



Amaranthus gangeticus (Amaranthaceae), a name *incertae sedis*

DUILIO IAMONICO

Laboratory of Phytogeography and Applied Geobotany, Section Environment and Landscape, Department PDTA, University of Rome Sapienza, 00196 Roma, Italy; email: d.iamonico@yahoo.it

As part of the revision of the genus *Amaranthus* Linnaeus (1753: 989) for the treatment of Amaranthaceae Jussieu for the Euro+Med PlantBase project (Iamonico, in prep.), and the typification work on the Linnaean names in this family (e.g., Iamonico 2012, 2013, 2014a, 2014b, Iamonico & Jarvis 2012, Iamonico & Del Pino 2014), it has been necessary to establish the identity of *A. gangeticus* Linnaeus (1759: 1268), especially in comparison with the related taxa included in the *A. tricolor* Linnaeus (1753: 989) aggregate (Iamonico 2014a).

Amaranthus gangeticus was placed by Linnaeus in the group “*Triandri*”. On the basis of the Linnaean protologue, *A. gangeticus* is morphologically similar to *A. tricolor*, *A. mangostanus* Linnaeus (1755: 32), *A. melancholicus* Linnaeus (1753: 989), and *A. tristis* Linnaeus (1753: 989). *Amaranthus tricolor* and *A. melancholicus* were distinguished by Linnaeus by their axillary inflorescences, while the other species have the flowers subspicate. Among *A. gangeticus*, *A. mangostanus* and *A. tristis*, the Linnaean diagnostic character is the leaf blade shape: “*fol. ovato-oblongis emarginatis*” (*A. gangeticus*), “*fol. rhombeis*” (*A. mangostanus*), “*fol. ovato-cordatis*” (*A. tristis*). The types of the names *A. mangostanus* and *A. tristis* were designated on the Linnaean specimens (at LINN) nos. 1117.10 and 1117.11 respectively (Iamonico 2014a). As regards *A. gangeticus*, Jarvis (2007: 283) indicates “Original material: Herb. Linn. No. 386.5 (S); Herb. Linn. No. 1117.9 (LINN)”. The specimen No. 1117.9 at LINN refers to *A. polygamus* (see Iamonico 2014a). The sheet No. S09-19096 (IDA microfiche number 386.5) at S-LINN (image available at <http://andor.nrm.se/kryptos/fbo/kryptobase/large/S09-019001/S09-19096.jpg>) includes the Linnaean annotation “*Amaranthus gangeticus*” (just below the plant) plus two other scripts: the first one (pencil annotation on the right) by C. A. M. Lindman (“*gangeticus* L. non est, cujus folia emarginata”) the second one (pen annotation on the bottom-right) by E. Wikström (“*Amaranthus melancholicus* Linn. var. *tricolor*”). Moreover, the Linnaean script “*gangeticus*” was crossed out by a horizontal line, probably by E. Wikström (A. Anderberg, *in verbis*). So, both Lindman and Wikström revised the identification. I agree with them. The exsiccatum at S-LINN lacks the Linnaean diagnostic leaf character of an emarginate apex, while the inflorescence is composed of axillary glomerules not spikes as stated by Linnaeus (“...*glomerulis...subspicatis...*”). The Linnaean specimens, therefore, are in conflict with the protologue and cannot be considered for the typification of the name *A. gangeticus*. Unfortunately, no authentic original material has been traced in any of the other Linnaean and Linnaean-linked herbaria (see also Jarvis 2007: 283), neither have exsiccata been found that could be used for neotypification. The combination of the leaf and inflorescence features (blade ovate-oblong with emarginate apex, and flowers in subspicate structure) does not appear to refer to any of the *Amaranthus* species included in the *A. tricolor* aggregate (sensu Mosyakin & Robertson 1996: 280. 1996). The diagnosis and description by Linnaeus (1759: 1268, 1763: 1403) are ambiguous. Despite this, the name *A. gangeticus* was often treated as a synonym of *A. tricolor* (see e.g., Townsend 1974: 13, Kerguelen 1993, Press *et al.* 2000, Bojian *et al.* 2003, USDA 2013). It is rarely accepted as a separate species (e.g., Larsen *et al.* 2003: 521–527), and the combination proposal by Fiori & Paoletti [1898: 322, as *A. tricolor* var. *gangeticus* (L.) Fiori & Paol.] has not been accepted by most subsequent authors. Finally, some authors have not cited *A. gangeticus* in their treatments of *Amaranthus*, although they recognized taxa of the *A. tricolor* aggregate (e.g., Mosyakin & Robertson 2003: 410–435, DAISIE 2008).

All things considered, the treatment of *Amaranthus gangeticus* appears inconsistent. However, this fact is not ground for rejecting of the name since the Linnaean name does not threaten any other name and thus there are no disadvantageous nomenclatural changes (Art. 56.1 of the ICN, McNeill *et al.* 2012).

The failure to properly designate a lectotype or a neotype, and the impossibility to reject *A. gangeticus* according to the ICN, causes the continued ambiguous nature of this Linnaean name and results in listing it as *incertae sedis*.

