**EUROPEAN VEGETATION SURVEY**

**14th Workshop - ROME (Italy), March 11-14, 2005**

Orto Botanico – Dipartimento di Biologia vegetale

Università di Roma “La Sapienza”

The main vegetation topic for 2005 was DWARF-SHRUB VEGETATION which includes not only the Calluno-Ulicetea but also montane heaths of the Loiseleurio-Vaccinietea and Mediterranean hedgehog and other heaths. The other main topic was USING VEGETATION SCIENCE FOR MONITORING & POLICY DELIVERY.

**PAPERS AND POSTERS:**

* **USING VEGETATION SCIENCE AND VEGETATION MAPPING FOR REGENERATING POST-INDUSTRIAL LANDSCAPES IN SOUTH YORKSHIRE, UNITED KINGDOM**

*John Rodwell (Ecological Consultant, Lancaster), Chris Ling (Research Student, Centre for Urban & Regional Ecology, Manchester University) & David Hey (Emeritus Professor of Landscape & Local History, Sheffield University)*

* **MEDITERRANEAN DWARF-SHRUB VEGETATION IN A LARGE-SCALE PERSPECTIVE**

*E. Bergmeier, H. Culmsee, R. Jahn, R. Guarino, S. Brullo*

In phytosociological literature, the classification concept of the Mediterranean dwarf-shrub vegetation has evolved from a regional perspective. On the basis of standardized constancy tables from the Western, Central and Eastern Mediterranean, we examine the degree of discreteness of higher-ranked syntaxonomic units of Mediterranean garrigue, matorral, tomillar and phrygana vegetation viewed from a wider perspective. The diagnostic value of species with supra-regional Mediterranean distribution and the use of schizo-endemics in the differentiation of higher synsystematic units are critically studied. The study concerns the following classes known from literature:

* Rosmarinetea officinalis Rivas-Martnez, T.E. Diaz, F. Prieto, Loidi & Penas 2002;
* Cisto-Lavanduletea Br.-B1. in Br.-B1., Molinier & Wagner 1940;
* Cisto-Micromerietea Oberdorfer 1954.
* **METHODOLOGIES AND PROCESSES FOR THE ANALYSIS, CONSERVATION AND MONITORING OF PLANT BIODIVERSITY**

*E. Biondi, S. Casavecchia, L. Nanni, L. Paradisi, S. Pesaresi & M. Pinzi*

*Dipartimento di Scienze Ambientali e delle Produzioni vegetali, Università Politecnica delle Marche, Via Brecce Bianche, 6013] Ancona, Italia*

The conservation of biodiversity asks for the conscious management of the ecosystems and the landscape and consequently involves a deep knowledge of the characterizing factors and the dynamic processes being at the basis of their origin and determining their spatial diffusion and the temporal transformation. Vegetation is a basic element of the landscape and owns a meaningful value of bio-indication being sensitive to the variation of the ecological factors. The phyotosociological and geosinphytosociological analysis supplemented by the GIS methods allow to suggest management interventions for biodiversity conservation of species and environments and to plan the bio-connections among sites having a different level of naturalness in order to improve the quality diffused in the territory. As a demonstrative example are presented some aspects regarding analysis, management and the monitoring of the Sites of Community Importance and Special Protection Areas individuated through the Habitat Directive 92/43/CEE.

* **ACTUAL VEGETATION MAPPING IN CENTRAL HUNGARY (KISKUNSÀG)**

*Birò M., Révész A., Molnar Zs.& Horvth F.*

*Institute of Ecology and Botany of the Hungarian Academy of Sciences, Vacratot, Hungary.*

In Hungary large areas are covered by sand. The most prominent wind-blown sand area is the region between the rivers Danube and Tisza (1.5 million hectars), where natural and semi-natural vegetation covers appr. 300 000 ha. We prepared the actual vegetation map of this area, based on field survey (24%), and on satellite image interpretation (76%). The map shows the pattern of natural, disturbed and recently destroyed habitas, the pattern of the landscape, fragmentation of the habitats and ecological corridors, as well. We made statistics of the habitats, and studied the pattern of the landscape. We compared the actual and the 18th century landscape types, pattern and habitats,the map can be used in basic and applied research, in nature conservation, and policy decisions. In this region the map was the basis for the designation of areas for Natura 2000 and the National Ecological Network.

* **VEGETATION OF LOWLAND WET MEADOWS ALONG A CLIMATIC CONTINENTALITY GRADIENT IN CENTRAL EUROPE**

*Z. Botta-Dukat, M. Chytry, P. Hajkova & M. Havlova*

Central European lowland wet meadows are habitats of great conservation interest, however, their phytosociological status has been to a large extent dependent on specific phytosociological traditions in different countries, In order to bridge the gaps between different national schemes of vegetation classification, a statistical analysis of variation in species composition of these meadows in the Czech Republic, E Austria, Slovakia, Hungary and NE Croatia was performed, using a data set of 387 geographically stratified vegetation relevés sampled at altitudes <350 m. Principal coordinates analysis was used to identify and partial out the noise component in the variation in this data set. The relevés were classified by cluster analysis. A new method for identifying the optimal number of clusters was developed, based on species fidelity to particular clusters. This method suggested the optimum level of classification with three clusters and secondary optimum levels with five and fine clusters. Classification based on three clusters separated the traditional phytosociological alliances of *Calthion palustris* and *Molinion caeruleae*, both with a suboceanic phytogeographical affinity, and a group of flooded meadows of large river alluvia, with a continental affinity. The latter group included the traditional alliances of *Agrostion albae*, *Alopecurion pratensis*, *Cnidion venosi*, *Deschampsion cespitosae* and Veronico *longzfoliae-Lysimachion vulgaris*; however, the internal heterogeneity of this group did not reflect putative boundaries between these alliances as proposed in the phytosociological literature. Therefore we suggest to unite these alliances in a singie alliance *Deschampsion cespitosae* Horvatic 1930 (the oldest valid name). Classification with fine clusters was interpreted at the level of broad phytosociological associations. Particular clusters were characterized by statistically defined groups of diagnostic species and related to macroclimatic variables.

