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Morphological Description and Evaluation of Six Newly- Introduced Grape Cultivars under Egyptian Conditions.

El-Morsy, F. M.; Aisha S. A. Gaser and Magda N. Mohamed
Viticulture Dept., Hort. Res. Instit., Agric. Res. Center, Giza, Egypt

ABSTRACT

Six newly-introduced grape cultivars nemely Arra 30, Arra 29, Arra 13, Arra 24, Arra 27, and Arra 15, were investigated in three successive seasons (2014, 2015 & 2016) for description and evaluation under Egyptian conditions.The cultivars were grown in a private vineyard situated at Birqash region – Giza governorate, Egypt. Vines were planted in sandy soil spaced 3X2 meters apart and irrigated by drip irrigation system and supported by Gable system. The study included time of bud burst, young shoots, young leaves, shoot, and time of bloom, flower, mature leaf, beside determining time of ripening, Bunch, berry, Tss, Acidity, Tss / acid ratio, and seed formation.The studied cultivars were characterized by good vegetative growth and good fruit quality. The tips of the studied cultivars were fully open Color of upper side of blade for the young leaf was green with anthocyanin spots in Arra 30, Arra 29, and Arra 24, but dark copper- red in Arra 13, and Arra 27, while light copper-red in Arra 15. The internode was long, thick and number of consecutive tendrils were less than three in all cultivars. The tip of tendril was tri-fid in Arra 29 & 15 while di-fid in Arra 13, it was di-tri in Arra 30,Arra 24 and Arra 27. The length of tendril was very long in Arra 30, Arra 29, and Arra15 and long in Arra 13, Arra 24 and Arra 27. Entire of cultivars had flowers with male and female parts fully stamens and developed gynoecium in all studied cultivars. The shape of blade was circular in Arra 27, and Arra 15, and pentagonal in the other cultivars. Depth of upper lateral sinuses was shallow in Arra 29 , Arra 27 and Arra 15 while was very deep in Arra 30 , Arra 13, and Arra 24. Arrangement of lobes of upper lateral sinuses was closed in Arra 27, and Arra 15, but slightly overlapped in the others . Petiole sinus slightly open at Arra 30, Arra 24, and Arra 15, wheaser half open in Arra 13, and Arra 27, and wide open in Arra 29. Petiole shape was u- shape in Arra 29, , Arra 13, and Arra 24, while it was v-u shape at the others. Length of petiole as compared to middle vein was moderately shorter as well as sinus limited by veins which was constantly absent in all cultivars. Anthocyanin pigment of main veins on the upper side of blades was strong in Arra 30, very low in Arra 29, low in Arra 24, and absent in the others. Yield / Feedan data showed that consequently for the studies cultivars were Arra 15> Arra 29 > Arra 30> Arra 27> Arra 24> Arra 13.Bunch weight of all studied cultivars was big, bunch shape was shouldered in Arra 30, Arra 27, and Arra 15, conical in Arra 29, and Arra 13, while winged in Arra 24. Berry shape in Arra 30, Arra 13, and Arra 15, was cylindrical and obtuse ovoid in Arra 29, And Arra 27, while broad ellipsoid in Arra 24. Berry color in Arra 30, and Arra 15, light green, while bright red in Arra 29, reddish black in Arra 24, dark red violet in Arra 13, and blue black in Arra 27. Formation of seeds was absent in Arra 29 and Arra 15, but rudimentary in the others (All cultivars seedless). Arra 24, ripened in the last week of May, Arra 30, and Arra 29, in the second week of June, Arra 13, in the third week of June while Arra 27, and Arra 15, in the third week of July. Woody shoot for the studied cultivar was yellowish brown expect Arra 13, which was dark brown and the relief surface for all cultivars was striate. Bud fertility lengthwise the cane increased gradually from the basal buds to middle buds than decreased gradually towards the distal buds, except with the variety Arra 13, as it increased at the basal buds then steadiness at middle and distal bud. It can be recommended to prune Arra 30, Arra 29, Arra 27, Arra 24, and Arra 15, to cane pruning system (8-10 buds / cane) while Arra 13, to be pruned according to the spur pruning system (2 buds).

INTRODUCTION

The world vineyards reached a total area of 7.5 million hectares hence, the number of the world cultivars exceeds 13,000 representing relatively large grape diversity OIV,(2013). Cultivars identification and description is an essential stage in the certification program, guaranteeing the trueness-to-type of the propagation materials, germplasm improvement and conservation, and monitoring of the genetic quality Rout, *et al*., (2006), and Barake, *et al*., (2010). Morphological and pomological traits continue to be the first step for the description and classification of any germplasm as well as useful tools for screening the accessions of any collection Cantini, *et al*., (1999).

Ampelography is a scientific methodology accepted for the characterization of grapevine genotypes, based on the description of different morphological, phonological and pomological characters. This method has been standardized and extended by many scientists for more logical and accurate identification of *Vitis* materials Galet,(1979); Alleweldt and Dettweiler, (1986) Dettweiler,(1991), Soylemezoglu, *et al.,* (2001), Santiago, *et al.,*(2007).

The total area in Egypt reached (196993) Feddans with a production of (1686706) Tons according to the latest statistics of Ministry of Agricuture (2015). Most of the grape area has been occupied by two main cultivars; Thompson seedless and Romi Ahmar besides a small area cultivated with some local cultivars. After (1981) some new table grape cultivars were introduced, which have been planted in different growing regions both in Delta and desert areas. These cultivars were found to be different in their morphologyical characteristies and fruit quality.

