

A STUDY OF WEEDS ON THE RIVER BANKS OF KATHMANDU VALLEY

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A B S T R A C T

The paper deals with weeds found along the river banks of the Kathmandu valley. It lists 219 species in 156 genera belonging to 50 families. *Pilea peploides* Hk. & Arn. is recorded here for the first time from the valley.

INTRODUCTION

Located in Central Nepal, Kathmandu valley is one of the largest inland valleys in Nepal. It occupies an area of 240 sq. km of a terraced valley. It lies at an altitude of 1300-1340 m above the sea-level. It is nearly circular or at least oval in outline and the east-west axis is 25 km long whereas the north-south axis is 19 km wide. The general slope of the valley area is towards the central portion and thence to the south-west (Pradhan *et al.*, 1970). It is surrounded by a chain of hills, all of which are steep and some of them rise into high mountains. Phulchoki (2715 m) is the highest peak, situated in south-east of the valley. The valley is watered by the Bagmati river along with its five principal tributaries—Bishnumati, Manohara, Dhobi khola, Hanumante and Nakhu khola. These rivulets and streams, which ultimately unite into the Bagmati river, run south through the passage of the mountains (Hamilton, 1819).

It is believed that the valley (including Patan, Bhaktapur) was once a lake. A legend gives the credit of draining away the lake-water to Manjusri. Geologically it is believed to have been formed during the Mid-Miocene times when the Mahabharat range was rapidly uplifted so as to obstruct the flow of the south flowing rivers (Malla, 1969-70). Thus mythological stories and geologi-

cal evidence, both point out to the lacustrine origin of Kathmandu valley.

So far little work has been done regarding the crop weeds of the valley. This taxonomic survey of the weeds may be useful to the workers engaged in weed control studies.

AREA AND SOIL.

The area under study is between 27°.38' to 27°.50' N latitude and 85°.15' to 85°.30' E longitude. The extent of suitable agricultural land in the valley is about 47800 hectares while about 61900 hectares are rocky and mountainous. The crop fields are mostly situated along the river banks. The forests occur only on the surrounding hills.

The valley is made up of fluvio-lacustrine deposits of Pleistocene age exposed in terraces situated at various altitudes (Rimal, 1968). The soil of this valley is commonly known as 'Kalimati' (Black soil). It consists of variety of porous bluish grey lacustrine deposits consisting of clay and silt where fine sand and the carbonaceous materials are also present.

CLIMATE

The mountains to the north keep out the cold air from Tibet, but the mountains in the southern side are not high enough to block the monsoon winds. The valley enjoys the temperate monsoon type of climate with rainy summers and winters.

About 80% of the total annual rainfall

is received during June to September and the remaining 20% during November to January. Sometimes there may be no rain at all in the later period.

The precipitation record in Kathmandu indicates a moderately humid climate (Kihara, 1956). The mean monthly maximum temperature in Kathmandu (altitude 1288 m) is 24°C while the mean monthly minimum temperature is 7°C in January (Pradhan *et al.*, 1970).

SPREAD AND CONTROL OF WEEDS

Generally weeds are spread by the agency of man, cattle, wind and water. The weeding by hand is practised in crop fields. But this process should be adopted, before the seed-formation in weeds. Above all, the weeds taken out by this process should be burnt. The crop-seeds for seedlings should be collected from weed free areas. Chemical weedicides can also be used to control weeds in crop fields.

FLORISTIC ANALYSIS AND DISCUSSION

The weeds were collected from three crop fields like paddy, wheat and maize. Besides this, the weeds were also collected from the different environs along the river banks. The terms abundant, common, frequent and rare are used to denote the occurrence of weeds.

In all 219 species of weeds were collected in the course of the study. They fall under 50 families and 156 genera. The dicotyledons are represented by 153 species while the monocotyledons represent 66 species. Out of the collected species, 180 annual and 39 perennial species are recorded. 174 species were collected from the paddy, wheat and maize fields and 45 species from their environs. The largest families are Asteraceae and Poaceae with 37 species each, followed by Cyperaceae (19), Polygonaceae (11), Lamiales (8), Solanaceae (7), Caryophyllaceae (6), Fabaceae (6), Scrophulariaceae (6), Acanthaceae (6), Euphorbiaceae (5), Urticaceae (5), Lythraceae (4), Amaranthaceae (4), Compositae (3). The families Ranuncula-

ceae, Malvaceae, Tiliaceae, Oxalidaceae, Onagraceae, Apiaceae, Primulaceae, Gentianaceae, Boraginaceae, Verbenaceae and Lemnaceae are represented by two species respectively while the rest 19 families include one species each.

79 species are recorded from the paddy fields. Out of these, 5 species are found to be abundant, 31 common, 31 frequent and 9 as rare species. The abundant species are *Ammannia auriculata* Willd., *Rotala indica* (Willd.) Koch., *Eclipta prostrata* L., *Alternanthera sessilis* (L.) DC. and *Euphorbia hirta* L.

