Resolving some nomenclatural issues on *Isoeto-Nanojuncetea* and four new communities of the Iberian Peninsula

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**Abstract.** We describe four new vegetation units and propose 17 new typifications and 24 altered names of syntaxa belonging to *Isoeto-Nanojuncetea*. Information is also provided on the publication dates of the alliances *Isoetion* and *Presliion*.

**Keywords:** Azores; ICPN; Isoetetalia; Mediterranean; nomenclature; phytosociology; syntaxonomy; temporary ponds.

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**Introduction and Methods**

We have been working on *Isoeto-Nanojuncetea* Br.-Bl. & Tüxen in Br.-Bl. et al. 1952, mainly in the Iberian Peninsula and northern Morocco, over the past 20 years (Molina & Casado, 1997; Espírito-Santo & Arsénio, 2005; Molina, 2005; Molina et al., 2009; Pinto-Cruz et al., 2009; Silva et al., 2009a, 2009b). Some new communities were described and others confirmed for the Iberian territory (Silva et al., 2008, 2009c; Costa et al., 2012). Plant communities of temporary ponds compose a highly specialized vegetation with an extremely patchy distribution that poses challenges for classification (e.g. Silva, 2009). Nevertheless, syntaxa belonging to this class have been described from the beginnings of phytosociology almost a century ago, often using obsolete name-giving taxa that make more complicate the nomenclatural interpretations of the units (e.g. Braun-Blanquet, 1922, 1936a).

Here we describe three new associations and one new subassociation, designate 17 type relevés and propose the correction, completion or mutation of 24 names following the rules of the 4th edition of the International Code of Phytosociological Nomenclature (ICPN; Theurillat et al., 2020). The nomenclature of vascular plants follows *Flora iberica* (Castroviejo, 1986–2019), and for families not yet published in this flora we followed Euro+Med (2006–), except for *Isoetes delilei*, which agrees with Greuter & Troia (2015), and *Isoetes longissima* with Troia & Greuter (2014).

Syntaxonomic nomenclature follows Rivas-Martínez et al. (2001, 2002), Costa et al. (2012), Brullo & Minissale (1998), and Mucina et al. (2016) for high-rank syntaxa. Biogeographical units are according to Rivas-Martínez et al. (2017). Coordinates of the type relevés are indicated in the Universal Transverse Mercator coordinate system (UTM) using WGS84 Datum, and were mostly retrieved from http://www.anthos.es/.

**Results and Discussion**

**Publication dates of the alliances *Isoetion* and *Presliion cervinae***

The name *Isoetion* was invalidly published by Braun-Blanquet (1931: 39) because a sufficient original diagnosis was not provided (ICPN, Art. 2b). Thereafter, the author provided a sufficient diagnosis validating the alliance name in the paper *Un joyau floristique et phytosociologique “L’Isoetion” méditerranéen*, that was published in the *Bulletin de la Société d’Étude des Sciences Naturelles de Nîmes* (Braun-Blanquet, 1936a) and also in a Communication of the SIGMA (Braun-Blanquet, 1936b). Text and page makeup are identical in both publications, except for the page numbering. The Communication is dated on the cover page in January 1936 and contains a reference to the Bulletin on the last page: “Extrait du Bulletin de la Société d’Étude des Sciences Naturelles de Nîmes, t. XLVII, 1930-35”. An
additional evidence that the *Communication* should be considered as a reprint of the *Bulletin* is that in both publications a reference to the ‘*Communication n° 40*’ is indicated in the first page under the title, but the *Communication* published is the number 42 of the series, suggesting that it was postponed until the *Bulletin* was published. The precise date of publication of volume 47 of the *Bulletin* is unknown, but on page 252 there is a reference to a meeting of the *Société* held on November 29, 1935. Hence, it is highly unlikely that the volume could have been published before 1936 (D. Kania, pers. comm.). The author citation should therefore be *Isoleotia* Braun-Blanquet 1936, as indicated by Theurillat et al. (2020).

The name *Preslietum cervinae* was also invalidly published by Braun-Blanquet (1931: 29) according to Art. 2b. An examination of M. Moor’s publications on the order *Isoleotia* (Braun-Blanquet & Moor, 1935; Moor, 1935, 1936, 1937) showed that the *Preslietum cervinae* alliance was not validated until Moor (1937: 22–23) provided a sufficient original diagnosis (Art. 2b). The fact that Moor (1937) indicated *Preslietum cervinae* Br.-Bl. 1931 n. n. *[nomen nudum]* in the proposal of the name does not invalidate the diagnosis. This has been clarified in the new edition of the ICPN, Art. 3b §2: ‘Names that are indicated as “manuscript” (“Mskr.”, “mscr.”) or “ined.” or “unpublished” are validly published if all the requested conditions for a valid publication are provided.’ The author citation should therefore be *Preslietum cervinae* Br.-Bl. ex Moor 1937 (Rec. 10C and 46D). Nevertheless, as the genus *Preslia* Opiz is included in *Mentha* L. in most of the recent floras (e.g. Castroviejo, 1986–2019; Euro+Med, 2006–), the name can be mutated according to Art. 45 (see below).

