

## Studies in the genus *Riccia* (Marchantiales) from southern Africa. 9. *R. nigrella* and the status of *R. capensis*

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**Keywords:** distribution, Marchantiales, *Riccia capensis*, *R. nigrella*, southern Africa, spores

### ABSTRACT

*R. nigrella* DC. (Lamarck & De Candolle 1815), with which *R. capensis* auct. non Steph.: S. Arnell (1952, 1963), is conspecific, is now also recognized from southern Africa. The thallus is brown marginally and dorsally and has shiny black scales with smooth margins at which coloured and hyaline cells alternate irregularly. Arnell's (1961) records of *R. capensis* Steph. from the Canary Islands are to be regarded as erroneous. *R. capensis* Steph. (Stephani in Brunnthaler 1913) is now placed in synonymy under *R. limbata* Bisch.

### UITTREKSEL

*R. nigrella* DC. (Lamarck & De Candolle 1815), waarmee *R. capensis* auct. non Steph.: S. Arnell (1952, 1963), konspesifiek is, word nou ook uit suidelike Afrika aangemeld. Die thallus is bruin langs die rande en dorsaal en besit blink, swart, gaafrandige skubbe met onreëlmatig afwisselende, gekleurde en hialine selle. Arnell se gegewens oor die verspreiding van *R. capensis* Steph. in die Kanariese eilande moet as foutief beskou word. *R. capensis* Steph. (Stephani in Brunnthaler 1913) is 'n sinoniem van *R. limbata* Bisch.

***Riccia nigrella* DC.** in Lamarck & De Candolle, Flore Française 6: 193 (1815); Gottsche *et al.*: 605 (1844); Camus: 212 (1892); Stephani: 334 (1898); Howe: 28 (1899); Boulay: 210 (1904); Casares-Gil: 220 (1919); Macvicar: 24 (1926); Frye & Clark: 21 (1937); Müller: 465 (1952); Na-Thalang: 93 (1980); Jovet-Ast: 323 (1986).

**TYPE.**—France, Dept. de l'Hérault, in sylvula Grammont prope Monspeulanum, *Bouchet 1807* [PC, holo., fide Jovet-Ast: 323 (1986); G (G23307), iso.].

*R. aggregata* Underw.: 275 (1894) after Howe (1899).

*R. pearsoni*(i) Steph.: 27 (1898); Steph.: 335, 336 (1898).

*R. porosa* Tayl.: 416 (1846); pp. fide Na-Thalang: 93 (1980).

*R. capensis* auct. non Steph.: S. Arnell: 312 (1952); S. Arnell: 28 (1963).

**Thallus** monoecious, perennial, in complete or incomplete rosettes, 8–15 mm across (Figure 2A), or scattered; generally rather small; simple or once to twice furcate, branches narrowly to moderately divergent, oblong to linear-ovate (Figures 1A1–4, 2B), up to 5 mm, occasionally up to 8 mm long, 0.5–1.0 mm broad, once to twice broader than thick; margins acute, slightly recurved, becoming somewhat obtuse toward base; apex rounded or subacute, emarginate; sulcus narrow and deep, visible along whole length of thallus (Figures 1B1–1B4, 2C), except at sporangia, sides convex; dorsally glaucous green to green, shiny, soon turning brown along margins, over older parts and sporangia; flanks steep, dark-coloured, covered by closely appressed, shiny black scales (Figure 1E); ventral surface rounded, green, often flecked with brown or purple;

when dry, scales cover most of dorsal surface, sides tightly inflexed distally, clasped together, except over sporangia and over proximal part of branches; margins raised and erect toward base. **Anatomy of thallus:** dorsal epithelium unistratose, cells 25–35 × 25–32 µm, short rectangular or subquadrate, dorsally rounded to nearly flat, persistent, (Figure 1C), often hyaline, but mostly with metachromatic contents, air pores small, usually triangular, ± 7.5 µm wide (Figures 1D, 2D); assimilation tissue occupying about ½ the thickness of thallus, consisting of 6–10 cells in vertical rows (Figure 1C), cells 25–30 × 20–25 µm, rarely a few cells enlarged and somewhat distended, up to 62 × 32 µm with hyaline or brownish contents, referred to as 'idioblasts' (Figure 2F); storage tissue with cells closely packed, angular, ± 30 µm wide, many containing chloroplasts; ventral epidermal cells often coloured brown or violet (Figure 2E). Rhizoids, some smooth, others tuberculate, ± 20 µm wide. **Scales** semilunar, imbricate, not extending above thallus margin (Figure 2C), size up to 550 × 450 µm, shiny violet-black, distal margin hyaline, sometimes single cells in interior reddish or hyaline, others deep purple to black, occasionally coloured and hyaline cells alternate irregularly at ± smooth margin, resembling a 'battlement' or dentate outline; cells rectangular or short hexagonal, in body of scale up to ± 52 × 25 µm, smaller at margin (Figure 1F), cell walls straight. **Antheridia** with hyaline necks. **Archegonia** with purple necks, in rows. **Sporangia** protruding dorsally, 300–400 µm in diameter, occupying nearly the whole width of thallus, in a row or crowded together, containing about 160–230 spores each, overlying tissue dark brown, breaking down over ripe capsules and leaving a large hollow filled with many spores. **Spores** (62.5–)70.0–85.0(–87.5) µm in diameter, triangular-globular, polar, light to dark brown, with wing narrow (Figure 3E), 2.5–5.0 µm wide, notched or with a pore at angles, margin finely crenulate; distal face incompletely reticulate with about 10–12 irregularly shaped areolae across, or vermicular with thickened, short, sinuous ridges, ± 2.5 µm wide, which

