

Notes on some species of *Avenula* and *Helictotrichon*

Poznámky k některým druhům rodů *Avenula* a *Helictotrichon*

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Owing to the change of the Code, *Avenochloa* HOLUB 1962 has to be replaced by *Avenula* (DUMORT.) DUMORT. 1868. The typification of the latter is discussed and correct names of infrageneric taxa are established. The illegitimity of *Avenastrum* OPIZ 1852 is demonstrated. Four new species (*Avenula gervaisii*, *A. murcica*, *A. peloponnesiaca*, *Helictotrichon murcicum*) and two new subspecies (*Avenula marginata* subsp. *pyrenaica*, *A. planiculmis* subsp. *angustior*) are described. Notes on taxonomy, nomenclature, diagnostics and chorology are given for 21 taxa of *Avenula* and *Helictotrichon*. Descriptions of *Avenula agropyroides* and *A. argaea* are completed. Nomenclatural problems of *Avenula marginata*, *A. mirandana* and *A. praeusta* are resolved. Relationships of the name *Avena sibthorpii* NYMAN are discussed. Data on the distribution area of *Avenula pratensis* are corrected.

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INTRODUCTION

When preparing an account of *Avenula* for the fifth volume of "Flora Europaea", some new facts came to light supplementing the knowledge of the genus. Three new species have been found in the herbarium material from southern Europe (*A. gervaisii*, *A. murcica*, *A. peloponnesiaca*); to express the variation pattern of *A. marginata* and *A. planiculmis*, two new subspecies have been described. Descriptions of some species could be supplemented on the basis of a more detailed investigation of their original materials (i.e. in *A. agropyroides* and *A. argaea*). The distribution ranges of some species were defined more precisely. The nomenclature of *A. marginata* and *A. mirandana* was found to be in need of a revision. Some further problems have emerged which could not be resolved in time because of lack of literature or insufficient herbarium materials. These problems as well as some suggestions for further investigation are outlined in this paper. Some new facts on *Pseudarrhenatherum* and *Arrhenatherum* (also compiled for "Flora Europaea" by the present author) as well as some further additions to the knowledge of *Avenula* will be published separately.

ON THE NOMENCLATURE OF AVENULA

These problems have been dealt with elsewhere in more detail (HOLUB 1976). They are mentioned here in short, with regard to the necessity to determine the correct names of infrageneric taxa. For the species group of *Helictotrichon* s. l., belonging in an earlier classification (HOLUB 1958) to the subgenera *Pratavenastrum* and *Pubavenastrum*, the present author (HOLUB 1962) proposed a new genus *Avenochloa*. On the basis of the change of Art. 63 of the Code accepted by the XII International Botanical Congress in Leningrad in 1975, this correct generic name, corresponding, at the time of its publication, to all rules of the Code, has to be replaced by *Avenula* (DUMORT.) DUMORT. 1868, in spite of the fact that DUMORTIER's generic name is taxon-

omically entirely identical with the earlier *Helictotrichon* BESS. 1827. *Avenula* was first used as a name of a section — *Trisetum* sect. *Avenula* DUMORT. 1824 — and because of the geographical limitation of DUMORTIER's publication (covering Belgian grasses only), it did not include the future lectotype of *Helictotrichon* BESS. 1827. However, when *Avenula* was raised to the generic rank in 1868, it combined the type species of *Helictotrichon* and corresponded by its circumscription fully to *Helictotrichon* BESS. 1827. If *Helictotrichon* s. l. is divided — according to the entirely different anatomical structure of basal leaves — into two genera, then with regard to the change of the text of the exception included in Art. 63 of the Code (earlier effective only for combinations, not for generic names!), *Avenula* (DUMORT.) DUMORT. 1868 — with regard to its type species (whether *A. pratensis* or *A. pubescens*) — is the correct name for *Avenochloa* HOLUB 1962.

Trisetum sect. *Avenula* DUMORT. 1824 included two species only — *T. pratense* (L.) DUMORT. = *Avena pratensis* L. 1753 and *T. pubescens* (HUDS.) DUMORT. = *Avena pubescens* HUDS. 1762. The latter species was confidently selected by HOLUB et POUZAR (1967) as the lectotype of the taxon in question and as the type of the generic name *Avenula* (DUMORT.) DUMORT. 1868 as well. Soon after this typification CVELEV (1968) typified DUMORTIER's section by *Avena pratensis* L. 1753. However, the lectotypification by HOLUB et POUZAR (1967) was preceded by one proposed by BREISTROFFER (1966 : 67), who — without any further details — selected *Avena pratensis* L. 1753 as the lectotype of *Avenula* (DUMORT.) DUMORT. 1868. No earlier typification is known to me and therefore that by BREISTROFFER has to be accepted as correct, with regard to its priority. This typification influences the names of infrageneric taxa. *Avenula* divides into two basic groups, which — regarding their considerable differences — must be classified as subgenera. Each of the two species of the original conception of *Trisetum* sect. *Avenula* DUMORT. 1824 belongs to an other subgenus. When BREISTROFFER's lectotypification is accepted, the type subgenus (and the type section as well) is by far the largest, including — in the present classification — all species of *Avenula* except for *A. pubescens*, belonging to the group *Pubavenastrum*, and *A. jahandiezii*, whose taxonomic position is not clear. For the second subgenus the subgeneric epithet "*Pubavenastrum*" has to be used. The type subgenus — subgen. *Avenula* — consists of three sections, of which two are monotypical (sect. *Scleravenastrum*, sect. *Brevitrichon*), while the type section includes the majority of the species of *Avenula*. The correct names for the infrageneric taxa have been proposed in my earlier paper (HOLUB 1976), in which, however, the typification by HOLUB et POUZAR (1967) was still considered valid (correction made during the print, see p. 291).

With respect to Art. 7 of the 1972 Code, the typification of *Trisetum* sect. *Avenula* DUMORT. 1824 influences also the typification of *Avena* sect. *Avenastrum* KOCH 1837. Regarding the inclusion of both syntype species of DUMORTIER's section *Avenula* into KOCH's *Avena* sect. *Avenastrum*, the latter is a nomenclaturally superfluous name and because it was not typified by its author at the time of its publication, its type must be the lectotype of the section *Avenula*. KOCH should have proposed the name "*Avena* sect. *Avenula*" for his taxon. As a result of BREISTROFFER's typification of the section *Avenula*, *Avena pratensis* L. 1753 becomes the type of *Avena* sect. *Avenastrum* KOCH. The typification of the KOCH's taxon by HOLUB et POUZAR (1967)

proposed in accordance with the earlier rules of lectotypification (when the concept of a forced typification was not included in the Code), aimed at typification of this taxon by the same type as was that of *Helictotrichon* BESS. 1827, because their taxonomic circumscriptions were identical. Under provisions of the present Code, this lectotypification has to be abandoned.

The generic name *Avenastrum* OPIZ 1852 is based on the name of KOCH's section by an indirect reference. With respect to the new typification of KOCH's taxon a question arises, whether OPIZ's generic name cannot be considered as the correct name instead of *Avenula* (DUMORT.) DUMORT. 1868. The name *Avenastrum* OPIZ 1852 has been discussed in more detail by HOLUB et POUZAR (1967) and its use was rejected. With respect to its dependence on KOCH's section *Avenastrum*, OPIZ's generic name is taxonomically entirely identical with *Helictotrichon* BESS. 1827, the nomenclatural type of the latter being included in KOCH's section. The difference in the present taxonomic classification of types of *Avenastrum* OPIZ (type: *Avena pratensis* L. — *Avenula*) and *Helictotrichon* BESS. (type: *Avena sempervirens* VILL. — *Helictotrichon*) is of no consequence, because the changed text of Art. 63 of the Code cannot be used, OPIZ's new generic name being based on the illegitimate name of KOCH's section. The illegitimacy of the name of the KOCH's section is twofold, because it is a later homonym of *Avena* sect. *Avenastrum* DUMORT. 1824 and is superfluous with regard to sect. *Avenula* DUMORT. 1824 (sub *Triseti*).