**New descriptions of vegetation units**

*Cypero badii-Menthetum cervinae* Rivas Goday in *Rivas Goday et al.* 1956 *mut.* V. Silva et al. *nom. mut.* *nov. ranunculetosum longipedis* V. Silva, J.A. Molina, J.C. Costa & Espírito-Santo in V. Silva et al. *subass.* *nova*

*Holotypus*: Silva et al., 2009b: 76–77, Table 1, rel. 11: Escarigo, Figueira de Castelo Rodrigo, 29TPF8323, Portugal.

*Syn.:* *As. Preslia cervina et Eleocharalis palustris agrostietosum salmanticae* Rivas Goday *in Rivas Goday et al.* 1956 *nom. inval.* (Art. 4a); *Agrostio salmanticae-Preslietum cervinae* Rivas Goday *in Rivas Goday et al.* 1956 *nom. inval.* (Art. 3a) (corresp. name).

*Meso-supramediterranean early-summer annual vegetation of temporary ponds from the Mediterranean Central Iberian province. Character species are *Lythrum baeticum*, *L. flexuosum* and *Isolepis cernua*. The *Isolepido-Lythretum castellani* was invalidly published by Rivas Goday (1970: 257–260) because the name-giving taxon *Lythrum castellanum* Gonz.-Albo is an invalid name (Art. 3f). Alcaraz et al. (1991: 119) subsequently proposed the name *Isolepido-Lythretum castiliane* for Rivas Goday’s association, giving a reference to the original diagnosis and correcting *L. castellanum* to *L. castiliane* Greuter & Burdet. However, this name is also invalid because the authors do not indicate the name-giving species of *Isolepis*, a genus with two character species (*I. cernua* and *I. supina*) in the original diagnosis (Art. 3g). Here we validate the association name with the same type designated by Rivas Goday (1970) using as name-giving taxa *Isolepis cernua* and *Lythrum baeticum*, the latter being the correct name for *L. castellanum* and *L. castiliane* according to Euro+Med (2006–) and *Flora iberica* (Castroviejo, 1986–2019).

This association was designated the ‘syntypus’ of the alliance *Lythron trivbracteatum* by Rivas Goday (1970: 257). Despite the association was invalid at the time, the alliance is however valid because typification is not mandatory before 1979 (Art. 17) and the original diagnosis includes other valid association (*Gnaphalio luteolabi-Plantaginetum intermediae* Rivas Goday & Ladero in *Rivas Goday* 1970) that contains *Lythrum trivbracteatum* (Art. 3f) and hence becomes the holotype of the alliance (Art. 18).
Thermo-meso-supramediterranean ephemeral vegetation from the Mediterranean West Iberian province dominated by *Elatine macropoda*, belonging to the alliance *Isoetion* Br.-Bl. 1936. *Juncus pygmaeus*, *Lythrum borysthenicum* and *L. hyssopifolia* are also frequent (Table 1). It extends along the margins of streams and temporary ponds on muddy or sandy substrates with shallow water in early spring. *Junco pygmaei-Elatinetum macropodae* can also occur as a monospecific community of *Elatine macropoda*, as indicated in Silva et al. (2009b). A close association is *Elatinetum macropodae* Br.-Bl. 1936, which has a Valencian-Provencal-Balearic distribution and can be distinguished by the character species *Damasonium polyspermum*, *Pulicaria vulgaris* and *Lythrum tribracteatum* (Braun-Blanquet, 1936a).

