

Prevalence of Different Morphogenetic Traits and their association with gender among the students in Faculty of Arts and Science Ghemines

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Abstract:

Physical traits are observable characteristics determined by specific segments of DNA called genes. The objectives of this study are to determine prevalence of some selected morphogenetic traits among the students of Faculty of Arts and Science and check the association of the each specific morphogenetic trait with the gender. This study was conducted from February to Jun 2023. The methodology used in this study was combination of descriptive , interviews and observations of the individuals .A total of 100 students are observed for 24 different morphogenetic traits such as body hair, bent pinkie, blood pressure rate, cleft in chin ,crossing of thumbs, dimples, earlobes, eyelash length, freckles, hairline, hair color, handedness, hitchhiker's thumbs, lips width, mid-digital hair, mongolian eye fold ,nose shape, nose width, toe length, tone hearing , tongue rolling (side edges up) , webbed fingers ,pigmented iris and polydactyly. The prevalence and inheritance patterns of the different morphogenetic varied among male and female students in Faculty of Arts and Science. These differences arise due to genetic and environmental factors. Chi-square test and Fisher's Exact Test show association of gender with some of the traits on the other hand no association of gender with general of the traits.

Keywords: Prevalence, Phenotype, Morphogenetic Traits, Dominant traits, Recessive traits.

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الملخص:

السمات الجسدية هي خصائص يمكن مشاهدتها تحددها أجزاء معينة من الحمض النووي تسمى الجينات. تهدف هذه الدراسة إلى تحديد مدى انتشار بعض الصفات المورفولوجية المختارة بين طلاب وطالبات كلية الآداب والعلوم والتحقق من ما إذا كان هناك ارتباط بين الصفات المدروسة والجنس (الذكور والإناث) أجريت هذه الدراسة في الفترة الممتدة من شهر فبراير إلى شهر يونيو 2023. وكانت المنهجية المستخدمة في هذه الدراسة عبارة عن مزيج من الوصف والمقابلات وملاحظات الأفراد. وقد تمت ملاحظة ما مجموعه 100 طالب (50 ذكور و50 إناث) لـ 24 سمة شكلية مختلفة مثل الشعر الجسمي والخنصر المنحني ومعدل ضغط الدم والشق في الذقن وتقاطع الإبهام والغمازات وشحمة الأذن وطول الرموش والنمش وخط الشعر ولون الشعر واستخدام اليد والإبهام المتحرك وعرض الشفاه وشعر منتصف الأصابع وطية العين المنغولية وشكل الأنف وعرض الأنف، وطول إصبع القدم وسماع النغمات والقدرة على ثني اللسان (الحواف الجانبية لأعلى) والتصاق أو ارتفاق الأصابع والقزحية المصبوغة وزيادة الأصابع. تبينت أنماط انتشار ووراثة الصفات المختلفة بين طلاب وطالبات كلية الآداب والعلوم، وتتسأ هذه الاختلافات نتيجة العوامل وراثية وبيئية. يبين اختبار مربع كاي واختبار فيشر الدقيق ارتباط الجنس ببعض السمات، ومن ناحية أخرى لا يوجد ارتباط بين الجنس وعموم السمات.

الكلمات المفتاحية: الانتشار، النمط الظاهري، الصفات المورفولوجية، الصفات السائدة، الصفات المتنحية

1.Introduction

Morphogenetic traits are physical traits of an individual and the pattern of inheritance of these traits is autosomal dominant as well as autosomal recessive (3). Human population provides and exclusive opportunity to study the morphogenetic variation among the endogamous population living in different geographical and ecological circumstances (9, 4, 8). Morphogenetic traits are observable

genetically inherited traits that can be transmitted from parents to offspring (1). Genetics factors and/or environment factors bring about genetic variations within individuals of the same species; like the Homosapiens in association with migration, assortment, genetic drift and gene flow (6). Human genetics deals with the study of inheritance as it occurs in human populations and their relevance in understanding human

diversity cannot be diminished (7).The continuous researches in the field of human genetics have made great socio-economic contribution to human welfare (7). Morphometric traits are of immense benefits to evolutionary biologist, anthropologist, human geneticist, clinicians, blood transfusion services and policy makers (5)

1.1. Aims of the study

To determine prevalence of some selected morphogenetic traits among the students of Faculty of Arts and Science. Check the association of the each specific morphogenetic trait with the gender.

