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GRASSES OF SHEVAROYS

S. KARTHIKEYAN
Botanical Survey of India, Pune

ABSTRACT

An account of 95 species of grasses comprising 52 genera, from Shevaroy hills of Salem District, Tamil Nadu, with a key for their identification, is presented.

INTRODUCTION

The Shevaroys are situated to the north-east of Salem town, Tamil Nadu at a distance of 26 km and lie between 11°45′ and 11°55′ N and between 78°10′ and 78°20′ E. This range of hills forms a compact block of about 20 km by 14 km in extent, with a plateau of about 150 sq. km.

The highest peaks are Sholaikaradu (about 1650 m), Sanyasikaradu (1594 m) and Kaveri peak (1558 m). Only a small portion of the fertile and undulating plateau in this hill block is under forest, most of the area being under coffee estates or other forms of cultivation (Harikrishnan, 1967).

GEOLOGY, ROCK AND SOIL

The Shevaroys are rich in archean charnockites (Krishnan, 1956). The soil is generally shallow, bouldery and poor in humus on the outer slopes of most forest areas, attaining a good depth only in some sheltered valleys.

CLIMATE

The south western monsoon is distinctly more active than the north eastern monsoon. There is rain practically every month from April to December and the rainfall is substantial from July to November. Even the relatively dry months of January to March are not entirely rainless (Harikrishnan, *l.c.*). The annual rainfall is 800-1200 mm and the annual mean maximum temperature is 29°C to 35°C and the annual mean minimum temperature is 18°C to 23°C.

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VEGETATION

The forests here are principally of the dry deciduous type. There are a few patches of subtropical hill forests on the plateau areas and upper slopes of the Shevaroys.

EARLIER WORK DONE

Subramanyam *et al.* (1960) and Ghatak (1965) gave a good account of pteridophytes of this area. Otherwise, the Flora of Shevaroys in general and grasses in particular have received scant attention.

From literature (Fyson, 1932 and Fischer, 1934) it is not easy to get a clear picture about the grasses of Shevaroys. Fyson (*l.c.*) listed only 3 species from this area and Fischer (*l.c.*) added another three. To fill up the gap in the knowledge about grasses of Shevaroys the author has undertaken the present study.

PRESENT WORK AND RESULTS

Collection was started on 24-9-1973 and completed on 3-10-1974. All the accessible areas in the plateau have been covered in all the seasons. A total of 95 species belonging to 52 genera have been collected and critically examined. Their group and tribe-wise break-up is as follows :

Groups	Genera	Species
Panicoideae		
Maydeae	1	1
Andropogoneae	16	25
Paniceae	16	35
Pooideae	19	34
Total	52	95

This study has revealed the occurrence of *Alloteropsis semialata* (R.Br.) Hitchc. which incidentally is a new record for Tamil Nadu. Formerly it had been reported only from Eastern Himalayas, Meghalaya, Assam, Manipur (Bor, 1960) and Karnataka (Ramamurthi, 1976).

Another interesting grass is *Arundinella setosa* Trin. var. *nilagiriana* Subba Rao & Kumari published recently (Subba Rao & Kumari, 1976).

The herbarium specimens have been deposited in *MH*.

KEY TO THE GENERA OF GRASSES OF SHEVAROYS

1. Spikelets 2-flowered, falling entire at maturity, usually with the upper floret hermaphrodite and the lower male or barren and if the latter, often reduced to the lemma or rarely the lemma entirely absent, all alike or more often differing in size, shape and structure, frequently dorsally compressed :
   2. Spikelets all bisexual or with male or barren and bisexual spikelets mixed in the same inflorescence and so arranged that a male or barren spikelet is near a bisexual spikelet or if unisexual then the lemma of the fertile floret indurated :
      3. Spikelets often paired, with one sessile and the other pedicelled, those of each pair similar or more often dissimilar, rarely solitary and all alike ; glumes as long as the spikelet and enclosing the florets, more or less rigid and firmer than the lemmas which are both hyaline or membranous ; upper lemma usually awned :
         4. Joints and pedicels not fused :
            5. Inflorescence spathed :
               6. Involucral spikelets absent :
                  7. Basal joint not bulbous ; panicles much branched ; racemes paired, one sessile, the other peduncled ; spikelets binate, one sessile the other pedicelled ; upper lemma of fertile spikelets 2-fid or lobed, awned or muticous .. *Cymbopogon*
                  7′. Basal joint bulbous ; panicles compound ; spikelets in threes at the tips of the branchlets, subtended by a boat-shaped bract, 1 sessile and 2 pedicelled ; upper lemma deeply 2-fid, and geniculately awned from the sinus .. *Apluda*
               6′. Involucral spikelets present .. *Themeda*
            5′. Inflorescence not spathed :
               8. Spikelets 2-nate :
                  9. Pedicelled spikelet reduced or absent :
                     10. Upper lemma of sessile spikelet awned from the base .. *Arthraxon*
                     10′. Upper lemma of sessile spikelet 2-fid or toothed, awned from the sinus .. *Sorghum*
                  9′. Pedicelled spikelets well developed :
                     11. Inflorescence a solitary raceme :
                        12. Upper glume of sessile spikelet aristate or awned ; racemes not terete :
                           13. Lower glume of sessile spikelet deeply grooved, 2-toothed or cuspidate .. *Sehima*
                           13′. Lower glume of sessile spikelet rounded on the back, truncate at apex .. *Pogonatherum*
                        12′. Upper glume of sessile spikelet obtuse ; racemes terete .. *Heteropogon*
                     11′. Inflorescence of digitate or fascicled, spiciform racemes or panicles :
                        14. Upper lemma of sessile spikelet awned :
                           15. Lower sheaths glabrous :
                              16. Upper lemma of sessile spikelets well developed, 2- fid or lobed, awned from the sinus :
                                 17. Lower glumes not channelled ; joints and pedicels flattened or sub-concave on the inner side, stout .. *Ischaemum*
                                 17′. Lower glumes dorsally longitudinally channelled ; joints and pedicels slender, long-ciliate .. *Microstegium*
                              16′. Upper lemma of sessile spikelets reduced to the hyaline stipe of the awn .. *Dichanthium*
                           15′. Lower sheaths red-brown tomentose at the base ; hairs of racemes usually reddish-brown ; culms densely brown-silky for a short distance below the inflorescence .. *Eulalia*
                        14′. Lemmas muticous ; inflorescence a terminal spiciform panicle ; spikelets binate, one short- the other long- pedicelled ; glumes covered by long silky hairs from the callus and from the lower half of the glumes .. *Imperata*
               8′. Spikelets 3-nate, one sessile and 2-pedicelled .. *Chrysopogon*
         4′. Joints and pedicels fused, spikelets 2-nate, one sessile, the other pedicelled :

