus urinaria, Lochnera pusilla, Heliotropium ovalifolium, Xanthium strumarium, etc. are dreaded for their poisonous principles.

A number of weeds are consumed as food by the poorer people during the times of scarcity or as a source of edible greens, viz. Ottelia alismoides, Coix-lachryma-jobi, Echinochloa colonum, Leptochloa chinensis, Setaria glauca, Alternanthera sessilis, Amaranthus gracilis, Glinus lotoides, Polycarpum prostratum, Aeschynomene aspera, Ipomoea aquatica etc.

The forage and fodder value of some of the weeds is of no less importance. Almost all the members of the Gramineae and a few of the Amaranthaceae, Portulacaceae, Leguminosae, Convolvulaceae and Umbelliferae belong to this category.
The following species of weeds are utilised as sandbinders: *Cynodon dactylon*, *Panicum repens*, *Saccharum spontaneum* and *Desmodium triflorum*. Those used as green manure and cover crop include *Eragrostis unioloides*, *Paspalum scrobiculatum*, *Pistia stratiotes*, *Eichhornia crassipes* etc. *Argemone mexicana* and *Imperata cylindrica* are regarded as suitable for reclaiming arid tracts.

*Chrysopogon aciculatus*, *Eragrostis gangetica*, *Cyperus iria*, *Aeschynomene aspera*, *A. indica*, *Sesbania aculeata*, *Melochia corchorifolia*, etc. yield products which are used in arts and industries.

The above discussion shows that rice-fields of West Bengal is the abode of many economically useful plants. Most of them contain valuable chemical substances which may be utilised in the Unani system of treatment or may be a source of Allopathic, Ayurvedic or Homeopathic medicines. Hence, local raw drug sellers may find the rice-field a good place of collection of plants during weeding operations by farmers. Besides, rice-field weeds can be used as a source of food for animals and human beings as well as can be put to a number of uses. There are a few weeds about which there is little or no information. These may provide many qualities, if properly assessed.
SUMMARY

Out of a total of 158 weeds collected from the rice-fields of Hooghly and Midnapore districts of West Bengal, it has been found that 125 species possess economical importance in one way or the other. The various uses of these weeds may be helpful for local sellers of crude drug plants and for manufacturers of various plant products.

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