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Validation of associations, alliances and orders of the Algerian forest and scrub vegetation

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Abstract. This paper presents description protocols of 13 new associations, 12 alliances, and 1 order of the Algerian forest and forest-associated vegetation of the classes *Quercetea ilicis, Junipero-Pinetea sylvestris, Quercetea pubescentis, Alno glutinosae-Populetea albae, Alnetea glutinosae, Franguletea* and *Nerio-Tamaricetea*.

Keywords: Algeria; alliance; association; nomenclature; order; syntaxonomy.

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Introduction

In 2017, Meddour *et al.,* have published (or validated) a large number of new syntaxa in this journal, then called Lazaroa. Since Lazaroa has been then already a fully electronic journal, these syntaxonomic novelties had been deemed ineffectively published (then Art. 1 of the Code, 3rd edition; Weber *et al*., 2000). The 4th edition of the International Code of Phytosociological Nomenclature (Theurillat *et al*., 2020), entering the effective period of applicability on 1 January 2021, recognises as valid also publication of the new syntaxa in electronic journals registered in the ISSN system. Since Mediterranean Botany, the seamless continuation of Lazaroa has a registered ISSN code, we publish (and/or validate) those ineffectively published syntaxa and some new names, here. Two of the syntaxa originally described in Meddour *et al.* (2017), namely the *Genisto quadriflorae-Pinetum halepensis* and the *Smilaco asperae-Pistacietum lentisci* have been either validly described or been validated by Bonari *et al*. (2021) and Paradis & Maurin (2017), respectively.

For the syntaxonomic classification of the validated syntaxa see Meddour *et al*. (2017).

Validation of the syntaxa

Osyrio quadripartitae-Tetraclinidion articulatae Siab-Farsi in Meddour & Mucina *all. nov.*
Thermomediterranean kermes oak and Barbary thuja forests and woodlands on deep soils in subhumid regions of Western Algeria.

Holotypus: Osyrio quadripartitatae-Quercetum cocciferae Hadjadj-Aoul & Loisel 1999 (Hadjadj-Aoul & Loisel 1999: 140).
Lonicero implexae-Quercion cocciferae Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Osyrio quadripartitae-Tetraclinidion articulatae Siab-Farsi 2018 *nom. ined.* (Art. 1)
incl. Oleo sylvestris-Quercenion cocciferae Hadjadj-Aoul & Loisel 2010 *nom. ined*. (Art. 1) (as suballiance).
incl. 'Tetraclino-Quercenion cocciferae' Hadjadj-Aoul & Loisel 1999 *nom. inval.* (Arts. 5 & 8) (as suballiance; orig. form).

Nomenclature note: Siab-Farsi (2018), in her (unpublished) doctoral thesis, described a new alliance, the *Osyrio quadripartitae-Tetraclinidion articulatae*, to accommodate all forest syntaxa dominated by *Tetraclinis articulata* typical of the subhumid thermomediterranean vegetation belt. She has not referred to the ineffectively published *Lonicero implexae-Quercion cocciferae* Meddour, Meddour-Sahar, Zeraia & Mucina 2017. Siab-Farsi (2018, p. 131) also suggested that this new alliance corresponds to another, invalidly described, suballiance, the *Tetraclinido articulatae-Quercenion cocciferae* Hadjadj-Aoul & Loisel 1999. Since the Siab-Farsi's diagnosis contains an authoritative syntaxonomic analysis of these communities, we have offered her to publish the name (and concept) of the *Osyrio quadripartitae-Tetraclinidion articulatae* here.
Lit.: Nègre (1964), Hadjadj-Aoul & Loisel (1999, 2010), Meddour *et al*. (2017), Siab-Farsi (2018).

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Smilaco asperae-Pistacietum lentisci Paradis & Maurin 2017.
'Oleo-Lentiscetum' Maire 1926 *nom. inval.* (Art. 2b) (orig. form).
'Oleo-Lentiscetum' Sauvage 1934 *nom. inval.* (Art. 2b) (orig. form).
'Oleo-Lentiscetum' Quéney 1938 *nom. inval.* (Art. 2b) (orig. form).
'Oleo-lentiscetum' Aubert & Monjauze 1946 *nom. inval.* (Art. 2b) (orig. form).
'Association à *Pistacia lentiscus* et *Olea europaea*' Nègre 1964 *nom. illeg.* (Art. 31).
Oleo sylvestris-Pistacietum lentisci Nègre 1964 *nom. superfl.* (Art. 31).
Oleo oleastri-Pistacietum lentisci Sadki 1988 *nom. ined.* (Art. 1).
'Groupement à *Olea europaea* et *Pistacia lentiscus'* (Toubal, 1986).
Smilaco asperae-Pistacietum lentisci (Nègre 1964) Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1; *nom. nov. ined.*).
non 'Oleo-Pistacietum' Braun-Blanquet & Molinier 1951 *sensu auct.* (phantom name)
non Oleo-Lentiscetum Re. Molinier 1952.