NEW TAXA IN AVENULA

1. *Avenula gervaisii* HOLUB, sp. nova

Plantae caespitosae; innovationibus mixtis; culmis 50—80 cm altis, 1—2 mm in diametro, scabriusculis; nodis violaceis; foliis basalibus 10—40 cm longis, ad 1/4—1/2 culmi attingentibus, arcte conduplicatis, siccitate 0,6 mm in diametro, vel rarius planis et 1,5—2 mm latis, glaucescenti-viridibus, siccis non spiralter tortis, extus convexis et sulcatis, in marginibus cartilagineis, in pagina superiore atque inferiore breviter pubescentibus, cum 8—12 nervibus lateralibus instructis, in sectione transversali rotundatis vel late ellipticis; foliis culmeis apice cartilagineis; folio culmeo supremo 3—8 cm longo, patente, spiralter non torto; vaginis scabris, tota longitudine glabris, eis foliorum basalium cinereo-subviolaceis; ligulis acutis, eis foliorum basalium 1,5—3,5 mm, eis foliorum culmeorum 4—7 mm longis; panicula 10—22 cm longa, lineari, densa, e (6—)13—21 (—27) spiculis composita; rhachidi et ramis scabris vel laeviusculis; pedicellis brevibus, apice incrassatis; spiculis (aristis exclusis) 18—30 mm longis, lineari-oblongis, e 7—9 floribus compositis, viridi-stramineis, numquam violaceis; internodio rhachillae (primo) 1,5—2,5 mm longo apicem versus non incrassato, glabro vel rarius cum pilis singularibus instructo; pilis calli (primi vel secundi) 0,5—1 mm longis, albis, basim lemmatis non vel vix superantibus; gluma inferiore 10—12 mm, superior 12—16 mm longa; lemmate (floris primi vel secundi) 12—15 mm longa, pallide viridi, ad apicem late albide scariosa, in 1/3 inferiore disperse sericea, margine glabro vel ciliato, in pagina dorsali non striata, apicem versus a 2/3 sat subito angustata, in apice subtruncata, breviter bifida et a nervibus duobus excurrentibus bisetosa; arista 15—22 mm longa, in parte inferiore atrofusca; palea 10—12 mm longa, angusta, lanceolata; antheris c. 5 × 0,9 mm magnis.

Typus: HUTER, PORTA, RIGO, ex itinere hispanico 1879, No 147; *Avena bromoides* GOÜ., fl. hisp. I. 69; Regnum Granatense, in collibus aridis circa Malaga, supra Torre S. Elmoeti, 2—300 m; 3.—11. Majo; PR, s. n. (planta major).

Isotypes: Two sheets from the same exsiccata collection with the same number deposited in PRC.

Etyymology: The new species is dedicated to Dr. C. Gervais (Saint-Foy, Quebec), who studied the problems of species in *Avenula* in detail and contributed substantially to the knowledge of the genus, especially from the viewpoint of cytotaxonomy.

By the anatomical structure of basal leaves, this species is referred to the group of taxa related to *A. bromoides* (GOÜAN) H. SCHOLZ. On the cross-section, the sclerenchyma between the carinal

and marginal sclerenchymatic groups (designated as lateral sclerenchyma in this paper) is represented in the outer side of each half of a leaf by 4—7 small groups, not connected by sclerenchyma or colourless parenchyma with opposite vascular bundles. Distinct stomatiferous furrows are present on the under-side of the leaves between the groups of the lateral sclerenchyma. The group of the carinal sclerenchyma is not much bigger than groups of lateral sclerenchyma. Four main and three secondary vascular bundles are usually present on each side of the mid-vein. The outline of the cross-section is \pm circular to shortly oval, without a distinct keel. The epidermis of both leaf surfaces is covered with relatively numerous hairs.

A. gervaisii differs from *A. bromoides* (GOÜAN) H. SCHOLZ in having basal leaves deeply sulcate and convex outside (o-shaped on cross-section), a well developed uppermost cauline leaf 3—8 cm long, spikelets 18—30 mm, lower glumes 10—12 mm, upper glumes 12—16 mm, lemma 12—15 mm and the palea 10—12 mm long. *A. bromoides* has basal leaves not distinctly sulcate beneath, with parallel surfaces (V-shaped on cross-section), upper cauline leaf short, 0.2—1.5 cm long, spikelets normally 12—20 mm, lower glume 6—9 mm, upper glume 8—11 mm, lemma 8—13 mm and palea 7—11 mm long.

From *A. cincinnata* (TEN.) HOLUB, *A. gervaisii* differs by the convex outer sides of basal leaves, the uppermost cauline leaf 3—8 cm long, shorter callus-hairs (only 0.5—1 mm long) and by the lemma tapering to the top in its upper two thirds. In *A. cincinnata* both surfaces of basal leaves are \pm plane and parallel to each other, the uppermost cauline leaf being 0.5—3 cm long, callus-hairs c. 1.5 mm long and the lemma tapering to the top in its upper half.

From *A. pruinosa* (BATT. et TRABUT) HOLUB, *A. gervaisii* differs by the absence of stolons, uppermost cauline leaf 3—8 cm long, longer ligules (1.5—3.5 mm in basal, 4—7 mm in upper cauline leaves), shorter upper glume (12—16 mm) and shorter lemma (12—15 mm) tapering to the top in its upper two thirds. *A. pruinosa* is stoloniferous, the uppermost cauline leaf is c. 1.5 cm long, ligules in basal leaves 1—2 mm, in upper cauline leaves 3—4 mm long, upper glume 17—20 mm and lemma 14—18 mm long, tapering to the top in its upper half.

Two taxa described by SAINT-YVES (1931) from South Spain are very closely related to and may prove identical with the new species; they are *Avena bromoides* subsp. *australis* var. *strigilosa* HACK. ex ST.-YVES, Candollea 4 : 482, 1931 and var. *filifolia* subvar. *iberica* ST.-YVES, l. c. 481. The tetraploid and hexaploid races of *A. bromoides*, described by GERVAIS (1973) from South Spain, are also similar to *A. gervaisii*; especially the hexaploid seems to be very closely related to it. However, with regard to some differences in certain characters (see below), the new species cannot be fully identified with this cytotype. Further investigation of its variation range and karyology is required.

The distribution of this species is limited to the southernmost part of Spain (vicinity of Malaga). Therefore its occurrence in the adjacent Morocco cannot be excluded.

2. *Avenula murcica* HOLUB, sp. nova

Plantae caespitosae, humiliores, gracillimae, innovationibus inferne subbulbose incrassatis, tunica straminea ad basim instructae; culmis 30—45 cm altis, gracilibus, 0,5—1 mm in diametro; nodis 1—2, nudis, atroviolaceis; foliis basalibus brevibus, 2—7 cm longis, setaceis, arcte conduplicatis, numquam planis, siccitate 0,3—0,4 mm in diametro, ad 1/10—1/6 culmi attingentibus, siccis spiraliter non tortis, extus asperrimis, in marginibus tenuiter et non conspicue cartilagineis, ecarinatis, in sectione transversali rotundatis, extus convexis; vaginis foliorum culmeorum scabris; folio culmeo supremo 0,3—0,9 cm longo, arcte conduplicato, non spiraliter torto, sub-

patente, breviter acuto; ligulis acutis, eis foliorum basialium 0,5—1 mm, eis foliorum culmeorum 1—2 mm longis; panicula spiciformi, lineari, simplici, ramis secundariis destituta, e 2—8 spiculis composita; pedicellis 1 mm longis; spiculis c. 14—15 mm longis, ellipticis, pallide stramineis; internodio rhachillae (primo) 1,5—2 mm longo, apicem versus dilatato, glabro; pilis calli (primi vel secundi) 0,8—1 mm longis, basim lemmatis brevissimae superantibus; glumis lemmatibus superpositis conspicue brevioribus, inferiore 7—8 mm, superiore c. 9 mm longis; lemmate 9—10 mm longa, in pagina dorsali punctulate asperrima, in parte inferiore laxiuscule sericea, non indurata neque striata, a 2/3 sat subito angustata, in apice rotundato-truncata et irregulariter 3—4-denticulata; nervibus lemmatis marginem eae superum attingentibus; arista c. 15 mm longa, in parte inferiore purpureo-fusca; palea c. 7 mm longa, angusta, in carinis ab aculeolis dense ciliata; antheris c. 4 mm longis.

Typus: PORTA et RIGO, Iter II. Hispanicum 1890 [s. n.]; *Avena bromoides* GOUËN; Murcia, Sierra Fuensanta, et Cabo de Gata, Majo; PR, s. n.

Further materials: PORTA et RIGO, Iter II. Hispanicum 1890, No 301; *Avena bromoides* GOUËN. β *microstachya* Wk.; Murcia, in pascuis argillosis prope Lorca, sol. schistoso, 300—400 m s. m., Majo. (PR, PR).

Etymology: The specific epithet is derived from the name of the Spanish province of Murcia, from where the species was described.

By the arrangement of lateral sclerenchyma in groups not connected with the opposite vascular bundles, *A. murcica* comes very close to *A. bromoides* (GOUËN) H. SCHOLZ. The basal leaves are \pm circular or oval-circular on cross-section, the outer surface of their halves is distinctly convex, the inner surfaces are closely pressed together. Stomatiferous furrows are well distinguishable in the outer side of basal leaves between lateral sclerenchymatic groups. The sclerenchymatic group below the mid-vein is flat and does not form a distinct keel of the leaf. Lateral sclerenchymatic groups on the upper surface of the leaf are absent or nearly absent. The epidermis of the upper surface is hairy, that of the lower surface is covered by prickelets, making the leaves scabrous. Except for the mid-vein, there are usually four main and three secondary vascular bundles in each half of the leaf. Bulliform cells are very small, functionless and the leaves are permanently closed.

By its distinct small and slender habit, this new species compares only with *A. bromoides* (GOUËN) H. SCHOLZ. It differs by its basal leaves 0.3—0.4 mm in diameter, not spirally twisted when dead, having only an indistinct cartilaginous margin, a very convex outer surface and lacking a keel beneath at the mid-vein. Basal leaves of *A. bromoides* are 1.5—3 mm wide, spirally twisted when dead, having a distinct (sometimes very thick) cartilaginous margin, plane and \pm parallel surfaces and a distinct keel. These characters render it possible to distinguish the new species safely from nanomorphoses of *A. bromoides*, which are habitually very similar to it.