2.Material and Methods

The students of Faculty of Arts and Science – Ghemines were the target of this research. This study was conducted from February to Jun 2023.The survey method was chosen include the individuals sex, and morphogenetic traits, whether it is a dominant or recessive based on the phenotypic expression. A total of 100 students are observed for 24 different morphogenetic traits such as body hair, bent pinkie, blood pressure rate, cleft in chin ,crossing of thumbs, dimples, earlobes, eyelash length, freckles, hairline, hair color,

handedness, hitchhiker's thumbs, lips width, mid-digital hair, Mongolian eye fold ,nose shape, nose width, toe length, tone hearing ,tongue rolling (side edges up) , webbed fingers, pigmented iris and polydactyl.

2.1.Statistical analysis

The coded data was analyzed using Statistical Package for Social Sciences (SPSS) version 25. Data were compared using simple percentages, the statistical analysis chi square and fisher exact test were used in this research to check the association of the each specific trait with the gender statistical significant was set at 5%.

3.Result and discussion

Phenotype is the external appearance of an individual for any trait, the distribution of inheritance pattern amongst students (males and females) in Faculty of Arts and Science were body hair, dominant 17(17%) while recessive 83(83%) ,bent pinkie, dominant 10 (10%) while recessive 90 (90%) , blood pressure rate, dominant 7(7%) while recessive 93(93%) ,cleft in chin , dominant 13(13%) while recessive 87 (87%),crossing of thumbs, dominant 22(22%)while recessive 78(78%), dimples,dominant 16(16%) while recessive 84(84%)earlobes,dominant 65(65%) while

recessive35(35%) eyelash length, dominant 6(6%) while recessive94(94%), freckles, dominant3(3%) while recessive 97(97%) hairline, dominant 12(12%) while recessive 88(88%) hair color, dominant 8(8%) while recessive 92(92%) handedness, dominant 87(87%) while recessive13(13%) hitchhiker's thumbs, dominant15(15%) while recessive 85(85%)lips width, dominant 70(70%) while recessive 30(30%) mid-digital hair, dominant6(6%) while recessive94(94%) mongolian eye fold, dominant 4(4%) while recessive94(94%) ,nose shape, dominant 14(14%) while recessive 86(86%), nose width dominant13(13%) while recessive 87(87%), toe length, dominant46 (46%) while recessive 54 (54%) tone hearing ,dominant 6(6%) while recessive 94(94%) tongue rolling (side edges up) dominant 15(15%) while recessive85 (85%) webbed fingers, dominant 0(0%) while recessive100(100%)pigmented iris dominant 6(6%) while recessive94(94%) and polydactyly dominant 0(0%) while recessive 100(100%) (Table1 and Table 2). Among population study the distribution of body hair abundant were 17% less than little 83%.The distribution of bent pinkie revealed

that able to bend were 10 % less than not able to bend 90%. The distribution of blood pressure rate revealed that high were 7% less than low 93%.The distribution of cleft chin revealed present were 13% less than absent 87 %.The distribution of crossing of thumbs revealed left thumb over right thumb were 22% less than right thumb over left thumb 78 %. The distribution of dimples, revealed present were 16% less than absent 84 %. free earlobes were 65% more than attached earlobes 35%. The distribution of eyelash length long eyelash were 6 % less than short eyelash 94 %.The distribution of freckles revealed present are 3% less than absent 97 %.The distribution of hairline revealed that widow's peak were 12 % less than straight % 88 .The distribution of hair color revealed that white hair streak were 8 % less than normal hair color 92 % .The distribution of handedness in this study revealed that right handedness are 87% more predominant than left handedness 13 % .The distribution of hitchhiker's thumbs in this study revealed that present were 15% less than absent 85 %.The distribution of lips width revealed that broad lips were 70% more predominant than Thin lips 30 % .The distribution of mid-digital hair revealed

that presence were 6% less than absence % 94. The distribution of mongolian eye fold revealed that presence were 4 % less than absence 96% . The distribution of nose shape revealed that roman nose (bump) were 14 % less than straight 86%. The distribution of nose width revealed that broad nose were 13 % less than narrow nose 87%. The distribution of toe length revealed that second toe longer than first toe were 46 % less than first toe longer than second toe 54 %. The distribution of tone hearing revealed that tone deafness were 6 % less

than normal hearing 94%. The distribution of tongue rolling (side edges up) revealed that ability to roll tongue were 15 % less than inability to roll tongue 85%. The distribution of webbed fingers revealed that presence were 0 % less than absence 100 %. The distribution of pigmented iris revealed that presence were 6 % less than absence 94 %. The distribution of polydactyly revealed that presence were 0% less than absence 100 % (Table 2 and Figure 1).

