# GENETIC STUDIES ON ECTOPIA LENTIS*

## II. ANTHROPOMETRIC AND LINKAGE DATA

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A kindred exhibiting dominant hereditary ectopia lentis has been reported by the authors in another publication (Falls & Cotterman, 1943), which describes the ocular findings on 157 members of the group. In the present paper, data are presented on several additional hereditary characters which were investigated in the same group of families. This series includes the *ABO* blood group, the *MN* blood type, the *Rh* agglutinogen of Landsteiner & Wiener (1940), the 'secretor' factor of Schiff & Sasaki (1932), taste reaction to phenyl-thiocarbamide, eye colour, and red-green colour-blindness. Ectopia of the lens has been frequently observed in association with arachnodactyly and other skeletal abnormalities (Marfan's syndrome). Although no striking evidence of this syndrome was observed in this kindred, a series of anthropometric measurements were secured with the view of studying a possible association of this kind. These records are also presented.

As is true of many other 'dominant' abnormalities, there is considerable variability in the degree of defect demonstrated by the affected individuals. Indeed, two women who must be regarded as carriers of the gene show no observable defect of the lenses at their present ages of 41 and 50 years. Owing to this occasional difficulty in diagnosis, the search for linkage with other more readily detectable genes is of practical importance. It is also hoped that the data will be of value to those interested in the mathematical analysis of human pedigrees. Since the kindred was selected for study because of the ocular defect alone, the records on other factors should provide unbiased estimates of the gene frequencies. However, as Fisher (1940) has shown, a sample of relatives supplies less information concerning gene ratios than a sample of unrelated individuals, and the problems of estimation are intricate. Thus, while 154 persons were tested for the agglutinogens *M* and *N* in the present kindred, an inspection of the pedigree will show that the number of independent genes sampled cannot exceed 88, or the equivalent of 44 unrelated individuals. On the other hand, the interrelationship of all families in the present data would be expected to enhance their value for the evaluation of linkage and other genetic ratios. A full utilization of the record, however, should require modification of the statistical methods now available for human data, since these have been primarily designed for collections of unrelated families.

It will be convenient first to describe the pedigree chart and the method used for designating individuals. This chart (Fig. 1) differs from the conventional diagram in having the children of each union arranged in vertical columns by order of birth. Each sibship is numbered, 1–58, and a particular individual may be specified by his sibship number and position of birth. Thus, 22–6 is the sixth, and youngest, member of sibship 22 and the daughter of 9–4. Stillbirths and miscarriages, as well as unexamined individuals, are all counted in constructing the individual's number.

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The propositi for our pedigree are the affected sister and brother, 32–3 and 32–4, who were both diagnosed as having 'congenital dislocation of the lenses' when examined in 1935 at the University of Michigan Hospital. A preliminary visit to their home established a dominant pattern of inheritance, with the abnormality tracing to the great-great-grandfather 1–1. This man resided in Germany and, according to his grandson (7–2), became blind during the fifth decade of life following a sudden attack of ocular pain. The authors interpret this as a probable instance of subluxation of the lenses into the anterior chamber, since this complication has been experienced by several of the descendants. Three of the children of 1–1 (2–1, 2–2, 2–5) emigrated to America and left descendants who, with few exceptions, are now living in Lucas County, Ohio. Most of these individuals, together with their spouses, were examined by us in their homes or at the University ophthalmic clinic during the summer of 1942.

Fig. 1 shows all of the known descendants of 1–1, but the spouses are not indicated on the diagram except in three instances of double family marriage (sibships 2 and 3, 7 and 8, 18 and 20) and in one case where the wife (19–1) possessed a child by previous marriage. These spouses, not shown on the chart, will be designated by suffixing the letter *a* to the number of the appropriate descendant. Thus, 16–2*a* is the husband (not shown) of 16–2 and the father of the propositi. In the case of double marriage the second spouse is indicated by the letter *b* and the marriage line is drawn below that for the first marriage. For example, 21–6*b* is the second husband of 21–6 and the father of sibship 48. Since genealogical information was not secured from the spouses, it is impossible to state whether consanguineous matings are represented in the pedigree. Further information regarding these families may be obtained from the University of Michigan Heredity Clinic where all records on the kindred (no. 256) are on file.

The following notes are concerned with the techniques used for determining the several characteristics studied.

*Ectopia lentis.* The ocular examinations were made as complete as was practicable in the home. Mydriatic drugs were employed in some cases, and several individuals of doubtful lenticular pathology were brought to the University ophthalmic clinic for slit-lamp examination and refraction. The two eyes of an affected individual usually presented quite similar abnormalities, but the degree of defect varied considerably between individuals. The direction of the dislocation was predominantly up and out. The extent of the displacement, however, varied from conditions in which the greater portion of the pupil was aphakic to minor degrees of dislocation or mere irregularity of the lens border and zonula. Complete subluxation into the anterior chamber had occurred in some of the younger, as well as in older, individuals, and was usually responsible for blindness in the absence of prompt surgical intervention. Iridodonesis, strabismus, lenticular myopia, cataract and glaucoma were common sequelae of the lenticular dislocation. Associated anomalies of the lids, lashes, cornea and pupil, such as have been noted in some pedigrees, were not observed. Further ophthalmological details are presented in a separate article (Falls & Cotterman, 1943). Individuals indicated in Fig. 1 as heterozygous for the abnormal gene are of three kinds: cases which were diagnosed on examination, cases which are regarded as 'probably affected' on the basis of information furnished by relatives and physicians, and cases presenting no pathology of the lenses but possessing affected children and grandchildren. Two women, 9–6 and 18–1, who received very thorough study, are placed in the last category.

