



Jungermannia (Solenostoma) Appressifolia var. Nigrican from Tiger hills.

By: Dr. Panzy Singh

Jungermannia appressifolia var. *Nigrican* was firstly reported by Amakawa (1967) as *Jungermannia decolyana* var. *nigrican* later on Vana (1972) recognized it as *Jungermannia appressifolia* var. *Nigrican*.

The species belongs to the section *Desmorhiza* of subgenus *Solenostoma*. Plants small 8-10 mm long dark brown or blackish brown. Rhizoids decurrent along the stem, forming a distinct fascicle. Leaves orbicular, sinuately inserted, dorsally decurrent, cells thin walled, trigones acute to slightly bulging. Dioecious Male inflorescence intercalary, bracts 6-8 pairs. Perianth clavate, tetra plicate, perigynium absent.

JUNGERMANNIA (SOLENOSTOMA) APPRESSIFOLIA VAR. NIGRICANS (AMAK.) VANA

Jungermannia (Solenostoma) appressifolia var. *nigricans* (Amak.) Vana, Journ. Hatt. Bot. Lab. 36: 58 (1972).

Jungermannia decolyana var. *nigricans* Amak., Journ. Hatt. Bot. Lab. 30: 185 (1967).

(Plate-1, Figs. 1-31; Plate-2, Figs. 1-3)

Plants in turfs (5) 8-10 mm long, 0.5-1.1 mm wide, dark brown or blackish brown. Stem erect usually simple or rarely branched, branching lateral intercalary, 0.25 mm or 12-13 cells across the diameter, cortical cells in 2-3 layers thick-walled, 20-25 x 15-25 µm, medullary cells thin-walled, 15-25 x 15-25 µm. Subfloral innovation hardly or rarely present. Rhizoids numerous, decurrent along the stem forming a distinct fascicle, light brown. Leaves succubous, contiguous-imbricate, sinuately inserted, dorsally decurrent, appressed to the stem, slightly concave when flattened orbicular, entire, (0.47) 0.7-0.8 mm long, (0.4) 0.8-0.9 mm wide, cells 10.2-17.0 x 10.2-13.6 µm along the leaf margin, 13.6-23.8 x 13.6-17.0 µm in the middle and 27.2-40.8 x 17.0-23.8 µm at the base, walls thin, trigones acute-slightly bulging, cuticle smooth.

Dioecious. Male inflorescence intercalary, bracts 6-8 pairs, ventricose, 0.32-0.37 mm long, 0.32-0.42 mm wide. Perianth longly clavate, 1.3-1.8 (2.3) mm long, 0.8-1.1 mm wide, tetra-plicate, exerted mouth crenulate, beak prominent, perigynium undeveloped. Apical cells of the perianth 10.2-17.0 x 10.2-13.6 µm, cells in the middle 13.6-23.8 x 13.6-23.8 µm (isodiametric) and the basal cells 37.4-88.4 x 17.0-30.6 µm. Female bracts in one pair, similar to cauline leaves, 0.6-0.7 mm long, 0.8-0.9 mm wide. Sporophyte with foot, seta and capsule. Seta 7 cells across diameter or 0.25 mm, composed of two central cells surrounded by 3 circles of cells, inner most circle with 4 cells, middle with 13 cells and the outer most circle with 20 cells, *J. appressifolia* var. *nigricans* type. Capsule four valved, capsule wall bistratose, outer layer cells broader than long with nodular thickenings on radial and end walls, cells of the inner layer much longer than broad with semiannular incomplete or complete thickening bands. Spores 13.6-17.0 µm in diameter, brown. Elaters bispirate, 47.6-74.8 µm long, 17.0-20.4 µm wide with broad ends.

SEM of spores: The sporoderm architecture is papillate, both small and large papillae are inter mixed. The tri-radiate mark is well developed and uplifted on the proximal face, terminating near the equator (Plate- 2, Figs. 2,3). The papillae present on the tri-radiate mark are comparatively larger than those in the furrow.

