

Project I: DETERMINATION OF THE CHROMOSOMAL COMPONENTS THAT CONTRIBUTE TO THE SPECIFICITY OF RACIAL CHARACTERISTICS.

purpose of
~~General Outline for Project I:~~

1. Examination of the F₂ progeny derived from crosses of two races, each exhibiting widely differing morphological and chromosomal characterizations. *To relate the chromosomal characters to the racial characters.*

2. The selected races for project I:

(a) Palomero Toluqueño with many knobs *and* Cacahuacintle with no knobs.

(b) Zapalote chico with many knobs *and* U.S. Knobless Flint.

3. Detailed outline for Project I.

(1) To be done at Raleigh, Summer 1962:

a). Sow 50 seed of Cacahuacintle on May 14, 1962

Sow 50 " " " " May 24, 1962

Sow 50 " " Palomero Toluqueño on May 10, 1962

Sow 50 " " Zapalote chico on May 10, 1962

Sow 50 " " U.S. Knobless Flint on May 17, 1962

Sow 50 " " " " " " May 24, 1962

Sow 50 " " " " " " May 31, 1962

(2) Collection of Sporocytes from:

a). 25 plants of Palomero Toluqueño, *To be* ~~and~~ examine before pollination time.

b). 35 " " Cacahuacintle, *Take* ~~and~~ examine rapidly to find those plants that have no knob or only 1 knob.

c). 35 Zapalote plants. Make chromosome examination of several of them before pollination time. Others *sports collections* ~~should~~ ¹ be placed in deep freeze for later examinations.

(3) Pollinations to be made:

a). Cross at least 20 plants of Palomero Toluqueño by knobless Cacahuacintle plants, using Palomero Toluqueño as the female in the cross.

b). Make the reciprocal cross with a few of the no-knob Cacahuacintle plants.

c). Sib or self the remaining no-knob Cacahuacintle plants and cross these to other Cacahuacintle plants that have only one or two knobs.

d). Cross reciprocally 20 plants of Zapalote chico, including those that received early cytological examination, --by U.S. Knobless Flint.

e). Sib Zapalote chico plants and plants of knobless flint not used in making the hybrid cross.

WINTER, 1962-63. To be conducted in Florida

1). Select 5 ears produced by each of the two types of hybrid cross outlined above.

2). Sow 2 rows of kernels derived from each ear (20-30 kernels per row)

3). Observe the degree of diversity of plant characters among the plants in each family.

4). Make sib crosses between individuals within each family (The plants to be selected for ^{each} sib crosses would depend upon??)

SUMMER, 1963. To be conducted at Raleigh.

The procedures for examining the F_2 progeny will be outlined after ears of the F_1 ^{sib crosses} have been examined. A conference will be scheduled to outline this.

<u>Race</u>	<u>Collection Number</u>	<u>Date of Sporocyte collection at Chapingo, 1959</u>	<i>number of seed required</i>
* Arrocillo amarillo	Pue. 260 (original)	6/22 to 6/23	
Bolita	Oax. 180 (original)	6/26 to 7/1	
* Cacahuacintle	Mex. 7a (derived)	6/18	
Celaya	Celaya II(derived)	7/6 to 7/8	
Chalqueño	Mex. 208 (original)	6/22	
* Chapalote	Sin. 6 (original)	6/29 to 7/6	
* Cónico	Mex. 207 (original)	6/18	
Maíz Dulce	Gto. 100 (original)	7/1	
* Nal-Tel	Yuc. 7 (derived)	7/8 to 7/10	
* Palomero Toluqueño	Mex. 210 (original ?)	7/1 to 7/8	
Reventador	Nay. 39 (derived)	6/29 to 7/6	
* Salvadoreño de Costa Rica	C.R. 30 (original)	7/6 to 7/8	
* Zapalote chico	Oax. 179 (original)	6/22 to 6/23	
* Zapalote grande	Chis. 236 (original)	6/22 to 7/1	