18. Herbs less than 1 m high ; racemes spiciform in axillary and terminal fascicles ; joints and spikelets uniform ; lower glume of the sessile spikelets cartilaginous, subglobose, pitted .. *Hackelochloa*

18′. Herbs more than 1 m high ; racemes spiciform, terminal ; joints and spikelets towards the apex reduced and forming a tail like appendage ; lower glume of sessile spikelet narrowly winged on both sides near the apex, upper glumes on the keel and the lower glume of pedicelled spikelets on one side .. *Rottboellia*

3′. Spikelets solitary or paired, more or less similar ; glumes usually membranous, the lower usually smaller or sometimes suppressed ; lower lemma often resembling the upper glume in texture ; upper lemma papery to very tough and rigid, usually muticous (shortly aristate in *Alloteropsis*) :

19. Glumes or lemmas aristate or awned :

20. Upper lemma muticous :

21. Lower glume muticous ; upper glume emarginate or 2-lobed, aristate from the sinus; inflorescence a compound panicle; branches and pedicels capillary, latter discoid and hairy at the tips ; spikelets clothed with pinkish hairs .. *Rhynchelytrum*

21′. Lower glume, upper glume and lower lemma awned ; racemes distant, panicled ; branches and spikelets not as above .. *Oplismenus*

20′. Upper lemma shortly aristate, lower lemma muticous ; margins of upper glume densely ciliate or winged .. *Alloteropsis*

19′. Glumes and lemmas muticous :

22. Spikelets subtended by 1-many bristles :

23. Upper lemma membranous to chartaceous, bristles not rigid .. *Pennisetum*

23′. Upper lemma boat shaped, crustaceous, often transversely rugose or striate ; bristles more or less rigid .. *Setaria*

22′. Spikelets not subtended by bristles :

24. Lower glume reduced or absent :

25. Spikelets elliptic, elliptic -oblong or elliptic-lanceolate :

26. Leaves linear or narrowly linear-lanceolate, acute or acuminate ; lower glume minute, scale-like or hyaline or sometimes absent ; upper lemma with flat hyaline margins .. *Digitaria*

26′. Leaves linear-oblong, obtuse at apex ; lower glume absent ; upper lemma with narrow in-rolled margins .. *Axonopus*

25′. Spikelets suborbicular, obtuse .. *Paspalum*

24′. Lower glume developed :

27. Inflorescence of panicles :

28. Panicles much divided, open :

29. Spikelets gibbous, strongly laterally compressed :

30. Spikelets about 2 mm long ; glumes hairy or glabrous .. *Cyrtococcum*

30′. Spikelets about 5 mm long ; upper glume boat shaped, gibbous below, 7-nerved, with rows of transparent spots between, naked or with hooked bristles from the spots .. *Pseudechinolaena*

29′. Spikelets not gibbous, more or less dorsiventrally compressed *Panicum*

28′. Panicle cylindric, spiciform ; spikelets ovoid, usually turgid ; upper glume with a saccate base, 5-13 nerved .. *Sacciolepis*

27′. Inflorescence of several racemes on a common axis :

31. Lower glume turned away from the axis :

32. All racemes as long as or longer than the internodes :

33. Leaves subcordate, upper lemma cuspidate ; spikelet flattened .. *Urochloa*

33′. Leaves rounded ; upper lemma obtuse or apiculate ; spikelets crowded, rather turgid .. *Echinochloa*

32′. Racemes usually, the lower always, shorter than the internodes; spikelets ovoid or subglobose ; lower glume broadly ovate or suborbicular, rounded .. *Paspalidium*

31′. Lower glume turned towards the axis ; rhachis trigonous or terete ; lower glume much shorter than the upper .. *Brachiaria*

2′. Spikelets unisexual ; female spikelet enclosed in a ovoid basal stony, polished bract through which the rhachis grows out and bears the male spikelets above ; culms 2-3 m high, usually near streams .. *Coix*

1′. Spikelets 1- to-many flowered, breaking up at maturity above the more or less persistent glumes, or if falling entire, then not- 2- flowered, with the lower floret male or barren and the upper bisexual, usually more or less laterally compressed or terete :

34. Lemmas or glumes cuspidate, aristate or awned :

35. Spikelets 1-flowered :

36. Inflorescence a panicle ; lemmas awned :

37. Awns of lemma with 3 setae ; lemma involute, more or less cylindric .. *Aristida*

37′. Awns of lemma without setae ; lemma narrowly lanceolate .. *Garnotia*

36′. Inflorescence a solitary terminal raceme ; lemmas muticous ; glumes tapering into long capillary awns ; awns 2 or more times as long as the glumes ; spikelets subulate *Perotis*

35′. Spikelets 2-many flowered :