*ABO and MN blood tests.* Small quantities of blood were obtained by finger puncture and preserved as saline suspensions. A refrigerated thermos jug was used in transporting the samples

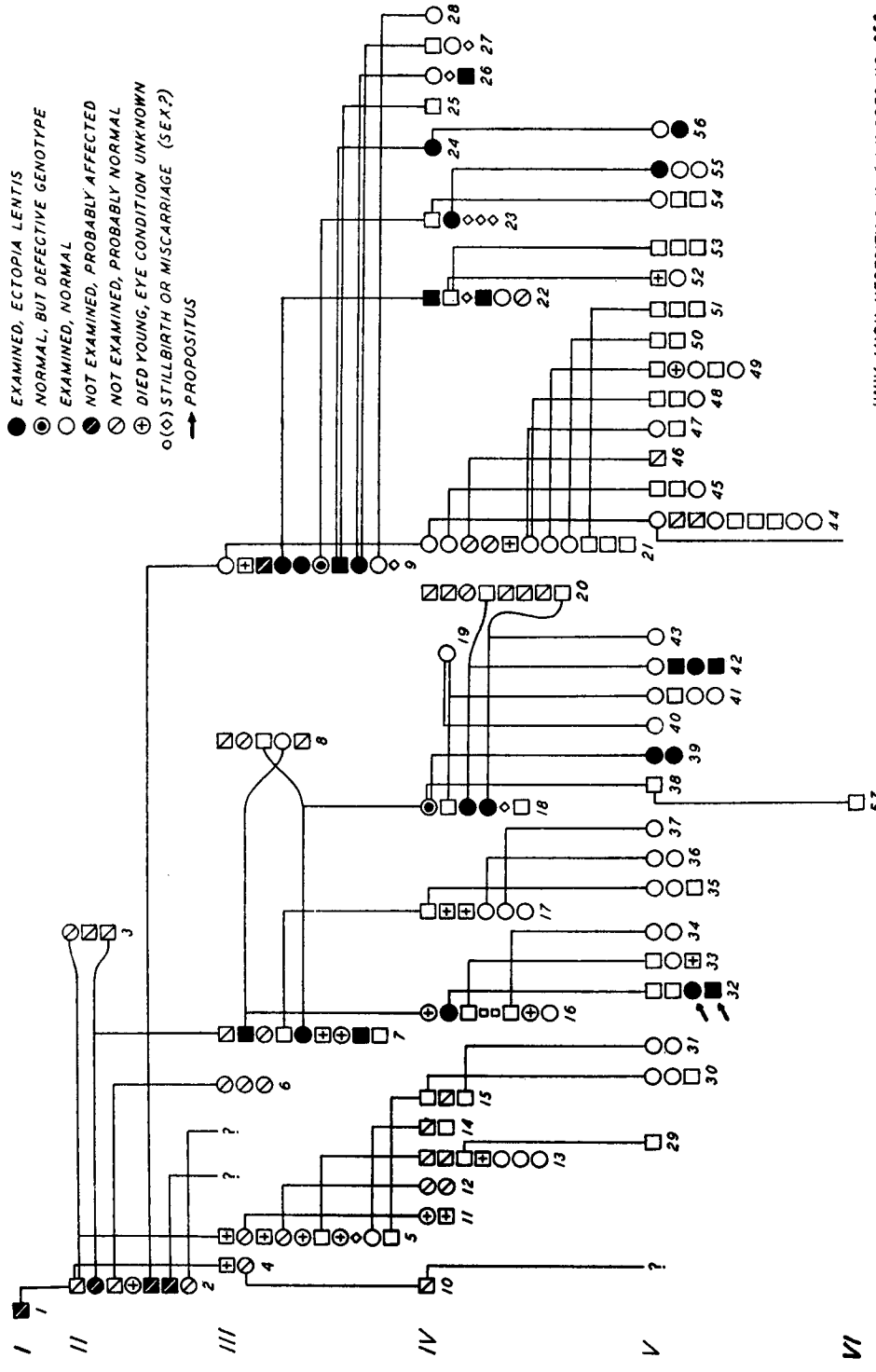


Fig. 1. Pedigree of kindred exhibiting ectopia lentis.

to the laboratory where they were tested within 48 hr. after collection. The tests for the presence of agglutinogens $A_1$, $A_2$, $B$, $M$ and $N$ were made with 2 % cell suspensions, using standard testing sera of high titres. Control bloods of the various *ABO*, *MN* and *Rh* classifications were employed in each series of tests.

*Rh agglutinogen.* A single human anti-*Rh* serum was employed for all but a few of the *Rh* determinations. This serum was obtained from a *Rh*-negative patient who had survived a transfusion reaction with *Rh*-positive blood. Since the patient belonged to group *A*, the serum was first diluted with the saliva of a group *B* secretor in order to neutralize the isoagglutinin $\beta$. A single drop of the diluted serum was then mixed with a drop of 2 % cell suspension and incubated for 2 hr. at 37° C. Sedimentation and agglutination readings were made at 1 and at 2 hr., following the techniques recommended by Wiener (1943). For the remainder of the *Rh* tests an anti-rhesus guinea-pig serum, absorbed with human cells of groups *A* and *B*, was employed.

The authors are indebted to Dr Alexander S. Wiener for his donation of these anti-*Rh* reagents. According to Dr Wiener, the human anti-*Rh* serum contains two distinct agglutinins, anti-$Rh_1$ and anti-$Rh_2$, which can be separated by elective absorption (cf. Wiener, 1943, p. 252). When used unabsorbed, the serum gave about 13 % negative reactions in Dr Wiener's studies, as compared with 17·5 % (27/154) in our kindred. The mode of inheritance of the *Rh*-positive property appears to be dominant, as in the families studied by Wiener and others (cf. Wiener, 1943, p. 249).

*Secretor test.* It was first shown by Lehrs (1930) and Putkonen (1930) that the salivas of certain individuals of groups *A*, *B* and *AB* contain the corresponding antigens in concentrations much higher than the red blood cells, while the salivas of other individuals of these same groups are nearly devoid of such substances. Schiff & Sasaki (1932) designated the two types of individual as 'secretors' and 'non-secretors', respectively. These authors further showed that the difference extends to group *O* individuals and is determined by a single dominant gene for secretion. Approximately 5 ml. samples of saliva were collected for the tests on the present kindred. In the case of infants, smaller quantities were obtained by swabbing the mouth with pieces of absorbent cotton. After collection, the tubes were promptly placed in boiling water for 10 min. to destroy the antigen-splitting enzyme present in the fresh saliva. The tubes were refrigerated during transport and centrifuged before testing in order to remove the sediment.

