SAPOGENINS AT DIFFERENT PLOIDY LEVELS OF *ASPARAGUS*

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THE genus *Asparagus* of the family Liliaceae is of medicinal importance[1] due to its steroidal sapogenins which is used as precursors of many pharmacologically active steroids. Several species of the genus have been studied for sapogenin content[2-6], even then there are species which are still unexplored. As different species of *Asparagus* are in a polyploid series[7] with the basic chromosome number $n = 10$, the present investigation was undertaken to identify and compare the distribution of sapogenins in seven different species belonging to three ploidy levels[8].

Plants were grown under identical habitat conditions in the departmental garden, from which roots were collected during active growth period. Dried, powdered roots were hydrolyzed with 30% V/V hydrochloric acid for 4 hr, filtered and neutralized. The hydrolyzed root residue was then dried at 60°C and Soxhlet extracted with chloroform for 30 hr. The chloroform extract was concentrated and analyzed for sapogenin by chromatography.

The extract was applied to thin-layer plates precoated with silica gel G and developed with chloroform-acetone (80:20). Liebermann-Burchard reagent[9] was used as the detection reagent. Standard sapogenin samples were used along with the extracts.

A gas chromatograph (Hewlett Packard model 5730A) containing U-shaped steel column (20" × 3/16") with the stationary phase 10% UCW-982, 80–100 WAW-DMCS was used for sapogenin analysis. The column temperature was 240°C and N_2 was the carrier gas at a pressure of 3 kg/cm^2.

On the basis of TLC and GLC, diversity in distribution of sapogenin in different species of *Asparagus* was recorded (table 1). The three diploid species were not identical in their sapogenin distribution showing both sarsasapogenin and diosgenin. But the two tetraploids yielded sarsasapogenin and both the hexaploid species showed diosgenin. The isolation of sarsasapogenin form *A. cooperi* and diosgenin from *A. pyramidalis* and *A. robustus* has not been recorded so far as evidenced from previous literature.

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Table 1. *Distribution of sapogenins in different species of Asparagus*

Species	Somatic chromosome number	Sapogenin*
A. racemosus Willd.	20	S
A. plumosus Baker.	20	D
A. pyramidalis.	20	D
A. cooperi Baker.	40	S
A. falcatus Linn.	40	S
A. robustus Hort.	60	D
A. sprengeri Regel.	60	D

*S = Sarsasapogenin; D = Diosgenin

ON THE OCCURRENCE OF A RARE LICHEN FROM INDIA

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LITHOTHELIUM, a small and rare lichen genus consisting of three species, is known to be solely confined to

Figure 1. Habit.