To improve grapevine production we need a wide knowledge of morphological characters of vegetative growth and fruit quality. In this respect many investigations were done for description and evaluation of grape cultivars. Olmo (1946), Kamel (1964), Winkler *et al*., (1965), Brooks and Otmo (1972), Watt (1983), Walker and Boursiquote (1992), Abd El-Kawi and El-Yam (1992 a, b and c), Abd El-Fatah and Kastor (1993 a and b), Morrison (1994), Tourky *et al*., (1995), El Sharkawy (1995), Fawzy (1998), Gaser, *et al*., (1998) and Marwad (2002 a and b),Gaser,(2006). Ates *et al*., (2011), Basheer-Salimia (2015), Carka, *et al*.,(2015), Rusjan, *et al*., (2015).

The main objectiv of this investigation was to study the morphological description and evaluation of six new Table grape cultivars namely Arra 30, Arra 29, Arra 13, Arra 24, Arra 27, and Arra 15, to determine adaptability to environmental conditions under Birkash-Giza Covermerate – Egypt.

MATERIALS AND METHODS

This investigation was conducted for three successive seasons 2014,2015 & 2016 on four years old grapevines including six cultivars Arra 30, Arra 29, Arra 13, Arra 24, Arra 27, and Arra 15. Vines were grown in a private vineyard situated at Birqash region-Giza governorate. Egypt.

The vines were planted in sandy soil spaced 3x2 meters apart and irrigated by drip irrigation system. Vines were supported by the Gable system. Three replicates for each cultivars were taken where each replicate consisted of five vines.

Morphological descriptions and evaluation, studies were carried out according to the International Ampelographic Registered Schedule Cosmo, *et al*., (1958), IPGRI, O.I.V. and UPOV (2008).

***The following characteristics were studied:**

- Time of bud burst.
- Young shoots

Openness of tip – prostrate hairs on tip – anthocyanin coloration

- **Young leaf:-**

Color of upper side of blade – density of prostrate hairs between main veins and erect hairs on main veins on lower side of blade.

- **Shoot:**

Attitude – Internodes color, Length and thickness – tendrils tip, length, color and number of consecutive.

- Time of bloom and flower sexual organs.
- **Mature Leaf:-**

Size, shape, surface, thickness, color, number of lobes, leaf sinuses,arrangement of lobes, petiole shape,leaf margin(apical tooth, length of teeth, length/width of teeth shape of teeth, Number of teeth and type of margin), hairs of blade and length of petiole compared to middle vein.

- Time of ripening
- Yield/Feedan
- **Bunch:-** weight, shape, density, length of peduncle.
- **Berry:-**

Size, weight, shape, color, thickness of skin, anthocyanin coloration of flesh, firmness flesh.

- Total soluble solids (TSS).
- Acidity (grams of tartaric acid/100 ml juice).
- TSS/acid ratio.
- Formation of seeds.
- Wood shoot
- Bud fertility

50 buds for each node position (1 to 10) were examined to determine coefficient of bud fertility which was calculated by dividing average number of bunches per vine by the total number of buds/vine for the studied cultivars according to Prasad and Pandey, (1969).

Statistical analysis:

The completely randomized design was adopted for this investigation. The obtained data were statiscally analyzed according to Snedccor and Cochran (1990). The new LSD values at 5% level was taken as a measure for comparing between means of treatments..

RESULTS AND DISCUSSION

Morphological description and evaluation of Arra 30, Arra 29, Arra 13, Arra 24, Arra27,and Arra15,are presented in tables (1&2) and illustrated in Figures (1,2,3,4,5,6,7,)

- **Bud burst:-**

Bud burst of Arra 30, occurred in the third week of Febauary, Arra 29, and Arra 13, in the second week of February, Arra 24 in the first week of February, whereas Arra 27, and Arra 15, in the last week of February.

- **Young shoot:-**

Openness of tip of the studied cultivars were fully open and the prostrate hairs on tip were spare at Arra 29 , Arra 13 and Arra 27 while they were medium in Arra 30, Araa 24 and Arra 15. Anthocyanin coloration of prostrate hairs on tip were very weak in Arra 30, Arra 29,and Arra 13, and absent in Arra 24, Arra 27 and Arra 15.

The present results are in harmony with Ates *et al*.,(2011) and Carka *et al*.,(2015).0n some grape cultivar.

- **Young leaf:-**

Color of upper side of blade for the young leaf was green with anthocyanin spots in Arra 30, Arra 29 and Arra 24 but dark copper- red in Arra 13 and Arra 27 while light copper-red in Arra 15. The density of prostrate hairs between main veins on lower side of blade were spare in all studied cultivars except for Arra 30, which was medium.

The same trend at the density of erect hairs on the main veins on lower side of blade was medium in Arra 30 and spare at the other cultivars under studies.

In this respect Ecevit and Kelen,(1999), Sabir *et al.,* (2009) and Ates *et al.,* (2011) 0n evaluated different cultivars of grape.

