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زانكۆی سه‌لاحه‌دین - هه‌ولێر  
Salahaddin University-Erbil

# Identifying lint properties of some cotton genotypes (*Gossipum hirsutum* L.) using different statistical models

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Acceptance of Research for Publication

Greetings...

As a result of review and revisions, we are pleased to inform you that, your following paper titled:  
**Identifying lint properties of some cotton genotypes (*Gossypium hirsutum* L.) using  
different statistical models**

was formally accepted for publication in one of the upcoming numbers of the (*Zanco Journal of Pure and Applied Sciences*).

Thank you for your contribution to our journal and we are looking forward to your future participation.

With our best regards...

Prof. Dr. Mustafa Sabir Al-Attar  
Editor-in-Chief

Prof. Dr. Asaad Hamid Ismail  
Editor Secretary

زانکو ژورنال بۆ  
هونەر، تکنالوژی و زانستی

# *INTRODUCTION*

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1. Cotton ([Gossypium hirsutum](#) L.), interests as a white gold due to its contribution in agricultural, industrial, and economy development. It is a major source of fibre and oil, in most of the tropical region in the world .
2. Traditionally, ideal cotton fibres are said to be as “white as snow, as strong as steel, as fine as silk and as long as wool “. Moreover, cottonseed are the second most important source of oil for human consumption and it contains about 15% oleic acid .
3. Genotype selection is an important factor which has a large impact on yield and quality attributes of cotton species .
4. Ullah et al (2019) reposted that the higher values of fibre quality were obtained between different genotypes .

# *Aims of the study*

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1. Comparison among nine cottonseeds genotypes originated from [Iraq](#), [Iran](#) and [American](#) on the seed oil and protein yields and fiber quality properties .
2. Using different statistical model to identify lint quality .
3. Study the possibility to adapt these genotypes in [Erbil environment](#) .

