these, plants showing the hypersensitive type of resistance were detected. True immunity was not found.

Two genes conferring the hypersensitive reaction have been recognized.. Rppl, from the variety "Colombia 2" (AFRO.29), confers reaction "01" (chlorotic - necrotic lesions, probably close to the "0;" of the Stakman system) to EA.1, but full susceptibility to EA.2. Rpp2, from a Mexican line (AFRO.24), and also probably from several other sources including certain plants of "Colombia 2", confers reactions "01" to "1" (necrotic lesions with small sori) or sometimes "X" (mixed) against both races of P. polysora. Rpp2 is incompletely dominant; Rppl apparently fully dominant.

These two genes have been transferred by the plant breeders to a number of East African maizes; and in 1957 bulks of several pure resistant stocks will be available for issue to cultivators.

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1. Geographic distribution of pericarp and cob color gene frequencies of Peruvian Highland corn.

A survey of pericarp and cob color gene frequencies was started in 1955, and is being continued at the present time on all collections made in Peru.

Five ears selected at random from each collection are scored according to a conventional classification (Emerson, Beadle and Fraser's) for pericarp and cob color alleles. While the survey is being made for the initial purpose of studying geographical variation in gene frequencies, the distribution of the different corn races is disregarded and counts are made on all collections from a given Department, considering for the time being only areas above 1800 meters above sea level. Later, the same data will be rearranged to provide information on gene frequencies within races, and in interaction with geographical areas.

Table No. 1 shows zygotic frequencies for some of the Sierra (Highland) Departments of Peru, without discriminating for altitude and races. Evidence appears there that Ancash is a center for $\underline{a}^{P1}$ (reddish-brown pericarp), while Ancash, Apurímac, Ayacucho, and Huancavelica have a very high frequency of $\underline{a}^{b1}$ (brown pericarp). We may also point out the high frequencies of $\underline{P}^{wr}$ in Cuzco and Cajamarca (notice also high frequencies of A in these two Departments), which

indicated an entirely different pattern of selection (against pericarp color) in those regions.

Table 1. Zygotic frequencies of pericarp and cob color alleles.

| | Ancash | Apurimac | Ayacucho | Cajamarca | Cuzco | Huancavel | Junin | Puno |
|---|---|---|---|---|---|---|---|---|
| A | 0.465 | 0.552 | 0.300 | 0.700 | 0.800 | 0.566 | 0.639 | 0.806 |
| $a^{p'}$ | 0.114 | 0.013 | 0.025 | --- | 0.021 | 0.037 | 0.033 | --- |
| $a^{b'}$ | 0.421 | 0.434 | 0.675 | 0.300 | 0.177 | 0.397 | 0.328 | 0.193 |
| $p^{rr}$ | 0.577 | 0.486 | 0.725 | 0.325 | 0.237 | 0.452 | 0.409 | 0.207 |
| $p^{rw}$ | 0.044 | 0.105 | 0.050 | 0.150 | 0.029 | 0.105 | 0.098 | --- |
| $p^{wr}$ | 0.052 | 0.092 | 0.100 | 0.400 | 0.410 | 0.288 | 0.229 | 0.483 |
| $p^{cr}$ | 0.179 | 0.144 | 0.025 | --- | 0.187 | 0.037 | 0.098 | 0.010 |
| $p^{cw}$ | 0.075 | 0.052 | 0.050 | --- | 0.028 | 0.009 | 0.033 | 0.034 |
| $p^{vv}$ | 0.031 | 0.092 | --- | 0.125 | 0.072 | 0.082 | 0.131 | 0.172 |
| $p^{mo}$ | 0.019 | 0.026 | --- | --- | 0.014 | 0.023 | --- | --- |
| P?* | 0.021 | --- | 0.050 | --- | 0.022 | 0.005 | --- | --- |

* New P allele, undescribed yet.

2. Association between imbrication and pericarp color in Peruvian Highland corn.

A study of association between imbrication and pericarp color disclosed that within collections originating in nine Sierra Departments there was a positive and highly significant association between those two characters, in the sense that ears with high score for kernel imbrication were more likely to be colored in the pericarp.

Table 2. Association between imbrications and pericarp color.

| Score for Imbrication | Observed Pericarp Color Yes | Observed Pericarp Color No | Expected Yes | Increase of Observed Yes over Expected |
|---|---|---|---|---|
| 0 | 630 | 767 | 698.5 | - 9.8 % |
| -1 | 102 | 53 | 77.5 | 31.6 % |
| 1 | 147 | 75 | 111.0 | 32.4 % |
| 2 | 66 | 33 | 49.5 | 33.3 % |
| 3 | 8 | 1 | 4.5 | 77.7 % |

$\chi^2 = 34.35^{**}$ d.f. = 5