Habitat: Terrestrial.

Type Locality: W. Bengal (Darjeeling area).

Distribution in India: Eastern Himalayas: W. Bengal- Darjeeling (Tiger Hill, Tonglu).

Range: India & Nepal: vorchimalaya, okhaldunga.

Characteristics of the species:

1. Plants small 8-10 mm long, dark brown or blackish brown.
2. Rhizoids decurrent along the stem, forming a distinct fascicle.
3. Leaves orbicular (0.4-0.8 mm long, 0.4-0.9 mm wide), sinuately inserted, dorsally decurrent, cells thin-walled, trigones acute to slightly bulging.
4. Dioecious. Male inflorescence intercalary, bracts 6-8 pairs.
5. Perianth clavate, tetra-plicate, perigynium absent.

Following specimens have been examined:

LWU 1353/69, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling, alt. ca 2134 m, Habitat: on soil in association with *Jungermannia* (*Solenostoma*) *apressifolia* Mitt. and *Jungermannia* (*Solenostoma*) *macrocarpa* Steph., Leg.: R. Udar & Party, Date: 31.12.1969, Det.: S.C. Srivastava & P. Singh.

LWU 1558/69, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling, alt. ca 2134 m, Habitat: on soil, Leg.: R. Udar and party, Date: 31.12.1969, Det.: S.C. Srivastava & P. Singh.

LWU 1800/69, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling (Tonglu), alt. ca 3070m, Habitat: on Soil in association with *Frullania* sp., Leg.: R. Udar & Party, Date: 4.1.1970, Det.: S.C. Srivastava & P. Singh.

LWU 2366/72, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling (Tiger Hill), ca 2590 m, Habitat: on soil in association with *Jungermannia* (*Solenostoma*) *apressifolia* Mitt., Leg.: R. Udar & Party, Date: 8.5.1972, Det.: S.C. Srivastava & P. Singh.

LWU 2725/72, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling, alt. ca 2134 m, Habitat: on soil in association with *Jungermannia* (*Solenostoma*) *purpurata* Mitt., Leg.: D. Kumar & V. Nath, Date: 31.12.1972, Det.: S.C. Srivastava & P. Singh.

LWU 2769/72, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling, alt. ca 2134 m, Habitat: on soil in association with *Jungermannia* (*Solenostoma*) *apressifolia* Mitt. and *Jungermannia* (*Solenostoma*) *purpurata* Mitt., Leg.: D. Kumar & V. Nath, Date : 31.12.1972, Det.: S.C. Srivastava & P. Singh.

LWU 8559/70, Bryophytes from Eastern Himalayas, *Jungermannia* (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana, Loc.: Darjeeling (Tonglu), alt. ca. 3070 m, Habitat: on soil in association with *Jungermannia* (*Solenostoma*) *subrubra* (Schiffn.) Steph. and *Jungermannia* (*Solenostoma*) *flagellaris* Amak., Leg.: R. Udar & Party, Date.: 4.1.1970, Det.: S.C. Srivastava & P. Singh.

Jungermannia (*Solenostoma*) *apressifolia* var. *nigricans* (Amak.) Vana has also smaller plants (8-10 mm) like the var. *minor*. However, it differs from the latter in having dark-blackish

brown plants (olive green to greenish brown in var. minor), orbicular, sinuately inserted, dorsally decurrent leaves (ovate, subtransversely inserted, dorsally decurrent leaves in var. minor) with relatively smaller leaf cells. Intercalary male inflorescence (bracts 6-8 pairs) and very rarely with subfloral innovation. *J. appressifolia* Mitt. differs from the var. *nigricans* in having larger (1-3 cm long), olive green to brown plants, orbicular to reniform, subtransversely inserted leaves (1.0-1.4 mm long, 1.3-2.0 mm wide), decurrent on both the sides, terminal or intercalary male inflorescence and subfloral innovations.