At present, *A. murcica* is known only from the province of Murcia in southeastern Spain (and perhaps from the province of Almeria because the locality Cabo de Gata is mentioned on the label of the type sheet). It may represent an endemic of this region, but only a more detailed investigation of the flora of NW. Africa can confirm this conjecture.

3. *Avenula peloponnesiaca* HOLUB, sp. nova

Plantae cum stolonibus subterraneis longis instructae; culmis 50—80 cm altis, rigide erectis, 1,5—2 mm in diametro, laevibus; nodis fusciscentibus; foliis basalibus c. 15 cm longis, ad 1/5—1/4 culmi attingentibus, marginibus albide cartilagineis serratisque; vaginis foliorum culmeorum fere laevibus; folio culmeo supremo 0,5—2 cm longo, ad culmum \pm adpresso; ligulis acutis, glabris, eis foliorum basialium c. 3 mm, eis foliorum culmeorum superiorum 4—5 mm longis; panicula lineari, stricta, spiciformi, subsimplici vel simplici, e 6—15 spiculis composita, ramis nodorum inferiorum in paniculis amplioribus duobus, 0,5 mm in diametro, brevissimis, primariis 1—2-spiculatis, secundariis unispiculatis; spiculis grandibus, (20—) 25—30 mm longis, anguste oblongis vel ellipticis, e 7—9 floribus compositis; internodio rhachillae (primo) usque 3 mm longo, glabro vel rarius in parte superiore cum pilis a callo superposito subdecurrentibus; pilis calli (primi vel secundi) 1—1,5 mm longis, albis, basim lemmatis \pm attingentibus; cicatrice ovali; gluma inferiore 11—12 mm, superiore c. 15 mm longa; lemmate c. 15 mm longa, glabra, flavescenti-iridis; apicem versus a 2/3 angustata, in apice subtruncata, breviter bifida vel irregulariter denticulata;

arista c. 21—22 mm longa; palea 10—12 mm longa, lata, acuta, in carinis ciliata; lodiculis 2,5—3 mm longis, ovario longioribus; antheris 6—8×0,5—0,7 mm magnis.

Typus: Thom. PICHLER, Pl. Graecae Exsicc.; *Avena pratensis* L. var. *taygetea* HELDR.; Morea, in aceros mts. Taygetos; PRC, s. n.

Further materials: ORPHANIDES, Fl. Graecae Exsicc., No 956; *Avena pratensis* cum spiculis majoribus (an species propria ?), in mt. Malevo Laconiae prope Hajos Joannis (rare), alt. 3000'; Fl. Jun.—Jul.; 6.—18. Jun. 1852; leg. Orphanides; (PR). — HELDREICH, Herb. Graecum Normale, No 1589; *Avena Sibthorpii* NYM.; Laconia, in m. Taygeti regione abietina, in faucibus Langada, l. d. Maeria Murga, in saxosis; 22. Jul. 1889; (PRC, PR).

Etymology: The specific epithet is derived from the distribution area of the new species; it represents very probably a Peloponnesian endemic.

The anatomical structure of basal leaves of this species corresponds fully to that of *A. cincinnata* (TEN.) HOLUB (for an illustration of the latter, see SAINT-YVES 1931 : 478), with which the new species has also been confused. In fact it is very closely allied to it, but it differs by its long stolons, more robust stem 1.5—2 mm in diameter, larger spikelets (20—)25—30 mm long and with 7—9 florets, an oval cicatrice, lemma tapering to the top in its upper two thirds, subtruncate at the apex, a broad palea and by anthers 6—8 mm long. *A. cincinnata* is caespitose, without distinct stolons, with stems rather slender, c. 1 mm in diameter, spikelets 18—24 mm long, containing 5—7 florets, cicatrice narrowly elliptical, lemma tapering to the top in its upper half, distinctly bifid at the apex, palea narrow and anthers 5—6 mm long.

At present, *A. peloponnesiaca* is known only from two mountain ranges in the southern part of Peloponnese — Taygetos and Malevon.

4. *Avenula marginata* (LOWE) HOLUB subsp. *pyrenaica* HOLUB, subsp. nova

Plantae caespitosae; innovationibus mixtis, ad basim subbulbose inerassatis; vaginis foliorum basialium emarcidis tunicam stramineam efficientibus; culmis 20—40 cm altis, 1 mm in diametro, gracilibus, laevibus, nodo uno, fusco instructis; foliis basalibus brevibus, latis, lineari-ensiformibus, 2—6(—13) cm longis et 1,5—3 mm latis, ad 1/10—1/6 culmi attingentibus, planis vel laxe conduplicatis, tantum subrigidiusculis, viridibus, cum 14—22 nervibus lateralibus instructis, in margine flavescenti-viridescenti cartilagineis et serratis, apice subcucullatis, carina laevi; vaginibus foliorum culmeorum laevibus; folio culmeo supremo brevissimo, 0,2—0,7 cm longo, quandoque quam ligula breviori, apice subacute, naviculari; ligulis acutis, eis foliorum basialium 1—2 mm, eis foliorum culmeorum superiorum 4—6 mm longis; panicula 6—10 cm longa, e 3—16 spiculis composita, lineari vel oblonge lineari, rhachidi inferne laevi, superne scabro; ramis in nodis singularibus vel duobus, 0,5—1,5 cm longis, primariis secundariisque spiculam unam ferrentibus; pedicellis superne inerassatis; spiculis 12—17 mm longis, viridi-infuscatibus; internodio rhachillae (primo) 1,5—2 mm longo, arcuato, ad apicem non dilatato, tantum in parte superiore pubescente a pilis 1,5—2 mm longis; pilis calli (primi vel secundi) 1 mm longis, infuscatibus vel albidis; cicatrice ovali; glumis et lemmatibus punctulate scabris; glumis lemmatibus superpositis conspicue brevioribus, acutissimis, in parte inferiore subviolaceis, gluma inferiore 7—9 mm, superiore 10—11 mm longa; lemmate 9—10 mm longa, pagina dorsali moderate sulcata, glabra, in parte inferiore infuscata vel fusca, indurata, conspicue nervata, apice bifida et a nervibus excurrentibus bisetosa; palea c. 7 mm longa, lata, infuscato-albida, in carinis ab aculeolis ciliata; antheris 3,5—4 mm longis; ovario densiuscule infuscate pubescente; caryopside c. 5×0,6 mm magno.

Typus: Dr. C. BAENITZ, Herbarium Europaeum, No [s. n.]; *Avena sulcata* GAY; Gèdre (Hautes Pyrénées); Tertre du Turon, 1050 m; 7. 84; leg. Bordère; PR, s. n.

Isotypes: Two sheets from the same exsiccata collection deposited in PRC.

Further materials: BORDÈRE, Flora Pyrenaica; Tertres à Gèdre, H. P.; Julio 1882; com. A. Toepffer; PR. — Gèdre, Htes Pyr.; Juillet 1884; Bordère; PR. — Gèdre, Ht. Pyr.; aout 1864; Bordère; PR. — Gèdre, Htes. Pyrénées; 1873; Bordère; PRC.

The type subspecies, subsp. *marginata*, occurring in lower altitudinal belts in Western Europe, has stems 40—100 cm high, 2—3 mm in diameter; basal leaves (5—)10—25(—40) cm long, 2—5(—8) mm wide, greyish green,

reaching $1/5-1/3$ of the stem, with 20–28 lateral veins; uppermost cauline leaf 0.5–2 cm long, longer than its ligule; panicle 7–20 cm long, with 12–36 spikelets; hairs of lower rhachilla-segments 2–3 mm long; cicutrice elliptical; lower glume 9–12 mm, the upper 12–15 mm long; lemma 10–13 mm long, deeply sulcate in the dorsal side; anthers 4–6 mm long.

At present, subsp. *pyrenaica* is known only from the vicinity of Gèdre, Dept. Hautes Pyrénées (see above). The material was collected in various years and is rather uniform from the morphological viewpoint. The occurrence in the Spanish side of the Pyrenees is probable. Mountain plants of *A. marginata* require further study. Plants habitually similar to subsp. *pyrenaica* were seen by the present author from the Cordillera Cantabrica in Prov. Leon ("pâturages alpestres près du Combento de Arvas, prov. de Léon; 1864 Bourgeau" PRC). It should be pointed out that the original (nomenclaturally invalid) concept of *Avena sulcata* J. GAY (a name generally used for *A. marginata*), refers to a mountain type, as it was described on the basis of material collected by DURIEAU in Port de Leitariegos and Pic d'Arvas (cf. LACAITA 1929) in the mountains between the provinces Asturia and Leon. The latter locality is near to (or perhaps identical with) that quoted above.

5. *Avenula planiculmis* (SCHRAD.) CHMELITSCHKE et SAUER subsp. *angustior* HOLUB, subsp. nova

Plantae subglaucescentes; culmis 30–80(–100) cm altis, 2–2,5 mm in diametro, scabris; foliis basalibus 4–8 mm latis, subcinereo-viridibus, scabris; panicula 7–23 cm longa, e 10–35 spiculis composita, simpliciore, nodis eae inferioribus tantum cum ramis duobus instructis; ramis primariis 1–3-spiculatis, secundariis inspiculatis; spiculis 15–25 mm longis.

