

## Catalogue and Ethnobotany of Invasive Alien Grasses of Bhagalpur District (Bihar), India

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### ABSTRACT

This paper deals with cataloging of 12 invasive alien grasses of Bhagalpur district (Bihar), India and documentation of ethnobotanical uses of these grasses in the life and economy of native people. These grasses occur as weeds (*Echinochloa colona*, *Echinochloa crusgalli*), cultivated plants (*Avena sativa*, *Dendrocalamus giganteus*, *Dendrocalamus membranaceus*, *Dendrocalamus strictus*), wild plants (*Cenchrus purpureus* Syn. *Pennisetum purpureum*, *Chloris barbata*, *Imperata cylindrica*, *Paspalum dilatatum*) and wild plants or weeds (*Cynodon dactylon*, *Saccharum spontaneum*) in varying frequencies throughout the geographical area of district. *Cynodon dactylon* and *Saccharum spontaneum* grow profusely round the year as dominant grasses in the entire region. All these invasive alien grasses act as valuable resources for the native people. Their utilization as fodder/forage, medicine, fibre, etc. seems to be crucial for the livelihood of rural people. *Cynodon dactylon* is lavishly used as excellent forage and as an effective medicine to cure anaemia, constipation, indigestion, menstrual disorders, poor urination, etc. *Dendrocalamus* spp. are utilized in building construction, basketry and weaving. *Saccharum spontaneum* is useful in thatching roofs of huts. *Cynodon dactylon* and *Saccharum spontaneum* are essentially put to use in religious ceremonies of Hindus. Commercial exploitation of *Dendrocalamus* spp. and *Saccharum spontaneum* may boost the economy of rural folk after adopting proper strategy for their efficient exploitation.

Figure : 00

References : 25

Table : 01

KEY WORDS : Alien, Catalogue, Ethnobotany, Invasive, Grasses

### Introduction

Alien plants, also referred to as exotic, introduced, foreign, non- indigenous or non-native plants are those that have been introduced by human beings accidentally or intentionally into a new region. They become invasive when they successfully reproduce and proliferate themselves in the introduced region to such an extent to overpass the native flora in terms of habitat occupation and exploitation of water and nutritional resources<sup>19</sup>. The number of invasive alien plants is rising steadily towards the warming level due to increased accessibility of new source pools and expansion in human population size<sup>16,21</sup>. The invasive alien plant species are well-known to pose severe threats to local biodiversity, ecosystem services, environmental quality and human livelihoods<sup>1,3,6,8,16,17</sup>. On the other hand, several exotic plants have been reported to be economically beneficial as they provide food, fodder, medicine, fuel, etc. to the local communities/ inhabitants<sup>2,9,11,18,20,23-25</sup>. The unique combination of harmful and beneficial attributes of invasive alien plants can clearly be seen in invasive foreign grasses that threaten regional and even global aspects of ecosystem function whereas they contribute positively in the life of human beings and animals<sup>12,15,24-25</sup>. Their

proper utilization requires comprehensive ethnobotanical information at regional level to unfold, widen and strengthen the dimension of such grass resource and its proper management as the natural resources to improve the economy of native rural folk. A perusal of literature reveals that invasive alien grasses of Bhagalpur district (Bihar) have neither been catalogued nor studied ethnobotanically. Although the area is considered to be rich in grass flora<sup>14</sup>. Therefore, the present study has been carried out to catalogue the invasive alien grasses of Bhagalpur district of Bihar state, India and to document their ethnobotanical uses too.

### Study Area

Bhagalpur district (25°07' - 25°30' NL and 86°37' - 87°30' EL, 141 feet MSL) is located in the southern part of the state Bihar (India). It is bordered by Godda and Sahebganj districts of Jharkhand state in the East and by the other districts of Bihar state itself in the rest sides (Madhepura, Purnea and Katihar in the North; Banka in the South; Munger and Khagaria in the West. It covers a geographical area over 2569 km<sup>2</sup> and forms the part of Gangetic plain with newer alluvium soil. It experiences monsoon type of climate with three seasons in a year.

TABLE -1: Enumeration of invasive alien grasses of Bhagalpur district (Bihar), India

S. No.	Botanicalname/Common name (Local name)/Voucher specimen number	Nativity	Uses
1	<i>Avena sativa</i> /Oat ( <i>Jai</i> )/ VANI-05	Eurasia, Africa	Shoots along with spikelets at flowering or fruiting stage is fed to milch cattle to increase milk quality and quantity
2	<i>Cenchrus purpureus</i> / Napier grass (Napier ghas)/VANI-83	Tropical America	Shoots are fed to cows to enhance milk production while used with rice stalk as fodder for pregnant cows.
3	<i>Chloris barbata</i> / Swollen finger grass ( <i>Ghas</i> )/ VANI- 19	Tropical America	Shoots are used as forage. Plant juice is used to treat skin diseases
4	<i>Cynodon dactylon</i> /Bermuda grass ( <i>Doob</i> )/VANI-26	Africa	Shoots are used as excellent forage. Juice of fresh shoot is taken orally to cure anaemia, constipation, indigestion and menstrual disorders whereas it is poured in nostril to check nasal bleeding. Shoot paste is applied on cuts and wounds to heal the injuries. Root decoction is taken as diuretic. Plant is used in most of the religious ceremonies of Hindus.
5	<i>Dendrocalamus giganteus</i> /Giant bamboo ( <i>Nal bans</i> )/ VANI-29	Malaya, Myanmar	Culms are used for building construction and weaving.
6	<i>Dendrocalamus membranaceous</i> / Waya Bamboo/ VANI-113	Myanmar	Culms are used for building purposes, basketry, matting and handicrafts.
7	<i>Dendrocalamus strictus</i> / Solid Bamboo ( <i>Harot bans</i> ) VANI-28	Myanmar	Culms are used in making huts and agricultural implements. Culm stripes are used to make baskets, mats, brushes, etc. Leaves are fed to cattle against retention of placenta. Leaf decoction is taken orally to get rid of cough.
8	<i>Echinochloa colona</i> / Awnlessbarnyard grass ( <i>Sama ghas</i> )/VANI-112	Tropical South America	Shoots are used as green forage.
9	<i>Echinochloa crusgalli</i> /Barnyard grass ( <i>Barsamaghas</i> )/ VANI-118	Tropical South America	Shoots are fed to draught cattle not to milch cattle as the feeding of shoots reduces milk production. Grains are used as famine food.
10	<i>Imperata cylindrical</i> / Cogon grass or Sword grass ( <i>Haddaghas</i> )/VANI-54	Tropical America	Green leaves are fed to cattle as fodder mixed with straw. Dried leaves are used for thatching roofs of huts.