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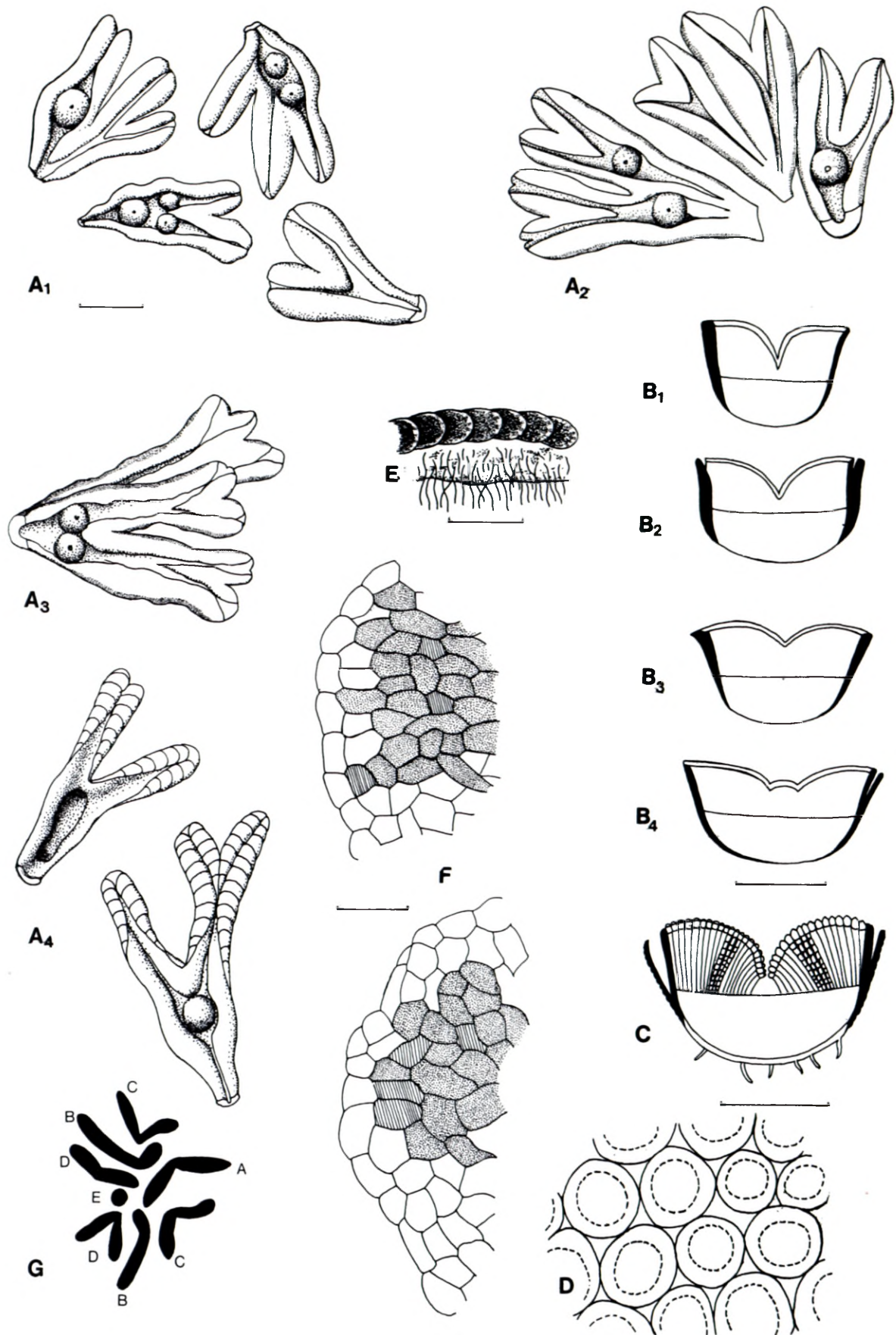


FIGURE 1.—*Riccia nigrella*. Structure of thallus, scales and chromosomes. A1–4, thalli; B1–4, transverse sections of thallus branch at intervals along its length; C, transverse section showing dorsal cells, chlorenchyma and storage tissue; D, dorsal cells and air pores from above; E, flank with scales and rhizoids; F, scales (dotted = dark purple; hatched = reddish); G, chromosomes. (A1, A3, C–G, Volk 81–214c; A2, Volk 81–289; A4, B1–4, S. M. Perold 520). (A–F, by Volk; G, by Bornefeld). Scale bar on A1–4, E = 1 mm; B1–4, C = 500  $\mu$ m; D, F, = 100  $\mu$ m; G = 1  $\mu$ m.