# *Cotton genotypes*

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**Iraqi  
genotypes**

Coker310  
Lachata

**Iranian  
genotypes**

Bakhtegan  
Khordad  
Varamin

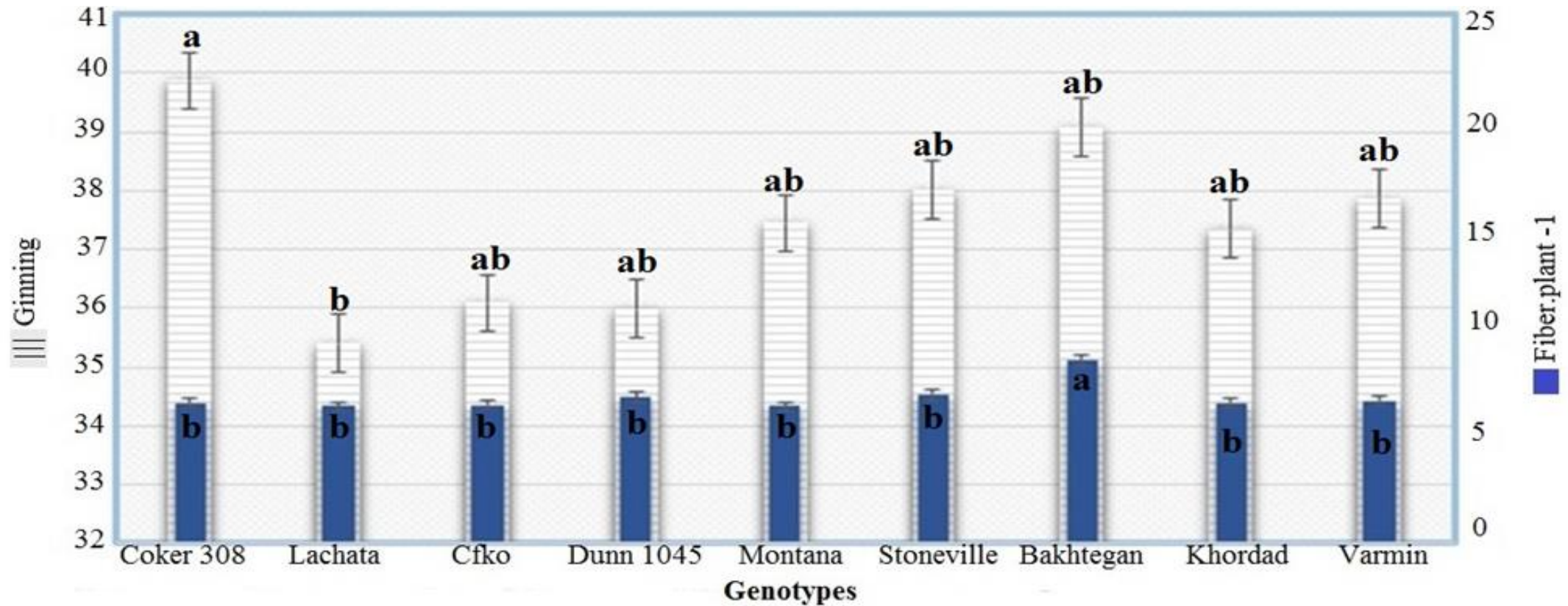
**American  
genotypes**

Cafko  
Dunn1047  
Montana  
Stoneville

# *Statistical analysis*

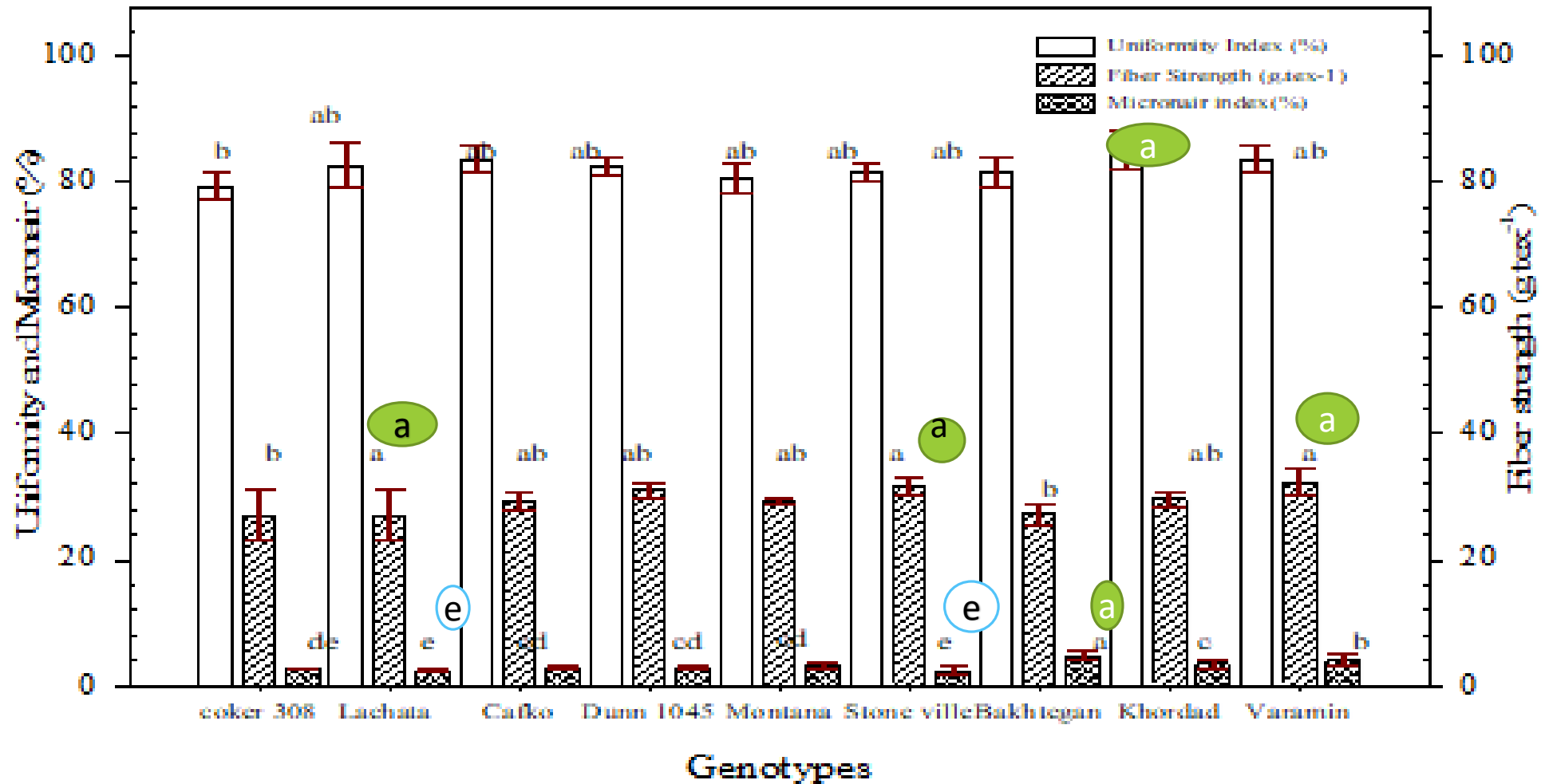
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- Data which collected on different parameters were analysed statistically by using Statistical Package for Social Sciences (SPSS) programmed (version 26) .
- Means were compared using Duncan's multiple range test at the ( $P \leq 0.05$ ) significance level (Cochran, 1957).
- The principal component analysis (PCA) was performed for comparing between the studied treatments combinations using XLSTAT-Premium Program



