Seeds Potentialities of Medicks in Sub-Humid Area to be used in Steppe Zone

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Abstract— *New pulse crops varieties more productive as medics should be made available to breeders located in semi-arid region of Algeria. So, and through two years of testing, pods yield and seeds production of twenty populations belonging to species* ***M.intertexta*** *,* ***M.ciliaris, M.polymorpha*** *,* ***M.Truncatula*** *and an introduced population* ***M.muricoleptis*** *is an Australian cultivar (Jemalong) are appreciated.Pods' yields of year 2013 vary between 78,66g/m² with poly$_{27}$ and 3637,33g/m² with I$_{107}$. Values of the second essay (2015) are different, they vary between 40,89g /m² with Poly$_{236}$ $_{and}$ 464,36 g/m² with I$_{11}$.The cultivar Jemalong offers a yield of 172,4 g/m². The corresponding seed yields also show a low production in year 2015. The ratio leaf / stem varies between 1,03 and 5. The average of yields in dry matter of 27 populations in 2013 was of 457,79g/m^2 against 127,41 g/m² in 18 populations in 2015. Jemalong cultivar records a yield of 12,8g/m². For the same dose of seed, number of plants by square meter varies between 44 and 112. Number of stems by square meter varies between 136 in C$_{204}$ and 420 in I$_{52}$..The average width of population's ramifications varies between 13cm in Tr$_{334}$ and 44 cm in I$_{52}$, The Jemalong cultivar offers an average of 17cm. So, production results of medicks depend of weather conditions in littoral zone of lower altitude than 600-700m. In steppe zones, we recommend to make tests in situ with these same populations.*

Keywords— Medicago, medicKs, populations, pods, yield in seed.

I. INTRODUCTION

Husbandry of ruminants is mainly located in arid regions of Algeria, in about 1/5 of the total area. This important availability of agricultural land requires fodder production In fact, fodder grown is one of the solutions considered, pass through intensification of fodder production, per unit of area, not only in quantitative terms (kg of fodder produced by m^2) but also in qualitative terms with a net improvement of nutritional quality. New pulse crops varieties more productive and with better nutritional value should be available to the breeders. Much appreciated by livestock, as well in green as in dry, pulse crops are richer in nutrients mainly in digestible nitrogenous matter, in vitamins and in mineral (2,5 kg of alfalfa hay represents 1 UF) (**Bouaboub -Mousab., 2012).** *M. truncatula* is a potential grazing cultivation that products high fodder level of good quality. A study carried out in South-East of Wyoming during 3 years, on three cultivars of ***M truncatula*** which are ***Calife, Mogul et Paraggio,*** revealed that average yield in dry matter was respectively of 1**.6, 3.1 et 4.0 t /ha (Babita., 2008).**

The first researchers' objectives have been to study kinds of ***Medicago*, *Trifolium*, *Scorpiurus*, *Hedysarum and Onobrychis*** **(Abdelguerfi., 2000),** They showed a positive correlation between bio geographical parameters, particularly altitutde and rainfall, and biological aspects linked to the growth and reproduction – flowering – inflorescences, pods and seeds. The 2/3 of Medicago's genus species (they are gathered under the term of medicKs). Originating of Mediterranean zone, are particularly adapted to drought conditions: Australia, Chile, California…**Piano et Talamucci, 1996).** Thanks to accumulation of dry grains, MedicKs' meadow regenerates between two cereal crops even after several years. This system is applied in various dry cereal areas: Maghreb, Middle East, Spain… (SAREP. 2013).

Diversification of steppe pastures by a combination of medicKs 'species allows increasing a chance to succeed in their plantation. If one of the cultures dies due to the drought or to the pests, another culture can allow saving the pasture. This allows to put in place pastures more sustainable and increasing soil security. In a well drained soil, sprigs of medicKs can contribute to increase soil organic matter. So, by improving soil health, pulses also help to biodiversity of micro-organisms present into the soil. They can biologically fix more than 350 kg of nitrogen by hectare and by year (FAO., 2015).

