

Validation of some alliances of the Aegean chasmophytic vegetation of the *Asplenietea trichomanis*

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Abstract: Bergmeier, E., Dimopoulos, P. & Mucina, L. *Validation of some alliances of the Aegean chasmophytic vegetation of the Asplenietea trichomanis. Lazaroa 32: 183-186 (2011).*

We validated the alliances *Asterion cretici*, *Capparo-Amaracion*, *Inulion heterolepidis* and *Petromarulo-Centaurion argenteae*, all classified within the *Cirsietalia chamaepeuces* (*Asplenietea trichomanis*) -an order of the thermo- and mesomediterranean chasmophyte-rich vegetation of calcareous cliffs of the Aegean region (Hellas and possibly also western Turkey). The name of the *Polygonion icarici*, an alliance having currently uncertain position within the *Asplenietea trichomanis*, was also validated. The nomenclatural history of the *Cirsietalia chamaepeuces*, and its relationship to the *Petromaruletalia pinnatae*, have been clarified.

Keywords: Aegean Islands, alliance, *Asplenietea trichomanis*, *Asterion cretici*, *Capparo-Amaracion*, chasmophyte, *Cirsietalia chamaepeuces*, Europe, Greece, *Inulion heterolepidis*, nomenclature, order, *Petromarulo-Centaurion argenteae*, phytosociology, *Polygonion icarici*, syntaxon, validation.

Resumen: Bergmeier, E., Dimopoulos, P. & Mucina, L. *Validación de algunas alianzas de vegetación casmófitica de Asplenietea trichomanis del Egeo. Lazaroa 32: 183-186 (2011).*

En este trabajo validamos las alianzas *Asterion cretici*, *Capparo-Amaracion*, *Inulion heterolepidis* y *Petromarulo-Centaurion argenteae* y las incluimos en *Cirsietalia chamaepeuces* (*Asplenietea trichomanis*), un orden de comunidades vegetales termo- y mesomediterráneas, ricas en casmófitos, de los acantilados calcáreos de la región Egea (principalmente Grecia y posiblemente el oeste de Turquía). También validamos el nombre de *Polygonion icarici*, una alianza que actualmente tiene una posición incierta dentro de *Asplenietea*. La historia nomenclatural de *Cirsietalia chamaepeuces* y su relación con *Petromaruletalia pinnatae* también queda clarificada en este trabajo.

Palabras clave: Islas del Egeo, alianza, *Asplenietea trichomanis*, *Asterion cretici*, *Capparo. Amaracion*, casmófito, *Cirsietalia chamaepeuces*, Europa, Grecia, *Inulion heterolepidis*, nomenclatura, orden, *Petromarulo-Centaurion argenteae*, fitosociología, *Polygonion icarici*, sintaxon, validación.

THE CONCEPT OF THE *CIRSIETALIA CHAMAEPUCES*

Cirsietalia chamaepeuces Horvat et al. ex Bergmeier, Dimopoulos et Mucina *all. nova hoc loco* (*Asplenietea trichomanis*).

Validated name: *Cirsietalia chamaepeuces* Horvat in Horvat et al. 1974 (HORVAT & al., 1974:

103-104) (art. 3b of the ICPN; WEBER & al., 2000).

Holotypus: *Petromarulo-Centaurion argenteae* Horvat et al. ex Bergmeier, Dimopoulos et Mucina *hoc loco* (HORVAT & al., 1974: 104).

Synonym: *Petromaruletalia pinnatae* Zaffran 1990 (ZAFFRAN, 1990: 424) (arts. 5, 8).

Character taxa of the order: *Brassica cretica*, *Capparis orientalis*, *Linum arboreum*, *Ptiloste-*

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mon chamaepeuce, *Silene gigantea*, *Stachelina fruticosa*.