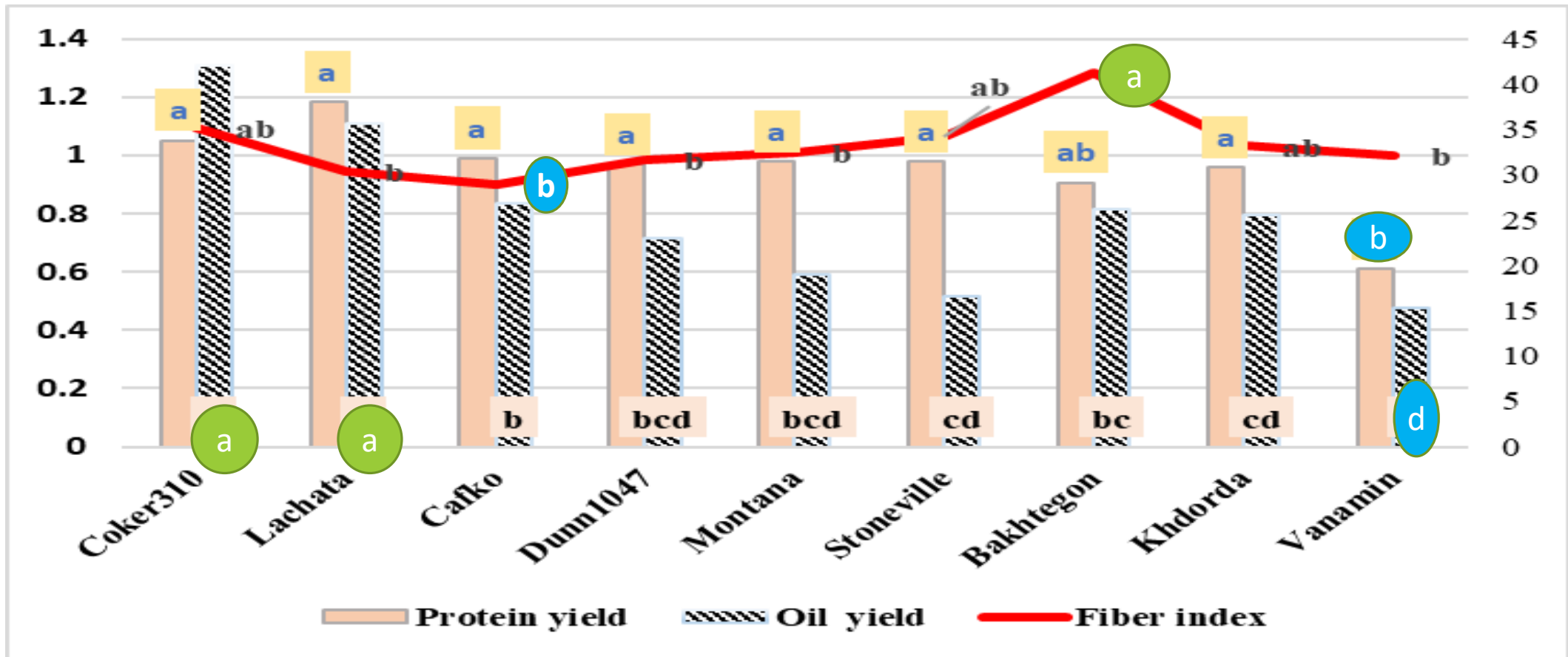
Means followed by the same letter in the bar chart indicate not significantly different Duncan's multiple tests, ( $P \leq 0.0$ ).