Altogether 122 species were collected from the wheat fields, 10 species are found to be abundant while the rest 56 common, 46 frequent and 7 rare species. The abundant species are *Oxalis corniculata* L., *Ageratum conyzoides* L., *Eclipta prostrata* L., *Galinsoga parviflora* Cav., *Mazus japonicus* (Thunb.) O. Kuntze, *Phyla nodiflora* (L.) L. C. Richard ex Michaux, *Alternanthera sessilis* (L.) DC., *Euphorbia hirta* L., *Cannabis sativa* L. and *Imperata cylindrica* (L.) P. Beauv.

Out of the 91 species collected from the maize fields, 6 abundant, 36 common, 31 frequent and 18 rare species are noted. The abundant species are *Oxalis corniculata* L., *Eupatorium adenophorum* Spr., *Galinsoga parviflora* Cav., *Phyla nodiflora* (L.) L. C. Richard ex Michaux, *Alternanthera sessilis* (L.) DC., *Euphorbia hirta* L.

Altogether 22 species are found to be common weeds in all the three crops. The common species are *Capsella bursa-pastoris* (L.) Medik., *Oxalis corniculata* L., *Duchesnea indica* (Andr.) Focke, *Centella asiatica* (L.) Urban, *Ageratum conyzoides* L., *Dicrocephala latifolia* DC., *Eclipta prostrata* L., *Picris hieracioides* L., *Sonchus brachyotus* DC., *Lindenbergia utriculata* L., *Mazus japonicus* (Thunb.) O. Kuntze, *Justicia procumbens* L. var. *simplex* (D. Don) Yamazaki, *Phyla nodiflora* (L.) L. C. Richard ex Michaux, *Alternanthera sessilis* (L.) DC.,

Amaranthus spinosus L., *Chenopodium morale* L., *Rumex nepalensis* Sprengel, *Euphorbia hirta* L., *Phyllanthus niruri* L., *P. urnaria* L., *Cynodon dactylon* (L.) Per., *Eleusine indica* (L.) Gaertn. and *Imperata cylindrica* (L.) P. Beauv.

37 species are found to be common in paddy and wheat fields while 78 common species are collected from wheat and maize fields. But when the paddy and maize fields are considered, only 23 species are observed to be common. 79 species are not common to any two crops. 38 species are restricted to paddy fields and 30 species to wheat fields. The lowest number of 11 species is restricted to maize fields. *Pilea peploides* Hk. f. & Arn. is recorded as a new species for the Kathmandu valley.

The families are enumerated according to Bentham and Hooker's system. The genera and species within the families are arranged in alphabetical order. The local names where known, are given. Each species is followed by a short field note, occurrence, habitat, flowering and fruiting period and the collection number; all collections being that of the author. All plants are housed in the Herbarium of the Deptt. of Medicinal Plants, Kathmandu, Nepal.

ENUMERATION

RANUNCULACEAE

Ranunculus diffusus DC., *Sano saro*.

Common, in paddy fields. Annual. Fls. yellow. Fls. & Frts. throughout the year. 558.

R. scleratus R. Br.

Common, in paddy fields. Annual. Fls. yellow. Fls. & Frts. throughout the year. 666.

PAPAVERACEAE

Argemone mexicana L., *Thakal*.

Frequent, in wheat fields. Annual. Fls. bright-yellow, Apr.-June. Frts. July-Aug. 9405.

BRASSICACEAE (CRUCIFERAE)

Capsella bursa-pastoris (L.) Medik.

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. Jan.-Oct. 9413.

Cardamine scutata Thunb.

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. throughout the year. 667.

Rorippa dubia Hara

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. Aug.-Nov. 9809.

VIOLACEAE

Viola serpens Wall., *Ghatte ghans*.

Rare, in maize fields. Annual. Fls. bluish-white, Mar.-Nov. Frts. Feb-Apr. 668.

POLYGALACEAE

Salomonina edentula DC., *Methi ghans*.

Rare, in maize fields. Annual. Fls. deep pink, July-Aug. Frts. Sept.-Oct. 7371.

CARYOPHYLLACEAE

Cerastium glomeratum Thuillier, *Vartri*.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. throughout the year. 9419.

Drymaria diandra Bl.

Common, in wheat fields and along the sides of maize fields. Annual. Fls. white. Fls. & Frts. throughout the year. 16797.

Lepyrodiclis glandulosa (Benth. ex G. Don) Ohba

Common, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. Mar.-Aug. 9413.

Stellaria latifolia Pers.

Frequent, in paddy, wheat and maize fields. Annual. Fls. white. Fls. & Frts. Mar.-Nov. 565.

S. vestita Kurz

Common, on open and moist land. Annual. Fls. white. Fls. & Frts. throughout the year. 669.

PORTULACACEAE

Portulaca oleracea L., *Salabakan*.

Common, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. Apr.-Oct. 16777.

HYPERICACEAE

Hypericum japonicus Thunb., *Kanike ghans*.
Common, in paddy fields. Annual. Fls. yellow. Fls. & Frts. June-Nov. 571.

MALVACEAE

Sida rhombifolia L., *Barena*.

Common, in wheat and maize fields. Perennial. Fls. yellow, May-Oct. Frts. Nov.-Dec. 4703.

Urena lobata L.

Frequent, in maize fields. Perennial. Fls. purple, Aug.-Oct. Frts. Nov.-Dec. 13363.

