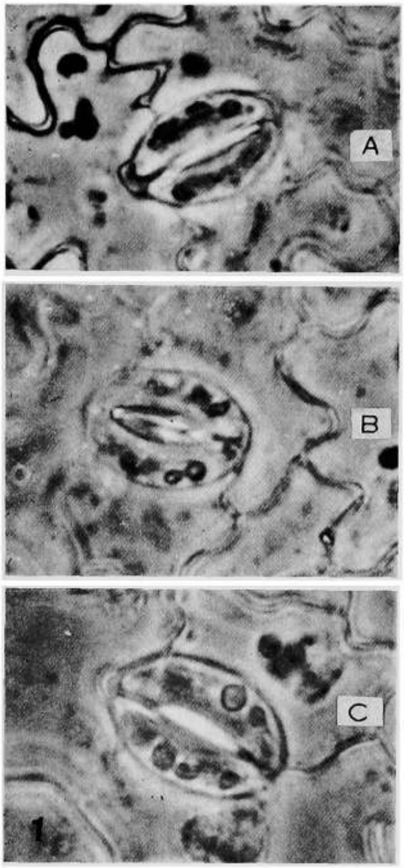
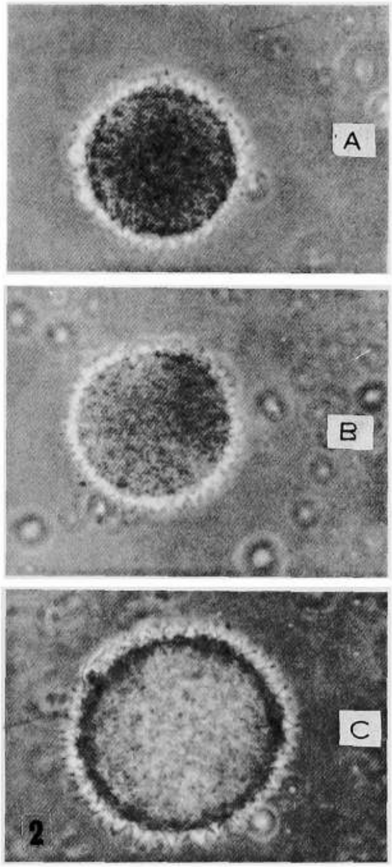
shape, broadly lanceolate in case of the diploid subspecies *rhombifolia* to rhombic in the other two subspecies. The leaves of the diploid plants under this condition are conspicuously bigger than those of the tetraploid–subsp. *alnifolia*. (Fig. 3).





Figs. 1–2. Photomicrographs of the stomata of *S. rhombifolia* complex. ×2811. A, stoma of diploid plant, subs. *rhombifolia*, REU 300 from Olorunsogo, Igbaga Elepo, along Ikorodu-Ibadan Rd., Ogun. B, stoma of diploid plant, subs. *retusa*, REU 317 Marina st., Badagry, Lagos. C, stoma of tetraploid plant, subs. *alnifolia*, Ugborogho and Musa 422 from Kainji Dam, Kwara. 2. Photomicrographs of the pollen grains of *S. rhombifolia*-complex. ×630. A, pollen grain of diploid plant, subs. *rhombifolia*, REU 532 from Ewu Gbodomo village, nr. Shagamu, Ogun. B, pollen grain of diploid plant, subs. *retusa*, REU 664 from Petrol filling station, University of Lagos, Akoka, Lagos. C, pollen grain of tetraploid plant, subs. *alnifolia*, REU 545 nr. aerodrome on Bodija side, Ibadan, Oyo.

Both the adaxial and abaxial surfaces of the leaves of the diploid plant possess short stellate hairs. In case of the tetraploid subspecies, the abaxial surface is covered with long stellate hairs while the adaxial surface usually possesses only simple hairs or at times a mixture of both stellate and simple hairs.