38. Inflorescence of solitary or umbelled spikes :

39. Spikes umbelled ; glumes not toothed :
40. Perfect floret 1, empty florets above the perfect floret 1-2 ; lemmas awned .. *Chloris*
40'. Floret 3-5, all bisexual or the uppermost more or less imperfect ; rhachis prolonged beyond the spikelets as a sharp point ; upper glume mucronate or cuspidate ; lemmas cuspidate .. *Dactyloctenium*
39'. Spikes solitary, terminal ; lower glume usually lodged in a furrow of the rhachis, 1- toothed or lobed on one side ; lemmas 4-fid, 2 inner lobes short, aristate from the sinus, 2 outer lobes short, aristate .. *Tripogon*
38'. Inflorescence a panicle .. *Arundinella*
34'. Lemmas and glumes muticous :
41. Spikelets 1-flowered :
42. Glumes, at least the lower reduced :
43. Inflorescence a panicle ; spikelets solitary ; glumes absent or reduced to an obscure, hyaline, entire or 2-lobed rim ; keels of lemma and palea bristly ciliate ; usually near water sources or in marshy places .. *Leersia*
43'. Inflorescence a solitary, spiciform raceme ; spikelets usually 2, facing each other ; lower glume reduced ; upper glume narrowly lanceolate, acuminate, 5- ribbed, ribs with hooked spinules ; usually in sandy places .. *Tragus*
42'. Both glumes well developed :
44. Inflorescence of solitary or umbellate spikes :
45. Spikes 2-8, umbelled ; leaves flat or complicate .. *Cynodon*
45'. Spikes solitary, slender, usually curved ; leaves filiform, convolute, sub-setaceous .. *Microchloa*
44'. Inflorescence a spiciform or effuse panicle .. *Sporobolus*
41'. Spikelets 2-many flowered :
46. Inflorescence of spikes :
47. Spikes solitary ; spikelets secund ; leaves convolute or complicate, puberulous above; keels of paleas often distinctly winged .. *Eragrostiella*
47'. Spikes umbelled or digitate ; spikelets imbricate ; leaves flat ; paleas not winged *Eleusine*
46'. Inflorescence of panicles :
48. Spikelets 2-flowered :
49. Lemmas obtuse or acute, not conspicuously veined ; paleas not long ciliate ; leaves not petiolate :
50. Panicles lax ; spikelets many ; rhachilla not much elongated ; leaves ovate to ovate-lanceolate .. *Isachne*
50'. Panicle spiciform, spikelets few ; rhachilla elongate between the lemmas ; leaves filiform or linear ; glumes suborbicular ; lemmas dissimilar, lower longer than the upper .. *Coelachne*
49.' Lemmas acuminate or caudate-acuminate, hairy below the middle, several veined, veins conspicuous ; paleas long-ciliate ; leaves flat or convolute, narrowed into a long channelled quasi petiole ; panicles effuse .. *Zenkeria*
48'. Spikelets many flowered ; inflorescence of open or contracted panicles ; spikelets strongly laterally compressed .. *Eragrostis*

KEY TO THE SPECIES AND ENUMERATION

[The genera (and species under them) have been arranged alphabetically and not according to group or tribe].

[The distribution of the following species either in Western/Eastern or both the Ghats has been indicated by using signs as follows to save space :

*occur in both Eastern & Western Ghats— 69 species—i.e., 72.6% of the total.

†occur only in Western Ghats— 19 species—i.e., 20% of the total.

‡occur only in Eastern Ghats— 2 species—i.e., 2.1% of the total.]

ALLOTEROPSIS J. S. Presl ex C. B. Presl

1. Base not thick and not covered with silky bases of sheaths .. *A. cimicina*
1'. Base very thick and covered with silky bases of old sheaths .. *A. semialata*

***A. cimicina** (L.) Stapf

Herb ; in humus soil in open ; rather sparse ; Ghat Road, Yercaud to Salem ; ± 458 m ; 15-11-73 ; SK 41400.

A. semialata (R. Br.) Hitche.

Herb, ±0.3 m high ; in humus soil in open areas ; abundant ; Orchidarium area, Sanyasimalai R. F., Yercaud ; ± 1370 m ; 25-5-74 ; SK 41431.

APLUDA L.

***A. mutica** L. (*A. aristata* L.)

Herb about 1 m high ; in humus soil under partial shade, along the edges of the river ; common ; Kongampallam river bed, Yercaud ; ±1220 m ; 24-9-73 ; SK 41303.

ARISTIDA L.

1. Glumes muticous .. *A. depressa*
1'. Glumes aristate .. *A. setacea*

***Aristida depressa** Retz.

Herb ; in gravelly soil in open ; common ; Ghat Road, Yercaud to Salem ; ±920 m ; 11-10-73 ; SK 41342.

***A. setacea** Retz.

Herb about 0.75 m high ; in humus soil in open ; abundant ; Ghat Road, Yercaud to Salem ; ±450 m ; 15-11-73 ; SK 41397 ; Elaipallam, Yercaud ; ±450 m ; 12-12-73 ; SK 41428.

ARTHRAXON P. Beauv.

1. Lower glume of sessile spikelets 2-keeled, keels with a double row of tubercles, gradually turning into spinules at the apex ; leaves ovate to oblong-lanceolate ; joints compressed, densely ciliate; pedicelled spikelet reduced to glumes or a pedicel .. *A. depressus*
1'. Lower glume of sessile spikelets not keeled, nerves minutely scaberulous ; leaves linear to elliptic-lanceolate ; joints sub-terete, ciliate on one side only ; pedicels absent .. *A. hispidus*

A. depressus Stapf ex C.E.C. Fischer

Herb ; in humus soil in open ; rather rare ; Ghat Road, Yercaud to Salem ; ±1340 m ; 11-10-73 ; SK 41328 ; way to Bauxite Mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41347.

A. hispidus (Thunb.) Makino

[*A. quartinianus* (A. Rich.) Nash]

Herb ; in humus soil in open ; abundant ; Chencaud Road, Yercaud ; ±1380 m ; 8-11-73 ; SK 41379.

ARUNDINELLA Raddi

1. Base of the plant glabrous ; upper lemma without setae :
   2. Spikelets very bristly from tubercle-based hairs ; rarely glabrous (*A. metzii*) ; leaves not rounded or subcordate at base, not drying yellow :
      3. Panicles compact, spikelets crowded .. *A. ciliata*
      3'. Panicles effuse, spikelets not crowded .. *A. metzii*
   2'. Spikelets glabrous or with few short hairs ; panicles open ; leaves rounded or subcordate at base, drying yellowish-green .. *A. purpurea*
1'. Base of the plant woolly ; upper lemma with 2 apical setae ; panicles effuse .. *A. setosa* var. *nilagiriana*

***A. ciliata** (Roxb.) Nees ex Miq.

(*A. holcoides* non Trin.)

Herb ; in humus soil in crevices of rocks near moist places ; common ; Ghat Road, Yercaud to Salem ; ±1400 m ; 11-10-73 ; SK 41327.

A. metzii Hochst. ex Miq.

Herb about 0.75 m high ; in humus soil near water courses ; rare ; Nagalur Road, Yercaud ; ± 1400 m ; 24-9-74 ; SK 41436.

†**A. purpurea** Hochst. ex Steud.