Nomenclature and syntaxonomic notes: Meddour *et al*. (2017) have introduced (ineffectively) a new name (*Smilaco asperae-Pistacietum lentisci*) based on Nègre's (1964) 'Association à *Pistacia lentiscus* et *Olea europaea*' to replace it because of an earlier, validly described name '*Oleo-Lentiscetum' (recte: Oleo-Pistacietum lentisci* Molinier 1952 or *Oleo-Pistacietum lentisci* Braun-Blanquet *et al.* 1952; the priority of these two concepts has not been established yet). It appears that the mention of the name (in form of '*Oleo-Lentiscetum'*) dates back as early Maire (1926). The name *Smilaco asperae-Pistacietum lentisci* has been, however, validly described by Paradis & Maurin (2017), rendering the validation of the Meddour's *et al*. (2017) *Smilaco asperae-Pistacietum lentisci* obsolete. It appears (through a comparison of the floristic composition and ecology), that the Paradis & Maurin (2017) syntaxon is identical with that of Nègre (1964).
Lit.: Maire (1926), Sauvage (1934), Quéney (1938), Aubert & Monjauze (1946), Braun-Blanquet *et al*. (1952), Debazac *et al.* (1952), Molinier (1952), Nègre (1964), De Bélair *et al*. (1984), Toubal (1986), De Bélair & Bencheikh-Lehocine (1987), Sadki (1988, 1995), Wojterski (1988, 1990), Khelifi & Sadki (1995), Toubal & Toubal (1996), Meddour (2002), Meddour *et al*. (2017), Paradis & Maurin (2017)

Rosmarino tournefortii-Tetraclinidetum articulatae Nègre 1964 *nom. invers. et mut.* Meddour & Mucina *nom. mut. nov.*
Original form of the name: '*Callitrieto-Rosmarinetum tournefortii*' Nègre 1964.
Rosmarino tournefortii-Tetraclinidetum articulatae Fennane 1987 *nom. ined*. (Art. 1).
Rosmarino tournefortii-Tetraclinidetum articulatae Fennane 1988 *nom. inval.* (Art. 5).
Nomenclatural note: In the original name of this association (Nègre, 1964: 40), the suffix *-etum* should be assigned to the species of higher stratum (*Tetraclinis articulata*, syn. *Callitris quadrivalvis*). Therefore, we suggest inverting the original name as well as mutating the inverted name according to Art. 45, since the concept of the genus *Callitris* has not been in use in North Africa for more than past 20 years. Molecular phylogenetic work (e.g. Gadek *et al*. 2000; Yang *et al*. 2012) confirmed that *Callitris* and *Tetraclinis* belong to different clades and hence should be considered different at the genus level. Fennane's (1987, 1988) *Rosmarino tournefortii-Tetraclinidetum articulatae* is syntaxonomically identical, yet invalidly published. However, validation of this name would create a later homonym (Meddour *et al*. 2017).
Lit.: Nègre (1964), Fennane (1987, 1988), Hadjadj-Aoul (1988), Achhal El Kadmiri *et al*. (2004), Medjahdi (2010), Meddour *et al*. (2017), Medjahdi & Letreuch-Belarouci (2017)

Genisto tricuspidatae-Calicotomion spinosae Dahmani-Megrerouche & Loisel *all. nov.*
Thermo- and mesomediterranean low maquis on acidic or decarbonated soils in subhumid and humid regions of Central Algeria.
Holotypus: Calicotomo spinosae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel ex Meddour & Mucina 2021 (see below).

Diagnostic taxa: *Ampelodesmos mauritanicus*, *Calicotome spinosa*, *Cistus creticus* subsp. *creticus*, *Genista tricuspidata*.

Genisto tricuspidatae-Calicotomion spinosi Dahmani 1984 *nom. ined.* (Art. 1).
Genisto tricuspidatae-Calicotomion spinosi Dahmani-Megrerouche & Loisel 2003 *nom. inval.* (Arts. 5 & 8).
Genisto tricuspidatae-Calicotomion spinosi Dahmani-Megrerouche & Loisel in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).

Syntaxonomic note: As pointed out by Meddour *et al*. (2017), this vegetation of central Algerian distribution includes matorrals and coppice of green oak, whose extension is alarming due to the frequency of fires. The degradation of green oak or cork oak forest, at thermomediterranean and mesomediterranean belts, in subhumid or even humid bioclimate, resulted in plant communities dominated by *Calicotome spinosa*, *Ampelodesmos mauritanicus*, *Genista tricuspidata* subsp. *tricuspidata*, which are characteristic species (Dahmani-Megrerouche, 1997). These are not typical tall-scrub formations, but as was reported by Quézel *et al*. (1988; see also Meddour, 2010) on some Moroccan vegetation types: "complex and heterogeneous vegetation structures, mainly integrating heavily anthropized degradation stages ('dematorralisation' process), in which the chamaephytes linked to the *Cisto-Lavanduletea* or *Rosmarinetea* can play an important physiognomic role and whose interpretation is not easy".

Lit.: Dahmani (1984), Dahmani-Megrerouche (1996, 1997), Dahmani-Megrerouche & Loisel (2003), Meddour *et al*. (2017).

Calicotomo spinosae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel ex Meddour & Mucina *ass. nov.*
Holotypus: Dahmani-Megrerouche & Loisel (2003: Table 6, rel. 3).
Calicotomo spinosae-Quercetum rotundifoliae Dahmani-Megrerouche 1996 *nom. inval.* (Art. 2b).
Calicotomo spinosae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel 2003 *nom. inval.* (Art. 5).
Calicotomo spinosae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel *in* Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
'Groupement à *Quercus rotundifolia* et *Genista tricuspidata'* (Miara, 2011).
Lit.: Dahmani-Megrerouche (1996, 1997), Mesli (2001), Dahmani-Megrerouche & Loisel (2003), Boulaacheb (2009), Meddour (2010), Miara (2011), Miara *et al*. (2012), Lemouissi (2014), Meddour *et al*. (2017).