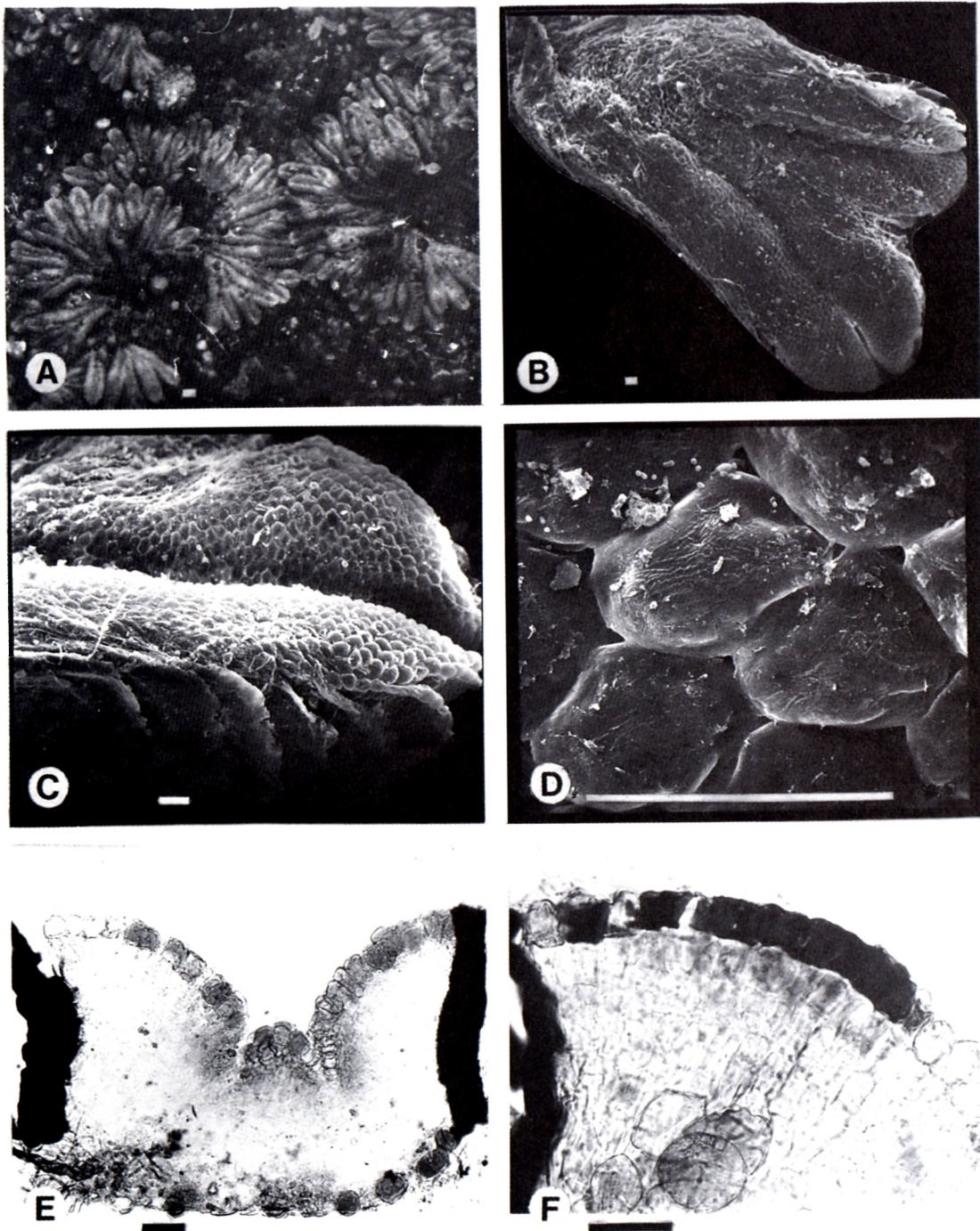


FIGURE 2.—*R. nigrella*. Structure of thallus and cells. A, rosettes; B, dorsal surface view of thallus; C, apex, groove and scales; D, dorsal epithelial cells and air pores; E, transverse section through branch, unstained; F, more enlarged transverse section through thallus branch, showing dorsal epithelial cells with finely granular contents, with unusually many 'idioblasts' in bottom left corner). [A, F, Volk 81-214c ; B-D, Volk 85-802; E, S. M. Perold 1147]. [A, photograph by Volk; B-D, SEM micrographs; E & F, LM (light microscope) micrographs by Perold]. Scale bar on A = 1 mm; on B-F = 50  $\mu$ m.

are often roughened with fine granules or papillae (Figure 3C, D, F); proximal face with triradiate mark distinct, its arms often wider at juncture with wing, about 30 small, rounded areolae on each of 3 facets, 2.5–5.0  $\mu$ m wide, ridges thick, slightly raised at nodes (Figure 3A, B). *Chromosome number*  $n = 8$  (Figure 1G) (Bornefeld 1984 on Volk 81-214c (as cf. *R. pottsiana*); Na-Thalang (1980, Australia); Jovet-Ast (1986, France).

