

Deviations from 1:1 and numbers of progeny necessary for establishing linkage

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Abstract

We have found the following table useful when assigning new genes to linkage groups, either with Parental:Recombinant random isolates or with Parental ditype:Nonparental ditype tetrads. The ratios for total numbers through 50 are from Perkins, D.D. 1953 *Genetics* 38:187-197, and were extracted from tables in Warwick, B.L. *Texas Agric. Exper. Sta. Bull.* 463:1-28. The ratios for total numbers from 51-100 were obtained using binomial probability paper (Mosteller, F., and J.W. Tukey. *J. Amer. Stat. Assoc.* 44:174-212).

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Smallest numerical ratios showing significant deviation in one direction from 1 : 1

| Total numbers | 5% | Ratios | |
|---------------|-------|--------|-------|
| | | 2.5% | 1% |
| 5 | 5:0 | | |
| 6 | 6:0 | 6:0 | |
| 7 | 7:0 | 7:0 | 7:0 |
| 8 | 7:1 | 8:0 | 8:0 |
| 9 | 8:1 | 8:1 | 9:0 |
| 10 | 9:1 | 9:1 | 10:0 |
| 11 | 9:2 | 10:1 | 10:1 |
| 12 | 10:2 | 10:2 | 11:1 |
| 13 | 10:3 | 11:2 | 12:1 |
| 14 | 11:3 | 12:2 | 12:2 |
| 15 | 12:3 | 12:3 | 13:2 |
| 16 | 12:4 | 13:3 | 14:2 |
| 17 | 13:4 | 13:4 | 14:3 |
| 18 | 13:5 | 14:4 | 15:3 |
| 19 | 14:5 | 15:4 | 15:4 |
| 20 | 15:5 | 15:5 | 16:4 |
| 21 | 15:6 | 16:5 | 17:4 |
| 22 | 16:6 | 17:5 | 17:1 |
| 23 | 16:7 | 17:6 | 18:5 |
| 24 | 17:7 | 18:6 | 19:5 |
| 25 | 18:7 | 18:7 | 19:1 |
| Total numbers | 5% | Ratios | |
| | | 2.5% | 1% |
| 26 | 18:8 | 19:7 | 20:6 |
| 27 | 19:8 | 20:7 | 20:7 |
| 28 | 19:9 | 20:8 | 21:7 |
| 29 | 20:9 | 21:8 | 22:7 |
| 30 | 20:10 | 21:9 | 22:1 |
| 31 | 21:10 | 22:9 | 23:8 |
| 32 | 22:10 | 22:10 | 23:9 |
| 33 | 22:11 | 23:10 | 24:9 |
| 34 | 23:11 | 24:10 | 25:9 |
| 35 | 23:12 | 24:11 | 25:10 |
| 36 | 24:12 | 25:11 | 26:10 |
| 37 | 24:13 | 25:12 | 26:11 |

| | | | |
|----|-------|-------|-------|
| 38 | 25:13 | 26:12 | 27:11 |
| 39 | 26:13 | 27:12 | 28:11 |
| 40 | 26:14 | 27:13 | 28:12 |
| 41 | 27:14 | 28:13 | 29:12 |
| 42 | 27:15 | 28:14 | 29:13 |
| 43 | 28:15 | 29:14 | 30:13 |
| 44 | 28:16 | 29:15 | 31:13 |
| 45 | 29:16 | 30:15 | 31:14 |

| Total | Ratios | | |
|---------|--------|-------|-------|
| numbers | 5% | 2.5% | 1% |
| 46 | 30:16 | 31:15 | 32:14 |
| 47 | 30:17 | 31:16 | 32:15 |
| 48 | 31:17 | 32:16 | 33:15 |
| 49 | 31:18 | 32:17 | 34:15 |
| 50 | 32:18 | 33:17 | 34:16 |
| 51 | 33:18 | | |
| 52 | 33:19 | | |
| 53 | 34:19 | | |
| 54 | 34:20 | | |
| 55 | 35:20 | | |
| 56 | 35:21 | | |
| 57 | 36:21 | | |
| 58 | 36:22 | | |
| 59 | 37:22 | | |
| 60 | 38:22 | | |
| 61 | 39:22 | | |
| 62 | 39:23 | | |
| 63 | 39:24 | | |
| 64 | 40:24 | | |

| Total | Ratios |
|---------|--------|
| numbers | 5% |
| 65 | 40:25 |
| 66 | 41:25 |
| 67 | 41:26 |
| 68 | 42:26 |
| 69 | 43:26 |
| 70 | 43:27 |
| 71 | 44:27 |
| 72 | 44:28 |
| 73 | 45:28 |
| 74 | 45:29 |
| 75 | 46:29 |
| 76 | 46:30 |
| 77 | 47:30 |
| 78 | 47:31 |
| 79 | 48:31 |
| 80 | 49:31 |
| 81 | 49:32 |
| 82 | 50:32 |
| 83 | 50:33 |
| 84 | 51:33 |
| 85 | 51:34 |
| 86 | 52:34 |
| 87 | 52:35 |
| 88 | 53:35 |
| 89 | 54:35 |
| 90 | 54:61 |

| | |
|-----|-------|
| 91 | 55:61 |
| 92 | 55:37 |
| 93 | 56:37 |
| 94 | 56:38 |
| 95 | 57:38 |
| 96 | 57:39 |
| 97 | 58:39 |
| 98 | 58:40 |
| 99 | 59:40 |
| 100 | 59:41 |

Numerical ratios are those attaining the one-sided significance level shown in percent.