The stomata, anthers and pollen grains of the tetraploid subspecies are more in size than those in the two diploid subspecies. While the difference in the sizes of the stomata in the two cytotypes may not be pronounced, the differences in the sizes of anthers and pollen grains are quite appreciable. (Table 1).

Karyotype

Chromosome counts were made on plants from twenty populations. Six of these were tetraploid with 2n=28 while the others were diploid with 2n=14. The chromosomes are too small (c. 2.0–3.0 μm) and similar in appearance for a detailed study of the karyotype to be undertaken. Figure 4 shows the chromosomes of the three subspecies of this complex species. A number of chromosome counts for the material of this species reported in the literature are listed in Table 3.

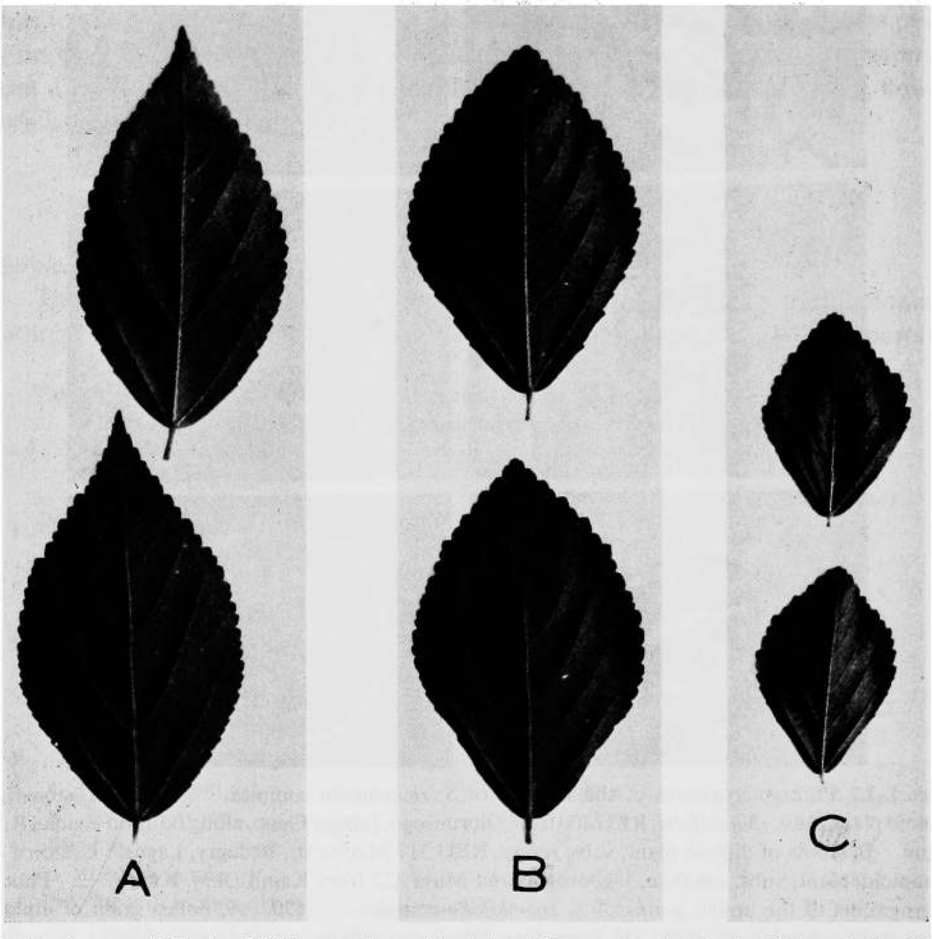


Fig. 3. Leaves of *S. rhombifolia* complex cultivated outdoor under the shade of trees in the Biological garden. ×1.0. A, subs. *rhombifolia*, REU 250 opp. Ikorodu town cemetery, Ikorodu, Lagos. B, subs. *retusa*, REU 296 by cement wall in front of the market opp. Biology Annexe, Dept. of Biological Sciences, University of Lagos, Akoka, Lagos. C. subs. *alnifolia*, REU 240 opp. No. 1, Ministry of Agric. Farm, Ikorodu, Lagos.

