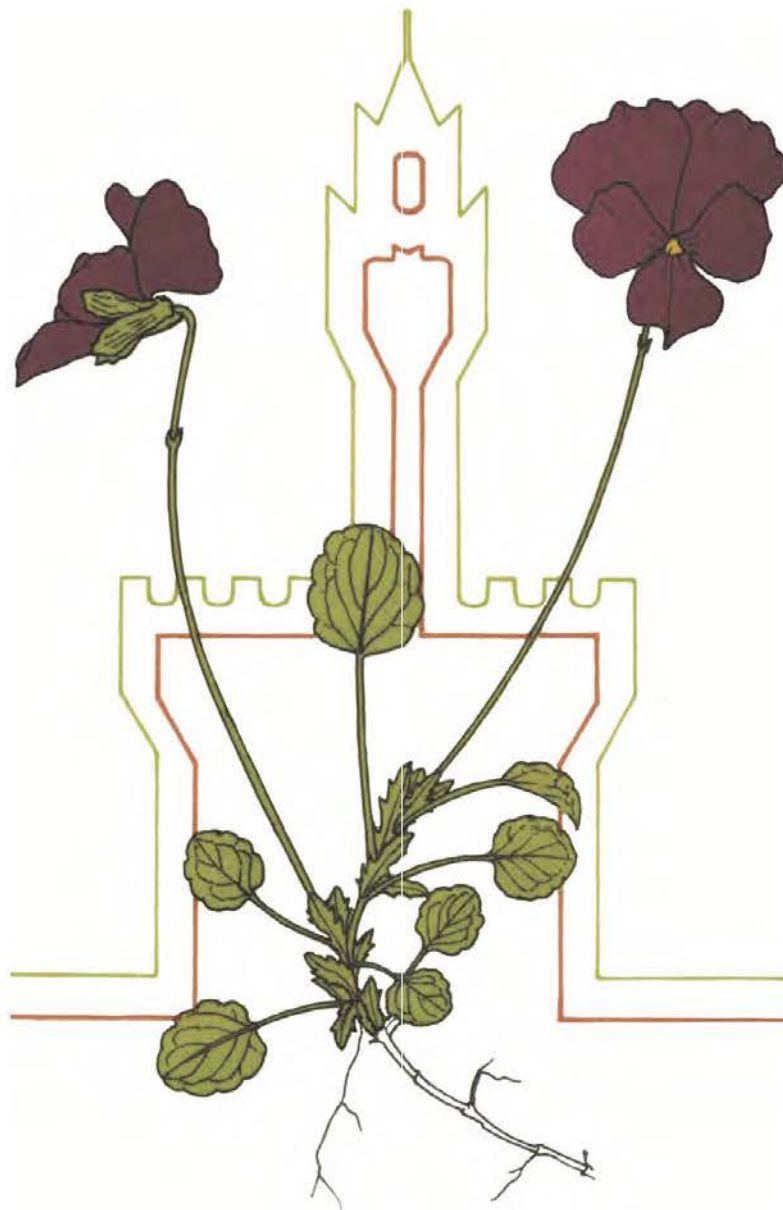


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3.1 = *MONOTROPA HYPOPHEGEA* WALLR., A NEW RECORD FOR THE SICILIAN FLORA