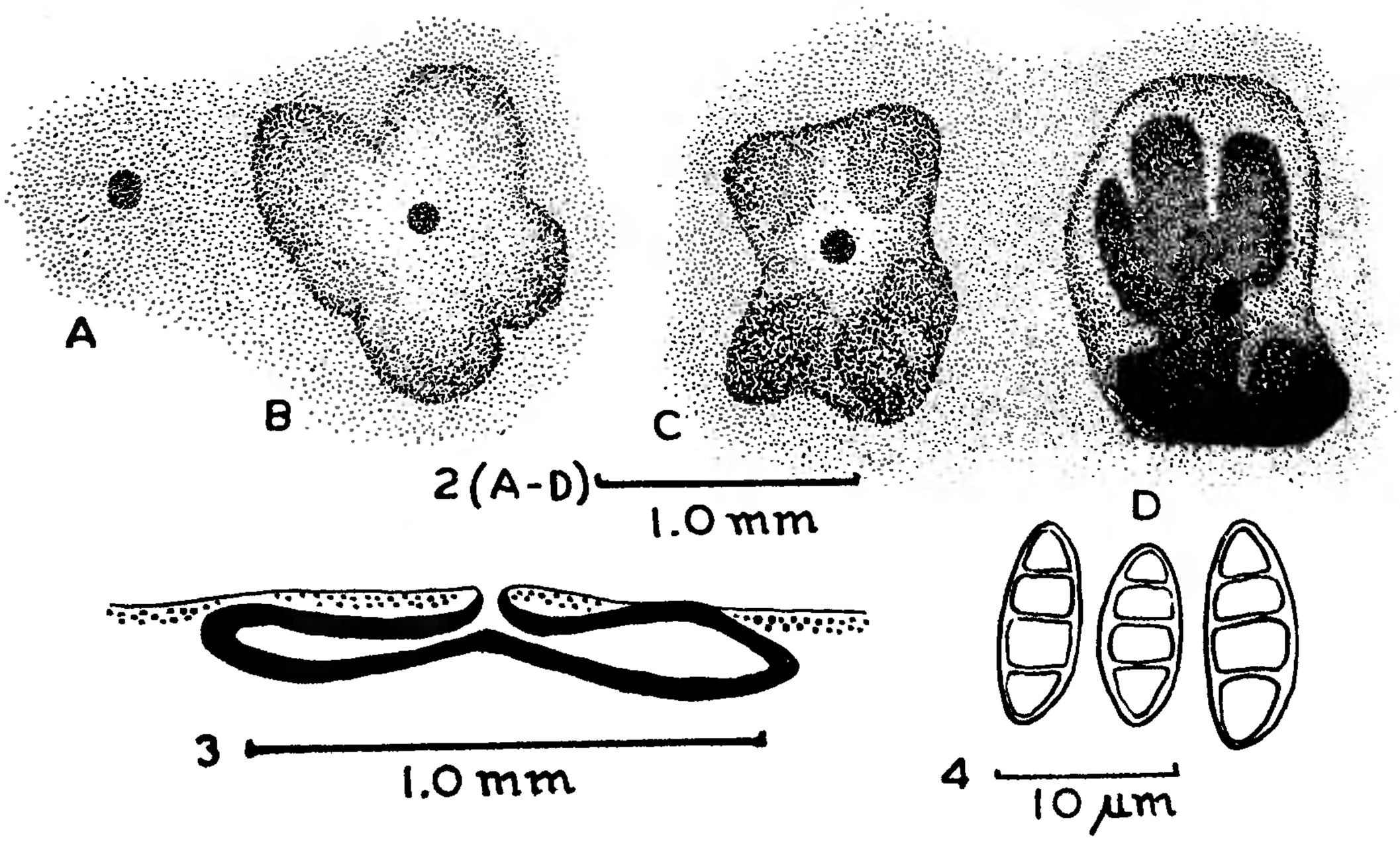
the neotropical region in the new world. It is rare in the sense that two of its species were discovered in the late nineteenth century and one in the early twentieth century. The present report comes to light after the lapse of about sixty years and that too from a far away region, which is a new record not only for the Indian lichen flora but for that of the entire old world.

Lithothelium indicum A. Singh sp. nov. (figures 1–4)

Thallus corticolous, albus vel cremeus, laevigatus. Stroma 4-6-carpa, 1.0–1.5 mm diam., immersa aut emergenta et parte superiora thallina non-algifera obducta, aut nuda et nigra, leviter convexa; ascocarpia radialia ordinata, horizontalia, pyriformia vel leviter oblonga, 0.4–0.5 mm diam., communis centralis ostiolis nigris; nucleus I+ vinose rubens, haud oleo inspersus; asci 8-spori; sporae uni- vel irregulater biseriatae, hyalinae, 3-septatae, ovatnae, cellulis cylindricis, 10–13 μm longae, 4–5 μm crassae.

Holotype: India: Arunachal Pradesh, Dibang Valley District, Roing, on way to Dhambukh, alt. ca. 500 m, Upreti L 81723 (LWG).

Figures 2–4. 2. Four stromata A–D (Ascocarps in A completely embedded in thallus, in B completely embedded in thalline verruca, in C covered with thalline corticiform layer, and in D naked), **3.** Vertical section of stroma, **4.** Spores.