The production of pulses is a water-saving, notably if we compare it to other protein sources, such as for instance: Indian dal (split peas, lentils) which necessitates 50 water liters by kg. Conversely, it is needed 4.325 water's liters to product 1 kg of poultry, 5.520 water's liters to product 1kg of mutton and 13.000 water liters to product 1 kg of beef. The low water footprint of pulses is an intelligent cultivation choice in areas and in arid regions, subject to drought (**FAO. 2015**). Thanks to their hard grains and drought tolerant, roots can enter 5 feet (1.524m) in depth to maintain soil in place and value drops of water (SAREP, 2013). Much constraint prevents annual alfalfa extension, local or introduced in Algeria.

However, we have been interested through two testing years in pods yield and to seeds production of about 20 populations belonging to species of *M.intertexta M.ciliaris, M.polymorpha , M.Truncatula* and a population introduced belonging to *M.muricoleptis* and so an Australian cultivar (Jemalong).At the same time, we have tried to approach determining parameters of this production which is: (i) green and dry matter (ii) width of ramifications (iii) weight of 50 pods and their seed (iiii) and number of stems by square meter. These data are thus, very interesting because during dry period, from June to October, pods constitute an available food for animals.

II. MATERIAL AND METHODS

The first trial is set on 13/12/2012 and the second on 24/12/2014 at the experimental farm of National Superior School of Agronomy, located in Algiers City.This station is at 30° 8' of longitude and latitude of 36°43' north and altitude of 48m.The previous cultural element of the first essay was corn, and for the second one was a fallow. The essay is a full random block with three repetitions. In each block, we have 20 populations for the first essay and 22 populations for the second one, represented each one by four lines of 1 meter with interval of 60cm with 80 grains by population and by line. Every block is spaced from other of 1.50m for the first essay and of 60cm for the second one.

The chemical-physics analysis of the soil was carried out on samples harvested on the plot before seeding, at depths of 20cm and 40cm. At the first essay the texture is silty (soils texture triangle), the soil is rich in calcium and low in nitrogen and organic matters, potassium and sodium. As for the second essay, texture is silty-clayey, low in nitrogen and in organic matter, a pH>7,23 (analysis carried out in Department of Soil Science of ENSA in 2013 and 2015.

Climatic conditions of the experiment period of the first essay 2013 gave a monthly temperature, the highest in May, with an average of 17.8°c with maximal of 23°c. The coldest month was February with an average of 11.5°c. The coldest day recorded 5.9°c. The highest rainfall amount recorded was of 137cm in three days. As for year 2015, the most rainy month was January with 98,9 mm and the hottest month was August with an average of 38.4°c. The maximum and minimum of temperature was also recorded in August with 39°c and 1.2°c (The agro-meteorology of ENSA, 2013 and 2015).The plant material used which comes from collection of the school is shown in table 1.

Table.1: Code and origins of the populations studied and the average weight of 1000 seeds

Species	**Populations' code**	**Weight of 1000 grains**	**Origins**
M.truncatula	Tr_{201},Tr_{407} Tr_{238} Tr_{334}	3,58g	Algeria (2004)
M .intertexta	I_{756} I_{107} I_{4O7} I_{11} I_{31} I_{52}	15,77g	Algeria (2004)
M.ciliaris	S_3 C_2 C_{204} S_5 S15 S7 C11 C58	13,21g	Algeria (2004)
M .polymorpha	poly $_{27}$ Poly $_{205}$	3,24g	Algeria (2004)
M.muricoleptis	Aus_{106}	6,26g	Turkey (2004)
M.truncatula CV Jemalong	CV	3,9 g.	Algeria (-)

Softwares used for statistical analysis are: Stat View and Statistica.

III. RESULTS AND DISCUSSION

Yields in dry matter of population vary between 1132,1g/m² in I_{52} and 38,85 g/m² in Tr_{221} en 2013 while in 2015 they vary between 453,33g/m² in I_{31} and 12,56g/m² in S_{15}. The average of 20 populations in 2013 is of 457,79 g/m² against 127,41g/m² in 18 populations in2015. Jemalong cultivar records a yield of 12,8g/m². In region of Tunisia yields in gram by square meter of dry matter (DM) of *M.polymorpha* vary from 84 to 530, *M.truncatula* varies from 31 to 450 while Jemalong CV witness varies from 0 to 340. The average of six species of annual alfalfa varies from 102 g/m² to 483g/m² (**Seklani et Hassen., 1990 in Seklani et *al*., 1996.).**

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En Alaska, yields of 339 to 384 g/m² of DM have been obtained in average on two doses of fertilizer N, 0 and 90 kg /ha, on a neutral ground **(Panciera et Sparrow., 1995).** The average of ramifications width of populations varies between 13cm in Tr $_{334}$ and 44cm in I_{52} Jemalong cultivar gives an average of 17cm. Number of stems by square meter varies between 136 chez C_{204} and 420 chez I_{52}. Number of plants by square meter varies between 112 to 44; cultivar Jemalong gives a number of 48 (Tab. 2).