- **Shoot:-**

Shoot attitude before tying for all studied cultivars were erect. The color of dorsal side and virtual side of internodes in Arra 30, Arra 29 and Arra 24 was green with red strips and green in Arra 27 and Arra 15 whereas Arra 13 had green colon dorsal side of internodes and green with red strips in virtual side of internodes. The density of erect hairs on internodes were spare at the six cultivars.

Length of the internode for Arra 30, Arra 29, Arra 13, Arra 24,Arra 27, and Arra 15 was long (13.05, 11.69, 8.68, 12.63, 8.00 & 10.09 cm), respectively, and the thickness had the values (9.10,10.87,10.08, 8.85, 8.85, 8.75 mm) respectively.

Number of consecutive tendrils was less than three in the all cultivars and the tip of tendril was tri-fid in Arra 29 & 15 while di-fid in Arra 13, it was di-tri in Arra 30,Arra 24 and Arra 27 the length of tendril was very long in Arra 30, Arra 29, and Arra 15 (21.6, 25.18 & 21.74 cm), respectively and long in Arra 13, Arra 24 and Arra 27 (16.4, 18.15 & 19.02 cm), respectively. The color tendrils was green at all studies cultivars.

Some studies on different cultivars are in line with the above mentined results Gaser, *et al.,* (1998), Gaser, (2006) and Rusjan, *et al*.,(2015).

- **Time of bloom:-**

Data in table (1) showed that flowering time in Arra 30, Arra 15, and Arra 13, occurred in the first week of April, Arra 29, and Arra 24, in the last week of March while in Arra 27 it took place in second week of April.

- **Flower sexual organs:-**

Entire of cultivars had flowers with male and female parts fully stamens and developed gynoecium in all studied cultivars.

- **Mature leaf:-**

Definition relevant to mature leaves have been generally approved as powerfull way of identifying genotypes (Kara,1990;Ortiz *et al*., 2004; and Satiago *et al*., 2007).

With respect to the shape of blade , data in table(1) showed that it was circular in Arra 27 and Arra 15 and pentagonal in the others cultivars. Leal surface was smooth at most cultivars except for Arra 30 and Arra 15 was rought , and leaf thickness was thick in Arra 30 and Arra 29 while its was medium in the others. leaf area was large (more than 125 cm^2) color of mature leaf upper surface was green with five lobes and revolute leaf profile in cross section in all cultivars under study.

Depth of upper lateral sinuses was shallow in Arra 29 , Arra 27 and Arra 15 while very deep in Arra 30 , Arra 13 and Arra 24. Arrangement of lobes of upper lateral sinuses were closed in Arra 27 and Arra 15 but slightly overlapped in the others . Petiole sinus slightly open at Arra 30 , Arra 24 and Arra 15 , wheaser half open in Arra 13 and Arra 27 and wide open in Arra 29.

Petiole shape was u- shape in Arra 29 , Arra 13 , and Arra 24 while it was v-u shape at the others. Length of petiole compared to middle vein was moderately shorter as well as sinus limited by veins were constantly absent in all cultivars.

Leaf teeth was medium, the ratio of length to width of teeth was broad in Arra 29 and Arra 15 whereas medium in the others. The apical teeth was pointed, number of teeth was many, type leaf margin irregularly dentate in the all studied cultivars and the shape of teeth was both sides convex in Arra 30, Arra 29, Arra 24, Arra 15, while its mixture of both sides was straight and both sides convex in Arra 13 and Arra 27.

Anthocyanin of main veins on the upper side of blades was strong in Arra 30, very low in Arra 29, low in Arra 24 and absent in the others.

Density of hairs between main and density of hairs on main veins were spare for all cultivars.

From the above mentioned data it is clear that leaf characters were more valuable in the identification and taxonomy of the tested varieties .

- **Time of berry ripening:-**

Data presented in table (1&2) obvious by showed that Arra 24, ripened in the last week of May, Arra 30, and Arra 29, in the second week of June, Arra 13, in the third week of June while Arra 27, and Arra 15, in the third week of July.

From the above mentined results, it can be studied that Arra 24, is avery early ripening , Arra 30, and Arra 29, early ripening Arra 13, mid early ripening while Arra 27, and Arra 15, mid late ripening varieties.

- **Bunch:-**

Data of tables (1) & (2) clearly show that bunch shape was shouldered in Arra 30, Arra 27, and Arra 15, conical in Arra 29, and Arra 13 while winged in Arra 24.

Bunch weight of the all studied cultivars was big (more than 500 g) and Arra 30 was the biggest one, while Arra 24 grape cultivar produced significantly the lowest values in the three seasons respectively.

The length of peduncle was long (more than 4 cm) and the bunch density was dense in all cultivars.

In this respect, Bessins (1965) stated that fruitfulness of grapevine buds proceeded progressively from the basal buds till the middle of the fruiting cane then declined towards the tip. Also, (Licul, 1969 and Monastra, 1971) found that fertility of buds increased from the base of the cane to the 10 th node, thereafter it fell slightly towards the tip. Abdel-Kawi and El-Yami (1992), Gaser *et al*.;(1998) Gaser (2006) found that fruitfulness of buds successively increased in general from the basal to the distal buds of the canes.