Each sample was tested for the presence of the three antigens *A*, *B* and *O* by means of the 'inhibition method'. Table 1 illustrates the test on a single family containing secretors and non-secretors of various blood groups. For each antigen present in the blood cells of the individual, quantitative tests were performed in six tubes, using single drops of saliva in serial four-fold dilution. For antigens not present in the blood, only two tubes (saliva 1 : 1 and 1 : 4) were used, these serving as controls. Omission of four tubes is indicated by 'o' in Table 1. Single drops of serum, adjusted to a titre of approximately 8, were then added to each series of tubes. After standing for 30 min. at room temperature, test cells of the appropriate group were added. The agglutination, which was observed after 2 hr., is recorded in the table in four grades ($\pm$, +, + +, + + +). In the presence of a group-specific substance in the saliva, the corresponding agglutinin of the serum is wholly or partially absorbed, thereby inhibiting the agglutination of the test cells.

The anti-*O* reagent which was used for the classification of group *O* salivas was prepared according to the method of Witebsky & Klendshoj (1941). A selected beef serum, having an initial titre of 256 against cells of group *O* and a titre of 64 against cells of groups $A_1$, *B* and $A_1B$, was absorbed three times with 1/100 portions of washed, packed cells of group $A_1B$. This preparation

was used in a dilution of 1 : 16, which strongly agglutinated group *O* but failed to agglutinate group *A*, *B* or $A_1B$ bloods. As is illustrated by Table 1, our tests have regularly confirmed the observation of Witebsky & Klendshoj that secretors of groups *A*, *B* and *AB* also secrete an *O* substance, although usually in concentrations smaller than those of group *O* secretors. The distribution of non-secretors in the pedigree appears to agree with the hypothesis of recessive inheritance, although the proportion of non-secretors (28/156 or 17·9 %) is small in comparison with the average value (27·2 %) found by several other investigators (cf. Wiener, 1943, p. 278). In making such comparisons, however, it must be remembered that our sample is worth only about 44 unrelated cases.

Table 1. *Tests for the salivary antigens A, B and O in several members of a family*

| Saliva of | Saliva dilution | | | | | | Blood group | Saliva reaction |
|---|---|---|---|---|---|---|---|---|
| | $4^0$ | $4^{-1}$ | $4^{-2}$ | $4^{-3}$ | $4^{-4}$ | $4^{-5}$ | | |
| | *B* serum + saliva + *A* cells | | | | | | | |
| 7–5 | − | − | − | − | ± | + | $A_1B$ | Secretor |
| 8–3 | + + + | + + + | o | o | o | o | *O* | Non-secretor |
| 18–1 | + + | + + | o | o | o | o | *B* | Secretor |
| 18–2 | − | − | − | − | ± | + | $A_1$ | Secretor |
| 18–3 | + + + | + + + | o | o | o | o | *B* | Non-secretor |
| 18–4 | + + + | + + + | o | o | o | o | *B* | Secretor |
| 18–5 | + + | + + + | + + + | + + + | + + + | + + + | $A_1$ | Non-secretor |
| 7–8 | + + | + + | o | o | o | o | *O* | Secretor |
| | *A* serum + saliva + *B* cells | | | | | | | |
| 7–5 | ± | + | + + | + + | + + | + + + | $A_1B$ | Secretor |
| 8–3 | + + + | + + + | o | o | o | o | *O* | Non-secretor |
| 18–1 | − | − | − | ± | + | + + | *B* | Secretor |
| 18–2 | + + + | + + + | o | o | o | o | $A_1$ | Secretor |
| 18–3 | + + + | + + + | + + + | + + + | + + + | + + + | *B* | Non-secretor |
| 18–4 | − | − | − | − | − | ± | *B* | Secretor |
| 18–5 | + + + | + + + | o | o | o | o | $A_1$ | Non-secretor |
| 7–8 | + + + | + + + | o | o | o | o | *O* | Secretor |
| | Anti-*O* serum + saliva + *O* cells | | | | | | | |
| 7–5 | − | ± | + | + + | + + | + + | $A_1B$ | Secretor |
| 8–3 | + + | + + + | + + + | + + + | + + + | + + + | *O* | Non-secretor |
| 18–1 | − | ± | + | + | + + | + + | *B* | Secretor |
| 18–2 | − | − | ± | + | + + | + + | $A_1$ | Secretor |
| 18–3 | + + + | + + + | + + + | + + + | + + + | + + + | *B* | Non-secretor |
| 18–4 | − | + | + + | + + | + + | + + | *B* | Secretor |
| 18–5 | + + + | + + + | + + + | + + + | + + + | + + + | $A_1$ | Non-secretor |
| 7–8 | − | − | − | ± | + | + + | *O* | Secretor |

*Taste test.* The separation of 'tasters' and 'non-tasters' of phenyl-thiocarbamide is probably best accomplished by means of threshold determinations with serial dilutions of a saturated solution. In the present study, however, small quantities of the powdered crystals were placed upon the tongue. Tasters were asked to describe the taste and non-tasters were tested a second time in order to check the result. Unfortunately, it was usually necessary to test a family under conditions which allowed the subject to learn the reactions of his relatives. Test substances other than phenyl-thiocarbamide were not employed as controls, and a number of tests are recorded for children who are perhaps too young for reliable diagnosis. Nevertheless, the results are

regarded as sufficiently accurate to make them of value for linkage detection. One apparent contradiction (48–2) to the recessive inheritance of taste deficiency is present in the record.

*Eye colour.* Although a detailed description of iris pigmentation was generally recorded, the eye colour is tabulated here merely as three grades of increasing pigmentation. Grade 1 includes eyes with little or no brown pigment; grade 2, with an intermediate amount of pigment; and grade 3, with heavy brown pigment. These records are included with the hope that they may be of interest in linkage analysis, even though the phenotypic classification is quite arbitrary.

*Colour-blindness.* All members of the kindred, with the exception of the younger children, were tested for colour-blindness by means of the pseudo-isochromatic charts of Ishihara and Stilling. Red-green blindness of the deuteranopia type was observed in eight males and in one female. Five of the affected males, 21–10, 22–1, 45–1, 45–2 and 48–1, are related through females and have most probably derived their gene from a common ancestor (2–5 or 2–5*a*). The other affected males, 20–8, 25–1 and 33–1, are apparently of independent origin. The colour-blind woman, 9–7*b*, has a colour-blind son (25–1) and also states that her father and a maternal uncle were known to have defective colour vision. This information, which is not included in the pedigree or table of data, confirms the expectation of sex-linked inheritance. It is of further interest that 9–7*b*, although unaware of her colour-blindness, actually showed a more pronounced defect than was demonstrated by her son or by other affected males of the kindred. Almost all of the Ishihara plates were read as blanks by this woman.

