



RESEARCH COMMUNICATION

# Lectotypification of names in the genus *Eragrostis* Wolf (Poaceae)

Shubham Jaiswal<sup>1,2</sup>, Smita Tiwari<sup>1</sup>, Dileshwar Prasad<sup>1</sup>, Rekha Yadav<sup>1,2</sup>, Shailja Tripathi<sup>3</sup>, Virendra K. Madhukar<sup>2</sup> & Priyanka Agnihotri<sup>1\*</sup>

<sup>1</sup>Plant Diversity, Systematics & Herbarium Division, CSIR- National Botanical Research Institute, Rana Pratap Marg, Lucknow 226 001, India

<sup>2</sup>Department of Botany, D.D.U. Gorakhpur University, Gorakhpur 273 009, India

<sup>3</sup>Department of Botany, Indira Gandhi Government P.G..College, Bangarmau, Unnao 209868, India

\*Email: priyagni\_2006@yahoo.co.in  
CSIR NBRI\_MS/2022/03/04

 OPEN ACCESS

## ARTICLE HISTORY

Received: 06 July 2022  
Accepted: 23 September 2022

Available online  
Version 1.0 : 10 November 2022  
Version 1.0 : 30 November 2022



## Additional information

**Peer review:** Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

**Reprints & permissions information** is available at [https://horizonepublishing.com/journals/index.php/PST/open\\_access\\_policy](https://horizonepublishing.com/journals/index.php/PST/open_access_policy)

**Publisher's Note:** Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Indexing:** Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS etc. See [https://horizonepublishing.com/journals/index.php/PST/indexing\\_abstracting](https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting)

**Copyright:** © The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited (<https://creativecommons.org/licenses/by/4.0/>)

## CITE THIS ARTICLE

Jaiswal S, Tiwari S, Prasad D, Yadav R, Tripathi S, Madhukar V K, Agnihotri P. Lectotypification of names in the genus *Eragrostis* Wolf (Poaceae). Plant Science Today (Early Access). <https://doi.org/10.14719/pst.1979>

## Abstract

In the present work three names within the genus *Eragrostis* viz, *Eragrostis coarctata*, *E. plana* and *E. superba* have been typified. Lectotypification has been performed for *E. coarctata*, and Second-step lectotypification has been done for the names *E. plana* and *E. superba*. For lectotypification, the rules and recommendations proposed by the International Code of Nomenclature for algae, fungi and plants (ICN) have been strictly followed. The selection of lectotypes are explained and the images of selected lectotypes are provided.

## Keywords

Chloridoideae, Eragrostideae, Gramineae, nomenclature, typification

## Introduction

*Eragrostis* Wolf (1), a member of the tribe Eragrostideae and sub-tribe Eragrostidinae is the largest genera of sub-family Chloridoideae, Poaceae (2), widespread throughout the world, ranging from the subtropical and tropical zones to warm temperate zones, flourishes well in poor and dry soils and in disturbed places (3). The genus is taxonomically complex and shows morphological diversity to a greater extent (3-7). The main characteristics of the genus include an open, contracted or spiciform paniculate inflorescence consists of laterally compressed, un-awned and 2-many flowered spikelets, disarticulation from above the glumes, glumes are often 1-nerved whereas lemmas are 3-nerved and 1-keeled, paleas are 2-nerved and 2-keeled (keel either ciliate, scaberulous or rarely smooth) and longitudinally bowed out (4-7). Worldwide, a total of ca 407 species have been recognised within the genus *Eragrostis* (8). From the Indian context, Hooker (9) was the first to compile a taxonomic account of *Eragrostis* in his Flora of British India (1896) and listed ca 27 species from the current political boundaries of India. Subsequently, Bor (4) documented the genus from Burma (Myanmar), Ceylon (Sri Lanka), India, and Pakistan, and reported a total of ca 39 species within the borders of India. In addition, several workers have also prepared checklists of the genus from India including Karthikeyan et al. (10), Moulik (11) and Kellogg et al. (12). Recently, Vivek et al. (7) published a taxonomic revision focusing on the genus *Eragrostis* from India and recorded 47 taxa (42 species and 5 varieties), of which eight taxa are found endemic to the country.