(*A. fuscata* Hk. f. non Nees ex Buese)

Herb about 0.5 m high ; in open in humus soil near water courses ; not common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41351.

†**A. setosa** Trin. var. **nilagiriana** Subba Rao & Kumari ..

Herb about 0.4 m high ; in open, in humus soil mixed with gravels ; not common ; Kongampallam, Yercaud ; ± 1300 m ; 24-9-73 ; SK 41317 ; way to Bauxite Mines, Yercaud ; ± 1470 m ; 19-10-73 ; SK 41354.

ARUNDO L.

A. donax L.

Herb about 3 m high ; in humus soil in open near water courses ; never observed in flower during October 72 to March 75 ; abundant ; Ghat Road, Yercaud to Salem ; ± 1060 m ; 15-11-73 ; SK 41363 (Cult. ?).

AXONOPUS P. Beauv.

A. compressus (Sw.) P. Beauv.

Herb, in humus soil ; commonly used as a turf grass in and around Yercaud ; Chencaud Road, Yercaud ; ± 1370 m ; 8-11-73 ; SK 41378.

BRACHIARIA Griseb.

1. Racemes spreading :
   2. Spikelets about 2 mm long ; upper glume obovate, obtuse, gibbous .. *B. semiundulata*
   2'. Spikelets 2.5 to 3 mm long ; upper glume broadly oblong, apiculate, never gibbous .. *B. ramosa*
1'. Racemes erect, appressed to the rhachis ; spikelets elliptic to broadly oblong ; lower glume glabrous, upper-pilose .. *B. eruciformis*

***B. eruciformis** (J. E. Sm.) Griseb.

Herb ; in humus soil in shade ; weed in coffee plantations ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41362.

***Brachiaria ramosa** (L.) Stapf

Herb; in humus soil in road cuttings in open; not common; Ghat Road, Yercaud to Salem; ± 915 m; 15-11-73; SK 41389.

†**B. semiundulata** (Hochst. ex A. Rich.) Stapf

Herb; in open; common; Kongampallam, Yercaud; ± 1220 m; 24-9-73; SK 41310; in road cuttings in gravelly soil; common; Chencaud Road, ± 1370 m; 8-11-73; SK 41382.

Chloris Sw.

1. Empty lemma solitary, reduced to a fine arista .. *C. dolichostachya*
1′. Empty lemmas 2, lower obovate, upper subglobose, both acistate .. *C. barbata*

***C. barbata** Sw.

Herb; in loamy soil; sparse; Elaipallam, Yercaud; ± 305 m; 12-12-73; SK 41430.

***C. dolichostachya** Lagasca

(*C. incompleta* Roth)

Herb about 1 m high; in humus soil on road cuttings; abundant; Ghat Road, Yercaud to Salem; ± 460 m; 15-11-73; SK 41395.

Chrysopogon Trin.

1. Pedicels half as long as the sessile spikelets or longer .. *C. orientalis*
1′. Pedicels less than half as long as the sessile spikelet .. *C. fulvus*

***C. fulvus** (Spr.) Chiov.

(*C. montanus* Trin. ex Spr.)

Herb; in gravelly soil on road cuttings; abundant; Ghat Road, Yercaud to Salem; ± 305 m; 15-11-73; SK 41407.

***C. orientalis** (Desv.) A. Camus

Herb about 1 m high; in humus soil in crevices of rocks in open; common; Ghat Road, Yercaud to Salem; ± 1280 m; 11-10-73; SK 41331; Sanyasimalai Reserve Forest, Yercaud; ± 1430 m; 6-11-73; SK 41369; ± 1400 m; 22-11-73; SK 41408.

Coelachne R. Br.

***C. simpliciuscula** (Wt. & Arn. ex Steud.) Munro ex Benth.

(*C. pulchella* R. Br. var. *simpliciuscula* Hook. f.)

Small herb; in marshy places in open; abundant; Tipperary, Yercaud; ± 1400 m; 12-12-73; SK 41424.

Coix L.

***C. lacryma-jobi** L.

Herb about 3 m high; in marshy places near water courses in open; abundant; way to Kiliyur waterfalls, Yercaud; ± 1370 m; 23-11-73; SK 41414.

Cymbopogon Spreng.

1. Upper lemma of fertile spikelets awned; lowest pedicel of sessile racemes swollen and connate to the base of the rhachis:
   2. Leaves linear-lanceolate, sub-cordate or amplexicaul, caudate-acuminate .. *C. martinii*
   2′. Leaves narrowly linear, rounded at base, acuminate at apex .. *C. caesius*
1′. Upper lemma of fertile spikelets muticous; all pedicels similar, not swollen .. *C. nardus*

***C. caesius** (Nees ex Hook. & Arn.) Stapf

Herb about 1.5 m high; in open gravelly soil; abundant; Puliyur, Yercaud; ± 1245 m; 5-12-73; SK 41422.

***C. martinii** (Roxb.) Watson

Herb about 1.5 m high; in open in gravelly soil; abundant; Ghat Road, Yercaud to Salem; ± 460 m; 15-11-73; SK 41399; Gundur, Yercaud; ± 915 m; 12-12-73; SK 41425 & 41426; Sanyasimalai Reserve Forest, Yercaud; ± 1400 m; 3-10-74; SK 41437.

†**C. nardus** (L.) Rendle

Herb about 1.5 m high; in humus soil in rock crevices in open; leaves scented; common; Ghat Road, Yercaud to Salem; ± 1160 m; 11-10-73; SK 41341.

Cynodon Rich.

1. Lemmas longer than the upper glumes; hairs on the keels of lemma not clavate .. *C. dactylon*
1′. Lemmas shorter or equal to the upper glumes; hairs on the keel of lemma clavate .. *C. barberi*

‡**C. barberi** Rang. & Tad.

Herb; in gravelly soil, under shade; abundant; Ghat Road, Yercaud to Salem; ± 305 m; 15-11-73; SK 41406.

***Cynodon dactylon** (L.) Pers.

Herb ; in reddish gravelly soil ; common ; way to Bauxite mines, Yercaud ; ± 1460 m ; 19-10-73 ; SK 41355 ; Kaveri Peak Estate—way to Bauxite mines, Yercaud ; ± 1400 m ; 24-7-1974 ; SK 41434.