In *R. nigrella*, the dorsal and ventral epithelial cells frequently contain hyaline or brownish metachromatic substances which stain blue with dilute aqueous solutions of Toluidine blue, as do the 'idioblasts' of *R. campbelliana* (Perold & Volk 1988). Rarely, enlarged cells

with a similar substance are also found in the assimilation and storage tissues of the thallus. In old specimens the contents of the dorsal cells may have shrunk away from the cell walls and are bright orange. European authors excepted, several others have commented on the striking character and the affinity the persistent dorsal epithelial cells have for certain stains (Howe 1899; Frye & Clark 1937; Na-Thalang 1980).

In southern Africa *R. nigrella* occurs quite rarely in the summer rainfall areas (with a moderately high annual precipitation up to 700 mm), of central and southern Transvaal, Natal, eastern and southern Orange Free State. It is more common in south-western and north-



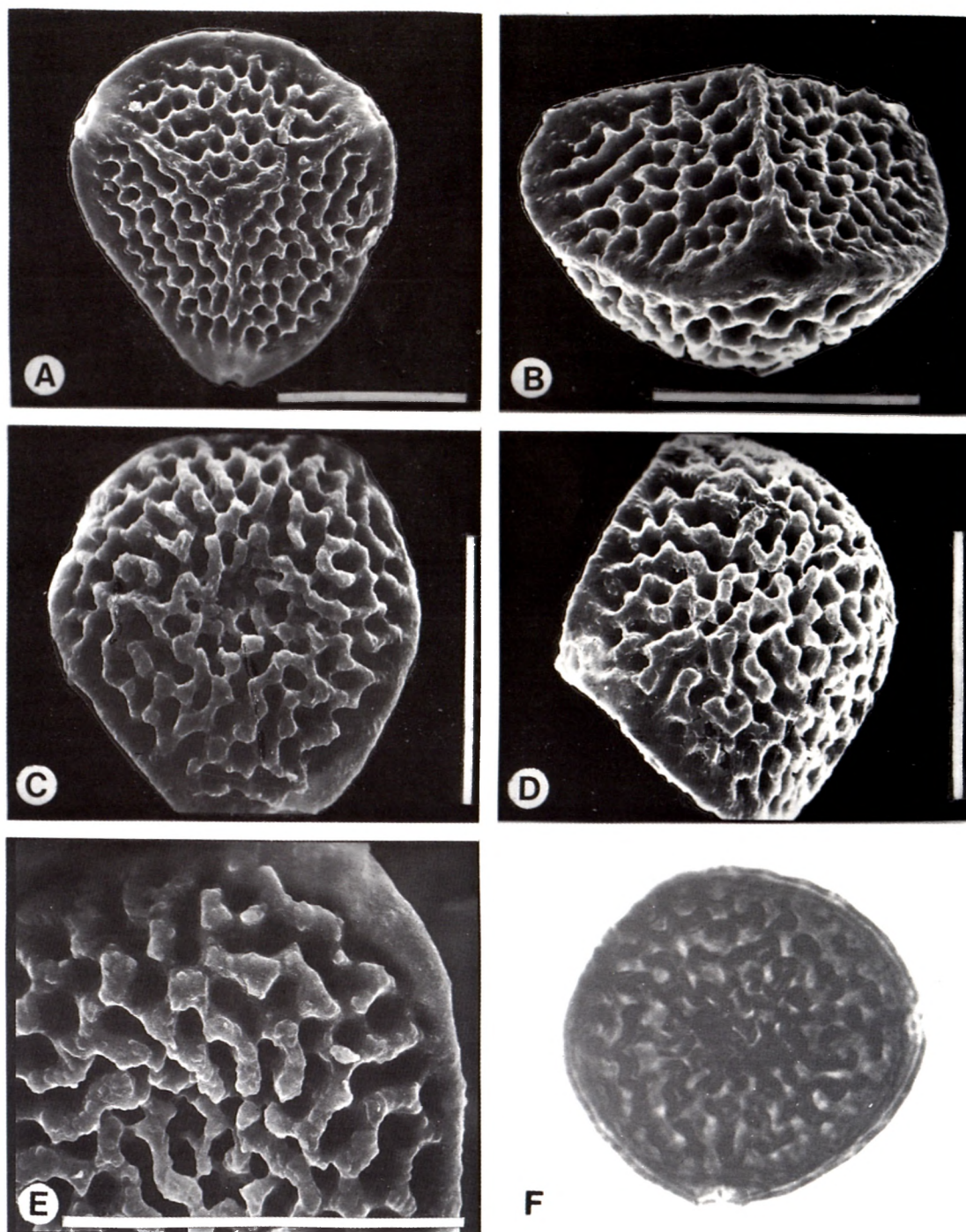


FIGURE 3.—*R. nigrella*. Spores. A, proximal face; B, viewed from side; C, distal face; D, distal side; E, more enlarged view of ridges on distal face; F, distal face. (A, B, Duthie 5019a; C–E, Loxly 5023; F, Arnell 792). (A–E, SEM micrographs and F, LM micrograph by Perold). Scale bar = 50  $\mu\text{m}$ ; diameter of spore on F,  $\pm 80 \mu\text{m}$ .