Thallus corticolous, whitish or cream coloured, smooth, K-, C-, KC-, P-, hypothallus indistinct. Stroma 4-6-carpous, 1.0–1.5 mm in diameter, completely embedded in thallus or emerging in the form of slightly convex thalline verruca; ascocarps radially arranged, horizontally placed, 0.4–0.5 mm in diameter, pyriform to slightly elongate due to lateral pressure from adjacent ascocarps, completely embedded within the thallus or in the thalline verruca, or upper part covered with thalline corticiform layer or becoming altogether naked and black in colour, each opening by means of a lateral ostiolar canal into the common, centrally situated black ostiole; excipuloid tissue black and carbonaceous; nucleus I+ wine red, without oil globules; paraphyses simple; asci 8-spored, cylindrical to narrowly clavate, apex annalasceous type, 55–60 × 8–11 μm; spores uni- or generally irregularly biseriate in ascus, hyaline, 3-septate (4-celled), ovate, cells cylindrical, 10–13 × 4–5 μm.

Remarks: Out of the hitherto known three species of this genus, only one, *L. paraguayense* Müll Arg is corticolous, in which stroma is 2-4-carpous and spores are larger, measuring 17–20 × 6–8.5 μm (Müll Arg, 1888). In *L. cubanum* Müll Arg, a limestone growing species, every ascocarp of a stroma (numbering 2–6) opens to the exterior by its independent ostiole (Müll Arg, 1885), instead of opening through a common ostiole. In *L. violascens* Malme, a calcicolous species, the stroma is 0.6–0.8(–1.0) mm in diameter and is bicarpous, rarely 1-3-carpous (Malme 1924).

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APHID VECTORS OF POTYVIRUS ISOLATES INFECTING GROUNDNUT AROUND TIRUPATI

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VIRAL diseases of groundnut in India have been recently reviewed[1]. Among them peanut mottle (PMV) and peanut green mosaic (PGMV) viruses were reported as members of potyvirus group. Three virus isolates, collected from the farmers' groundnut fields around Tirupati, were identified as members of potyvirus group based on particle morphology, inclusions and serology[2]. Serologically these isolates reacted with PGMV and peanut stripe virus (PStV) but not with PMV antisera. The aphid vectors of these three groundnut virus isolates are reported here.

The virus isolates were established in insect-proof wire mesh house by grafting and single lesion isolation techniques, and subsequently maintained by frequent sap inoculation on *Arachis hypogaea* cv TMV-2. They were tentatively marked as non-systemic (NS), systemic necrosis (SN) and systemic mosaic (SM) isolates based on the symptoms incited by them on *Phaseolus vulgaris* cv local. In the sap-inoculated groundnut plants, they incited systemic chlorotic spots and vein chlorosis in the young leaves 10–12 days after inoculation. Symptoms that subsequently developed varied with the isolate: with NS-mosaic, large dark green and light green areas, leaf size and plant height apparently normal; with SM-mosaic, whitish areas over normal green colour, the size of the leaves and whole plant reduced; with SN-vein clearing, oak leafline pattern besides green stripes along the veins, stunted plants with small leaves.

Groundnut (cv TMV-2), raised in earthen pots 15 cm dia containing garden soil, at 2–3 leaf stage were used as test plants. Fully expanded groundnut leaves showing severe symptoms were chosen as the virus source for the aphids. Naturally occurring adults of *Aphis craccivora* from groundnut and cowpea, *A. gossypii* from brinjal, *Myzus persicae* from tobacco and *Toxoptera odinae* from *Aralia* sp were used as vectors of virus isolates. Some of the aphids of each type were directly fed on healthy test plants to check that they were not carrying other viruses. The aphids were given 1 hr pre-acquisition starvation in glass test tubes, and allowed to acquire the virus on virus source leaves for 5 min. The viruliferous aphids (10/test plant) were transferred to terminal unfolding leaves of test plants and were given a test feeding period of 24 hr. After 24 hr, aphids were killed by spraying with ROGOR insecticide. The plants were observed for infection and the suspected plants were checked by sap inoculation on groundnut and French bean.

Potyviruses with characteristic particle morphology induce diagnostic inclusions and are usually transmitted by aphids in non-persistant manner[3]. PMV and PGMV, reported from India as members of potyvirus group, are transmitted by aphids in non-persistant