Table 1. Morphological description and evaluation for six newly grape cultivars :

Cultivars	Arra 30	Arra 29	Arra 13	Arra 24	Arra 27	Arra 15
-Time of bud burst .	Third week of February	Second week of February	Second week of February	First week of February	Last week of February	Last week of February
-Young shoot:-						
*Openness of tip.	Fully open	Fully open	Fully open	Fully open	Fully open	Fully open
*Prostrate hairs on tip.	Medium	Spare	Spare	Medium	Spare	Medium
*antocyanin coloration of prostrate hairs on tip.	Very week	Very week	Very week	Absent	Absent	Absent
-Young leaf						
* color of upper side of blade	Green with Anthocyanin post	Green with Anthocyanin post	Dark copper-red	Green with anthocyanin post	Dark copper-red	Light copper- red
* density of prostrate hairs between main veins on owerside of blade.	Medium	Spare	Spare	Spare	Spare	Spare
*density of erect hairs on main vines on lower side of blade.	Medium	Spare	Spare	Spare	Spare	Spare
Shoot:						
*attitude (before tying)	Erect	Erect	Erect	Erect	Erect	Erect
*color of dorsal side of internodes	Green with red stripes	Green with red stripes	Green	Green	Green	Green
*color of virtual side of internodes.	Green with red stripes	Green with red stripes	Green with red stripes	Green with red stripes	Green	Green
*density of erect hairs on internodes	Spare	Spare	Spare	Spare	Spare	Spare
*length of internodes .	Long(13.05cm)	Long(11.69cm)	Long(8.68 cm)	Long(12.63cm)	Long(8.00cm)	Long(10.09cm)
*thickness of internodes.	Thick (9.10 mm)	Thick (10.87 mm)	Thick (10.08 mm)	Thick (8.85 mm)	Thick (8.85 mm)	Thick (8.75 mm)
-Tendrils:						
*number of consecutive tendrils.	Less than three	Less than three	Less than three	Less than three	Less than three	Less than three
*tip	Di- tri	Tri	Di	Di- tri	Di- tri	Tri
*length.	Very long (21.6cm)	Very long (25.18cm)	long (16.4cm)	long (18.15cm)	long (19.02cm)	Very long (21.6cm)
*color	Green	Green	Green	Green	Green	Green
Time of bloom	First week of April	Last week of March	First week of April	Last week of March	Second week of April	First week of April
-Flower sexual organs	Fully developed Stamens And developed gynoecium	Fully developed Stamens And developed gynoecium	Fully developed Stamens And developed gynoecium	Fully developed Stamens And developed gynoecium	Fully developed Stamens And developed gynoecium	Fully developed Stamens And developed gynoecium
-Mature leaf:						
* leaf area	Large (179.52 cm^2)	Large (168.20 cm^2)	Large (195. cm^2)	Large (190.57 cm^2)	Large (161.03cm^2)	Large (197.50cm^2)
* shape of blade	pentagonal	pentagonal	pentagonal	pentagonal	circular	circular
* leaf surface	rough	smooth	smooth	smooth	smooth	smooth
* leaf color	green	green	green	green	green	green
* leaf thickness	thick	thick	medium	medium	medium	medium
* leaf profit in cross section	revolute	revolute	revolute	revolute	revolute	revolute
* leaf number of labs	five	five	five	five	five	five
-leaf sinuses						
•depth of upper lateral sinuses	very deep	shallow	very deep	very deep	shallow	shallow
•arrangement of labs of upper lateral sinuses	slightly over lapped	slightly over lapped	slightly over lapped	slightly over lapped	closed	closed

Cont. Table 1.

Cultivars	Arra 30	Arra 29	Arra 13	Arra 24	Arra 27	Arra 15
•petiole sinus	slightly open	wide open	half open	slightly open	half open	slightly open
•petiole shape	v-u shape	u-shape	u-shape	u-shape	v-u shape	v-u shape
•length of petiole compared to middle vein	moderately shorter(0.93)	moderately shorter(0.85)	moderately shorter(0.80)	moderately shorter(0.80)	moderately shorter(0.83)	moderately shorter(0.75)
• petiole sinus limited by vines	absent	absent	absent	absent	absent	absent
- leaf margin :						
* length of teeth	medium	medium	medium	medium	medium	medium
* length \ width of teeth	medium	broad	medium	medium	medium	medium
* apical teeth	pointed	pointed	pointed	pointed	pointed	pointed
* shape of teeth	both sides convex	both sides convex	mixture of both sides	both sides convex	mixture of both sides	both sides convex
* number of teeth	mange(77.63)	mange(76.63)	mange(82.21)	mange(78.15)	mange(66.30)	mange(66)
*type of margin	irregularly dentate	irregularly dentate	irregularly dentate	irregularly dentate	irregularly dentate	irregularly dentate
* anthocyanin of main veins	strong	very low	absent	low	absent	absent
* density of hairs between main veins	very spare	spare	spare	spare	spare	spare
* density of hairs on main veins	spare	spare	spare	spare	spare	spare
- Time 0f berry ripening	Second week of June	Second week of June	Third week of June	Last week of May	Third week of June	Third week of June
-Bunch:						
*shape	shouldered	conical	conical	winged	shouldered	shouldered
*weight	big	big	big	big	big	big
*density	dense	dense	dense	dense	dense	dense
* length of peduncle	Long(6cm)	Long(4cm)	Long(5cm)	Long(4cm)	Long(5.5)	Long(4.5)
- Berry:						
*size	Very large	Very large	Large	Large	Large	Large
*shape	Cylindroids	Obtuse ovate	Cylindroids	Broad elliptic	Obtuse ovate	Cylindroids
*color	Light green	Bright red	Dark red violet	Reddish black	Blue black	Light green
*thickness of skin	Medium	Thin	Medium	Thin	Medium	Thin
*ease of detachment from pedicel	Difficult	Difficult	Difficult	Moderately easy	Moderately easy	moder
* anthocyanin coloration of flash	Absent	Absent	Absent	Absent	Absent	Absent
* firmness flash	Very firm	Slightly firm	Slightly firm	Moderately firm	Moderately firm	Moderately firm
- formation of Seeds	Rudimentary	Absent	Rudimentary	Rudimentary	Rudimentary	Absent
-Woody shoot:-						
•Main color	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
•Relief surface	striate	striate	striate	striate	striate	striate