CYRTOCOCCUM Stapf

1. Pedicels short, as long as the spikelets :
   2. Spikelets few, hispid .. *C. trigonum*
   2′. Spikelets numerous, glabrous, rarely softly puberulous .. *C. oxyphyllum*
1′. Pedicels very long, much longer than the spikelets .. *C. patens*

***C. oxyphyllum** (Steud.) Stapf

Herb ; in open, in humus soil ; common ; Ghat Road, Yercaud to Salem ; ± 1220 m ; 11-10-73 ; SK 41336.

†**C. patens** (L.) A. Camus

Herb ; in humus soil on road sides ; common ; Ghat Road, Yercaud to Salem ; ± 1220 m ; 11-10-73 ; SK 41337 ; below Pagoda Point, Yercaud ; ± 1220 m ; 8-11-73 ; SK 41384 ; Nagalur Road, Yercaud ; ± 1370 m ; 22-11-73 ; SK 41412 ; Kaveri Peak Estate, Yercaud ; ± 1400 m ; 24-7-74 ; SK 41435.

***C. trigonum** (Retz.) A. Camus

Herb ; in humus soil, under shade ; common ; Chencaud Road, Yercaud ; ± 1400 m; 8-11-73 ; SK 41375.

DACTYLOCTENIUM Willd.

***D. aegyptium** (L f.) P. Beauv.

Herb ; in gravelly soil near wet places ; abundant ; Ghat Road, Yercaud to Salem ; ± 760 m ; 15-11-73 ; SK 41393.

DICHANTHIUM Willemet

1. Inflorescence of digitate, spiciform racemes ; usually the lower glumes pitted :
   2. Lower glumes usually with a median pit, rarely 2, on the back above the middle, occasionally quite smooth; leaves mostly aggregated near the base .. *D. pertusum*
   2′. Lower glume of sessile spikelets 1-pitted and of pedicelled spikelets 2-4-pitted ; leaves mostly cauline .. *D. insculptum*
1′. Inflorescence of much divided panicles ; lower glumes smooth, glabrous, puberulous or villous throughout or only below the middle ; nodes densely bearded ; callus of sessile spikelets densely villous .. *D. huegeli*

***D. huegelii** (Hack.) Jain & Deshpande

[*Capillipedium huegelii* (Hack.) Stapf]

Herb about 0.75 m high ; in open, in humus soil, common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41345.

†**D. insculptum** (A. Rich.) W. D. Clayton

[*Bothriochloa insculpta* (Hochst.) A. Camus]

[*Amphilophis insculpta* (Hochst.) Stapf]

Herb ; in humus soil in crevices of rocks ; common ; Ghat Road, Yercaud to Salem ; ± 1340 m ; 11-10-73 ; SK 41330 ; Sanyasimalai Reserve Forest, Yercaud ; ± 1430 m ; 6-11-73 ; SK 41366.

†**D. pertusum** (L.) W. D. Clayton

[*B. pertusa* (L.) A. Camus]

[*Amphilophis pertusa* (L.) Nash ex Stapf]

Herb about 0.5 m high ; in humus soil under shade ; common ; Sanyasimalai Reserve Forest, Yercaud ; ± 1430 m ; 6-11-73 ; SK 41364 ; Furz Bungalow, Chencaud Road, Yercaud ; ± 1370 m ; 8-11-73 ; SK 41381.

DIGITARIA Haller

1. Inflorescence of panicles :
   2. Panicles large, effuse ; branches and pedicels capillary ; glumes minute or one or both absent ; lower lemma glabrous or hairy between the nerves .. *D. tomentosa*
   2′. Panicles pyramidal, compact ; lower branches opposite or whorled ; lower glume absent ; upper glume and lower lemma several-ribbed, hairy between the ribs .. *D. wallichiana*
1′. Inflorescence of racemes :
   3. Hairs on the spikelets never verrucose :
      4. Hairs clavate :
         5. Rhachis flat, narrowly winged ; pedicels 2-3-nate with a tuft of hairs at the tips .. *D. ternata*
         5′. Rhachis flexuous, trigonous, capillary ; pedicels 2-5-nate, without hairs at the tips .. *D. abludens*
      4′. Hairs not clavate :
         6. Rhachis flat, margins winged ; racemes conjugate, digitate or a few false whorls in succession .. *D. ciliaris*

6′. Rhachis trigonous, not winged ; racemes with interrupted loose groups of spikelets .. *D. griffithii*
3′. Hairs on spikelets verrucose .. *D. longiflora*

***Digitaria abludens** (R. & S.) Veldk.
(*D. pedicellaris* Prain)
Herb about 0.4 m high ; in humus soil in open in crevices of rocks near streams ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41314.

***D. ciliaris** (Retz.) Koel.
(*D. marginata* Link)
Herb about 0.3 m high ; in open grasslands ; common ; Kongampallam, Yercaud ; ± 1250 m ; 24-9-73 ; SK 41318 ; Ghat Road ; ± 1340 m ; 11-10-73 ; SK 41322 ; Way to Bauxite mines, Yercaud ; ± 1465 m ; 19-10-73 ; SK 41356 ; Ghat Road, Yercaud to Salem ; ± 915 m ; 15-11-73 ; SK 41386.

†**D. griffithii** (Hk. f.) Henr.
Herb about 1 m high ; in shade in humus soil ; common ; in coffee plantations ; Kongampallam, Yercaud ; ± 1250 m ; 24-9-73 ; SK 41320 ; Ghat Road, Yercaud to Salem ; ± 400 m ; 15-11-73 ; SK 41403.

***D. longiflora** (Retz.) Pers.
Herb about 0.3 m high ; in humus soil in rock crevices ; common ; Sanyasimalai Reserve Forest, Yercaud ; ± 1430 m ; 6-11-73 ; SK 41368.

***D. ternata** (A. Rich.) Stapf
Herb about 0.5 m high ; in humus soil under shade ; common ; Kongampallam, Yercaud ; ± 1320 m ; 24-9-73 ; SK 41306.

‡**D. tomentosa** (Koenig ex Willd.) Henr.
(*Panicum subeglume* Trin.)
Herb ; in open, in humus soil in rock crevices ; rare ; Ghat Road, Yercaud to Salem ; ± 400 m ; 15-11-73 ; SK 41402.

