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Inventory of wild and ornamental plants in green space of M'sila University - Pole 2 (Algeria) — first report

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ABSTRACT

The ornamental flora of green spaces of the University of M'sila (Pole 2) includes 32 ornamental plants (tree, shrub and herbaceous), belonging to 22 botanical families and 29 genera. The greens contain 89 wild plants belonging to 29 families which find refuge at the edge and in these green spaces; of which the Asteraceae family is most abundant, in second place comes the Fabaceae and Poaceae families, then the Brassicaeae with and Euphorbiaceae on the other hand the Geraniaceae, the Plantaginaceae, the Polygonaceae are weakly represented. The chorological types of wild species show the dominance of the elements of the Mediterranean group over all other groups. The analysis of biological types of wild species reveals the dominance of therophytes over all biological types, followed by hemicryptophytes, geophytes and chamaephytes.

Key Words: Ornamental flora, Wild flora, Green space, Inventory, University of M'sila (Pole 2).

In Algeria, the works carried out on green spaces are numerous such as: Azzouzi, 2011; Benlaldj, 2016; Hamidat and Boudraa, 2017; Fergani and Moumene, 2018; Banaldjia *et al*., 2019; Boukerzaz and Guermiche, 2019; Mili *et al*., 2019. Therefore to inventory the ornamental plants and wild plants that find refuge in the green spaces of Mohamed Boudiaf University of M'sila (Pole 2), followed by a taxonomic, biological and chorological analysis of this flora from the flora of Quezel and Santa (1962-1963), the synonymic index of the Flora of North Africa by Dobillard and Chatelain (2010-2013), guides and websites dealing with ornamental plants. The positive effects of plants have been observed by numerous studies based on surveys carried out in different countries (ASTÉRES-UNEP, 2016).

MATERIALS AND METHODS

The study area is located in the North of municipality of M'sila. It is limited to the north by El Ach (Bordj Bou Arreridj) and to the east by Ouled Mansour, to the west by Maarif and Souamaa and to the south by Oueld Madhi (Fig 1).

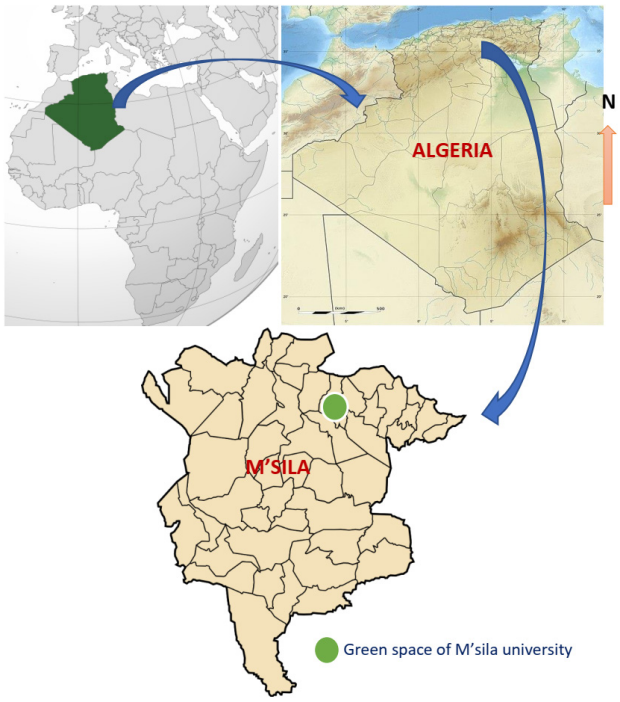


Fig 1. Geographical location of study area

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The nearest post is that of M'sila (period of 1984-2018, *source*: meteorological station of M'sila). The average annual precipitation is 221 mm at the M'sila station. January is the coldest month with an average minimum temperature of –1.50°C, while hottest month is July, with an average maximum temperature of 43.58 °C. The decreasing ranking of the total seasonal precipitation shows that the seasonal regime of the M'sila region is of the APHE type. According to Q2 and Emberger's climagram, the M'sila station is located in the arid bioclimatic stage with cold winter.

The material used for observing of plants consists of pruning shears, a black pencil and a notepad to write down all the information on the plants and study area, plastic bags, a digital camera to take photos of plants. The importance of the period during which field trips are carried out is decisive for any work aiming to inventory the vegetation. The physiognomic state of the species (flowering, fruiting, leaf fall) varies during the seasons.

