

DOI: 10.2478/arls-2023-0005
Research Article

New Data on Orchid Flora (*Orchidaceae*) in the Tell Region of Saida (Western of Algeria)

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Received January, 2023; Revised March, 2023; Accepted March, 2023

Abstract

This work aims to better to know the floral richness of Tell region (Saida, western of Algeria) particular orchid flora. This inventory was started in 2017-2022; It's based on random samples, in spring and autumn. The surveys directly targeted open areas (Northern Saida). This inventory revealed the presence of 11 orchids including 2 species, 6 subspecies and 2 varieties. The 11 taxa belong to 5 genera: *Anacamptis*, *Dactylorhiza*, *Himantoglossum*, *Orchis* and *Ophrys*. Some taxa are rare, endemic and are protected (threatened) by the IUCN Red List as a near threatened species and/or are endemic and protected in Algeria, rare species in the Tell region. A stationary precision made it possible to know the distribution area of each identified taxon. Due to anthropogenic threats, a strategy to protect habitats seems very urgent.

Keywords: New data; orchidoflora; protected; IUCN red list; Saida.

Introduction


Conforming to to Gravendeel et al. [1], orchids are considered among the most diverse families (between 25,000-30,000 taxa worldwide and 800 genera), of which 95% are present in tropical-regions and only 05% at temperate-regions [2,3]. They are herbaceous plants, of various types,

autotrophic or mycoheterotrophic, with reduced leaves, scales, or developed, terrestrial or epiphytic, perennial, rhizomatous or tuberous, from temperate to tropical regions. Symbiosis, whether autotrophic, saprophytic or even parasitic, takes place with a microscopic fungus which allows the plant to compensate for the absence of any reserve in its seeds as well as the absence of rootlets at the level of its roots [2,3].

The Algerian orchidoflore benefited of very specific interest, much work has been done to determine its wealth in certain parts of the country (Algeria): De Belaire et al. [4] at Numidia;

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Beghami et al. [5] at Aurès; Babali et al. [6] at Tlemcen; Hamel et al. [7] at Peninsula of Edough (Sekikda); Bougaham et al. [8] at Bâbords; Madoui et al. [9] at Setif; Boukehili et al. [10] at Souk-Ahras, Nouar [11] in Tiaret and Aouadj et al. [12] at Doui Thabet (Saida). The orchid flora of 'western Algeria' has been the subject of only 3 'real works' (unfortunately): Babali & al. [6] at Tlemcen; Aouadj & al. [12] at the Doui Thabet forest (North-East of Saida) and Nouar [11] in Tiaret and some limited attempts here and there. The orchid family is represented in Algeria by about thirty taxa from all terrestrial species [2,3]. They are first of all botanical curiosities, somewhat used in traditional medicine and which may be of horticultural interest. It should be noted that the entire orchid family is threatened with extinction from the planet either by the hand of man or by natural phenomena (variation in climate, sterility). It is therefore absolutely necessary to take protection and conservation measures [2,3].

The objective of this study is to specially inventorie orchids at the Tell region (Saida) which are part of the biogeographic sub-sector of the Tellien Oranais-Atlas [13]. Despite previous studies on the flora in this region [14-22], the Orchid oflora remains unknown.

Material and Methods

Study region

The Tell region of Saida is located north-west of Algeria and it belongs to the domain Mauritanian-Mediterranean, in the Oran sector and in the sub-sector biogeographic of the Tellien Oranais Atlas (O3) [13], while the steppe part to the south belongs to the domain Mauritanian-steppe (H1)

[22]. The climate of this region is semi arid lower where an annual rainfall 350 mm, with a seasonal regime of H.P.A.E. (Figure 1).