Counting both genes of the affected female, five genes for deuteranopia may be considered to have been sampled in this kindred. Individual 22–1 inherited both deuteranopia and ectopia lentis from his mother. However, all other persons having ectopia lentis, including those with seriously impaired vision, were definitely normal in colour vision, and the data suggest nothing other than independent transmission of the two anomalies. No cases of yellow-blindness (tritanopia) were detected by means of the Stilling charts.

*Anthropometric measurements.* The skeletal changes most commonly accompanying ectopia lentis are those producing an elongation of the hands and feet. For the present investigation, six measurements were adopted because of their easy determination. These include (1) total stature, (2) span, (3) biacromial diameter, (4) length of left hand, measured from the flexion crease at the base of the palm to the apex of the middle finger, (5) width of the left hand, taken as the maximum contact diameter at right angles to the axis of the palm, and (6) length of the left middle finger, measured from the base of the first phalanyx to the apex of the finger. The hand measurements were made with the hand and fingers extended and resting, palm upwards, on a flat surface. The difference between measurements (2) and (3) provides a measurement of arm length.

The data are presented in Table 2. The ages at the time of examination are included chiefly for their interest in connexion with the anthropometric measurements and eye colour. Taste tests, colour-vision tests and body measurements were omitted in the case of young children. Colour vision was also indeterminate in 7–5 and 26–3 because of blindness resulting from complications of ectopia lentis. Due to lack of co-operation, blood samples were not obtained from 22–6 and 43–1, but the blood groups were reconstructed in such cases from the saliva. The testing of 44–8 is incomplete owing to the death of this child occurring before the authors' second visit to the home. It should also be mentioned that the anomalous blood group ($A_2$) of 41–3 would make it seem advisable to omit this child's record for the purpose of calculation.

Table 2. *Test factors and measurements on a kindred exhibiting ectopia lentis*

The data are arranged by sibships, with the parental records preceding each list when one or both parents have been examined. Entries preceded by an asterisk (*) are previously listed in the table and may be omitted in the tallying of frequencies. The columns of data represent: (1) individual number, corresponding to the pedigree of Fig. 1; (2) sex; (3) *E* = heterozygous for ectopia lentis; *e* = normal; (4) *ABO* blood group; (5) *S* = secretor, *s* = non-secretor; (6) *MN* blood type; (7) *Rh* = presence, *rh* = absence of agglutinogen *Rh*; (8) *T* = taster, *t* = non-taster of phenyl-thiocarbamide; (9) *C* = normal colour vision, *c* = deuteranopia; (10) grade of eye colour; (11) stature; (12) span; (13) biacromial diameter; (14) hand length; (15) hand width; (16) length of middle finger; (17) age, in months. The measurements are all in millimetres.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5–6 | ♂ | *e* | $A_1B$ | *S* | *N* | *Rh* | *T* | *C* | 1 | 1714 | 1829 | 401 | 195 | 89 | 116 | 648 |
| 5–9 | ♀ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1601 | 1643 | 347 | 173 | 75 | 104 | 603 |
| 5–10 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1778 | 1823 | 404 | 193 | 89 | 116 | 565 |
| 7–2 | ♂ | *E* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1758 | 1773 | 375 | 181 | 82 | 111 | 797 |
| 7–4 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *t* | *C* | 1 | 1597 | 1624 | 352 | 172 | 80 | 107 | 742 |
| 7–5 | ♀ | *E* | $A_1B$ | *S* | *MN* | *Rh* | *T* | — | 3 | 1530 | 1603 | 354 | 165 | 74 | 99 | 718 |
| 7–8 | ♂ | *E* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1737 | 1763 | 353 | 183 | 83 | 110 | 641 |
| 7–9 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 2 | 1517 | 1558 | 341 | 162 | 77 | 97 | 615 |
| 8–3 | ♂ | *e* | *O* | *s* | *M* | *Rh* | *T* | *C* | 1 | 1669 | 1810 | 400 | 180 | 82 | 110 | 651 |
| 8–4 | ♀ | *e* | *O* | *s* | *M* | *Rh* | *t* | *C* | 3 | 1537 | 1593 | 356 | 161 | 75 | 95 | 598 |
| 9–1 | ♀ | *e* | *O* | *S* | *N* | *Rh* | *T* | *C* | 1 | 1641 | 1675 | 356 | 181 | 79 | 112 | 744 |
| 9–4 | ♀ | *E* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 3 | 1613 | 1678 | 361 | 184 | 82 | 107 | 651 |
| 9–5 | ♀ | *E* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1677 | 1662 | 337 | 179 | 75 | 111 | 623 |
| 9–6 | ♀ | *E* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1673 | 1763 | 362 | 181 | 82 | 109 | 604 |
| 9–7 | ♂ | *E* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 1 | 1787 | 1877 | 356 | 203 | 92 | 125 | 564 |
| 9–8 | ♀ | *E* | *O* | *s* | *MN* | *Rh* | *t* | *C* | 3 | 1661 | 1672 | 362 | 175 | 82 | 107 | 530 |
| 9–9 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1632 | 1619 | 349 | 171 | 76 | 101 | 490 |
| *5–6 | ♂ | *e* | $A_1B$ | *S* | *N* | *Rh* | *T* | *C* | 1 | 1714 | 1829 | 401 | 195 | 89 | 116 | 648 |
| 5–6*a* | ♀ | *e* | $A_2$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1601 | 1643 | 347 | 173 | 75 | 104 | 579 |
| 13–3 | ♂ | *e* | $A_2B$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1775 | 1879 | 414 | 206 | 90 | 124 | 330 |
| 13–5 | ♀ | *e* | $A_2B$ | *s* | *N* | *Rh* | *t* | *C* | 1 | 1687 | 1727 | 370 | 177 | 76 | 106 | 266 |
| 13–6 | ♀ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 1 | 1628 | 1663 | 339 | 177 | 69 | 104 | 189 |
| 13–7 | ♀ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 1 | 1584 | 1601 | 344 | 163 | 72 | 98 | 146 |
| 5–9*a* | ♂ | *e* | *B* | *S* | *MN* | *rh* | *T* | *C* | 3 | 1722 | 1815 | 409 | 188 | 87 | 115 | 632 |
| *5–9 | ♀ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1601 | 1643 | 347 | 173 | 75 | 104 | 603 |
| 14–2 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1738 | 1822 | 386 | 177 | 79 | 103 | 232 |
| *5–10 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1778 | 1823 | 404 | 193 | 89 | 116 | 565 |
| 5–10*a* | ♀ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 2 | 1577 | 1549 | 368 | 159 | 72 | 103 | 570 |
| 15–1 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1711 | 1775 | 390 | 192 | 83 | 116 | 324 |
| 15–3 | ♂ | *e* | *O* | *S* | *M* | *Rh* | *t* | *C* | 2 | 1750 | 1786 | 402 | 185 | 87 | 115 | 267 |
| *7–2 | ♂ | *E* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1758 | 1773 | 375 | 181 | 82 | 111 | 797 |
| *8–4 | ♀ | *e* | *O* | *s* | *M* | *Rh* | *t* | *C* | 3 | 1537 | 1593 | 356 | 161 | 75 | 95 | 598 |
| 16–2 | ♀ | *E* | $A_1$ | *s* | *MN* | *rh* | *T* | *C* | 3 | 1627 | 1628 | 351 | 164 | 77 | 99 | 471 |
| 16–3 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *t* | *C* | 3 | 1674 | 1697 | 383 | 171 | 80 | 102 | 429 |
| 16–6 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1781 | 1839 | 391 | 185 | 82 | 112 | 498 |
| 16–8 | ♀ | *e* | *O* | *s* | *M* | *Rh* | *t* | *C* | 2 | 1595 | 1666 | 337 | 177 | 70 | 107 | 220 |
| *7–4 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *t* | *C* | 1 | 1597 | 1624 | 352 | 172 | 80 | 107 | 742 |
| 7–4*a* | ♀ | *e* | $A_1$ | *S* | *M* | *rh* | *t* | *C* | 1 | 1590 | 1585 | 322 | 166 | 75 | 103 | 678 |
| 17–1 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1718 | 1770 | 389 | 188 | 86 | 111 | 437 |
| 17–4 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1543 | 1554 | 340 | 170 | 75 | 104 | 317 |
| 17–5 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1559 | 1549 | 347 | 165 | 70 | 98 | 296 |
| 17–6 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1540 | 1573 | 347 | 167 | 69 | 100 | 260 |