Table 2. Some physical and chemical characteristics of bunches and berries of some grape cultivars in 2014, 2015 and 2016 seasons

Characteristics / Cultivars	Bunch weight (g)	Bunch length (cm)	Bunch width (cm)	Berry weight (g)	Berry Size (cm^3)	Berry length (cm)	Berry diameter (cm)	Berry shape	TSS (%)	acidity (%)	TSS/ acid ratio	Yield/ Feddan Ton
First season												
Arra 30	870.4	24.11	17.49	8.22	7.61	3.17	2.14	1.48	16.79	0.58	28.95	12.43
Arra 29	730.3	24.50	17.04	7.15	6.66	2.39	2.20	1.09	16.92	0.52	32.54	12.74
Arra 13	745.5	23.45	17.36	7.19	6.69	2.83	2.18	1.30	16.84	0.50	33.68	7.83
Arra 24	641.7	20.78	11.21	4.89	4.40	2.28	2.13	1.07	16.73	0.55	30.42	11.21
Arra 27	656.2	22.67	15.27	6.95	5.82	2.64	2.18	1.21	16.81	0.63	26.68	11.46
Arra 15	781.6	23.78	16.83	7.90	7.40	3.12	2.14	1.48	16.76	0.59	28.41	13.39
New LSD at 5%	87.4	0.42	0.12	0.29	0.19	0.04	0.01	0.01	N.S.	0.02	0.67	0.63
Second season												
Arra 30	883.3	24.72	17.67	8.29	7.68	3.15	2.11	1.49	16.83	0.61	27.59	12.06
Arra 29	736.7	24.43	17.09	7.18	6.68	2.36	2.21	1.07	16.77	0.50	33.54	12.91
Arra 13	773.2	24.07	17.52	7.20	6.58	2.82	2.15	1.31	16.74	0.49	34.16	8.11
Arra 24	653.4	16.74	11.03	4.93	4.53	2.23	2.14	1.04	16.81	0.52	32.33	11.39
Arra 27	685.1	22.67	15.21	6.91	5.79	2.60	2.20	1.18	16.77	0.61	27.49	12.03
Arra 15	794.8	23.85	16.67	8.00	7.50	3.10	2.15	1.44	16.84	0.61	27.61	14.03
New LSD at 5%	88.1	0.34	0.14	0.24	0.17	0.02	0.01	0.03	N.S.	0.01	0.59	0.89
Third season												
Arra 30	928.4	24.92	17.29	8.22	7.72	3.14	2.13	1.47	16.83	0.60	28.05	12.96
Arra 29	748.3	24.65	17.04	7.15	6.65	2.37	2.30	1.03	16.77	0.52	32.25	13.02
Arra 13	781.9	24.27	17.13	7.18	6.52	2.84	2.21	1.29	16.87	0.50	33.74	8.20
Arra 24	664.1	16.89	11.47	4.94	4.6	2.21	2.12	1.04	16.75	0.53	31.60	11.62
Arra 27	693.3	22.85	15.23	6.84	5.69	2.58	2.18	1.18	16.79	0.68	24.69	12.14
Arra 15	816.8	23.96	16.38	7.68	7.16	3.12	2.15	1.45	16.81	0.60	28.02	14.23
New LSD at 5%	94.7	0.31	0.15	0.35	0.23	0.01	0.03	0.01	N.S.	0.01	0.71	0.97

- **Berry:-**

With respect to physical properties of berries, data showed that the highest values of berry weight and length was significantly obtained from Arra 30, and Arra 15, grape cultivar, whereas the highest values of berry diameter were significantly gained from Arra 29 grape cultivar. On the other hand, Arra 24 grape cultivar had significantly the lowest values of these parameters in the three seasons respectively.

Berry shape in Arra 30, Arra 13 and Arra 15 was cylindrical and obtuse ovoid in Arra 29, And Arra 27 while broad elliptic in Arra 24.

Berry color in Arra 30 and Arra 15 light green, while bright red in Arra 29, reddish black in Arra 24,dark red violet in Arra 13 and blue black in Arra 27.

Berry thickness of skin was medium in Arra 30, Arra 13 And Arra 27 but thin in Arra 29, Arra24and Arra 15.

Berry ease of detachment from pedicle was difficult with Arra 30, Arra 29 and Arra 13, moder in Arra 15 while was moderately easy in Arra 27 and Arra 24.Anthocyanin coloration of flesh was absent in all studied cultivars.

Berry firmness flesh was very firm in Arra 30, slightly firm in Arra 29 and Arra 13 while moderately firm in the other cultivars.