It is interesting that the elaters are relatively very large 102-136 μm long, 8.5-10.2 μm wide in *J. appressifolia* Mitt. and nearly so in var. *Minor* while in var. *nigricans* they (elaters) are very small, 47.6-74.8 μm long and 17.0-20.4 μm wide.



PLATE -1

Jungermannia (Solenostoma) appressifolia var. nigricans (Amak.) Vana

(Figs. 1-31)

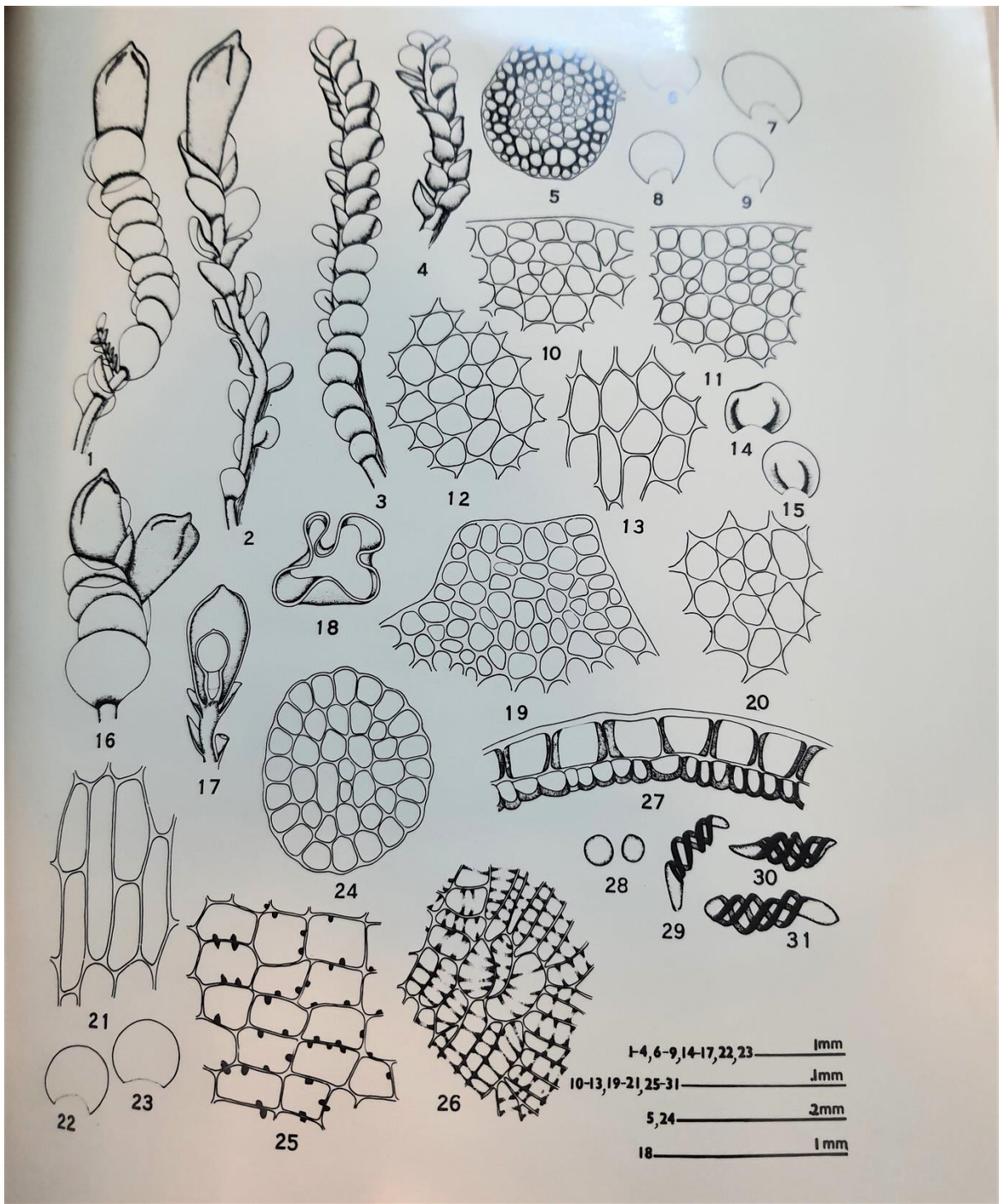


Fig. 1. Female plant (lateral view).