January is the coldest month (minimum of 2°C) and August is the warmest (average maximum of 35°C). This zone is characterized by a fairly short rainy and cold period, on average from November-March, and a second dry and hot period the rest of the month of the year [23-27]. The landform of the study area is mountainous; including the parts of ridges and rocky peaks, divided by ravines and deep abysses [18]. More than 40% of the region is dominated by gentle slopes (0% - 3%) which characterize all the valley bottoms (land located on the plains, the wadis spreading areas) and low foothills [19]. 25% of the area has medium slopes (3% - 15%) and characterizes the low foothills of hills (Djebels and hilly areas). The remaining space (25%) has steep slopes (> 25%), especially to the east [20]. Lithosol, Red Brown Soils and Brown Soils are the main pedological and lithological units characterizing forest soils Lithosol, Red Brown Soils and Brown Soils [21]. The territory of Saïda consists mainly of secondary lands; generally Jurassic and Cretaceous sandstone to hardness variable depending on the degree of consolidation as well as limestone, marly or dolomitic [22]. Depressions and valleys are covered with land of continental origin (fluvial and wind turbines) of Tertiary age often undifferentiated (Mio-Pliocene) and Quaternary of extended way [23]. A more or less thick formation of reddish, sandy-clayey stratum Tertiary age where a calcareous crust covering is encountered, in a variable way [26]. This crust represents a fossilization of the topographic surface formed by continental tertiary alluvium [28].



Figure 1. The region Area (Saida-Western of Algeria)

Inventory technique

The method of De Belair et al. [4] random sampling open area for the inventory of orchids throughout Numidia was used in this work due to an absence of information on the distribution of orchid-flora in the region area (Tellian region of Saida), the inventory and orchid surveys were carried out using random indoor sampling from each station during the spring and autumns, prospecting has started since December 2017-November 2022 (Figure 2).

The identification of species was made at the laboratory of Ecology at the University of Tlemcen using many works: Quezel and Santa [13]; Maire [29]; Fennane & al. [30]; Dobignard and Chatelain [31]; Delforge [32] and Martin & al. [33]. To identify the protected taxa for Algeria, we consulted decree (12/03) [34] setting the list of

protected species in Algeria and also the IUCN red list [35] and the consulting expert.

Ecology is based on observations or statements. For the abundant taxa we have noted the most favorable environments in which they were there frequently observed. For rare taxa, we have limited them to the environments where we have them observed without providing the most favorable habitat for their development due to lack of observations.

The distribution of the taxa in Algeria is given according to the flora of Algeria by Quezel and Santa [13]; This information is given only for rare taxa. Also, we have clarified the repair of taxa in the region of Saida. we underline the exact place where it was found. This distribution is accompanied by a synthesis map (repartition).



Figure 2. Prospecting and photographing Orchids (Photo: Aouadj Sid Ahmed 2022)

Results and discussion

This botanical catalog has enabled us to find 11 taxa in the Saida region including 2 species, 6 sub-species and 2 varieties. The 11 taxa belong to 5 genera: *Anacamptis*, *Dactylorhiza*, *Himantoglossum*, *Orchis* and *Ophrys* (Table 1, Figure 3).

The present inventory on the flora of the orchids in Tellian region of Saïda revealed the existence of 11 species, i.e. 2.6 % of the flora richness (379 species) of the region area [14-27, 36] i.e 13 % of orchid's taxa from Algeria (75 taxa of orchids) [31].

The ecological analysis of the characteristics of the region shows that the (11) orchids that we have identified mainly thrive in open and/or disturbed places such as lawns and in riparian forests (Figure 4).

Dactylorhiza elata has been inventoried in the scrub (altitude: 800 m - 1150 m). It is a rare taxa in the western of Algeria and quite-common in the Algerian-Constantine tell. It is also a near-

threatened and endemic taxa. It is present only in the mounts of Tlemcen. This result is in agreement with Quezel and Santa [13]; Aouadj & al. [20]; Véla & al. [37] and more regional studies [11], with the exception of the studies by [6]. We have observed it in many sites: El Ache, Oum Touadjine et Aioun Branisse.

