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Studies on the genus *Atriplex* (Amaranthaceae) in Italy. V. *Atriplex tornabenei*

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Abstract

The typification of the name *Atriplex tornabenei* (a nomen novum pro *A. arenaria*) is discussed. An illustration by Cupani is designated as the lectotype, while a specimen from FI is designated as the epitype. Chorological and morphological notes in comparison with the related species *A. rosea* and *A. tatarica* are also provided. A nomenclatural change (*Atriplex tornabenei* subsp. *pedunculata* stat. nov.) is proposed.

Key words: *Atriplex tornabenei* var. *pedunculata*, epitype, infraspecific variability, lectotype, Mediterranean, nomenclatural change, nomen novum

Introduction

Atriplex Linnaeus (1753: 1054) is a genus of about 260 species distributed in arid and semiarid regions of Eurasia, America and Australia (Sukhorukov & Danin 2009).

Several names (at species, subspecies, variety and form ranks) were described related to the high phenotipic variability of this critical genus (Al-Turki *et al.* 2000). As conseguence, misapplication of names and nomenclatural disorders exist and need clarification.

In this paper, the identity of the *A. tornabenei* Tineo ex Gussone (1843: 589) is discussed as part of the treatment of the genus *Atriplex* for the new edition of the Italian Flora (editor, Prof. S. Pignatti) and within the initiative "*Italian Loci Classici Census*" (Domina *et al.* 2012) launched in 2010 under the auspices of the Italian Botanic Society (e.g. Iamonico 2010, 2012a, 2012b, 2013, Iamonico *et al.* 2011, Di Pietro *et al.* 2012, Gallo *et al.* 2012, Iamonico & Reveal 2012, Amadei *et al.* 2013).

Materials and Methods

The present study was carried out by an extensive analysis of literature (protologues included), personal field investigations and the examination of the specimens kept in the Herbaria APP, FI, GZU, HFLA, KUFS, LINN, MA, NAP, P, PAL, RO, and W (acronyms according to Thiers 2011). The descriptions are based on personal observations.

Typification of the names

Gussone' protologue (Gussone 1843: 589) consists of a detailed dignosis and description with two synonyms cited from Tineo (1827: 276-277) and Cupani (1696: 27), the first one referred to *A. arenaria* Tineo (1827: 276), a later heterotypic synonym of *A. arenaria* Nuttall (1818: 198) and so, an illegittimate name under the art. 53.1 of the ICN (McNeill *et al.* 2012). Therefore, Gussone (l.c.) proposed a new name pro *A. arenaria*

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Tin., dedicating it to F. Tornabene (1813−1897), author of importan contributors to the Sicilian flora. The habitat and provenance ("*In arenosis maritimis; Palermo a Solanto, da Trapani a Catania per la costa meridionale et in saline a Maretimo*") and a reference to iconographies ["*Atriplex marina, minor, supina, lanceolato folio incano, semine tricuspidato alato. Cup. Panph. 2. t. 111 – Bon. t. 75*" referred to Cupani (1713) and Bonanni (1719), respectively] are also reported. The work by Bonanni (1719) is an incomplete second edition of the Cupani's Panphyton Siculum (A. Managlia, *in verbis*), and the images published are the same. In every case, this illustration can be considered original material for the name *A. tornabenei*.

In the Gussone collection at NAP there is only one sheet (not numbered) collected in "*Ischia, alla marina di Casamicciola, Aug 1860*"). Although the plants beared in this sheet are identifiable as *A. tornabenei* according to the diagnosis by Gussone (1843), the later date of collection does not allow to consider this material as original and the locality ("*Ischia...*") is not cited in the protologue, so the exsiccatum is not useful for typification purposes (art. 9.3 of the ICB).

In the Herbarium Panormitanum (PAL) there is one exsiccatum (not numbered) collected in locality "*Solanto*" bearing a plant that matches the diagnosis by Gussone (1843).

Finally, in the Herbarium Universitatis Florentinae (FI) there is one sheet (Barcode FI002557, image available from parlatore.msn.unifi.it/types/search.php) that bears a plant collected by V. Tineo in "*Catania spiaggia*".

Both the specimens from PAL and FI do not bear the date of collection, so we cannot sure that the plants were collected ante 1843 (year of the original publication). As conseguence these exsiccata cannot be considered original material.