Typus: Podkarpatská Rus; průrvy pod Bliznici; 17. VIII. 1929; PRC, s. n. [= Ucrania Transcarpatia; locis saxosis sub monte Bliznica; leg. M. Deyl].

This taxon occurs in the Carpathians (especially Eastern) and in the Balkan Peninsula (in the Illyrian mountain ranges in its northwestern part and in Bulgaria — Vitoša Mts.).

The type subspecies — subsp. *planiculmis* — occurring in the East Sudeten Mts. and in the West Carpathians has more robust stems (60–120 cm high and thicker), basal leaves 6–12 mm wide, deep green, panicle 13–26 cm long, compound, with 15–40(–55) spikelets, lower panicle-nodes with 2–3 (or very rarely more) branches, the primary ones having 2–4 spikelets and spikelets 20–30 mm long.

Certain difficulty may be encountered in distinguishing subsp. *angustior* from planiculmoid types of *A. praeusta* (REICHENB.) HOLUB. In addition to somewhat wider basal leaves (4–8 mm) and greater number of lateral veins (16–24), *A. planiculmis* has panicle often interrupted in its lower part (the lowest node is somewhat separated from the next superimposed one) and lemmas usually brown and indurated in their lower half. *A. praeusta* has relatively narrow basal leaves (2–6 mm), fewer lateral veins in basal leaves (12–20) and panicle normally compact, not interrupted below; lemmas are pale and only slightly indurated in their lower half.

BRIEF NOTES ON SOME SPECIES OF *AVENULA*

1. *Avenula aetolica* (RECH. f.) HOLUB

This species is known only from two localities in Central Greece, whence it was described (Aetolia, Mt. Korab; Evritania, Mt. Veluchi — RECHINGER 1936). In PRC a sheet (s. n.) was found, originating from the mountain range Pindhos in Greece (C. HAUSSKNECHT, Iter Graecum

1885; *Avena australis* PARL.; *Agrapha* (*Dolopia* *veterum*); in reg. super. Pindi montis Karava, alt. 5500', substratu schistoso; dieb. 1.—3. Jul.) and containing plants somewhat similar to *A. aetolica*. In comparison with the original description of *A. aetolica*, the plants from Pindhos are higher (50—60 cm), laxly caespitose, with basal leaves not rigid, ligules only 3,5 mm long and panicle up to 10 cm long, oblong-linear. Ecological conditions in this locality (schistaceous substratum) differ somewhat from those of the type locality of *A. aetolica* (calcareous serees). A more detailed study is needed.

2. *Avenula agropyroides* (BOISS.) HOLUB

This species is very rare and known only from one collection made by SPRUNER in the region of Argolis (NW. Peloponnese) in 1841. This original material (G-BOIS; W), represented in each of these herbaria by one single plant collected before florescence, was studied by the present author. In spite of the scarcity of the material, its specific distinction could be confirmed. Therefore *A. agropyroides* was accepted as a distinct species in my account of *Avenula* for "Flora Europaea". Because BOISSIER's description (Diagn. Plant. Nov. Orient. 2/13 : 50, 1853) is incomplete (it does not mention the many characters important in the present classification of *Avenula*, especially quantitative and anatomical) and because later descriptions (HALÁCSY Consp. Fl. Graec. 3 : 317, 1904; HAYEK Prodr. Fl. Penins. Balcan. 3 : 316, 1933) are fully dependent on BOISSIER's original description, more detailed data on *A. agropyroides* are given in the following text:

Plants caespitose. Stems 35—50 cm high, slender, 1—1.5 mm in diameter. Basal leaves short, 3—8 cm long, reaching 1/6 of the stem, only slightly rigid, brownish cartilaginous in the margin (perhaps due to the old age of the gathering), with a cartilaginous hood at apex; keel smooth; the uppermost cauline leaf c. 1.5 cm long, patent. Ligules of basal leaves 1.5 mm, those of the upper leaves 4 mm long, all acute. Panicle narrow, simple, linear in outline, with 8—9 spikelets; panicle branches singular from each node, with one spikelet only, c. 0.8 cm long, 0.3 mm in diameter, smooth, thickened below the spikelet. Spikelets 15—18 mm long, lanceolate, greenish (later perhaps somewhat brownish). Lower rhachilla-segments 2.5—3 mm long, glabrous, not dilated to the top; callus-hairs white, 1 mm long, somewhat exceeding the base of the superimposed lemma. Upper glume as long as its superimposed lemma. Lemma c. 14 mm long, in the lower part silky hairy, pale greenish to pale brownish, in the lower part moderately indurated, distinctly veined, slightly sulcate, gradually tapering to the top in its upper half, shortly bifid at the apex; awn 15—20 mm long, arising in the middle of the lemma. Palea 9 mm long, relatively wide, slightly brownish, much shorter than the lemma.

By the anatomical structure of its basal leaves, this species is very similar to *A. cincinnata* (TEN.) HOLUB. Lateral sclerenchyma is in small groups (three to four on the outer side and three on the inner side of each half of the leaf, the latter being much smaller than the first). All groups are separated from the opposite vascular bundles by chlorenchyma. On the outer side of basal leaves furrows (sometimes rather indistinct) may be found between the groups of the lateral sclerenchyma. The keel at the mid-vein is not very distinct.

A. agropyroides is closely related to *A. cycladum* and to *A. cincinnata*. From *A. cycladum* (RECH. f. et SCHEFFER) GREUTER it differs by its basal leaves being less stiff, unequal ligules (those of the upper leaves are longer than those of the basal leaves), glabrous rhachilla-segments and lemma silky hairy in its lower half. *A. cycladum* has very stiff basal leaves, all ligules \pm of the same length, rhachilla-segments hairy in their upper part and lemma completely glabrous on its dorsal side.

From *A. cincinnata* (TEN.) HOLUB, *A. agropyroides* differs by its shorter basal leaves (3—8 cm long), simple panicle, shorter spikelets (15—18 mm long) and lemma silky hairy in its lower half. *A. cincinnata* has longer basal leaves (10—15 cm long), panicle more compound (with secondary branches from lower nodes) and with more spikelets, larger spikelets (18—24 mm long) and lemma glabrous on its dorsal side.

3. *Avenula argaea* (BOISS.) HOLUB

This species is known only from the original gathering: B. BALANSA, Pl. d'Orient 1856, No 847; *Avena pratensis* L.; Région alpine du Mont-Argée (Cappadoce), vers 1200 metres d'alt.; 9 Juillet. Because neither BOISSIER (Fl. Orient. 5 : 546, 1884) nor SAINT-YVES (1931) described this species fully, a more detailed description is given here, based on the original material from BOISSIER's herbarium (G-BOIS).

Plants laxly caespitose to shortly stoloniferous; non-flowering shoots extravaginal; sheaths of basal leaves undivided relatively high up. Stems 35—45 cm high, 1—2 mm in diameter, slightly scabrous above; nodes dark brown. Basal leaves narrow, 0.7 mm wide, lower cauline leaves 1.5—3 mm wide, perhaps glaucescent, with a very thick cartilagineous margin, serrate; the uppermost cauline leaf long (up to 7 cm), spirally twisted. Ligules in basal leaves 1 mm, in lower cauline leaves up to 4 mm, in upper cauline leaves up to 10 mm long. Panicle 7—9 cm long, narrowly oblong, somewhat dense, \pm simple, composed of 8—16 spikelets; branches single or two from a node, scabrous. Spikelets 17—19 mm long, composed of c. 4 florets, brownish, without a distinct violet coloration. Glumes 3—5-veined, shiny, indurated in the lower part, hyaline and membranous in the upper part, as long as or longer than their superimposed lemmas, the lower 12—13 mm long, subobtusate to shortly acute, the upper 14—16 mm long. Rhachilla segments (between the first and the second floret) c. 2 mm long, slightly hairy in the upper half, hairs white, 0.7 mm long; callus-hairs 1.5—2 mm long, distinctly exceeding the base of the superimposed lemma; cicatrice elliptical-oblong. Lemma 12—13 mm long, indurated, dull, scabrous, distinctly veined, with veins reaching up to its upper margin, subobtusate, slightly bifid at apex, and with two wide, short, indistinct (not setaceous) teeth at the top; awn c. 17 mm long. Palea c. 8 mm long, broad, shortly and obtusely emarginate at the apex. Anthers 3—4 mm long, suffused with violet.

The distribution of this species is to be investigated. Only study of a plentiful material can elucidate its variation range and its relationships to *A. adzharrica* (ALBOFF) HOLUB, occurring in the Adjarian region of Transcaucasia. The conspecific identity of these two taxa seems to be probable.

4. *Avenula blavii* (ASCHERS. et JANKA) CHMELITSCHek et SAUER

This is an endemic species of the Illyrian mountains. Problems may arise in distinguishing it from *A. pratensis*, especially from plants with narrow, long and convolute basal leaves. The two species seem, however, to replace each other geographically (see note on *A. pratensis*).

