

## Mosses from the Mascarenes - 3.

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**Abstract:** 37 species of mosses are reported from the Mascarenes. Of these 19 belong to the genus *Campylopus* and 8 to *Leucoloma*. Three are new to the Mascarenes i.e. *Campylopus leucochlorus* (C.Müll.) Par., *C. paludicola* Broth. and *C. subperichaetialis* Biz. & Kilb., two are new to Mauritius i.e. *Bryum truncorum* (Brid.) Brid. and *Leucoloma cinclidotioides* Besch. and four are new to Réunion i.e. *Campylopus incacorrallis* Herz. *C. praetermissus* J.-P. Frahm, *C. trachyblepharon* (C. Müll.) Mitt. ssp. *comatus* (Ren. & Card.) J.-P. Frahm and *Leucoloma rutenbergii* (Geh.) Wright var. *elatum* Ren. The variety is new to the Mascarenes.

### Introduction

In the first part of this work (Een 1976) I gave background information, which is not repeated here, except for the list of localities, which is somewhat different. I have used the nomenclature of Crosby & Schultze-Motel (1983) and for the genus *Campylopus* that of Frahm (1985).

Since the publication of my second report (Een 1978) I have received a collection of bryophytes, which was sent by the late Dr. Thérésien Cadet of Réunion to the late Dr. Herman Persson. The hepatics were determined by the late Dr. Sigfrid Arnell and the mosses are now included in my study. The collection in my possession is numbered CT2 to CT123 and comprises 37 specimens.

New records are marked with \*.

### List of localities.

#### Mauritius

Loc.4. Perrier Nature Reserve near Mare aux

#### Vacoas.

Loc.5. Petrin Heath Nature Reserve, alt. 2200 feet.

Loc.6. Macabé, upland climax forest, alt. 1800 feet.

Loc.7. Le Pouce, the top, alt. 2660 feet.

Loc.9. Le Pouce, forest halfway to the top. Loc.10.

Le Pouce, on rocks blasted for the old road from Port Louis to St. Pierre, alt. 1800 feet.

Loc.13. Mount Cocotte, the northern slope.

Loc.14. Mount Cocotte, plateau north of the mountain, alt. 2300 feet.

Loc.15. Mount Cocotte, Sphagnum fen, alt. 2300 feet.

Loc.16. Plaine Champagne, heath.

#### Réunion

Loc.1. Cilaos, 100 m. above the village, alt. 1100 m.

Loc.2. Cilaos, Réserve Biologique, alt. 1200 m.

Loc.19. Forest above St. Denis, zone de branle, alt. 1700-1900 m.

Loc.20. Forest above St. Denis, zone de tamarin, alt. 1400-1800 m.

Loc.21. Forest above St. Denis, the lower part of zone de tamarin, alt. 1400-1600 m.

Loc.22. Forest above St. Denis, zone de bois de couleurs, alt. below 1500 m.

Loc.23. Plaine des Cafres, alt. 1800 m.

Loc.24. La Grande Montée, upper part.

Loc.27. West of Plaine des Palmistes, wet forest with tree ferns.

Loc.29. East of the volcano, on a lavabed from 1932.

Loc.30. Above St. Paul, alt. 2000 m., Forêt de Benard, alt. 1700- 2100 m.

### List of species

*Aerobryidium subpiligerum* (Hampe) Card.  
Réunion: Le Tévelave (Bras-Sec), alt. 850 m., en sous bois clair, Cadet 20.7.1963 CT4 (Herb. Een R507).

*Anomobryum laceratum* (Besch.) Broth.  
Réunion: Loc.2 (R396, R502, R503).  
My plants compare fairly well with the description by Bescherelle (1880:99), but I have not seen any lacerated leaves. R502 is 40 mm tall and has blunter leaves than the other two specimens.

*Blindia acuta* (Hedw.) B.S.G.  
Réunion: Loc.1 (R520).  
Reported from Réunion by De Sloover (1979:393).

*Bryum erythrocaulon* (Schwaegr.) Brid.  
Mauritius: Loc.6 (M409), on wood.  
The plant compares very well with the description given by Mohamed (1979:428-431), although I have not found any tubers. This plant has been seen by Ochi, who suggested it should be called *B. billardieri* Schwaegr., and I reported it under that name in my first report (Een 1976:214).