All things stated, the illustration by Cupani (or Bonanni) is the only element available for the lectotypification. Fortunately, it matches the diagnosis and agree with the current application of the name *A. tornabenei* (e.g. Pignatti 1982, Castroviejo 1990, Akeroyd 1993). So, it is designated as the lectotype (Fig. 1). However, according to Jarvis (2007: 21-22), the exsiccata have potential ability to provide large number of additional characters (micromorphological, chemical, molecular, etc.) that cannot be matched by images, so we also prefer to designate an epitype, the specimen at FI that appears better preserved than the exsiccatum at PAL.

Taxonomic relationships

On the basis of the original materials and the protologue, *A. tornabenei* can be included in the sect. *Obionopsis* Lange (1856–1959: 635) (= sect. *Sclerocalymma* Ascherson 1864: 578), the taxa of which are characterized by the presence of hardened fruiting bracts connate at the half of their length (e.g. Aellen 1961, Pastor & Juan 1990; Sukhorukov 2006). However, after Kadereit *et al.* (2010), it is united under C4-group distributed worldwide, and the sectional division should be clarified. Although *A. tornabenei* is currently accepted as a distinct species (see e.g. Uotila 2011), the usage of the name changed over time, showing disagreement among the authors. Just four years later the publication by Gussone (1843), De Candolle (1849: 104-105) included *A. tornabenei* in the list of "*Species non satis notæ*" and provided a short description plus the locality "*in Sicilia*" and doubtfully proposed the varietal rank under *A. laciniata* ("*An A. laciniatæ Linn. varietas?*"). Bertoloni (1854: 414) synonymized *A. tornabenei* with *A. laciniata* Linnaeus (1753: 1053). Caruel (1893) listed only the Chenopodiaceae genera agreeing with Bertoloni (1854). Arcangeli (1882, 1894) accepted it as a distinct species, recording it in "*Sicilia e ad Ischia*" and "*Nell'Italia mer., nelle isole maggiori e ad Ischia*" ("*In southern Italy, in the greatest islands and in Ischia island*"), respectively, so extending its distribution area. Fiori & Paoletti (1986–1898) indicated *A. tornabenei* as variety of *A. laciniatum* ["*A. laciniatum L. β-tornabenei (Tin.)*"] in the same locality cited by Arcangeli (1894). Fiori (1923) agrees with Fiori & Paoletti (1898). Pignatti (1982: 168) indicates *A. tornabenei* in note under *A. rosea* Linnaeus (1763: 1493). Castroviejo (1987, 1990) accepted it as separate species. Akeroyd (1993) included *A. tornabenei* in *A. tatarica* Linnaeus (1753: 1053).

FIGURE 1. Lectotype of the name *Atriplex tornabenei* (*Atriplex marina minor supina lanceolato foliola incano semine tricuspide alata*, T. III from Cupani 1713).

Atriplex tornabenei appears to be related to *A. rosea* (neotype designated by McNeill *et al.* 1983: 553) on a Haller's specimens kept in P) and *A. tatarica* (lectotype designated by Hedge 1997: 75). On the basis of the analysis of the protolugue and the comparison among the types and the herbarium materials, the three taxa can be distinguished by the inflorescence and the fruiting bracts-like cover (Table 1, Fig. 2).

TABLE 1. Morphological diagnostic features in *Atriplex tornabenei*, *A. rosea* and *A. tatarica*.

Atriplex tornabenei	*Atriplex rosea*	*Atriplex tatarica*
Flowers arranged in axillary glomerules and in spike-like inflorescences (at the end of the branches). Lateral spikes leafy, the terminal leafless.	Flowers arranged in axillary glomerules and in spike-like inflorescences (at the end of the branches). All spike leafy.	Flowers arranged spike-like or panicle-like inflorescences usually leafless.
Fruiting bract-like cover slightly longer than wider.	Fruiting bract-like cover wider than longer (somentimes about longer than wider).	Fruiting bract-like cover longer than wider.
Fruiting bract-like cover with smooth dorsal surface or with 1–2 appendixes and cup-shaped base.	Fruiting bract-like cover with tuberculate dorsal surface (appendixes always more than 2) and cuneate base.	Fruiting bract-like cover with smooth or ± tuberculate dorsal surface and usually cuneate base.