HORVAT, GLAVAČ & ELLENBERG (1974) were the first to classify the vegetation of calcareous cliffs of the thermo- and mesomediterranean belts of the Aegean region (Hellas and possibly also western Turkey) as a new order - the *Cirsietalia chamaepeuces* within the *Asplenietea trichomanis*. Using field notes from K. H. Rechinger (see RECHINGER & RECHINGER-MOSER, 1951), HORVAT & al. (1974) listed several woody plants (nanophanerophytes and chamaephytes) as character species of the order, among them the name-giving *Cirsium chamaepeuce* (L.) Ten., known in modern botanical literature (GREUTER, 1973) as *Ptilostemon chamaepeuce* (L.) Less. In addition, HORVAT & al. (1974: 104) compiled the Table 10 based on a manuscript of the late Professor Ivo Horvat. This synoptic table of the *Cirsietalia chamaepeuces* is featuring five new associations representing three new alliances. Glavač and Ellenberg (in HORVAT & al., 1974) were quite convinced about the concept of the new order (in their words: "... zwingen uns zur Aufstellung einer besonderen Ordnung ... *Cirsietalia chamaepeucei* [sic!]..."), and they cited 'Horvat prov.' (obviously referring to Ivo Horvat's bequeathed manuscript) as the author of the name. Because of the preliminary status of the name (art. 3b of the International Code of Phytosociological Nomenclature; WEBER & al., 2000), the name of the order published effectively by HORVAT & al. (1974) remained invalid until today.

EICHBERGER (2001: 167 and onwards) used the names *Cirsietalia chamaepeuces* ('*chamaepeucis*') and *Petromarulo-Centaurion argenteae* with the author citation 'Horvat in HORVAT *et al.* 1974' to classify two of his relevés with *Euphorbia dendroides* from cliff habitats of Crete. Since he failed to designate the nomenclatural types, both syntaxa remained invalidly described.

ZAFFRAN (1990) in his contributions to the vegetation of Crete was apparently unaware of the names suggested by HORVAT & al. (1974) as he did not refer to this iconic vegetation monograph at all. He coined the concept of the *Petromaruletalia pinnatae* ('*pinnati*') to accommodate the cliff vegetation of Crete found at the altitudes spanning

the sea level and ca. 1200 m. Within the *Petromaruletalia pinnatae* he described two alliances, such as the *Scutellarion sieberi* and the *Asterion cretici* ('*creticae*'), for the cliff vegetation of western and eastern Crete, respectively, each comprising several associations. However, as pointed out by DIMOPOULOS & al. (1997) and BERGMEIER (2002), all these syntaxon names coined by ZAFFRAN (1990) should be considered as invalid because no nomenclatural types had been explicitly designated (arts. 5, 8).

We consider the *Petromaruletalia pinnatae* as a part of the *Cirsietalia chamaepeuces*, the former concept being a heterotypic synonym of the latter. Both would require validation, but we focus here on the older (latter) name. As no nomenclatural type was designated for the *Cirsietalia chamaepeuces* either by HORVAT & al. (1974) or later authors, we are choosing here the *Petromarulo-Centaurion argenteae* Horvat in HORVAT *et al.* 1974 as the nomenclature type (see below) of the order.

The plant communities of the *Cirsietalia chamaepeuces* are still poorly known. We believe that new data and revision of this group will reveal new syntaxa and amend the list of the character species.

NOMENCLATORIAL SYNOPSIS AND VALIDATIONS OF THE ALLIANCES

Petromarulo-Centaurion argenteae Horvat in Horvat *et al.* ex Bergmeier, Dimopoulos *et Mucina all. nova hoc loco*

(*Cirsietalia chamaepeuces*, *Asplenietea trichomanis*).

Validated name: *Petromarulo-Centaurion argenteae* Horvat in HORVAT *et al.* 1974 *nom. inval.* (art. 3b) (HORVAT & al., 1974: 104-105).

Holotypus: *Inulo candidae-Celsietum arcturi* Horvat *et al.* ex Bergmeier, Dimopoulos *et Mucina hoc loco* (HORVAT & al., 1974: 104).

Synonym: *Scutellarion sieberi* Zaffran 1990 *nom. inval.* (arts. 5, 8).

Character taxa of the alliance: *Centaurea argentea* subsp. *argentea*, *Ebenus cretica*, *Galium*

fruticosum, *Origanum dictamnus*, *Petromarula pinnata*, *Scutellaria sieberi*, *Stachelina petiolata*.

Here we chose the first of two associations listed by HORVAT & al. (1974: 104) the *Inulo candidae-Celsietum arcturi*, as the typus of the alliance. Five associations were distinguished by ZAFFRAN (1990) and classified within the *Petromarulo-Centaurion argenteae*. These include the *Eryngio ternati-Calaminthetum creticae*, the *Inulo candidae-Asperuletum taygeteae*, the *Teucrio brevifolii-Stachyetum tournefortii*, the *Teucrio cuneifolii-Lutzietum creticae* and the *Teucrio divaricati-Centaureetum redemptae*. All of them are invalidly published (arts. 5, 8), however here we refrain from validating these names since the entire order is in need of profound syntaxonomic revision.

