

## *Riccardia elisabethae*, a new species of Aneuraceae (Marchantiophyta) from New Caledonia

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### Abstract

A new species of *Riccardia*, *R. elisabethae*, is described from ultramafic substrate in mountain scrubland of New Caledonia. The new species is a member of the subgen. *Thornoneura* and differs from other species of this group by the rigid, unwinged thallus made up of large epidermal cells surrounding smaller medullary cells with thick porose walls and huge trigones.

### Introduction

Aneuraceae of New Caledonia have been investigated by Stephani (1908, 1917, 1923), Pearson (1922) and, especially, Hürlimann (1976). In addition, some species records were published by Paris (1910), Thériot (1910), Engel (1975) and Schuster (1985). As a result of these studies, 24 species of Aneuraceae are known from New Caledonia (Thouvenot et al. 2011), including 3 species of the genus *Aneura* Dumort. and 21 of *Riccardia* Gray, with one further species, *R. bipinnatifida* (Colenso) Hewson, being a doubtful record. More than half of these species (14) are only known from New Caledonia.

During a field trip in New Caledonia in September 2008, one of the authors (LT) collected a species of *Riccardia* which exhibited unusual features and seemed to be undescribed. At the recommendation of Jérôme Munzinger, then curator of the herbarium of the *Institut de recherche pour le développement* (IRD) Centre de Nouméa (NOU), part of the sample was sent to Elizabeth Brown, who confirmed that it was likely a new species. Unfortunately, she was not given the time to work on the topic. The species is described here in her honour.

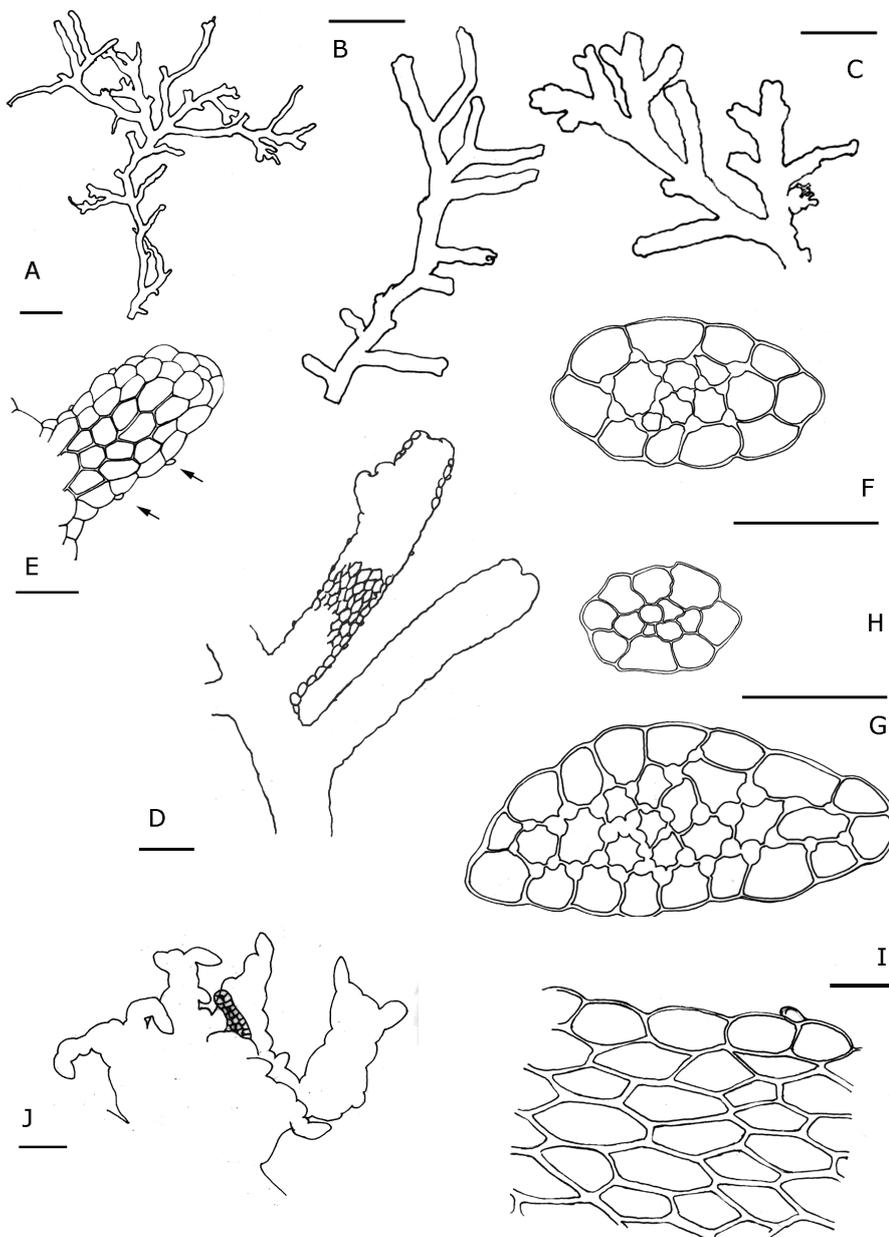
### Description

*Riccardia elisabethae* Thouvenot & Reeb *sp. nov.*

**Typus**—NEW CALEDONIA: Province Sud (South): Dumbéa, Mont Dzumac, UTM 58K 0649771E–7561282N, 1075 m, 18 Sept 2008, *L. Thouvenot NC280*, (holotype PC0703246; isotypes NSW, private herb. L. Thouvenot).