* **A SYNTAXONOMICAL SURVEY OF THE SICILIAN DWARF SHRUB VEGETATION BELONGING TO THE CLASS RUMICI-ASTRAGALETEA SICULI**

*S. Brullo, A. Cormaci, G. Giusso del Galdo, R. Guarino, P. Minissale, G Siracusa & G. Spampinato*

Basing on literature data and unpublished relevés from Sicily, a survey of the syntaxa belonging to the class *Rumici-Astragaletea siculi* Pignatti & Nimis 1980 em. Mucina 1997 (= *Cerastio-Carlinetea nebrodensis* Brullo 1984) is presented. The class groups orophilous plant communities dominated by dwarf-shrubs, often with a pulvinate and thorny growth form. The class is represented in Sicily by two orders: *Rumici-Astragaletalia siculi* Pignatti & Nimis 1980, including the sole alliance *Rumici-Astragalion siculi* Poli 1965, restricted to Mount Aetna, and *Erysimo-Jurinetalia bocconei* Brullo 1984, including two alliances: the acidophilous *Armerion nebrodensis* Brullo 1984 and the basiphilous *Cerastio-Astragalion nebrodensis* Pignatti & Nimis cx Brullo 1984. Within the class, nineteen associations have been recognized. Nomenclature, floristic settlement, ecology and chorology are examined for each syntaxon. The floristic autonomy of the class *Rumici-Astragaletea siculi* is examined from the phytogeographic viewpoint and is confirmed by numerical analyses including not only the Sicilian phytocoenoses, but also those occumng in Sua and Aspromonte (Calabria) and ascribed to the same class by Brullo, Scelsi & Spampinato 2001 and Brullo, Gangale & Uzunov 2004. It is, as well, highlighted that the Pollino massif represents the southemmost limit to the distribution range of the class *Festuco-Brometea*, whose southward expansion is hampered by the lack carbonatic highlands in the southernmost tip of the Italian Peninsula.

* **INTEGRATION OF REMOTE SENSING AND GIS FOR MAPPING AND SPATIAL MODELING VEGETATION IN THE SUPRAMONTE MOUNTAIN AREA (CENTRAL EAST SARDINIA)**

*G.Brundu & I. Camarda*

*Department of Botany and Plant Ecology, University of Sassari, Via Muroni, 25, Sardinia, Italy. E-mail: gbrundu@tin.it, camarda@uniss.it*

Remote sensing is a tool offering well-documented advantages in vegetation science, including a synoptic view on large areas, multispectral data availability, multitemporal coverage and reducing costs of the technology. It is now widely applied on collecting arid processing data. It has proved to be a feasible approach to study complex geographic terrains and diverse inaccessible ecosystems. It provides a wide range of sensor systems including aerial photographs, airborne multi-spectral scanners, satellite imagery, low and high spatial, temporal and spectral resolution data and ground based spectrometer measurements. Digital image analysis techniques have progressively improved as well, as in the case of spectral mixture analysis.Integrated GIS and remote sensing have already successfully been applied to map the distribution of several plant species, their ecosystems, landscape, bio-climatic conditions, and factors such as Iand change, facilitating range expansion or erosion of certain species, biological invasions. A more integrated approach, i.e. botanical field surveys, location of DGPS ground control points, retrospective analysis with historical aerial photos, satellite remote sensing and GIS (e.g. analysis of DEM and derived thematic layers), have resulted to fuel mapping and spatial modelling of vegetation in Mediterranean mountain areas. This applies also in highly fragmented system, where geometric resolution of remotely sensed data may be become a limitation.   
An application of this integrated approach for the “Supramonte di Orgosolo”, a Sardinian mountain area on Limestone and siliceous substrata, is presented herewith. Historical b/w aerial photographs are available since 1950s, and satellite data since 1970s. Botanical field surveys and vegetation studies have started with the work of Arrigoni et al. (1990; 1991;1996), Camarda (1977) which are fairly contemporary with the availability of remotely sensed data. This frameworks the digital image processing. A first application of this methodology was presented in 1998 (Brundu et al.). More recently, additional ground control plots have been individuated to extend the methodology over siliceous areas, aiming to producing vegetation maps for larger areas with semiautomatic procedures. The main vegetation units detected in the study area are as follows: (1) *Quercus ilex* forest; (2) *Quercus ilex*, *Phillyrea latfolia* and *Arbutus unedo* forest; (3) *Juniperus phoenicea* and *J. oxycedrus* mixed formations; (4) *Juniperus oxycedrus* formations; (5) Garigues with *Santolina insularis* and dwarf shrubs; (6) Garigues with *Ephedra major*; (7) Discontinuous vegetation of limestone pavements; (8) *Erica arborea* and *Arbutus unedo* shrublands; (9) *Erica scoparia* shurblands; (10) Garigues with *Genista corsica* and *Thymus catharinae*; (11) Herbaceous comrnunities with *Asphodelus microcarpus*; (12) Herbaceous communities on hydromorphic soils; (13) Riparian formations with *Alnus glutinosa*; (14) Burned areas and recovering of vegetation; (15) Afforestation areas with exotic conifers. The method allows to realise different maps to describe vegetation and human impacts at smail and large scales and to update maps more frequently as requested for management purposes.