Meiosis was regular in the species complex. Tetrad formation was quite normal in all the specimens considered. Percentage of pollen stainability was quite high in the three subspecies, usually above 98%.

Table 2. (cont'd)

Species	Mitotic	Gametic	Collector's name and number	Origin
3. 〃 〃	28	14	〃 321	By Coop. store, Ojo Town, Lagos state
4. 〃 〃	28	—	Ugborogho & Musa 422	Kainji Dam, Field opp. Dam, Kwara state
5. 〃 〃	28	—	Ugborogho 577	Ikom-Calabar rd., c. 1.6 km. from Ikom, Cross River state
6. 〃 〃	28	—	〃 627	Nr. 2nd Infantry, Nigerian Army Engineering Depot, Aba, Imo state

* Foreign plant.

Hybridization Experiments

Crosses between subsp. *rhombifolia* and subsp. *retusa* were successful only when subsp. *retusa* was the female parent. All the crosses between subsp. *rhombifolia* and subsp. *alnifolia* failed. Similarly, crosses between subsp. *retusa* and subsp. *alnifolia* failed to set seeds and when seeds were formed in three out of twenty crosses, all the seeds were deformed and inviable.

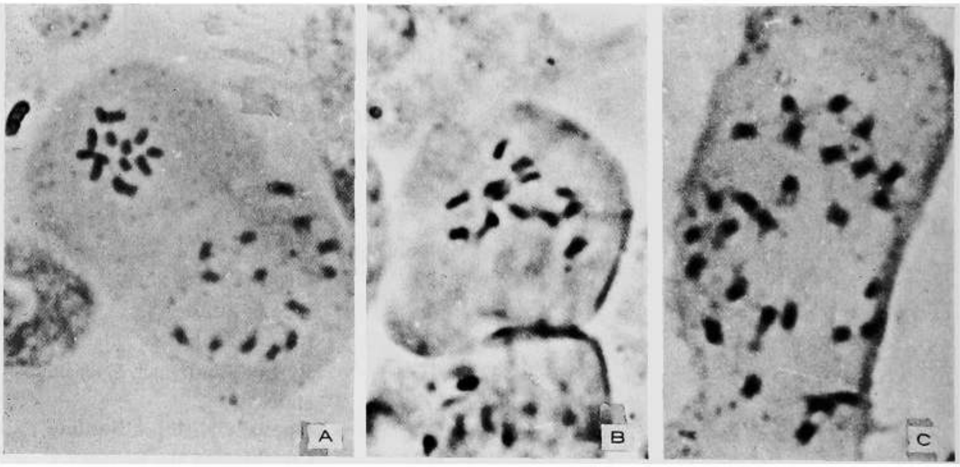


Fig. 4. Photomicrographs of the somatic chromosomes of *S. rhombifolia* complex. ×3015. A, chromosomes of diploid plant, subs. *rhombifolia*, REU 300 from Olorunsogo, Igbaga Elepo, along Ikorodu-Ibadan rd., Ogun. B, chromosomes of diploid plant, subs. *retusa*, REU 664 from Petrol filling station, University of Lagos, Akoka, Lagos. C, chromosomes of tetraploid plant, subs. *alnifolia*, Ugborogho and Musa 422 from Kainji Dam, Kwara.