Cisto salviifolii-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel ex Meddour & Mucina *ass. nov.*
Holotypus: Dahmani-Megrerouche & Loisel (2003: Table 8, rel. 8).
Cisto salviifolii-Quercetum rotundifoliae Dahmani-Megrerouche 1996 *nom. inval.* (Art. 2b).
Cisto salviifolii-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel 2003 *nom. inval.* (Art. 5).
Cisto salviifolii-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Lit.: Dahmani-Megrerouche (1996, 1997), Brakchi (1998), Dahmani-Megrerouche & Loisel (2003), Meddour *et al*. (2010), Miara *et al*. (2012), Meddour *et al*. (2017).

Calicotomo intermediae-Quercion cocciferae Dahmani-Megrerouche & Loisel ex Meddour & Mucina *all. nov.*
Thermo- and mesomediterranean scrub on calcareous soils in semi-arid or subhumid regions of Western Algeria.
Holotypus: *Calicotomo intermediae-Quercetum rotundifoliae* Dahmani-Megrerouche & Loisel ex Meddour & Mucina 2021 (see below).

Diagnostic taxa: *Calicotome infesta* subsp. *intermedia*, *Quercus coccifera*, *Quercus ilex* subsp. *ballota*, *Chamaerops humilis*.

Calicotomo intermediae-Quercion cocciferae Dahmani 1984 *nom. ined.* (Art. 1).
Calicotomo intermediae-Quercion cocciferae Dahmani-Megrerouche & Loisel 2003 *nom. inval.* (Arts. 5 & 8).
Calicotomo intermediae-Quercion cocciferae Dahmani-Megrerouche & Loisel in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Lit.: Dahmani (1984), Dahmani-Megrerouche & Loisel (2003), Meddour *et al*. (2017).

Calicotomo intermediae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel ex Meddour & Mucina *ass. nov.*
Holotypus: Dahmani-Megrerouche & Loisel (2003: Table 9, rel. 4).
Calicotomo intermediae-Quercetum rotundifoliae Dahmani-Megrerouche 1996 *nom. inval.* (Art. 2b).
Calicotomo intermediae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel 2003 *nom. inval.* (Art. 5).
Calicotomo intermediae-Quercetum rotundifoliae Dahmani-Megrerouche & Loisel in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Lit.: Dahmani-Megrerouche (1996, 1997), Kadi-Hanifi (1998), Dahmani-Megrerouche & Loisel (2003), Meddour *et al*. (2017)

Loto dorycnii-Quercion rotundifoliae Djebaïli in Meddour & Mucina *all. nov.*
Tall-scrub 'pre-forest' green-oak and Aleppo pine vegetation of the Saharan Atlas.
Holotypus: Loto dorycnii-Pinetum halepensis Djebaïli in Meddour & Mucina 2021 (see below).

Nomenclature note: The concept of this alliance was originally conceived by Prof. Djebaïli (1935-1994), a grand personality of Algerian biology who tragically deceased (https://fr.wikipedia. org/wiki/Salah_Djebaïli). As a token of our appreciation, we suggest that this alliance should be described under his name.

Diagnostic taxa: *Argyrolobium zanonii*, *Asparagus acutifolius*, *Coronilla valentina* subsp. *pentaphylla*, *Genista pseudopilosa*, *Lotus dorycnium* (syn. *Dorycnium suffruticosum*, *D. pentaphyllum*), *Phillyrea angustifolia*, *Pistacia lentiscus*, *P. terebinthus*, *Quercus ilex* subsp. *ballota*, *Thymelaea nítida*.

'Alliance à *Pinus halepensis* et *Quercus ilex*' Djebaïli 1978 *nom. ined*. (Art. 1).
'Alliance à *Pinus halepensis* et *Quercus ilex'* Djebaïli 1984 *nom. inval*. (Art. 8).
'Alliance à *Pinus halepensis* et *Quercus ilex'* Djebaïli 1990 *nom. inval.* (Art. 8).
'*Pino halepensis-Quercion rotundifoliae* Djebaïli 1978' *corr.* Meddour 2010 *nom. ined.* (Art. 1).

Loto dorycnii-Quercion rotundifoliae Djebaïli in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).

Syntaxonomic note: Kaabèche (1995) has demonstrated, using a numerical analysis, that the *Pinus halepensis* and *Quercus ilex* plant communities of the Saharan Atlas, described by Djebaïli (1978, 1984), Kadik (1983), Bouzenoune (1984), and Kaabèche (1990), have close floristic affinities. Undoubtedly, they should belong to a new alliance of the *Pistacio-Rhamnetalia*. Yet, the syntaxonomic classification of the vegetation with *Pinus halepensis* and *Quercus ilex*, widespread in the Saharan Atlas, remained unclear and poorly defined due to the choice of matorral species as diagnostic. It appears, however, that coining of a new alliance to accommodate

the 'pre-forest' (scrub) green-oak and Aleppo pine formations of the Saharan Atlas is justified and supported by the notion of 'continental faciès of the Saharan Atlas' for the Aleppo pine-dominated vegetation as described by Maire (1926).
Lit.: Djebaïli (1978, 1984), Kadik (1983), Bouzenoune (1984), Kaabèche (1990, 1995), Meddour *et al*. (2017).