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* **CISTUS INCANUS DOMINATED COMMUNITIES IN THE SOUTHERN PART OF THE BALKAN PENINSULA**

*A. Carni1, V. Matevski2*

*1Institute of Biology, Scientific Research Center of the Slovenian Academy of Sciences and Arts, Novi trg 2, p.b. 306, SI-1001 Ljubljana*

*2Institute of Biology, Faculty of Natural Sciences and Mathematics, Gazi baba b/B, p.b. 162, MK 91 000 Skopje*

The analysis reveals the pattern of the communities dominated by Cistus incanus agg. in the southern part of the Balkan Peninsula. *Cistus* incanus communities were sampled in two zones: in the zone of evergreen Mediterranean vegetation and in the zone of sub Mediterranean Ostryo-Carpinion orientalis vegetation. In all communities *Cistus* incanus was the dominant species are they were found only on non-carbonate bedrock. Two associations were identified:  
  
The first one found in evergreen zone is classified within the *Calicotomo-Cistetum villosae* Oberdorfer 1954 (*CIstIo-Hyperidon bithynici*, *Poterietalia spinosi* and *Cisto-Micromerietea julianae*). The dominant species is *Cistus incanus subsp. creticus*, and there appear quite some shrub species, Iike *Cistus salvifolius*, *Erica arborea*, *Juniperus oxycedrus*, etc.. Among herb species *Campanula lingulata, Campanula spruneriana, Crucianella Iatifolia, Cytinus hypocistis, Dorycnium hirsutum, Hymenocarpus circinatus, Hypochoeris cretensis*, and many others, those make a clear distinction with the following association;  
  
The community from sub Mediterranean region is classified in the *Diantho-Cistetum incani* Micevski & Matevski 1985 (*Trifolion cherleri, Astragalo-Potenilletalia, Festuco-Brometea*). In this association shrub species, except *Quercus coccifera*, do not appear. The most common species are *Chrysopogon gryllus, Dianthus liliaceus subsp. pinifolius, Poa bulbosa, Tuberaria guttata, Thymus heterotrichus*, to mention only some of them. Many of them indicate the transition to the *Thero-Brachypodietea*.

* **FROM A DATABASE TO A REGIONAL PHYTOSOCIOLOGICAL OVERVIEW - WHAT CAN BE LEARNED FROM THE PROJECT ‘PLANT COMMUNITIES OF MECKLENBURG-VORPOMMERN AND THEIR VULNERABILITY’**

*Jurgen Dengler*

Within the project ‘Plant communities of Mecklenburg-Vorpommern and their vulnerability’, a current synopsis of all syntaxa from this federal state in NE Germany has been worked out and published in a two-volume monograph (table-volume: BERG et al. 2001, text-volume: BERG et al. 2004). An extensive TURBO(VEG) database with more than 50,000 relevés and a consistent concrete application of the Braun-Blanquet approach provided the basis for the classification. The syntaxonomic system that is presented differs in many respects from other overviews, which is mainly a result of the logical application of our integrate methodology throughout (e.g. the separate classification of woodland and non-woodland vegetation; the acceptance of up to one ‘central’ syntaxon within each superior syntaxon). The sociological value of all taxa (vascular plants, bryophytes, lichens and ‘algae’) has been checked in the whole database. As a result, we recognised 34 classes, 70 orders, 125 alliances and 284 associations, which is significantly less than in other recent overviews of comparable regions. In presenting the outcomes, we pursued new courses in various respects, too. I will shortly illucidate the following points in my presentation: (1) Lay-out of the synoptic tables; (2) thorough application of the ICPN; (3) different types of distribution maps of syntaxa; (4) nature conservation assessment of plant communities. Finally, I will present a résumé of the project and give some recommendations for similar projects both on regional and larger levels. I will also briefly outline what we are planning to do with our vegetation data base in future.

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* **MOUNTAIN HEATHS IN THE WESTERN CARPATHIANS - A NEW APPROACH TO THE CLASSIFICATION**

*Z. Dubravcova, I. Jarolimek, J. Kliment, J. Sibik & M. Valachovic*

* **PREDICTING THE DISTRIBUTION OF TREE SPECIES IN LAZIO REGION (CENTRAL ITALY) FROM ENVIRONMETAL VARIABLES**

*Francesconi F., Attorre F., De Sanctis M.& Bruno F.*

*Dipartimento di Biologia Vegetale, Università di Roma “La Sapienza” P.le A. Moro 5, 00185 Roma*

The first results of a more general project aimed to study the effects of climate changes to the distribution of some tree species of Lazio region are here presented. Empirical data (600 permanent plots) were used to elaborate two models simulating the present potential distribution of tree species. The models were interfaced to a geographic information system (GIS) and used to generate numerical distribution maps. GIS-based maps of climatic variables were obtained by interpolating values observed at measurement stations. After comparing different interpolation methods (multiple regression, de-trended inverse distance weighting, universal kriging, multilayer neural networks trained with backpropagation), we decided to use the universal kriging method to produce the climatic maps. Those maps were than used to produce a set of GIS-bioclimatic maps based on the following bioclimatic indexes: Emberger ombrothermic quotient, Rivas-Martfnez ombrothermic and thermicity indexes, and Mitrakos monthly cold and drought stress indexes. A Regression Tree Analysis (RTA) was used to produce current potential distribution map of each tree species based on their importance value, while a Classification Tree Analysis (CTA) was used to produce maps based on presence—absence data. Thirty environmental predictor variables (climatic, bioclimatic and topographical) were used. The tree analyses were generated with a random selection of 80% of the data. To evaluate the model outputs, a comparison of predicted current and actual distributions were made using correlation, verification, and validation processes. A cut-off of five observations per terminal node was used. Cross-validation was used to determine the optimum tree size yielding the most robust predictions. Finally, the GIS-maps were produced using ArcGIS 9 and the Geostatistical Analyst extension. The simulated distribution maps of the tree species are an important tool in the assessment of the possible impacts of climate changes on the distribution of tree species.