collection dates

- ① Anzales Amarillos - 6/22 - 6/23
- ② Nal-Tel - (different peelytans) 7/8 - 7/10
- ③ Cacahuacinte - 6/15 (good peelytans)
- ④ Chapalote 6/29 - 7/6 (some with good peelytans)
- ⑤ Maíz dulce 7/1 (good peelytans for ~~that~~ ^{that})
- ⑥ Cónuco 6/18 -
- ⑦ Reventador 6/29 - 7/6 (different peelytans)
- ⑧ Zapalote dulce 6/22 - 6/23 (good figs in ^{some} poor quality)
- ⑨ " Jucos 6/22 - 7/1 " " " " " " "
- ⑩ Chalquero 6/22
- ⑪ Olaya 7/6 - 7/8 " " " " " "
- ⑫ Bolita 6/26 - 7/1
- ⑬ Palomero Toluquero 7/1 - 7/8 " " " " " "

Solva ~~de~~, Honduras. 6/26 - 6/29 (coll # Honduras 19) ^{out of}

" de Nicaragua 6/29 - 7/6 (Vic 4 Germ)

⑫ Costa Rica = see Feb. class - 7/6 - 7/8
 CCR 30 out of P

parent and about 2

Project II. THE EFFECT OF K-10 ON THE DISTRIBUTION OF PARENTAL CHARACTERS IN F₂ PROGENIES DERIVED FROM RECIPROCAL CROSSES OF F₁ PLANTS, ~~PRODUCED FROM THE CROSS OF A XXXXXXXXX PLANT CARRYING MANY KNOBS WITH ONE CARRYING NO KNOBS.~~

1. Parental races selected:

a). Those carrying K-10:

- Zapalote grande, Mexican collection # Chis. 236
- (Arrocillo amarillo, " " # Pue. 260
- (Bolita " " # Oax. 180
- (Celaya " " # Celaya II)

Salvadorano de Costa Rica C.R. 30 origin.

(Salvadorano de Costa Rica)

b). U.S. Knobless Flint.

2. Sow 50 kernels of Zapalote grande in Raleigh, May 10, 1962

3. Collect sporocytes of plants and examine immediately to determine presence or absence of K-10 in each.

4. Cross Zapalote ~~chico~~ *chico* ^{*with*} ~~with~~ ^{*carrying*} K-10, by U.S. Knobless Flint, using Zapalote chico as female parent in cross.

5. Do same with plants that do not carry K-10.

WINTER 1962-63. To be conducted in Florida.

1. Grow 4 families (10 plants each) from kernels on ears produced by cross given in 4. above.

2. Grow 4 families (10 plants each) from kernels on ears produced by cross given in 5. above.

3. Grow plants of U.S. Knobless Flint (2 plantings)

4. Make reciprocal crosses between plants in 1. above and those in 2. above with the knobless Flint plants.

SUMMER, 1963. To be conducted at Raleigh.

1. Grow progenies produced by reciprocal crosses described above.

2. Examine the diversity of plant types derived from the reciprocal crosses. If strong diversity is exhibited among them, in the manner expected of preferential segregation of segments of chromosomes carrying the knobs contributed by Zapalote Grande, examine ^{*chromosomes*} plants to determine if

K-10 is present in plants ~~of families exhibiting~~ of these families and is absent from plants derived from families that do not show this ^wscud distribution of ~~family traits~~ parental traits.

To be attended to by Bill:

1. Seed of (1) U.S. Kumbles Fluct
 - (2) Zapalote chico - to determine if any seed available
 - (3) For good polytypes.
 - (4) Polvera - ^{used to} Ramirez
2. Write to Hathaway to obtain information on crosses of races - quantity of F_1 , and on stability of races following subbreeding.

To be attended to by Urc.

1. Write to Wellhausen for seed from Mexico: To be sent to Bill Brown
 - a) of designated races
 - b) of races in ^{with} Eastern section of Great Valley + in Yucatan + South Eastern Mexico.
2. Write to Rieger for seed of races of interest -- designated, with details of origin of collection (place collected) + method of propagation (no "pooled" races can be used). Explain method of seedling race. Request that Blumenschein bring some seed with him and the method of packing - (DOT destroy; also package; Note from Bill Brown - ~~Shaffer~~ suggest this in order to facilitate entry).

3. Collection dates, ^{in terms of spores of} for different rows to be used in study. ✓

4. Check notes on quality of olivine preparation of *Salvadora* - ✓