TILIACEAE

Triumfetta bartremia Roxb., *Dalle kuro*.

Rare, in paddy fields. Annual. Fls. yellow. Fls. & Frts. Oct.-Dec. 8478.

T. pilosa Roth, *Ban kuro*.

Rare, in paddy fields. Annual. Fls. yellow, Sept.-Dec. Frts. Nov.-Dec. 9430.

GERANIACEAE

Geranium nepalense Sweet, *Chunitro ghans*.

Common, on moist land. Annual. Fls. pink, Apr.-July. Frts. Aug.-Sept. 10521.

OXALIDACEAE

Oxalis corniculata L., *Chari amilo*.

Common, in paddy, wheat and maize fields. Perennial. Fls. yellow. Fls. & Frts. throughout the year. 757.

O. latifolia H.B.K., *Thulo chari amilo*.

Common, on moist and shady places. Annual. Fls. light purple, July-Aug. Frts. Oct.-Nov. 16728.

FABACEAE (LEGUMINOSAE)

Lotus corniculata L.

Common, in wheat fields. Annual. Fls. orange colour, Jan.-June. Frts. Oct.-Nov. 670.

Lathyrus aphaca L., *Pitpir*.

Common, in wheat fields. Annual. Fls. yellow, Jan.-Feb. Frts. Mar.-Apr. 1705.

Melilotus alba Lam.

Rare, in wheat fields. Annual. Fls. white, Feb.-Apr. Frts. May-June. 796.

Trifolium repens L., *Pyaunli*.

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. throughout the year. 9817.

T. pratense L.

Common, on open land around the wheat fields. Annual. Fls. white. Fls. & Frts. Jan.-Mar. 650.

Viscia hirsuta (L.) S. F. Gray, *Mun mun*.

Common, in paddy and wheat fields. Annual. Fls. bluish-white. Fls. & Frts. Sept.-Apr. 16759.

ROSACEAE

Duchesnea indica (Andr.) Focke., *Pahenlo phul*.

Common, in paddy, wheat and maize fields. Annual. Fls. yellow. Apr.-May. Frts. June-July. 6601.

.. LYTHRACEAE

Ammannia auriculata Willd.

Abundant, in paddy fields. Annual. Fls. pink. Fls. & Frts. Sept.-Dec. 6615.

Cuphea procumbens Cav.

Rare, in paddy fields but abundant on moist and shady places. Annual. Fls. deep violet. Fls. & Frts. Aug.-Nov. 573.

Rotala indica (Willd.) Koch., *Belaiti jhar*.

Abundant, in paddy fields. Annual. Fls. greenish, Sept.-Dec. Frts. Jan.-Mar. 4724.

R. rotundifolia (Roxb.) Koch.

Frequent, in wheat fields. Annual. Fls. pinkish. Fls. & Frts. Jan.-June. 651.

ONAGRACEAE

Ludwigia perennis L.

Common, in paddy fields. Annual. Fls. yellow. Fls. & Frts. Aug.-Nov. 6618.

Oenothera rosea Aiton

Common, in wheat and maize fields. Annual. Fls. pink. Fls. & Frts. May-Aug. 16795.

CUCURBITACEAE

Bryonopsis laciniosa (L.) Naud.

Common, on unused and moist land. Annual. Fls. yellow, Sept.-Nov. Frts. Dec.-Jan. 9449.

MOLLUGINACEAE

Mollugo pentaphylla L.

Frequent, in maize fields. Annual. Fls. reddish, July-Aug. Frts. Sept.-Nov. 16727.

APIACEAE (UMBELLIFERAE)

Centella asiatica L., *Chortapre*.

Common, in paddy, wheat and maize fields. Perennial. Fls. pinkish. Fls. & Frts. throughout the year. 16789.

Hydrocotyle sibthorpioides Lam.

Frequent, in paddy and wheat fields. Perennial. Fls. green. Fls. & Frts. throughout the year. 16790.

RUBIACEAE

Galium hirtiflorum Requier ex DC.

Frequent, on moist and shady places. Annual. Fls. greenish. Fls. & Frts. July-Sep. 4701.

G. elegans Wall. ex Roxb., *Lahare kuro*.

Frequent, on moist land. Annual. Fls. greenish. Fls. & Frts. May-Aug. 671.

Oldenlandia corymbosa L.

Frequent, in paddy and wheat fields. Annual. Fls. violet, June-July. Frts. Oct.-Nov. 672.

ASTERACEAE (COMPOSITAE)

Ageratum conyzoides L., *Ganamane ghans*.

Abundant, in wheat and maize fields, also frequent in paddy fields. Annual. Fls. white. Fls. & Frts. throughout the year, 9437.

A. houstonianum Miller

Frequent, in wheat and maize fields. Annual. Fls. blue. Fls. & Frts. throughout the year. 563.

Anaphalis adnata DC., *Buke phul*.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. June-Nov. 9435.

A. contorta (D. Don) Hk. f.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. June-Nov. 9427.

A. triplinervis (Sims) C. B. Cl.

Rare, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. Aug.-Nov. 562.

Bidens bipinnata L., *Kuro*.