western Cape Province, extending to the southernmost part of South West Africa/Namibia, which are winter rainfall areas (Figure 4), with low annual precipitation ranging from less than 200 to 500 mm. It grows at altitudes between 200 and 1 800 m above sea level and prefers very shallow, sandy to dusty, acid soils overlying rock outcrops. *R. nigrella* is able to survive and propagate vegetatively by forming small, round, perennating turions. It is often associated with other xerophilous *Riccia* species, e.g. *R. okahandjana* S. Arnell and/or *R. atropurpurea* Sim, and occasionally with *R. campbelliana* Howe. It can be distinguished from the other southern African species with shiny black scales by its generally smaller size, by scales that are closely appressed

and do not extend above the thallus margins and by the dark brown dorsal colour. It bears some resemblance to a small *R. campbelliana*, which is also brown dorsally, and occasionally a few 'idioblasts' are also present in the inner tissues of *R. nigrella*. *R. nigrella* grows diffusely or in partial or complete rosettes. When sporulating, it is seen with overlying clumps of large numbers of dark brown spores.

This nearly cosmopolitan species (Jovet-Ast 1986) is found in all countries bordering the Mediterranean, and in Wales, Cornwall, the Channel Islands, the Macaronesian Islands (Madeira, Azores and the Canaries), North America, Australia, and now also in southern Africa.



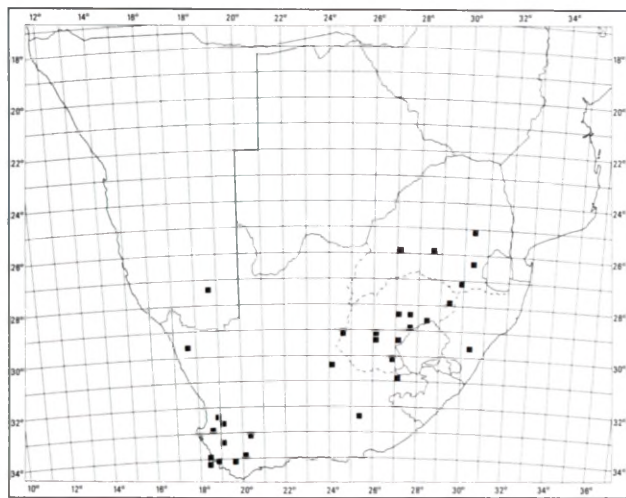


FIGURE 4.—Map showing distribution of *R. nigrella* in southern Africa.

#### THE STATUS OF *R. CAPENSIS* AUCT. NON STEPH.: S. ARNELL

*R. capensis* auct. non Steph.: *S. Arnell* is conspecific with *R. nigrella* DC.

While visiting South Africa in the early nineteen fifties, Arnell collected a number of specimens of a small, black-scaled *Riccia* species (held at BOL, PRE, S and UPS). He experienced problems in correctly identifying his collections and originally named them *R. brunomarginata*. Later he changed his mind and thought he was dealing with *R. capensis* Steph., but when he (Arnell 1952) examined the type specimen of *R. capensis* Steph., leg. Brunnthaler, Gnadenthal, from W, the packet contained only sand and no *Riccia* could be found. He obviously did not know of Brunnthaler's collection [(G13334!) held at G], on which Stephani had based his diagnosis of *R. capensis*. His only recourse therefore, was to rely on Stephani's drawings in the latter's unpublished *Icones hepaticarum* (G; M). As the transverse sections of the thalli of his collections seemed to him to be similar to Stephani's figures of *R. capensis*, he chose his specimens Arnell 59 (S) & 162 (BOL) as types for *R. capensis* sensu Arnell (Arnell 1952, 1963). The authors have now found that these and all the other specimens named *R. capensis* by Arnell, are in fact *R. nigrella*. He thus misapplied the name *R. capensis* Steph. when he referred his own and other collections of *R. nigrella* to *R. capensis* Steph. and in so doing, failed to recognize *R. nigrella* in the south-western Cape Province. *R. nigrella* DC. is accordingly newly reported from southern Africa and Arnell's collections of *R. capensis* have to be renamed as such.