Loto dorycnii-Pinetum halepensis Djebaïli in Meddour & Mucina *ass. nov.*
Holotypus: Djebaïli (1984: Table 1, rel. 195).

Syntaxonomic note: This association (where *Argyrolobium zanonii* is significatively present) appears to have close floristic affinities with the *Argyrolobio linneani-Pinetum halepensis* Achhal 1986 (see Quézel & Barbero, 1986; Fennane, 2003) described from the Central High Atlas, but belonging to the *Tetraclinido-Pistacion atlanticae*.
Dorycnio suffruticosi-Phillyreetum mediae Djebaïli 1978 *nom. ined.* (Art. 1).
Dorycnio suffruticosi-Phillyreetum mediae Djebaïli 1990 *nom. inval.* (Art. 2b).
Loto dorycnii-Pinetum halepensis Djebaïli in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Lit.: Djebaïli (1978, 1984, 1990), Wojterski (1988), Meddour (2010), Chermat (2014), Meddour *et al*. (2017).

Ephedro majoris-Juniperetalia phoeniceae Quézel & Barbero ex Mucina & Meddour *ordo nov.*
Maghrebian montane-mediterranean and lower oromediterranean juniper scrub and woodlands in semi-arid and arid regions.
Holotypus: Ephedro nebrodensis-Juniperion phoeniceae Quézel & Barbero in Asensi, Díez-Garretas & Quézel 2007 (Asensi *et al*. 2007: 607).
Thymo hirti-Juniperetalia phoeniceae El Hamrouni, Kadik & Loisel in El Hamrouni 1978 *nom. inval.* (Art. 8).
Ephedro majoris-Juniperetalia phoeniceae Quézel & Barbero 1981 *nom. inval.* (Art. 8)

Nomenclatural note: Quézel & Barbero (1981: 1141) give a list of character species; however, no alliance was described in this paper, hence the order name remains invalid.

Ephedro majoris-Juniperetalia phoeniceae Quézel & Barbero 1986 *nom. inval.* (Art. 8).

Nomenclatural note: Since the *Ephedro majoris-Juniperetea phoeniceae* Quézel & Barbero 1981 has been invalidly described at time when Quézel & Barbero (1986: 106) attempted down-ranking of this to the level, the name '*Ephedro majoris-Juniperetalia phoeniceae* Quézel & Barbero (1981) 1986' remains invalid.

Ephedro-Juniperetalia Quézel & Barbero ex Quézel, Barbero, Benabid, Loisel & Rivas-Martínez 1988 *nom. inval.* (Art. 5).

Nomenclatural note: This name was supposedly validated by Quézel *et al.* (1988: 100), however since these authors chosen the *Junipero thuriferae-Quercion rotundifoliae* Quézel & Barbero 1980' as the type (*holotypus*), the name remains invalidly published (contrary to what Asensi *et al*. 2007 would claim). There is no publication by Quézel & Barbero (1980) cited in Quézel *et al*. (1988) that would contain a valid diagnosis of this name. Therefore, the name *Ephedro-Juniperetalia* remains invalidly published.

Ephedro majoris-Juniperetalia phoeniceae Quézel & Barbero ex Mucina & Meddour in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1)
Lit.: El Hamrouni (1978), Quézel & Barbero (1981, 1986), Quézel *et al*. (1988), Asensi *et al*. (2007), Taleb & Fennane (2010), Meddour *et al*. (2017).

Lamio garganici-Cedrion atlanticae Abdessemed in Meddour & Mucina *all. nov.*
Cedar forests of the Saharan Atlas (Aurès, Belezma and Hodna Mts.) in subhumid (locally semi-arid) and pronounced continental bioclimate.
Holotypus: Ranunculo aurasiaci-Cedretum atlanticae Meddour & Mucina 2021 (see below)

Diagnostic taxa: *Carum montanum*, *Cedrus atlantica*, *Cephalanthera longifolia*, *Lamium garganicum* subsp. *garganicum*, *Ranunculus aurasiacus*.

Lamio numidici-Cedrion atlanticae Abdessemed in Wojterski 1988 *nom. inval.* (Art. 8).
Lamio numidici-Cedrion atlanticae Abdessemed in Dahmani-Megrerouche 1996 *nom. inval.* (Art. 8).
Lamio numidici-Cedrion atlanticae Abdessemed 1981 *nom. ined.* (Art. 1).
Lamio numidici-Cedrion atlanticae Abdessemed 1984 *nom. inval.* (Art. 8).
Lamio numidici-Cedrion atlanticae Abdessemed in Yahi, Médiouni & Géhu 1999 *nom. inval.* (Art. 8).
Lamio garganici-Cedrion atlanticae Abdessemed in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
non Viola munbyanae-Cedrion atlantici Barbero, Quézel & Rivas-Martínez 1981 *nom. inval.* (Art. 5).
non Viola munbyanae-Cedrion atlantici Barbero, Quézel & Rivas-Martínez ex Quézel & Barbero 1989.
Lit.: Abdessemed (1981), Barbero *et al*. (1981), Wojterski (1988), Quézel & Barbero (1989), Dahmani-Megrerouche (1996), Yahi *et al*. (1999), Meddour *et al*. (2017).