Table 2 (*continued*)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *8–3 | ♂ | *e* | *O* | *s* | *M* | *Rh* | *T* | *C* | 1 | 1669 | 1810 | 400 | 180 | 82 | 110 | 651 |
| *7–5 | ♀ | *E* | $A_1B$ | *S* | *MN* | *Rh* | *T* | — | 3 | 1530 | 1603 | 354 | 165 | 74 | 99 | 718 |
| 18–1 | ♀ | *E* | *B* | *S* | *M* | *Rh* | *t* | *C* | 2 | 1499 | 1543 | 340 | 155 | 69 | 95 | 494 |
| 18–2 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1725 | 1848 | 404 | 185 | 85 | 114 | 467 |
| 18–3 | ♀ | *E* | *B* | *s* | *MN* | *rh* | *T* | *C* | 1 | 1594 | 1632 | 351 | 166 | 76 | 100 | 422 |
| 18–4 | ♀ | *E* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1660 | 1669 | 365 | 169 | 75 | 102 | 406 |
| 18–6 | ♂ | *e* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 1 | 1687 | 1838 | 412 | 177 | 85 | 107 | 362 |
| *9–1 | ♀ | *e* | *O* | *S* | *N* | *Rh* | *T* | *C* | 1 | 1641 | 1675 | 356 | 181 | 79 | 112 | 744 |
| 21–1 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1577 | 1589 | 342 | 166 | 73 | 101 | 509 |
| 21–2 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1616 | 1655 | 346 | 175 | 74 | 108 | 476 |
| 21–6 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1677 | 1712 | 322 | 179 | 73 | 110 | 391 |
| 21–7 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1687 | 1699 | 332 | 192 | 78 | 116 | 370 |
| 21–8 | ♀ | *e* | $A_1$ | *S* | *MN* | *rh* | *t* | *C* | 2 | 1631 | 1603 | 345 | 177 | 79 | 109 | 347 |
| 21–9 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1752 | 1734 | 363 | 196 | 85 | 118 | 312 |
| 21–10 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *c* | 2 | 1717 | 1712 | 368 | 191 | 85 | 115 | 294 |
| 21–11 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1626 | 1682 | 336 | 184 | 78 | 114 | 239 |
| 9–4*a* | ♂ | *e* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 1 | 1616 | 1790 | 416 | 182 | 85 | 110 | 695 |
| *9–4 | ♀ | *E* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 3 | 1613 | 1678 | 361 | 184 | 82 | 107 | 651 |
| 22–1 | ♂ | *E* | $A_1$ | *s* | *M* | *Rh* | *T* | *c* | 1 | 1747 | 1780 | 394 | 194 | 82 | 117 | 361 |
| 22–2 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1755 | 1796 | 389 | 183 | 89 | 116 | 337 |
| 22–4 | ♂ | *E* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 3 | 1813 | 1921 | 424 | 199 | 87 | 123 | 293 |
| 22–5 | ♀ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1558 | 1628 | 350 | 163 | 73 | 99 | 259 |
| 22–6 | ♀ | *e* | *A* | *S* | — | — | — | — | — | — | — | — | — | — | — | 224 |
| 9–6*a* | ♂ | *e* | $A_2B$ | *S* | *M* | *Rh* | *T* | *C* | 2 | 1731 | 1845 | 391 | 188 | 85 | 117 | 629 |
| *9–6 | ♀ | *E* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1673 | 1763 | 362 | 181 | 82 | 109 | 604 |
| 23–1 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1766 | 1820 | 376 | 170 | 88 | 116 | 350 |
| 23–2 | ♀ | *E* | $A_2$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1724 | 1718 | 357 | 187 | 76 | 114 | 331 |
| *9–7 | ♂ | *E* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 1 | 1787 | 1877 | 356 | 203 | 92 | 125 | 564 |
| 24–1 | ♀ | *E* | $A_1$ | *S* | *M* | *Rh* | *t* | *C* | 3 | 1728 | 1730 | 350 | 191 | 73 | 110 | 288 |
| *9–7 | ♂ | *E* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 1 | 1787 | 1877 | 356 | 203 | 92 | 125 | 564 |
| 9–7*b* | ♀ | *e* | *O* | *s* | *N* | *Rh* | *T* | *c* | 1 | 1548 | 1550 | 339 | 172 | 74 | 102 | 511 |
| 25–1 | ♂ | *e* | $A_1$ | *s* | *MN* | *Rh* | *T* | *c* | 1 | 1712 | 1688 | 375 | 195 | 83 | 115 | 232 |
| 9–8*a* | ♂ | *e* | *O* | *s* | *N* | *rh* | *T* | *C* | 1 | 1721 | 1750 | 404 | 191 | 84 | 115 | 563 |
| *9–8 | ♀ | *E* | *O* | *s* | *MN* | *Rh* | *t* | *C* | 3 | 1661 | 1672 | 362 | 175 | 82 | 107 | 530 |
| 26–1 | ♀ | *e* | *O* | *s* | *N* | *rh* | *T* | *C* | 1 | 1664 | 1692 | 345 | 185 | 74 | 109 | 244 |
| 26–3 | ♂ | *E* | *O* | *s* | *N* | *rh* | *t* | — | 1 | 1767 | 1798 | 381 | 192 | 86 | 117 | 233 |
| 9–8*b* | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1676 | 1738 | 384 | 181 | 84 | 114 | 606 |
| *9–8 | ♀ | *E* | *O* | *s* | *MN* | *Rh* | *t* | *C* | 3 | 1661 | 1672 | 362 | 175 | 82 | 107 | 530 |
| 27–1 | ♂ | *e* | *O* | *S* | *MN* | *rh* | *T* | *C* | 2 | 1626 | 1672 | 353 | 181 | 80 | 112 | 193 |
| 27–2 | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1235 | 1238 | 252 | 132 | 60 | 83 | 92 |
| 9–9*a* | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1757 | 1738 | 401 | 174 | 82 | 110 | 527 |
| *9–9 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1632 | 1619 | 349 | 171 | 76 | 101 | 490 |
| 28–1 | ♀ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 2 | 1138 | 1115 | 231 | 123 | 56 | 71 | 72 |
| *13–3 | ♂ | *e* | $A_2B$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1775 | 1879 | 414 | 206 | 90 | 124 | 330 |
| 13–3*a* | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1645 | 1721 | 375 | 175 | 80 | 109 | 304 |
| 29–1 | ♂ | *e* | $A_2$ | *s* | *MN* | *Rh* | — | — | 1 | — | — | — | — | — | — | 4 |