* **MONITORING AND CONSERVATION STATUS ASSESSMENT FOR SPECIES AND HABITATS IN GREECE: FUNDAMENTALS AND EXEMPLARY CASES**

*1Dimopoulos P., 2Bergmeier E. & 2Fischer P.*

*1University of Ioannina, Dept. of Environmental and Natural Resources Management, Lab. of Ecology and Biodiversity Conservation, Seferi 2, GR-30100 Agrinio, Greece*

*2University of Gottingen, AvH-Institute of Plant Sciences, Dept. of Vegetation Analysis and Phytodiversity, Untere Karspule 2, D-37073 Gottingen, Germany*

In the framework of the Habitats Directive and to the conservation status assessment of plant species and habitat types of Greece, the basic principles for planning and implementing an effective monitoring system, are outlined. Emphasis is given to parameters that are essential for monitoring concepts and in urgent need of clarification such as: Representation of species and habitat types in Natura 2000 sites in Greece, national responsibility for species, habitat types and certain subtypes on the level of EU and the Mediterranean biogeographic region, degree of vulnerability on a national level. Specific methodical aspects are recommended for species and habitats and a comparison is made emphasizing shortcomings and the short-termed additional actions for bridging the gaps. When planning monitoring for habitat types or species it is crucial to gather data not only on distribution and frequency but also on hazards and threats. For the first time a reference list of negative impacts and threats corresponding to each of the Greek Natura 2000 habitat types has been prepared and evaluated. An evaluation matrix of the conservation status for species and habitats of Community interest is suggested for implementation in Greece, and exemplary cases are given. The following criteria are adopted for the assessment of the conservation status (1) of species: habitat quality, status of the population, impacts; (2) of habitat types: representation of habitat-specific structures, representation of habitat-specific species, impacts. A Monitoring Guide for the habitat types and plant species of Greece, including their fuil identification and interpretation, is currently in progress and is expected to be published in April-May 2005. An attempt was made, through intensive discussions and literature evaluations, to achieve a certain degree of standardization on a European level in both monitoring technique and conservation status assessment.

* **A CONTRIBUTION TO THE SYNTAXONOMICAL KNOWLEDGE OF CONIFEROUS MOUNTAIN VEGETATION IN THE CENTRAL AND SOUTHERN APENNINE**

*Di Pietro R., Copiz R. & Blasi C.*

*Plant Biology Department, University of Rome “La Sapienza “.*

The upper mountain and subalpine belts of the Apennines were once intensively used for pastures, but the changes in the socio-economic situation which followed the end of the 2nd World War led to a progressive abandonment of traditional land-use pattern. As a result these mountain areas (especially above the timberline) are being taken over by rapid natural dynamic phenomena with strong changes in vegetation cover especially due to the re-colonization of nanophanerophytic and chamaephytic vegetation. The dwarf-shrubland vegetation that developed above the timberline in the central and southern Apennines has in the past been the subject of various phytosociological studies (Migliaccio, 1966; Bonin, 1978; Petriccione, 1988; Blasi *et al*., 1989, 1990, 1991; Abbate et al., 1994; Stanisci *et al*., 1994; Stanisci, 1997; Pignatti, 1998; Biondi *et al*., 1999; Brullo *et al*., 2001; Ubaldi 2003). Nevertheless, most of the problematic issues which have arisen through these years are still being debated today and this led to the proposal of several syntaxonomical schemes. In the central Apennine the structure of the coniferous and chamaephytic formations Is rather homogeneous and dominated by few wide-distribution species (*Juniperus communis, Arctostaphylos uva-ursi, Pinus mugo, Vaccinium myrtillus*), while more heterogeneous and complex is the floristic situation in the southern Apennines and in Sicily were several mediterranean mountain tree species occur (*Pinus nigra subsp. calabrica, Pinus leucodermis, Abies nebrodensis, Juniperus hemisphaerica*, ecc...) The classes more often involved in the syntaxonomy of the mountain pine and dwarf-scrub vegetation of the Apennines were *Vacciriio-Piceetea, Frico-Pinetea and Pino-Juniperetea* (although there were also other proposal such as *Querco-Fagetea, Roso penduline-Pinetea, Cerastio-Carlirtetea, Sedo-Scleranthetea*...). On the basis of bioclimatic, biogeographic, coenological, and geosymphytosociological elements, a new syntaxonomical scheme for central and southern Apennines is proposed in this paper. From this scheme emerges that most of the dwarf-scrub mountain vegetation types of central and southern Apennine is to be included in *Erico-Pin.etea* and *Pino-Jurtiperetea*, while the presence of *Vaccinio-Ptceetea* is restricted to few chamaephytic communitis typically developed on acid substrates.

* **SCOTS PINE FORESTS IN AUSTRIA: AN OVERVIEW**

*1C. Eichberger, 1P. Heiselmayer & 2S. Grabner*

*1Mag. Dr. Christian Eichberger Prof. Mag. Dr. Paul Heiselmayer Department for Organismic Biology Study Group for Diversity and Ecology of Plants University of Salzburg Hellbrunnerstr. 34 A-5020 Salzburg Austria. E-mail: christian.eichberger@sbg.ac.at; paul.heiselmayer@sbg.ac.at*

*2Mag. Dr. Sabine Grabner Institute of Botany University of Innsbruck Sternwartestr. 15 A-6020 Innsbruck Austria. E-mail: sabine.grabner@uibk.ac.at*

Since the beginning of vegetation science Scots pine forests have often been investigated. However, a satisfactory synsociological classification for Central Europe does not exist until now. In 2004 a syntaxonomical revision of Scots pine forests in Austria was worked out. A TWINSPAN-analysis based on 1372 phytosociological relevés from Austria and adjacent areas of Germany, Italy and the Czech Republic shows three major types of Scots pine forests: thermophilous communities of continental inner alpine valleys (Ononido-Pinion), Erica-Scots pine forests on calcareous rocks (Erico-Pinion) as well as moss-Scots pine forests growing on acid soils (Dicrano-Pinion). Because of floristic relationships, the Ononido-Pinion (in former times: class Pulsati1lo-Pinetea) could be integrated in the class Erico-Pinetea. Within the three alliances six associations can be distinguished. On calcareous rocks as limestone and dolomite only one association Enco-Pinetum sylvestris consisting of eight subassociations is presented, because sufficient relevant character species can not be found. For every syntaxon its floristic characteristics, its site conditions and its distribution is descnbed in detail. The nomenclature of the syntaxa will be discussed and revised. A synoptic table as well as determination keys for all associations and subassociations are added.

