

***Ptychomitrium acutifolium* Hook. f. et Wils.  
(Ptychomitriaceae, Musci),  
a distinct species endemic to Australia**

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**Abstract** – *Ptychomitrium acutifolium* Hook. f. et Wils., which was synonymized in *P. australe* by Catcheside in 1980, proved to be a distinct species endemic to Australia. The differences between *P. acutifolium* and *P. australe* are detailed.

**Australia / Musci / *Ptychomitrium acutifolium* / endemic**

*Ptychomitrium acutifolium* Hook. f. et Wils. was described from Australia (Wilson, 1859). This species was recorded in Tasmania, Victoria and South Australia (Scott & Stone, 1976). Catcheside (1980) considered *P. acutifolium* as a synonym of *P. australe* (Hampe) A. Jaeger, a common species in Australia. However, comparison of the types and other specimens of *P. acutifolium* and *P. australe* indicate that *P. acutifolium* should be retained as a good species. A detailed description of *P. acutifolium* is provided and the characters distinguishing *P. acutifolium* from *P. australa* are discussed below.

***Ptychomitrium acutifolium*** Hook. f. et Wils., *Fl. Tasm.* 2: 180. 1859. — TYPE: Tasmania, “on banks and trap rocks near the Derwent, Glen Leith, very rare, J. D. Hooker.” (lectotype, BM!; isotype, H!); “On rocks, Port Sorrell Archer.” (syn-type, BM, not seen). — Figs 1-16, 29-40.

Plants rather small, 0.3-0.8 cm high, in dense cushions, yellow-green above, blackish below. Stems with a well-developed central strand. Leaves strongly crisped and incurved when dry; erect-spreading when moist, linear-lanceolate from a long narrow, elongate base, 3.0-3.5 mm long, 0.4-0.5 mm wide, with an acute tip; margins plane, entire; costa strong, single, ending just below apex; upper leaf cells clear and somewhat sparse, rounded-quadrate to quadrate, 4.7-7.0 µm wide, thin

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walled; middle leaf cells short-rectangular, 7.1-11.8  $\mu\text{m}$  long, 7.1-9.4  $\mu\text{m}$  wide, basal leaf cells elongate, 28.2-56.4  $\mu\text{m}$  long, 7.1-9.4  $\mu\text{m}$  wide, hyaline, thin-walled.

Autoicous. Perichaetial leaves similar to vegetative leaves, slightly smaller. Setae straight, 2.5-3.5 mm long. Capsules erect, oblong-ovoid, 1.7 mm long, 0.7 mm wide; annulus well-developed, consisting of single row of thick-walled cells; peristome teeth short, lanceolate, obtuse, forked nearly to the base, 0.13-0.15 mm long, densely papillose. Opercula with long, erect beaks. Calyptra small and mitrate, only covering the operculum or upper part of capsule, lobed at base. Spores small, yellow-green, spherical, 7.9-9.4  $\mu\text{m}$ , finely papillose.