Generally, it is well known that leaves-stems ratio is a good indicator of the forage quality and offers a potential for cultivars selection, this last one varies at the beginning of flowering in 2015 between 5 in population of S_5 and 1.03 in population of Tr_{334}. In *M.truncatula,* it varies of 1.03 in Tr_{334} and 2,81 in Tr_{238} while in Jemalong cultivar species, it gives a ratio close of the latter (2,8) (Tab.2) while in 2013, it varies between 0,5 in $Poly_{205}$ and 2,91 in Tr_{407}. **Porquiddu (2001)** records lower values in *M.polymorpha cv***.** Cercle Valley that *M truncatula*. cv. Chypre et *M. Tornata* cv. Dornafield with respectively 0.97, 0.80 and 0,76. A decrease of this ratio is observed during pods and grains formation probably linked to their high demand for products of photosynthesis with presence of species interaction x age **Derkaoui et *al*., 1990).** The percentage of viable plants at early flowering stage varies in 2013 between 37,08% in Tr_{334} and 19,16% in Tr_{55}. Average between species varies between 24.06% in *M.polymorpha* and between 29.32% in *M.intertexta.* In 2015 this same parameter (Tab.2) varies between 0% in *M.polymorpha* and most of *M.truncatula* reaches 35% in *M.intertexta*, Jemalong cultivar offers a viability of 15%. We can say that both species (*M.truncatula* , *M.intertexta)* are more resistant to abiotic stress than other both species *(M.plymorpha, M.truncatula)* probably due to the grains size.

The Fisher's test offers homogeneous groups for biometrical parameters of forage production (Tab.2). By contrast, for production of pods, no group is formed. The growing cycle parameter of the plan offers seven groups which overlap, except for populations Tr_{27} and I_{52} where there is not overlapping. As for matter, green, dry and width of ramifications, population I_{52} is individualized from other groups. The LS ratio in dry, forms with population S_5 the homogeneous group *a* and population I_{52} and Tr_{334} form another group d which did not overlap with other.

Table.2: Average of biometrical parameters studied for production of dry matter in MedicKs populations studied.

Populations	Cycle in days	Number of plants by m²	Number stems by m²	Width in cm	MV g/m²	MS g/m²	F/T Sec	Perc of viability
S_5	110fg	70,67abc	209,33 abc	18ef	160efg	53,79 def	4,5a	22,08
S_{15}	110g	66bc	154 c	13,5ef	91,2efg	12,56 def	2,43bcd	20,625
C_2	114efg	100bc	244 bc	19,5ef	129,613	27,253 def	4,02bcd	31,25
S_7	115efg	64bc	260 abc	22,25ef	205,46 efg	37,06 def	3,16bcd	20
S_3	116def	44bc	156 bc	20ef	80efg	320def	5b	13,75
C_{11}	116def	64abc	276 bc	18ef	244,4efg	47,68 def	3,21bc	20
C_{204}	116def	56abc	136 bc	23ef	158,04 efg	33def	3,64bcd	17,5
C_{58}	120,33cd	54,67bc	189,33 bc	20,33def	252,87 Defg	91,567 cde	2,33bcd	18,125
CV	118de	48c	116 c	17ef	78,96	12,8 def	2,8cd	15
Tr_{238}	117de	76ac	312 abc	18,5ef	256,54 efg	74,06 def	2,81bcd	23,75
Tr_{334}	128 ,33ab	70,67bc	209,33 bc	13f	80fg	51,72f	1,03d	18,125
Tr_{27}	130a	28bc	172 c	19ef	140efg	36bef	1,28cd	18,500
I_{253}	124bc	112a-	420 a	38,33abc	1072abc	196ab	2,07bcd	35
I_{756}	124,67bc	94,67ab-	353,33 ab	36abcd	749,33 abcd	141,33 abc	1,94bcd	23,88
I_{107}	124,33	60bc	314,67 abc	40,67	942,67	174,67	1,66cd	25,79

