Typification of names and their taxonomic assignment within the Brachypodium distachyon complex (Poaceae)

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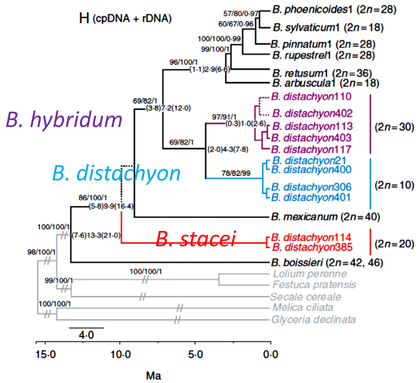
The *Brachypodium distachyon* complex includes (at least) three annual species, whose taxonomic identities have recently been demonstrated by cytological, molecular and morphological data (Catalan et al. 2012 - *Ann. Bot.*, 109: 305-405).



The initial taxonomic studies contained no nomenclatural revision of the fifteen or so heterotypic, valid and legitimate synonyms at species rank [wcsp.science.kew.org/synonomy.do?name_id=399871, modified]

***Brachypodium distachyon* (L.) P.Beauv., Ess. Agrostogr.: 101, 155 (1812).**
Festuca monostachyos Lam., Encycl. 2: 461 (1788) ; *F. monostachya* Poir., Voy. Barbarie 2: 98 (1789), nom. illeg. !
***Festuca rigida* Roth, Catal. Bot. 1: 12 (1797) ≡ *Triticum asperum* DC., Cat. Pl. Horti Monsp.: 153 (1813), nom. nov.** ≡ *Triticum asperrimum* DC., in Link, Handbuch 1: 18 (1829), orth. var.
Festuca pseudistachya Koeler, Descr. Gramin.: 270 (1802).
~~*Triticum brevisetum* DC., Cat. Pl. Horti Monsp.: 153 (1813).~~
Bromus pentastachyos Tineo, Pl. Rar. Sicil.: 4 (1817).
Bromus paradoxus C.Presl, Fl. Sicul. 1: XLV (1826).
Brachypodium macrostachyum Besser in J.A.Schultes & J.H.Schultes, Mant. 3: 651 (1827).
Brachypodium megastachyum Besser in J.A.Schultes & J.H.Schultes, Mant. 3: 651 (1827).
Triticum flabellatum Tausch, Flora 20: 117 (1837).
+*Triticum poliens* Tausch, Flora 20: 117 (1837). [unresolved]
Triticum subtile Fisch., C.A.Mey. & Avé-Lall., Index Seminum (LE, Petropolitanus) 10: 59 (1845).
Brachypodium geniculatum K.Koch, Linnaea 21: 422 (1848).
***Triticum schimperi* Hochst. ex A.Rich., Tent. Fl. Abyss. 2: 441 (1850).**
Festuca tauschii Steud., Syn. Pl. Glumac. 1: 317 (1854).
Brachypodium platystachyum Huber, Cat. Graines 1868: 8 (1868), nom. nudum !
~~*Brachypodium × pauí* Sennen, Bol. Soc. Aragonesa Ci. Nat. 10: 177 (1911).~~

Considering the impossibility to study molecularly the herbarium type materials of these names, this precluded the analysis of these samples and the authors needed to describe two species as new (Catalán et al., 2012, Ann. Bot., 109: 305-405).

B. stacei Catalán et al., 2n=20, 2C+/-0.56pg
Holotypus : Balearic (Spain)

An improvement of the morphological methods, including new criteria relevant both in situ and in herbarium, now allows us to do this nomenclatural synthesis, according to the current taxonomic treatment [Véla, Bianchin, Croze, Pavon & Tison, unpubl.].

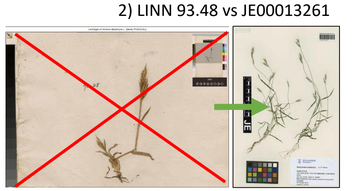
New criteria compared to Catalán et al. 2016	*B. cf. distachyon* (FR, IT, TN, DZ) ≠ IK	*B. cf. hybridum* (ES, FR, IT, TN, DZ ; LB) + IK	*B. cf. stacei* (ES, FR, IT, TN, DZ ; LB)
Top of the culm :	smooth or slightly rough downward	+/- smooth	**rough upward**
Top of the culm :	thin (<1.0 mm)	slightly thickened	**thickened** (>1.2mm)
Leaf-blades margin :	ciliate (+/-long)	ciliate (+/-short)	**not ciliate**
Leaf-blades margin :	both straight	straight (rarely one wavy)	**one wavy, other straight**
Leaf-blade underside :	**glabrescent except bristle**	**mixed** (short bristle + lax fluff)	**fluffy hair**
Veins on leaf-blade topside :	**7-13, embossed** and visible to the eye	11-21, **dimorphic** (3-5 visible, other inconspicuous)	**17-31, inconspicuous** (visible with a magnifier)
Inflorescence	**dense** (interspace < glumes)	+/- lax (interspace	**lax** (interspace > ½ spikelet)
Mature spikelets	**spread**	+/- erected	**imbricated**

Morphological details of *B. distachyon* (2n=10) [SE-France] vs *B. hybridum* (2n=30) [N-Algeria / SE-France] vs *B. stacei* (2n=20) [SE-France]

Material & Methods : Fresh French, Algerian-Tunisian and Iraqi material from the three species has been calibrated with DNA genome size (2C) and molecular barcoding (ITS + tnrLF).

1) *Festuca rigida* Roth (B-W 02109 2)

2) LINN 93.48 vs JE00013261



3) *B. platystachyum* vs *B. hybridum* [Algiers, same soil, same locality]

4) *B. distachyon* : from SE-France from N-Iraq

Four main results :

1) *Brachypodium stacei* has got a prioritary name *B. rigidum* (Roth) Link [1821] : to be rejected ?
2) The lectotypus (LINN 93.48) of *B. distachyon* (L.) P.Beauv. is morphologically a *B. hybridum* ! : to be conserved ?
3) Another hybrid species (not *B. hybridum* s.s.) has morphology of *B. platystachyum* (Coss.) : missing combination
4) Middle Eastern (epitypus) and Western Medit. *B. distachyon* hasn't got the same morphology : cryptic species ?

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