Arnell (1952) noted that his specimens with their black scales looked like *R. limbata* Bisch., but were much smaller and had quite differently ornamented spores (see below under *The status of R. capensis* Steph.); he seems to have ignored Stephani's thallus dimensions of 2,5 mm wide, which are definitely those of a wider plant. Furthermore, he incorrectly (and misleadingly) described the scale margins of his plants as 'quadrangulately serrate' (1952) and as 'irregularly dentate' (1963), which indicates that he did not notice the hyaline cells in between the dark cells at the  $\pm$  smooth margins. Serrate or dentate scale margins rarely occur in the genus *Riccia*. The striking colouration of the scales and their margins in *R. nigrella* has not been commented on by

previous authors and is only suggested by Macvicar's figure (1926: 25). Arnell's description of the margins and dorsal surface of the thallus turning yellowish brown, the deep and sharp dorsal groove with convex sides and, on transverse section, the rectangular to quadrate epithelial cells, indicate that he was referring to *R. nigrella*. He reported the spores to be 50–60  $\mu$ m in diameter, the 'ridges often with a brighter midline or two bright lines and a dark midline', an effect which is often seen with thickly ridged aerolar walls.

Besides several places in the Cape Province, Arnell (1961) also reported his *R. capensis* from two localities in the Canary Islands. Despite repeated attempts, these specimens have not been traced. At UPS only a single microscope slide labelled '*R. capensis* Steph. Gran Canaria, Montana de Tafira', in Arnell's writing, is held. On the slide holder he has altered the label to read *R. capensis* = *macrocarpa*. Arnell's distribution records for *R. capensis* in Macaronesia were, however, accepted and repeated by Eggers (1982), Grolle (1983), Düll (1984), Sérgio (1984). His collections, *S. Arnell* 28/2/1959 (S; UPS); *S. Arnell* 4/3/1959 (UPS) and *S. Arnell* 5/3/1959 (S; UPS), from La Calzada and Montana de Tafira, as well as *J. Lid* 14/2/1954 (UPS), from Gomera, were seen and the determinations confirmed as *R. nigrella*. Two other specimens, *S. Arnell* 4/3/1959 (S) and *S. Arnell* 7/3/1959 (S), from Montana de Tafira, as well as one from Las Palmas, *S. Arnell* 28/12/51 (UPS 20638), that he had referred to *R. nigrella*, were incorrectly determined and are *R. trabutiana* Steph., which was not listed by Arnell (1961) as occurring in the Canary Islands. Some collections of *R. atromarginata* and *Targionia* sp. were also misidentified as *R. nigrella*.

Arnell furthermore remarked on some resemblance between *R. nigrella* and *R. atropurpurea* Sim (1963: 28) in the appearance of the thalli, and although they are both dorsally deeply grooved, somewhat glaucous gray and shiny when wet, they are quite different in their margins and scales. The following note which Arnell wrote to Talbot, was found with a specimen collected by Pearson 8956 (PRE): 'I made a mistake in calling this plant *R. nigrella* var. *austro-africana*, as Sim had already called it *R. atropurpurea*', which, however, it is not either! Arnell identified specimens of *R. atropurpurea*, *Sim* July 1920 (PRE; UPS) from the Matopos, Zimbabwe [Southern Rhodesia], as well as *Sim* Jan. 1918 (Vereeniging) (PRE) and *Volk* 2766 Farm Donkerhoek, SWA (PRE) as *R. nigrella* var. *austro-africana*.

#### THE STATUS OF *R. CAPENSIS* STEPH.

*R. capensis* Steph. is now placed in synonymy under *R. limbata* Bisch.

***R. limbata* Bisch.** MS. ex Gottsche, Lindenberg et Nees ab Esenbeck in Synopsis Hepaticarum: 606 (1844); Stephani: 326 (1898); Sim: 12 (1926); Arnell: 23 (1963). Type: Cap. Bonae Spei, in locis humidis ad latera Montium Tafelberg, Duyvelsberg et Leuvenberg, *Krauss* *Julio* 1838 G13165 (G, ? holo.); CBS (= Cap. Bonae Spei), Gnadenthal, *Krauss* *Dec.* 1838 (BM! ex Herb. Hampe).

*R. capensis* Steph. in Denkschriften der Mathematisch-naturwissenschaftlichen Klasse der kaiserlichen Akademie der Wissenschaften 88: 724 (1913). Type: Cape Colony, Gnadenthal by Caledon, *Brunnthaler Oct. 1909* G 13334 (G!) [G, holo. fide Grolle: 226 (1976), fide Jovet-Ast in lit.]; W [fide Arnell: 312 (1952)] (only sand in specimen packet).

Stephani was evidently unaware that a paratype specimen of *R. limbata* had also previously been gathered at Genadendal (by Krauss), when he described *R. capensis* as a new species (Stephani 1913) from a specimen collected in October 1909 at Genadendal near Caledon, by *Brunnthaler* (G13334). His descriptions of *R. capensis* (1913) and *R. limbata* (1898) differ in that he described the latter plants as large and four times wider than thick in cross section, with obliquely sloping flanks, whereas the former are small, twice as wide as thick and have erect flanks, indicating that they were not yet fully grown. In both descriptions he however, referred to the imbricate, purple scales and the thick thalli.