*Keywords: pine forests, Scots pine, syntaxonomy, nomenclature, phytosociology, synchorology, Erico-Pinetea, Erico-Pinetum, Austria.*

* **THE STUDY OF ALTITUDINAL AND PHYTOSOCIOLOGICAL DIFFERENCES BETWEEN COMMUNITIES OF THE VACCINIO-PICEETEA AND LOISELEURIO-VACCINIETEA IN MOUNTAINS OF YAKUTIA (EASTERN SIBERIA)**

*Nikolai Ermakov*

*Central Siberian Botanical Garden Zolotodolinskaya, 101 Novosibirsk, 630090 Russia. E-mail:botany@dus.nsc.ru*

Yakutia is mountain region of Eastern Siberia characterized by the most cold continental climate in North Hemisphere and widespread permafrost. These environments are favorable for formation of the most cryophyte variants of zonal communities of boreal forests and high mountains. Classification and ordination of 180 releves representing various vegetation types from the Stanovoye Plateau were performed with the use of Twinspan and Decorana. Two main altitudinal subdivisions of vegetation were received: boreal forests (*Larix cayanderi, Picea obovata*) of the class Vaccinio-Piceetea and subalpine shrub-dwarf shrub and krummholz communities of the class Loiseleurio-Vaccinietea. The clear phytosociological boundary between these two classes was not exposed. As a basis for identification of the Loiseleurjo-Vaccjnjetea in the Yakutian mountains can be used a combination of floristic and phytocoenotic features: 1) absence or low values of constancy (less then 20%) characteristic species of the Vaccinio-Piceetea - *Linnaea borealis, Pyrola incarnata, Orthilia obtusata, Goodyera repens, Equisetum varie gatum* and local moderatelly thermophilous species (*Atragene sibirica, Aegopodium alpestre, Zigadenus sibiricus, Mitella nuda*); 2) welldeveloped shrub layer of subalpine species - *Pinus pumila, Betula divaricata, B. exilis, Rhododendron aureum, Rh. adamsi, Rh. parviflorum, Juniperus sibirica*; 3) group of subalpine dwarf shrubs - *Ledum decumbens, Loiseleuria procumbens, Cassiope ericoides*; 4) distinct patch-structure of ground layer. Some floristic and phytocoenotic features are not reliable for division of the Vaccinio-Piceetea and Loiseleurio-Vaccinietea: 1) presence of trees of *Larix cajanderi* (which always form light open layer); 2) predominance of widespread boreal dwarf shrubs - *Vaccinium vitis-idaea, V. uliginosum, V. myrtillus, Ledum palustre, Empetrum nigrum*; 3) presence of boreal mosses *Hylocomium splendens, Pleurozium schreberi, Dicranum polysetum*. All Yakutian subalpine shrub-dwarf shrub and krunimholz communities were included in the order Vaccinio-Pinetalia pumilae Suzuki 1964, class Loiseleurio-Vaccinietea.

* **GENISTA DESOLEANA VAIS. DWARF-SHRUB VEGETATION IN SARDINIA**

*Farris E., Mameli G., Bageila 5 & Filigheddu R.*

*Dipartimento di Botanica ed Ecologia Vegetale Università Degli Studi, Via Muroni 25-07100 Sassari (Italy)*

*Genista desoleana* Valsecchi is a dwarf-shrub species belonging to the section *Erinacoides* Spach of the genus *Genista L*. and endemic of the Tyrrhenian area (Northem Sardinia, Corsica. Tuscany and Liguria) (Valsecchi. 1993), where it grows only on siliceous substrata and is limited to meso-supratemperate phytoclimatic belts (*sensu* Rivas-Martìnez, 2004) in mountain areas. In Sardinia it is particularly abundant in the mountain areas of Montiferru (*locus classicus*) and Marghine-Goceano.   
In the Sardinian area of distribution *G. desoleana* colonises open areas after fire or grazing abandonment, and constitutes dwarf spiny secondary communities with *Thymus catharinae* Camarda and *Armeria sardoa* Sprengei subsp. *sardoa*, referred to the association *Armeno sardoae-Genistetum desoleani* (Vaisecchi, 1994), included in the endemic ailiance *Teucrion mari* of the *Cisto-Lavanduletea* ciass (Biondi, 2000). In secondary succession dynamics dwarf communities are followed by shrub ones, dominated by *Enea arborea* L., G. *desoleana* and *Teline monspessulana* (L.) Koch, referred to the *Ericion arboreae* ailiance of the *Quercetea ilicis* ciass. These communities are the semi-natural vegetation closer to the potential one, represented by mesophlous woods dominated by *Quercus ilex* L., *Ilex aquifolium* L. and *Sanicula europaea* L., recently referred to the association *Saniculo europaeae-Quercetum ilicis* (Bacchetta et al., 2004). Ecological research, stili in progress, shows a key-role of G. *desoleana* dwarf-shrub communities for piant biodiversity conservation.