| Table 1. *Junco pygmaei-Elatinetum macropodae* V. Silva, Ribeiro, Pinto-Cruz & J.A. Molina in Vasco et al. ass. nova (*Isoetion, Isoetetalia, Isoeto-Nanojuncetea*) |
|-------------------------------------------------|---------------|---------------|---------------|---------------|
| Altitude (m asl)                                | 345           | 175           | 175           | 345           |
| Area (m²)                                       | 5             | 0.5           | 0.5           | 0.25          |
| Species N.                                      | 4             | 9             | 8             | 4             |
| Relevé N.                                       | 1             | 2             | 3             | 4             |
| Characteristics                                |               |               |               |               |
| *Elatine macropoda*                             | 2             | 2             | 4             | 4             |
| *Juncus pygmaeus*                               | .             | 3             | 1             | +             |
| *Lythrum borysthenicum*                         | .             | 1             | 2             | .             |
| *Lythrum hyssopifolia*                          | .             | 1             | 1             | .             |
| *Marsilea batardae*                             | .             | 3             | .             | .             |
| *Eryngium corniculatum*                         | 3             | .             | .             | .             |
| *Isoetes longissima*                            | .             | .             | 2             | .             |
| *Juncus hybrida*                                | .             | .             | 1             | .             |
| *Lythrum portula*                               | .             | .             | .             | 1             |
| *Mentha pulegium*                               | .             | +             | .             | .             |
| Other species                                   |               |               |               |               |
| *Polypogon maritimus*                           | .             | +             | .             | +             |
| *Glyceria declinata*                            | .             | +             | 1             | .             |
| *Eleocharis palustris*                          | +             | +             | .             | .             |
| *Ranunculus saniculifolius*                     | 1             | .             | .             | .             |
| *Callitriche stagnalis*                         | +             | +             | .             | .             |
| *Baldellia repens* subsp. *cavanillesii*        | .             | +             | .             | .             |

Localities: 1, 4: Cáceres, Casar de Cáceres, arroyo La Hurona, 29SQD28, Spain; 2, 3: Baixo Alentejo, Castro Verde, São Marcos da Ataboeira, ribeira de Cobres, 29SNB97, Portugal.

Thermomediterranean small summer terophytic vegetation from the Gaditan-Sadense territory dominated by *Cyperus michelianus*, *C. fuscus* and Ludwigo palustris belonging to the alliance *Nanocyperion flavescentis* Koch 1926. It is a southern and thermophilous vairiant of the *Cypero-Helechochloetum alopecuroidis* and it was provisionally described from Doñana National Park by Rivas-Martínez et al. (1980). Despite this, Brullo & Minissale (1998) accepted the name and positioned it in the alliance *Verbenion supinae*.

New typifications and altered names in the order *Isoetalia* Br.-Bl. 1936

**Chamaemelo nobilis-Menthetum pulegii** Lüpnitz 1976

**Cypero badii-Menthetum cervinae** Rivas Goday in Rivas Goday et al. 1956

The syntaxon name must be completed (Rec. 10C) and mutated (Art. 45) with the updated name-giving taxon, namely *Anthemis nobilis* (Lüpnitz, 1976: 216–217), a synonym of *Chamaemelum nobile* (Euro+Med, 2006–2019; Castroviejo, 1986–2019).
Original name: ‘Cypero badii-Preslietum cervinae Rivas Goday’ (Rivas Goday et al., 1956: 379).

*Hyperico-Cicendietum filiformis* Rivas Goday 1970 nom. corr.

Syn.: ‘Cicendietum filiformis’ (Allorge 1922) salmantico y onubense’ Rivas Goday 1964 nom. inval. (Art. 3d); *Hyperico-Cicendietum filiformis* Rivas Goday 1970 nom. inept. (Art. 43).

The association ‘*Hyperico-Cicendietum filiformis*’ was validly proposed by Rivas Goday (1970: 239), but the name-giving taxon indicated was *Hypericum humifusum subsp. australis* (Ten.) Rouy & Fouc., which is an illegitimate synonym of *H. australis* Ten. Although *H. humifusum* was the only species indicated in the original relevés of Rivas Goday (1964: 222), we can conclude that Rivas Goday (1970) subsequently assumed that the taxon they contained corresponded to *H. humifusum* subsp. *australe* (Rivas Goday, 1970: 226, 231, 239). According to *Flora iberica* (Castroviejo, 1986-2019) this taxon is not present in the area from which the association was described, and the name completed according to the original diagnosis and Art. 10a Note 2 (*Hyperico australis-Cicendietum*) is therefore an inadequate name that cannot be used (Art. 43, nom. ineptum). Although the name ‘*Hyperico humifusi-Cicendietum filiformis*’ has been used in several publications (Rivas-Martinez et al., 2001; Costa et al., 2012; De Foucault, 2013a; Gigante et al., 2013), Rivas Goday’s name has still not been formally corrected. The correction of this name according to Art. 43 would also create an illegitimate later homonym (Art. 31) of the name *Hyperico humifusi-Cicendietum filiformis* Brullo & Minissale 1998 (Brullo & Minissale, 1998: 282). This latter name, based on relevés from the province of Zamora (Navarro & Valle, 1984), is a taxonomic synonym and in fact the name that must be used for the association.