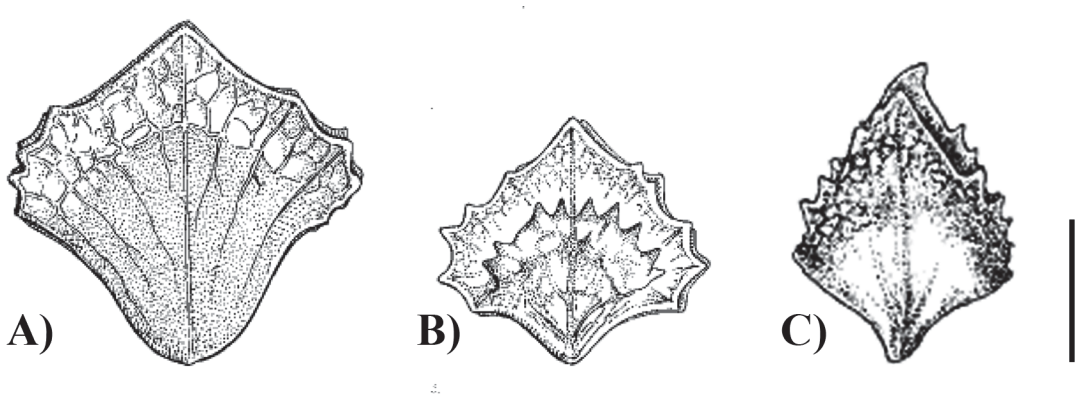

FIGURE 2. Fruiting bracts in *Atriplex tornabenei* (A), *A. rosea* (B) and *A. tartarica* (C) (images of *A. tornabenei* and *A. rosea* from Castroviejo 1990, that of *A. tatarica* from Zhu *et al.* 2003). Scale bar: 3 mm.

Atriplex tornabenei Tineo ex Gussone (1843: 589) *nom. nov. pro Atriplex arenaria* Tineo (1827: 276) *nom. illeg.* non Nuttall (1818: 198).

Type (lectotype here designated):—ITALY. **[Icon]**: *Atriplex marina minor supina lanceolato foliola incano semine tricuspide alata*, T. III in Cupani (1713; Fig. 1 image on the right).

Type (epitype here designated):—ITALY. **Sicily**: Catania, Spiaggia, *sine die, V. Tineo FI002557* (FI!).

≡ *Atriplex laciniata* var. *tornabenei* (Tineo ex Guss.) Fiori & Paol. (1896–1898: 306)

≡ *Atriplex tatarica* Tineo ex Guss. subsp. *tornabenei* (Tineo ex Guss.) C. Blanché, Molero & Rovira (1984: 117)

Description:—Annual herb (therophyte), (1–)3–7(–10) cm tall. Stem erect, branched with diffuse-ascending branches. Lower leaves opposite, upper leaves alternate, usually subsessile, grey to silvery the abaxial surface, with blade rhomboidal, ovate (0.5–1.5 × 0.7–2.5 cm), margins usually irregularly sinuate-lobed; base cuneate, apex acute to obtuse. Floral glomerules arranged in terminal and/or lateral spike-likes (lateral spikes with bract-leaves, the terminal one leafless); flowers monomorphic, unisexual, the males with 5 perianth segments and 5 stames, the females, with 4–5 tepals and 2 stigmas; fruiting bract-like cover rhombic [(4–)6–8 × (5–)7–

9 mm], slightly longer then the wide, connate to the half-way, with entire margins (or with 1–2 obtuse lateral teeth) and dorsal surface smooth or with 1–2 appendages, base rounded cup-shaped; one seed, vertical, black.

Chromosome number:—2*n* = 54 (Pastor & Juan 1990, Pastor *et al.* 1990).

Ecology:—the species grows on coasts on sandy or gravel substrates, at the sea level. It is a member of some psammophilous and halophilous communities and characteristic species of *Cakilo aegyptiacae-Atriplicetum tornabenei* Géhù 1984, a phytosociological association currently know only for Sardegna and Puglia region (Central and Southern Italy). The communities with *Salsola soda* Linnaeus (1753: 223) was described at subassociation level as *Cakilo aegyptiacae-Atriplicetum tornabenei* Géhù 1984 subass. *Salsoletosum sodae* Géhù 1984.

Distribution:—*A. tornabenei* is a western-mediterranean species (Spain, France, Italy, Algeria and Tunisia) with a disjuntion in the east (Turkey) (Uotila 2011). As concerns Italy, it is recorded in Lazio, Sicilia, Sardegna (Conti *et al.* 2005, 2007), recently rediscovered in Puglia (Iamonico & Buono 2013) and historically recorded in Campania (Iamonico & Del Guacchio 2012).