Regarding chemical properties of berries, data revealed that Arra 29 grape cultivar attained significantly the lowest percentage of acidity and the highest value of TSS/acid ratio, in the three seasons respectively. Concerning percentage of TSS, data revealed that insignificant differences were noticed among all grape cultivars under study in the three seasons.

With respect to yield / Feedan data showed that consequently for the studies cultivars were Arra 15> Arra 29 > Arra 30> Arra 27> Arra 24> Arra 13.

Formation of seeds:-

Formation of seeds was absent in Arra 29 and Arra 15 whereas it was rudimentary in the others.

These results go in line with those early reported by many investigation for different cultivars (Fawzy,1998; Gaser, *et al.,* 1998; Gaser,2006;Basheer 2015,Carka, 2015 Rusjna, *et al.,* 2015)

- **Woody shoot:-**

Datat in table (1) showed that the main color of woody shoot for the studied cultivar was yellowish brown except with Arra 13 which was dark brown and the relief surface for all cultivars was striate .

- **But fertility:-**

It is one of the most important factors to determine coefficient of bud fertility for each bud position as to help for the choice of the suitable training and pruning system for each cultivars.

Fig (1) showed that bud fertility for the studied cultivars ranged between high and very high and bud fertility lengthwise the cane increased gradually from the basal buds to middle buds them decreased gradually towards the distal buds,except Arra 13, as it was increased at the basal buds then steadiness at middle and distal bud.

The highest coefficient of bud fertility was obtained at 4 - 8 node position in Arra 24, and Arra 30, at 5-10 node position Arra 29, at 4-7 node position in Arra 27, 6-8 node

position in Arra 15, while in Arra 13, at first and second node position.

From the above mentent results, it can be recommended to prun Arra 30, Arra 29, Arra 27, Arra 24 and Arra 15, to cane pruning system (8-10 buds / cane) while Arra 13, can be pruned according to spur pruning system (2 buds).

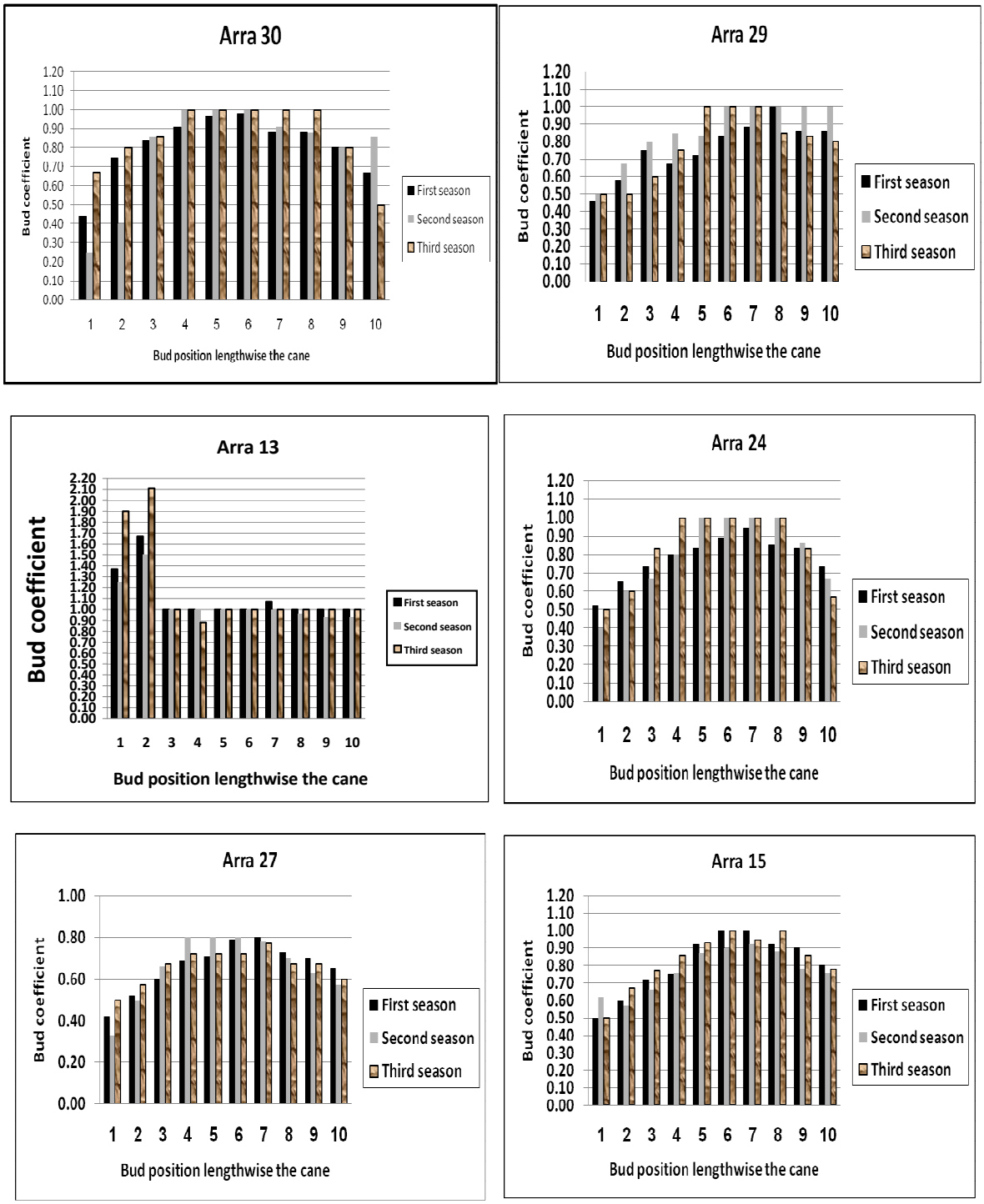

Fig 1. Coefficient of bud fertility in six - newly grape cultivars during 2014 , 2015 & 2016 seasons.