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* **DWARF SHRUB HEATH VEGETATION AND CLIMATE IN THE FAROE ISLAND**

*Anna Maria Fosaa*

The pattern of dwarf shrub heath vegetation in the Faroe Islands is described on the basis of systematic sampling of the vegetation along five mountain slopes. On south-facing slopes, dwarf shrub heath vegetation is characteristic for the temperate vegetation zone up to 200 m a.s.l with the two communities, *Calluna vulgaris-Nardus stricta* community and *Empetrum nigrum-Calluna vulgaris* community. These two communities, which were not found on north-facing slopes, are on the margin of their distribution area and the species in these communities are mainly species restricted to cooler regions of the southern hemisphere. As this vegetation type identifies the limit between temperate and arctic-alpine vegetation in the islands it is a perfect setting for studying the effect of global change. Here, the limiting factor for this vegetation type in the Faroe Island will be discussed in relation to different temperature parameters by comparing vegetation and temperature data from north- and south- facing slopes at different altitudes. Potential effects on this vegetation type will also be discussed in a climate change scenario.

* **FACTORS AFFECTING THE NEMORAL PLANT SPECIES RICHNESS OF THE FRAGMENTED FOREST PATCHES OF ROME**

*De Sanctis M., Attorre F., Francesconi F., Alfò M., Bruno F.*

*Dipartimento di Biologia Vegetale, Università “La Sapienza” P.le A. Moro 5, 00185 Roma*

This work describes an attempt to determine the importance of different factors on the nemoral plant species richness of the fragmented forest patches of Rome. A list of Campagna Romana nemoral species is presented. Sixty forest patches were chosen on the basis of a stratified random sampling and were surveyed for the presence of those plant species. For each patch, a series of environmental variables were determined: area, mean and standard deviation of the slope, shape indexes, isolation indexes, habitat diversity, stand structure indexes and edaphic parameters. The presence-absence of grazing and of surrounding agricultural fields were recorded also. The analyses were carried out for all the woody patches and for the mesophilous (characterised by *Querco-Fagetea* species) and termphilous (characterised by *Quercetea ilicis* species) patches separately. The species richness was found to be correlated with area and habitat diversity. Instead there was no significant relationship between species richness and the isolation indexes. Using the Mann-Whitney test thirty one species have been proved to reliably indicate species richness. In particular *Ajuga reptans* L., *Euphorbia amygdaloides* L. subsp. *amygdaloides* e *Melica unflora* Retz were the species indicating a high species richness in ali forest types. A Seemingly Unrelated Regression Equation was used to predict the species richness. This model is more reliable than the linear regression analysis when the indipendent variables are correlated. Prediction based only on GIS data was not satisfactory (R2=0.45). The inclusion of the field data increased the efficiency of the model (R2=0.71). The most reliable model (R2=0.88) was obtained adding the presence-absence information of the three best indicator species. It is thus possible to predict nemoral species richness using the following set of variables: area, habitat diversity, organic matter, mean slope and predictor species, which is useful to elaborate biodiversity conservation strategies.

* **CONTRIBUTION OF THE EXTENSION OF ROTATION ON ECOLOGY AND PRODUCTIVITY IN A GREEK OAK COPPICE FOREST**

*N. Grigoriadis and 2T. Zagas*

*1National Agricultural Research Foundation (NAGREF), Forest Research Institute, Thessaloniki, Greece Tel.: +30 231 0 461 17 1,2,3 Fax: +30 231 0 461 341 E-mail: giignick@fri.gr*

*2Aristotle University of Thessaloniki, Department of Forestry and Natural Environment, Laboratory of Silviculture, P.O.Box 262, 540 06 Thessaloniki, Greece Tel.: +30 231 0 998903 E-mail: zagas@for.auth.gr*

The coppice forests cover 48.0% (about 1.6 million ha) of the total forest area of Greece. They are low productivity forests and have suffered for a long time through degradation processes. The coppice oak forests cover a significant area (1.5 million ha). Twelve oak species are native to Greece, including deciduous and evergreen species with a great range of site adaptation. One of the most important is *Quercus frainetto* Ten. The objective of this research was to evaluate the extension (doubling) of the rotation in an oak coppice forest on carbon sequestrate and wood products. The study area is a private forest enterprise in the Prefecture of Pieria (North Greece) (elevation:100-350 m). The forest covers 1917 ha, and the dominant species is *Q. frainetto*. The forest has been managed continuously under the same system for several decades. The management system is based on clear cutting (20 years rotation) with standards (12% reserve trees) and the main product is the fuel wood. The forest was classified and divided according to the site quality (good, moderate and bad sites). Taking into account the current yield tables—current and mean annual increment- the rotation is determined to 20 years for the good and moderate sites. But, due to many considerations of issues such as extensive exploitation, site degradation and carbon sink issue; the extension of the rotation is proposed from 20 to 40 years. At a 60 years transitional period and just after 20 years in this period, it is estimated that the wood storage will be multiplied by seven (from 31,000 m3 to 235,000 m3) and at the end of this period will be quadruplicated (13 1,000 m3). Also, in the beginning of the extension of the rotation the wood production will decrease (from 2700 m3 /year production today to 887 m3/year), in the next 10 years the increment will be the same (2749 m3) and until the end of the transition period will be redoubled (7048 m3). Furthermore, there is an improvement of the quality of wood products (higher proportion of round wood).

*Keywords: forest management, coppice, oak forest, extension of rotation.*

* **ESTABLISHMENT OF HABITAT MONITORING SYSTEM AT WETLAND AGRAS (PELLA, GREECE)**

*1N. Grigoriadis, 2S. Donth, K. 3Theodoropoulos & 3E. Eleftheriadou*

*1National Agricultural Research Fundation, Vassilika 57006 Thessaloniki, 2Environmetalist, Chrysoupoiis 64200 Kavala,*

*3Aristotie University of Thessaloniki, Department of Forestry & Natural Environment,*