†**D. wallichiana** (Wt. & Arn. ex Steud.) Stapf
Herb about 0.3 m high ; in humus soil in disturbed areas ; common ; way to Bauxite mines, Yercaud ; ± 1460 m ; 19-10-73 ; SK 41358 ; Nagalur Road—Yercaud ; ± 1400 m ; 22-11-73 ; SK 41413.

ECHINOCHLOA P. Beauv.

***E. colonum** (L.) Link
Herb ; in wet places, in humus soil ; abundant ; Ghat Road, Yercaud to Salem ; ± 770 m ; 15-11-73 ; SK 41392.

ELEUSINE Gaertn.

***E. indica** (L.) Gaertn.
Herb ; in humus soil in open ; common ; Ghat Road ; ± 1250 m ; 11-10-73 ; SK 41335.

ERAGROSTIELLA Bor

***E. bifaria** (Vahl) Bor
[*Eragrostis bifaria* (Vahl) Wt. ex Steud.]
Herb ; in humus soil in open ; common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41343 ; Sanyasimalai Reserve Forest, Yercaud ; ± 1430 m ; 6-11-73 ; SK 41367.

ERAGROSTIS P. Beauv.

1. Lemmas falling off from the apex downwards ; rhachilla more or less jointed :
2. Panicles thyrsiform, lemmas obtuse or emarginate .. *E. aspera*
2′. Panicles linear, contracted to oblong and effuse, lemmas obtuse or acute *E. tenella*
1′. Lemmas falling off from the base upwards ; rhachilla tough, persistent :
3. Spikelets linear or linear-oblong, lateral nerves of lemmas not prominent :
4. Leaves and spikelets dark green :
5. Mouths of sheaths naked ; lower glume much smaller than the upper glume .. *E. tenuifolia*
5′. Mouths of sheaths bearded ; glumes more or less subequal *E. nigra*
4′. Leaves and spikelets glaucous, usually near water sources .. *E. gangetica*
3′. Spikelets ovate to ovate-oblong, usually purplish ; lemmas mucronate, their lateral nerves prominent, finely pitted .. *E. unioloides*

***E. aspera** (Jacq.) Nees
Herb about 0.5 m high ; in gravelly soil in open ; abundant ; Gundur, Yercaud ; ± 915 m ; 12-12-73 ; SK 41427.

***E. gangetica** (Roxb.) Steud.
Herb about 0.75 m high ; in humus soil in crevices of rocks in the middle of the stream (usually found to occur near and around water sources) ; common ; Kongampallam river-Yercaud ; ± 1220 m ; 24-9-73; SK 41301.

***Eragrostis nigra** Nees ex Steud.

Herb about 0.5 m high ; in humus soil in crevices of rocks, in disturbed areas ; common ; way to Bauxite mines, Yercaud ; ± 1460 m ; 19-10-73 ; SK 41357.

***E. tenella** (L.) P. Beauv. ex R. & S.
(*E. plumosa* Link)

Herb ; in humus soil in open ; Ghat Road, Yercaud to Salem ; ± 1070 m ; 15-11-73 ; SK 41385.

***E. tenuifolia** Hochst. ex Steud.

Herb ; in gravelly soil, in open ; Ghat Road, Yercaud to Salem ; ± 1340 m ; 11-10-73 ; SK 41324.

***E. unioloides** (Retz.) Nees ex Steud.

Herb about 0.4 m high ; in open near marshes in the edges of the stream ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41319.

EULALIA Kunth

***E. phaeothrix** (Hack.) O. Ktze.

Herb about 1 m high ; in humus soil in rock crevices in open ; not common ; way to Bauxite mines, Yercaud ; ± 1460 m ; 19-10-73 ; SK 41353.

GARNOTIA Brongn.

1. Leaves basal, rigid, trigonous in cross section, margins scabrid ; margins of sheaths woolly ; culms tufted ; nodes glabrous ; lower glume cuspidate ; upper muticous .. *G. elata*
1'. Leaves scattered, flat ; margins of sheaths not woolly ; culms not tufted, nodes hairy ; lower glume muticous, upper cuspidate .. *G. tenella*

***G. elata** (Arn. ex Miq.) Janowski
(*G. scoparia* non Thw.)

Herb ; leaves ± 1.5 m long ; in humus soil in crevices of rocks in open ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41308.

***G. tenella** (Arn. ex Miq.) Janowski
(*G. stricta* non Brongn.)

Herb ; in humus soil in the crevices of wet rocks ; rare ; Ghat Road, Yercaud to Salem ; ± 760 m ; 15-11-73 ; SK 41391.

HACKELOCHLOA O. Ktze.

***H. granularis** (L.) O. Ktze.

Herb upto 0.73 m high ; in gravelly soil on rocks ; rare ; Ghat Road, Yercaud to Salem ; ± 915 m ; 15-11-73 ; SK 41388.

HETEROPOGON Pers.

***H. contortus** (L.) P. Beauv. ex R. & S.

Herb about 0.5 m high ; in open ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41309.

IMPERATA Cyr.

***I. cylindrica** (L.) P. Beauv. var. **major** (Nees) C. E. Hubb. ex Hubb. & Vaughan
[*I. cylindrica* (L.) P. Beauv. var. *koenigii* (Retz.) Dur. & Schinz.]

Herb about 0.75 m high ; in open red soil ; abundant ; near Furz Bungalow, Chencaud Road, Yercaud ; ± 1370 m ; 8-11-73 ; SK 41380.

ISACHNE R. Br.

1. Glumes longer than the lemmas, cuspidate or caudate ; lemmas subequal .. *I. kunthiana*
1'. Glumes as long as or shorter than the lemmas, obtuse ; lemmas unequal, lower elliptic to oblong, upper broadly ovate to suborbicular .. *I. dispar*

***I. dispar** Trin.

Herb ; in marshy places ; Graigmore, Yercaud ; ± 1370 m ; 28-1-66 ; SK 26991.

†**I. kunthiana** (Wt. & Arn. ex Steud.) Miq.

Herb about 0.5 m high ; in humus wet soil near water courses ; abundant ; around Bauxite mines, Yercaud ; ± 1525 m ; 19-10-73 ; SK 41359.

ISCHAEMUM L.