We consider the *Petromarulo-Centaurion argenteae* as being restricted to the cliff vegetation of western Crete, and exclude the *Hyperico amblycalycis-Stachelinetum fruticosae* Horvat in Horvat et al. 1974 of eastern Cretan cliffs which we classify within the *Asterion cretici* (see below).

Asterion cretici Zaffran ex Bergmeier, Dimopoulos et Mucina *all. nova hoc loco*

(*Cirsietalia chamaepeuces*, *Asplenietea trichomanis*).

Validated name: *Asterion cretici* ('creticae') Zaffran 1990 *nom. inval.* (arts. 5, 8).

Hototypus: *Anthemido tomentellae-Stachelinetum fruticosae* Zaffran ex Bergmeier, Dimopoulos et Mucina 2011 (for the validation of the association see below).

Character taxa of the alliance: *Asperula crasula*, *A. tournefortii*, *Aster creticus*, *Campanula pelviformis*, *Galium graecum* subsp. *pseudocanum*, *Hypericum amblycalyx*.

The oldest association, which should be classified within the *Asterion creticae* is the *Hyperico amblycalycis-Stachelinetum fruticosae* Horvat et al. 1974, originally classified within the *Petromarulo-Centaurion argenteae* by HORVAT & al. (1974: 104). The column 2 in Table 10 of HORVAT & al. (1974) features the constancy values of species of the *Hyperico amblycalycis-Stachelinetum fruticosae* and it is based on 11 relevés. No species of *Hypericum* is listed in that column, howe-

ver *Hypericum amblycalyx* is named on the following page 105 of HORVAT & al. (1974), explicitly referring to both the association and the table column.

Here we validate the *Anthemido tomentellae-Stachelinetum fruticosae* Zaffran 1990 (arts. 5, 8) by selecting the relevé 50 in his Table 13 (part of a folder accompanying Zaffran's monograph) as the holotypus of the association.

The following associations belong to this alliance: the *Anthemido paleaceae-Violetum scorpiuroidis* Zaffran 1990 *nom. inval.* (art. 5), the *Anthemido tomentellae-Stachelinetum fruticosae* Zaffran ex Bergmeier, Dimopoulos et Mucina 2011, the *Hyperico amblycalycis-Stachelinetum fruticosae* Horvat et al. 1974 and the *Serratulo creticae-Valerianetum asarifoliae* Zaffran 1990 *nom. inval.* (art. 5).

Capparo-Amaracion tournefortii Horvat in Horvat et al. ex Bergmeier, Dimopoulos et Mucina *all. nova hoc loco*

(*Cirsietalia chamaepeuces*, *Asplenietea trichomanis*).

Validated name: *Capparo-Amaracion* Horvat in Horvat et al. 1974 *nom. inval.* (art. 3b) (HORVAT & al., 1974: 106).

Holotypus: *Cirsio chamaepeuces-Scrophularietum heterophyllae* Horvat in Horvat et al. 1974 (HORVAT & al., 1974: 104-106).

Character taxa of the alliance: *Campanula heterophylla*, *C. reiseri*, *C. rupestris*, *Helichrysum amorginum*, *Inula candida* subsp. *limonella*, *Origanum calcaratum*.

The *Capparo-Amaracion*, coined to comprise north and central Aegean vegetation of calcareous cliffs, has not been validly published by HORVAT & al. (1974) for the same reason as the *Cirsietalia chamaepeuces* (art. 3b). The name-giving species of the *Capparo-Amaracion tournefortii* are *Capparis spinosa* (see Table 10, HORVAT & al., 1974: 104, wrongly applied name for a taxon called *Capparis orientalis* Veill. as understood today; INOCENCIO & al., 2006) and *Amaracus tournefortii* (Aiton) Benth., today known as *Origanum calcaratum* Juss. (syn. *O. tournefortii* Aiton).

The *Cirsio chamaepeuces-Scrophularietum heterophyllae* Horvat in Horvat et al. 1974 is the

only association classified within the *Capparo-Amaracion tournefortii* to date.

Inulion heterolepidis Horvat in Horvat et al. ex Bergmeier, Dimopoulos et Mucina *all. nova hoc loco*

(*Cirsietalia chamaepeuces*, *Asplenietea trichomanis*).