Anacamptis papilionacea was observed in the Forest, pre-forest and spaces open, pasture prefers calcareous soils and clayey (altitude: 800 m -1150 m; exposures: North-West to North-East). This result is in agreement with that of Bouvet et Joseph [38]. It is a fairly rare taxa in the Tell region and protected by Executive Decree (12/03), establishing the list of spontaneous taxa protected in Algeria. We have observed it in many sites: Sid Ahmed zeggai, El Ache, Mimouna and Aioun Branisse This result is also in agreement with Quezel and Santa [13].

Himantoglossum robertianum was observed in the Forest, pre-forest and spaces open, scrubland, on limestone (altitude:750 m-1000 m; exposures: North/East). This specie is quite-

common in the Algerian Tell. Its presence in these ecological conditions confirms the work of Quezel & Santa [13]. We have observed it in many sites:

Mimouna, Taffrent, Aioun Branisse and Hammame Rabi.

Table 1.

Orchidoflora in the Saida area (2017-2022) (Aouadj Sid Ahmed and Djebbouri Mohamed)

Taxa	Rarty	Biogeographical origin	Protected in Algeria	(IUCN 2019)	Class	Observation date	Area
<i>Anacamptis papilionacea</i> (L) R.M. Bateman, Pridgeon & M.W. Chase Subsp. <i>grandiflora</i> (Boiss.) Kreutz = <i>expansa</i>	ER	Circummed.	yes	/	I	June 2019 May 2020	Sid Ahmed zeggai, El Ache, Mimouna, Aioun Branisse
<i>Dactylorhiza elata</i> Subsp. <i>durandoi</i>	RR	End Mor/N-Alg	no	NT	+	June 2019	El Ache, Oum Touadjine and Aioun Branisse
<i>Ophrys lutea</i> Cavanilles subsp. <i>lutea</i>	AC	Med.	no	/	IV	April 2019 April 2020 March 2021	All
<i>Ophrys tenthredinifera</i> subsp. <i>ficahoana</i> var. <i>ficahoana</i> (J.A. Guim) M.R. Lowe & D. Tyteca	CC	Circummed.	no	LC	III	May 2018 March 2021	OumTouadjine, Taffrent and Ras Ma
<i>Ophrys speculum</i> Link subsp. <i>speculum</i>	AC	Med.	no	/	IV	April 2020 March 2021	All
<i>Himanthoglossum robertianum</i> (Loiseleur) Delforge	ER	Circummed.	no	/	III	April 2020 March 2021	Mimouna, Taffrent, Aioun Branisse and Hammame Rabi
<i>Ophrys fusca</i> Link subsp. <i>fusca</i>	AC	Med.	yes	NE	kII	April 2019 March 2021	Sid Ahmed zeggai and Fenouane
<i>Ophrys tenthredinifera</i> Willd. subsp. <i>tenthredinifera</i>	AC	Med.	non	/	II	April 2020 March 2021 March 2022	Aioun Branisse,
<i>Orchis anthropophora</i> (L.) Allioni	CC	Med.	non	LC	III	April 2019	Fenouane and Sidi Ahmed zeggai
<i>Ophrys tenthredinifera</i> subsp. <i>ficahoana</i> var. <i>lutescens</i> . (J.A. Guim) M.R. Lowe & D. Tyteca	AC	Med.	no	LC	III	April 2019 March 2021	Taffrent
<i>Himanthoglossum hircinum</i> (L.) Spreng. subsp. <i>hircinum</i>	CC	Med.	non	LC	III	April 2021	Aioun Branis

ER: quite rare taxa; C: common taxa; End: endemic taxa; NE: not evaluated; R: rare taxa; LC: minor concern ; NT: almost threatened taxa; Alg: Algerian; N: North; Mor: Moroccan; (+): very rare; Med: Mediterranean taxa; Circummed: Circu- Mediterranean taxa; *: Modified rarity; RR: very rare taxa.