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	bc			ab	ab	Ab		
I_{11}	126ab	86,67ab-	332 ab	27cde	41,5cdef	166	2,53bcd	27,083
I_{58}	126,67ab	61,33bc	248 abc	29,67bcd e	530,67 bcde	117,33	1,55cd	19,167
I_{31}	126,67 ab	74abc	290bc	28,33 abc	113,33 abc	453,33 ab	1,32cd	25
I_{52}	130a	86,67ab-	420a	44a	1277,06a	260a	1,11d	27,08

Our yields pods in littoral region in 2013 vary between 79.88g/m^2 in poly$_{27}$ and 3637.33g/m^2 in I_{107} (Alane et *al*., 2014)**.** Values of the second essay (2015) are different, they vary between 40,89g /m² in Poly$_{236}$ $_{and}$ 464,36 g/m² in I_{11}. The cultivar Jemalong offers a yield of 172.4g/m2, if we compare it to local species of *M.truncatula*, population Tr$_{238,}$ it gives a higher yield of 247,51 g/m² (Tableau 3) while yield of pods obtained by l'ITGC in 1977in sub-littoral zone was of 10g/m^2. The results comparison of both experiment years show a different yield: for instance year 2013, yield of both quoted populations (Aus$_{106}$ 944g/m², I_{11} 2428, 444g/m²) is superior to that of year 2015 (AUS $_{106}$13g/m², I_{11}464, 36 g/m²). Furthermore, some populations as Poly$_{27}$ have not germinated. This result may be explained by difference of weather conditions between both years of experiments. Soil of the first essay is well fertilized having experienced several essays on medicKs, thus well provided in rhizobium, unlike to soil of the second essay which was a fallow during several years. In addition, climatic data of the first essay record an abundant rainfall compared to that of the second test.

Yields in seeds corresponding to performances in pods produced (g/m²), also show for the same reasons, a low production in 2015 compared to 2013. Since they vary in 2013 between 21,533 g/m² in Poly$_{27}$ and 900,375g/m² in I_{107} while introduced population Aus$_{106}$ gives a yield of 359,077 g/m² (Alane et *al*., 2014). In 2015 the essay gives in seeds yield which varies between 425, 67g/m² in S_7 and of 5,71g/m² in I_{52} (Table.3). According to **Laouar et *al* (2000)** *M .ciliaris* is earlier and products more plant/pods but with a low number of pod/grains, contrary to *M intertexta.*

However, according to results of our essays, we confirm precociousness of *M.ciliaris's* populations (Fig.1), but for production of seed, yield of *M.intertexta* depends of annual weather conditions since in 2013, average yield of M.intertexa exceeds that of *M.ciliaris* (S :354,602g/m², I :821,997g/m²) while in 2015 the contrary occurred (S: 106,20575g/m², I : 55,215 g/m²).Jemalong cultivar gives a yield of 40,936g/m². This also has been observed in clover by Clark (2014) who noticed that cycle of clover varies from 100 to 126 days after seeding depending of the place, and of timing of sowing, and so of cultivars used. The introduced population in our essay Aus$_{106}$ gives the lowest yield 4,51g/m² (Table 3).

For information purpose, populations with early flowering have trend to belong to drier habitats and the hottest, and numerous authors found similar results in several other annual pulses (**Graziano et *al,* 2010).**

Furthermore, population's origin influences directly on weight of 1000 grains where itself influences on yield. In effect, populations which come from areas with more annual rainfalls had more small pods and grains at upper sizes than of dry environments **(Graziano et *al*., 2010).** These results are confirmed by **Del Pozo et *al* (2002)** who affirm that sizes of grains and pods have an adaptive value. Nevertheless, the grains performance may be reduced through over-grazing, freeze, and drought. (**Muir et *al*., 2005).** Since 70% of feedings have been insured by pods of MedicKs, proportion decreased rapidly to zero when green material becomes available after rain **(Porqueddu., 2001).** Much of leguminous fodder species are depending to permanent grassland **(Duc et *al*., 2010).** Weight of grains constitutes a compensation mechanism to support grain yield under impact of the drought (**Yousfi et *al*., 2012).**

Table.3: Average of biometrical parameters studied for production of pods and seed in medics' populations studied.