An entirely unclear taxon belonging perhaps here is *Avenastrum vierhapperi* ADAMOVIĆ, Rad Jugoslav. Akad. Znan. Umjetn., Ser. Mat. Natur., Zagreb, 195 (52) : 93, 1912 (25. XI. 1912), described from the Mt. Jastrebnica in Crna Gora (Monte Negro). ADAMOVIĆ gave only a very brief description in the Serbian language, mostly concerning characters rather unimportant for the taxonomy of *Avenula*. This species was mentioned neither by HAYEK in his Prodr. Fl. Penins. Balcan., nor by ROHLENA in his summarizing work on the flora of Crna Gora. Following is a translation of ADAMOVIĆ's description into Latin:

Plantae perennes, scabrae; rhizomate ramoso, dense caespitoso; foliis scabris, in margine cartilagineo serratis; culmis laevibus; folio caulino supremo ad basim attenuato; panicula magis compacta, ramis brevibus et densis instructa; spiculis hirsutis; glumis et lemmatibus oblongis, longe attenuatis.

According to ADAMOVIĆ, this species is intermediate between *Avena compacta* Boiss. (= *Danthoniastrum compactum*) and *A. blavii*. From the former it should differ by its habit, scabridity and smaller panicle, from the latter (to which according to ADAMOVIĆ it should be more similar) it is said to differ by lower height, broader leaves and form of glumes and lemmas. Plants corresponding to this description (especially those with hairy spikelets) have not been found by the present author in the plentiful material of *A. blavii* studied hitherto.

5. *Avenula bromoides* (GOÜAN) H. SCHOLZ

This species also occurs in the Islas Baleares but was not reported from there in the monographic study by SAINT-YVES (1931). The locality is as follows: Balearium insula Major, in

collibus caespitos. di Belloes et S. Porta, sol. calcareo, 10—20 m s. m., 1. Junio 1885, leg. Porta et Rigo; PR, PRC.

GERVAIS (1973) distinguished three cytotypes: $2x$, $4x$ and $6x$ ($2n = 14, 28, 42$). However, only the diploid belongs to *A. bromoides* s. s. The other two cytotypes, occurring in Europe only in S. Spain, may be referable to the group *A. gervaisii* HOLUB + *A. pruinosa* (BATT. et TRABUT) HOLUB; however, a safe identification is not possible. The hexaploid is very close to *A. gervaisii* but differs, according to the description given by GERVAIS (1973), by several characters: leaves spirally twisted when dead; the uppermost cauline leaf only 0.1—2 cm long; spikelets only 15—18 mm long.

6. *Avenula cincinnata* (TEN.) HOLUB

This species is known with certainty only from Sicily and S. Italy. Reports from Peloponnese refer to the closely related *A. peloponnesiaca* HOLUB, those from Crete to *A. cycladum* (RECH. f. et SCHEFFER) GREUTER. Occurrence in North Africa is possible but the available data require critical revision. Reports from Balears and the East Pyrenees (PIGNATTI — sec. PAUNERO 1959) are uncertain.

Recently GERVAIS (1973) questioned the specific status of this taxon, especially with respect to its diploid chromosome number which is identical with that of *A. bromoides*; therefore SCHOLZ (1974) classified it as a subspecies of the latter. This classification can hardly be accepted. The two species are related but this relationship cannot justify their treatment as subspecies. The differences concern characters important for the distinguishing of species in *Avenula*. *A. bromoides* has basal leaves non-sulcate beneath, groups of lateral sclerenchyma on the cross-section very small to nearly absent; callus-hairs very short, not reaching up to the base of the superimposed lemma; lemma tapering rather abruptly to the top in the upper third (or in the upper quarter), rotundate-truncate and irregularly denticulate at apex, sometimes silky hairy in the lower part of its dorsal surface. In contrast, *A. cincinnata* has basal leaves distinctly sulcate beneath, groups of the lateral sclerenchyma on the cross-section well developed at least on the outer side of the leaf; callus-hairs longer, reaching or exceeding the base of the superimposed lemma; lemma gradually tapering to the top in its upper half, acute and deeply bifid at the apex, glabrous on the whole dorsal surface. No transitional forms between these two taxa have been seen by the present author. The two taxa are readily distinguishable on the basis of a number of characters and their classification at the species level is quite justified. The other possibility is the unnatural species concept proposed by SAINT-YVES (1931) in which the only natural entities are the varieties.

7. *Avenula cycladum* (RECH. f. et SCHEFFER) GREUTER

This endemic plant from Kikhlades and Crete with an interesting combination of characters — anatomical structure of basal leaves as in the *A. bromoides* agg. and hairiness of rhachilla-segments as in the *A. pratensis* agg. — was distinguished in material from Kikhlades forty years ago. Recently it has been reported from Crete (GREUTER, *Annal. Mus. Goulandris* 1 : 75, 1973).

In connection with this species the problems of the name *Avena sibthorpii* NYMAN Sylloge Europ., 412, 1854—1855 have to be revised. It was proposed as a (somewhat uncertain) "nomen novum" for *Avena caryophyllea* SM. in SIBTH. et SM. Fl. Graec. Prodr. 1 : 67, 1806; Fl. Graeca, 71, tab. 89, 1806, in view of an earlier homonym *Avena caryophyllea* WEBER in WIGG. 1780. SMITH's species was described from the Kikhlades (islet Kimolos); because no other species of *Avenula* is known to occur there, the relationships of *Avena sibthorpii* to *Avenula cycladum* require a careful study. The original description of *Avena caryophyllea* SM. reads as follows: "*Avena spicata*, calycibus octofloris, receptaculis nudis, foliis planis, glabris"; the locality is "In Cimoli insulae cretaeis". An illustration is provided in SIBTHORP et SMITH's Flora Graeca with the following text on page 71: "Hac planta caret herbarium Sibthorpiarum. Ex icone videtur *Avenae pubescenti* et *pratensi* affinis esse, discrepat vero foliis planis, glabris, glaucescentibus, flosculis numerosioribus, receptaculis, sive rhachibus partialibus, nudis, nec pilosis". This taxon is usually identified with *Avena australis* PARL. (= *Avenula cincinnata* in our classification). Because of the short description, the taxonomic identification of *Avena sibthorpii* is — in spite of the relatively detailed drawing — rather difficult. The drawing may not be correct, however. This may be inferred from a neglected note by SMITH (1811 : 336—337). With respect to its importance (not only for *Avena caryophyllea*), it is quoted here in its entirety:

"That was one of the few Greek grasses, drawn by Mr. Ferdinand Bauer, of which I could find no specimen in Dr. Sibthorp's herbarium. I was therefore obliged to take their specific characters from the drawings; and I did so with confidence, having had such frequent experience of the fidelity of this excellent artist. The rhachis of the *Avena* being delineated quite smooth, and that part having been resorted to by Linnaeus in this genus for his specific differences, I seized upon it, in conjunction with the greater number of florets to establish a specific character. But I have lately discovered specimens of this grass, along with most, if not all, of the other of the Flora Graeca that were in the same predicament, quite out of their places, confounded amongst a heap of rubbish, which I had supposed not to belong to the Greek herbarium at all. Thus then I am enabled to have recourse to Nature herself, and I find the rhachis is actually hairy, exactly in the peculiar manner of that of *A. pratensis*, the greater number of florets, being about double, constituting the only distinctive character of the *caryophyllea*; for its leaves are rough-edged and scarcely less involute than those of *pratensis*".

Whether the plants found by SMITH were really the factual model for the drawing discussed, remains not quite certain.

The drawing and the description of *Avena caryophyllea* may be compared with the following species of *Avenula* occurring in the southern part of Balkan Peninsula and in adjacent regions: *A. compressa* (HEUFF.) CHMELITSCHK et SAUER, *A. agropyroides* (BOISS.) HOLUB, *A. cycladum* (RECH. f. et SCHEFFER) GREUTER, *A. aetolica* (RECH. f.) HOLUB, *A. cincinnata* (TEN.) HOLUB and *A. peloponnesiaca* HOLUB. *A. agropyroides* may be omitted because of the small number of florets per spikelet (c. 4) and lemma silky hairy in the lower third; *A. cycladum* because of the small number of florets per spikelet (3—5) and hairiness of rhachilla-segments; *A. cincinnata* because of the lemma tapering to the top in its upper half. The drawing and the original description of *Avena sibthorpii* (without considering SMITH's later correction) correspond largely either to *A. compressa* or to *A. peloponnesiaca*; the latter is, however, a mountain species and its occurrence in the Kikhladian islets is rather unlikely. When SMITH's information is accepted as correct the plants may correspond (except for the number of florets per spikelet) to *A. cycladum* or *A. aetolica*. This name is therefore best treated as a "nomen dubium", because at present it cannot safely be used for any of the species concerned.