Common, in wheat and maize fields. Annual. Fls. yellow, Aug.-Nov. Frts. Dec.-Feb. 9829.

B. pilosa L.

Common, in wheat and maize fields. An-

nual. Fls. yellow, Aug.-Nov. Frts. Dec.-Feb. 9447.

Caesulia axillaris Roxb.

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. July-Dec. 6625.

Centipeda minima (L.) A. Br. et Aschers.

Common, in maize fields. Annual. Fls. centrally yellow. Fls. & Frts. July-Oct. 570.

Circium argyracanthum DC.

Common, in wheat fields. Annual. Fls. pinkish when young. Fls. & Frts. Jan.-May. 9419.

C. wallichii DC., *Kanre thakal*.

Common, in wheat fields. Annual. Fls. pink. Fls. & Frts. Aug.-Apr. 16750.

Conyza japonica Less.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. Oct.-May. 9407.

C. stricta Willd.

Common, in wheat and maize fields. Annual. Fls. orange colour. Fls. & Frts. throughout the year. 616.

Cotula anthermoides L.

Frequent, in wheat fields. Annual. Fls. yellow. Fls. & Frts. Mar.-Aug. 9818.

Crassopetalum crepidioides (Benth.) S. Moore, *Sala Ko gu*.

Common, in wheat and maize fields. Annual. Fls. orange-colour. Fls. & Frts. throughout the year. 4713.

Dicrocephala latifolia DC., *Hachhinka Jhar*.

Frequent, in paddy, wheat and maize fields. Fls. centrally yellow. Fls. & Frts. Mar.-Sept. 16773.

Eclipta prostrata L., *Antali*.

Abundant, in paddy and wheat fields. Perennial. Fls. white. Fls. & Frts. Mar.-Sept. 16781.

Emilia sonchifolia (L.) DC.

Frequent, in wheat and maize fields. Annual. Fls. pink. Fls. & Frts. throughout the year. 613.

Erigeron floribundus (H.B.K.) Sch.-Bip.

Frequent, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. May-July. 674.

Erigeron multicaulis Wall., *Rukhmi*.

Frequent, on moist and open land. Annual. Fls. yellowish. Fls. & Frts. throughout the year. 16733.

Eupatorium adenophorum Spr., *Banmara*.

Common, in wheat fields. Perennial. Fls. white. Fls. & Frts. Mar.-May. 576.

Galinsoga parviflora Cor.

Abundant, in wheat and maize fields. Perennial. Fls. yellow. Fls. & Frts. throughout the year. 577.

Gnaphalium affine D. Don, *Buke phul*.

Common, on open land. Annual. Fls. yellow. Fls. & Frts. throughout the year. 626.

G. leuto-album L., *Buke phul*.

Common, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. throughout the year. 561.

G. purpureum L.

Common, in wheat and maize fields. Annual. Fls. dirty white. Fls. & Frts. Nov.-July. 625.

Grangea madaraspata Poir.

Frequent, in wheat fields. Annual. Fls. greenish. Fls. & Frts. throughout the year. 16768.

Lactuca polyccephala Benth.

Common, in moist and open land. Annual. Fls. yellow. Fls. & Frts. throughout the year. 675.

Laggera alata (D. Don) Sch.-Bip.

Frequent, on open land. Fls. pink. Fls. & Frts. Nov.-Feb. 8196.

Picris hiracioides L., *Ban duthi*.

Common, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. May-Aug. 7192.

Siegesbeckia orientalis L., *Dudhe ghans*.

Common, in wheat and maize fields. Fls. yellow. Fls. & Frts. Oct.-Apr. 16758.

Sonchus brachyotus DC.

Common, in wheat and maize fields. Perennial. Fls. yellow. Fls. & Frts. throughout the year. 4714.

Spilanthus acmella (L.) Merr., *Lato ghans*.

Frequent, in wheat and maize fields.

Annual. Fls. yellow. Fls. & Frts. June-Nov. 9476.

Taraxacum officinale Wigg., *Tuki phul*.

Frequent, in wheat and maize fields. Perennial. Fls. yellow. Fls. & Frts. throughout the year. 652.

Tridax procumbens L., *Ramnne jhar*.

Frequent, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. Mar.-Oct. 9838.

Veronica cinerea (L.) Less, *Sahadeya*.

Common, in wheat and maize fields. Perennial. Fls. light violet. Fls. & Frts. throughout the year. 589.

Xanthium strumarium L., *Kuch kuche*.

Frequent, in wheat and maize fields. Annual. Fls. greenish. Aug.-Oct. Frts. Nov.-Feb. 16756.

Youngia japonica (L.) DC., *Chaulene*.

Frequent, in wheat and maize fields. Annual. Fls. yellow. Fls. & Frts. Sept.-June. 16765.

CAMPANULACEAE

Campanula colorata Wall., *Nepali bikh*.

Common, on moist land. Annual. Fls. blue. Fls. & Frts. July-Nov. 4716.

LOBELIACEAE

Lobelia chinensis Lour.

Frequent, in paddy fields. Annual. Fls. purplish. Fls. & Frts. Aug.-July. 16782.

L. heyneana Roem.

Frequent, in paddy fields. Annual. Fls. violet. Fls. & Frts. Oct.-Dec. 4702.