Amaranthus gangeticus Linnaeus (1759: 1268), *nomen incertae sedis*

Acknowledgements

Thanks are due to J. Wiersema (Beltsville) for constructive comments, and to A. Anderberg (Swedish Museum of Natural History, Stockholm) for the help in the interpretation of the annotations on the Linnaean specimens at S-LINN.

References

- Bojian, B., Clemants, S.E. & Borsch, T. (2003) *Amaranthus* L. In: Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.), *Flora of China* 5. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis, pp. 415–429.
- DAISIE (2008) *European Invasive Alien Species Gateway. Celosia* L. Available from: <http://www.europe-aliens.org/> (accessed: 20 February 2014).
- Fiori, A. & Paoletti, G. (1898) *Flora Analitica d'Italia* 1. Tipografia del Seminario, Padova, 944 pp.
- Iamónico, D. (2012) Proposal to reject the name *Gomphrena polygonoides* (Amaranthaceae). *Taxon* 61: 1326–1327.
- Iamónico, D. (2013) Lectotypification of the Linnaean name *Bosea yervamora* (Amaranthaceae). *Anales del Jardín Botánico de Madrid* 70(2): in press.
<http://dx.doi.org/10.12705/631.34>.
- Iamónico, D. (2014a) Lectotypification of Linnaean names in the genus *Amaranthus* L. (Amaranthaceae). *Taxon* 63: 146–150.
<http://dx.doi.org/10.12705/631.34>
- Iamónico, D. (2014b) Lectotypification of Linnaean names in the genus *Achyranthes* L. (Amaranthaceae). *Taxon* 63: in press.
DOI: <http://dx.doi.org/10.12705/631.34>.
- Iamónico, D. & Jarvis, C.E. (2012) Lectotypification of Linnaean names in the genus *Celosia* L. (Amaranthaceae). *Taxon* 61: 1101–1102.
- Iamónico, D. & Sánchez Del Pino, I. (2014) Lectotypification of the Linnaean name *Gomphrena vermicularis* L. (Amaranthaceae). *Taxon* 63: in press.
<http://dx.doi.org/10.12705/631.34>.
- Jarvis, C.E. (2007) *Order out of Chaos; Linnaean Plant Names and their Types*. Linnean Society of London and the Natural History Museum, London, 1016 pp.
<http://dx.doi.org/10.3366/e0260954108000442>
- Kerguelen, M. (1993) *Index synonymique de la flore de France*. Available from: <http://www2.dijon.inra.fr/bga/fdf/am.htm> (accessed: 20 February 2014).
- Larsen, T., Thilsted, S.H., Biswas, S.K. & Tetens, I. (2003) The leafy vegetable amaranth (*Amaranthus gangeticus*) is a potent inhibitor of calcium availability and retention in rice-based diets. *British Journal of Nutrition* 90(3): 521–527.
<http://dx.doi.org/10.1079/bjn2003923>
- Linnaeus, C. (1753) *Species Plantarum* 2. Laurentii Salvii, Stockholm, 1200 pp.
- Linnaeus, C. (1755) *Centuria I Plantarum*. Reg. Acad. Typogr., Stockholmiae, 36 pp.
- Linnaeus, C. (1759) *Systema Naturae, ed. 10*. 2. Laurentii Salvii, Stockholm, 559 pp.
- McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, D.L., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J., Proud'Homme van Reine, W.F., Smith, J.F. & Wiersema, J.H. (eds.) (2012). International Code of Nomenclature for algae, fungi and plants (Melbourne Code): Adopted by the Eighteenth International Botanical Congress, Melbourne, Australia, July 2011. Koeltz Scientific Books, Königstein, XXX + 208 pp. [Regnum Vegetabile 154].
- Mosyakin, S.L. & Robertson, K.R. (1996) New infrageneric taxa and combinations in *Amaranthus* (Amaranthaceae). *Annales Botanici Fennici* 33: 275–281.
- Mosyakin, S.L. & Robertson, K.R. (2003) *Amaranthus* L. In: Flora of North America Editorial Committee (eds.), *Flora of North America North Mexico (Magnoliophyta: Caryophyllidae, part 1)*. 4. Oxford University Press, Oxford, pp. 410–435.
[http://dx.doi.org/10.1663/0013-0001\(2007\)61\[312c:fonano\]2.0.co;2](http://dx.doi.org/10.1663/0013-0001(2007)61[312c:fonano]2.0.co;2)
- Press, J.R., Shrestha, K.K. & Sutton, D.A. (2000) *Annotated Checklist of the Flowering Plants of Nepal*. Available from: http://www.efloras.org/flora_page.aspx?flora_id=110 (accessed: 20 February 2014).
- Townsend, C.C. (1974) Amaranthaceae. In: Nasir, E. & Ali, S.I. (eds), *Flora of West Pakistan*. 71. Fakhri Press, Karachi, p. 5.
- USDA (2012) *United States Department of Agriculture. Natural Resources Conservation Service*. Available from: <http://plants.usda.gov/java/nameSearch?keywordquery=manihot&mode=sciname&submit.x=0&submit.y=0> (accessed: 20 February 2014).