1. Lower glume of sessile spikelets entire, narrowly winged at keels, smooth or with 1-3 shallow marginal nodules usually joined by shallow curved transverse ridges ; lower glume of pedicelled spikelet widely winged on one keel, the other keel wingless or narrowly winged at apex .. *I. commutatum*
1'. Lower glume of sessile spikelets 2-toothed or cuspidate and winged at apex, margins expanded below the middle, incurved at the base, margins smooth ; lower glume of pedicelled spikelet not as above .. *I. indicum*

†**Ischaemum commutatum** Hack.

Herb about 0.75 m high; in humus soil near water courses; common; way to Bauxite mines, Yercaud; ± 1400 m; 19-10-73; SK 41348; Way to Kiliyur water falls, Yercaud; ± 1370 m; 23-11-73; SK 41415.

***I. indicum** (Houtt.) Merrill

(*I. aristatum* auct. non L.)

Herb about 1 m high; in humus soil near water courses; common; way to Bauxite mines, Yercaud; ± 1400 m; 19-10-73; SK 41346.

LEERSIA Soland. ex Sw.

†**L. hexandra** Sw.

Herb about 0.75 m high; in marshy places near water courses; abundant; way to Kiliyur water falls, Yercaud; ± 1370 m; 23-11-73; SK 41418.

MICROCHLOA R. Br.

***M. indica** (L. f.) P. Beauv.

Herb about 0.1 m high; in crevices of rocks; common; Kongampallam, Yercaud; ± 1250 m; 24-9-73; SK 41319.

MICROSTEGIUM Nees

†**M. ciliatum** (Trin.) A. Camus

Herb; under shade near stream; rare; near Athiyur Marapalam-Sanyasimalai Reserve Forest, Yercaud; ± 1400 m; 22-11-73; SK 41411.

OPLISMENUS P. Beauv.

***O. compositus** (L.) P. Beauv.

Herb; in humus soil in road cuttings under shade; common; Ghat Road, Yercaud to Salem; ± 1340 m; 11-10-73; SK 41321.

PANICUM L.

1. Upper lemma smooth :
   2. Spikelets not gaping at maturity :
      3. Lower glume less than half as long as the spikelet, sub-orbicular, truncate; leaves linear, base rounded, often involute, markedly distichous .. *P. repens*
      3'. Lower glume more than half as long as the spikelets, ovate, acute; leaves lanceolate, flat, base cordate .. *P. notatum*
   2'. Spikelets gaping at maturity; lower glumes more than half as long as the spikelet; glumes and lower lemma acuminate .. *P. trypheron*
1'. Upper lemma transversely rugose .. *P. maximum*

***P. maximum** Jacq.

Herb about 1.5 m high; under shade in humus soil; common; Ghat Road, Yercaud to Salem; ± 1150 m; 11-10-73; SK 41340.

***P. notatum** Retz.

(*P. montanum* Roxb.)

Herb about 1.5 m high; in humus soil in road cuttings in open; common; Ghat Road, Yercaud to Salem; ± 1340 m; 11-10-73; SK 41323.

***P. repens** L.

Herb about 0.5 m high; in marshes on the edges of the lake; not common; Lake, Yercaud; ± 1370 m; 6-11-73; SK 41373; Chencaud Road, Yercaud; ± 1370 m; 8-11-73; SK 41383.

***P. trypheron** Schult.

Herb about 0.3 m high; in humus soil; common; Sanyasimalai Reserve Forest, Yercaud; ± 1430 m; 6-11-73; SK 41365; Chencaud Road, Yercaud; ± 1400 m; 8-11-73; SK 41376; Ghat Road, Yercaud to Salem; ± 920 m; 15-11-73; SK 41387; ± 460 m; 15-11-73; SK 41398.

PASPALIDIUM Stapf

***P. flavidum** (Retz.) A. Camus

Herb; in marshes in the fringes of the lake; rare; Lake, Yercaud; ± 1370 m; 6-11-73; SK 41372; Ghat Road, Yercaud to Salem; ± 460 m; 15-11-73; SK 41401.

PASPALUM L.

***P. scrobiculatum** L.

Herb about 0.5 m high; in marshy places in open; not common; Kongampallam, Yercaud; ± 1220 m; 24-9-73; SK 41316.

PENNISETUM Rich.

1. Rhachis of the spikes villous or woolly *P. purpureum*
1'. Rhachis of the spikes glabrous or scabrid .. *P. hohenackeri*

***P. hohenackeri** Hochst. ex Steud.

Herb about 0.75 m high; in marshes along the lake fringes; not common; Lake,

Yercaud ; ± 1370 m ; 6-11-73 ; SK 41371 ; Asambur, Yercaud ; ± 1370 m ; 5-12-73 ; SK 41420.

***Pennisetum purpureum** Schumach.

Herb about 2.5 m high ; in moist places near water courses ; probably cultivated ; way to Kiliyur waterfalls, Yercaud ; ± 1370 m ; 23-11-73 ; SK 41416 & 41419.

PEROTIS Ait.

***P. indica** (L.) O. Ktze.

Herb ; in gravelly soil ; abundant ; Ghat Road, Yercaud to Salem ; ± 350 m ; 15-11-73 ; SK 41405.

POGONATHERUM P. Beauv.

***P. paniceum** (Lamk.) Hack.

Herb ; Marapalam to Nagalur Road ; ± 1400 m ; 15-4-66 ; Rao 27463.

PSEUDECHINOLAENA (Hook. f.) Stapf

†**P. polystachya** (HBK) Stapf

Herb ; in humus soil under shade in the edges of Coffee plantations ; rare ; Chencaud Road, Yercaud ; ± 1400 m ; 8-11-73 ; SK 41374.

RHYNCHELYTRUM Nees

†**R. repens** (Willd.) C. E. Hubb.

Herb about 0.5 m high ; in humus soil in open ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41305.

ROTTBOELLIA L. f.

***R. cochinchinensis** (Lour.) W. D. Clayton (*R. exaltata* L. f.)

Herb about 1 m high ; lower sheaths covered by strong bristles ; in humus soil in crevices of rocks associated with *Phoenix* sp. in open ; not common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41344.