Fig. 2. Female plant (Dorsal view).

Figs. 3, 4. Male plants.

Fig. 5. Cross section of stem.

Figs. 6-9. Leaves.

Figs. 10, 11. Marginal cells of leaf.

Fig. 12. Median cells of leaf.

Fig. 13. Basal cells of leaf.

Fig. 14, 15. Male bracts.

Fig. 16. Apex of a female plant showing two perianths.

Fig. 17. L.S. perianth.

Fig. 18. T.S. perianth.

Fig. 19. Apical cells of perianth.

Fig. 20. Median cells of perianth.

Fig. 21. Basal cells of perianth.

Figs. 22, 23. Female bracts.

Fig. 24. Cross section of seta.

Fig. 25. Cells of outer layer of capsule wall.

Fig. 26. Cells of outer layer of capsule wall.

Fig. 27. T.S. capsule.

Fig. 28. Spores.

Figs. 29-31. Elaters.

Figs. 1-9, 11-23 drawn from LWU 8559/70.

Figs. 10, 24-31 drawn from LWU 1353/69.

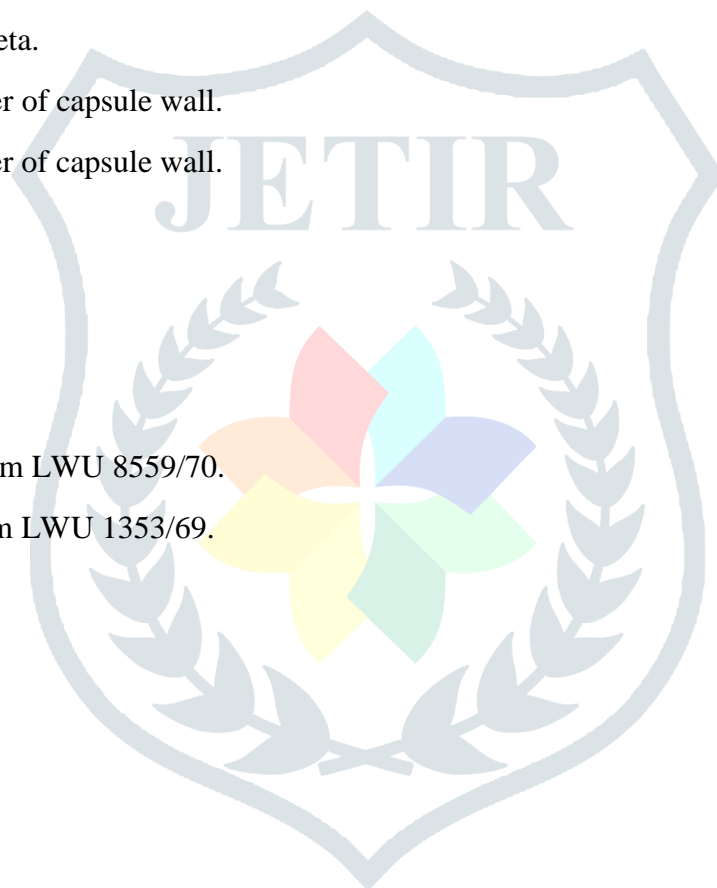


PLATE -2

Jungermannia (Solenostoma) appressifolia var. *nigricans* (Amak.) Vana

(Figs. 1-3)

