BOTANY

Chairman: PAUL WEATHERWAX, Indiana University and Franklin College

J. H. Maysilles, Hanover College, was elected chairman for 1963

Genetics and Biochemistry of the "Dark-eye" Phenotype in *Impatiens balsamina* L. ELEANOR S. KUTLICH and CHARLES W. HAGEN, JR., Indiana University.—The "dark-eye" race of *Impatiens balsamina* originated from open-pollinated seed collected in a Bloomington garden. By selection, a true-breeding race was established which approached in appearance the inbred genotype llhhP^rP^r. In the F_1, resulting from the cross white llhhpp), isogenic with llhhP^rP^r, to the "dark-eye" race, the following characteristics of the "dark-eye" race appear dominant: pigmentation of the upper stem, deep red foliar nectaries, red midribs, bluish-red pigment of petal bases, and intense sepal color. In the F_2, nectary color segregated independently, whereas color of the upper stem, midribs, sepals, and petal bases were associated. The characteristics associated with the "dark-eye" race also segregated independently of the gene P^r, but were not expressed in the presence of the gene p. Intensity of pigmentation is reduced in hybrids, probably as a result of heterozygosity at the P^r locus. Chromatographic analyses reveal pelargonidin as the only anthocyanidin in petals of the genotype llhhP^rP^r, whereas the sepals contain cyanidin, peonidin and traces of pelargonidin. In the "dark-eye" race, pelargonidin and total anthocyanidins are increased in the sepals. Cyanidin and peonidin occur in the petals along with pelargonidin, the cyanidin and peonidin being concentrated at the base and diminishing toward the edge. This distribution, which characterizes the "dark-eye" phenotype, suggests that the responsible gene operates to spread precursors of the pigments or the ability to produce individual pigments into regions not involved in the inbred genotype llhhP^rP^r.

Differential Temperature Effects for Identification of Wheat Leaf Rust Resistance Combinations. L. B. JOHNSON and J. F. SCHAFER, Purdue University.—The resistant wheat varieties Frontana and La Prevision 25 exhibited more susceptible reaction types to races 1 and 2 of *Puccinia recondita* Rob. ex Desm. at 80 than at 60°F. Reaction types of Aniversario increased from 60 to 80 only with race 2. Highly resistant selections from the crosses Aniversario x Frontana and La Prevision 25 x Aniversario behaved as did Aniversario. A La Prevision 25 x Frontana selection followed the pattern of its parents. Aniversario and La Prevision 25 also showed a lesser degree of resistance to race 2 than did Frontana. These results suggested techniques for identifying combined resistance varieties using differential temperature effects. Selections from crosses of La Prevision 25 x Aniversario and La Prevision 25 x Frontana possessing both parental resistances as previously determined by other methods may be crossed, insuring plants having the La Prevision 25 resistance. Testing F_2's with race 1 at 80° and discarding plants with higher than a zero reaction type would leave only

those possessing the Aniversario resistance. Moving the plants to 60°, inoculating with race 2, and saving only plants of zero reaction type would leave only those possessing Frontana resistance. These remaining plants would then have resistance from all 3 parents. Repetition of tests on F_3 plants would allow detection of homozygotes.

A Potent *Penstemon* Pathogen, *Ramularia nivosa* (Ell. & Ev.) Shaw & Cooke, JOE F. HENNEN, Indiana State College.—Controlled inoculation studies have shown that *Ramularia nivosa* (Ell. & Ev.) Shaw & Cooke is an incitant of a severe leaf and stem blight of various species and hybrids of Penstemons in Indiana. In this region this disease is a limiting factor in the cultivation of many species and hybrids of this valuable ornamental genus. Observations on plants grown in field plots under natural conditions indicate that only six of 38 species seem to have natural resistance to this parasite. These were *P. barbatus, P. ambiguous, P. pinifolius, P. peckii, P. richardsonii* and *P. vaseyanus.* Preliminary cultural studies of the pathogen showed that best vegetative growth occurred at 20°C and malt agar was the best of several different media used.