Validated name: *Inulion heterolepidis* ('heterolepis') Horvat in Horvat et al. 1974 *nom. inval.* (art. 3b) (see HORVAT & al., 1974: 104-106).

Holotypus: *Campanulo hagielliae-Inuletum heterolepidis* Horvat in Horvat et al. 1974 (see HORVAT & al. (1974: 104-106).

Character taxa of the alliance: *Alcea apterocarpa*, *Asyneuma giganteum*, *Campanula hagielliae*, *Centaurea lactucifolia*, *Dianthus fruticosus* subsp. *rhodius*, *Inula heterolepis*.

The *Inulion heterolepidis* encompasses plant communities of calcareous cliffs on southeast Aegean islands (HORVAT & al., 1974: 105). The eponymous species of the *Inulion heterolepidis* is *Inula heterolepis* Boiss., an east Mediterranean chasmophyte. The *Campanulo hagielliae-Inuletum heterolepidis*, chosen here as the holotypus of the alliance, is based on relevés from the Dodecanese Archipelago (Rhodes, Samos, Ikaria).

So far two associations have been classified within the *Inulion heterolepidis*, such as the *Campanulo hagielliae-Inuletum heterolepidis* Horvat

in Horvat et al. 1974 and the *Teucrio heliotropifolii-Inuletum heterolepidis* Horvat in Horvat et al. 1974.

Polygonion icarici Horvat et al. ex Bergmeier, Dimopoulos et Mucina *all. nova hoc loco*

(*Cirsietalia chamaepeuces?*, *Asplenietea trichomanis*).

Validated name: *Polygonion icarici* Horvat in Horvat et al. 1974 *nom. inval.* (art. 3b) (HORVAT & al., 1974: 103-104).

Holotypus: *Polygonetum icarici* Horvat in Horvat et al. 1974 (HORVAT & al., 1974: 103).

Character taxa of the alliance: *Campanula samothracica*, *Dianthus elegans*, *Polygonum icaricum*, *Rorippa icarica*.

The *Polygonion icarici* comprises plant communities of Aegean non-calcareous cliffs and might be exclusive to the islands of Ikaria and Samothraki (HORVAT & al., 1974: 103). The eponymous species of the *Polygonion icarici* is *Polygonum icaricum* Rech. fil. The syntaxonomic position of this alliance remains inconclusive. Tentatively, we classify it within the *Cirsietalia chamaepeuces*, being however aware of the fact that the cliff vegetation of siliceous substrates of the Eastern Mediterranean might belong to a new, yet not described order.

So far only one association (the *Polygonetum icarici* Horvat in Horvat et al. 1974) has been classified within the *Polygonion icarici*.

BIBLIOGRAPHY

- Bergmeier, E. — 2002 — The vegetation off the high mountains of Crete - a revision and multivariate analysis — *Phytocoenologia* 32: 205-249.
- Dimopoulos, P., Sýkora, K.V., Mucina, L. & Georgiadis, T. — 1997 — The high-rank syntaxa of the rock-cliff and scree vegetation of the mainland Greece and Crete — *Folia Geobot. Phytotax.* 32: 313-334.
- Eichberger, C. — 2001 — Die Baumartige Wolfsmilch *Euphorbia dendroides* L. Biologie, Ökologie, Pflanzensoziologie und soziokulturelle Stellung einer mediterranen Art — *Diss. Bot.* 344: 1-351.
- Greuter, W. — 1973 — Monographie der Gattung *Ptilostemon* (Compositae) — *Boissiera* 22: 1-215 + 8 plates.
- Horvat, I., Glavač —, V. & Ellenberg, H. — 1974 — Vegetation Südsteuropas — G. Fischer, Stuttgart. 768 pp.
- Inocencio, C., Rivera, D., Obón, C., Alcaraz, F. & Barreña, J.-A. — 2006 — A systematic revision of *Capparis* section *Capparis* (Capparaceae) — *Ann. Missouri Bot. Gard.* 93: 122-149.
- Rechinger K.-H. & Rechinger-Moser, F. — 1951 — *Phytogeographia Aegaea* — *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr.* 105/2: 1-208.
- Weber, H.E., Moravec, J. & Theurillat, J.-P. — 2000 — International Code of Phytosociological Nomenclature. 3rd edition — *J. Veg. Sci.* 11: 739-768.
- Zaffran, J. — 1990 — Contributions à la flore et à la végétation de la Crète — Univ. Provence, Marseille. 615 pp. + 30 tables.

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