**Figure 1.** Effect of genotypes on ginning out turn and fiber weight plant<sup>1</sup>.



**Figure 2.** Mean performance for various fiber qualities of nine cottonseeds *G. hirsutum* genotypes

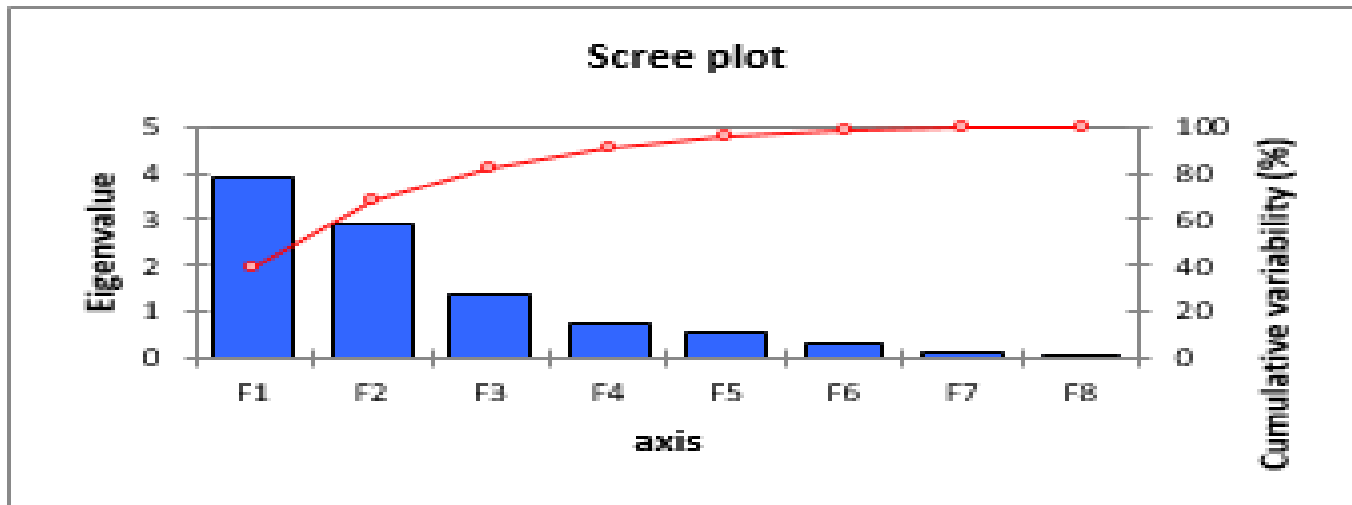




**Figure 3.** Oil, protein yield and fibre index as affected by cotton genotypes.

**Table 2.** Shows the eigenvalue and the variability among the genotypes.

	F1	F2	F3	F4	F5	F6	F7	F8
Eigenvalue	3.941	2.921	1.406	0.766	0.575	0.286	0.089	0.016
Variability (%)	39.412	29.209	14.056	7.665	5.754	2.859	0.89	0.155
Cumulative(%)	39.412	68.621	82.677	<u>90.342</u>	96.096	98.955	99.845	100



**Figure 4.** Shows the decrease in slope for scree plot after F3.

F1: Fiber weight, Fiber index, Protein yield, Fiber length, Microner index and Maturity.

