

NOTEWORTHY GRASSES OF GUJARAT

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Regular field survey and critical laboratory observation has revealed the addition of eight new grass species for the Gujarat state. Their vegetative and reproductive morphology was studied in detail and differences with their allied species are mentioned here.

Key words: : Grasses, Noteworthy, South Gujarat.

The documentation and diversity of all vegetational components including grasses has gained momentum in last few years to assess the phyto diversity of our nation. Grasses as a whole, are mostly herbaceous members in the plant kingdom and shows great adaptability in their morphological and reproductive strategies for their own survival. Initially, Shah (1978) reported 89 genera and 235 species of grasses, after that there were no reports about the increase or decreases in the species diversity for Poaceae except Joshi (1980), Meena (2004). Present authors have reported 3 new species to plant science and 30 new records to the state flora (Raole and Desai 2008, Raole et al. 2011, Desai and Raole 2011, 2012a, b, 2013 a, b). In Meena and Pandey (2004) number was raised to 105 genera and 274 species without giving any specific details. Moreover, in recent literatures the reassessment of floristic diversity has been reviewed and suggested the conservation measures with specific reference to the Gujarat state (Pandey and Singh 1999, Dixit et al. 2001, Singh and Parabia 2003, Meena 2004). Biological spectrum of the past and present works has given an idea of changes occurred and going on in the study area. Hence, in order to understand the changes in vegetation pattern, particularly in grasses, a detailed study is planned and conducted for south Gujarat region.

Grasses forms the major components of

different ecosystems during monsoon and post monsoon period in and around the forest area. Variety of land forms, environmental conditions, hilly terrains and less anthropogenic activities are main cause for the high species diversity in south Gujarat. Continuous field surveys from last 4 years to the study area have given an opportunity to look into different grasses in detail. After critical morphological observation and thorough review of literature (Cooke, 1902-08; Blatter and Mc Cann, 1935; Patel, 1965; Shah and Survanarayana, 1969; Shah, 1978; Bole and Pathak, 1988; Bhandari, 1990; Gandhi and Yusufzai, 1999; Pandey and Padhye, 1997, 2005, 2006; Pandey, 2001, 2002; Meena, 2004, 2005, 2007; Meena and Pandey, 2004, Gohil, 2006, Gohil and Patel, 2006; Raole and Desai 2008, Raole et al. 2011; Desai and Raole 2011, 2012 a, b, 2013 a, b) few of them turned out as an addition to the state flora of Gujarat as their presence were not reported earlier. Their morphological differences and habitat prefrence with their allied species, distribution status and herbarium details are mentioned here.

MATERIALS AND METHODS

During botanical exploration in last four years to different parts of South Gujarat forests and nearby areas, the authors could collect some variable grasses. The gross morphology of different vegetative and reproductive features were studied with the help of Stereo photo



Figure 1: A-C Arthraxon nudus, A:Habit, B: Inflorescence, C: Spikelet close-up showing barren pedicel along with sessile spikelet; D-F Dichanthium maccannii, D: Plant growing on rocky riverbed, E: Inflorescence, F: Close-up of spikelet pair showing tubercled hairs on pedicelled spikelet; G-I Oryza latifolia, G: Habit, H: Inflorescence, I: Spikelet; J-L Oryza glaberrima, J: Inflorescence, K: Drying of plants in agricultural field, L: Close-up of awned and awnless spikelets; M-O Panicum paianum, M: Habit, N: Leaf sheath and blade showing tubercled hairs, O: Spikelet; P-R Tripogon filiformis, P: Habit, Q: Inflorescence, R: Spikelet close-up; S: Sacciolepis interrupta inflorescence close-up. T-U Phragmites australis, T: Plant flurishing along Kim river, U: Inflorescence close-up.

microscope. Plant identification has been done with the help of available floras and above mentioned literatures. Voucher specimens of all the grasses were submitted to the BARO herbarium ('Herbarium Universitas Barodensis', Department of Botany, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat), and details are provided. Accepted scientific name was followed from IPNI data base (http://www.ipni.org/).

RESULTS AND DISCUSSION

After critical morphological studies and thorough review of literature below mentioned grass taxa are found to be noteworthy to the state. Hence, in the present communication they are reported as an addition to the flora of Gujarat and new distributional range for the Indian subcontinent.