Working on the family Poaceae from Western Himalaya India, authors have studied nomenclature accounts of the accepted names of Indian *Eragrostis* with their types and protologues. While doing so, the first author came

across 3 names viz. *Eragrostis coarctata* Stapf (13), *E. plana* Nees (14) and *E. superba* Peyr. (15) which have been surrounded by uncertainty in typification as multiple syntypes are associated with single or with multiple gatherings. Therefore, to rectify this nomenclature ambiguity, here we have lectotypified these names following the International Code of Nomenclature (16).

## Materials and Methods

In the course of the study, we have extensively analysed the protologues of all three names and checked the morphological description and type information. In addition, other relevant literature, as well as important online databases (BHL, IPNI, JSTOR Global Plants, POWO, TROPICOS and WCVF) were thoroughly searched to ensure that selected names have not been typified yet. We turned to TL-2 (17) for information about the authors, collectors and the herbaria where the original material might be kept. To trace the original material, herbaria A, B, BM, BR, BP, BRNM, C, CAL, CGE, DD, DPU, E, G, GE, HAL, HBG, IBF, K, LE, LI, M, MO, NMW, NY, P, S, TR, W and WU (18) have been thoroughly searched either in person or through online means. Each herbarium specimen that constituted the original material was critically examined and compared with the protologue. The best representative of the species has been chosen as lectotypes by following the Art. 9.3 and Art. 9.17 of the Shenzhen Code (16).

## Results and Discussion

*Eragrostis coarctata* Stapf (1896: 313) (Fig. 1).

### Type (lectotype designated here)

MYANMAR, Irrawaddy R. [Ayeyarwady R.], Yenangheum [Yenangyaung], *Wallich 5003* [K000643387 (digital image!); isolectotypes K000643386 (digital image!), K001104470 (digital image!), K001104471 (digital image!)]

### Further original material

INDIA, Jharkhand (Central Province), Hazaribagh (Chota Nagpur), Lohardaga, Nontilo, 2000 ft, 12 November 1883, *CB Clarke 34086* [K000245063 (digital image!); Parmnath, 4500 ft, 07 October 1883, *CB Clarke 33690* [K000245064 (digital image!); Sikkim, *JD Hooker s.n.* [K000245065 (digital image!); BANGLADESH, Chittagong, *Hooker & Thomson s.n.* [W0027628 (digital image!)]

### Nomenclatural Notes

*Eragrostis coarctata* Stapf (13) was described by O. Stapf in Hooker's Flora of British India. In the protologue, a brief diagnosis accompanied by morphological description has been provided and the gatherings made by C.B. Clarke, Hooker and Thomson, and Wallich from "Upper Gangetic plain, Moradabad to Sikkim Behar, Chittagong, Arracan and Burma" were cited. We have traced out a total of eight specimens belonging to the cited gatherings of which seven specimens i.e., K000643386, K000643387, K001104470, K001104471 (*Wallich 5003*), K000245063 (*Clarke 34086*), K000245064 (*Clarke 33690*) and K000245065 (*Hooker s.n.*) housed in K, and one in W i.e., W0027628 (*Hooker & Thom-*



**Fig. 1.** Lectotype of the name *Eragrostis coarctata* Stapf. (Barcode K000643387). [© The Board of Trustees of the Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew]

*son s.n.*) The specimens belonging to Wallich's catalogue number 5003 (19) viz. K000643386, K000643387, K001104470 and K001104471 bear a handwritten annotation of type locality "Irrawaddy R. Yenangheum" and a label of Wallich catalogue number 5003. In the protologue, Stapf used the word 'in part' for *Wallich 5003* specimens, though after critical examination, we found that these specimens matched well with the protologue and Stapf presumably used this word due to the existence of many duplicates. Specimens K001104470 and K001104471 are mounted together on a single sheet while specimen K000643386 is mounted in parts. Specimen K000643387 has a drawing of dissected spikelet parts that agrees with the characters as described in the protologue of the name. Clarke's specimens K000245064 (*Parmnath, 4500 ft, 07 October 1883*) and K000245063 (*Lohardaga, Nontilo, 2000 ft, 12 November 1883*) are mounted together and carry an annotation referring to their locality and date of collection in Clarke's handwriting. Hooker's specimen with barcode K000245065 (Sikkim; *Hooker s.n.*) and W0027628 (Chittagong; *Hooker & Thomson s.n.*) bear a handwritten identification slip by Hooker having collection details. Both Wallich and Clarke identified their specimens up to the genus level, however, Hooker thoroughly studied his specimens and determined them as "*E. cylindrica* Nees" (*E.*