S. No.	Botanicalname/Common name (Local name)/Voucher specimen number	Nativity	Uses
11	<i>Paspalum dilatatum</i> /Dalla grass (Dallaghas)/VANI-77	Tropical America	Shoots are used as valuable forage.
12	<i>Saccharum spontaneum</i> / Thatchgrass (Kans/Khar)/VANI-93	Tropical West Asia	Shoots are used for thatching roofs of huts. Sheathes of flag leaves are used to prepare fibre of domestic use (Vern. <i>Munj</i> ). Tender leaves are weaved into mats, carpets and grain containers for domestic purposes. Inflorescence axes are tagged tightly with <i>munj</i> at their lower, thicker, sub-terminal ends to make broom (Vern. <i>Jharu</i> ). Leaf paste is applied on cuts and wounds to check pus formation. <i>Gur</i> (loose jaggery) is prepared from sprawlers* of <i>diarakans</i> and eaten by <i>Gangotas</i> ** to cure piles.

\*Shoot trailing along the ground and having shorter laminae and more sugar content than the normal erect ones.

\*\* Folks of diara lands of Ganga basin of Bihar.

## Materials and Methods

The diverse habitats located in different parts of Bhagalpur district (Bihar) were visited frequently in every season during August 2019- July 2022 to collect the grass species in flowering or fruiting stage and to document the ethnobotanical uses of concerned grass species in the life and economy of native folk of the region. The grass specimens were collected, dried and pressed in the field, and brought to the laboratory and the herbarium was prepared according to the customary methods<sup>10</sup>. The grass specimens were critically studied and properly identified with the help of various grass floras<sup>4,5,7</sup> and also consulting the Herbarium of University Department of Botany, Tilka ManjhiBhagalpurUniversity, Bhagalpur (Bihar), India.

The identified grass specimens were deposited in the herbarium. The nativity of invasive alien grasses was ascertained from available literature<sup>13,18,22,24,25</sup>. The website of Botanical Survey of India, Kolkata ([http://www.bsienvis.nic.in/database/invasive\\_alien\\_species\\_15896.aspx](http://www.bsienvis.nic.in/database/invasive_alien_species_15896.aspx)) was also visited to search for information on the nativity of invasive non-indigenous grasses that grow in different habitats of Bhagalpur district (Bihar), India.

The ethnobotanical information pertaining to naturalized exotic grasses was gathered through conversations, interviews and discussions with elderly knowledgeable native persons following semi- structured questionnaires. For ethnomedicinal information, local

herbalists famous as *Vaidyas* or *Hakims* were also consulted, taken in confidence and interrogated. Repeated enquires were made to authenticate the ethnomedicinal information. The identified species of invasive alien grasses have been enumerated alphabetically with respect to their botanical name followed by common name, local name in parenthesis, voucher specimen number, nativity and uses.

## Results and Discussion

A total of 12 species of invasive alien grasses from Bhagalpur district (Bihar), India have been documented (Table-1). These grasses occur as weeds (*Echinochloa colona*, *Echinochloa crusgalli*), cultivated plants (*Avena sativa*, *Dendrocalamus giganteus*, *Dendrocalamus membranaceus*, *Dendrocalamus strictus*), wild plants (*Cenchrus purpureus* Syn. *Pennisetum purpureum*, *Chloris barbata*, *Imperata cylindrica*, *Paspalum dilatatum*) and wild plants or weeds (*Cynodon dactylon*, *Saccharum spontaneum*) in varying frequencies throughout the geographical area of district. *Cynodon dactylon* and *Saccharum spontaneum* grow profusely round the year as dominant grasses in diverse habitats located in almost all parts of the region.

The recorded invasive alien grasses act as the valuable resources for the native people. Their utilization as fodder/forage, medicine, fibre, etc. seems to be crucial for the livelihood of rural people. More or less, all the invasive alien grasses except bamboos (*Dendrocalamus* spp.) are used as fodder/forage in the region. Bermuda

grass (*Cynodon dactylon*) is lavishly used as excellent forage and also as an effective medicine to cure several ailments such as anaemia, constipation, indigestion, menstrual disorders, poor urination, etc. Bamboos are widely utilized in building construction, basketry and weaving. Thatch grass (*Saccharum spontaneum*) is useful in thatching roofs of huts. Both the dominant invasive alien grasses (*Cynodon dactylon* and *Saccharum*

*spontaneum*) are essentially put to use in religious ceremonies of Hindus. Commercial exploitation of bamboos and thatch grass may help to boost the economy of people involved in the collection, processing and trading of their products. Therefore, there is a need to adopt a proper strategy for efficient exploitation of the useful invasive alien grasses to improve the economy of the poor rural folk of the region.

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