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CYTOGEOGRAPHY AND NOMENCLATURAL NOTES ON *SOLANUM* L. SECTION *SOLANUM*

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Solanum nigrum L. complex (*Solanum* section *Solanum*) is a polyploid group with $x = 12$ chromosomes. The occurrence of diploid, tetraploid and hexaploid cytotypes was reported in India[1] but the hexaploid cytotype is not yet recorded in South India[2]. Recent taxonomic studies suggest a separate specific status to each cytotype and restrict the binomial *Solanum nigrum* L. to hexaploid taxon[3,4]. However, Indian botanists have been using the epithet *S. nigrum* L. for all the three cytotypes. The present note reports the occurrence of hexaploid cytotype in Tamil Nadu and provides correct binomials for diploid and tetraploid species together with a diagnostic key.

During the field survey, it was found that the diploid and tetraploid taxa are common throughout Tamil Nadu, whereas the hexaploid form has restricted distribution. The latter grows in Ooty and the adjacent places in Nilgiris. The tetraploid taxon is easily recognizable in the field by its short-spreading habit and translucent orange-red berries. The diploid and hexaploid taxa are similar in their habit, but differ in the nature of inflorescence, flower size and shape, berry colour, pollen grain diameter, and seed size and number.

The confusion in nomenclature is apparent while considering the diploid and tetraploid species. The names *S. americanum* Mill. *S. nodiflorum* Jacq., *S. photeinocarpum* Nak. and *S. nigrum* L. are used for the diploid taxa. They are readily crossable and conspecific with each other[4-7]. *S. americanum* Mill., being earlier, is the correct epithet for this taxon. The binomials *S. villosum* Mill., *S. luteum* Mill., *S. miniatum* Bernh., *S. alatum* Moench, *S. flavum* Kit., *S. rubrum* Mill., *S. ochroleucum* Bast. and *S. roxburghii* Dun. are used for orange-red/yellow berried tetraploid taxa. It is thus proved that they are synonyms and *S. villosum* Mill., being earlier, is the correct name for this taxon[8,9]. These two are the most common species in Tamil Nadu. Therefore, future flora should record *S. americanum* Mill. and *S. villosum* Mill. in addition to *S. nigrum* L.

Key for the field identification:

I. Fruits orange-red, longer than broad, translucent; plants short with spreading branches; pollen diameter 21–26 μm. Chromosome number $2n = 48$, common throughout... *S. villosum* Mill.
I. Fruits black, plants erect and tall... II.
II. Fruits shiny bluish-black; seeds small 0.8–1.2 mm long and 0.6–0.9 mm wide. Inflorescence unbelliform, fruiting pedicels pendulous, flowers small, corolla 5–7 mm in diameter. Pollen grain 18–23 μm across, chromosome number $2n = 24$, common throughout... *S. americanum* Mill.
II. Fruits dull purplish-black, seeds large 1.1–1.4 mm wide. Flowers large, corolla diameter 8–11 mm; pollen grain 25.5–31.2 μm across; chromosome number $2n = 72$. Grows in high altitude regions of Nilgiris only... *S. nigrum* L.

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FLOWER ON TENDRIL IN *TRICHOSANTHES ANGUINA* LINN.

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Tendril is a typically long and slender structure that may be branched or unbranched[1]. It is a

modification of various organs viz. an axillary bud (*Passiflora* sp.), whole leaf (*Lathyrus aphaca*) or a petiole (*Clematis* sp.). The present observation on some mixoploid plants of *Trichosanthes anguina* (family Cucurbitaceae) bearing female flowers on tendrils indicates the modified nature of the tendril.