*Juncetum perpusilli* Rivas-Martinez 1964 mut. V. Silva et al. nom. mut. nov.

Original name: *Juncetum nani* ['nanae'] (Rivas-Martinez, 1964: 72).

*Lectotypus hoc loco*: Rivas-Martinez, 1964: 72–80, Table 8, rel. 10: El Gargantón, Gredos, 2200 m asl, 30TTK66, Spain.

This Carpetan-Leonese and Oroiberian syntaxon was originally assigned to *Cicendion* (Rivas Martinez, 1964, 1981), a position also accepted by Jansen & Sequera (1999) for Serra da Estrela. It was subsequently subordinated to the alliance *Menthion cervinae* (Rivas-Martinez et al., 2001; Costa et al., 2012), which is typical of sites with a higher flooding level. According to the original diagnosis and its Iberian-Atlantic character, it seems more appropriate to reassign it to *Cicendion*.

The name-giving taxon *Juncus tenageia* F. nanus Cout. (Coutinho, 1913: 118) is a synonym of *J. tenageia* subsp. *perpusillus* Fern.-Carv. & Navarro, a name accepted in Euro+Med (2006–) and in Fernández-Carvajal (1982: 129). Thereby we consider muting the association name (Art. 45). The mutation was already proposed by Rivas-Martinez et al. (2002: 440).

*Junco pygmaei-Isoetetum longissimae* Rivas Goday in Rivas Goday et al. 1956 nom. corr.

*Lectotypus hoc loco*: Rivas Goday et al., 1956: 380–381, Table III, rel. 4: Santillana dam, Manzanares el Real, Madrid, 900 m asl, 30TVL20, Spain.

Syn.: *Junco pygmaei-Isoetetum velatae* Rivas Goday in Rivas Goday et al. 1956 nom. inept. (Art. 44).

The correct name-giving taxon for this association is *Isoetes longissima* Bory as *Isoetes velata* A. Braun is an illegitimate name according to Troia & Greuter (2014). Although only *Isoetes velata* subsp. *tenussima* was indicated in the original table (Rivas Goday et al., 1956: Tab. 3), the two entities *I. velata* and *I. velata* subsp. *tenussima* are mentioned in the text as being present in the relevés (Rivas Goday et al., 1956: 381). The new ICPN (Art. 10a Note 2) clarifies these cases, ruling that if the author chose the specific epithet (and not the infraspecific epithet) as the name-giving taxon, this decision must be followed. Hence the name ‘*Isoeto tenussimae-Juncetum pygmaei*’ indicated by Brullo & Minissale (1998: 276) is invalid (Art. 3q).

*Loto hispidi-Chaetopogonetum fasciculati* Rivas-Martinez & Costa in Rivas-Martinez, Costa, Castroviejo & E. Valdés 1980 nom. corr.

Syn.: *Loto subbiflori-Chaetopogonetum fasciculati* Rivas-Martinez & Costa in Rivas-Martinez, Costa, Castroviejo & E. Valdés 1980 nom. inept. (Art.44).

The correct name-giving taxon is not *Lotus subbiflorus* but *Lotus hispidus* (Castroviejo, 1986–1999; Euro+Med,
2006–). Rivas-Martínez et al. (2002: 268) had proposed this correction as nom. mut. propos.

**Lythro borysthenici-Agrostietum pourretii** Rivas Goday in Rivas Goday et al. 1956 nom. corr. et mut. V. Silva et al. nom. mut. nov.  
Original name: **Peplido-Agrostietum salthmanticae** Rivas Goday (Rivas Goday et al., 1956: 388).  
*Lectotypus hoc loco*: Rivas Goday et al., 1956: 388–389, Table 21, rel. 2: La Serena, Castuera, Badajoz, 29STH89, Spain.  
*Syn.: Peplido-Agrostietum salthmanticae* Rivas Goday in Rivas Goday et al. 1956 nom. inept. (Art. 44).

*Agrostis pourretii* Willd. is the correct name in the genus *Agrostis* for *Agrostis salthmanticana* (Lag.) Kunth, and the association name must be corrected according to Art. 44. The other name-giving taxon is *Peplis erecta*, a later synonym of *Peplis borysthenica* Schrank which is modernly included in the genus *Lythrum*: *Lythrum borysthenicum* (Schrank) Litv. (Castroviejo, 1986–2019; Euro+Med, 2006–). According to Rec. 10C and Arts. 44 and 45, the association name should be completed, corrected and mutated.

*Peplido borysthenicae-Agrostietum pourretii* is the lectotype of the alliance *Agrostion pourretii* Rivas Goday 1958 nom. corr. (Rivas-Martínez & Belmonte, 1986). We consider this association a taxonomic synonym of the *Palicario paludosae-Agrostietum salthmanticae* Rivas Goday in Rivas Goday et al. 1956 (Molina & Casado, 1997).