\* *Bryum truncorum* (Brid.) Brid.  
Mauritius: High Forest, on damp rocks, Vaughan M/52, det. Dixon (1937:123) as *B. nanorrhodon* C. Müll. (Herb. Een M229); Without locality or date, Vaughan M/126 (Herb. Een M468). - Réunion: Loc. 27 (R501).

For my determinations I have used the monograph by Mohamed (1979). In no case have I been able to find any tubers. The Réunion plant compares well with the description of *B. truncorum* (Mohamed 1979:426-428). The

Vaughan plant M/126 is much bigger but otherwise has the same characteristics. Macroscopically it looks like *B. erythrocaulon* but microscopically it shows a broad margin with sharp teeth in the upper part of the leaf and a flat margin in the lower part. Dixon (1937:123) called it *B. nanorrhodon* and referred to the comments by Renauld & Cardot (1915:297-298), who said that the margin is rather large with 3 to 5 rows of cells. This in turn leads to *B. truncorum* according to Mohamed (1979), who gives *B. nanorrhodon* as a synonym to *B. erythrocaulon*. Mohamed did not cite the works by Dixon or Renauld & Cardot. New to Mauritius but see Bescherelle (1880:97).

*Calyptrochaeta asplenioides* (Brid.) Crosby  
Réunion: Piste forestière de la Plaine d'Affrouches, alt. 1200 m., sur sol très humide, incliné, et couvert par des *Hedychium*, localité 7, Cadet 29.1.1964 CT67 (Herb. Een R516).

### *Campylopus* Brid.

In dealing with this difficult genus I have followed Frahm (1985) in a rather uncritical manner. I have used a small desk top computer for this part of the work, with input also from De Sloover (1982), Gradstein & Sipman (1978), Nyholm (1987), Renauld & Cardot (1915) and Smith (1978). My methods and conclusions have been published elsewhere (Een 1988A). A complete record of all my primary data has been deposited in the IAB software library (Een 1988B). Anybody who is interested in knowing more about this is welcome to contact me.

*Campylopus aureonitens* (C. Müll.) Jaeg.  
Réunion: Loc. 29 (R546).  
My determination of this specimen is based on its dark colour and small ventral cells as seen in a section across the nerve. Fertile stems have very pronounced "heads". On the other hand the tips of the leaves do not bend outwards as described by Frahm (1985:25). The plant has sporophytes.

*Campylopus aureus* Bosch. & Lac.  
Réunion: Loc. 19 (R534).  
The specimen is typical in every respect including the golden brown colour.

*Campylopus cambouei* Ren. & Card.  
Mauritius: Loc. 4 (M486); 13 (M281).

Both specimens have previously been determined as *C. arctocarpus* ssp. *madecassus* by Bizot (1968:472) and myself, partly on the basis of the presence of flagellae/gemmae. A distinguishing characteristic according to Frahm (1985:47), is the thin walls of the cells in the lower part of the lamina. A disturbing fact however is that the picture of *C. cambouei* (Frahm 1985:46:e) shows thicker cell walls than the picture of *C. arctocarpus* (Frahm 1985:17:e).

*Campylopus crateris* Besch.

Réunion: Loc. 19 (R530)

The specimen matches the description given by Frahm (1985:60), but the back of the nerve is slightly ridged (1/2 cell high).

*Campylopus flexuosus* (Hedw.) Brid.

Mauritius: Sine loco, 1876 Robillard, det. Renault? as *C. brachymastix* C. Müll., (S), Frahm (1985:80); Sine loco, 1890 Rodriguez, det. Renault? as *C. virescens* Besch., (S), Frahm (1985:80). - Réunion: Loc. 1 (R521); 2 (R527); 19 (R529, R535); 30 (R554); Plaine des Grègues?, 1889? Rodriguez, det. Renault? as *C. virescens*, (S, ex herb. Renault, Musci Masc.-Madag. 104?).

The section of the nerve shows ventral cells that are smaller than the median cells and usually more numerous. The cells in the lower part of the leaf have thick walls, which sometimes are slightly uneven. Gemmae have been seen in one of the specimens (R527). R529 has formed very compact cushions. R554 is a rather tall and pale plant with sporophytes. The leaves have long fine points with a few pale teeth and a serrate margin rather far down the lamina.