Table 1. Prevalence of some selected morphogenetic traits among male and female students in Faculty of Arts and Science

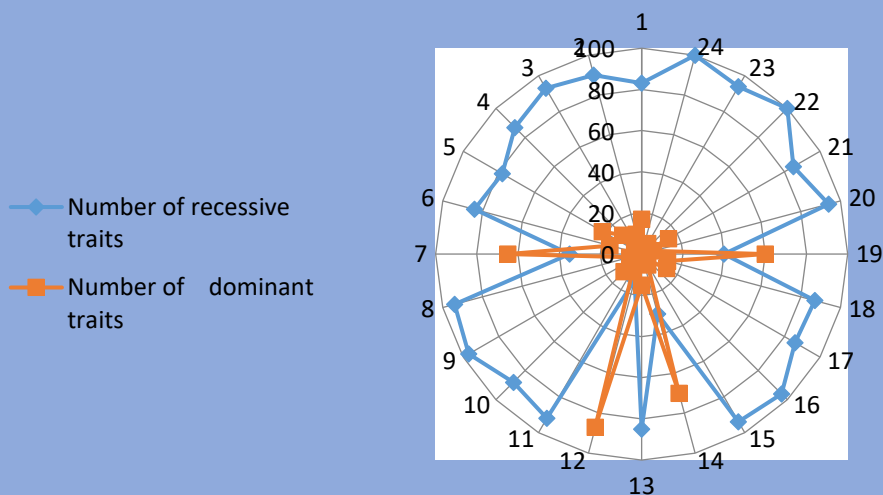
Trait	Number of male dominant	Number of male recessive	% df dominant males	% of recessive males	Number of female dominant	Number of female recessive	% of dominant female	Of recessive female
Body hair	8	42	16	84	9	41	18	82
Bent pinkie	6	44	12	88	4	46	8	92
Blood pressure rate	6	44	12	88	1	49	2	98
Cleft in chin	8	42	16	84	5	45	10	90
Crossing of thumbs	13	37	26	74	9	41	18	82
Dimples	5	45	10	90	11	39	22	78
Earlobes	27	23	54	46	38	12	76	24
Eyesh length	3	47	6	94	3	47	6	94
Freckles	1	49	2	98	2	48	4	96
Hairline	4	46	8	92	8	42	16	84
Hair colour	6	44	12	88	2	48	4	96
Handedness	43	7	86	14	44	6	88	12

Hitchhiker thumbs	11	39	22	78	4	46	8	92
Lips width	33	17	66	34	37	13	74	26
Mid digital hair	6	44	12	88	0	50	0	100
Mongolian eye fold	3	47	6	94	1	49	2	98
Nose shape	5	45	10	90	9	41	18	82
Nose width	7	43	14	86	6	44	12	88
Toe length	19	31	38	62	27	23	54	46
Tone hearing	3	47	6	94	3	47	6	94
Tongue rolling	10	40	20	80	5	45	10	90
Webber fingers	0	50	0	100	0	50	0	100
Pigmented iris	3	47	6	94	3	47	6	94
Polydactyly	0	50	0	100	0	50	0	100

Table 2 . Number of total dominant traits and recessive traits among male and female students in Faculty of Arts and Science.

Trait	Number of dominant traits	Number of recessive traits
Body hair	17	83
Bent pinkie	10	90
Blood pressure rate	7	93
Cleft in chin	13	87
Crossing of thumbs	22	78
Dimples	16	84
Earlobes	65	35
Eyelash length	6	94
Freckles	3	97
Hairline	12	88
Hair colour	8	92
Handedness	87	13
Hitchhiker thumbs	15	85
Lips width	70	30
Mid digital hair	6	94
Mongolian eye fold	4	96

Nose shape	14	86
Nose width	13	87
Toe length	60	40
Tone hearing	6	94
Tongue rolling	15	85
Webber fingers	0	100
Pigmented iris	6	94
Polydactyl	0	100



From 1 to 24 are traits

Figure (1) Number of total dominant traits and recessive traits among male and female students in Faculty of Arts and Science.