Sampling consists of collecting data by choosing elements in such a way as to obtain objective information of measurable precision on the whole plant communication studied (Guinochet, 1973).

We opted for subjective sampling which enabled us to carry out two prospecting and floristic inventory trips of ornamental plants and wild plants in the green spaces of Pole 2 of the MB University of M'sila. For making of a herbarium, we collected plant samples during March - April 2022.

The results of the inventory will be presented in the form of a catalogue, following a systematic order of higher units, and alphabetically of families, genera and species. We will indicate for each taxon having changed name that which corresponds in the flora of Quezel and Santa (1962-63). The biological type of each taxon is represented using the following abbreviations: Ph: phanerophyte, Ch: chamaephyte, Hem: hemicryptophyte, Ge: geophyte, Th: therophyte. For wild flora inventoried in green spaces, different chorological types are represented as follows: Med: Mediterranean, Iber-Maur: Ibero-Mauritanian, End NA: endemic to North Africa, End Alg-Tun: endemic to Algeria -Tunisian, End Alg-Mar: Algerian-Moroccan endemics, End Alg: Algerian endemics, Sah: (Saharan, Euras: Eurasian, Eur: European, Paleo-Temp: paleotemperate, Bor: circumboreal, Atl-Med: Atlantic Mediterranean, Eur -Med: Euro-Mediterranean, Med-As: Asian Mediterranean, Med-Sah-Sind: Mediterranean-Saharo-Sindian, Med-Ir-Tour: Iranian-Turanian Mediterranean, Neo-Trop: Neo-tropical, Cosm: cosmopolitan (Miara *et al*., 2017).

The biological and chorological types were assessed through the bibliographical documents consulted (Quezel and Santa, 1962-63; Dahmani, 1997, Rebbas, 2014), as well as our personal field observations. We have used the symbol ≡ to designate the new chorological data appearing in the index of Dobignard and Chatelain (2010-11-12-13) compared to those of Quezel and Santa (1962-63). For ornamental plants, we used guides and websites that cover their descriptions and their worldwide geographical distribution.

RESULTS AND DISCUSSION

The wild plants inventoried in the green spaces of the University of M'sila (Pole 2) are grouped in the floristic list, presented by family, species, vernacular name, biological type, chorology and economic interest are assigned to each species (Table 1). The green spaces are home to 89 wild plants belonging to 29 families. The Asteraceae family is the most abundant, in second place comes the Fabaceae and Poaceae families, then the Brassicaeae with and Euphorbiaceae. Geraniaceae, Plantaginaceae, Polygonaceae are weakly represented. The rest of families are less abundant, they are only represented by one (01) or two (02) species.

Plant life forms are a valuable tool for describing the physiognomy and structure of vegetation. These elements are considered as an expression of the adaptation strategy of flora and vegetation to environmental conditions (Dahmani, 1997; Messaoudene *et al.*, 2007). Biological types incorporate various essential aspects of plant life (Raunkiaer, 1934). According to McIntyre *et al*. (1995), these biological types, by their definition (position of renovation organs during the bad season), first take into account the physiology and forms of resistance of plants, hence their proven major role in the response of communities to various disturbances (Miara *et al*., 2017). Analysis of biological types clearly shows that therophytes represent major part of biological types in inventory, followed by hemicryptophytes. Geophytes and Chamephytes are scarce.

The importance of biogeographical diversity of Mediterranean Africa is explained by the climatic

modifications undergone by this region since the Miocene, which have led to migrations of tropical and extratropical flora of which some vestiges are currently found (Quézel and Médail, 2003). Quézel (1999) emphasizes that a phytogeographical study constitutes an essential basis for any attempt to conserve biodiversity.

Analysis of flora reveals a high number of elements of the Mediterranean group over all the other groups. The Mediterranean group is dominated by strictly Mediterranean elements followed by Nordic group occupying the second position and the Cosmopolitans in third position. The other groups (other species, transition species) are less represented.

We have inventoried 32 ornamental plants (trees, shrubs and herbaceous). These plants belong to 22 botanical families and 29 genera. Indications of chorology, description of plants and their economic interest have been made (Table 1).