8. *Avenula jahandiezii* (LITARD.) HOLUB

This rare endemic, confined to the Moyen Atlas Mts. in Morocco, occupies a relatively isolated position in the genus. By its sheaths of basal leaves being divided in their upper parts only, spikelets with only few florets, long hairs on rhachilla-segments, subcylindrical lower part of the awn and relatively short lodicules, it resembles *A. pubescens* of the subgenus *Pubavenastrum* but differs substantially by the anatomical structure of basal leaves (for an illustration, see SAINT-YVES 1931 : 424), scabrous margin of basal leaves, all ligules short, long-hairy lemmas, narrow lodicules and especially by the palea long ciliate on the keels. A peculiar character shared by several members of *Helictotrichon* as well as by the species of the monotypical genus *Danthoniastrum* is the loosening of the dead blades from the sheaths in basal leaves.

Based on the characters mentioned above, the classification of this species as a separate monotypical section is fully justified; it could well be treated as a subgenus.

9. *Avenula marginata* (LOWE) HOLUB

This Euro-Atlantic species has usually been referred to as *Avena sulcata* J. GAY or under names based on this name. A study of plants from Madeira, described as *Avena marginata* LOWE 1838, has shown that they are taxonomically identical with *Avena sulcata* J. GAY. The latter name has usually been ascribed to J. GAY; however, it was first validly published in DELASTRE Fl. Anal. Dep. Vienne, 477, tab. 4, 1842. *Avena marginata* LOWE 1838 has priority over the name proposed by J. GAY and validly published by later authors (cf. LACAITA 1929). Therefore a new nomenclatural combination is proposed below.

A. marginata was described by LOWE from Madeira. Plants from there were later distinguished by SAINT-YVES (1931 : 464) as *Avena pratensis* subsp. *sulcata* var. *gayana* f. (vel subvar.) *maderensis* ST.-YVES with the following description: "Elata. Panicula dives, rachi, ramis pedicellisque laevissimis." Tall plants having panicle with many spikelets occur also in lower altitudinal belts in Western Europe. Plants with smooth rachis and panicle-branches do not seem to be confined to Madeira. Plants from there may also have slightly scabrous panicle-branches, but never as much as those from the Continent. A. HANSEN (København) sent me an interesting specimen of this species collected by him ("Madeira, on rocks near Pico Ruive, c. 1800 m, 7. 7. 1971, leg. A. Hansen"). This plant differs from normal plants of *A. marginata* by its pale (greenish-yellowish) and rather membranaceous lemma. The brown colour of lemmas is entirely missing and they are not distinctly indurated in their lower parts, as they are in normal plants of this species collected in the same phenological phase. However, other specimens of *A. marginata* from Madeira seen by the present author had normal set of characters, typical for the species discussed. Further study of a more plentiful material is required. SAINT-YVES (1931) reported similar plants as a speciality from North Morocco; they were later described as *Avena pratensis* subsp. *sulcata* var. *gayana* f. *concolor* MAIRE et WEILER in MAIRE Fl. Afrique Nord 2 : 301, 1953.

Some further notes on this species will be published elsewhere later.

10. *Avenula mirandana* (SENNEN) HOLUB

This is the correct name for the species named recently *Avenochloa vasconica* (SENNEN) GERVAIS by GERVAIS (1973 : 95) The basionym of the latter combination is a name from SENNEN's exsiccata collection published as a "nomen nudum"; therefore GERVAIS's combination is invalid. It was validly published by KERGUÉLEN (1975 : 301) who based it on the validly published name *Avena pratensis* L. subsp. *iberica* ST.-YVES var. *vasconica* ST.-YVES. In the taxonomic circumscription accepted by SAINT-YVES and the present author, this species includes an earlier published specific name *Avena mirandana* SENNEN, published in the exsiccata collection SENNEN, Pl. Espagne, 1928, No 6709. The following description is provided on a printed label: "Rachis glabre; glume inférieure sillonné au sommet; glumelle inférieure bifide; panicule pauciflore; feuilles glabres jonciformes, les caulinaires courtes mucronées". This species was described from the same area where plants of *Avena vasconica* SENNEN were collected. A new combination, *Avenula mirandana*, has been proposed by the present author (HOLUB 1976).

11. *Avenula planiculmis* (SCHRAD.) CHMELITSCHK et SAUER

This species may sometimes be difficult to distinguish from robust plants of *A. praeusta* (REICHENB.) HOLUB. In addition to the robust habit and wide

basal leaves (with a greater number of lateral veins), two more characters (spikelets usually violet, brown and whitish variegated and panicle usually interrupted, with the lowest node somewhat separated) are important in distinguishing the two species. However, cultivated plants of *A. planiculmis* or those from shady ecotopes may be devoid of the characteristic coloration of the panicle and their spikelets are pale. They are, however, always more robust than plants of *A. praeusta* from analogical ecological conditions. According to literature data (KULCZYŃSKI 1936), East Carpathian plants of *A. planiculmis* — in contradistinction to those from the West Carpathians — should usually have smooth sheaths. Such a difference does not exist, however. Scabrous sheaths have been found also in many plants of *A. planiculmis* from the East Carpathians. As in *A. praeusta*, differences in the scabridity of sheaths do not seem to be taxonomically important (see also GOLA 1912). The isolated occurrence of *A. planiculmis* in north-eastern Turkey (Lazistan, "in valle Djimil Ponti Lazici, 6000', leg. Balansa" — BOISSIER 1884 : 547) is very interesting from the phytogeographical viewpoint. In contrast to the presupposition, the material seen from there corresponds morphologically rather to the type subspecies from the north-western part of the distribution area of the species than to subsp. *angustior* occurring relatively not far from Lazistan. Further investigation of this regional population is necessary.

12. *Avenula praeusta* (REICHENB.) HOLUB

Problems of distinguishing this species from *A. planiculmis* have been discussed above. To a certain degree the two species differ also by their altitudinal distributions. *A. planiculmis* is a mountain plant, occurring at the upper (alpine) tree-line (supramontane and subalpine belts), whereas *A. praeusta* is a species of lower situations, only rarely extending to the higher altitudinal belts. In plants from the latter habitats or in those originating from the regions where *A. planiculmis* occurred during the Glacial era in lower altitudinal belts than now, an introgression of *A. planiculmis* with *A. praeusta* is very probable. Thus the otherwise relatively easy distinguishing of the two species is made more difficult.

GERVAIS (1973 : 103) treated our taxon as a hybrid between *A. planiculmis* and *A. pratensis* and named it *Avenochloa* × *praeusta* (REICHENB.) GERVAIS; the latter nomenclatural combination had been proposed by SOJÁK (1972). This hypothesis was confirmed by his successful hybridization experiments. However, the natural material of *A. praeusta* can hardly be designated as a recent hybrid; phytogeographical evidence does not support this hypothesis. The present distribution areas of the putative parents exclude themselves fully both geographically and ecologically. Hybridization may have occurred in the past. The taxonomic group including *A. planiculmis* must be — in spite of its high ploidy level (18x and hyperploids) — very old, considering its extensive discontinuous distribution from the Atlantic Ocean to Kamtchatka. In view of the small morphological difference between *A. planiculmis* (SCHRAD.) CHMELITSCHek et SAUER from Central Europe and *A. dahurica* (KOMAROV) CHMELITSCHek et SAUER from E. Asia, this species group appears to be of prae-Glacial origin. Therefore during the Glacial era hybridization might have taken place and *A. praeusta* may be a relic and stabilized remnant of it. The possibility cannot be excluded, however, that this species represents a remnant of ancestral, evolutionarily primitive populations, from which

the descendant types as *A. planiculmis* and *A. pratensis* have developed by divergent evolution and that the present artificial hybrids imitate morphologically that ancestral type.

The name *Avena alpina* SM. 1811 and names based on it have been mostly used for *Avena praeusta*, based on REICHENBACH's *Avena praeusta* from 1831. SMITH's name was first used for *A. praeusta* by REICHENBACH three years after the description of his *A. praeusta* (REICHENBACH, Iconogr. Bot., Cent. 11, p. 43, tab. 150, fig. 1703, 1834), and its use has spread and was established by its acceptance in such books as ASCHERSON et GRAEBNER Synopsis, HEGI Ill. Flora Mittel-Europa etc. However, the name *Avena alpina* SM. does not refer to that taxon. SMITH's taxon was described from the highest situations of Clova in Angus, Scotland, and belongs to *Avenula pratensis* agg. The original description refers to a densely caespitose habit ("compact tuft") without any indication of creeping stolons, contrasting with the character of subterranean parts of *A. praeusta*. Sheaths are described as scabrous, contrasting with descriptions by later authors who used that name for Central European plants. The importance of this character was, however, overvalued. Rhachilla-segments in Scottish plants are hairy only in their upper parts and this character was one of the reasons to apply the name *Avena alpina* SM. to plants of *A. praeusta*. Scottish plants are here treated as conspecific with *A. pratensis*; from the biotaxonomic viewpoint a diverging regional population may be represented by these plants, as it is shown especially by their ability to colonize ecotopes very different from those to which *A. pratensis* is usually limited in its main distribution area. Further investigation in the field by special methods (biometry) is desirable.