Following colchicine (0.5%) treatment of seeds for 12 h, three plants having serrate instead of entire leaf margins were isolated in C_0 generation. The tendrils of the control plants are extra-axillary and trifid at the apex (figure 1A). Female flowers are borne in the axils of the leaves. The tendrils in the

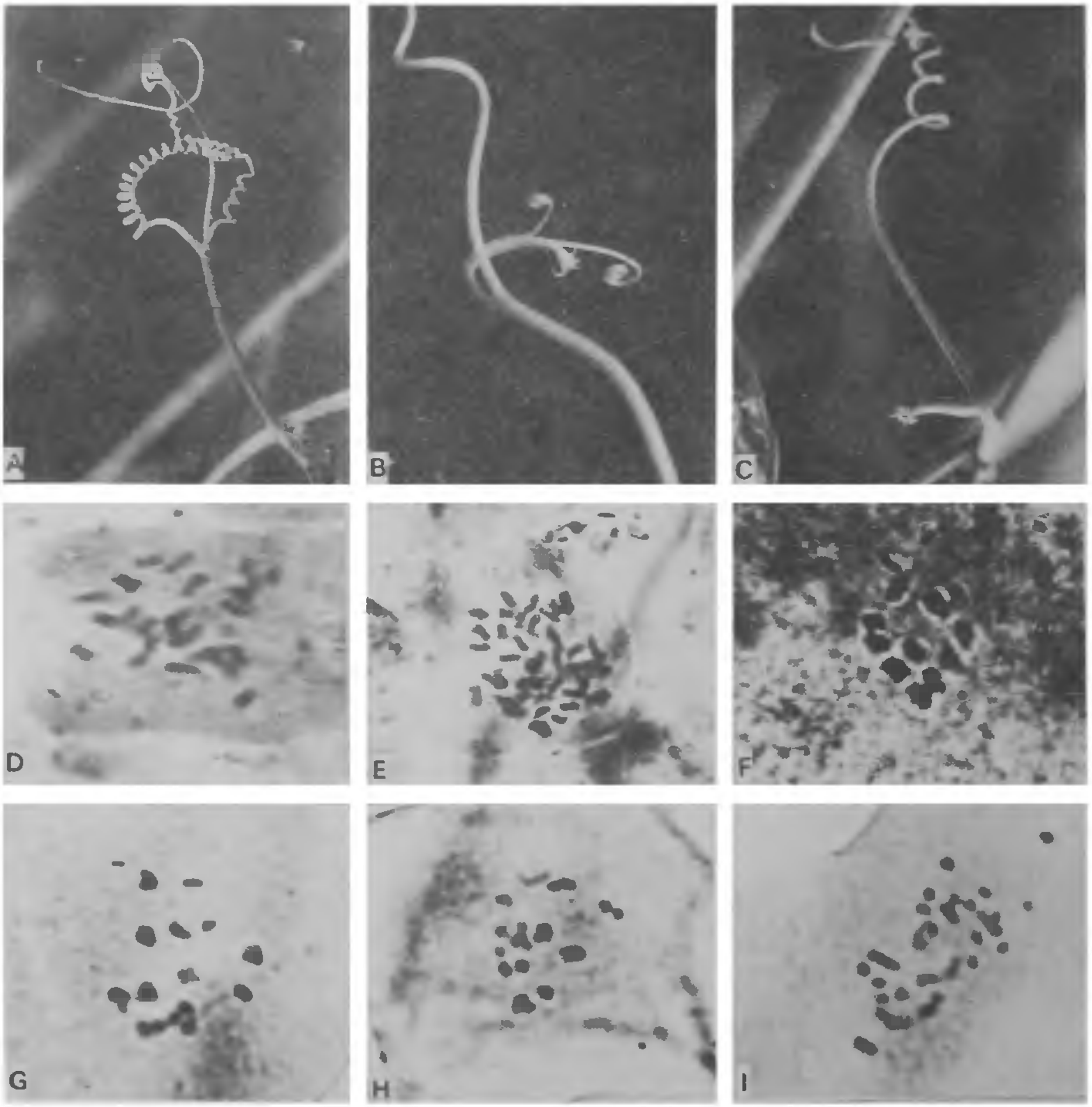

Figure 1.A–C. Tendrils of *Trichosanthes anguina* Linn. **A.** Trifid tendril of control plants; **B.** A female flower fused with the tendril along the entire length of corolla tube; **C.** Female flower attached to the tendril at its base. **D–F.** Mitotic and meiotic metaphase stages in the diploid. **D.** Mitotic metaphase in the diploid ($2n = 22$); **E.** Mitotic metaphase in the tetraploid ($4n = 44$); **F.** Meiotic metaphase I in the pollen mother cell showing 11 IIs. **G–I.** Meiotic diakinesis and metaphase I stages in the tetraploid pollen mother cell showing various associations. **G.** Pollen mother cell with 7 IVs and 8 IIs; **H.** Pollen mother cell with 8 IVs and 6 IIs; **I.** Pollen mother cell with 4 IVs, 1 III, 7 IIs and 11 univalents.

three plants were also extra-axillary and trifid at the apex but one of the three branches had a female flower attached to it. The female flowers remained either attached to the tendril along the entire length of the corolla tube (figure 1B) or were free (figure 1C). These plants were named 'flower on tendril' (FOT).