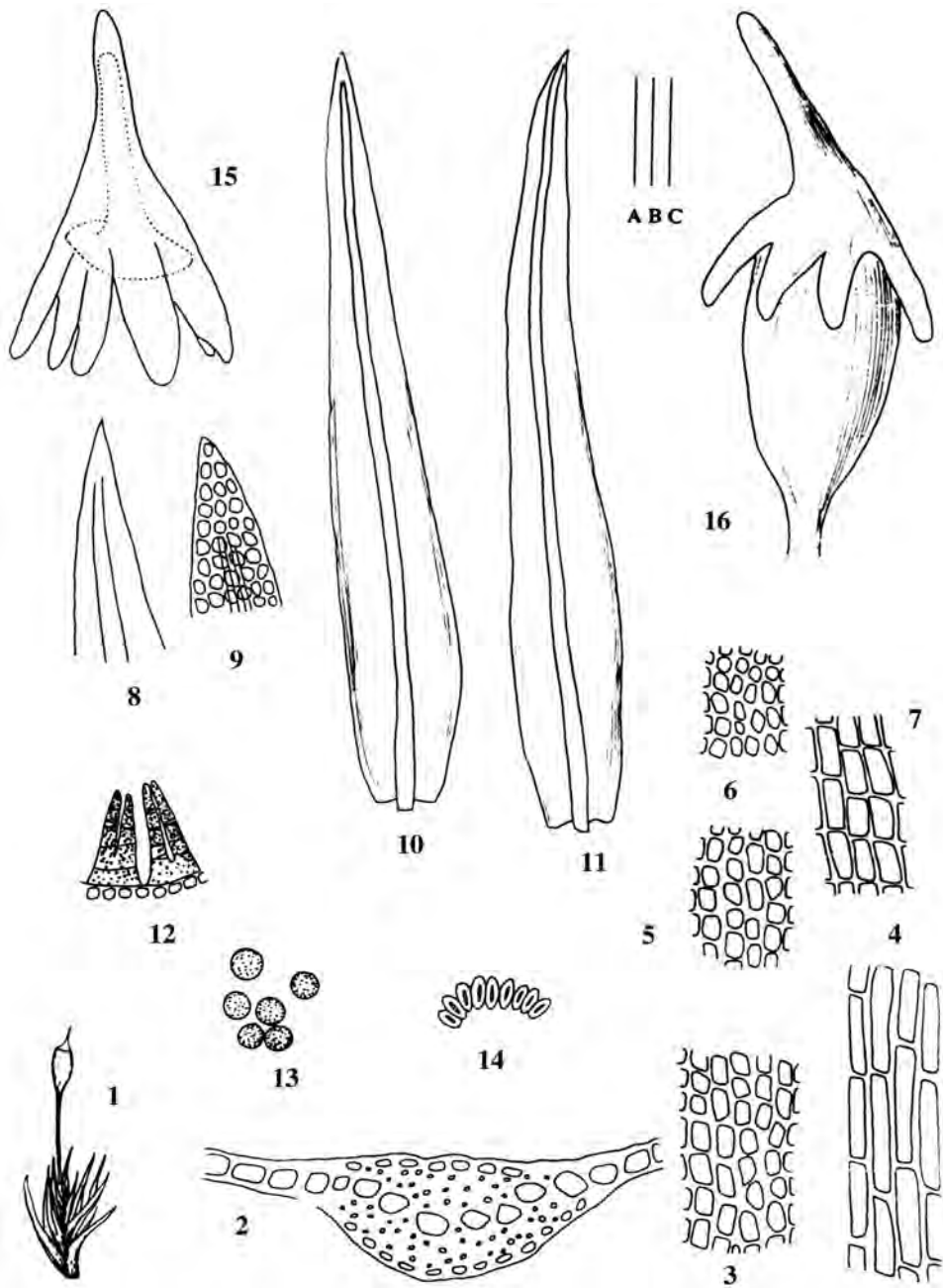
*Ptychomitrium acutifolium* is characterized by having: 1) rather small plants; 2) leaves linear-lanceolate from a long narrow elongate base, with entire margin and acute tip; 3) upper and middle leaf cells, somewhat sparse and hyaline; 4) calyptra only covering the opercula or the upper parts of capsule; and 5) peristome teeth short, yellowish, lanceolate, obtuse at the tips, forked nearly to the base.