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During field investigations in the Mountains around Palermo, an unusual population of *Monotropa* sp. was found. After revision of the taxonomic literature and herbarium specimens, it was referred to *Monotropa hypophegea* Wallr. This species is closely related to *M. hypopitys* L., and in the past was considered only a variety (1) or a subspecies (2) of it. More recently this entity has been considered an independent taxon deserving the rank of species (3). The most important morphological differences between the two taxa are the number of flowers in the raceme and the hairiness of sepals, petals and capsule. The individuals of the observed population have short racemes, with less than 8 flowers, are glabrous in all parts, including the sepals and inside petals and have glabrous, spherical capsules. On the contrary *M. hypopitys* has denser racemes (generally with 8-11 flowers), flowers hairy in the inner part of petals and in the sepals, and ovoid capsules. According to the literature (1) *M. hypophegea* is typical of deciduous forests, especially beech woods, while *M. hypopitys* prefers coniferous forests. However, in Sicily *M. hypopitys* is known only in the beech forests of the Madonie and the Nebrodi Mountains, with the lone exception of one locality in a black pine forest of the Etna Mountain (4). *M. hypophegea*, that was unknown in the island (4, 5), was found in an artificial *Pinus halepensis*, *Pinus pinea* and *Cupressus sempervirens* plantation. In particular, the locality where the species was found is in the Casaboli Wood at 790 m a.s.l., in the municipality of Monreale, near Palermo. It is an old reforestation with a high degree of dynamism to the return of natural vegetation, represented by *Quercus ilex* L. in the form of dense shrubs that constitute a undergrowth below the conifers. This discovery represents a further enrichment for the flora of Sicily. The Mountains around Palermo are one of the richest areas in terms of plant biodiversity in Sicily. This is underlined by the recent description of punctual endemic species such as *Silene kemoniana*, *Brassica trichocarpa*, *Hieracium busambarense* and *Sorbus busambarensis* (6, 7, 8, 9).



Fig.1 : *Monotropa hypophegea* (foto di Giuseppe Di Gregorio).



Fig. 2: Dettaglio del fiore.

- 1) S. Pignatti (1982) Flora d'Italia, 1-3. Edagricole, Bologna
- 2) B. Křisa (1972) *Monotropa* P. 5 in T.G. Tutin & al. Flora europaea, 3. Cambridge University Press, Cambridge
- 3) F. Conti, G. Abbate, A. Alessandrini, C. Blasi (2005) An annotated checklist of the Italian vascular flora. Palombi, Roma
- 4) G. Giardina, F.M. Raimondo, V. Spadaro (2007) *Bocconea*, 20, 5-582
- 5) F.M. Raimondo, G. Domina, V. Spadaro (2010) *Quad. Bot. Amb. Appl.*, 21(2010), 189-252
- 6) C. Brullo, S. Brullo, G. Giusso del Galdo, V. Ilardi, S. Sciandrello (2012) *Anales Jard. Bot. Madrid*, 69(2), 209-216
- 7) C. Brullo, S. Brullo, G. Giusso del Galdo, V. Ilardi (2013) *Phytotaxa*, 122(1), 45-60
- 8) O. Caldarella, L. Gianguzzi, G. Gottschlich (2014) *Pl. Biosyst.*, 148(3), 439-443
- 9) G. Castellano, P. Marino, F.M. Raimondo, V. Spadaro (2012) *Pl. Biosyst.*, 146(suppl.), 338-344

3.1 = PLANT LANDSCAPE OF RAS DIMAS PENINSULA (GOVERNATORATE OF MONASTIR, CENTRAL COASTAL TUNISIA)

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The Ras Dimas lagoon lies along the coast of Central Tunisia (35°37'45.84"N, 11° 2'44.61"E), in the region of Sahel, about 20 km linear distance to the south from Monastir and about 160 km from Tunis.

The lagoon is made up by a sandy peninsula with white sands rich in limestone with fine granulometry, about 3 km long, up to 200 m wide and up to 2 m high, that contains about 120 hectares of sea. Previously this peninsula was regularly isolated from the continent forming the island of Edzira, in the last years, sea storms and the different streams course, likely caused by the restructuring of the Port of Bekalta, has given the actual configuration of a peninsula.

In April 2013, as part of the Initiative PIM, a scientific mission, initially planned in the Island of Kuriat, has been moved to the coast of central Tunisia due to bad weather conditions. This shift made possible the floristic survey of areas with great naturalistic value, still not well floristically known.

During this mission, phytosociological relevés have been taken and herbarium specimens have been collected and stored in the *Herbarium Mediterraneum Panormitanum* (PAL); plant identification has been done with the help of the Flora of Italy (1) and of Tunisia (2, 3) and by direct comparison with the exsiccata housed in PAL.