**Illustrations:** Figs 1, 2

**Thalli** whitish to light brown, narrow, subcylindrical, rigid, not appressed to the substrate and intermixed within other bryophytes and litter, up to 10 mm long; branching bifurcate or more rarely trifurcate to sparsely pinnate, branches rather similar to main axis, primary branches usually spreading at 45°–50°, rarely right-angled. **Thallus surface** smooth, thallus margins swollen due to bulging cortical cells. **Main thallus axis** well-defined, linear with parallel edges, sometimes very slightly enlarged before bifurcation; in cross section rounded to elliptical, 5 or 6 cells and 100–125 µm high, 150–200 µm wide, margin rounded, not winged; mucilage papillae present on the margins, regularly spaced. Chloroplasts present in epidermal and medullary cells, oil bodies not seen. **Axis of primary branches** 4 or 5 cells and 100–120 µm high, (100–)185–250(–300) µm wide, otherwise similar to main axis, with regularly spaced mucilage papillae on the margins. **Epidermal cells** in surface view long hexagonal, 50–115 µm long, 25–50 µm wide, with walls 2.5–3.7 µm thick, in cross section 25–50 µm wide, 15–30 µm high, external cell-walls thin and internal cell-walls thick



**Fig. 1.** *Riccardia elisabethae*. A, thallus. B, thallus fragment. C, thallus with female branch. D, pinnate branches. E, ultimate branch with papillae (arrows). F, G, transverse sections of thallus. H, transverse section of stolon. I, marginal and cortical dorsal cells. J, female branch. Scale bars: A–C = 1 mm, D = 200 µm, E–H, J = 100 µm, I = 50 µm.

with trigones. Mycorrhizae absent. **Medullary cells** smaller than epidermal cells and becoming progressively smaller to the thallus centre, 15–45  $\mu\text{m}$  in largest diameter, cell-walls thick and porose, in cross section with huge, bulging trigones. **Stolons** rare to frequent, rounded, born laterally or terminally, single or in bundles, to 5 mm long, 4 or 5 cells high, cells rounded to quadrate, epidermal cells twice larger than internal cells, all cell walls thin, trigones lacking. **Gemmae** absent. **Rhizoids** not seen.

Dioicous (?male branches not seen). **Female branches** short, present along the main axis, margin winged and with large, triangular, irregularly toothed scales. Calyptra and sporophyte not seen.

**Etymology:** The specific epithet '*elisabethae*' is based on the well-established latinized form of 'Elizabeth', namely 'Elisabeth'. This plant is named in honour of Dr. Elizabeth Anne Brown (1956–2013) who showed great interest in New Caledonian bryophytes but passed away too early, before being able to dedicate herself fully to the knowledge of that flora.