*Campylopus fragilis* (Brid.) B.S.G.

Réunion: Loc. 1 (R522).

\* *Campylopus incacorrallis* Herz.

Réunion: Loc. 20 (R539).

The section of the nerve shows ventral cells that are smaller than the median cells and usually twice as many. Furthermore the cells in the base of the leaf near the nerve have thick and porous

walls. The first of these characteristics agrees with the text of Frahm (1985:96) but not with the picture (1985:95), which is drawn from the type of *C. subperichaetialis* Biz. & Kilb. On the other hand there is a good fit with the picture of the closely related species *C. flexuosus* (Frahm 1985:77). Is *C. subperichaetialis* really a synonym? My specimen has gemmae as in *C. flexuosus*. New to Réunion.

*Campylopus jamesonii* (Hook.) Jaeg.

Réunion: Loc. 20 (R538).

The plant fits well with the description in Frahm (1985:102).

*Campylopus julaceus* Jaeg. ssp. *arbogastii* (Ren.& Card.) J.-P. Frahm

Mauritius: Loc. 5 (M489). - Réunion: Loc. 1 (R524); 2 (R562); 19 (R532); 30 (R550, R551); Le Tévelave (Bras Sec), alt. 800 m., en plein terre dans un bois clair, 1963 Cadet CT6 (Herb. Eén R560).

This species is close to *C. pilifer* in leaf structure. As distinguishing characteristics I have used the appressed leaves and the nodulose habitus, which give this species a rather special appearance (var. *capitulifer* Ren. & Card.). All my specimens are straw-coloured and rather pale. The border between the thin-walled cells in the base of the leaf and the thick-walled cells further up is very sharp and situated in the upper part of the leaf which gives it a Tortella-like appearance. The lamellae on the back of the nerve are often up to 3 cells high in the upper part of the leaf. R550 is not typical in the sense that I have found leaves with clearly differentiated alar cells. Some of my specimens have sporophytes (R532, R550 and R551) which is new according to Frahm (1985:111).

\* *Campylopus leucochlorus* (C. Müll.) Par.

Réunion: Loc. 19 (R330); 23 (R540).

R540 fits well with the description by Bizot & Kilbertus (1979:85) and Frahm (1985:115-117). This species is close to *C. nivalis*, something which Frahm has failed to point out. He separates the two species in the key (1985:13) by the shape of the cells in the upper part of the lamina. As another distinguishing characteristic I have used the fact that this species has large, hyaline alar

cells. R330 contains a few small stems scattered among *Bryum argenteum* and *Ceratodon purpureus*, and thus the determination is far from certain and of limited value. New to the Mascarenes.

\* *Campylopus paludicola* Broth.

Réunion: Loc. 30 (549).

The plant compares well with the description in Frahm (1985:134) except for the alar cells, which in my case are not very distinct. It has plenty of sporophytes. New to the Mascarenes.

*Campylopus perichaetialis* P.Varde & Thér.

Réunion: Loc. 19 (R528).

This species is very close to *C. nivalis*. As distinguishing characteristics I have used leaf points with no or very few teeth and somewhat shorter and broader cells in the base of the lamina (Ratio 2.9 compared with 6.0 in *C. nivalis* according to Frahm (1985:125+136)).

*Campylopus pilifer* Brid.

Mauritius: Loc. 7 (M412, M490, M491); 10 (M459, M492); Pioneer species on bare laterite in the uplands, 1935 Vaughan M/60, det. Dixon (1937:123) as *C. introflexus* Hedw. var. mauritianus Dix. (Herb. Een M231). - Réunion: Loc. 1 (R185, R523); 2 (R477, R526); 19 (R536); 29 (R547); 30 (395, R552, R553, R556, R557, R561).

The leaves of this species are very similar to those of *C. julaceus* ssp. *arboastii* but the lamellae at the back of the nerve tend to be more than 3 cells high. Furthermore the stems are evenly thick and without nodes. Two specimens, i.e. M491 and R561 show rather low lamellae (not more than 2 cells high) and could thus be referred to the old species *C. brevrameus* Dix. Compare with Frahm (1985:149). I have seen clearly differentiated alar cells in 5 specimens (M412, M491, R395, R477 and R526). Three of my specimens (R556, R557 and R561) show some leaves with a strongly squarrose hair point, but the leaf shape is that of the present species (Frahm 1985:144) and not of *C. introflexus* (Hedw.) Brid. (Frahm 1985:98). A confusing fact here is that Smith (1978:184) illustrates the shape of the leaves of the two species in a reversed fashion! For further information on these two species see Frahm

(1974), Gradstein & Sipman (1978) and Magill (1981).