**Lythro borysthenici-Isotetum delilei** Br.-Bl. 1936 nom. invers. et corr. et mut. V. Silva et al. nom. mut. nov. Original name: ‘Association à Isoetes setacea et Peplis hispídula (*Isotetum setacei*)’ (Braun-Blanquet, 1936a: 157–159).  
*Lectotypus*: Braun-Blanquet, 1936a: 158–159, rel. 2 [designated by De Foucault, 2013a].  
*Syn.: Isoeto setaceae-Peplidetum hispidulae* Br.-Bl. 1936 nom. inept. (Art. 44).

This association was published by Braun-Blanquet (1936a) from the ‘mares temporaires de Roque-Haute’ in the Occitanian-Provencal biogeographic sector. However, the name-giving taxon *Isoetes setacea* Bosc ex Delile is a later homonym for which the correct name is *I. delilei* Rothm. (Greuter & Troia, 2015), and Theurillat *et al.* (2020) have corrected the association name (Art. 44). As *Peplis hispídula* is a later synonym of *Lythrum borysthenicum* (Castroviejo, 1986–2019; Euro+Med, 2006–) and according to Art. 45, a mutation is performed here. In addition, as *Isoetes delilei* is clearly more abundant than *Lythrum borysthenicum* in the original relevés, the name must be inverted (Art. 10b, 42).

**Menthethum cervinae** Br.-Bl. ex Moor 1937 mut. V. Silva et al. nom. mut. nov.  
Original name: *Preslietum cervinae* Br.-Bl. ex Moor 1937 (Moor, 1937: 23–24).

**Neotypus hoc loco**: Molinier & Tallon, 1948: 351, rel. 2: Redessan, Gard, 31TFJ25, France (4 *Preslia cervina*, 2 *Eleocharis palustris*, 2 *Polygopon maritimus*, 1 *Coronopus procumbens*, 1 *Ranunculus sardous*, + *Inula britannica*, + *Alisma ramunculoides*, 2 *Eurychium circinatum*).

*Preslietum cervinae* is an invalid name published by Braun-Blanquet (1931, 1936a) as nomen nudum (Art. 2b) and finally validated by Moor (1937: 23–24), which provided a sufficient original diagnosis including a synoptic table. For the neotypification of the association (Art. 21) we chose a relevé from the Costières nimoises (Molinier & Tallon, 1948), an area included in the same biogeographical unit (Occitanian-Provencal) as the relevés in the synoptic table of the original diagnosis from Languedoc (Rec. 21A). The relevé of the *Preslietum cervinae* published by Ocaña García (1959: 37) from Haute Languedoc (La Gardiole) would also serve as the neotype; however, this area belongs biogeographically to the Cevennes-Pyrenean province in the Eurosiberian region.

**Menthion cervinae** Br.-Bl. ex Moor 1937 mut. V. Silva et al. nom. mut. nov.  
Original name: *Preslietum cervinae* Br.-Bl. ex Moor 1937 (Moor, 1937: 22–23).

The mutation of this name according to Art. 45 is appropriate because in most of the recent floras (e.g. Castroviejo, 1986–2019; Euro+Med, 2006–) the genus *Preslia* is included in *Mentha*, and *Preslia cervina* becomes a nomenclatural synonym of *Mentha cervina*. Rivas-Martínez *et al.* (2002: 268) had proposed this name change as nom. mut. propos.

**Mentho cervinae-Eryngietum corniculati** Rivas Goday 1957 nom. invers. et mut. V. Silva et al. nom. mut. nov.  
Original name: ‘As. nova *Eryngium corniculatum et Preslia cervina* Rivas Goday (*Eryngio corniculate-Preslietum*)’ (Rivas Goday, 1957: 510).  
*Lectotypus hoc loco*: Rivas Goday, 1957: 510, Table 3, rel. 15: Villarín de Campos, Zamora, 30TTM82, Spain.

Since *Mentha cervina* is the accepted name in the recent floras (Castroviejo, 1986–2019; Euro+Med, 2006–), the name of the association is mutated (Art. 45). Likewise, the name must be inverted because *Eryngium corniculatum* is the most abundant of the name-giving taxa in the original relevés (Art. 10b, 42).

Rivas Goday (1970: 249) had already proposed the inversion of the original name.