The distribution of taxa and phytocoenoses resulted to be influenced by elevation and distance from the sea shore. The studied vegetation is characterized by psammophilous and halophytic communities. Flat areas near the sea are colonized by communities referable to the class *Cakiletea maritima*, followed inwards by a belt of embryo dunes that houses perennial rhizomatous *Poaceae* characterizing the class *Ammophiletea* and related *syn-taxa*. The flat, periodically flooded, areas behind the dunes are dominated by *Juncus maritimus* Lam., in contact with saltmarshes dominated by *Sarcocornia perennis* (Mill.) A.J. Scott (classes *Juncetea maritimi* and *Sarcocornietea fruticosae*, respectively). Where the altitude is some decimetres a.s.l., a more mature vegetation dominated by small cushion shaped chamaephytes belonging to *Crucianelletalia maritima*. Near the inner part of the lagoon, where the elevation is a bit higher (some dm a.s.l.), there is a grassland of *Lygeum spartum* L. On the inner, on stabilized dunes, there are few remnants of a psammophilous maquis dominated by *Retama retam* subsp. *bovei* (Spach) Talavera & Gibbs, ascribed to the class *Quercetea ilicis* (Oleo-Ceratonion).

Taxa of particular biogeographic interest found in the surveyed area are: *Anagallis monelli* L., *Echiochilon fruticosum* Desf., *Helianthemum stipulatum* (Forssk.) C. Chr., *Linaria aegyptiaca* (L.) Dumort., *Silene succulenta* Forssk. and *Stachys arenaria* Vahl.

Cuscuta palaestina Boiss. subsp. *palaestina* and *Carduus argyroa* Biv. are here reported for the second time from Tunisia (4, 5).

The exploration of the peninsula of Ras Dimas, allowed us to collect and study many taxa and to gather an unprecedented herbarium and photographic documentation of the flora and plant communities. Further research is aimed, that will provide new data also in comparison with the previous vegetation cover of the area.

1) S. Pignatti (1982) Flora d'Italia, 1-3. Bologna

2) A. Cuénod, G. Pottier-Alapetite, A. Labbé (1954) Flore analytique et synoptique de la Tunisie. Tunis

3) G. Pottier-Alapetite (1979-1981) Flore de la Tunisie, 1-2. Tunis

4) M. Raffaelli, C. Ricceri (1995) Fl. Medit., 5, 247-259

5) E. Le Floch, L. Boulos, E. Vela (2010) Catalogue synonymique commenté de la Flore de Tunisie. Tunis

Study performed thanks to the contribution of APAL (Coastal protection and planning agency of Tunisia) and of PIM (Small Mediterranean Island) Initiative coordinated by the Conservatoire du littoral (France).

3.1 = *VERBENA BONARIENSIS* (VERBENACEAE) ADVENTIVE IN ITALYVIVIENNE SPADARO¹, FRANCESCO M. RAIMONDO¹, GIANNIANTONIO DOMINA²¹Dip. STEBICEF / Sez. di Botanica ed Ecologia vegetale, Università di Palermo, Via Archirafi, 38, I – 90123, Palermo;²Dip. SAF, Università di Palermo, Via Archirafi 38, I – 90123, Palermo

Among the species of *Verbena* L. cultivated in Italy Traverso (1) reports: *V. venosa* Gilles, *V. tenera* Sprengel (= *V. pulchella* Sweet.) and the horticultural hybrid *V. hybrida* Hort. (= *V. hortensis* Hort.). No trace of *V. bonariensis* L., that is reported about 60 years later as naturalized in Tuscany (2). In the Herbarium Centrale Italcum (FI) are housed specimens collected in Piedmont and Tuscany, labelled as *V. venosa* – taxon considered a variety of *V. bonariensis*.