\* *Campylopus praetermissus* J.-P. Frahm

Réunion: Loc. 21 (R541).

The plant compares fairly well with the original description given by Frahm (1985:152), although the alar cells are coloured and not hyaline. This species seems to have many characters in common with *C. flexuosus* a fact which was not indicated by Frahm. The distinguishing characteristic according to the key (Frahm 1985:15) is that in this species the back of the nerve is smooth while it is ridged in *C. flexuosus*. My plant has sporophytes. New to Réunion.

*Campylopus pseudobicolor* C. Müll.

Mauritius: Loc. 14 (M493).

My computer suggested this species on the basis of large ventral cells of the nerve, lamellae 1-2 cells high on the back of the nerve, clearly differentiated alar cells and cells with thin walls in the lower part of the lamina. The use of the key in Frahm (1985:13) led to *C. hildebrandtii*. I am not happy with this determination. My plant is 40 to 50 mm. tall, light green with a red tomentum and looks like a cross between the two species. Thus I am not suggesting here that *C. pseudobicolor* is new to the Mascarenes.

*Campylopus robillardaei* Besch.

Mauritius: Loc. 5 (M488); 16 (M495, M497); Chemin Cheval near Grand Bassin, 1933 Vaughan M/45, det. Dixon (1937:122), (Herb. Een M223); Petrin heath vegetation, at base of trees and on clay paths under shade, alt. 2150 feet, rainfall 160 inches, 1962 Vaughan M/116 (Herb. Een M498, M499); Base of trees near Petrin, 1962 Vaughan M/122 (Herb. Een M500). - Réunion: Loc. 23 (R174).

The text in Frahm (1985:165) differs from the picture (1985:166) in several respects. After some hesitation I have used the picture for my determination. Thus the width of the nerve should be about 2/3 of that of the lamina and the back of the nerve has lamellae 1-2 cells high. M500 is different in being rather light yellow and in having terminal 'heads'. M495 and M497 are probably identical but rather different from the other specimens. They are much larger, somewhat

nodulose and have plenty of reddish tomentum. Is this *C. gallienii* Par.? Frahm (1985:164) has *gallieni* as a new synonym but there is no indication that he has seen it (1985:168). I have used a description in Renault & Cardot (1915:105-106 + Pl. 24A). I hesitate including R174. Bizot (1968:472) named it *C. capitiflorus* Mont. (= *C. arcuatus* (Brid.) Jaeg.) but the nerve section shows ventral cells which are equal to or larger than the median cells in size. On the other hand I have not seen ridges at the back of the nerve.

*Campylopus stenopelma* (C.Müll.) Par.

Réunion: Loc. 24 (R543).

I have named this specimen on the basis of the cells in the lower part of the leaf near the nerve being very uneven with porous walls and the cells near the margin being linear with a small lumen, forming a rather distinct border. Compare Frahm (1985:181) and Magill (1981:141-143). The species seems to be new to Réunion but has been recorded before from Mauritius under the name *C. chlorotrichus* (C.Müll.) Par. (Melville 1888:101).

\* *Campylopus subperichaetialis* Biz. & Kilb.  
Réunion: Loc. 1 (R370); 30 (R555). - Tanzania: Morogoro district. Uluguru Mts. On the top of Bondwa Peak, alt. 1950-2100 m. On the ground in subalpine heath. Leg. Pócs & Gibbon 1969-10-12. Det. Bizot. Isotype. (SEM 2879, herb. Een T034).

The plants match well the description given by Bizot & Kilbertus (1979:75-76) and the isotype. A section through the nerve shows ventral cells of more or less the same size and type as the median cells. The cells in the lower part of the lamina have smooth walls. Frahm (1985:94) has reduced this species to a synonym to *C. incacorralsis*, but see my comments under that species. New to the Mascarenes at least under this name.