**Molineriello laevis-Illecebrum verticillati** Rivas Goday 1954 mut. V. Silva et al. nom. mut. nov.  
Original name: ‘Ass. nova, *Illecebrum verticillatum* L. et *Periballia laevis* (Brot.) Asch. Gr. S. Rivas Goday (=*Periballieto-Illecebrum verticilliati S. Rivas Goday*)’ (Rivas Goday, 1954: 460–461).  
*Lectotypus hoc loco*: Rivas Goday, 1954: 460–461, Table 1, rel. 1: Portezuelo, Cáceres, 500 m asl, 29SQE11, Spain.
The name-giving taxon is *Periballia laevis*, which is a homotypic synonym of *Molineriella laevis*, the currently accepted name (Tutin et al., 1980; Euro+Med, 2006–). This mutation was already proposed by Jansen & Sequeira (1999).

Myosuro-Bulliardetum vaillantii Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 corr. et mut. V. Silva et al. nom. corr. et mut. nov.

Original name: ‘Myosuro-Bulliardetum vaillantii Br.-Bl.’ (Braun-Blanquet et al., 1952: 85).

Lectotypus hoc loco: Braun-Blanquet, 1936a: 156, rel. 2: Roque-Haute to Agde, Hérault, 31TEH39, France.

Syn.: Myosuro-Bulliardetum vaillantii Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. inept. (Art. 43).

This syntaxon was published as provisional by Braun-Blanquet (1936a: 155) and by Moor (1937: 18). Later on, Braun-Blanquet et al. (1952: 85) validly published the association and provided a synoptic table with four relevés that constitutes a sufficient original diagnosis (Art. 21). The other name-giving taxon in the valid proposal (Braun-Blanquet et al., 1952) was Myosurus heldreichii H. Lév. (=M. breviscapus Huth), which is also a synonym of *M. sessilis* S. Watson, according to Flora iberica (Castroviejo, 1986–2019) and Euro+Med (2006–). However, the presence of this taxon in France is doubtful (Euro+Med, 2006–), and according to eFlore (Tela Botanica, 2020), Myosurus minimus L. is the only species that occurs in Hérault, the original locality of the association (Braun-Blanquet, 1936a). Therefore, the name must be corrected (Art. 43). The other name-giving taxon is Bullarda vaillantii, which currently is included in the genus Crassula as Crassula vaillantii (Castroviejo, 1986–2019; Euro+Med, 2006–). According to Art. 44 and 45, the association name should be corrected and mutated.

De Foucault (2013b: 90) designated a lectotype for the name ‘Myosuro-Bulliardetum vaillantii Br.-Bl. 1936’, but this lectotypification is superfluous because the name is invalid (Art. 19c). The original diagnosis (Braun-Blanquet et al., 1952) includes a reference to Braun-Blanquet (1936a) and provides a synoptic table that exactly matches the four relevés published by Braun-Blanquet in 1936. The relevé we selected as type corresponds to the four relevés published by Braun-Blanquet (1936a) and provides a synoptic table indicating that the taxon present in the association corresponds to *Juncus hybridus* Brot., but do not corrected the association name. Indeed, the name-giving taxon *Juncus tingitanus* Maire & Weiller is absent from the area (Cádiz province) where the association was described (Castroviejo, 1986–2019; Romero Zarco, 2010). Silva et al. (2008) formerly proposed the correction of this name to Laurentio michelii-Juncetum hybridi (Art. 43).

Solenopsio laurentiae-Juncetum hybridi Rivas Goday & Borja in Rivas Goday 1968 corr. V. Silva & Galán de Mera in V. Silva et al. 2008 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Laurentio-Juncetum tingitani Rivas Goday & Borja’ (Rivas-Goday, 1968: 1022).

Neotypus: Pérez Latorre et al., 1999: 158–159, Table 9, rel. 2 [designated by Pérez Latorre et al., l.c.].

Syn.: Laurentio-Juncetum tingitani Rivas Goday & Borja in Rivas Goday 1968 nom. inept. (Art. 43).

This association was firstly published in Rivas Goday (1968: 1022–1023) with a sufficient original diagnosis including a synoptic table. Thereafter, Pérez Latorre et al. (1999) designated the neotype indicating that the taxon present in the association corresponds to *Juncus hybridus* Brot., but do not corrected the association name. Indeed, the name-giving taxon *Juncus tingitanus* Maire & Weiller is absent from the area (Cádiz province) where the association was described (Castroviejo, 1986–2019; Romero Zarco, 2010). Silva et al. (2008) formerly proposed the correction of this name to Laurentio michelii-Juncetum hybridi (Art. 43).

Solenopsio laurentiae-Phymatocerotetum bulbiculosi Br.-Bl. 1936 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Laurentieto-Anthocerotetum’ (Braun-Blanquet, 1936a: 149–151).