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Table 1. List of ornamental plants in green spaces of the University of M'sila (Pôle 2) (for chorology and description of plants: Aquaportail, 2022; Baumel *et al.,* 2017; Baumel *et al.,* 2018; Baumel, 2020; Breton, 2006; *Deuff, 1993;* Equipedia, 2021 ; Grué, 2010; Jaime-jardiner, 2022; Jardins-volpette, 2022; Homegarden, 2022; Maurieres *et al*., 1995; *Phytomania, 2022; Raj et al., 2017;* Sanchez, 2000; Taylor, 1994; Wikipedia, 2022)

Family	Scientific name	Economic importance	Chorology
Anacardiaceae	*Schinus molle* L.	This is also cultivated for its ornamental character in South and Central America and in Mediterranean gardens.	Native to South America
Anacardiaceae	*Schinus terebinthifolia* L.	Throughout South and Central America, Brazil pepper is considered an astringent, antibacterial, diuretic, digestive stimulant, tonic, antiviral and healing.	Native to South America
Apocynaceae	*Nerium oleander* L.	All parts of the plant contain oleandrin, a cardiotonic glycoside, the ingestion of which is fatal at low doses; indeed, a few leaves can kill an adult. In North Africa, beware of water from streams in which oleander roots have been soaked. Even the smoke from the burning of its branches is harmful.	Mediterranean basin, Asia Minor, India and Japan
Arecaceae	*Washingtonia robusta* H. Wendl.	This palm is widely grown in parks and along streets in regions with a mild climate.	Native to Baja California and Sonora
Asparagaceae	*Yucca aloifolia* L.	It is valued as an ornamental plant. The aloe-leaved yucca is a hardy plant, enjoying draining and dry soils, such as sandy shores.	Native to Mexico and the southern United States
Asteraceae	*Gazania linearis* (Thunb.) Druce	Annual plant to create beautiful points of color in rockeries, flowerbeds and flower beds. It can also be grown in pots and planters	South Africa
Asteraceae	*Gazania rigens* (L.) Gaertn.	Annual plant to create beautiful points of color in rockeries, flowerbeds and flower beds.	Native to South Africa and Mozambique
Asteraceae	*Argyranthemum frutescens* (L.) Sch.Bip.	They are more or less lignified herbaceous plants that can reach 60 cm to 1 m high depending on the cultivar.	Canary Islands but is widely used in horticulture
Asteraceae	*Osteospermum ecklonis* (DC.) Norl .	The different species include evergreen perennials, annuals, and subshrubs. When in bloom, it forms a veritable carpet of colors.	South Africa and the Arabian Peninsula

(Table continued)

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Family	Scientific name	Economic importance	Chorology
Asteraceae	*Dimorphotheca sinuata* DC.	Dimorphoteca (Dimorphotheca) is a perennial plant, which shows limited resistance to cold (-5°C) since heat is essential to it as a heliophilous plant (Jardinage.lemonde, 2022).	South Africa and tropical Africa
Bignoniaceae	*Podranea ricasoliana* Sprague	The Bignone rose is a persistent climbing shrub with woody and twining stems, devoid of tendrils, which can reach a height of 5 m. The species is considered invasive in Australia, New Zealand and Hawaii. Its vigorous habit and dense masses of foliage and branching tend to smother the surrounding vegetation.	Native to South Africa, Malawi, Mozambique and Zambia
Bignoniaceae	*Jacaranda mimosifolia* D.Don	It is a subtropical tree species. It has been widely planted elsewhere due to its beautiful and long-lasting blue summer bloom.	Native to south-central South America
Casuarinaceae	*Casuarina equisetifolia* L.	The casuarina tree is widely planted to stabilize coastal areas with sandy soils.	Australia
Celastraceae	*Euonymus japonicus* Thunb.	It has been frequently used to make mono-species hedges in parks and gardens.	Japan
Cupressaceae	*Platycladus orientalis* (L.) Franco	Resistant to drought, it is very often used as an ornamental tree and to make hedges because it supports all sizes very well.	Native to China but naturalized from Iran to Japan
Fabaceae	*Ceratonia siliqua* L.	It has been used since Antiquity for its fruits (carobs), for humans and livestock. This tree with beautiful foliage provides shade which is appreciated in sunny countries. In Tunisia, it is used as the basis of soft drinks called boga and El-Meddeb cider.	Native to the eastern Mediterranean region.
Fabaceae	*Leucaena leucocephala* (Lam.) de Wit	It is a fast-growing small tropical tree, used for various applications: vegetable, firewood, fibers, fodder for livestock. It is thus useful as a green manure but also to shade plantations and fight against erosion.	Native to Mexico and Central America
Lamiaceae	*Salvia rosmarinus* Spenn.	Fresh or dried, this condiment herb is found in Mediterranean cuisine, and a domesticated variety is grown in gardens.	Originating from the Mediterranean basin.
Malvaceae	*Hibiscus rosa sinensis* L.	It is a superb flowering plant that we like to use at the end of spring or summer to embellish balconies, terraces and gardens by growing it in pots, indoors. The plant will appreciate a bit of invigorating air.	Native to tropical areas of Southeast Asia
Mimosaceae	*Acacia retinodes* Schltdl.	Evergreen ornamental shrub that can flower at several times of the year. It also has the particularity of supporting calcareous soils, unlike most other species, hence its frequent use as a rootstock.	Native to the far south of Australia
Moraceae	*Ficus carica* L.	Very decorative, it can also be grown in a container and installed on a balcony. The fig that we eat is actually the receptacle of the flower that botanists call "sycone".	Afghanis -tan