\* *Campylopus trachyblepharon* (C.Müll.) Mitt.  
ssp. *comatus* (Ren. & Card.) Frahm  
Mauritius: Loc. 5 (M487); 15 (M252); 16 (M494); Mare aux Vacoas, at base of trees, 1933 Vaughan M/43, det. Dixon (1937:43) as *C. capitiflorus* Mont. (Herb. Een M221); In the uplands, forming dense clumps under trees, 1936 Vaughan M/95, det. Dixon as *C. 'Robillardi'*

(Herb. Een M244). - Réunion: Loc. 2 (R525); 19 (R531, R533); 23 (R542); Le Tévelave (Bras Sec), alt. 800 m., en pleine terre dans un bois clair, 1963 Cadet CT6 (Herb. Een R559). - Madagascar: île Sainte-Marie, sur l'humus, 1891 Arbogast, det. Renault (1891:290) as *C. comatus* Ren. & Card. (S, ex herb. Renault, Musci Masc.-Madag. no. 55); Prope pagum Lohomby, ad arb. 'Kimba' dictam, inter Cladonias, c. 1200 m. alt., 1904 Salvan, det. Paris (1905:52) as *C. comatus* (S, ex herb. E.G. Paris).

Most of my plants are clearly nodulose and the cells in the base of the leaf near the nerve have thick and porous walls. M244 is of special interest as it was determined by Dixon as *C. robillarderi* but is not the specimen referred to in his paper (Dixon 1937:122). He was uncertain about it and so am I. I find that the cells in the lower part of the lamina near the nerve have thick walls, but these are not porous although somewhat uneven. Furthermore I have seen flagellae/gemmae in the heads of the clearly nodulose plant. R531 and R533 are two samples from the same locality and probably identical. They are different in not being comate and in having longer cells (50-80 microns, compared with 20-48 in Frahm 1985:189) in the lower part of the lamina with thin walls and large triangles in the corners (i.e. not thick porous walls). Also R559 differs from the description in Frahm (1985:189). It is a large plant, slightly comate, yellowish and with long silky leaves which are more than 7 mm. long. All previous reports such as Bizot (1968:472) and Frahm (1985:191) refer to Mauritius. Thus the species is new to Réunion.

*Dicranoloma billardieri* (Brid.) Par.

Réunion: Loc. 19 (R491); 20 (R492); 22 (R493); 27 (R188, R496); Cirque de Cilaos, De Sloover 22.12.1973 no. 17641 (S).

Bizot (1968:472) determined my plant R188 as var. *scopareolum* (C. Müll.) Thér. It has however dicranoid leaves with many teeth at or near the point. The variety has orthophyllous leaves with practically no teeth as described by Renault (1897:62). I have taken the spelling of the name from a recent monograph by Tan & Koponen (1983:329-331).

*Homali dendron exiguum* (Bosch & Lac.)

Fleisch.

Réunion: Les Avirons (Oratoire de Lourdes), alt. 400 m., surface rocheuse verticale à l'ombre, Cadet 3.8.1963 CT19 (Herb. Eén R515).

*Hypopterygium laricinum* (Hook.) Brid.

Réunion: Les Avirons (Oratoire de Lourdes), alt. 400 m., surface rocheuse très irrégulière sous ombrage léger, Cadet 3.8.1963 CT18 (Herb. Eén R511); Piste forestière de la Plaine d'Affouche, alt. 1200 m., sur sol humide, sous *Hedychium*, forme des tufs volcanique, tapis denses, localité 7, Cadet 29.1.1964 CT76 (Herb. Eén R512).

Regarding the name of this plant I refer to previous comments (Eén 1978:220).

*Leucoloma bifidum* (Brid.) Brid.

Mauritius: Sine loco (S, ex herb. Kew). - Réunion: Loc. 1 (R490); Grand Brûlé (Voisinage de la route N1), alt. 120 m., sur tronc mort, dans une clairière de la forêt, Cadet 5.1.1964 CT31 (Herb. Eén R513).

The Cadet plant has sparse dichotomous branchings and the simple stems are up to 100 mm. long.

\* *Leucoloma cinclidotioides* Besch.

Mauritius: Loc. 4 (M480).

I have not seen other specimens of this species. My plant compares well with the descriptions given by Bescherelle (1880:22-23) and Renault (1897:68) but it lacks the denticulation in the tip of the leaf mentioned by Bescherelle. New to Mauritius.