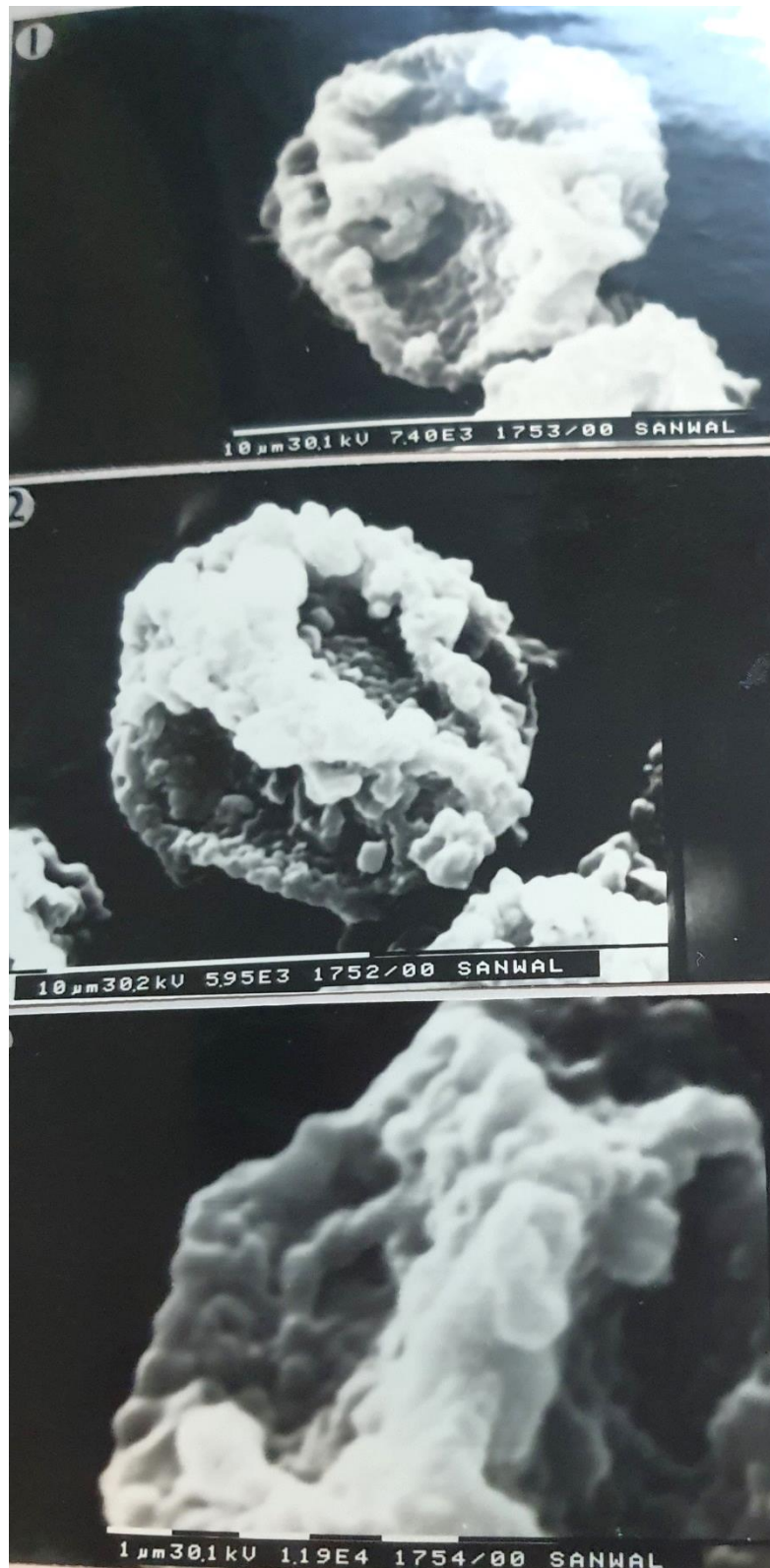


Fig. 1. Spore, proximal view.

Fig. 2. Spore, proximal view.

Fig. 3. Spore, proximal view (a portion enlarged).

(SEM from LWU 1353/69).