Pratia numularia (Lam.) A. Br. & Aschers., *Nilo ghottape*.

Frequent, in paddy fields. Annual. Fls. pinkish-white, Sept.-May. Frts. Aug.-Dec. 556.

PLUMBAGINACEAE

Plumbago zeylanica L., *Chitu*.

Frequent, in wheat fields. Annual. Fls. white. Fls. & Frts. Aug.-Nov. 9846.

PRIMULACEAE

Anagallis arvensis L., *Aramale*.

Frequent, in wheat fields. Annual. Fls. blue. Fls. & Frts. Dec.-Mar. 16755.

Androsac saxifragaefolia Bunge.

Frequent, in wheat fields. Annual. Fls. white. Fls. & Frts. Mar.-June. 587.

GENTIANACEAE

Gentiana capitata Buch.-Ham. ex D. Don,
Hans phul or *Ban cauli*.

Common, on open land. Annual. Fls. bluish. Fls. & Frts. Oct.-Feb. 623.

G. pedicullata Wall.

Frequent, on open land. Annual. Fls. bluish. Fls. & Frts. Mar.-June. 624.

BORAGINACEAE

Bothriospermum tenellum Fisch.

Frequent, hanging on moist wall. Fls. white. Fls. & Frts. Sept.-Mar. 16763.

Cynoglossum furcatum Wall., *Kanika phul*.

Frequent, in neglected fields. Fls. blue. Fls. & Frts. June-Oct. 16799.

CONVOLVULACEAE

Pharabitis purpurea L.

Frequent, on moist and shady places. Fls. purple, Aug.-Nov. 16753.

SOLANACEAE

Datura stramonium L., *Seto dhatura*.

Common, on moist and neglected land. Fls. white. Fls. & Frts. June-Aug. 6610.

D. suaveolens Hunb. & Bonpl., *Dhatura*.

Common, in unused land. Fls. white. Fls. & Frts. June-Oct. 4717.

Nicotiana plumbaginifolia Viv.

Frequent, in maize fields. Annual. Fls. white. Fls. & Frts. July-Dec. 16788.

Solanum indicum L., *Bihi* or *Nilo bihi*.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. May-Aug. 1020.

S. nigrum L., *Kalo bihi*.

Common, in wheat and maize fields. Perennial. Fls. white. Fls. & Frts. throughout the year. 9450.

S. pseudo-capsicum L.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. June-Sept. 6604.

S. torvum Swartz., *Ban bihi*.

Frequent, in wheat and maize fields.

Perennial. Fls. white. Fls. & Frts. July-Dec. 677.

SCROPHULARIACEAE

Lindenbergia utricaefolia L.

Common, in wheat and maize fields. Perennial. Fls. yellow. Fls. & Frts. June-Oct. 16787.

Mazus japonicus (Thunb.) O. Kuntze

Abundant, in wheat fields. Annual. Fls. white. Fls. & Frts. Nov.-Apr. 572.

M. surculosus D. Don

Frequent, in paddy and wheat fields. Annual. Fls. bluish. Fls. & Frts. Feb.-July. 10852.

Vandellia ciliata (Colasm.) Yamazaki, *Sano kane*.

Common, in paddy and wheat fields. Annual. Fls. white. Fls. & Frts. June-Nov. 4705.

Veronica anagalis-aquatica L.

Common, in paddy fields. Annual. Fls. white. Fls. & Frts. July-Aug. 678.

V. javanica Bl.

Frequent, in wheat fields. Annual. Fls. white. Fls. & Frts. June-July. 16745.

ACANTHACEAE

Barleria cristata L.

Rare, in maize fields. Annual. Fls. blue. Fls. & Frts. Aug.-Nov. 7396.

Dicliptera bupleuroides Nees

Rare, in wheat and maize fields. Perennial. Fls. white. Fls. & Frts. Oct.-Nov. 679.

Justicia procumbens L. var. **simplex** (D. Don), Yamazaki.

Frequent, in paddy, wheat and maize fields. Annual. Fls. pinkish. Fls. & Frts. July-Sept. 9426.

Lepidagathis hyalina Nees

Rare, in maize fields. Perennial. Fls. white. Fls. & Frts. Feb.-Apr. 9409.

Peristrophe speciosa Nees

Rare, in wheat and maize fields. Annual. Fls. pinkish. Fls. & Frts. Nov.-Dec. 12971.

Rungia parviflora Nees, *Ukucha*.

Common, in wheat and maize fields. Perennial. Fls. faint-blue. Fls. & Frts. throughout the year. 9410.

VERBENACEAE

Phyla nodiflora (L.) L.C. Richard ex Michx., *Kokana*.

Abundant, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. Apr.-Aug. 566.

Verbena officinalis L.

Common, in paddy and wheat fields. Annual. Fls. pinkish-white. Fls. & Frts. July-Sept. 16772.

LAMIACEAE (LABIATAE)

Clinopodium umbrosum (M.-Bieb.) C. Koch.

Frequent, in wheat fields. Annual. Fls. pink. Fls. & Frts. May-Sept. 16738.

Craniotome versicolor Reichb., *Bose jhar*.