Another fact referring to this name must be mentioned here. *Avena alpina* SM. 1811 is an illegitimate name, being a later homonym of *Avena alpina* HONCKENY 1782 and *A. alpina* LATOURR. 1785 (cf. KERGUÉLEN 1975). The first species was described from Switzerland and has never been correctly identified; it seems to be composed of a mixture of *Avenula versicolor* (VILL.) LAÍNZ and *Trisetum distichophyllum* (VILL.) P. BEAUV. The second species, described from the French Alps, has been identified with *Avenula versicolor* (KERGUÉLEN 1975).

Some taxa have been referred to the relationships of *A. praeusta*, but hardly belong there; they are *Avena pseudoviolacea* KERN. and *Avenastrum aussendorferi* (ASCHERS. et GRAEBN.) FRITSCH. The latter scarcely merits a taxonomic recognition. They belong to mountain variants of *A. pratensis* agg. and are known from the higher situations of the Alps. By this distribution pattern they differ — analogically as *Avena alpina* SM. in Scotland — from *A. pratensis* s.s. which occurs in rather thermophilous communities of lower altitudinal belts. This interesting regional population deserves further investigation from the biotaxonomic viewpoint.

The distribution of *A. praeusta* in the Balkan Peninsula is not sufficiently known. Attention should be paid especially to plants from Bulgaria and Yugoslavian Macedonia. An example of such critical plants is material from Macedonia deposited in PRC (s. n.) — „Skoplje, Mt. Koráb, in pratis subalpinis supra pagum Muhovo, 16. 7. 1936, leg. Skřivánek". This poor material is, however, insufficient to make any qualified decision.

13. *Avenula pratensis* (L.) DUMORT.

Normal plants of *A. pratensis* are densely caespitose, without distinct creeping stolons. The presence of subterranean stolons or creeping rhizomes is usually evidence of introgressive influence of other species (e. g. *A. mirandana*, *A. praeusta*). Creeping subterranean part may sometimes be found outside the area of introgression. An example is material collected in Southern England: "Berkshire, V. C. 23, Winter Hill, open chalky grassland, 10. June 1961, Peter H. Raven et E. B. Bangarter, 160 43; PR 584 661".

The distribution area of *A. pratensis* has long been obscure, because this name covered many unrelated species from North Africa, Asia and North America. Even at present, *A. pratensis* is reported from regions not within its real distribution area. BOR (1960 : 439) reports this plant as a native in NW. India (Kashmir); his species concept is, however, very broad, including, in addition to *A. pratensis*, also *A. argaea*, *A. praeusta* and *A. cincinnata*. These all are separate and very different species and no one can be identified with the Kashmirian plants. A broad distribution area is attributed to *A. pratensis* by BOR (1970 : 322) also elsewhere. *A. pratensis* is a European suboceanic species and the eastern limit of its distribution area runs from the vicinity of Leningrad through Baltic republics of the U.S.S.R., Kaliningrad region, Central Poland and Central Czechoslovakia to Eastern Austria. Data from the area eastwards of this line (e.g. from the Western Ukraine, Transsilvania, Balkan Peninsula — see MEUSEL, JÄGER et WEINERT 1965) require a critical revision as this species is known to be absent from Hungary (HOLUB 1972).

14. *Avenula requienii* (MUTEL) HOLUB

In my account for "Flora Europaea", this critical taxon is based phenotypically, including several cytotypes of presumably hybridogeneous origin. It requires an intensive study in its distribution area (parts of France and Spain adjacent to the Pyrenees). GERVAIS (1973) reported following chromosome numbers for this taxon: $2n = 112, 126, 133, c. 146$. This would correspond to $16x, 18x, 19x$ and $21x$, the latter being the highest ploidy level in *Avenula* at all.

BRIEF NOTES ON *HELICTOTRICHON*

1. *Helictotrichon* BESS.

In my earlier study (HOLUB 1958), species belonging to *Helictotrichon* in its present circumscription were referred to two subgenera — subgen. *Archavenastrum* (VIEFF.) HOLUB and subgen. *Helictotrichon*. Of the European species, only two [*H. decorum* (JANKA) HENR. and *H. montanum* (VILL.) HENR. (= *H. sedenense* (DC.) HOLUB)] were included in the former subgenus. All the other were accommodated in the type subgenus. The main differences between the two subgenera were seen in the anatomy of basal leaves (cf. HOLUB 1958). On the basis of the present knowledge, the division of European species into two subgenera is to be re-examined. The European species of *Helictotrichon* being rather closely related and their relationships to extra-European species being poorly known, the infrageneric classification has been omitted from my account of *Helictotrichon* for "Flora Europaea".

2. *Helictotrichon cantabricum* (LAG.) GERVAIS

This distinct taxon, though described long ago by LAGASCA as a separate species, has not been accepted in this rank by other authors and has erroneously been confused either with *H. filifolium* (LAG.) HENR. or *H. convolutum* (C. PRESL) HENR. From the former species it differs sufficiently by the absence of dark violet, shiny sheaths of basal leaves, from the latter by the more robust character of all parts, by longer hairs of rhachilla-segments (4.5–5 mm, compared with 2.5–3.5 mm in *H. convolutum*) and by its chromosome number ($2n = 84, 98$, compared with $2n = 14$ in *H. convolutum*). According to GERVAIS (1973), plants with $2n = 84$ ($12x$) occur in the Pyrenees, those with $2n = 98$ ($14x$) in the Cordillera Cantabrica; the nomenclatural type of the species originates from the latter mountain range. Further investigation is necessary to decide on the taxonomic classification of the cytotypes.

3. *Helictotrichon filifolium* (LAG.) HENR.

In spite of its relatively rare occurrence and small distribution area (Spain and NW. Africa), *H. filifolium* is a rather variable taxonomic group. For good reasons, two species have been excluded from it, viz. *H. cantabricum* (LAG.) GERVAIS, occurring in North Spain, and *H. sarracenorum* (GANDOG.) HOLUB, known from South Spain. In the province Murcia in SE. Spain plants were collected which differ from normal plants of *H. filifolium* s. s. by their slender habit, shorter stems, narrower basal leaves, shorter spikelets (and their parts) and by shorter callus-hairs. Stems of these plants are only 40–60 cm tall, basal leaves 0.7–0.9 mm in diameter, lower glume c. 10 mm, the upper c. 12 mm long, and callus-hairs 3–3.5 mm long. Typical plants of *H. filifolium* s. s. are very robust, with stems 50–120 cm tall, basal leaves thick, 1–1.3 mm in diameter, lower glume 13–15 mm, the upper 15–20 mm long and callus-hairs 4.5–6 mm long. Considering the karyological differentiation in closely related species, these small plants may represent a lower ploidy level than that of normal plants of *H. filifolium* (14x). In my opinion, plants from Murcia mentioned above should be classified as a minor species of *H. filifolium* agg., for which the name *Helictotrichon murcicum* is proposed here. The name is validated by the following differential diagnosis:

Helictotrichon murcicum HOLUB, sp. nova

A *H. filifolio* (LAG.) HENR. differt culmis gracilioribus, brevioribus, tantum 40–60 cm altis, foliis basalibus tenuioribus, 0,7–0,9 mm in diametro, spiculis brevioribus, gluma inferiore c. 10 mm, gluma superiore c. 12 mm longa, pilis calli (primi vel secundi) 3–3,5 mm longis.

Typus: PORTA et RIGO, Iter II. Hispanicum, 1890, No 298; *Avena filifolia* LAG. α *glabra* BSS.; Murcia, in montanis rupestribus c. Lorca, sol. schistoso, 200–800 m s.m.; Majo; PRC, s.n.

The original sheet contains many plants, all belonging to the same taxon. However, another sheet from the same (very broadly defined) locality, distributed in the same exsiccata collection under the same number (PRC), contains only plants of typical *H. filifolium*. In the vicinity of Lorca, the two taxa may occur in the same locality or rather in different localities in the same region; the altitudinal range of the "locality" indicates that many localities may be concerned. Further sheets of PORTA et RIGO Iter II. Hisp. 1890, No 298, must be examined for *H. murcicum*. Sheets containing only plants of the new species may be considered isotypes of *H. murcicum*.

4. *Helictotrichon parlatoresi* (WOODS) PILGER

GERVAIS (1973) found tetraploid plants of this diploid species in one locality in the Alpi Cozziani. According to his statement, their spikelets (and certainly also their parts) are substantially larger [(12–)14–15(–16) mm] than those of the diploid [(8–)10–12(–13) mm]. Plants with such great spikelets have not been found by the present author in the relatively plentiful herbarium material available. Further investigation of this cytotype is necessary, to decide on the taxonomic classification.

5. *Helictotrichon planifolium* (WILLK.) HOLUB

In the Pyrenees, *H. sedenense* agg. is represented by diploid and tetraploid plants which differ both by morphological characters and geographical distribution; they are treated here as minor species. The name *H. planifolium* has been proposed for tetraploid plants (HOLUB 1974). The differences between the two taxa are as follows: *H. planifolium* is robust, basal leaves are longer and \pm flaccid, mostly flat, (2–)3–4(–7) mm wide, panicle-

branches \pm stiff, spikelets 11–14 mm long, with 3–4 fertile florets, rhachilla-segments with hairs 3.5–5 mm, callus-hairs 2.5–3 mm and anthers c. 5 mm long. Plants of *H. sedenense* (DC.) HOLUB s. s. are slender, their leaves are 10–25 cm long, (1–)2(–4) mm wide, spikelets (7–)9–12(–13) mm long, with 2–3 fertile florets, hairs of rhachilla-segments 2.5–4 mm, callus-hairs 2–2.5 mm and anthers 3–4.5 mm long.