Ranunculo aurasiaci-Cedretum atlanticae *ass. nov.*
Holotypus: Abdessemed in Wojterski (1988: Tab. 52, rel. 1)
Viola munbyanae-Juniperetum communis Abdessemed 1981 *nom. ined.* (Art. 1).
Viola munbyanae-Juniperetum hemisphaericae Abdessemed 1981 *sensu auct*., *nom ined.* Art. 1; *nom. corrigend. ined.*).

Nomenclatural note: Correction of this name (replacement of '*communis*' by '*hemisphaericae'*) is not admissible because there are two taxa listed in the original diagnosis

(in the unpublished thesis of Abdessemed, 1981), namely *J. communis* var. *hemisphaerica* and *J. communis* subsp. *eu-communis* and the author used explicitly '*communis*' as the eponymous species. If effectively published, the name *Violo munbyanae-Juniperetum communis* cannot be used since none of the eponymous species is a species of the dominant layer (Art. 29b). This is a forest community, dominated by *Cedrus atlantica*.
Violo munbyanae-Cedretum atlanticae (Abdessemed 1981) Meddour & Géhu 1998 *nom. ined.* (Art. 1; *nom. nov. inval.*).
Ranunculo aurasiaci-Cedretum atlanticae Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
Lit.: Abdessemed (1981), Wojterski (1988), Meddour & Géhu (1998), Meddour *et al.* (2017).

Abietion numidicae *all. nov.*
Relict Algerian fir forests on dolomitic substrates.
Holotypus: Asperulo odoratae-Abietetum numidicae Quézel 1956 (Quézel, 1956: 18).

Diagnostic taxa: *Abies numidica*, *Acer opalus* s.l., *Calamintha grandiflora* subsp. *baborensis*, *Doronicum plantagineum* subsp. *atlanticum*, *Ilex aquifolium*, *Myosotis macrocalycina*, *Paeonia mascula* subsp. *atlantica*, *Senecio perralderianus*, *Taxus baccata*.

Abietion maroccano-numidicae Mucina & Meddour in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
incl. Abietenion marocanae Barbero, Quézel & Rivas-Martínez 1981 (as suballiance)
non Paeonio broteroi-Abietion pinsapo Rivas-Martínez 1982 *nom. inval.* (Art. 8).
non Paeonio broteroi-Abietion pinsapo (Rivas-Martínez 1987) Rivas-Martínez, Fernández-González, Loidi, Lousã & Penas 2002.

Syntaxonomic note: Besides the type of association, this could also contain the *Taxus baccata*-dominated forests (e.g. Meddour & Laribi, 1999; Gharzouli, 2007).
Lit.: Quézel (1956), Barbero & Quézel (1975), Barbero *et al*. (1981), Meddour & Laribi (1999), Rivas-Martínez *et al*. (2002), Gharzouli (2007), Meddour *et al*. (2017).

Plagio maghrebini-Quercion canariensis *all. nov.*
Algerian-Tunisian deciduous oak and mixed forests of cold, humid (subhumid) regions on brown forest soils in the supramediterranean belt.
Holotypus: Plagio maghrebini-Quercetum canariensis Laribi in Meddour & Mucina 2021 (see below).

Diagnostic taxa (*endemic to North Africa): *Alliaria petiolata*, *Cytisus villosus*, *Doronicum plantagineum* subsp. *atlanticum**, *Drymochloa drymeja*, *Galium tunetanum*, *Hedera algeriensis**, *Hyacinthoides aristidis**, *Lathyrus niger*, *Laurus nobilis*, *Melica minuta*, *Myosotis latifolia*, *Plagius maghrebinus**, *Prunella vulgaris*, *Prunus avium*, *Pulicaria odora*, *Quercus afares**, *Q. canariensis*, *Scutellaria columnae*, *Teucrium kabylicum**

Syntaxonomic note: This new alliance replaces the Iberian *Quercion fagineae* and the *Aceri granatensis-Quercion fagineae* in North African mountains. In Algeria, these forests are found in the Tellian Massif along the East Algerian coast. They are distinguished from the Iberian alliances by presence of several endemic taxa (see above).
Scutellarion columnae Aimé, Bonin, Chaabane, Loisel & Saoudi 1986 *nom. inval.* (Art. 8).
Plagio maghrebini-Quercion canariensis Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
'*Scutellario columnae-Quercion fagineae*' (Aimé, Bonin, Chaabane, Loisel & Saoudi 1986) Meddour 2010 *nom. nov. ined.* (Art. 1**).**
non Aceri granatensis-Quercion fagineae (Rivas Goday, Rigual & Rivas-Martínez in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez, 1960) Rivas-Martínez 1987.
non Quercion fagineae Braun-Blanquet, P. Silva & Rozeira 1956.
non Quercion broteroi Braun-Blanquet, P. Silva & Rozeira 1956 corr. Rivas-Martínez 1972 *nom. corrigend. illeg.*

Nomenclatural note: The correction of the original name *Quercion fagineae* to *Quercion broteroi* is not legitimate, unlike claimed by Rivas-Martínez *et al*. (2011), because *Q. broteroi* is often understood as a subspecies of *Q. faginea* (see www.emplantbase.org).
non Quercion fagineo-suberis (Braun-Blanquet, P. Silva & Rozeira 1956) Rivas-Martínez 1975 *nom. superfl.* (Art. 29).
Lit.: Aimé *et al.* (1986), Meddour (2010), Rivas-Martínez *et al*. (2011), Meddour *et al*. (2017).