*cylindrica* (Roxb.) Ar.) (20). When Stapf examined all the above-mentioned specimens, he first considered them as *E. plumosa* var. *compacta* (*nom. nud.*: only written on the type specimens), however, later he changed his view and established them as *E. coarctata*. Since, all the above specimens belong to the gatherings as indicated in the protologue and further verified by Stapf himself, therefore, they are all original material and because none of them was specified as type specimen, they are also be considered as syntypes (Art. 9.4 and 9.6 of the ICN) (16). Considering the above discussion and for fulfilling the norms of Art. 9.3 of the Shenzhen Code (16) here, a lectotype is required for the name *E. coarctata*. We have made the specimen with barcode K000643387 as lectotype of the name *E. coarctata*, as the specimen possesses all the vegetative as well as reproductive parts with a drawing of dissected spikelet, and matches well with the protologue.



**Fig. 2.** Lectotype of the name *Eragrostis plana* Nees. (Barcode P00439402). [© Muséum national d'Histoire naturelle, Paris, France. Reproduced with the consent of the Muséum national d'Histoire naturelle, Paris].

***Eragrostis plana*** Nees (1841: 390) (Fig. 2).

### Type

(lectotype, first-step designated by Vivek *et al.* 2021: 75):—SOUTH AFRICA. Eastern Cape, between Geckau and Mbashe (*et inter Geckau et Basche*), Drège *s.n.* (six sheets); Type (lectotype, second-step designated here):—SOUTH AFRICA. Eastern Cape, between Geckau and Mbashe (*et inter Geckau et Basche*), 1500'–2000' ft, 23 January 1832 (23/1 32), Drège *s.n.* [P00439402 (digital image!)], isolectotypes HAL0106976 (digital image!), K000365769 (digital image!), S-G-2299 (digital images!).

### Further original material

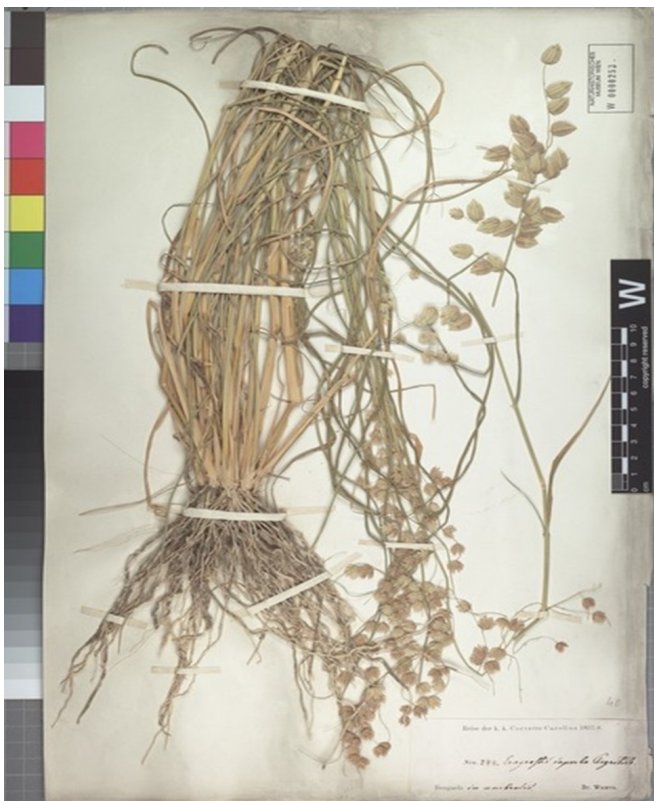
SOUTH AFRICA. Eastern Cape, To the river near Kachu and Zandplaat alt. 1500' ft and between Geckau and Mbashe (*Ad flumen prope Kachu el Zandplaat alt. 1500' ft et inter Geckau et Basche alt. 1500–2000' ft*), Drège *s.n.* [LE00009557 (digital image!)]]; To the river near Kachu el Zandplaat (*Ad flumen prope Kachu el Zandplaat*) alt. 1500' ft, Drège *s.n.* [W0000252 (digital image!)]