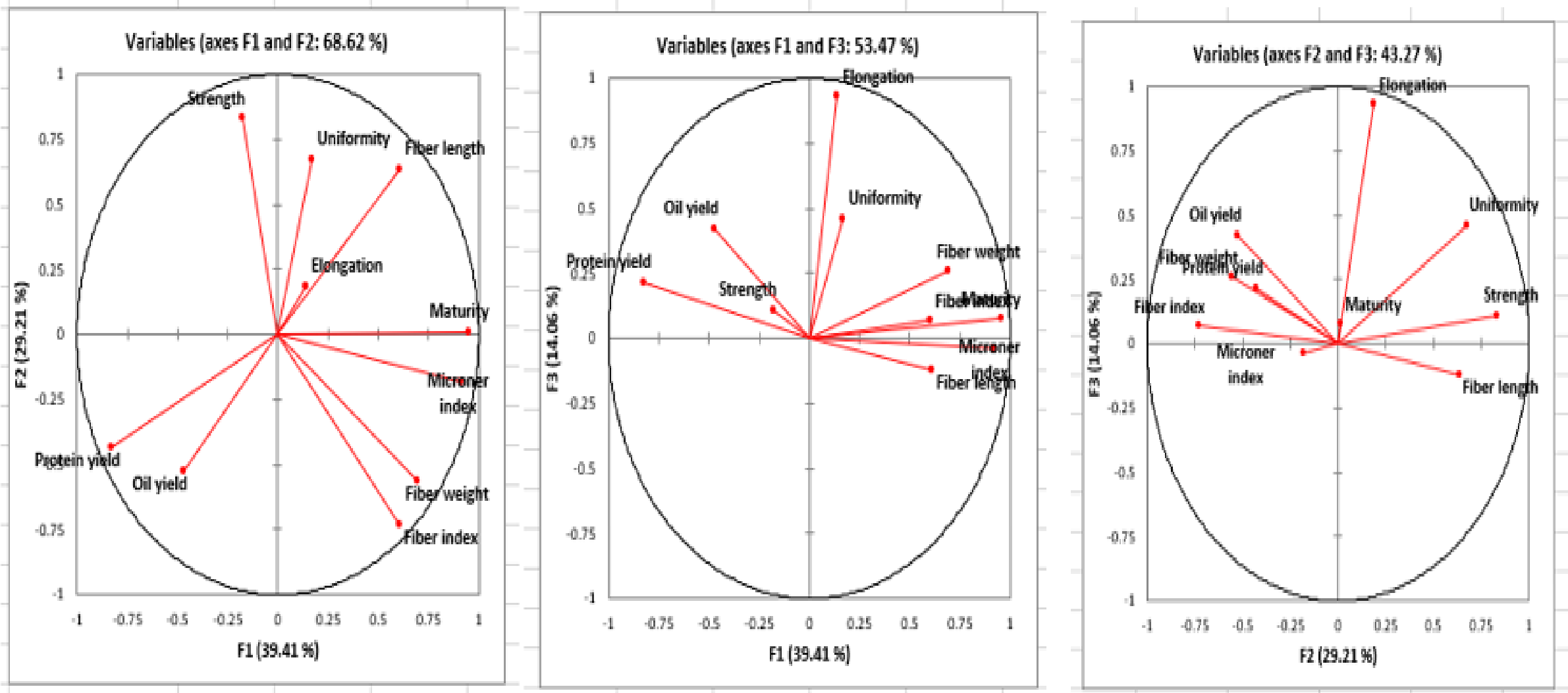
F2: Fiber index, Fiber length, Strength and Uniformity.

F3: Elongation only.

**Table 3.** Shows loadings or the correlation coefficient between the studied parameters and factors.

	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>	<b>F6</b>	<b>F7</b>	<b>F8</b>
Fiber weight	<b>0.692</b>	-0.560	0.258	-0.271	0.227	0.039	-0.119	0.000
Fiber index	<b>0.602</b>	<b>-0.729</b>	0.068	-0.060	0.196	-0.054	0.238	-0.007
Protein yield	<b>-0.826</b>	-0.432	0.215	-0.136	0.098	0.235	-0.001	-0.036
Oil yield	-0.470	-0.525	0.421	0.503	-0.187	0.194	0.027	0.015
Fiber length	<b>0.608</b>	<b>0.635</b>	-0.117	0.458	0.036	0.002	0.044	-0.023
Microner  index	<b>0.915</b>	-0.179	-0.037	-0.071	-0.289	0.189	-0.009	0.074
Maturity	<b>0.954</b>	0.010	0.075	0.178	0.093	0.186	-0.070	-0.064
Elongation	0.140	0.188	<b>0.930</b>	0.125	0.104	-0.227	-0.033	0.021
Strength	-0.180	<b>0.830</b>	0.107	-0.070	0.445	0.243	0.050	0.045
Uniformity	0.169	<b>0.672</b>	0.462	-0.389	-0.372	0.086	0.084	-0.037

□



**Figure 5.** PCA on the parameters of lint properties of nine cotton genotypes. The negative and positive values for factors (F1, F2), (F1, F3) and (F2, F3) are limiting, the locations of vectors or variables in the circle.