*Leucoloma crepinii* Ren. & Card.

Mauritius: Loc. 5 (M479); 7 (M482); 9 (M483); 10 (M484). - Madagascar: Silva Fito, distr. Tamatave, leg. Perrot July 1897, det. Renault n.24 (S, ex herb. Levier).

M484 is a somewhat bigger plant and the intermediate cells ('cellule intermédiaires' Renault 1909:6) adjacent to the chlorophyllose cells towards the top of the leaf have clearly porous longitudinal walls.

*Leucoloma dichelymoides* (C. Müll.) Jaeg.

Mauritius: Loc. 5 (M403, M481); Petrin on Phillipia heath, leg. Vaughan M/94, det. Dixon (1937:122)(Herb. Eén M243). - Madagascar: Montagne d'Ambre, leg. De la Bathie Sept. 1926,

det. Thériot (1929:107)(S, ex herb. Thériot).

My plants come from the same locality as the Vaughan plant. They differ from the latter and from the description in Renault (1897:86-87) in the following details: The internal cells have thicker walls and dorsal papillae are more obvious, the intermediary cells are narrower but have thicker walls, the leaf point is not flexuose and has only small distant blunt teeth, the alar group is separated from the nerve and the nerve is broader - 50 microns versus 35.

*Leucoloma fuscifolium* Besch.

Réunion: Le Tévelave (Bras-Sec), alt. 800 m., sur rocher, en sous bois obscur, Cadet 20.7.1963 CT7 (Herb. Eén R500). - Madagascar: Versant oriental, leg. Girod-Genet 1900 (S, ex herb. Renault) (Renault & Cardot 1915:97).

The Cadet plant is much bigger than the Madagascar one. The leaves are 11 mm. long as compared with 6.2 mm.

*Leucoloma longifolium* (Brid.) Wijk & Marg.

Mauritius: Loc. 4 (M478); 13 (M485). - Réunion: Piste forestière de la Plaine d'Affouche, alt. 1200 m., sur sol très humid, incliné, et couvert par des *Hedychium*, localité 7, Cadet CT91 29.01.1964 (Herb. Eén R499); Leg. Rodriguez (S, ex herb. Cardot).

I have studied M478 in more detail than the other. It compares well with the description by Renault (1897:81-82). The leaves are long (about 11 mm) which indicates var *setifolium* (Besch.) Wijk & Marg., but on the other hand the stems are short (max. 2 cm. and not 4 cm). The pale margin is 10 microns wide and is composed of 2 (or 3) cells, which indicates *L. capillifolium* Ren. rather than *L. longifolium* (Renault 1897:85-86). I have not seen *L. capillifolium*.

*Leucoloma mafatense* Ren.

Réunion: Loc. 23 (R495).

I have not seen any other specimen of this species but my plant compares well with the description given by Renault (1897:66).

\* *Leucoloma rutenbergii* (Geh.) Wright \* var. *elatum* Ren.

Réunion: Grand Brûlé (près route N1), alt. 100 m., base d'un tronc de Aguaria près du sol, Cadet

5.1.1964 CT45 (Herb. Een R498). - Madagascar: Territoire Sakalave, Cercle de Maintirano, récoltées par les tirailleurs sakalave 1901 (Paris 1902:77)(S, ex herb. E.G.Paris).

The Cadet plant as well as that from Madagascar has a nerve which is 70 microns broad at the base. Renault (1897:84) says 90-105 microns. Macroscopically the Cadet plant CT45 is rather like CT7, which I have called *L. fuscifolium*. The former has tall papillae on the dorsal upper part of the leaf and these papillae are often bent towards the tip of the leaf. CT7 has no papillae. The species is new to Réunion and the variety is new to the Mascarenes.

*Racopilum mauritianum* Besch.

Réunion: Les Avirons (Oratoire de Lourdes), alt. 400 m., à la base d'un rocher, près du sol, lieu à demi-ombragé, Cadet 3.8.1963 CT17 (Herb. Een R508); Les Avirons, sur sol humide, à l'ombre d'un rocher, Cadet 3.8.1963 CT20 (Herb. Een R509); Les Avirons, surface rocheuse irrégulière retenant l'humus, Cadet 3.8.1963 CT28 (Herb. Een R510).

I have used the same distinguishing characteristics as before (Een 1978:221).

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