### Nomenclatural Notes

Nees (14) described *Eragrostis plana* based on Drège's collection from two different localities of Eastern Cape, South Africa i.e., "*Ad flumen prope Kachu el Zandplaat alt. 1500' ft and et inter Geckau et Basche alt. 1500–2000' ft*, (Drège)". J. F. Drège was a German botanist, who explored African flora and collected numerous plant species from different localities during 1826–34 (21). Literature survey followed by access to various online databases reveals that Drège provided his set of specimens to E. Meyer (German botanist), who further documented Drège's collection in the form of *Commentorium de Plantis Africae Australioris* (22). Despite this, a large number of Drège's specimens could not be documented, and therefore Meyer distributed the remaining set of specimens to various European herbaria, which were later investigated and documented by various workers like Nees, De Candolle and Kunth etc. (21, 23). Drège assigned a roman numeral "V, b." for type locality *Gekau et Basche* and *Kachu el Zandplaat* (23). In the protologue of the species, Nees did not designate any particular specimen as the type specimen. Therefore, as per the ICN rules (16), here, a lectotypification is required. We were able to locate six specimens of *E. plana* housed in K (K000365769), HAL (HAL0106976), LE (LE00009557), P (P00439402), S (S-G-2299) and W (W0000252). From the above-mentioned specimens four specimens with barcodes HAL0106976, K000365769, P00439402 and S-G-2299 undoubtedly belonged to Drège's collection "*et inter Geckau et Basche alt. 1500–2000'*" as all these specimens bear labels with details of this collection [HAL0106976: *et inter Geckau et Basche 1000-2000' ft*, J. F. Drège (typed later); P00439402: "*23/1 32. et inter Geckau et Basche, 1500–2000' ft, V, b.*" (original Drège ticket) and "&. a. 4263"; K000365769: *Afr. Austr., Between Geckau et Basche, 1000-2000, Drège, 1840*, (old note, the year 1840 presumably referring to E Meyer distribution of Drège set); S-G-2299: "*Zwischen Gekau und Basche, Grasfelder, 1000-2000 Fuss, Januar (J. F. Drège)*" (J. F. Drège (typed ticket)], and an additional original ticket of Nees "*Eragrostis plana* N.ab.E. b" from Meyer's set of distribution. However, the same cannot be said for the remaining two specimens with barcodes LE00009557 and W0000252, as there is no concrete indication of which gathering they belong to. In the case of specimen LE00009557, besides the original ticket of Nees, there is a label that carries the details of both the gatherings and therefore, it is very difficult to predict its associated gathering. Similar confusion exists in the case of specimen W0000252, as no information regarding the type locality has been provided, however, the W database explicitly states that it is tied to "*Ad flumen prope Kachu el Zandplaat alt. 1500'*". Since all of the above specimens are part of cited gatherings and none of them was designated



as the type specimen, therefore, they should be considered as original material and syntypes (Art. 9.4 and 9.6 of the Shenzhen Code) (16). In the recent taxonomic revision of the genus *Eragrostis* from India, it was cited as "Type: South Africa, between Gekau and Basche, J.F. Drège s.n." (7). The type citation is incomplete, and has to be accepted as the first step of lectotypification because it is uncertain which specimen they designated as the type and where it is placed (7). Thus, a lectotype (second-step) has to be designated by following the Art. 9.17 of the ICN (16), here, we narrowed our choice to a single specimen and designate P00439402 as lectotype of the name *E. plana* as it is complete, well mounted, best matched with the protologue and the only specimen that has original handwritten collection slip (23/1 32. et inter Geckau et Basche, 1500–2000' ft, V, b ) by Drège.



**Fig. 3.** Lectotype of the name *Eragrostis superba* Peyr. (Barcode W0000253). [© Naturhistorisches Museum Wien, Vienna, Austria. Reproduced with the consent of the Naturhistorisches Museum Wien, Vienna, Austria].

