

**A PRELIMINARY STUDY ON THE SELF INCOMPATIBILITY  
AND FRUIT SETTING ABILITY IN SWEET POTATO  
(*IPOMOEA BATATAS* (L.) Lam.)**

**R. ISLAM AND M.M. HOSSAIN**

*Department of Botany,  
University of Rajshahi, Rajshahi, Bangladesh.*

In general most of the sweet potato varieties are self incompatible, even some of them are cross incompatible (Martin, 1965). Only a few varieties has been found self compatible (Wang, 1964). Present investigation was undertaken to study self incompatibility and fruit setting ability in sweet potato.

Fifteen indigenous and exotic strains of sweet potato were used and 25 plants were grown from each strain in 15 meter long rows. When the plants were in full bloom they were tested for self incompatibility. At least 30 flowers were selfed for each strain from randomly selected 10 plants. Before selfing the selected unbloom flowering sheets were bagged. After opening of flowers and bursting of anthers the flowers were selfed and rebagged. For microscopic observation stigma and part of the style were collected 24 h after pollination and were fixed in aceto alcohol (3:1). Fixed pistils were squashed in a drop of acid fuchsin light green stain and examined under microscope. Empty and unstained pollen grains with pollen tubes entering into the stigmatic papillae were scored as compatible (+) and stained pollen grains without pollen tubes were scored as incompatible (-). A considerable number of flowers were kept undisturbed for fruit setting.

Depending on the length of the style, 15 strains were grouped into 3 families. These were short styled, mid styled and long styled strains. The strains showing short style had style short in length and corresponding same height with the smallest stamen. The strains bearing medium style had style medium in length and corresponding same height with the longest stamen. In long styled strains the style. was longer than the longest stamen. It was observed that among 15 strains 5 were short styled, 5 were mid styled and 5 long styled. Mean number of full and empty pollens of different strains is given in Table 1. In most of the cases the pollen grains were full and did not germinate on the stigmatic surface. It indicates that some growth barriers were operating on the stigmatic surface which inhibited pollen germination. In a very few cases pollen grains germinated and the pollen tubes appeared to enter into the stigmatic papillae. In S-20 and S-38, a greater number of empty pollen grains entering into the stigmatic papillae were found. One short styled strain (S-14), two mid styled strains (S-31 and S-33) and one long styled strain (S-42) showed no empty pollen grains on their stigmatic surfaces.

Flowers kept undisturbed for fruit setting were examined and it was observed that none of the 15 strains set any fruit and selfed flowers were dropped off within 2 or 3 days of pollination. Therefore, all the strains were self incompatible. Though some strains showed empty and unstained pollen grains with pollen tubes entering into the stigmatic papillae under microscope but they also failed to set any fruit. It indicates that there were also some growth barriers in the style or in the ovary which retarded pollen tube growth. Presence of growth barriers operating in the stigmatic surface of sweet potato was noted

**Table 1. Mean number of full and empty pollen grains of self pollinated stigmas of different strains of sweet potato.**

Strains	Style length	Number of full pollen grains/stigma		Number of empty pollen grains/stigma		Compatibility reaction
		Mean	Range	Mean	Range	
S-6	Short	11.8 ± 2.81	03-20	1.2 ± 0.37	0-2	-
S-14	Short	04.4 ± 2.06	00-12	nil	nil	-
S-20	Short	12.8 ± 4.87	00-30	6.8 ± 2.41	1-13	-
S-29	Short	16.2 ± 4.78	04-23	4.4 ± 1.59	1-8	-
S-30	Short	19.0 ± 4.75	05-32	0.8 ± 0.37	0-2	-
S-8	Medium	17.0 ± 4.83	06-30	0.6 ± 0.24	0-2	-
S-11	Medium	08.6 ± 1.68	04-12	1.4 ± 0.67	0-3	-
S-31	Medium	09.8 ± 3.33	02-21	nil	nil	-
S-33	Medium	11.2 ± 2.79	05-21	nil	nil	-
S-38	Medium	17.0 ± 1.94	10-21	5.0 ± 0.89	3-8	-
S-3	Long	15.0 ± 1.94	10-25	1.4 ± 0.67	0-4	-
S-19	Long	16.6 ± 3.75	08-29	2.6 ± 1.16	1-7	-
S-25	Long	17.0 ± 8.47	04-50	1.6 ± 1.02	0-5	-
S-27	Long	17.4 ± 4.90	09-24	1.4 ± 0.87	1-5	-
S-42	Long	04.4 ± 1.56	01-10	nil	nil	-

by Martin & Cabamillas (1960). Marrewijk (1973), reported the presence of two growth barriers one of which inhibits the pollen tubes to pass the border between stigma and style and second operating in the ovary. The effects of cross pollination between short-long, short-mid, and mid-short strains on the compatibility reaction needs investigation.

#### References

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