6. *Helictotrichon sarracenorum* (GANDOG.) HOLUB

Various chromosome numbers — $2n = 14, 28, 70$ — have been reported for this species (GERVAIS 1973), corresponding to $2x, 4x$ and $10x$. This karyological differentiation suggests that further taxonomic differentiation is probable. Even though normal plants of *H. sarracenorum* have leaves distinctly hairy with patent hairs, glabrous plants also occur. They resemble *H. filifolium* (LAG.) HENR., especially by their robust habit, thick leaves and size of spikelets [by these characters they differ from *H. convolutum* (C. PRESL) HENR.] but the sheaths of basal leaves are brown or yellowish-brownish, not dark violet, the latter being one of the most important distinguishing characters of *H. filifolium*. Their taxonomic status requires further study. These plants are known to me only from the vicinity of Ronda in southernmost Spain. Following herbarium sheets were seen in the herbaria of Prague:

E. REVERCHON, Plantes de l'Andalousie 1889, No 375; *Avena filifolia* LAG., det. HACKEL; Sierra de la Nieve, bois de sapin, sur le calcaire, 12. Juillet; PR, PRC. — FRITZE R., Reise durch das südliche Spanien 1873; *Avena filifolia* LAG.; Ronda, Sierra de la Nieve; 2. 6.; PR.

7. *Helictotrichon sempervirens* (VILL.) PILGER

The normal chromosome number of this species is $2n = 42$ ($6x$). However, TOMBAL (1968) gives a tetraploid number of $2n = 28$ for material from Mt. Col de Bleine in the Alpes Maritimes. GERVAIS (1973 : 41) found a hexaploid number in material from the same locality. The taxonomic status of TOMBAL's plants is not known. It is not excluded that hybrids between *H. sempervirens* ($6x$) and *H. setaceum* (VILL.) HENR. ($2x$) were concerned. MELZER (1967) reported such obscure plants from the West Alps. Morphologically transitional plants between these two species have been named *Avena lejocolea* GOLA var. *major* GOLA (see GOLA 1912).

NEW COMBINATIONS

Avenula marginata (LOWE) HOLUB, comb. nova. — Bas.: *Avena marginata* LOWE, Trans. Cambridge Philosoph. Soc. 6/3 : 7, 1838.

Avenula pungens (SENNEN ex ST.-YVES) HOLUB, comb. nova. — Bas.: *Avena pungens* SENNEN Plantes d'Espagne 1927, No 6276 (typus); *A. pratensis* subsp. *pratensis* var. *pungens* SENNEN ex SAINT-YVES, Candollea 4 : 449, Genève 1931.

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SOUHRN

Při zpracování rodu *Avenula* a *Helictotrichon* pro 5. svazek díla „Flora Europaea“ byla zjištěna četná nová fakta a zároveň se vynořily i nové problémy; obojí jsou námětem tohoto článku.

Na základě změny textu o ilegilititě jmen (čl. 63 Kódu), přijaté XII. Mezinárodním botanickým kongresem v Leningradě v r. 1975 musí být dříve správné rodové jméno *Avenochloa* HOLUB 1962 nahrazeno jménem *Avenula* (DUMORT.) DUMORT. 1868, i když nově zaváděné jméno je

taxonomicky zcela totožné s rodovým jménem *Helictotrichon* Bess. 1827 a nomenklatoricky nadbytečné. Jméno *Avena* (DUMORT.) DUMORT. musí být typifikováno druhem *Avena pratensis* L. a této typifikaci musí odpovídat i nomenklatura infragenerických jednotek. Jméno *Avenastrum* OPIZ 1852 musí být rovněž typifikováno druhem *Avena pratensis* L.; přes shodný nomenklatorický typ s rodem *Avenula* nemůže však být Opizovo rodové jméno přijato jako správné místo *Avenula*, a to vzhledem k ilegilitě jeho bazionymu a taxonomicko-nomenklatorické totožnosti s rodem *Helictotrichon* Bess. 1827.

Jako nové druhy jsou popsány *Avenula gervaisii* (z příbuzenství *A. bromoides*, z jižního Španělska), *A. murcica* (z příbuzenství *A. bromoides*, z jihovýchodního Španělska), *A. peloponnesiaca* (z příbuzenství *A. cincinnata*, z pohoří jižního Peloponésu) a *Helictotrichon murcicum* (z příbuzenství *H. filifolium*, z jihovýchodního Španělska). Na úrovni specíe jsou vylíšeny dva nové taxóny — *Avenula marginata* subsp. *pyrenaica* (horský typ, popsáný z francouzské strany centrálních Pyrenejí) a *A. planiculmis* subsp. *angustior* (méně statné rostliny tohoto druhu, vyskytující se v Karpatech a na Balkánském poloostrově; statné rostliny typového plemene jsou známy z Východních Sudet a Západních Karpat).

K 21 taxónům (převážně druhům) jsou připojeny poznámky, týkající se jejich taxonomické, nomenklatorické, diagnostické i chorologické problematiky. V řeckém pohoří Pindhos byly zjištěny rostliny podobné málo známému středořeckému druhu *Avenula aetolica*. Popisy druhů *A. agropyroides* a *A. argaea*, jež jsou oba známy jen z jediné lokality, byly doplněny na základě revize originálního materiálu. Řecký druh *A. agropyroides* je samostatný druh z okruhu *A. cincinnata*, anatolský *A. argaea* je blízce příbuzný či totožný s *A. adzhariae*. U *A. blavii* je zmíněn zatím zcela nejasný druh *Avenastrum vierhapperi* ADAMOVIČ 1912. *A. bromoides* s. s. se vyskytuje i na Baleárech; tetraploidní a hexaploidní cytotypy zjištěné v jižním Španělsku nepatří k tomuto druhu, ale představují nejspíše samostatné druhy; hexaploidní typ je velmi blízký nově popsanému druhu *A. gervaisii*. *A. cincinnata* je dobře rozlišitelný, samostatný druh; jeho inkluze do *A. bromoides* je neoprávněná. V textu o *A. cycladum* je probrána problematika jména *Avena sibthorpii* NYMAN, jež je na základě širší analýzy pokládáno za „nomen dubium“. Atlaský endemit *A. jahandiezii* je taxonomicky velmi izolován a jeho zařazení do samostatné monotypické sekce nebo dokonce i podrodu je nutné. Jméno *A. marginata* musí nahradit jméno *A. sulcata*, a obdobně jméno *A. mirandana* musí nahradit jména, v nichž bylo užito specifické epiteton „*vasconica*“. *A. praecusta* nemůže být nějakým současným hybridem *A. planiculmis* × *A. pratensis*, jak se domnívají někteří autoři; dávný hybridogenní vznik není však u tohoto druhu vyloučen. V textu o tomto druhu je také probrána otázka užití jména *Avena alpina* SM., jež se v původním pojetí vztahuje k horským rostlinám z okruhu *A. pratensis*; z nomenklatorického hlediska se však jedná o ilegitimní jméno. U *A. pratensis* je poukázáno na nutnost revize údajů o výskytu tohoto druhu v oblastech mimo Evropu a ve východní a jihovýchodní Evropě. U *Helictotrichon cantabricum*, *H. parlatorei* a *H. sempervirens* je podtržena nutnost taxonomického výzkumu odlišných cytotypů, zjištěných u těchto druhů v poslední době. U *H. sarraconorum* musí být podrobnější pozornost věnována lysému taxónu, vyskytujícímu se v nejnižším Španělsku.

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NOTE: An important study of the East Alpine members of *Avenula* was published by SAUER et CHEMLITSCHKE (Mitteil. Bot. Staatssamml. München 12 : 513—607, 1976) which could not be taken into consideration in this paper.

Výročí 1977

RNDr. František Nováček

* 2. 8. 1897 † 2. 4. 1944

Odborný učitel, od r. 1920 v Mohelně, od r. 1933 v Třebíči. V r. 1932 byl na brněnské universitě promován na doktora přírodních věd. Nevšední pílí a také přičiněním svého učitele R. Dvořáka se vypracoval na dobrého znalce sinie. Studoval je nejen po stránce systematické, ale věnoval se u nich do značné míry i studiu ekologickému. Pracoval jak v terénu, tak s kulturami. Přispěl např. k objasnění životního cyklu rodu *Gloeocapsa*. V r. 1934 vydal svou nejobsáhlejší studii o epilittických sinicích řádu *Chroococcales* na mohelenských serpentínech. Poté co byl přeložen do rodné Třebíče, jej upoutala rybníční oblast v okolí Třebíče a hlavně Studence, kam jezdil na hydrobiologickou stanici. Těžiště jeho práce se přesunulo od epilittických sinie k organismům planktonním a k hydrobiologii vůbec, zčásti si všiml i společenstev vyšších rostlin. Hodně energie věnoval snahám ochranným a popularizačním přírodních věd.