A



B



C



D



E



F



G



H



J



I

Figure 3. Orchid flora (Telle region-Saida) (2017-2022) (Photo: Aouadj Sid Ahmed and Djebbouri Mohamed)

Explanations: A - *Anacamptis papilionacea* ssp. *papilionacea*; B - *Dactylorhiza elata* ssp. *durandoi*; C - *Ophrys speculum* ssp. *speculum*; D - *Ophrys tenthredinifera* ssp. *ficvalhoana* var. *ficvalhoana*; E - *Himantoglossum robertianum*; F - *Ophrys lutea* ssp. *lutea*; G - *Orchis anthropophora*; H - *Ophrys fusca* Link ssp. *fusca*; I - *Ophrys tenthredinifera* ssp. *tenthredinifera*; J - *Ophrys tenthredinifera* ssp. *ficvalhoana* var. *lutescens*.

Ophrys fusca Link ssp. *fusca* was observed in the Forest, pre-forest and spaces open (altitude:1000 m-1200 m; exposures: North-East). We have observed it in many sites: Sid Ahmed zeggai and Fenouane.

Ophrys lutea ssp. *lutea* was observed in the Forest, pre-forest and spaces open at an altitude between 700 and 1250 m. We have observed it in the whole region.

Ophrys speculum ssp. *speculum* is present in many stations, grows best in open area and riverine forests (altitude: 580 m-1203 m) on many sides, particularly the south side. Its presence in this type of area confirms the studies of Quezel and Santa [13] and previous regional works and other regional studies [5,11].

Ophrys tenthredinifera ssp. *ficvalhoana* var. *ficvalhoana* grows in degraded open environments (degraded forest of *Pinus halepensis*) in the region area (altitude: 700 m-900 m), on all soil.

This specie is cited in the work of Quezel and Santa [13] and other regional studies [5,11]. We have observed it in many sites: Oum Touadjine, Taffrent et Ras Ma.

Ophrys tenthredinifera ssp. *tenthredinifera* was observed in the Forest, pre-forest and spaces open (altitude: 700-900 m); on the North exposure. We have observed it in only one site: Aioun Branisse.

Orchis anthropophora was observed in the Forest and pre-forest environments, Brush, on clay soils and limestone. We have observed it in many site: Fenouane and Sidi Ahmed zeggai.

Ophrys tenthredinifera ssp. *ficvalhoana* var. *lutescens* grows in degraded open environments (degraded forest of *Pinus halepensis*) in the study area (altitude: 900 m-1000 m), on all types of soil. This specie is cited in the work of Quezel and Santa [13] and other regional studies. We have observed it in only one site: Taffrent.

Himantoglossum hircinum (L.) Spengel ssp. *hircinum* We have identified 10 individuals of this orchid in the cemetery of Zaatria, at an altitude of 750 m, on calcareous soil facing south, accompanied by a flora consisting essentially of tufts of *Chamaerops humilis* et *Thymelaea hirsuta* with relics of *Pistacia atlantica* [39-41].

Conclusions

This study has identified 11 orchid taxa for the northern region of Saida since 2017- nowadays. The 11 taxa belong to 5 genera: *Anacamptis*, *Dactylorhiza*, *Himantoglossum*, *Orchis*, *Ophrys*. Sure the 75 Orchidaceae taxa reported in Algeria, 15% of this wealth is present in the northern region of Saida (for the now). This richness in orchids is explained by the diversity of habitats that exist in the northern region of Saida, and especially the important busy environment by pre-forest ecosystems that provide shelter and light, favorable ecological conditions for this family (Orchideae). We must emphasize that all the stations of these orchids occupy the northern exposures and the riverine forests, because of a more favorable humidity. In the future, we try to explore the steppe region and even continue prospecting in the northern region. Orchids in the Saida region are subject to strong anthropogenic pressure and strong climatic constraints. It therefore appears necessary to complete this inventory and the ecological characterization in order to arrive at a complete inventory which can prepare the establishment of a good conservation plan in particular through ex-situ conservation (production in Plant nursery).

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