THE OCCURRENCE OF A NICOTIANA GLUTINOSA HAPLONT

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In recent reports\(^1\) of the discovery of haploid Angiosperms attention has been directed to the relative frequency with which they occur in various genera of the Solanaceae. The present note adds another species of this family to the rapidly increasing list of angiospermous haplonts, the first of which were described in 1922 by Blakeslee\(^3\) and his co-workers. Seven haploid plants of \(N.\) Tabacum have occurred in our cultures in \(F_1\) interspecific progenies.\(^4\) All previous haplonts have been found either in \(F_1\) of interspecific hybrids or in progenies artificially subjected to abnormal environmental influences or in cultures characterized by a segregating factorial composition or an unbalanced chromosomal condition. The single haploid individual of \(N.\) glutinosa found in the summer of 1928 is apparently the first instance in which such a plant has occurred in a pure-line progeny.

The species \(glutinosa\) is included in the Rustica section of the genus although it might be better placed in Tabacum especially if \(tomentosa\), with which it has certain affinities, is included in-the latter section.\(^5\) It is a strictly monotypic species of some horticultural interest and is widely grown in botanical gardens. Although quite distinct in external morphology from almost all other Nicotiana species, \(F_1\) hybrids have been produced with a number of them belonging to all three sections of the genus. It possesses 12 pairs of chromosomes. It is interesting to note that Levine\(^6\) has found 4\(n\) cells in induced neoplastic tissue in this species.

The \(glutinosa\) haplont was one of 24 plants which grew from seedlings which were subjected to x-radiation 5 weeks after germination. The seedlings at the time of treatment had produced from 5-7 small, true leaves which for some weeks thereafter gave evidence of considerable abnormality in growth and development. The effect on external morphology was in most cases ephemeral and when put out into the field all the young plants except two were normal in appearance. These two were so slow growing and poorly developed that they were held for some weeks in the green house. One of them, the haplont, became more vigorous and was ultimately set out in the field; the other remained small and weak and after some months came to flower and set selfed seed on a single shoot less than 6 inches long. Undoubtedly the occurrence of the haplont was spontaneous and in no wise to be referred to the treatment received during the seedling stages.

The haploid plant was, in a general way, a replica of its diploid parent...
on a considerably reduced scale. The flower color was a greenish yellow rather than a salmon-red and flower and leaf form were considerably altered. Its anthers were small and shriveled and no selfed seed was set, nor did its eggs or pollen grains set seed with gametes of diploid plants after the relatively few pollinations which were made. The plant continued to send up basal shoots and to grow vigorously long after the diploid plants had ceased to flower.

**FIGURE 1**

*Nicotiana glutinosa* (n = 12)—haplont. P.M.C. a, I-A, lateral view, 4–8 chromosome distribution still under way; c, later I-A, polar view, 5–7 distribution completed; b, interkinesis, a 5–7 distribution. Aceto-carmine preparations.

In somatic tissues the chromosome number of this plant was 12 and at *I-M* 12 univalents were found. The appearance of *I-A* and interkineses in P. M. C. is illustrated in figure 1. There was apparently no true conjugation within the chromosome group and the 12 large units were exceedingly well distributed and easy to count at *I-A*. This statement applies to E. M. C. as well as P. M. C. Random distribution of the 12 univalents was the rule and no cytoplasmic or other disturbances such as
were seen in *Tabacum* and *Triticum* haplonts were observed. Suspended
*I*-A stages followed by equational division were not infrequent and were
reflected in the occurrence of dyads at the tetrad stage. Otherwise, division
of univalents at *I*-A rarely, if ever, took place according to *II*-M counts,
which uniformly gave a total of 12 units in the two plates. *II*-M counts
also showed that all types of distribution, on the basis of random assort-
ment at *I*-A, occurred—6-6, 7-5, 8-4, 9-3, 10-2, 11-1 and all 12 in a
single *II*-M plate having been observed. Further cytological studies of
the *glutinosa* haplont are in progress and will be reported on at a later
date.

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**FURTHER REMARKS CONCERNING THERMIonic**
**"A" AND "b," A REVISION AND EXTENSION**

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This paper is written in continued support of the thesis that all the
known facts regarding thermionic emission from metals are consistent
with the original conception of Richardson, which assumed the emitted
electrons to come from a body of free electrons sharing the energy of ther-
al agitation within the metal. In the course of the paper I shall have
occasion to revise some remarks which I have made concerning the equality
of "A" in different metals, and I shall consider the possibility that the
photo-electric work function, represented by "b₀," is variable with tem-
perature, but nothing that I have to say involves any departure from the
fundamental conceptions of the dual theory of electric conduction which
I so many times set forth in print.

There is a strong tendency at present to identify the thermionic work
function and the photo-electric work-function, numerically at least. This
tendency is represented on the experimental side by DuBridge and
Warner, and on the theoretical (thermodynamical) side by Bridg-
man. In the abstract of a recent paper Bridgman says, "The ther-
mionic work-function and the photo-electric work function are found to