Hybrid viability and vigour

S. rhombifolia subsp. *retusa* $(n=7) \times$ *S. rhombifolia* subsp. *rhombifolia* $(n=7)$: Out of fifteen crosses made between the two subspecies only seven developed into fruits with well formed carpels. Seven of the seedlings resulting from the crosses developed to maturity. The hybrids were vigorous and generally intermediate morphologically between the two parents in many respects. Some morphological features (e. g. surface of carpel) resembled just one of the parents. The growth habit of the hybrid was more or less different from both parents (Fig. 5). Details of the morphological features and growth habits of the hybrid plants and their parents are

Table 3. Published chromosome counts of *Sida rhombifolia* complex

Species and authority	Data	2n	n	origin
S. rhombifolia Linnaeus				
1. Skovsted, A.	1935	14	—	Africa
	1941	14	—	Columbia, Queensland
		14+1	—	South Africa
		28	—	Ceylon
2. Adhikary, A. K.	1963	14	—	West Bengal, India
3. Bates, D. M.	1967	—	7	Mexico and Ecuador
4. Hsu, C. C. (as var. *longipedicellata*)	1968	—	14	Taiwan
5. Gadella, Th. W. J., E. Kliphius, J. C. Lindenam and E. A. Mennega	1969	14	—	Brazil
6. Hazra, R. and A. Sharma	1971	14	—	India
7. Ugborogho, R. E.	1975	14, 28	—	Nigeria

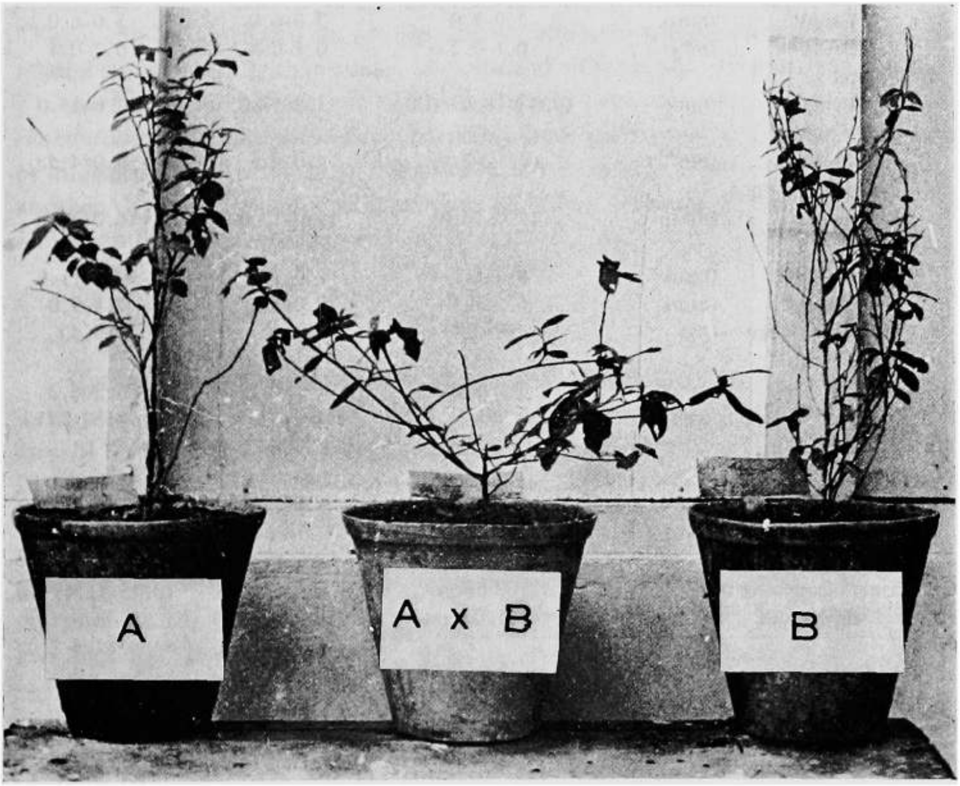


Fig. 5. Potted plants of two subspecies of *S. rhombifolia* and their F_1-hybrid. ×0.2. A, subsp. *rhombifolia* (Male parent, erect), REU 767 from Adebayo Mokulu st., Anthony Village, Lagos. A×B. F_1-hybrid, spreading. B. subsp. *retusa* (Female parent, erect), REU 317 from Marina st., Badagry, Lagos.