The male and female flowers of FOT plants were significantly larger than those of the control plants. In FOT plants (24.45%) cells of the tendril tips had $2n = 22$ (figure 1D) and 75.55%, cells had $2n = 44$ (figure 1E). In comparison to normal meiosis (11, II, figure 1F) in the control, the FOT plants were characterized by the presence of both diploid and tetraploid pollen mother cells. The tetraploid pollen mother cells had a mixture of quadri- (5.66/cell), tri-(1.16/cell), bi-(8.33/cell) and univalents (1.16/cell, figure 1G). The pollen grain sterility (20.03%) as well as the polar axis (95.02 μm) of fertile pollen grains were significantly higher in FOT than in the control (2.27%, 61.49 μm). The average yield of seed per fruit (3.50) and single seed weight (248 mg) were low as compared to the control. The plants raised from seeds collected from FOT plants had normal tendrils. However, crosses between FOT and control plants were abortive. Thin layer chromatography of phenolic compounds in young leaves, following the method of Mukherjee *et al*[2], revealed no difference in the distribution of spots for phenolic compounds, colour reaction to flavone (diphenyl boric acid ethanolamine complex) and hR_f values in FOT and control plants. Both FOT and control plants showed 10 spots in their chromatograms having the same colour reaction and hR_f values.

FOT due to polysomatic tissues in the plants is not warranted because many plants recovered from the C_0 plants show mixoploid nature of the somatic cells, without any change in the position of emergence of female flower. Mixoploidy may be one of the factors leading to the production of such tendrils.

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A TIME-TEMPERATURE SCHEDULE FOR TERMINATING DIAPAUSE IN PREPUPAE OF *COTESIA KAZAK*

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THIS paper deals with a time-temperature schedule (TTS), a new technique developed for breaking diapause in the prepupae of the exotic parasitoid, *Cotesia kazak* Telenga (Hymenoptera: Braconidae). This exotic parasitoid was imported into India in November 1985 from the Commonwealth Institute of Biological Control, Switzerland for conducting biocontrol trials against *Heliothis armigera* (Hubner) (Lepidoptera: Noctuidae), a serious polyphagous pest, attacking various crops of economic importance.

C. kazak has been reported to be a major parasitoid of *H. armigera* on tomato, cotton, etc. in various Russian provinces[1,2]. *H. armigera* larvae reared on artificial diet[3] were used as host culture for multiplying *C. kazak*.

During December 1985 and January 1986 the prepupae of *C. kazak* lodged inside the cocoons entered into diapause. Diapause in *C. kazak* has also been observed earlier[4,5]. Normally, *C. kazak* adults emerge in 7–9 days from the date of cocoon formation. In the present study, even after a month from the date of cocoon formation, no adults emerged. The cocoons were then dissected and the presence of viable purpupae inside the cocoons confirmed diapause. In February 1986, one more consignment of *C. kazak* was obtained and their progeny did not enter into diapause (henceforth called the non-diapausing population or NDP).

The TTS was formulated by combining and modifying the chilling[5] and acclimatization techniques[6]. This was followed by various laboratory trials. The cocoons were retained at room temperature (25 ± 2°C) and at relative humidity of 60 ± 2% for a month. To break diapause they were passed through the following temperatures (figure 1) 15°C (5 days) → 10°C (5 days) → 5°C (21 days) → 0°C (21 days) and reversed back through the same series to room temperature. To avoid any possible interference by light, the cocoons were kept in the BOD incubator under dark conditions.

Using TTS, the diapause was broken and *C. kazak* adults emerged (henceforth called the diapausing population or DP) from 50 to 83% of the treated cocoons in different replications in 13 ± 2