Variability:—The var. *pedunculata* Castroviejo (1987: 475) was described from populations mainly observed in the Balearic islands (holotype available from http://plants.jstor.org/specimen/ma29221). The taxon differs from the nominal variety in having flowers with peduncles up to 11 mm. Our field surveys and examination of herbaria specimens allow to verify that plants collected out of the sites studied by Castroviejo (1987) have always flower sessile or nearly so. The distribution area of the two taxa does not overlap. Hence, we here propose the subspecies level for the var. *pedunculata*.

Atriplex tornabenei Tineo ex Guss. subsp. ***tornabenei***

Atriplex tornabenei Tineo ex Guss. subsp. ***pedunculata*** (Castroviejo 1987: 475) Iamonico, ***stat. nov.***
Bas.: *Atriplex tornabenei* Tineo ex Guss. var. *pedunculata* Castrov. (1987: 475).
Holotype:—SPAIN. Baleares, Arenales marítimos, 06.X.1947*, P. Ferrer s.n.* (MA!).

Selected specimens examined

Atriplex tornabenei **Tineo ex Guss. subsp. *tornabenei*:**—ITALY. **Campania**: Napoli al Fusaro, Bagnoli, October 1826, *sine coll. s.n.* (sub *A. laciniata*) (NAP!); Pozzuoli, August 1844, *sine coll. s.n.* (sub *A. tornabeni*) (NAP!); Ischia, alla marina di Casamicciola, August 1860, *Gussone s.n.* (NAP!); tra il Fusaro e Torre Gaveta, in arenosis maritimis, June 1912, *Guadagno s.n.* (NAP!); Campi Flegrei, Coroglio, September 1919, *N. Terracciano s.n.* (NAP!); **Lazio**: Tarquinia, Pian di Spille, spiagge, 1 m s.l.m., 1 October 2004, *Iocchi et Bartolucci* (FI!, APP!); **Puglia**: Bari, località Fesca a circa 100 m dalla foce del torrente Tiflis, sabbie ciottolose, 2 m s.l.m., 8 September 2011, *Iamonico et Buono s.n.* (HFLA-*Herb. Iamonico*!); **Sicily**: Catania, Spiaggia, *sine die, V. Tineo FI002557* (FI!, lectotype); Palermo, Solanto, *sine die, V. Tineo s.n.* (NAP!).

Atriplex tornabenei **Tineo ex Guss. subsp. *pedunculata* (Castrov.) Iamonico:**—SPAIN. **Baleares**: Arenales marítimos, 6 October 1947*, P. Ferrer s.n.* (MA!)

Atriplex tatarica **L.:**—AFGHANISTAN. **Bamyan**: Drachental, suedwestlich von Bamian, 25 August 1970, *Podlech 15913a* (W!); Syadarrah,3 km E Kalandeh, an der Strasse Behsud, 2900 m s.l.m., 27 July 1970, *Podlech 17011* (W!); **Ghazni**: SO-Ufer der Dash-e-Nawa, 13 August 1970, *Podlech 19249* (KUFS!); **Kabul**: Kabul, 13 km E, road side near Charkhi, 19 September 1967, *Freitag 1977* (W!); **Samangan**: Westhang des Kotal-e-Mirza Atbili, ca. 30 km ostlich von Aybak under road near to Pul-e-Khumri 10 August 1969, *Podlech 17011* (KUFS!); AUSTRIA. **Wien III**: simmeringer Hauptstraβe/Dampfmühlgasse, 4 October 1991, leg.et det. *Walter s.n.* (W!); ITALY. **Friuli-Venezia Giulia**: Trieste, salinendamme bei Zaule, 31 July 1886, leg. et det. *Engelhardt* (sub *A.laciniatum*), rev. *Walter 1573e* (GZU!); IRAN. **Zentral-Erbus**: ungebumg von Keredj, Odland am Keredj-Fluss, ca. 1330 m, 18 September 1948, *Aellen et Aellen s.n.* (W!); UNKNOWN ORIGIN: *Linnaeus 1221.10* (LINN!).

***Atriplex rosea* L.:**—CYPRUS. **Limassol**: zypern archäologischen Gelände des Heiligtumsder Aphrodite, 22 June 1996, *Walter 7920* (W!); ITALY. **Lazio**: Cerenova (Lido di Cerveteri), spiaggia, paludi, ruderi, ecc., 23 October 1977, *Anzalone* (RO!); Ladispoli-Cerenova, loc. Campo di Mare, September 1985, *Anzalone* (RO!); SPAIN. **Madrid**: Colemar de Oreja prés de Madrid, 19 September 1980, *Sag 1007* (P!).

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