Fig: (2) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 30

Fig: (3) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 29

Fig: (4) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 13

Fig: (5) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 24

Fig: (6) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 27

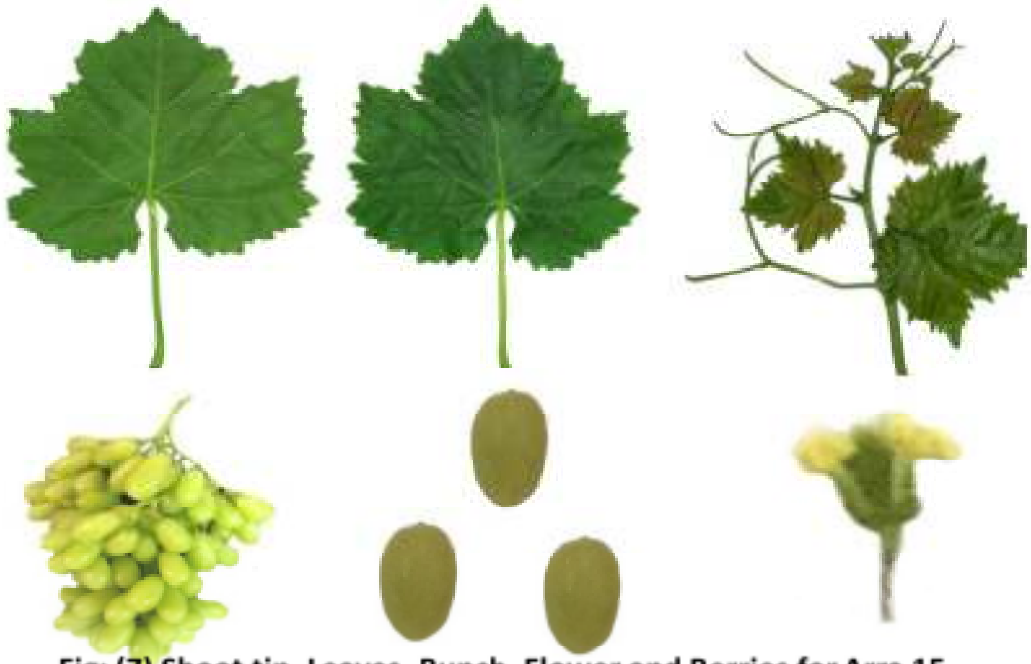

Fig: (7) Shoot tip, Leaves, Bunch, Flower and Berries for Arra 15

CONCLUSION

The present investigation proved that Arra 24 is very early ripening , Arra 30, and Arra 29, early ripening Arra 13, mid early ripening while Arra 27, and Arra 15, mid late ripening. Berry shape in Arra 30, Arra 13 and Arra 15 was cylindrical and obtuse ovoid in Arra 29, And Arra 27 while broad elliptic in Arra 24. Berry color in Arra 30 and Arra 15 light green, while bright red in Arra 29, reddish black in Arra 24,dark red violet in Arra 13 and blue black in Arra 27. Prun Arra 30, Arra 29, Arra 27, Arra 24 and Arra 15, to cane pruning system (8-10 buds / cane) while Arra 13, can be pruned according to spur pruning system (2 buds).

Moreover future studies are intended to follow up the current research through approaching their attitude according to their reaction, i.e, finger print, storage ability and succeptibility or tolerance to the common main fungal diseases and prevailing pests.

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التوصيف المورفولوجى والتقييم لستة أصناف عنب مستوردة حديثاً تحت الظروف المصرية