V. bonariensis, as indicated by the specific epithet, is a South American species, herbaceous, usually perennial, also cultivated as an ornamental. Several varieties and wild forms are known of this taxon. The International Plant Names Index (IPNI) records: *V. bonariensis* f. *albiflora* Moldenke, *V. bonariensis* var. *brevibracteata* Kuntze, *V. bonariensis* var. *conglomerata* Briq., *V. bonariensis* f. *gracilis* (Cham.) Voss., *V. bonariensis* var. *hispida* Moldenke, *V. bonariensis* var. *litoralis* Hook., *V. bonariensis* var. *longibracteata* Kuntze, *V. bonariensis* var. *rigida* (Spreng.) Kuntz, *V. bonariensis* f. *robustior* Chodat, *V. bonariensis* f. *venosa* (Gillies & Hook.) Voss.

This species is native of S. America (Argentina, Brasile, Paraguay and Uruguay) (3, 4) and introduced in the USA (5), Azores, Great Britain, Canary Islands, Portugal, Madeira (6) and in Italy, as reported above, in Tuscany, in Tombolo Pisano (PI) (2, 7, 8) and in Liguria (8).

Some considerations on the tendency of naturalization of the species in Sicily (9) where accidentally misinterpreted as the report of naturalization in the region (10, 11). This record was neglected in the subsequent floras and checklists (7, 8, 12, 13).

Recently we verified the spontaneous occurrence of *V. bonariensis* at the edges of a channel, in the southern outskirts of the city of Palermo (Sicily). This population, referred to *V. bonariensis* var. *hispida*, is made up of about 100 vigorous and perennial individuals with tendency to expand, actually, in the same area.

The taxonomic identity of the Tuscan populations is different. In this region, it is known from Tombolo Pisano (2) as well as from Florence as documented by specimens collected in the square in front of the rail station of S. Maria Novella (*Raimondo et Domina*, 21/06/2012, PAL), in the fenced area for works of rearrangement of the square. In comparison with the population from Tombolo Pisano, referred to the nominal type, the population from Florence looks like annual and belonging to a different variety, also in comparison with the Sicilian one.

The recent discovery in Sicily as well as increasing the quota of adventitious exotic vascular flora of the island, confirms the tendency of the species to spread further in the national territory.

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4.1 = BOTANICAL CONTRIBUTION TO ARCHAEOLOGICAL LAND EVALUATION IN THE FP7 MEMOLA PROJECT

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The Memola Project (FP7-SSH-2013-2), “MEDiterranean MOntainous LAndscapes: an historical approach to cultural heritage”, aims to analyse cultural landscapes basing on interdisciplinary approach to cultural landscapes of Mediterranean mountainous areas, taking as a central axis the historical study of two natural resources essential to generate agro-systems: water and soil.

The different exploitation strategies have resulted in different landscapes and forms of cultural expression throughout Europe and the Mediterranean, but have also produced very important common areas. Agro-systems represent one of their greatest expressions.

The knowledge of the different ways in which the natural resources are exploited and managed over time is crucial for landscape conservation and its adaptation to current global changes: globalization, agrarian industrialization, climate change, loss of peasants knowledge and rural population.

The project is focused on Sierra Nevada (Spain), Monti di Trapani (Italy), Colli Euganei (Italy) and Vjosa Valley (Albania).

The main objectives of the Project are:

- Investigate the logic that rules the process of historical landscapes formation in relation to natural resources within a diachronic framework. Introduce the historical perspective (4th dimension), which we consider to be a powerful interpretation key, in landscape studies.
- Draw context-tailored strategies of preservation, diffusion and valorisation of the cultural heritage (both tangible and intangible) and of the environment. Stimulate sustainable development in rural areas.
- Analyse the efficiency of these systems and the current problems of survival within the context of global climate change and the framework of European policies.
- Develop new methodologies for the study of cultural landscapes, through the creation of scalable working protocols, able to take advantage of the solid background of technologies and analysis methods available to the research group.
- Use a multidisciplinary approach, thus widening the range of specialists involved in cultural heritage study to agronomist, hydrologists, botanists, hydro-geologists, geologists and architects. Promote skills hybridization among researches (humanistic and scientific sides), prompting new forms of job creation.