Frequent, in wheat and maize fields. Annual. Fls. white. Fls. & Frts. Sept.-Nov. 12948.

Mentha viridis L., *Bawari*.

Common, in moist land. Perennial. Fls. faint-violet. Fls. Sept.-Oct. 6620.

Micromeria biflora Benth., *Buchhko jhar*.

Rare, in maize fields. Annual. Fls. pink. Fls. & Frts. Feb.-Aug. 7363.

Plectranthus coetsa Ham. ex D. Don, *Kalo miri*.

Rare, in maize fields. Perennial. Fls. light-blue. Fls. & Frts. July-Nov. 617.

Salvia coccinia L.

Frequent, on open places. Annual. Fls. red. Fls. & Frts. July-Oct. 770.

Scutellaria discolor Colb.

Rare, in paddy fields. Annual. Fls. blue. Fls. & Frts. Aug.-Sept. 12903.

S. rivularis Wall., *Babre ghans*.

Frequent, in open land. Annual. Fls. violet. Fls. & Frts. Apr.-July. 16779.

PLANTAGINACEAE

Plantago major L., *Esapgol*.

Common, in paddy wheat fields. Perennial. Fls. green. Fls. & Frts. Apr.-Nov. 9416.

NYCTAGINACEAE

Mirabilis jalapa L.

Rare, in moist land. Annual. Fls. pink. Fls. & Frts. Aug.-Nov. 9445.

AMARANTHACEAE

Achyranthus bidentata Blume, *Datiwan*.

Rare, in maize fields. Annual. Fls. greenish. Fls. & Frts. Aug.-Sept. 9431.

Alternanthera sessilis R. Br., *Bhiringe jhar*.

Abundant, in paddy, wheat and maize fields. Fls. white. Fls. & Frts. throughout the year. 4712.

Amaranthus spinosus L., *Dhuti ghans*.

Common, in wheat and maize fields. Annual. Fls. greenish. Fls. & Frts. throughout the year. 9438.

Cyathula capitata Moq., *Gawro or Kurso*.

Rare, in maize fields. Annual. Fls. greenish. Fls. & Frts. July-Dec. 680.

CHENOPODIACEAE

Chenopodium album L., *Bethe*.

Common, in wheat fields. Annual. Fls. greenish. Fls. & Frts. Dec.-Mar. 681.

C. ambrosioides L., *Rato latte*.

Common, in wheat and maize fields. Perennial. Fls. green. Fls. & Frts. throughout the year. 16793.

C. morale L.

Frequent, in paddy, wheat and maize fields. Annual. Fls. greenish. Fls. & Frts. Sept.-June. 9441.

POLYGONACEAE

Fagopyrum dibotrys (D. Don) Hara

Frequent, along the paddy fields. Annual. Fls. white. Fls. & Frts. June-Sept. 6624.

Polygonum amplexicaule D. Don., *Ratnaule*.

Frequent, along the river banks. Perennial. Fls. red. Fls. & Frts. July-Oct. 682.

P. capitatum Ham. ex D. Don., *Ratanaule jhar*.

Common, in wheat and maize fields. Perennial. Fls. pink. Fls. & Frts. throughout the year. 16774.

P. hydropiper L., *Pire jhar*.

Common, in wheat field. Annual. Fls. white. Fls. & Frts. June-Nov. 16736.

P. lanigerum R. Br.

Frequent, in paddy field. Annual. Fls. white. Fls. & Frts. Aug.-Nov. 4720.

Polygonum microcephalum D. Don., *Ban pira*.
Common, in paddy fields. Annual. Fls. pink. Fls. & Frts. June-July. 683.

P. minus Huds.

Common, in paddy field. Annual. Fls. pinkish. Fls. & Frts. May-Nov. 578.

P. perfoliatum L.

Frequent, on open land. Annual. Fls. yellowish. Fls. & Frts. July-Nov. 6612.

P. plebejum R. Br., *Bethe*.

Common, in wheat fields. Annual. Fls. pinkish. Fls. & Frts. throughout the year. 9404.

P. posumbu Ham. ex D. Don, *Seto pira ghans*.

Common, in paddy, wheat and maize fields. Annual. Fls. whitish. Fls. & Frts. throughout the year. 9801.

Rumex nepalensis Spreng., *Halhale*.

Common, in paddy, wheat and maize fields. Annual. Fls. whitish. Fls. & Frts. throughout the year. 559.

EUPHORBIACEAE

Euphorbia heterophylla L.

Common, in wheat and maize fields. Perennial. Fls. greenish. Fls. & Frts. July-Aug. 654.

E. hirta L., *Rato mas lahare*.

Abundant, in paddy, wheat and maize fields. Annual. Fls. green. Fls. & Frts. throughout the year. 655.

E. prostrata Aiton

Common, in wheat and maize fields. Annual. Fls. reddish. Fls. & Frts. Mar.-Aug. 660.

Phyllanthus urinaria L.

Common, in paddy, wheat and maize fields. Annual. Fls. cream-colour. Fls. & Frts. Oct.-Feb. 684.

P. niruri L.

Common, in paddy, wheat and maize fields. Annual. Fls. greenish. Fls. & Frts. throughout the year. 588.