Table 2 (*continued*)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *15–1 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1711 | 1775 | 390 | 192 | 83 | 116 | 324 |
| 15–1*a* | ♀ | *e* | $A_2$ | *S* | *M* | *Rh* | *T* | *C* | 3 | 1558 | 1611 | 363 | 164 | 74 | 98 | 314 |
| 30–1 | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1211 | 1195 | 265 | 128 | 57 | 77 | 97 |
| 30–2 | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1091 | 1096 | 249 | 118 | 54 | 70 | 77 |
| 30–3 | ♂ | *e* | $A_2$ | *s* | *MN* | *Rh* | *T* | — | 3 | 838 | 844 | 214 | 100 | 44 | 60 | 26 |
| 16–2*a* | ♂ | *e* | *O* | *S* | *MN* | *rh* | *T* | *C* | 1 | 1806 | 1918 | 384 | 199 | 87 | 117 | 510 |
| *16–2 | ♀ | *E* | $A_1$ | *s* | *MN* | *rh* | *T* | *C* | 3 | 1627 | 1628 | 351 | 164 | 77 | 99 | 471 |
| 32–1 | ♂ | *e* | *O* | *S* | *MN* | *rh* | *T* | *C* | 3 | 1698 | 1791 | 385 | 169 | 77 | 104 | 253 |
| 32–2 | ♂ | *e* | *O* | *S* | *MN* | *rh* | *T* | *C* | 1 | 1815 | 1922 | 410 | 198 | 88 | 118 | 238 |
| 32–3 | ♀ | *E* | *O* | *S* | *N* | *rh* | *T* | *C* | 1 | 1638 | 1672 | 321 | 166 | 74 | 102 | 221 |
| 32–4 | ♂ | *E* | $A_1$ | *S* | *MN* | *rh* | *T* | *C* | 1 | 1635 | 1683 | 316 | 174 | 76 | 106 | 188 |
| *16–3 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *t* | *C* | 3 | 1674 | 1697 | 383 | 171 | 80 | 102 | 429 |
| 16–3*a* | ♀ | *e* | *O* | *s* | *MN* | *Rh* | *T* | *C* | 1 | 1575 | 1609 | 351 | 166 | 74 | 100 | 466 |
| 33–1 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *c* | 1 | 1643 | 1717 | 394 | 180 | 81 | 109 | 193 |
| 33–2 | ♀ | *e* | $A_1$ | *s* | *M* | *Rh* | *t* | *C* | 2 | 1435 | 1448 | 315 | 147 | 66 | 87 | 162 |
| *16–6 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1781 | 1839 | 391 | 185 | 82 | 112 | 408 |
| 16–6*a* | ♀ | *e* | *O* | *S* | *M* | *Rh* | *T* | *C* | 3 | 1718 | 1751 | 352 | 184 | 77 | 112 | 341 |
| 34–1 | ♀ | *e* | *O* | *S* | *M* | *Rh* | *t* | *C* | 1 | 1266 | 1234 | 263 | 126 | 56 | 80 | 82 |
| *17–1 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1718 | 1770 | 389 | 188 | 86 | 111 | 437 |
| 17–1*a* | ♀ | *e* | $A_2$ | *S* | *MN* | *rh* | *T* | *C* | 2 | 1640 | 1662 | 352 | 172 | 73 | 100 | 412 |
| 35–1 | ♀ | *e* | $A_2$ | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1491 | 1509 | 320 | 162 | 65 | 97 | 144 |
| 35–2 | ♀ | *e* | $A_1$ | *S* | *MN* | *rh* | *t* | *C* | 1 | 1423 | 1431 | 312 | 149 | 67 | 89 | 120 |
| 35–3 | ♂ | *e* | $A_1$ | *S* | *M* | *rh* | — | — | 2 | — | — | — | — | — | — | 16 |
| 17–4*a* | ♂ | *e* | *B* | *s* | *N* | *rh* | *T* | *C* | 2 | 1741 | 1836 | 390 | 188 | 84 | 116 | 335 |
| *17–4 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1543 | 1554 | 340 | 170 | 75 | 104 | 317 |
| 36–1 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1177 | 1197 | 251 | 130 | 57 | 78 | 87 |
| 36–2 | ♀ | *e* | $A_1B$ | *S* | *N* | *rh* | *T* | *C* | 1 | 990 | 1006 | 231 | 113 | 48 | 68 | 51 |
| 17–5*a* | ♂ | *e* | *O* | *S* | *M* | *rh* | *T* | *C* | 1 | 1772 | 1860 | 389 | 191 | 83 | 122 | 353 |
| *17–5 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1559 | 1549 | 347 | 165 | 70 | 98 | 296 |
| 37–1 | ♀ | *e* | $A_1$ | *S* | *M* | *Rh* | — | — | 1 | — | — | — | — | — | — | 6 |
| *18–1 | ♀ | *E* | *B* | *S* | *M* | *Rh* | *t* | *C* | 2 | 1499 | 1543 | 340 | 155 | 69 | 95 | 494 |
| 38–1 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1721 | 1715 | 352 | 177 | 82 | 105 | 270 |
| 18–1*b* | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1785 | 1885 | 387 | 201 | 90 | 119 | 462 |
| *18–1 | ♀ | *E* | *B* | *S* | *M* | *Rh* | *t* | *C* | 2 | 1499 | 1543 | 340 | 155 | 69 | 95 | 494 |
| 39–1 | ♀ | *E* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1622 | 1650 | 341 | 167 | 73 | 102 | 192 |
| 39–2 | ♀ | *E* | *O* | *S* | *M* | *Rh* | *T* | *C* | 2 | 1656 | 1670 | 320 | 176 | 74 | 106 | 171 |
| *18–2 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1725 | 1848 | 404 | 185 | 85 | 114 | 467 |
| 19–1 | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1525 | 1607 | 362 | 169 | 74 | 93 | 438 |
| 41–1 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1530 | 1609 | 329 | 158 | 72 | 100 | 175 |
| 41–2 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1205 | 1239 | 264 | 126 | 58 | 75 | 89 |
| 41–3 | ♀ | *e* | $A_2$ | *S* | *MN* | *Rh* | *T* | — | 3 | 942 | 950 | 213 | 104 | 46 | 61 | 36 |
| 41–4 | ♀ | *e* | *O* | *S* | *M* | *Rh* | — | — | 2 | — | — | — | — | — | — | 11 |
| *18–3 | ♀ | *E* | *B* | *s* | *MN* | *rh* | *T* | *C* | 1 | 1594 | 1632 | 351 | 166 | 76 | 100 | 422 |
| 42–1 | ♀ | *e* | *B* | *S* | *N* | *Rh* | *T* | *C* | 1 | 1526 | 1544 | 329 | 157 | 67 | 96 | 184 |
| 42–2 | ♂ | *E* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 3 | 1506 | 1550 | 320 | 159 | 74 | 98 | 162 |
| 42–3 | ♀ | *E* | *B* | *S* | *N* | *Rh* | *T* | *C* | 3 | 1139 | 1147 | 254 | 121 | 54 | 72 | 84 |
| 42–4 | ♂ | *E* | *B* | *S* | *N* | *rh* | — | — | 1 | 957 | 949 | 211 | 105 | 48 | 67 | 45 |