***Eragrostis superba* Peyr. (1860: 584) (Fig. 3).**

**Type** [lectotype, first-step designated by Cope 1982: 85]

ANGOLA. near Benguela and Luanda (*in locis umbrosis prope Benguela ac Loanda*), 1861, *Wawra 244* (3 sheets); Type (lectotype, second-step designated here):—ANGOLA. near Benguela and Luanda (*in locis umbrosis prope Benguela ac Loanda*), 1861, *Wawra 244* [W0000253 (digital image!)]]; isolectotypes W0000254 [digital image!] and W19160020240 [digital image!].

#### Nomenclatural Notes

Petritsch (15) established a new species in the genus *Eragrostis* based on Wawra's collection from Angola. In the protologue, a brief diagnosis with a detailed morphological description is provided and the gathering *Wawra 244* ("*in locis umbrosis prope Benguela ac Loanda*") was cited

without designating any particular specimen as the type specimen. Also, nothing was specified about the herbaria where the original material might be kept. We have located three herbarium specimens of *Wawra 244* deposited in W with barcodes, W0000253, W0000254 and W19160020240. These specimens carried a label having collection details of *Wawra 244* ("*in locis umbrosis prope Benguela ac Loanda*") in Wawra's handwriting, this establishes them as original material, and since not a single specimen was designated as type specimen, they must be treated as syntypes (Art. 9.4 and 9.6 of the ICN) (16). An in-depth investigation of the literature, reveals that previously Cope (24), Peterson (25), Kellogg et al. (12), and Vivek et al. (7) indicated that the type specimen is deposited in W. Since we have found more than one specimen placed in W, and none of them was marked as holotype, therefore, as per Art. 9.17 of ICN (16), here a second step of lectotypification is needed, the choice of Cope (24) is considered as first step of lectotypification. After a critical examination, we agreed that all the specimens best matched with the protologue of the species. We narrowed down the choice to a single specimen, and designated specimen with barcode W0000253 as lectotype for the name *E. superba*, as comparatively it is the best-preserved specimen consisting of all vegetative and reproductive parts.

#### Acknowledgements

We would like to express our gratitude to the Director of CSIR-National Botanical Research Institute, Lucknow for providing all the necessary facilities. We also thank the Head, Department of Botany, DDU Gorakhpur University for assisting. We sincerely thank Dr Tariq Husain, former Chief Scientist, CSIR-National Botanical Research Institute, Lucknow for his constant guidance and invaluable suggestions. We thank the directors and curators of A, B, BM, BR, BP, BRNM, C, CAL, CGE, DD, DPU, E, G, GE, HAL, HBG, IBF, K, LE, LI, M, MO, NMW, NY, P, S, TR, W and WU for providing access to the Herbarium, digitally or in person. The first author thanked UGC, New Delhi, and the second, third and fourth authors thanked CSIR, New Delhi, for the research grant for carrying out the research work. We also thankfully acknowledge SERB, New Delhi for financial support under the CRG scheme (CRG/2021/000720).

#### Authors contributions

SJ first identified the problem, conducted the necessary research and prepared the first draft of the manuscript. ST, DP, RY and STP provided important suggestions to improve the manuscript. VKM reviewed the final draft of the manuscript and made some key additions. PA supervised the whole work and sent the manuscript for publication.

#### Compliance with ethical standards

**Conflict of interest:** The author emphatically affirms that this research is conducted without any conflicts of interest.