Examination of *Brunnthaler's* collection and comparison with the type specimens of *R. limbata* Bisch., leg. *Krauss July 1838* (G) G13165 and *Krauss December 1838* (BM) by the authors, clearly show it to be a specimen of *R. limbata*, generally a medium-sized to large species, possessing shiny black scales that, however, do extend beyond the thallus margins; the thalli lack 'idioblasts' and the spores (recovered from the soil in *Brunnthaler's* apparently sterile specimen) are large, 100–120  $\mu\text{m}$  in diameter, with the ornamentation on the distal face typically consisting of parallel rows of papillae spiralling outwards to the wing and the proximal face almost smooth with scattered pores.

Jovet-Ast (1969) reported the chromosome number for *R. capensis* Steph. on a specimen collected by Een, 14/3/1967. This gathering from Tanzania, Serengeti Park, Senora Lodge, contains only *R. congoana* Steph. and *R. atropurpurea* Sim.

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## SPECIMENS EXAMINED

**R. nigrella****Southern Africa**

SWA/NAMIBIA.—2718 (Grunau): Noachabeb (—BC), *Ortendahl* 14.vi.1931 (UPS).

TRANSVAAL.—2527 (Rustenburg): 2 km to Derby on road from Rustenburg (—CC), *S. M. Perold* 888a (PRE). 2528 (Pretoria): 19 km N of Bronkhorstspuit (—DC), *S. M. Perold* 150, 320 (PRE); *Volk* 81/023 (M, PRE). 2530 (Lydenburg): 29 km to Dullstroom on R540 (—AB), *S. M. Perold* 425 (PRE). 2630 (Carolina): Chrissiemeer, Farm Knock Dhu (—AD), *Smook* 4892a (PRE). 2729 (Volksrust): 9 km from Amersfoort on road to Perdekop (—BB), *S. M. Perold* 1088a (PRE).

O.F.S.—2729 (Volksrust): 31 km NE of Verkykerskop, on road from Memel (—CD), *S. M. Perold* 1274 (PRE); 2827 (Senekal): Allemanskraal Dam, on plateau near caravan park (—AC), *Volk* 81/214c (M, PRE); Senekal, near reservoir on koppie (—BC), *S. M. Perold* 1336, 1340 (PRE); 6 km N of Clocolan on road to Marquard (—DC), *S. M. Perold* 1322 (PRE). 2926 (Bloemfontein): Bloemfontein (—AA), *Duthie* 5457a, 5494a (BOL); Bloemfontein, next to Bot. Garden (—AA), *Volk* 81—289 p.p. (M); 30 km S of Bloemfontein on N1 (—AC), *S. M. Perold* 956 (PRE). 2927 (Maseru): 10 km from Ladybrand on R26 (—AC), *J. M. Perold* 35b (PRE). 3026 (Aliwal North): between Zastron and Wesselsdale, Farm Olievenrand (—BB), *Van Rooy* 2414, 2417 (PRE).

NATAL.—2930 (Pietermaritzburg): Edendale (—CB), *Sim* CH 1025 (with *R. atropurpurea*) (PRE).

CAPE.—2917 (Springbok): Komaggas, top of T'nouroeas—Van Reenen se water plateau (—DA), *Glen* 1472, 1585 (PRE). 2924 (Hope-town): 54 km from Kimberley on road to Hayfields (—BA), *Smook* 3544a (PRE). 3024 (De Aar): 25 km from De Aar on road to Phillips-town, Farm Welgegund (—AC), *Smook* 3418a (PRE). 3027 (Lady Grey): 23 km S of Lady Grey (—CC), *Van Rooy* 2598 (PRE). 3218 (Clanwilliam): 20 km N of Citrusdal, near Farm Hexrivier (—BD), *S. M. Perold* 533 (PRE); Weltevrede, 7 km W of Piketberg (—DC), *S. M. Perold* 501 (PRE); Middelpos (—DC) *S. M. Perold* 506 (PRE). 3219 (Wuppertal): 18 km S of Citrusdal (—CA), *S. M. Perold* 520 (PRE). 3225 (Somerset East): Cradock Mtn Zebra Park (—AD), *Smook* 6028 (PRE). 3318 (Cape Town): Lion's Head (—CD), *Arnell* 26, 36 (S); *Arnell* 49, 59 (S, UPS); *Arnell* 50 (BOL); Newlands, Pillans's garden (—CD), *Garside* 6650 (BOL); Newlands, Schelpe's garden (—CD), *Lambert* 1 (BOL, PRE); near University of Cape Town (—CD), *Loxly* 5023 (BOL); Tamboerskloof (—CD), *P.K.* 5368 (BOL); Rosebank (—CD), *leg. unknown* 5023 (BOL); Stellenbosch (—DD), *leg. unknown* 5019a (BOL); Glen Bawn (—DD), *Duthie* 5340 (BOL); 13 km from Franschhoek on road to Paarl (—DD), *S. M. Perold* 1147 (PRE). 3319 (Worcester): Tulbagh (—AC), *Vogel* C682 (MJG, PRE). 3320 (Montagu): 'Witteberge' turnoff on N1, before Laingsburg (—AB), *C. M. van Wyk* 2523, 2525 (PRE); Cogman's Kloof (—CC), *Arnell* 792 (BOL, PRE, S, UPS); *Arnell* 802 (BOL, PRE, S). 3418 (Simonstown): Wynberg Park Hotel garden (—AB), *Arnell* 150 (BOL, PRE, S); *Arnell* 162 (PRE); 186 (S); 189, 302 (BOL); 302a & b (S); near Eerste River (—BA), *Van Brakel* 5019 (BOL). 3419 (Caledon): Greyton, kloof, on earth bank (—BA), *S. M. Perold* 1171a (PRE).