Table 2 (*continued*)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20–8 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *c* | 1 | 1706 | 1797 | 385 | 191 | 79 | 114 | 466 |
| *18–4 | ♀ | *E* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1660 | 1669 | 365 | 169 | 75 | 102 | 406 |
| 43–1 | ♀ | *e* | *AB* | *S* | — | — | *T* | *C* | 1 | 1375 | 1367 | 298 | 136 | 65 | 81 | 120 |
| 21–1*a* | ♂ | *e* | $A_1B$ | *S* | *N* | *rh* | *T* | *C* | 3 | 1684 | 1719 | 382 | 188 | 86 | 114 | 562 |
| *21–1 | ♀ | *e* | *A* | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1577 | 1589 | 342 | 166 | 73 | 101 | 509 |
| 44–1 | ♀ | *e* | $A_1B$ | *S* | *N* | *Rh* | *T* | *C* | 3 | 1526 | 1541 | 358 | 163 | 73 | 97 | 300 |
| 44–5 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | *C* | 3 | 1566 | 1564 | 310 | 159 | 75 | 99 | 192 |
| 44–6 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1408 | 1387 | 276 | 147 | 68 | 92 | 132 |
| 44–7 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1307 | 1297 | 264 | 137 | 61 | 86 | 107 |
| 44–8 | ♀ | *e* | — | — | — | — | — | *C* | 3 | 1090 | 1091 | 234 | 119 | 53 | 76 | 68 |
| 44–9 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | — | — | 3 | 852 | 871 | 200 | 99 | 44 | 61 | 26 |
| 21–2*a* | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1754 | 1806 | 391 | 178 | 84 | 111 | 528 |
| *21–2 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 2 | 1616 | 1655 | 346 | 175 | 74 | 108 | 476 |
| 45–1 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *c* | 1 | 1741 | 1829 | 365 | 189 | 79 | 114 | 270 |
| 45–2 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *c* | 1 | 1790 | 1882 | 375 | 195 | 86 | 118 | 222 |
| 45–3 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1123 | 1144 | 241 | 121 | 57 | 73 | 62 |
| *21–6 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1677 | 1712 | 322 | 179 | 73 | 110 | 391 |
| 47–1 | ♀ | *e* | $A_1$ | *s* | *N* | *Rh* | *T* | *C* | 2 | 1550 | 1564 | 309 | 166 | 76 | 102 | 176 |
| 47–2 | ♂ | *e* | *O* | *S* | *N* | *Rh* | *T* | *C* | 1 | 1472 | 1600 | 306 | 166 | 69 | 100 | 153 |
| 21–6*b* | ♂ | *e* | *O* | *S* | *M* | *Rh* | *t* | *C* | 1 | 1763 | 1823 | 353 | 183 | 86 | 107 | 497 |
| *21–6 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1677 | 1712 | 322 | 179 | 73 | 110 | 391 |
| 48–1 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *c* | 1 | 1369 | 1388 | 280 | 139 | 67 | 85 | 128 |
| 48–2 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1219 | 1211 | 242 | 133 | 55 | 80 | 85 |
| 48–3 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | — | — | 1 | — | — | — | — | — | — | 48 |
| 21–7*a* | ♂ | *e* | $A_1$ | *S* | *MN* | *rh* | *t* | *C* | 3 | 1791 | 1896 | 441 | 209 | 98 | 125 | 447 |
| *21–7 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1687 | 1699 | 332 | 192 | 78 | 116 | 370 |
| 49–1 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1546 | 1550 | 313 | 180 | 81 | 107 | 158 |
| 49–3 | ♀ | *e* | $A_1$ | *S* | *MN* | *Rh* | *t* | *C* | 3 | 1269 | 1280 | 251 | 143 | 64 | 88 | 89 |
| 49–4 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | — | *C* | 3 | 1083 | 1087 | 229 | 124 | 56 | 75 | 72 |
| 49–5 | ♀ | *e* | $A_1$ | *s* | *MN* | *Rh* | — | — | 1 | — | — | — | — | — | — | 24 |
| 21–8*a* | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1738 | 1789 | 388 | 190 | 90 | 116 | 444 |
| *21–8 | ♀ | *e* | $A_1$ | *S* | *MN* | *rh* | *t* | *C* | 2 | 1631 | 1603 | 345 | 177 | 79 | 109 | 347 |
| 50–1 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1485 | 1447 | 299 | 165 | 70 | 96 | 134 |
| 50–2 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *t* | *C* | 1 | 1345 | 1275 | 272 | 145 | 62 | 83 | 100 |
| *21–9 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 2 | 1752 | 1734 | 363 | 196 | 85 | 118 | 312 |
| 21–9*a* | ♀ | *e* | $A_1$ | *S* | *MN* | *rh* | *T* | *C* | 2 | 1609 | 1658 | 335 | 176 | 71 | 108 | 296 |
| 51–1 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | — | 2 | 1133 | 1095 | 239 | 118 | 56 | 78 | 61 |
| 51–2 | ♂ | *e* | $A_1$ | *S* | *N* | *Rh* | *T* | — | 2 | 930 | 940 | 207 | 112 | 48 | 61 | 38 |
| 51–3 | ♂ | *e* | *O* | *S* | *MN* | *rh* | — | — | 1 | — | — | — | — | — | — | 6 |
| *22–2 | ♂ | *e* | $A_1$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1755 | 1796 | 389 | 183 | 89 | 116 | 337 |
| 22–2*b* | ♀ | *e* | $A_2$ | *S* | *MN* | *rh* | *T* | *C* | 3 | 1621 | 1667 | 368 | 167 | 74 | 103 | 285 |
| 53–1 | ♂ | *e* | *O* | *S* | *MN* | *Rh* | — | — | 3 | — | — | — | — | — | — | 36 |
| 53–2 | ♂ | *e* | $A_2$ | *S* | *M* | *Rh* | — | — | 3 | — | — | — | — | — | — | 20 |
| 53–3 | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | — | — | 3 | — | — | — | — | — | — | 8 |
| *23–1 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1766 | 1820 | 376 | 170 | 88 | 116 | 350 |
| 23–1*a* | ♀ | *e* | *B* | *S* | *M* | *Rh* | *T* | *C* | 1 | 1596 | 1651 | 369 | 173 | 75 | 101 | 320 |
| 54–1 | ♀ | *e* | *B* | *s* | *MN* | *Rh* | *T* | *C* | 1 | 1242 | 1268 | 279 | 139 | 61 | 83 | 78 |
| 54–2 | ♂ | *e* | *B* | *S* | *M* | *Rh* | — | — | 1 | 948 | 962 | 215 | 108 | 52 | 66 | 43 |
| 54–3 | ♂ | *e* | *B* | *S* | *M* | *Rh* | — | — | 1 | — | — | — | — | — | — | 18 |