SACCIOLEPIS Nash

1. Lower glumes much less than half as long as the spikelet ; culms robust, spongy below, floating in water ; spikelets usually in interrupted crowded fascicles .. *S. interrupta*
1′. Lower glumes half as long as the spikelet ; culms slender, tough below, terrestrial ; spikes continuous .. *S. indica*

***S. indica** (L.) A. Chase

Herb about 0.5 m high ; in humus soil near water courses in open ; not common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-73 ; SK 41349.

***S. interrupta** (Willd.) Stapf

Herb ; floating in the pond ; abundant ; Manjakuttai Lake, Yercaud ; ± 1400 m ; 5-12-73 ; SK 41421.

SEHIMA Forssk.

***S. nervosum** (Rottl.) Stapf

Herb about 0.5 m high ; in open, in gravelly soil in disturbed forest areas ; not common ; way to Bauxite mines, Yercaud ; ± 1400 m ; 19-10-1973 ; SK 41350 ; Elaipallam, Yercaud ; ± 460 m ; 12-12-73 ; SK 41429.

SETARIA P. Beauv.

1. Leaves flat not plicate ; upper lemma transversely rugose :
   2. Barbellae of bristles ascending :
      3. Panicles continuous, cylindric, straight .. *S. pallide-fusca*
      3′. Panicles interrupted, lax, flexuous .. *S. intermedia*
   2′. Barbellae of bristles descending .. *S. verticillata*
1′. Leaves plicate ; panicles expanded or contracted ; upper lemma faintly transversely striate .. *S. palmifolia*

***S. intermedia** R. & S.

Herb ; in gravelly soil in open ; common ; Ghat Road, Yercaud to Salem ; ± 1340 m ; 11-10-73 ; SK 41325 ; ± 915 m ; 15-11-73 ; SK 41390.

***S. pallide-fusca** (Schumach.) Stapf & C. E. Hubb.

Herb about 0.5 m high ; in marshy areas near the edges of streams ; common ; Kongampallam, Yercaud ; ± 1220 m ; 24-9-73 ; SK 41307 ; Ghat Road, Yercaud to Salem ; ± 1280 m ; 11-10-73 ; SK 41333 & 41334.

***S. palmifolia** (Koen.) Stapf

Herb about 1 m high ; in humus soil in rock crevices in the middle of the streams, under partial shade ; common ; Kongampallam-Yercaud ; ± 1220 m ; 24-9-73 ; SK 41302.

***S. verticillata** (L.) P. Beauv.

Herb about 2 m high ; in open humus

soil; abundant; Ghat Road, Yercaud to Salem; ±460 m; 15-11-73; SK 41394.

SORGHUM Moench

1. Primary branches of the panicle undivided; nodes hairy; lower glume of sessile spikelets black and polished when ripe .. *S. nitidum*
1'. Primary branches of the panicle divided; nodes glabrous; glumes of sessile spikelet white hairy .. *S. halepense*

***S. halepense** (L.) Pers.

Herb about 2 m high; in humus soil in crevices of rocks; abundant; Ghat Road, Yercaud to Salem; ± 1200 m; 11-10-73; SK 41338.

***S. nitidum** (Vahl) Pers.

Herb about 1 m high; in humus soil in crevices of rocks in open; rare; Sanyasimalai Reserve Forest, Yercaud; ±1430 m; 6-11-73; SK 41370.

SPOROBOLUS R. Br.

1. Upper glume shorter than the lemma :
2. Panicles effuse .. *S. indicus* var. *diander*
2'. Panicle spiciform or narrow .. *S. indicus* var. *fertilis*
1'. Upper glume as long as or longer than the lemma; panicles contracted, subspiciform .. *S. piliferus*

***S. indicus** (L.) R. Br. var. **diander** (Retz.) Jovet & Guedes

[*S. diander* (Retz.) P. Beauv.]

Herb; in humus soil in rock crevices in open; common; Kongampallam-Yercaud; ± 1220 m; 24-9-73; SK 41313; Ghat Road, Yercaud to Salem; ± 400 m; 15-11-73; SK 41404.

***S. indicus** (L.) R. Br. var. **fertilis** (Steud.) Jovet & Guedes

[*S. indicus* auct. *non* (L.) R. Br.]

Herb; in gravelly soil in open; not common; Ghat Road, Yercaud to Salem; ± 1340 m; 11-10-73; SK 41326.

***S. piliferus** (Trin.) Kunth

Herb; in open; in humus soil; common; Ghat Road, Yercaud to Salem; ± 1280 m; 11-10-73; SK 41332.

THEMEDA Forssk.

1. Fascicles of racemes globose or fan-shaped, drooping; all involucral spikelets on the same level .. *T. triandra*
1'. Panicle decompound, thyrsiform; involucral spikelets in superposed pairs .. *T. cymbaria*

†**T. cymbaria** Hack.

Herb about 2 m high; in humus soil in rock crevices in open; sparse; Sanyasimalai Reserve Forest, Yercaud; ± 1400 m; 22-11-73; SK 41409.

***T. triandra** Forssk.

Herb 1-2 m high; in humus soil in open; common; Kongampallam, Yercaud; ± 1220 m; 24-9-73; SK 41304; Ghat Road; ± 1190 m; 11-10-73; SK 41339.

TRAGUS Scop.

***T. roxburghii** Panigrahi

(*T. biflorus* Schult.)

Herb; in gravelly soil in open; abundant; Ghat Road, Yercaud to Salem; ± 460 m; 15-11-73; SK 41396.

TRIPOGON R. & S.

***T. bromoides** R. & S.

Herb; in humus soil in rock crevices in open; common; Kongampallam, Yercaud; ± 1220 m; 24-9-73; SK 41312.

UROCHLOA P. Beauv.

***U. panicoides** P. Beauv.

Herb; in open, gravelly soil; not common; Ghat Road, Yercaud to Salem; ± 1340 m; 11-10-73; SK 41329; Chencaud Road, Yercaud to Salem; ± 1400 m; 8-11-73; SK 41377; on way to Kiliyur water falls, Yercaud; ± 1370 m; 17-7-74; SK 41432.

ZENKERIA Trin.

†**Z. elegans** Trin.

Herb; in humus soil in crevices of rocks in open; common; Nagalur-Yercaud Road; ± 1400 m; 19-10-73; SK 41360; Sanyasimalai Reserve Forest, Yercaud; ± 1400 m; 22-11-73; SK 41410.

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