**Europe**

BRITAIN.—*Pearson* 290 (C); *April* 1877 CH542, *June* 1879 CH473 (PRE); *May* 1885 (S); *April* 1881 (UPS).

PORTUGAL.—*Casas et al.* 2, 4, 10, 11 (LISU); *Sérgio et al.* 26.1, 28.3 (LISU).

SPAIN.—*S. Arnell* 6.5.1960 (S); *S. Arnell* 3.5.1960 (UPS); *Casas* 12.4.57, 16.4.1957, 4.4.1958, 25.9.76, 3.1.1984, 2.5.1984 (BCB); *Cros et al.* (BCB); *Volk* 75-584, 82-983 (M).

FRANCE.—*D'Arice* Fevr. '84 (UPS); *D'Arice* Mars '89 (UPS); *Boulay* Avril '96 (UPS); *Crozals* 3/1902 (ex Schiffner) (W, S); *De Sloover* 25.130 (PRC); *Hebrard* 1-4382, 1-5283, 3-14586 (Private Herb. J. P. Hebrard); *K. Preis* 27.5.37; *Jiri Vána* 4.4.1977 (PRC).

ITALY.—*H. Gams* 3.4.37 (GB, S); 15.2.1952 (S); *Levier* Bryotheca Italica; ex herb. Guzelberg; G, S, UPS); *Milde* 2 Aug. '97 (UPS); *Oliver* April 1867 (UPS).

YUGOSLAVIA.—*Baumgartner* 5.4.1908, 15.3.1910, 28.6.1911, 19.4.1913 (W); *Glowacki* 26.7.1896 (S); *Latzel* 10 Febr. 1908; *Schiffner* 10.4.1909, 12.4.1909; *Weiss* 29 Jan. 1867 (W).

GREECE.—*Volk* 85-802, 86-948 (M).

NORTH AFRICA.—*Trabut*, March 1908, 1171 (1939) (S).

**Macaronesia**

CANARY ISLANDS.—*S. Arnell* 28.2.1959, 5.3.1959 (S); *Losada & Rivero* (TFC).

MADEIRA ARCHIPELAGO.—*M. Nóbrega* 20.1.1954, 21.1.1954, 4.11.1953 (S).

**United States of America**

CALIFORNIA.—*H. N. Bolander* 26; *Brandeger* 1892 (NY); *A. M. Carter* 252 (PRC); *Howe* 165 (NY); *April* 1894 (Ohio State Univ.); *Feb.* 8, 1896 (W); *E. W. Koch* s.n.; *Dale* M. J. Mueller 6905, *Walter R. Shaw* 1901; no collector's name, 1704 (in part), 1729; no collector's name or number (NY).

MISSOURI.—*J. A. Steyermark* 428 (NY).

PENNSYLVANIA.—*T. C. Porter* s.n. (NY).

TEXAS.—*F. McAllister*, March 1929; *M. S. Young* (NY).

**Australia**

NEW SOUTH WALES.—*Na-Thalang* 54, 72. (SYD).

SOUTH AUSTRALIA.—*Na-Thalang* 126 (SYD).

**R. trabutiana Steph. incorrectly determined as R. nigrella**

PORTUGAL.—*Casas et al.* 2, 10 (LISU).

CANARY ISLANDS.—*S. Arnell* 4.3.1959, 7.3.1959 (S); 28.12.1951 (UPS).

**R. atromarginata Lev. incorrectly determined as R. nigrella**

SPAIN.—*S. Rungly* 2931 (C).

FRANCE.—*S. Arnell* 16.7.53 (UPS).

**R. congoana Steph. incorrectly determined as R. capensis Steph.**

TANZANIA.—*G. Een* 14.3.1967. (Herb. Een, S).

**R. atropurpurea Sim incorrectly determined as R. nigrella var. austro-africana**

ZIMBABWE.—*Sim* July 1920 (PRE, UPS).

SWA/NAMIBIA.—*Volk* 2766 (PRE).

TRANSVAAL.—*Sim* Jan. 1918 (PRE).