*Institute of Forest Botany — Geobotany, 54124 Thessaloniki, Greece.*

The Agras (Pella, Greece) wetland is a proposed Priority Site for Conservation under the European Natura 2000 Network (LIMNI AGRA, GR 1240004), according to Ecotope and Biodiversity (92143/EOC, proviso 3) and Birds (79/409/ EOC, proviso 4) Directives. The site is divided to the core, which is occupied mostly by azonal forests near lakes, and to the regional zone, which is dominated by terrestrial ecosystems. The core’s ecotopes have a great ecological importance due to the existence of priority ecotopes (calciferous fens with *Cladium mariscus*) and the abundant and significant habitats for migratory avifauna. The object of the research was a monitoring system establishment for the important vegetation types (ecotopes) in order to trace the great changes while estimating the current wetland’s conditions. The environmental monitoring system was developed inside the wetland and focused to specific important vegetation types: natural eutrophic iakes (315030 Eu-Potamion and 315040 Nymphaeion), mediterranean tall — herb and rush meadows (6420), calcareous fens with *Cladium mariscus* and *Carex davalliana* (7210\*) and reed beds (72A010 Phragmition australis). In the selected vegetation types plant samples took place and where it was necessary, water and soil sampies and anaiyses.

*Keywords: wetland, ecotope, biodiversity, monitoring system, vegetation type.*

* **10 YEARS CHANGES IN STRUCTURE AND FLORISTIC COMPOSITION OF THE HEATHLANDS OF THE BALLOËRVELD, THE NETHERLANDS**

*Rense Haveman, Anja van der Berg & Raymond van der Wijngaart*

* **THE CLASS CISTO-MICROMERIETEA ON CRETE**

*Ralf Jahn*

* **DIVERSITY OF ASH FORESTS IN THE SOUTHERN PART OF LATVIA**

*Dace Mangale*

* **EXPERIENCES OF STANDARDIZATION OF ACTUAL VEGETATION MAPPING**

*Molnár, Zs., Bölöni, J., Kun, A. (Institute of Ecology and Botany of the Hungarian Academy of Sciences,Vácrátót, Hungary)*

* **ACTUAL VEGETATION MAPPING OF HUNGARY**

Molnár, Zs. (projekt leader) (Institute of Ecology and Botany of the Hungarian Academy of Sciences, Vácrátót, Hungary)

* **VEGETATION STUDIES, HABITAT MONITORING AND MANAGEMENT IN CENA MIRE (LATVIA)**

*Mara Pakalne\*, Iluta Luce\* (\*University of Latvia, Department of Botany and Ecology, Kronvalda Blvd. 4, LV-1010, Riga, Latvia)*

* **DIVERSITY OF THE GENISTA AETNENSIS BUSH VEGETATION ON MT. ETNA (SOUTHERN ITALY)**

*Emilia Poli Marchese &, Daniela Spampanato (DACPA, Sez. di Biologia ed ecologia vegetale, Università di Catania, via Valdisavoia - 95123 Catania - e-mail : epolimar@unict.it)*

* **MONITORING AND HABITAT MANAGEMENT IN THE “MIRE”LIFE PROJECT SITES IN LATVIA**

*Mara Pakalne*

* **METHODOLOGICAL ASPECTS ABOUT THE EVALUATION OF BIODIVERSITY ON THE FRAMEWORK OF FOREST MANAGEMENT PLAN. (CASE STUDY ON ZALL-GJOCAJ FORESTS)**

*Arsen PROKO (Rruga Don Bosko; Pallatet Hawai Nr. 4 7/8 Tirana, Albania E mail: aproko@albmail.com or aproko1954@yahoo.com)*

* **SYNTAXONOMY OF ALPINE DWARF-SCHRUB VEGETATION OF THE C&W BALKAN**

*Redzic Sulejman (Dep. of Biology, Faculty of Science University of Sarajevo, 33-35 Zmaja od Bosne St., 71 000 Sarajevo, Bosnia and Herzegovina)*

* **LARGE-SCALE PHYTOSOCIOLOGY: DO WE KNOW WHERE ARE WE GOING?**

*Jan Roleček (Department of Botany, Masaryk University, Kotlarska 2, CZ-611 37 Brno, Czech Republic - honza.rolecek@centrum.cz)*

* **ERICA TETRALIX L. COMMUNITY IN LATVIA**

*Salmina L. (Latvian Fund for Nature, Kronvalda boulvd. 4, LV – 1010, Rīga, Latvia. E-mail: lsalmina@latnet.lv)*

* **MONITORING TECHNIQUES FOR GRADUAL SPATIAL TRANSITIONS IN VEGETATION**

*Sebastian Schmidtlein (University of Bayreuth, Dept. of Biogeography, 95440 Bayreuth, Germany; sebastian.schmidtlein@uni-bayreuth.de)*

* **A GIS SUPPORTED EVALUATION OF THE THERMO-MEDITERRANEAN NATURA 2000 PHRYGANA HABITATS PROTECTED WITHIN THE FRAMEWORK OF THE NATIONAL MARINE PARK OF ZAKYNTHOS,GREECE**

*Gail Schofield, Andrew Hartley, Lucy Mottram, Kostas Katselidis & John Pantis (National Marine Park of Zakynthos)*

* **MONITORING VEGETATION FOR NATURE CONSERVATION IN THE UK**

*Ian M Strachan, Senior Habitats Adviser, Joint Nature Conservation Committee (JNCC)*

* **THE SALZBURG BIODIVERSITY DATABASE NETWORK**

*Peter T. Strobl, Mag. rer. Nat. (FB Organismische Biologie & Ökologie Universität Salzburg, Austria Hellbrunnerstr. 34 5020 Salzburg, Austria - peter.strobl@sbg.ac.at)*

* **AN EXAMPLE OF REALIZATION OF ECOLOGICAL MAPS DERIVED FROM ELLENBERG INDICATOR VALUES GEOREFERENCIATED BY GIS IN THE BIOLOGICAL RESERVE OF DOÑANA (SPAIN).**