URTICACEAE

Boehmeria platyphylla D. Don, *Kisi nhyanka*.

Rare, in maize fields. Perennial. Fls.

greenish. Fls. & Frts. throughout the year. 4709.

Gonostegia hirta (Bl.) Miq.

Common, in wheat fields. Annual. Fls. green. Fls. & Frts. July-Sept. 16757.

Pilea peploides Hk. f. & Arn.

Frequent, on moist places near the wall. Annual. Fls. pinkish. Fls. & Frts. June-July. 16754.

Pouzolzia zeylanica (L.) Bennett et Brown, *Mas lahare*.

Frequent, in wheat and maize fields. Perennial. Fls. greenish. Fls. & Frts. throughout the year. 6611.

Urtica dioica L., *Sisnu*.

Abundant, in waste land. Perennial. Fls. yellowish. Fls. & Frts. throughout the year. 6609.

CANNABINACEAE

Cannabis sativa L., *Bhang*.

Abundant, in wheat fields. Annual. Fls. yellowish. Fls. & Frts. July-Dec. 16737.

PONTEDERIACEAE

Monochoria vaginalis (Burm. f.) Pers.

Frequent, in paddy fields. Annual. Fls. blue. Fls. & Frts. Oct.-Nov. 9842.

COMMELINACEAE

Commelina bengalensis L., *Ban Kane*.

Frequent, in paddy fields. Annual. Fls. blue. Fls. & Frts. Apr.-Aug. 661.

C. paludosa Bl.

Rare, in paddy fields. Annual. Fls. blue. Fls. & Frts. Aug.-Nov. 685.

Floscopa scandens Lour., *Sim kane ghans*.

Frequent, in moist land. Annual. Fls. white. Fls. & Frts. Aug.-Nov. 7470.

Murdannia nudiflora (L.) Brenan

Frequent, in wheat fields. Annual. Fls. blue. Fls. & Frts. Aug.-Nov. 612.

LEMNACEAE

Lemna perpusilla Torrey

Aquatic, common in ditches. Annual. 8914.

Spirodela polyrrhiza Schleid., *Kai*.

Aquatic, common in ditches. Annual. 8915.

POTAMOGETOMACEAE

Potamogeton polygonifolius Pourr.

Aquatic, frequent on road side. Fls. blue.
Fls. & Frts. July-Sept. 686.

JUNCACEAE

Juncus elegans Samuelss.

Frequent, on moist and open places. Fls.
white. Spikelets Sept.-Nov. 662.

ERIOCAULACEAE

Eriocaulon nepalense Pers., *Bhuri ghans*.

Common, in paddy fields. Annual. Fls.
white. Spikelets Sept.-Nov. 687.

CYPERACEAE

Bulbostylis densa (Wall. ex Roth) Hand-
Mzt. ex Karsten & Schenk.

Frequent, in paddy fields. Annual. Spike-
lets Nov.-Mar. 2176.

Carex daltoni Boott

Common, on moist and shady places. An-
nual. Spikelets Sept.-Mar. 688.

C. filicina Nees ex Wight

Common, on shady places. Annual. Spike-
lets July-Sept. 7392.

C. longipes D. Don

Common, on dry places. Annual. Spike-
lets. May-Aug. 7418.

C. vesiculosa Boott, *Mothe ghans*.

Common, on shady places. Annual. Spike-
lets July-Nov. 688.

Cyperus aristatus Rottb.

Frequent, in wheat and maize fields. An-
nual. Spikelets Oct.-Dec. 4723.

C. brevifolius (Rottb.) Hassk.

Frequent, in wheat fields. Annual. Spike-
lets Aug.-Nov. 7370.

C. cyperoides (L.) O. Kuntze, *Fir fire ghans*.

Common, along the maize fields. Annual.
Spikelets June-Sept. 664.

C. difformis L., *Chatta*.

Frequent, in paddy fields. Annual. Spike-
lets Oct.-Dec. 580.

C. globosus All.

Frequent, in paddy fields. Annual. Spike-
lets Sept.-Dec. 9816.

C. haspen L.

Common, along the paddy fields. Annual.
Spikelets Sept.-Dec. 4721.

C. iria L., *Mothe*.

Frequent, in open land. Annual. Spikelets
June-Sept. 663.

C. rotundus L., *Mothe*.

Common, in paddy and wheat fields. Per-
ennial. Spikelets June-Nov. 16747.

Eleocharis congesta D. Don

Common, in paddy fields. Annual. Spike-
lets July-Nov. 976.

Eriophorum comosum Wall. ex Nees

Common, on moist places. Annual. Spike-
lets June-Nov. 16749.

Fimbristylis dichotoma (L.) Vahl

Frequent, in paddy fields. Annual. Spike-
lets July-Aug. 584.

Lipocarpus chinensis (Obs.) Kern, *Bhakunde ghans*.

Rare, on open places. Annual. Spikelets
July-Nov. 689.

Pycrenus sanguentus Vahl

Frequent, in paddy fields. Annual. Spike-
lets Oct.-Nov. 588.

Scirpus juncoides Roxb.

Common, along the paddy fields. Annual.
Spikelets Aug.-Dec. 590.