Plagio maghrebini-Quercetum canariensis Laribi in Meddour & Mucina *ass. nov.*
Holotypus: Laribi *et al*. (2008: Tab. 3, rel. 5)

Nomenclature note: The name-giving species are *Q. canariensis* and *Plagius maghrebinus* Vogt & Greuter (formerly *Chrysanthemum fontanesii nom. inval.*; see Euro+Med PlantBase). Although the effectively (yet invalidly) published name *Chrysanthemo fontanesii-Quercetum canariensis* Laribi, Derridj & Acherar 2008 was published earlier than the invalid name *Plagio maghrebini-Quercetum canariensis* Laribi in Meddour 2010, the former name cannot be used for validation because it was derived from an invalid taxon name (see Art. 3l).
Chrysanthemo fontanesii-Quercetum canariensis Laribi 2000 *nom. ined.* (Art. 1).
Chrysanthemo fontanesii-Quercetum canariensis Laribi, Derridj & Acherar 2008 *nom. inval.* (Arts. 3l & 5).
Plagio maghrebini-Quercetum canariensis Laribi 2000 corr. Meddour 2010 *nom. ined.* (Art. 1).
Plagio maghrebini-Quercetum canariensis Laribi in Meddour 2010 *nom. inval.* (Art. 5).
Plagio maghrebini-Quercetum canariensis Laribi in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).

Lit.: Laribi (2000), Laribi *et al*. (2008), Meddour (2010), Meddour *et al*. (2010), Meddour *et al*. (2017).

Viburno tini-Quercetum canariensis *ass. nov.*
Holotypus: Meddour (2002: Tab. 7, rel. 6).
Phillyreo mediae-Quercetum fagineae Aimé, Bonin, Chaabane, Loisel & Saoudi 1986 *nom. inval.* (Art. 5).
Viburno tini-Quercetum canariensis Meddour 2002 *nom. inval.* (Art. 5).
Viburno tini-Quercetum canariensis Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
non Viburno tini-Quercetum fagineae Torres & Cano in Cano, Pinto, Valle, Torres, García-Fuentes, Salazar, Melendo & Mendes 2002.
Lit.: Aimé *et al*. (1986), Hadjadj-Aoul (1988), Meddour (2002), Meddour *et al*. (2017).

Quercetum balloto-broteroi *ass. nov.*
Holotypus: Alcaraz (1989: Tab. 1, rel. 11).

Taxonomic note: *Quercus faginea* subsp. *tlemcenensis* (A. DC.) Maire & Weiller ex Greuter *et al*., is *Q. faginea* subsp. *broteroi* (Cout.) A. Camus according to Euro+Med PlantBase.
Quercetum balloto-broteroi Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
'Groupement à *Quercus faginea'* (Abdessemed, 1981).
'Groupement à *Quercus rotundifolia* et *Quercus faginea* subsp. *tlemcenensis'* (Dahmani, 1984).
'Groupements mixtes à *Quercus ilex* et *Quercus faginea* subsp. *tlemcenensis'* (Alcaraz, 1989).
'Groupement à *Quercus suber* et *Quercus faginea* subsp. *baetica'* (Miara, 2011).
'G1: *Quercus rotundifolia-Quercus faginea subsp. tlemcenensis'* (Benabdellah, 2011).
Lit.: Abdessemed (1981), Dahmani (1984, 1994), Hadjadj-Aoul (1988), Alcaraz (1989), Benabdellah (2011), Miara (2011), Miara *et al*. (2012).

Scrophulario laevigatae-Acerion obtusati *all. nov.*
Submediterranean xero-thermophilous broad-leaved scree and ravine maple forests of the Maghreb.
Holotypus: Scrophulario laevigatae-Aceretum obtusati Wojterski ex Meddour & Mucina 2021 (see below).

Diagnostic taxa: *Acer obtusatum*, *Cystopteris fragilis*, *Ilex aquifolium*, *Lonicera etrusca*, *Polystichum setiferum*, *Primula acaulis* subsp. *atlantica*, *Ruscus aculeatus*, *Scrophularia laevigata.*
Drabo muralis-Acerion obtusati Azira-Atroune 2001 *nom. ined.* (Art. 1).
Scrophulario laevigatae-Acerion obtusati Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).

Syntaxonomic note: The Maghrebian scree forests are distinct from all scree forests found further north (in Europe; for more details on those see Meddour *et al*., 2017) which are typically found on nutrient-rich soils subject to downslope erosion or occur in water-rich sheltered habitats such as steep slopes of gorges. Floristically, they mediate between the mesic-habitat vegetation of *Quercus canariensis* and alluvial (riparian) forests. Typically, maple (*Acer*) and lime (*Tilia;* missing in North Africa) species occur as dominants in these scree forests. As noted by Meddour *et al*. (2017), the position of the Maghrebian *Scrophulario laevigatae-Acerion obtusati* remains contentious. Three options are worth testing in a large-scale syntaxonomic revision: (1) placement of the *Scrophulario laevigatae-Acerion obtusati* within the *Aceretalia pseudoplatani* (belonging to the *Carpino-Fagetea*), or (2) description of a new Maghrebian order accommodating the new alliance, and finally (3) placement of the *Scrophulario laevigatae-Acerion obtusati* within the broadly conceived *Querco-Cedretalia atlanticae.* Since the known scree forests of the Maghreb have been so far classified within the latter, until proven otherwise, we shall follow this option.
Lit.: Wojterski (1988), Azira-Atroune (2001), Mucina *et al*. (2016), Meddour *et al*. (2017).