*Testi A., Cara E., Fanelli G.*

* **SYNECOLOGY OF QUERCUS SUBER COMMUNITIES IN S EUROPE ALONG GEOGRAPHICAL AND ECOLOGICAL GRADIENTS.**

*Testi A., Spada F., Ponziani S. (Orto Botanico di Roma - Dipartimento di Biologia Vegetale, Università “La Sapienza” P.le A. Moro 5, 00185 Roma, e-mail: francesco.spada@uniroma1.it)*

* **ON THE ECOLOGY AND SOCIOLOGY OF VACCINIUM MYRTILLUS AND V. VITIS-IDAEA IN GREECE**

*Tsiripidis Ioannis (Institute of Systematic Botany and Phytogeography, Division of Botany, Department of Biology, Aristotle University of Thessaloniki, GR-541 24 Thessaloniki, Greece.*

* **A COMPARISON OF SHRUB COMMUNITIES’ FLORA IN THE STAGE OF PRIMARY SUCCESION BETWEEN KULA VOLCANO (TURKEY) AND VOLCANIC ISLAND, MIYAKE-JIMA (JAPAN).**

*Emin Ugurlu1, Takashi Kamijo2 (1 Ege University, Faculty of Science, Department of Biology, 35100 Bornova – Izmir Turkey - 2 Institute of Agriculture and Forestry, University of Tsukuba,* Tsukuba Ibaraki 305-8572, Japan)

* **NUMERICAL ANALYSIS AND SYNTAXONOMICAL REVISION OF THE DWARF SHRUB COMMUNITIES OF AUSTRIA AND CZECHIA (CENTRAL EUROPE)**

*Wolfgang Willner (Vienna), Andreas Exner (Vienna) & Milan Chytrý (Brno)*

* **DIVERSITY OF THE GENISTA AETNENSIS BUSH VEGETATION ON MT. ETNA (SOUTHERN ITALY)**

*Daniela Spampinato & Emilia Poli Marchese (DACPA, Sez. di Biologia ed ecologia vegetale, Università di Catania, via Valdisavoia - 95123 Catania - e-mail : epolimar@unict.it)*

* **METHODOLOGICAL ASPECTS ABOUT THE EVALUATION OF BIODIVERSITY ON THE FRAMEWORK OF FOREST MANAGEMENT PLAN. (CASE STUDY ON ZALL-GJOCAJ FORESTS)**

*Arsen PROKO\* & Genti KROMIDA\*\* (\*Rruga Don Bosko; Pallatet Hawai Nr. 4 7/8 Tirana, Albania E mail: aproko@albmail.com or aproko1954@yahoo.com \*\*National Parks on* General Directorate of Forest and Pasture)

* **REMOTE SENSING IN PHYTOSOCIOLOGY: THE MAP OF VEGETATION OF THE PROVINCIA OF ROME**

*Fanelli G.1, Bianco P.M.2-4, Cazzagon P.2, D’Angeli D.2, De Sanctis M.1-2, Ramello A.2, Rinieri G.2, Serafini Sauli A.1-2, Tescarollo P.1-2, De Corso S.3, Gioia P.3, Testi A.1, Pignatti S.1*

*(1Dipartimento di Biologia Vegetale, Università di Roma La Sapienza, P.le Aldo Moro, 5, 00185 Roma - 2 Cooperativa Pineto 2000, V. Andrea Barbato 28, 00168 Roma, 3IPT: Informatica per il Territorio e l’Ambiente, 4Università del Molise,Dipartimento Scienze e Tecnologie dell’Ambiente e del Territorio, Via Mazzini, 86170 ISERNIA)*

* **ALPINE HEATHS IN THE WESTERN CARPATHIANS – A NEW APPROACH TO THE CLASSIFICATION**

*Z. Dúbravcová, I. Jarolímek, J. Kliment, A. Petrík, J. Šibík & M. Valachovič (Slovakia)*

* **BULGARIAN BEECH FORESTS AND THEIR IMPORTANCE FOR THE NATURA 2000 NETWORK IN BULGARIA**

*Tzonev, R., Chytry, M., Dimitrov, M., Roussakova, V., Dimova, D., Gussev, Ch., Pavlov, D., Vulchev, V., Vitkova, A., Nikolov, I., Gogoushev, G., Borisova, D., Ganeva, A.*

* **SYNTAXONOMY OF ALPINE DWARF-SCHRUB VEGETATION OF THE C&W BALKAN**

*Redzic Sulejman (Dep. of Biology, Faculty of Science University of Sarajevo, 33-35 Zmaja od Bosne St., 71 000 Sarajevo, Bosnia and Herzegovina - E-mail:sredzio@pmf.unsa.ba or redzic0102@yahoo.com)*

* **THE MEDITERRANEAN DWARF SHUBS: ORIGIN AND ADAPTIVE RADIATION**

G. Giusso del Galdo1, R. Guarino2 & S. Pignatti3 (1Università di Catania, Dipartimento di Botanica, via A. Longo 19, I-95125 Catania, 2Università di Cagliari, Dipartimento di Scienze Botaniche, viale S. Ignazio da Laconi 13, I-09123 Cagliari, 3Università di Roma “La Sapienza”, Orto Botanico, largo Cristina di Svezia 24, I-00165 Roma)

* **SYNBIOSYS EUROPE: PRESENT STATE AND PROSPECTS**

*Schaminée Joop, Hennekens Stephan (Alterra, PO Box 47 Wageningen, 6700 AA The Netherlands)*

* **THE POTENTIAL DISTRIBUTION OF NATURA 2000 HABITATS BY USING VARIOUS SPATIAL DATA SOURCES, SHORT CONTRIBUTION.**

*Schaminée Joop, Hennekens Stephan (Alterra, PO Box 47 Wageningen, 6700 AA The Netherlands)*

* **SOME CONTRIBUTION OF LANDSCAPE ECOLOGICAL THEORY TO VEGETATION SCIENCE**

*Vittorio Ingegnoli (University of Milan, Italy)*