POACEAE (GRAMINEAE)

Alepecurus aequalis Sobol.

Frequent, in wheat fields. Annual. Spike-
lets Apr.-May. 2576.

Arthraxon lancifolius (Trin.) Hochst.

Frequent, in wheat and maize fields. An-
nual. Spikelets Oct.-Nov. 7434.

A. micans Hochst.

Frequent, in wheat and maize fields. An-
nual. Spikelets Aug.-Nov. 4722.

Bothriochloa assimilis (Steud.) Ohwl.

Frequent, on shady places. Annual. Spike-
lets Jan.-Aug. 575.

Coix lachryma-jobi L.

Rare, in maize fields. Annual. Spikelets
July-Nov. 665.

Cryptococcum acerescens (Trin.) Stapf

Common, on moist land. Annual. Spike-
lets Nov.-Dec. 17459.

C. patens (L.) A. Camus

Frequent, on shady places along the river
banks. Spikelets Nov.-Feb. 17499.

Cynodon dactylon (L.) Pers., *Dubo*.

Common, in paddy, wheat and maize fields. Perennial. Spikelets throughout the year. 14176.

Eleusine indica (L.) Gaertn., *Kodo ghans*.

Frequent, in paddy, wheat and maize fields. Annual. Spikelets June-Dec. 581.

Eragrostis atrovens (Desf.) Trin. ex Steud., *Tike jhar*.

Common, in wheat and maize fields. Annual. Spikelets Oct.-Mar. 13176.

E. japonica (Thunb.) Trin., *Ranki*.

Frequent, in wheat and maize fields. Annual. Spikelets Nov.-Mar. 666.

E. tenella (L.) P. Beauv., *Dule ghans*.

Common, in wheat and maize fields. Annual. Spikelets Dec.-July. 16791.

E. uniloides (Retz.) Nees ex Steud.

Common, in wheat and maize fields. Annual. Spikelets Oct.-Mar. 585.

Eulaliopsis binata (Retz.) C. E. Hubb., *Banki khar*.

Frequent, in wheat fields. Annual. Spikelets Jan.-June. 3276.

Hemarthria compressa (L.) R. Br.

Frequent, in paddy fields. Perennial. Spikelets June-Aug. 8910.

Imperata cylindrica (L.) P. Beauv., *Phulki*.

Abundant, in wheat fields. Perennial. Spikelets Sept.-June. 14795.

Isachne albens Trin.

Frequent, in paddy fields. Annual. Spikelets Aug.-Mar. 7339.

I. miliacea Roth

Frequent, in paddy fields. Annual. Spikelets June-Aug. 690.

Oplismenus burmanii (Retz.) P. Beauv.

Rare, in wheat fields. Annual. Spikelets Oct.-May. 691.

O. compositus (L.) P. Beauv.

Rare, in wheat fields. Annual. Spikelets Nov.-Dec. 622.

Paspalum distichum L.

Frequent, in paddy fields. Annual. Spikelets Oct.-Mar. 621.

P. scrobiculatum L., *Banse banso*.

Frequent, in paddy fields. Annual. Spikelets June-Sept. 16783.

Phalaris minor Retz., *Hee ghyan*.

Common, in wheat fields. Annual. Spikelets Jan.-Apr. 692.

Pogonanthrum paniceum (Lam.) Hack., *Muse khari*.

Frequent, in wheat fields. Annual. Spikelets Dec.-Mar. 16826.

Polypogon fugax Nees ex Steud., *Chhoya ghyan*.

Common, in wheat fields. Annual. Spikelets Apr.-June. 14776.

P. monospeliensis (L.) Desf.

Frequent, in wheat and maize fields. Annual. Spikelets Jan.-Apr. 620.

Sacciolepis indica (L.) Chase

Common, in wheat and maize fields. Annual. Spikelets July-Dec. 583.

Setaria forbesiana (Nees ex Steud.) Hk. f.

Frequent, in maize fields. Annual. Spikelets Aug.-Nov. 618.

S. glauca P. Beauv., *Bale banso*

Frequent, in open land. Annual. Spikelets June-Aug. 7324.

S. pallide-fusca (Schum.) Stapf & C. E. Hubb., *Bander ghans*.

Frequent, in wheat and maize fields. Annual. Spikelets Nov.-June. 564.

S. tomentosa (Roxb.) Kunth

Frequent, in wheat and maize fields. Annual. Spikelets June-Sept. 16748.

Sporobolus diander (Retz.) P. Beauv.

Rare, in wheat and maize fields. Annual. Spikelets Aug.-July. 591.

S. fertilis (Steud.) W. D. Clayton, *Bandhan jhar*.

Frequent, in wheat fields. Annual. Spikelets July-Nov. 592.

Themeda hookeri (Griseb.) A. Camus

Common, in open land. Perennial. Spikelets Oct.-Jan. 668.

Tripogon filiformis Nees ex Steud.

Frequent, in wheat and maize fields. Annual. Spikelets Oct.-Jan. 8928.

***Tripogon trifidus* Munro ex Stapf**

Frequent, in wheat and maize fields. Annual. Spikelets Aug-Dec. 560.

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