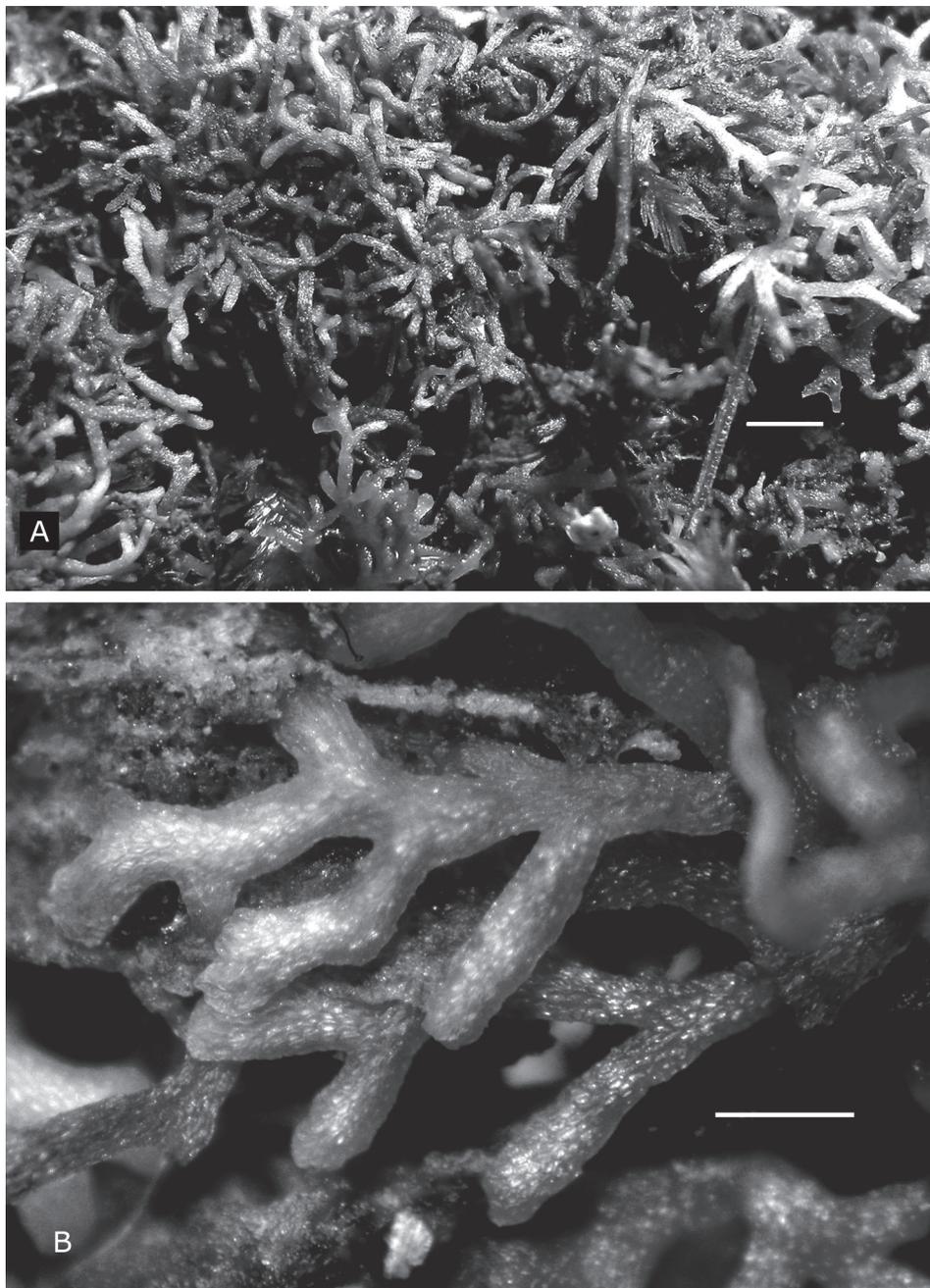


Fig. 2. *Riccardia elisabethae*: A, B, habit. Scale bars: A = 1 mm, B = 0.5 mm.

**Habitat:** Only known from the type locality, on humus over ultramafic rock, in mountain scrubland with Cyperaceae, ferns, and a great abundance of *Dracophyllum* sp., growing mixed with *Fissidens oblongifolius* Hook.f. & Wilson var. *oblongifolius*, *Chiloscyphus grandiflorus* var. *latifolius* Herzog and *Kurzia caduciloba* R.M.Schust.

## Discussion

*Riccardia elisabethae* is well-characterised by the following characters: 1) the rigid, subcylindrical thallus made up of large epidermal cells and smaller medullary cells, the medullary cells becoming progressively smaller to the centre of the thallus; 2) medullary cell walls are thick and porose, in cross-section with huge, bulging trigones; and 3) the margin of the thallus has regularly spaced mucilage papillae. The first two characters readily separate the new species from all other New Caledonian species of *Riccardia*, while regularly spaced mucilage papillae on the thallus margin is known from two other New Caledonian species, *R. baumannii* Hürl. and *R. inconspicua* (Steph.) Reeb & Bardat (*R. tenuicostata* Schiffn.; see Reeb and Bardat 2014). The latter feature is typical of *Riccardia* subgen. *Thornoneura* Furuki (Furuki 1991, 1994, 2013), a small subgenus of three species worldwide. *Riccardia elisabethae* is a distinct new member of the subgen. *Thornoneura* and clearly differs from all known species of this group by the small medullary cells with huge trigone-like thickenings. From the two other New Caledonian species of this subgenus, *R. baumannii* and *R. inconspicua*, the new species is furthermore readily separated by the rigid, subcylindrical thallus, the unwinged thallus branches and the unbranched mucilage papillae. In *R. baumannii* and *R. inconspicua* the thallus is flaccid and more flattened, the branches are winged and the mucilage papillae are mostly branched.

Two *Riccardia* species from New Zealand, *R. umida* E.A.Br. and *R. furtiva* E.A.Br. & Braggins, are very similar to *R. elisabethae* in habit. However, they clearly differ by having medullary cells equal in size to epidermal cells and without large trigones. Moreover, the surface of the thallus in these two species is papillose, whereas it is smooth in *R. elisabethae* (Brown and Braggins 1989).

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