Table 3. Chi square test on relationship between gender and morphogenetic traits in Faculty of Arts and Science

Asymp. Sig (2-sided)	χ^2 Value	Degree Freedom	Total Percentage1 00 (%)	Inheritance pattern in individual	Morphogenetic Traits
0.790	0.071	1	17(17%) 83(83%)	Dominant Recessive	Body hair Abundant Little
0.505	0.444	1	10(10%) 90(90%)	Dominant Recessive	Bent pinkie Able to bend Not able to bend
0.148	2.095	1	13(13%) 87(87%)	Dominant Recessive	Cleft in chin Presence Absence
0.334	0.932	1	22(22%) 78(78%)	Dominant Recessive	Crossing of thumbs Left thumb over right thumb.Right thumb over left thumb.
0.102	2.679	1	16(16%) 84(84%)	Dominant Recessive	Dimples Presence Absence
0.021	5.319	1	65(65%) 35(35%)	Dominant Recessive	Earlobes Definite free earlobes Attached earlobes
0.218	1.515	1	12(12%) 88(88%)	Dominant Recessive	Hairline Widow's peak Straight
0.766	0.88	1	87(87%) 13(13%)	Dominant Recessive	Handedness Right handedness. Left handedness.
0.01 0	6.625	1	15(15%) 85(85%)	Dominant Recessive	Hitchhiker's thumbs.Presence Absence
0.000	16.103	1	70(70%) 30(30%)	Dominant Recessive	Lips width Broad lips Thin lips
0.249	1.329	1	14(14%) 86(86%)	Dominant Recessive	Nose shape Roman nose (bump).Straight.
0.766	0.088	1	13(13%) 87(87%)	Dominant Recessive	Nose width Broad nose. Narrow nose.
0.108	2.576	1	46(46%) 54(54%)	Dominant Recessive	Toe length Second toe longer than first toe. First toe longer than second toe.
0.161	1.961	1	15(15%) 85 (85%)	Dominant Recessive	Tongue rolling (side edges up). Ability to roll tongue. Inability to roll tongue.

No statistic	No statistic	1	0(0%) 100(100%)	Dominant Recessive	Webbed fingers. PresenceAbsence
No statistic	No statistic	1	0(0%) 100(100%)	Dominant Recessive	Polydactyl Presence Absence
Asymp. Sig. (2-sided)	χ^2 Value	Degree Freedom	Total Percentage1 00 (%)	Inheritance pattern in individual	Morphogenetic Traits

Table 4. Fisher's Exact Test on relationship between gender and morphogenetic traits in Faculty of Arts and Science

Exact Sig. (1-sided)	Degree Freedom	Total Percentage 100 (%)	Inheritance pattern in individual	Morphogenetic Traits
0.056	1	7(7%) 93(93%)	Dominant Recessive	Blood pressure rate High Low
0.661	1	6(6%) 94(94%)	Dominant Recessive	Eyelash length Long eyelash Short eyelash
0.500	1	3(3%) 97(97%)	Dominant Recessive	Freckles. Presence Absence
0.134	1	8(8%) 92(92%)	Dominant Recessive	8-Hair color. White hair streak. Normal hair color.
0.013	1	6(6%) 94(94%)	Dominant Recessive	Mid-digital hair Presence Absence
0.309	1	4(4%) 96(96%)	Dominant Recessive	Mongolian eye fold. Presence Absence
0.661	1	6(6%) 94(94%)	Dominant Recessive	Tone hearing Tone deafness. Normal hearing.

The statistical analysis chi square and fisher's exact test were used in this research to check the association of the each specific trait with the gender and it was found that p-value was greater for following traits: body hair, bent pinkie, blood pressure rate, cleft in chin ,crossing of thumbs, dimples, eyelash length, freckles, hairline, hair color, handedness, mongolian eye fold ,nose shape, nose width, toe length, tone hearing , tongue rolling (side edges up) and pigmented iris which shows that there is no enough evidence to conclude any association between the gender and these traits (Table 3 and Table4) this result agree with another study done by (11) which found that there was no significant gender difference in the expression of dominant or recessive characters with most of the traits showing the same pattern of expression in either sex , while the p-value was less for, earlobes, hitchhiker's thumbs lips width and mid-digital hair which shows that there is evidence to conclude association between the gender and these traits (Table 3 and Table 4) , another studies done by (2 , 10) which show that there is some of the traits were significantly associated with gender.

4.Conclusion

The present prevalence revealed that two individuals are not the same, these differences arise due to genetic and environmental factors. Morphogenetic traits are of great important to many areas such as forensic pathology, anthropology and other related disciplines.

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