Table 2 (*continued*)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23–2*a* | ♂ | *e* | $A_2$ | *S* | *MN* | *Rh* | *T* | *C* | 1 | 1709 | 1773 | 386 | 182 | 81 | 110 | 359 |
| *23–2 | ♀ | *E* | $A_2$ | *S* | *M* | *Rh* | *T* | *C* | 1 | 1724 | 1718 | 357 | 187 | 76 | 114 | 331 |
| 55–1 | ♀ | *E* | *O* | *S* | *MN* | *Rh* | *t* | *C* | 1 | 1221 | 1215 | 245 | 131 | 58 | 75 | 76 |
| 55–2 | ♀ | *e* | *O* | *S* | *MN* | *rh* | *T* | *C* | 1 | 1037 | 1036 | 230 | 112 | 50 | 67 | 46 |
| 55–3 | ♀ | *e* | $A_2$ | *s* | *M* | *Rh* | — | — | 1 | — | — | — | — | — | — | 2 |
| 24–1*a* | ♂ | *e* | $A_1$ | *s* | *M* | *Rh* | *T* | *C* | 3 | 1718 | 1766 | 369 | 184 | 80 | 113 | 301 |
| *24–1 | ♀ | *E* | $A_1$ | *S* | *M* | *Rh* | *t* | *C* | 3 | 1728 | 1730 | 350 | 191 | 73 | 110 | 288 |
| 56–1 | ♀ | *e* | $A_1$ | *S* | *M* | *Rh* | *t* | *C* | 3 | 1075 | 1027 | 230 | 118 | 51 | 71 | 60 |
| 56–2 | ♀ | *E* | $A_1$ | *s* | *M* | *Rh* | — | — | 1 | 915 | 914 | 198 | 105 | 45 | 61 | 35 |
| *38–1 | ♂ | *e* | *B* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1721 | 1715 | 352 | 177 | 82 | 105 | 270 |
| 38–1*a* | ♀ | *e* | *O* | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1658 | 1680 | 335 | 172 | 73 | 102 | 235 |
| 57–1 | ♂ | *e* | *O* | *S* | *M* | *Rh* | — | — | 3 | — | — | — | — | — | — | 19 |
| 44–1*a* | ♂ | *e* | $A_1$ | *S* | *MN* | *Rh* | *T* | *C* | 3 | 1728 | 1812 | 403 | 195 | 85 | 116 | 397 |
| *44–1 | ♀ | *e* | $A_1B$ | *S* | *N* | *Rh* | *T* | *C* | 3 | 1526 | 1541 | 358 | 163 | 73 | 97 | 300 |
| 58–1 | ♀ | *e* | $A_1$ | *S* | *N* | *Rh* | — | — | 3 | — | — | — | — | — | — | 12 |

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