فرج محمد المرسى ، عائشة صالح عبد الرحمن جاسر و ماجدة نجيب محمد عبدالله

قسم بحوث العنب - معهد بحوث البساتين- مركز البحوث الزراعية

أجرى هذا البحث على ستة أصناف عنب أرا ٣٠ ، أرا ٢٩ ، أرا ١٣ ، أرا ٢٤ ، أرا ٢٧ ، أرا ١٥ خلال مواسم ٢٠١٤ ، ٢٠١٥ ، ٢٠١٦ للتوصيف المورفولوجى والتقيم تحت الظروف المصرية.وقد كانت هذه الأصناف منزرعة بمزرعة خاصة بمنطقة برقاش محافظة الجيزة- جمهورية مصر العربية وكانت الكرمات نامية فى تربة رملية على مسافة ٣ X ٢ م وتروى بنظام الرى بالتنقيط وكان نظام التدعيم جيبل.وقد شملت الدراسة على :- ميعاد تفتح البراعم – الأفرع الحديثة – الأوراق الحديثة – الأفرع – ميعاد التزهير – الأزهار- الأوراق الناضجة – ميعاد النضج العنقود – الحبة – تكوين البذور فى الحبة – المواد الصلبة الذائبة الكلية – الحموضة – نسبة المواد الصلبة الذائبة الكلية الى الحموضة. وقد أظهرت الدراسة نجاح هذه الأصناف تحت الظروف المصرية حيث أعطت نمواً قوى وجودة عالية للعناقيد والحبات وكانت القمة النامية كاملة التفتح فى جميع الأصناف تحت الدراسة وكان لون السطح العلوى للأوراق الحديثة أخضر مع وجود نقط من صبغة الأنثوسيانين فى أرا ٣٠ ، أرا ٢٩ ، أرا ٢٤ ، ولكن الأوراق الحديثة لونها أخضر مع وجود لون أحمر نحاسى غامق فى أرا ١٣ ، أرا ٢٧ بينما الأوراق الحديثة لونها أخضر مع وجود لون أحمر نحاسى فاتح فى أرا ١٥ . السلميات طويلة وسميكة وتتابع المحاليق كان أقل من ثلاثة فى جميع الأصناف . وكان طرف المحلاق ثلاثى فى أرا ٢٩ ، أرا ١٥ ، بينما ثنائى فى أرا ١٣ وثنائى ثلاثى فى أرا ٣٠ ، وأرا ٢٤ ، وأرا ٢٧ . جميع الأصناف كانت الأزهار كاملة إكتمال تطور الأسدية وإكتمال تطور المتاع. الأوراق الناضجة كانت مستديرة الشكل فى أرا ٢٧، وأرا ١٥ وخماسية الشكل فى باقى الأصناف وكان عمق التجويف العلوى الجانبى ضيق فى أرا ٢٩ ، أرا ٢٧ ، أرا ١٥ بينما كان عميق جدا فى أرا ٣٠ ، أرا ١٣، أرا ٢٤، وكان نظام تجويف الفصوص العلوية الجانبية مغلق فى أرا ٢٧، أرا ١٥ بينما متداخل بسيط فى باقى الأصناف. وكان تجويف عنق الورقة مفتوح فى أرا ٣٠، أرا ٢٤، أرا ١٥، بينما كان نصف مفتوح فى أرا ١٣، أرا ٢٧، ومفتوح واسع فى أرا ٢٩.وكانت فتحة عنق الورقة على شكلU فى أرا ٢٩، أرا ١٣، أرا ٢٤ بينما كان على شكل V-U فى باقى الأصناف وكان طول عنق الورقة الى طول العرق الوسطى متوسط قصير وكان تحديد الفصوص بالعرق الوسطى غائب فى جميع الأصناف وتكوين صبغة الأنثوسيانين على العرق الوسطى الرئيسى لسطح العلوى للنصل كان شديد فى أرا٣٠ ومنخفض جداً فى أرا ٢٩ ومنخفض فى أرا ٢٤، وغائب فى باقى الأصناف. كان متوسط إنتاج محصول الفدان أرا ١٥ ثم أرا ٢٩ ثم أرا ٣٠ ثم أرا ٢٧ ثم أرا ٢٤ وأقلهم أرا ١٣ وزن العنقود كان كبير فى جميع الأصناف وشكل العنقود ذو أكتاف فى أرا ٣٠، أرا ٢٧، أرا ١٥ ولكن مخروطى طويل فى أرا ٢٩ ومخروطى فى أرا ١٣، بينما كان شكل العنقود مجنح فى أرا ٢٤. شكل الحبة أسطوانى فى أرا ٣٠، أرا ١٣، أرا ١٥ بينما كان شكل الحبة بيضاوية مستديرة فى أرا ٢٩، أرا ٢٧ بينما بيضاوية عريضة فى أرا ٢٤ وكان لون الحبة فى أرا ٣٠، أرا ١٥ أخضر فاتح بينما لون أحمر زاهى فى أرا ٢٩ وأسود محمر فى أرا ٢٤، وأحمر بنفسجى غامق فى أرا ١٣، وأسود مزرق فى أرا ٢٧. تكوين البذور فى الحبة كان غائب فى أرا ٢٩، أرا ١٥ بينما أثرياً فى باقى الأصناف (جميع الأصناف لابذرية). كان ميعاد النضج فى أرا ٢٤، الأسبوع الأخير من شهر مايو و أرا ٣٠، أرا ٢٩ الأسبوع الثانى من شهر يونية وأرا ١٣ الأسبوع الثالث من شهر يونيه بينما أرا٢٧، أرا ١٥ الأسبوع الثالث من شهر يوليو وكان خشب الأفرع لونه بنى مصفر فى جميع الأصناف ما عدا صنف أرا ١٣ كان بنى غامق وكان سطح الخشب فى جميع الأصناف مخطط. معامل خصوبة البراعم على طول القصبة يزيد تدريجيا من البراعم القاعدية حتى البراعم الوسطية ثم يقل تدريجيا فى إتجاه البراعم الطرفية فى جميع الأصناف فيما عدا صنف أرا ١٣ حيث ترتفع فى البراعم القاعدية ثم تثبت فى باقى البراعم. ولذلك يوصى بتقليم الأصناف أرا ٣٠، أرا ٢٩، أرا ٢٧، أرا ٢٤، أرا ١٥ بالتقليم القصبى (٨-١٠ عين / قصبة) بينما صنف أرا ١٣ يقلم تقليم دابرى (٢ عين).