Diachronic analysis of landscape is carried out using the Land evaluation to reach the objectives of the project. In particular for reconstruction of ancient landscape and for evaluation of the actual landscape structure (e.g. is the vineyard in the mountains around Trapani (Sicily) the best use of the territory in terms of environmental and economic sustainability?)

The techniques of land evaluation refer mainly to “Framework for Land Evaluation” of the Food and Agriculture Organization (1) and this approach has been generally well received and has been used for many surveys. A theoretical framework for Land Evaluation is given by Rossiter (2).

The same approach is used for the reconstruction of ancient landscapes. Van Joelen defined the archaeological land evaluation discipline (3).

The method applied is based on matching and comparing of historical Land Use and Ecological Land Unit taking into account the landscape ecology approaches (4). The natural potential vegetation is used to represent territorial areas ecologically homogeneous useful for evaluating the fitness of a type of land for a specific kind of land use. The phytosociological analysis of semi-natural and natural vegetation is the starting point of ecological characterization. Archaeological, Archaeopedological, Archaeobotanical data, Written sources, Toponymy, Ethnographical data, Monumental Trees, are needed to historical landscape reconstruction.

1) FAO (1976) Soils Bulletin no. 32. FAO, Rome, 87 pp.

2) D.G. Rossiter (1996) Geoderma, 72(3), 165-190

3) E. Van Joelen (2003) PhD thesis, Rijksuniversiteit Groningen

4) C. Blasi, M.L. Carranza, F. Frondoni, L. Rosati (2000) Appl. Veg. Sci., 3(2), 233-242

4.5 = EVALUATION OF THE DNA BARCODING APPROACH IN *HYPERICUM* SPP. DISCRIMINATION

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Hypericum genus, with more than 450 species, is widespread in temperate zones all over the world.

In Italy 30 taxa are known, 26 species and 4 subspecies; 10 of them are native of Sicily, in addition to *H. calycinum* which was found as naturalized.

Hypericum biochemical compounds (flavonoids, coumarins, glycosides, sesquiterpenes, tannins, volatile oils) are well recognized for many pharmacological activities: anti-inflammatory, improving blood flow, against traumas, in wounds and burns recovering. The most important activity is ascribed to the hypericin, a compound especially derived from *Hypericum perforatum* L., with successfully application in anti-depressive phytotherapy.

The medical field relevance and the related commercial interest led to the input for improving the taxonomic identification method to dispose of certain plant material. Methods for fast and accurate identification of the plant species are required to support morphological characterization.

In this study the potential of the "DNA Barcoding" molecular method was investigated in discriminating the Italian *Hypericum* taxa in order to develop an easy authentication assay helpful in solving taxonomic doubts or in commercial trade traceability of whole plants, portions or derived products.

The samples range was mainly recovered from native habitats in Italy, during the flowering period. Some samples were also sourced from certified herbarium collection.

The DNA extraction was carried in three biological replicates, according to CTAB protocol for plant material (1). The DNA bank and also the *ex-situ* collection are stored at CRA-SFM of Bagheria.

The three plastid regions, *rbcL*, *matK* and *trnH-psbA*, were assessed, according to the CBOL Plant Working Group indications (2). Phylogenetic analysis of each molecular marker were conducted by comparing sequences including those available from international databases (BOLD/NCBI) based on Kimura 2-parameter (Kimura, 1980). The preliminary results indicate the effectiveness of the method in discriminating the taxa of *Hypericum*, suggesting the possibility to build a fast and accurate molecular identification method by barcode.

1) Doyle, J.J. and J.L. Doyle. 1987. A rapid DNA isolation procedure for small quantities of fresh leaf tissue. *Phytochemistry Bulletin* 19:11-15

2) CBOL Plant Working Group (2009). *Proceedings of the National Academy of Sciences USA* 106: 12 794–12 797