1. Arthraxon nudus (Nees ex Steudel) Hochstette

So far it is reported and known from Uttar Pradesh-Assam, extending to south-east Asia (Bor, 1960). Now, it has also been observed and recorded from forest understory in post monsoon season in Dangs. It differs from its closest relative *A. quartinianus* and *A. hispidus* by presence of three stamens instead of two and 1.5-2.5 mm long glabrous pedicel. (Fig. 1 A-C) Specimen Examined: Gujarat, Dangs district, Pandwa and Bhenshkatri; BARO RJD/ 881, 882, 846, 855.

2. Dichanthium maccannii Blatter

It is earlier reported and known to be endemic to Maharashtra only (Bor 1960, Karthikeyan *et al.* 1989). Now, it has also been noticed and recorded only from the Rocky riverbed of Gira, Near Ambapada, Dangs after monsoon. The plant looks a like *D. annulatum or D. caricosum*, but its lower glume of pedicelled spikelets are armed with bulbous based bristles. (Fig. 1 D-F)

Specimen Examined: Gujarat, Dangs district, Ambapada; BARORJD/818, 819, 822.

3. Oryza latifolia Desv.

So far it is reported as introduced one from

Maharashtra only (Bor 1960, Karthikeyan *et al.* 1989). Now, it has also been observed and recorded under the shade of trees near Pathree and Rabdee, Valsad district, during and after monsoon. Ligule of lower leaves up to 6 mm in comparison to other species of Oryza which has 15-45 mm. (Fig. 1 G-I)

Specimen Examined: Gujarat, Valsad district, Pathree & Rabdee; BARO RJD/73, 106, 736.

4. Oryza glaberrima Steud.

At the first sight it may be mistaken for *O. minuta or O. sativa* with which it resembles in general appearance, but having awnless 6-7mm long persistent glabrous spikelets are typical for it. It is mostly noticed under cultivation at Dharampur and Kaprada, Valsad district and eastern side of Dangs district. So far it is reported as introduced one from Madhya Pradesh only (Bor 1960, Karthikeyan *et al.* 1989). (Fig. 1 J-L)

Specimen Examined: Gujarat, Valsad district, Dharampur and Kaprada; Dang district, Gadad BARO RJD/395, 722, 735, 802

5. Panicum paianum Naik & Patunkar

It is earlier reported and known to be endemic to Marathwada region of Maharashtra only (Patunkar 1980, Karthikeyan *et al.* 1989). It differs from its close resemblance *P. curviflorum* by its acute lower glume and from *P. atrosanguineum* due to 1/3 or 1/4 length of lower glume with respect to spikelet. Now it has been observed and collected from damp, swampy grounds of Navsari and Surat district during and after monsoon. (Fig. 1 M-O) Specimen Examined: Gujarat; Surat district,

Bardoli and Mahuwa; BARO RJD/779, 780, 786, 790.

6. Tripogon filiformis Nees ex Steud

It has also not been reported earlier from the Gujarat (Bor 1960, Karthikeyan *et al.* 1989). It differs from *T. bromoides* by toothed lemma apex with long median awn, which is twice as long as lemma. It occurs frequently on the rocky riverbeds and hill tops in Dangs district. (Fig. 1 P-R)

Specimen Examined: Gujarat, Dangs district,

Pampa Sarovar and Girmal; BARO RJD/226, 233, 567.

7. Sacciolepis indica (L.) Chase

It differs from its closest relative, i.e. *S. interrupta and S. mysorensis* in having slender, non-spongy culms and laterally compressed 2-3mm long spikelets. It found in association with *Ischaemum sayajiraoi*, *Scleria annularis*, *Themeda triandra* and annual Leguminosae members in moist places. Earlier only *S. interrupta* was reported as common component at moist places from the state (Shah, 1978). (Fig. 1 S)

Specimen Examined: Gujarat, Valsad district, Nana-Vaghchhipa; BARO RJD/1012, 1013.

8. *Phragmites australis* (Cav.) Trin. ex Steud. Easily recognised due to its height i.e. 3-4 m tall grass; leaves with long filiform apex, inflorescnce open panicle, 10-50 cm lomg, contorted, branches distant, rachis hairs = 10 mm. Found usually along the water channels and river banks of Surat district. It has been earlier reported from North-west India and Central Himalaya only (Bor 1960, Karthikeyan *et al.* 1989). (Fig. 1 T-U)

Specimen Examined: Gujarat, Surat district, Kim river bank near Olpad and Mindhola river bank near Mahuwa; BARO RJD/75, 282, 476.

In our view these recent additions to the grasses of Gujarat can be considered as an extension to the geographical range of grasses. At the same time, some of these noteworthy grasses have been introduced by the dispersal mechanism or anthropogenic activities.

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