Scrophulario laevigatae-Aceretum obtusati Wojterski ex Meddour & Mucina *ass. nov.*
Holotypus: Wojterski (1988: 100, Table 32, rel. 1).
Scrophulario laevigatae-Aceretum obtusati Wojterski 1988 *nom. inval.* (Art. 5).
Scrophulario laevigatae-Aceretum obtusati Wojterski ex Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
'Erablière à *Acer obtusatum'* (Meddour & Laribi, 1999)
Lit.: Wojterski (1988), Meddour (1994, 2002), Meddour & Géhu (1998), Meddour & Laribi (1999), Meddour *et al*. (2017).

Clematido cirrhosae-Populion albae Bensettiti & Lacoste ex Meddour & Mucina *all. nov.*
Thermomediterranean deciduous alluvial willow-poplar forests along in summer often dry rivers of the Maghreb.
Holotypus: Irido foetidissimae-Populetum albae Nègre 1964 (Nègre, 1964: 13)

Diagnostic species: *Aristolochia sempervirens*, *Arundo donax* (naturalised in the Western Mediterranean), *Clematis cirrhosa*, *Iris foetidissima*, *Populus alba*.

Nomenclatural note: Bensettiti & Lacoste (1999) called this informally *Populion albae* "méridional".
Clematido cirrhosae-Populion albae Bensettiti & Lacoste 1999 *nom. inval.* (Art. 5).

Clematido cirrhosae-Populion albae Bensettiti & Lacoste in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
non Populion albae Braun-Blanquet 1930 (phantom name).
non Populion albae Braun-Blanquet 1931 *nom. inval.* (Art. 8).
non Populion albae Tüxen 1931 *nom. inval.* (Art. 8).
non Populion albae de Bannes-Puygiron 1933 *nom. inval.* (Art. 8).
non Populion albae Szafer in Soó 1941 *nom. inval.* (Art. 8).
non Populion albae Braun-Blanquet & Tüxen 1943 *nom. inval.* (Art. 8).

non Populion albae Braun-Blanquet 1948 *nom. inval.* (Art. 8).
non Populion albae Braun-Blanquet ex Tchou 1949.
non Saponario officinalis-Populion albae (Braun-Blanquet 1931) Bensettiti & Lacoste 1999 *nom. inval.* (Art. 8).

Nomenclatural note: Bensettiti & Lacoste's (1999) '*Populion albae* "septentrional" = *Saponario-Populion'* is *de facto* a *nomen novum* introduced for the *Populion albae* Braun-Blanquet 1931 *nom. inval.,* and therefore rendered invalid as well.
Lit.: Nègre (1964), Wojterski (1988), Bensettiti & Lacoste (1999), Quézel & Médail (2003), Bensettiti & Barbero (2009), Belouahem-Abed (2012), Meddour *et al*. (2017).

Salici pedicellatae-Fraxinion angustifoliae *all. nov.*
Maghrebian high-elevation (meso- to supra-mediterranean) riparian ash-dominated forests.
Holotypus: *Equiseto maximi-Fraxinetum angustifoliae* Bensettiti & Lacoste ex Meddour & Mucina 2021 (see below).

Diagnostic species: *Alliaria petiolata*, *Apium nodiflorum*, *Celtis australis*, *Clinopodium vulgare*, *Fraxinus angustifolia*, *Ilex aquifolium*, *Lamium flexuosum*, *Polystichum setiferum*, *Prunus avium*, *Salix pedicellata*.

Nomenclatural note: The description of this new alliance is not an up-ranking of the suballiance *Salici pedicellatae-Fraxinenion angustifoliae* Bensettiti & Lacoste 1999 since this suballiance was not validly described (Art. 5).
Salici pedicellatae-Fraxinion angustifoliae Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
non Lauro nobilis-Fraxinion angustifoliae I. Kárpáti & V. Kárpáti 1961.
*non Fraxinion angustifolia*e Pedrotti 1970 *nom. inval.* (Art. 3b).
non Fraxinion angustifoliae Pedrotti ex Biondi & Casavecchia in Biondi, Casavecchia & Pesaresi 2010 *nom. inval.* (Art. 5).
non Carici remotae-Fraxinion oxycarpae Pedrotti ex Pedrotti, Biondi, Allegrezza & Casavecchia in Biondi, Allegrezza, Casavecchia, Galdenzi, Gasparri, Pesaresi, Vagge & Blasi 2014.
non Lauro nobilis-Ulmion minoris Biondi, Casavecchia, Gasparri & Pesaresi in Biondi, Allegrezza, Casavecchia, Galdenzi, Gasparri, Pesaresi, Vagge & Blasi 2014.
Lit.: Bensettiti & Lacoste (1999), Bensettiti & Barbero (2009), Meddour *et al*. (2017).

Equiseto maximi-Fraxinetum angustifoliae Bensettiti & Lacoste ex Meddour & Mucina *ass. nov.*
Holotypus: Bensettiti & Barbero (2009: Table 4, rel. 1).

Nomenclatural note: Because the original (invalid) description of the association (Bensettiti & Lacoste, 1999) contains only a synthetic (constancy) table, a single relevé has to be selected as holotype.