Populations	**Weight of 50 pods**	**Weight of seed of 50 pods**	**Yield in pods g/m²**	**Yield of seed g/m²**
S_5	12,1 3	2,98	254,8	63,72
S_{15}	9,64	2,89	142,54	42,27
C_2	13,64	3,38	345,8	87,01
S_7	15,62	3,84	425,67	425,67
S_3	13,28	3,58	245,9	66,29
C_{11}	12,97	3,42	241,2	60,72

C_{204}	17,08	4,85	163,47	46,25
C_{58}	9,71	2,74	392,93	57,75
CV Tr	1,99	0,47	172,4	40,94
Tr_{407}	3,32	0,74	66,567	16,18
Tr_{201}	6,43	1,56	170,8	41,42
Tr_{238}	5,87	1,524	247,51	65,25
Tr_{334}	4,99	1,40	113,3	31,96
I_{755}	13,46	3,19	86,133	20,73
I_{756}	17,76	4,79	320,8	86,17
I_{107}	18,27	4,24	283,53	71,58
I_{11}	17,82	3,70	464,36	97,07
I_{31}	16,53	4,023	197,3	50,03
I_{52}	21,53	36,80	175,45	5,71
$Poly_{205}$	4,76	1,16	75,6	36,80
$Poly_{236}$	1,18	0,29	40,89	9,97
AUS_{106}	3,353	1,16	13	4,51

Variance analysis of dry matter production parameters, shows great significance **(p<0, 0001)** (Table 4). The correlation matrix of these parameters for a ddI of 48 is reported in table (5). Parameters' variance analysis of pods yield and populations 'seed studied also show a highly significant difference (p**<0,0001)** (**Table 6).** Correlation matrix of these parameters for ddI of 68 is reported in table (7).

Table.4: Univariate analysis of dry matter production parameters

Parameters	Variance	DDL	Chi2	P	95%inf	95%sup
Number of plant	47,930	56	2684,097	<0,0001	36,043	67,437
Number of stems	896,770	54	48425,602	<0,0001	671,150	1270,472
Width (cm)	123,931	55	6816,214	<0,0001	92,976	174,963
L/S (green)	49,077	56	2748,304	<0,0001	36,906	69,051
L/S(dry)	13,896	56	778,173	<0,0001	10,450	19,551
GMg/m²	177410,971	56	9935014,349	<0,0001	133412,622	249615,463
DMg/m²	6283,627	55	345599,462	<0,0001	4714,124	8871,072

Table.5: Correlation matix of dry matter production parameters

	Number of plant	**Number of stems**	**Width of ramifications**	**Rapport L/S(dry)**	**GM g/m²**	**DM g /m²**
Number of plant	1					
Number of stems	0,685***	1				
Width of ramifications	0,188	0,481***	1			
Rapport L/S(vert)	0,256	-0,139	-0, 314*			
Rapport L/S(sec)	0,127	-0,167	-0,291*	1		
GM g/m²	0,447***	0,772***	0,862***	-0,218	1	
DM g /m²	0,401***	0,687***	0,788***	-0,177	0,934***	1

Table.6: Univariate analysis of pods yield parameters

Parameters	**Variance**	**DDL**	**Chi2**	**p**	**95%inf**	**95%sup**
Weight of 50 pods	680,096	69	46926,641	<0,0001	524,958	922,214
Seed of 50 pods	7,303	69	503,884	<0,0001	5,637	9,904
Weight of collected Pods	10029,572	69	692040,458	<0,0001	7741,706	13601,626

Seed of collected pods	3778,920	69	260745,462	<0,0001	2916,903	5124,790
Yield of pods in g/m²	27789,048	69	191744,294	<0,0001	21450,032	37686,179
Yield of seed in g/m²	1754,650	69	121070,833	<0,0001	1354,393	2379,572

Table.7: Correlation matrix of dry matter production parameters

	Weight of 50 pods	**Seed of 50 pods**	**Weight of collected pods**	**Seed of collected pods**	**Yield of pods g/m²**	**Yield of seed g/m²**
Weight of 50 pods	1					
Seed of 50 pods	0,925***	1				
Weight of collected pods	-0,091	0,085	1			
Seed of collected pods	0,043	0,187	0,584***	1		
Yield of pods g/m²	0,203	0, 346**	0,749***	0,535***	1	
Yield of seed g/m²	0,203	0,368***	0,690***	0,534***	0,973***	1

Number of homogeneous groups given by Fisher's test for green matter production parameters at early flowering is shown in table (2). No homogeneous group is given for pods production parameters.