**Ethical issues:** None.

## References

1. Wolf NMV. Genera Plantarum Vocabulis Characteristicis Definita. Danzig, Königsberg; 1776.
2. Kellogg EA. Flowering plants, monocots, Poaceae. In: Kubitski, K. (Ed.) The families and genera of vascular plants. Vol. 13. Cham: Springer International; 2015.
3. Clayton WD, Renvoize SA. Genera graminum – Grasses of the World. The Board of Trustees of the Royal Botanic Gardens, Kew; 1986.
4. Bor NL. Grasses of Burma, Ceylon, India and Pakistan (excluding Bambuseae). Pergamon Press. London; 1960. <https://doi.org/10.1097/00010694-196111000-00009>
5. Veldkamp JF. Revision of *Eragrostis* (Gramineae, Chloridoideae) in Malesia. Blumea. 2002; 47:157-204.
6. Chaisongkrama W, Chantaranonthaia P, Hodkinsonb TR. A taxonomic revision of the genus *Eragrostis* in Thailand. Sci. Asia. 2013;39:111-23. <https://doi.org/10.2306/scienceasia1513-1874.2013.39.111>
7. Vivek CP, Murthy GVS, Nair VJ. The Genus *Eragrostis* (Poaceae: Chloridoideae) in India: Taxonomic Revision. Nelumbo. 2021;63 (1):33-101. Available at: <http://nelumbo-bsi.org/index.php/nlumbo/article/view/165149> <https://doi.org/10.20324/nelumbo/v63/2021/165149>
8. WCV. The World Checklist of Vascular Plants. Available from: <https://wcvp.science.kew.org/> (accessed 02 May 2022)
9. Hooker JD. The Flora of British India, Vol.7. L. Reeve & Co. Ltd, England; 1896.
10. Karthikeyan S, Jain SK, Nayar MP, Sanjappa M. Poaceae. In: Florae Indicae Enumeratio Monocotyledonae. Botanical Survey of India, Kolkata; 1989.
11. Moulik S. The grasses and bamboos of India, Vol. 1. Jodhpur: Scientific Publishers; 1997.
12. Kellogg E, Abbott JR, Bawa K, Gandhi K, Kailash BR, Ganeshiah KN et al. Checklist of the grasses of India. PhytoKeys. 2020;163:1-560. <https://doi.org/10.3897/phytokeys.163.38393>
13. Stapf O. *Eragrostis*. In: Hooker, J.D. (Ed.), The Flora of British India. Vol. 7. L. Reeve & Co., London; 1896.
14. Nees von Esenbeck CG. Florae Africae Australioris Illustrationes Monographicae. Glogaviae; 1841. <https://doi.org/10.5962/bhl.title.7585>
15. Peyritsch J. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe; 1860.
16. Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS et al. International Code of Nomenclature for algae, fungi and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten; 2018. <https://doi.org/10.12705/Code.2018>
17. Stafleu FA, Cowan RS. Taxonomic Literature, 2nd ed. Vols. 1 –7. Bohn, Scheltema & Holkema, Utrecht; 1976-88.
18. Thiers B. Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Published on the Internet; <http://sweetgum.nybg.org/science/ih/> (Accessed 02 May 2022)
19. Wallich N. A Numerical List of Dried Specimens of Plants in the East India Company's Museum, Collected under the Superintendence of Dr. Wallich of the Company's Botanic Garden at Calcutta. London; 1829. <https://doi.org/10.5962/bhl.title.1917>
20. Hooker WJ, Arnott GAW. The Botany of Captain Beechey's Voyage. Henry G. Bohn, London; 1837.
21. Gunn M, Codd LE. Botanical exploration of southern Africa. An illustrated history of early botanical literature on the Cape flora. Biographical accounts of the leading plant collectors and their activities in southern Africa from the days of the East India Company until modern times. A.A. Balkema, Cape Town; 1981.
22. Meyer EHF. Commentorium de Plantis Africae Australioris. Vol.1, Fascicle 2. Leipzig: Voss; 1837.
23. Drège JF. Zwei pflanzengeographische Documente nebst einer Einleitung von Dr. E. Meyer. Besondere Beigabe zur Flora 1843 Band II. Leipzig, Regensburg; 1843. <https://doi.org/10.5962/bhl.title.87612>
24. Cope TA. Poaceae. In: Nasir E, Ali SI. (Eds.) Flora of Pakistan, Vol. 143. Department of Botany, University of Karachi, Karachi; 1982.
25. Peterson PM, Boechat SC. *Eragrostis*. Pp. 81-115. in Peterson, P.M., Soreng, R.J., Davidse, G., Filgueiras, T.S., Zuloaga F.O. and Judziewicz E.J. Editors. Catalogue of New World grasses (Poaceae: Chloridoideae). Contr U.S. Natl Herb. 2001;41:1-255.

§§§