'Carici-Fraxinetum' sensu auct. maghrebianum (misapplied name).
Equiseto maximi-Fraxinetum angustifoliae Bensettiti & Lacoste 1999 *nom. inval.* (Art. 7).
Equiseto maximi-Fraxinetum angustifoliae Bensettiti & Lacoste ex Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
non Carici-Fraxinetum excelsioris Koch ex Faber 1936.
non Carici-Fraxinetum angustifoliae Pedrotti 1970.
non Carici-Fraxinetum angustifoliae Jovanović & Tomić 1979 *nom. superfl.* (Art. 29).
non Carici-Fraxinetum angustifoliae Piccoli & Gerdol 1984 *nom. superfl.* (Art. 29).
non Carici-Fraxinetum oxycarpae Pedrotti 1970 *corr.* 1992 (*nom. corrigend. illeg.*).

Nomenclatural note: The correction of the name *Carici-Fraxinetum angustifoliae* Pedrotti 1970 by Pedrotti (1992) is superfluous since *Fraxinus oxycarpa* Willd. is considered the basionym of *Fraxinus angustifolia* subsp. *oxycarpa* (Willd.) Franco & Rocha Afonso (see Euro+Med PlantBase) and hence either misidentification or taxonomic homonymy do not apply.
Lit.: Wojterski (1988), Wojterski & Bensettiti (1988), Bensettiti (1995), Bensettiti & Lacoste (1999), Bensettiti & Barbero (2009), Meddour *et al*. (2017).

Carici remotae-Alnion glutinosae *all. nov.*
North African mesotrophic regularly flooded alder carr.
Holotypus: Rusco hypophylli-Alnetum glutinosae Géhu, Kaabèche & Gharzouli 1994 (Géhu *et al* 1994: 68).

Diagnostic taxa: *Alnus glutinosa*, *Allium triquetrum*, *Apium nodiflorum*, *Arum italicum*, *Campanula alata*, *Carex pendula*, *C. remota*, *Laurus nobilis*, *Ruscus hypophyllum*, *Smilax aspera*, *Vitis vinifera* subsp. *sylvestris.*
Campanulo alatae-Alnion glutinosae Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
incl. Campanulo alatae-Alnenion glutinosae Bensettiti & Lacoste 1999 (Arts. 5 & 8)
non Alnion glutinosae Malcuit 1929.

Syntaxonomic note: This North African syntaxon comprises remarkable southern outliers of wooded mires experiencing several months of waterlogging under summer-hot, humid Mediterranean climate (Bensettiti, 1992; Bensettiti & Lacoste, 1999). The '*Carici remotae-Alnetum glutinosae'* Debazac 1959, described from Tunisia (Debazac, 1959: 77), might belong here as well.
Lit.: Debazac (1959), Bensettiti (1992), Bensettiti & Lacoste (1999), Meddour *et al*. (2010, 2017), Belouahem-Abed *et al*. (2011).

Dioscoreo communis-Salicion atrocinereae de Foucault & Julve ex Meddour & Mucina *all. nov.*
Willow carr of Atlantic coastal regions of southwestern France, Iberian Peninsula and North Africa.
Holotypus: *Dioscoreo communis-Salicetum acuminatae* de Foucault 1995 (de Foucault, 1995: 61, Tab. 17).

Diagnostic taxa: *Arum italicum*, *Dioscorea communis*, *Laurus nobilis*, *Ruscus hypophyllum*, *Salix cinerea* subsp. *oleifolia* (= *S. atrocinerea*).

Tamo communis-Salicion atrocinereae de Foucault & Julve 2001 *nom. inval.* (Art. 5).
Tamo communis-Salicion atrocinereae de Foucault & Julve ex Mucina & Meddour in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).

Nomenclatural note: De Foucault & Julve (2001) classified three, all validly described associations in this alliance, namely: *Tamo communis-Salicetum acuminatae* de Foucault 1995, *Viti viniferae-Salicetum acuminatae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & Valdes 1980, *Clematido campaniflorae-Rubetum ulmifolii* Peinado & Velasco in Peinado, Moreno & Velasco 1983 (this association actually belongs to the *Pruno-Rubion ulmifolii*). Since de Foucault & Julve (2001) failed to designate the holotype of the *Tamo communis-Salicion atrocinereae*, we step up and validate it here.
non Salicion cinereae T. Müller & Görs ex Passarge 1961.

Syntaxonomic and nomenclatural note: The *Tamo communis-Salicion atrocinereae* is a warm-temperate (South European and North African) geographic analogue of the European boreo-temperate *Salicion cinereae*, and it differs from the latter by its diagnostic taxa (see above).
Lit.: de Foucault (1995), de Foucault & Julve (2001), Meddour *et al*. (2017).

Nerio oleandri-Tamaricetum africanae Kaabèche, Gharzouli & Géhu *ass. nov.*
Holotypus: Kaabèche *et al*. (1995: Table 11, rel. 2).
Nerio oleandri-Tamaricetum africanae Kaabèche, Gharzouli & Géhu 1995 *nom. inval.* (Art. 5).
Nerio oleandri-Tamaricetum africanae Kaabèche, Gharzouli & Géhu ex Mucina & Meddour in Meddour, Meddour-Sahar, Zeraia & Mucina 2017 *nom. ined.* (Art. 1).
'Groupement à *Nerium oleander* et *Tamarix africana'* (Toubal, 1986).
Lit.: Toubal (1986), Géhu *et al.* (1994, 1998), Kaabèche *et al.* (1995), de Foucault *et al*. (2012), Meddour *et al*. (2017).

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