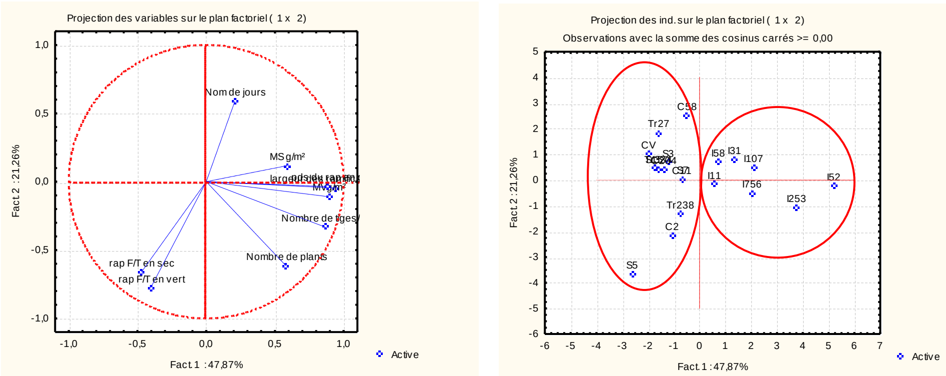

Fig.2: Principal Components Analysis (PCA) of dry production parameters

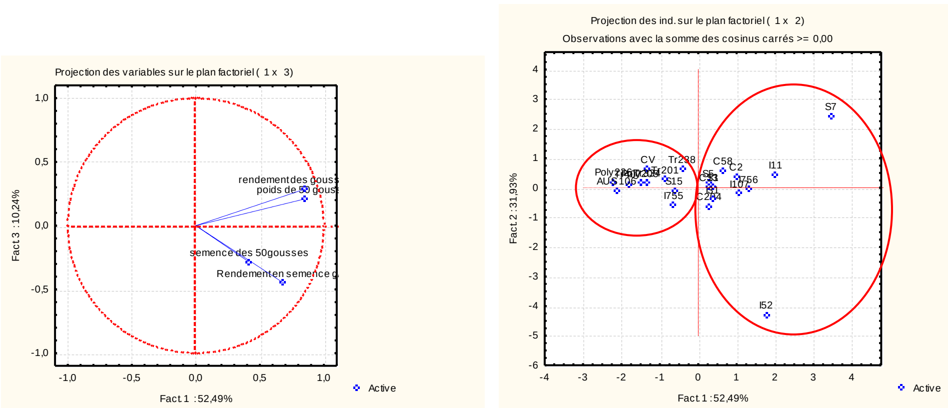

Fig.3: Principal Components Analysis (PCA) of pods production parameters.

Principal Components Analysis (PCA) led us to the study of Kaiser Criterion, this one offers us for dry matter production parameters, three designs (1,2), (1,3), 2,3) and in elbow criterion, we observe an important fall from the first axis (of 47 ,87% to 8,96% of inertia). We retained the first factorial design (1 and 2) (Figure 2) which gives information of 69.13% (47,87 + 21,26 = 69,13%) parameters that are close to circle are GM(g/m²), width of ramifications, weight which served to the ratio determination, number of stems, number of plants and ratio in green and dry, thus they are effectively well correlated with the two factors used for this design (F1 and F2), by contrast, dry matter (DM/m^2) and cycle of the plant in day number are less near to the circle.