## *Conclusion*

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This study comprised of two Iraq's, three Iran's and four American's cottonseed (*G. hirsutum* L.) genotypes on the fiber quality, oil and protein. They varied in the studied parameters. It was concluded that the *G. hirsutum* genotypes were differing in their traits. Among the nine genotypes under test the response of genotype Lachata very well in terms of fiber quality, was oil, protein yield. Then, one Iran's of genotype Bakhtin has greater fiber quality, under the prevailing environmental conditions in the northern territories of Mesopotamia (Erbil). Therefore, these traits may be used to advice farmers not only about cotton specie but also other species which is understand the impact of difference genotypes on the quality and quantity of yield.

# References

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Table 1. Some agronomic characteristics and fiber quality of nine *G. hirsutum* genotypes studied.

Genotypes	Seed Index (g or %)	Seed (%)	Ginning %	Fiber. plant <sup>-1</sup> g
Coker 310	5.30 <sup>b</sup>	63.91 <sup>ab</sup>	39.87 <sup>a</sup>	6.64 <sup>b</sup>
<u>Lachata</u>	5.52 <sup>ab</sup>	64.60 <sup>a</sup>	35.40 <sup>b</sup>	6.48 <sup>b</sup>
<u>Cafko</u>	5.13 <sup>b</sup>	60.13 <sup>b</sup>	36.09 <sup>ab</sup>	6.55 <sup>b</sup>
Dunn 1047	5.63 <sup>ab</sup>	64.01 <sup>ab</sup>	35.99 <sup>ab</sup>	6.89 <sup>b</sup>
Montana	5.42 <sup>ab</sup>	62.55 <sup>ab</sup>	37.45 <sup>ab</sup>	6.46 <sup>b</sup>
Stoneville	5.58 <sup>ab</sup>	61.99 <sup>ab</sup>	38.01 <sup>ab</sup>	7.02 <sup>b</sup>
<u>Bakhtegan</u>	6.40 <sup>a</sup>	60.91 <sup>ab</sup>	39.09 <sup>ab</sup>	<b>8.65<sup>a</sup></b>
Khordad	5.56 <sup>ab</sup>	62.65 <sup>ab</sup>	37.35 <sup>ab</sup>	6.64 <sup>b</sup>
<u>Varamin</u>	5.28 <sup>b</sup>	62.13 <sup>ab</sup>	37.87 <sup>ab</sup>	6.74 <sup>b</sup>

Note: Means followed by the same letter in the column did not significantly differ (Duncan's multiple test,  $P \leq$  or  $> 0.05$ ). □

Table 3. Mean performance for various traits (fiber weight, fiber index, protein and oil yields) of nine cottonseeds (*G. hirsutum*) genotypes studied.

Genotypes	Fiber Weight (gm)	Fiber Index	Protein yield	Oil yield
<b>Coker310</b>	353.92 <sup>b</sup>	35.22 <sup>ab</sup>	105.04 <sup>a</sup>	130.57 <sup>a</sup>
<b>Lachata</b>	345.60 <sup>b</sup>	30.39 <sup>b</sup>	118.27 <sup>a</sup>	110.92 <sup>a</sup>
<b>Cafko</b>	349.44 <sup>b</sup>	28.95 <sup>b</sup>	98.97 <sup>a</sup>	83.63 <sup>b</sup>
<b>Dunn1047</b>	367.68 <sup>b</sup>	31.64 <sup>b</sup>	96.95 <sup>a</sup>	71.62 <sup>bcd</sup>
<b>Montana</b>	344.67 <sup>b</sup>	32.46 <sup>b</sup>	97.87 <sup>a</sup>	59.24 <sup>bcd</sup>
<b>Stoneville</b>	374.61 <sup>b</sup>	34.19 <sup>ab</sup>	97.79 <sup>a</sup>	51.61 <sup>cd</sup>
<b>Bakhtegon</b>	461.19 <sup>a</sup>	41.22 <sup>a</sup>	90.64 <sup>ab</sup>	81.33 <sup>bc</sup>
<b>Khdorda</b>	354.46 <sup>b</sup>	33.16 <sup>ab</sup>	95.69 <sup>a</sup>	79.36 <sup>cd</sup>
<b>Vanamin</b>	359.57 <sup>b</sup>	32.19 <sup>b</sup>	60.88 <sup>b</sup>	47.38 <sup>d</sup>

Note: Means followed by the same letter in the column did not significantly differ (Duncan's multiple test,  $P \leq \text{or} > 0.05$ ).

The circles (1,2and 3) representing the locations of vectors and correlation between them ,if the onlyangle value between two variables  $\leq 90^\circ$  it means there is significant correlation between them and via versa