



MODELS FOR DESCRIBING FLORAL QUALITY INDICES IN *LILIUM* "GOLDEN MATRIX"

Cristina TOȚA¹, Sorana INDRIEȘ², Cristian BERAR³, Florin SALA^{4,5,*}

^{1,2,3}University of Life Sciences "King Mihai I" from Timișoara, Faculty of Engineering and Applied Technologies,
 Department of Horticulture

⁴University of Life Sciences "King Mihai I" from Timisoara, Faculty of Agriculture, Department of Soil Sciences

⁵Agricultural Research and Development Station Lovrin, Lovrin, Romania

Abstract: The study evaluated the relationship between vegetative growth and floral quality in *Lilium* 'Golden Matrix' cultivated in greenhouse conditions. Plant height, stem height, leaf number, flower number, flower height, and flower diameter were analyzed. The results showed normal distribution and different levels of variability among the evaluated traits. Polynomial models highlighted significant relationships between vegetative parameters and floral quality indices, indicating both convergent and divergent effects. The findings provide useful information for improving ornamental quality in *Lilium* cultivation.

Introduction:

Lilium is one of the most important ornamental plant genera used for potted plants and cut flowers due to its high decorative and economic value. Floral quality in lilies is influenced by genetic, environmental, and cultivation factors, which affect plant growth and flowering characteristics.

The evaluation of vegetative parameters and floral quality indices is important for improving ornamental performance and cultivation technologies. This study aimed to analyze the relationship between plant morphological traits and floral quality indices in *Lilium* 'Golden Matrix' cultivated under greenhouse conditions.

Material and methods:

The study was conducted in a greenhouse at the University of Life Sciences "King Mihai I" from Timișoara during 2025. The biological material consisted of *Lilium* 'Golden Matrix' grown in 10 cm pots on peat substrate under controlled irrigation conditions.

At flowering stage, the following parameters were evaluated: plant height, stem height, leaf number, flower number, flower height, and flower diameter. Statistical analysis included descriptive statistics, ANOVA, variability assessment, and regression analysis to evaluate the relationships between vegetative traits and floral quality indices. Data processing and graphical representation were performed using specialized statistical software.

Results and discussions

The evaluated parameters showed normal distribution and statistical reliability according to ANOVA analysis. Low variability was recorded for plant height, stem height, leaf number, and flower diameter, while flower number and flower height showed moderate variability.

Regression analysis highlighted significant relationships between vegetative traits and floral quality indices. Plant height showed an important influence on flower number, flower height, and flower diameter. Convergent and divergent interactions between vegetative parameters were identified through polynomial models and graphical representations.

The strongest relationship was observed between flower height and the parameters plant height and stem height ($R^2 = 0.976$; $p = 0.0010$). Overall, the results indicate that vegetative growth parameters strongly influence ornamental quality in *Lilium* 'Golden Matrix'.

Table 1.

Descriptive statistical analysis results for *Lilium* "Golden Matrix" plant parameters

Statistical parameter	Ph	Sh	Ln	Fn	Fh	Fd
N	15	15	15	15	15	15
Min	27.00	20.00	35.00	2.00	5.00	9.00
Max	35.00	29.00	53.00	3.00	11.00	14.00
Sum	476.20	366.70	674.00	38.00	109.50	167.50
Mean	31.75	24.45	44.93	2.53	7.30	11.17
Std. error	0.65	0.62	1.44	0.13	0.46	0.41
Variance	6.27	5.81	31.07	0.27	3.24	2.56
Stand. dev	2.50	2.41	5.57	0.52	1.80	1.60
Median	32.00	24.20	46.00	3.00	7.00	12.00
25 prcnil	30.20	22.00	41.00	2.00	6.00	9.00
75 prcnil	34.00	26.50	49.00	3.00	8.50	12.00
Skewness	-0.43	0.03	-0.36	-0.15	0.58	-0.20
Kurtosis	-0.77	-0.37	-0.78	-2.31	-0.36	-0.94
Geom. mean	31.65	24.34	44.60	2.48	7.10	11.06
Coeff. var	7.89	9.86	12.40	20.38	24.67	14.33

Table 2.

ANOVA Test results

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	24662.36	6	4110.394	584.664	2.28E-74	2.1925
Within Groups	688.97	98	7.030			
Total	25351.34	104				

Conclusions

Vegetative parameters significantly influenced floral quality in *Lilium* 'Golden Matrix'. Flower number and flower height showed moderate variability, while the other traits presented low variability. Regression models revealed both convergent and divergent relationships between plant growth and floral characteristics, highlighting the importance of vegetative development for ornamental quality.



Lilium bulbs



Lilium plant



Lilium Plant in bloom

Figure 1. Aspects of the experiment phases

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