(Table continued)

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(Table continued)

Family	Scientific name	Economic importance	Chorology
Moraceae	*Ficus microcarpa* L.	It is commonly grown as a houseplant in temperate regions, especially as a bonsai.	Native to Asia, Southeast and Oceania
Moraceae	*Morus alba* L.	The White Mulberry was widely cultivated for its leaves, the exclusive food of the silkworm. For sericulture, white mulberry is often grown as a hedge to facilitate leaf harvesting.	Originally from China
Myoporaceae	*Myoporum laetum* G.Forst.	*Myoporum laetum* is a shrub from coastal New Zealand . It has antibacterial properties and the leaves are traditionally used by Maori to protect their skin from mosquitoes.	Originally from New Zealand
Oleaceae	*Ligustrum japonicum* Thunb	It is sometimes cultivated as an ornamental plant or for the composition of hedges. It grows fast, supports pruning well, and is often used to create topiaries . The fruit is used in herbal medicines as a cardiotonic , diuretic , laxative and tonic treatment.	Originally from southern Japan
Oleaceae	*Olea europaea* L.	Widespread across Africa, Asia and Mediterranean Europe, a variety of which has been domesticated and cultivated to become the olive tree. Representatives of the species *Olea europaea* are evergreen (evergreen) bushes, shrubs or trees up to 15 m in height.	Originally from Asia Minor where it would have developed wildly more than 14,000 years ago.
Pittosporaceae	*Pittosporum tobira* Banks ex Gaertn.	This tree is weakly hardy. Pittosporum tobira easily reaches three to five meters tall unpruned, dense growth. The branched brown trunk ends in the shape of a panicle which bears the leaves and the flowers.	Native to Pacific islands and warm regions of Asia
Platanaceae	*Platanus orientalis* L.	The Oriental plane tree is a large tree, about 30 m high, with a wide and irregular crown . It is used as an ornamental tree . Its wood can be used in carpentry.	Native to Southeast Europe and the Middle East
Poaceae	*Festuca ovina* L.	Lawn plants widely used in mixtures to create resistant lawns in dry land in particular. It can grow on very poor soil but tolerates less trampling than red fescue.	Native to temperate and cold regions of Europe and Asia.
Rosaceae	*Rosa chinensis* Jacq	This species is widely cultivated in China as an ornamental plant ; many cultivars have been selected for their flowers of various colors, with many petals (semi-double, double or full flowers).	Native to central China (Guizhou , Hubei and Sichuan)
Rutaceae	*Citrus ×limon* (L.) Burm. f.	The lemon tree was originally used as an ornamental plant in pleasure gardens in the Middle Ages , notably Islamic gardens 3 . Lemon is gradually introduced into the diet.	Its wild ancestor in the Assam region, the Indo- Burmese region or in China .
Verbanaceae	*Lantana camara* L.	The lantana tree can be planted outdoors or indoors. Note: It has an invasive plant status and It is fire resistant, and grows rapidly on burned areas, even becoming a serious obstacle to the natural regeneration of important native species.	Native to the West Indies or Central America,

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CONCLUSION

The green spaces of the University of M'sila (Pole 2) contain 89 wild plants belonging to 29 families. The Asteraceae family is most abundant, followed by Fabaceae, Poaceae, Brassicaeae, Euphorbiaceae, Geraniaceae, Plantaginaceae and Polygonaceae.

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