Lectotypus: Braun-Blanquet, 1936: 150, rel. 1 [designated by Silva et al., 2008].

This association was published from near Tanger (Morocco) by Braun-Blanquet using as name-giving taxa *Laurentia michelii* and *Anthoceros dichotomus* (Braun-Blanquet, 1936a: 149–151). Thereafter, Silva et al. (2008) designated the lectotype and formerly proposed the mutation of the association name with a reference to Braun-Blanquet (1936b).

*Anthoceros dichotomus* Raddi is the entity that occurs in the same geographical area as the relevés (Maire & Werner, 1934: 45), which, in turn, is a synonym of *Anthoceros bulbiculosus* Brot. That has been moved to the genus *Phymatoceros* as *P. bulbiculosus* (Brot.) Stotler, W.T. Doyle & Crand.-Stotl, and this is the accepted name in recent authoritative taxonomic treatments (Ros et al., 2007; Casas et al., 2009; Hodgetts et al., 2020). *Laurentia michelii* is currently included in the genus *Solenopsis* as *S. lauritina* (L.) C. Presl (Castroviejo,
New typifications and altered names in the order

**Nanocyperetalia Klíka 1935**

*Crypsis schoenoidis-Fimbristyletum bisumbellatae*

Br.-Bl. & Rivas Goday in Rivas Goday et al. 1956 nom. corr. et mut. V. Silva et al. nom. mut. nov.

Original name: ‘As. Helecholeta-Fimbristyletum
Br. Bl. et Rivas Goday, nova (as. Helecholea
schoenoides et Fimbristylis dichotoma)’ (Rivas Goday et al., 1956: 366).

*Lectotypus hoc loco*: Rivas Goday in Rivas Goday et al. 1956: 367, Table 11, rel. 2, Rivilla river, Badajoz, 29SPD70, Spain.

**Syn.:** Helecholechoschoenoidis-Fimbristyletum dichotomae
Br.-Bl. & Rivas Goday in Rivas Goday et al. 1956 nom. inept. (Art. 44); Fimbristyloto-dichotomae-Helecholetum alopecuroidis Br.-Bl. 1967 (syntax. syn.).

The first name-giving taxon of this association is

*Helecholea schoenoides*, currently a synonym of

*Crypsis schoenoides* (Tutin et al., 1980; Euro+Med, 2006–), and the name needs to be mutated (Art. 45). Rivas-Martinez et al. (2002: 256) already proposed the mutation. The second name-giving taxon,

*Fimbristylis dichotoma* (L.) Vahl, was historically interpreted as present in the southern Iberian Peninsula (e.g. Willkomm & Lange, 1861), but the only species recorded in this area is in fact *F. bisumbellata* (Forssk.) Bubani (Castroviejo, 1986–2019). Brullo & Minissale (1998) formerly proposed the correction of this association name, but under the new edition of the ICPN this is a case of misapplication of a name-giving taxon (Art. 44) rather than a misidentification (Art. 43).

*Cy pero michelian i-Crypsietum alopecuroidis*

Rivas Goday & E. Valdés in Rivas Goday 1970 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Cy pero-Helecholetum alopecuroidis
Rivas Goday & E. Valdés’ (Rivas Goday, 1970: 267).

Since *Helecholea alopecuroides* is currently included in the genus *Crypsis* as *Crypsis alopecuroides* (Tutin et al., 1980; Euro+Med, 2006–), the name of the association may be mutated (Art. 45). Rivas-Martinez et al. (2002: 256) already proposed the mutation. Although several *Cyperus* species are indicated in the original diagnosis, only *C. michelianus* (the more frequent and abundant) is considered as character species of the association by the authors.

*Digitario debilis-Fimbristyletum bisumbellatae*

Rivas Goday in Rivas Goday et al. 1956 nom. corr. et mut. V. Silva et al. nom. mut. nov.

Original name: ‘As. Panicum debile et Fimbristylis dichotoma
Rivas Goday, nova, (Paniceto debile-Fimbristylotum
dichotomae)’ (Rivas Goday et al., 1956: 368).

Lectotypus hoc loco: Rivas Goday in Rivas Goday et al., 1956: 369, Table 12, rel. 1, Zújar river, Entrerrios, Villanueva de la Serena, Badajoz, 30STJ61, Spain.

**Syn.:** Panico debilis-Fimbristyletum dichotomae Rivas Goday in Rivas Goday et al. 1956 nom. inept. (Art. 44).

The original name-giving taxon is *Fimbristylis dichotoma*, a misapplied name for *F. bisumbellata* in southern Spain (Castroviejo, 1986–2019). Brullo & Minissale (1998) formerly proposed the correction of this association name, which corresponds to Art. 44.