The first information axis, whereby is preserved by projection of maximum initial dispersion of points of the cloud. All variables occupy a fairly narrow zone inside of the correlations circle. Maximum angle between two variables is below 90°. This suggests that all variables are positively correlated between them. So, two large populations groups are formed, the first one based on parameters : GM, DM, width of ramifications, weight served to ratio determination, number of stems containing *M.intertexta* (I_{31},I_{11},I_{107},I_{58},I_{756},I_{253},I_{52}) the second group containing *M.ciliaris* and *M.truncatula* (S_3,S_5,*cv*,C_{204}, C_{11},Tr_{27}, Tr_{334}, Tr_{238}, C_2,C_{58}) are determined by parameters ratio leaves/stems in green and in

For pods production, the Kaiser Criterion, led us to retain two axes and in elbow criterion, we observe an important fall from the first axis (de 52,49% to 10,24% of inertia). In the first design, all parameters are close of the circle, thus, they are effectively well correlated with both factors constituting this design (F1 and F2). The first factorial axis gives (52,49%+ 31,93%=84,42%), axis that is preserved , by projection of maximum initial dispersion of cloud points. All variables occupy a rather limited area inside of the correlations circle Maximum angle between two variables is below 90°. This suggests that all variables are positively correlated between. And so, two populations groups are formed. The first group determined by all parameters studied includes only both species : *M.ciliaris* and *M.intertexta* (S_7,S_5,I_{52}, C_{58},S_3,I_{756},C_{11},C_2,C_{204},I_{107},I_{11}) while the second group is a mixture of species examined *M.ciliaris* , *M.intertexta*, *M.truncatula* ,*M.polymorpha*, *M.granadensis* ($poly_{236}$, Aus_{106}, Tr_{106}, Tr_{407}, CV ,$poly_{205}$, Tr_{334}, Tr_{201}, Tr_{238},S_{15},I_{755}).

IV. CONCLUSION

Evaluation of genetic material of medics based on agronomic aspects should take into account of appropriate variability for some characteristics linked to fodder and to production of pods. The results of comparison of both years of experimentation show a different yield: that of 2013 is higher than of 2015. Some populations had not germinated in the last essay. Weather conditions strongly influence on quantity of dry matter produced and also on yield of pods and seed. Both species (*M.ciliaris, M.intertexta)* are more resistant to abiotic stress than other both species *M.plymorpha, M.truncatula)* probably due to the grain's size. *M.ciliaris* are earlier than other local species but for seed production, yield of *M.intertexta* depends of annual weather conditions since in 2013 average yield of *M.intertexta* exceeds that of *M.ciliaris* (S :354,602g/m², I :821,997g/m²) while in 2015 the opposite happened (S: 106,20575g/m², I : 55,215 g/m²). Moreover, this is the last ones which lose their leaves and their greenery until half of June and have a broader land use than other species.

Jemalong cultivar is earlier than all populations studied, but it records a low yield in dry matter and in pods. Variance analysis of dry matter production parameters shows a very high significance ($p<0, 0001$). Principal components analysis (PCA) of dry matter production parameters forms two large populations groups: the first based on parameters: green matter (GM), dry matter (DM), width of ramifications, weight served to the ratio determination, number of stems containing only in *M.intertexta* (I_{31},I_{11},I_{107},I_{58},I_{756},I_{253},I_{52}), the second group containing *M.ciliaris* and *M.truncatula* (S_3,S_5,cv,C_{204}, C_{11},Tr_{27}, Tr_{334}, Tr_{238}, C_2,C_{58}*)* are determined by ratio parameters leaves/stems in green and in dry. Therefore, parameters of pods production form two other populations groups. The first group determined by all parameters examined comprises only both species *M.ciliaris* and *M.intertexta* (S_7,S_5,I_{52}, C_{58}, S_3,I_{756}, C_{11},C_2, C_{204}, I_{107},I_{11}) while the second group is a mixture of species examined *M.ciliaris* , *M.intertexta, M.truncatula* ,*M.polymorpha, M.granadensis* ($poly_{236}$, Aus_{106}, Tr_{106}, Tr_{407}, CV ,$poly_{205}$, Tr_{334}, Tr_{201}, Tr_{238},S_{15},I_{755}).

Results of medics seed production depend on weather conditions in littoral area, of altitude lower than 600/700m. In steppe regions, it is necessary to make trials in situ with these known populations. Mixture of population seeding with small and large grains: will give a better ecological balance and in the same time a high nutritional value. Finally, to control seed population of annual alfalfa (Medics) some number of significant barriers must be overcome: seed bed, maintenance, operation, cultivation through grazing, are determinant on results of pods harvesting. This is particularly delicate and requires an appropriate material.

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