The first name-giving taxon *Panicum debile* is currently treated as a synonym of *Digitaria debilis* (Tutin et al., 1980; Euro+Med, 2006–), and the name needs to be mutated (Art. 45).

*Gnaphalio uliginosi-Isolepidetum pseudosetaceae*

Rivas Goday 1970

Original name: ‘Gnaphalio-Isolepidetum pseudosetacei’

(Rivas Goday, 1970: 242).

*Lectotypus hoc loco*: Rivas Goday, 1970: 244, Table 2, rel. 6, Guadarrama river, Batres, Madrid, 30TVK15, Spain.

Though Rivas Goday (1970: 242) did not indicate which of the two *Gnaphalium* species (*G. uliginosum* and *G. luteoalbum [=Pseudognaphalium luteoalbum]*) present in the original relevés and considered as character species is the name-giving taxon, *G. uliginosum* is clearly the most frequent and abundant in the table. Thereby we propose the completion of the name according to Rec. 10C and Art. 40b.

*Gnaphalio uliginosi-Lythretum portulae*

O. Bolós 1979

mut. V. Silva et al. nom. mut. nov.

Original name: ‘Gnaphalio (uliginosi)-Peplidetum
tonulae’ (Bolós, 1979: 202).

The name-giving taxon *Peplis portula* is a synonym of *Lythrum portula* (Castroviejo, 1986–2019; Euro+Med, 2006–). Therefore, we formulate the mutation of the name (Art. 45).

*Gnaphalio uliginosi-Veroniceetum peregrinae*

Molero Brion. & Romo 1988 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Filaginello uliginosae-Veroniceetum
peregrinae’ (Molero & Romo, 1988: 282).

*Gnaphalium uliginosum* is the type of the genus *Gnaphalium*, thereby *Filaginella uliginosa* is a later synonym (Euro+Med, 2006–; Castroviejo, 1986–2019). For this reason we propose this mutation (Art. 45).

*Heliotropio supini-Crypsietum schoenoidis*

Rivas Goday in Rivas Goday et al. 1956 mut. V. Silva et al. nom. mut. nov.

Original name: ‘As. Heliotropium supinum et Helecholea
schoenoides nova, Rivas Goday (Heliotropieto supini-
Heleochloetum schoenoidis)’ (Rivas Goday et al., 1956: 371).

Lectotypus hoc loco: Rivas Goday et al., 1956: 372, Table 14, rel. 6: Laguna de Ontígola, Aranjuez, Madrid, 30TVK43, Spain.

Since the name-giving taxon Helchochloa schoenoides is currently considered a synonym of Crypsis schoenoides (Tutin et al., 1980: Euro+Med, 2006–), a mutation is performed according to Art. 45. Rivas-Martínez et al. (2002: 262) already proposed this mutation.

Isolepis cernuae-Cyperetum flavescentis Roselló 1994 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Scirpo cernui-Cyperetum flavescentis’ (Roselló, 1994: 378, 459).

The name-giving taxon Scirpus cernuus is a synonym of Isolepis cernua (Castroviejo, 1986–2019; Euro+Med, 2006–). Therefore, a mutation is performed (Art. 45).

This association belonging to the alliance Nanocyperion was originally described for the Valencian-Provencal and Balearic province (Rivas-Martínez et al., 2001). It is a vicariant of the Junco compressi-Parvocyperetum Br.-Bl. 1922 (=Cyperetum flavescentis Koch 1926) from the Swiss Alps, Central European Province (Braun-Blanquet, 1922; Mucina et al., 2016).

Lythro flexuosi-Crypsietum schoenoidis Rivas-Martínez 1966 mut. V. Silva et al. nom. mut. nov.

Original name: ‘Lythro-Helchochloetum’ (Rivas-Martínez, 1966: 363).

Lectotypus hoc loco: Rivas-Martínez, 1966: 364, Table 1, rel. 2: Portazgo de Albacete, 30SWJ91, Spain.

The name-giving taxa are Lythrum flexuosum and Helchochloa schoenoides, whereby the name is completed according to Rec. 10C. As the name currently accepted for H. schoenoides is Crypsis schoenoides (Tutin et al., 1980; Euro+Med, 2006–), a mutation is also performed (Art. 45). Rivas-Martínez et al. (2002: 268) already proposed this mutation.

Verbeno supinae-Gnaphalietum Rivas Goday 1970

Lectotypus hoc loco: Rivas Goday, 1970: 270–271, Table 8, rel. 1: Burguillos dam, El Tiemblo, Ávila, 30TUK77, Spain.

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