**Habitat:** On exposed, dry rocks and boulders.

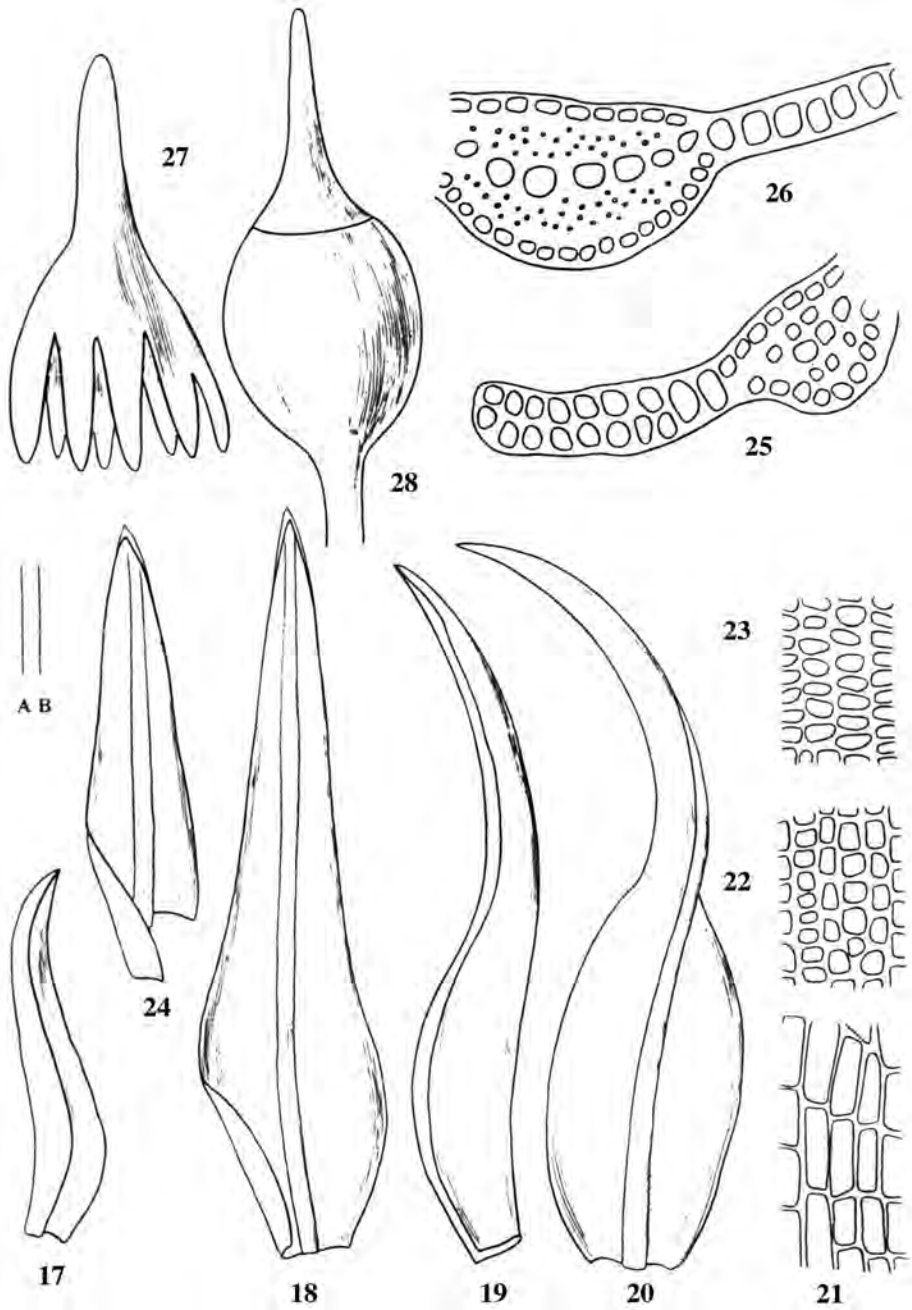
**Distribution:** Australia: Tasmania, Victoria and South Australia.

**Representative specimens of *P. acutifolium* examined:** **New South Wales:** Bungonia Creek Gorge, *H. Streimann* 6199 (CANB); Budawang Range, *H. Streimann* 29 (CANB); Hanging Rock, *H. Streimann* 387 (CANB); Burbie Spring, *H. Streimann* 480 (CANB); Deriah State Forest, *H. Streimann* 735 (CANB); Oakey CK., *H. Streimann* 1669, 1670, 5071 (CANB); Wadbilliga River, *H. Streimann* 3796 (CANB); Sassafras, *H. Streimann* 7869 (CANB); 4 km E of Koorowatha, *H. Streimann* 10454, 10455 (CANB); Road to Mt. Ulandra, *H. Streimann* 43300 (CANB); Stroud-Gloucester Road, *H. Streimann* 43909 (CANB); Whoota Hill, *H. Streimann* 44254 (CANB); Weddin Mountains National Park, *H. Streimann* 44756, 49271 (CANB); Mt. Macquarie, *H. Streimann* 45058 (CANB); Eugowra-Cudal Road, *H. Streimann* 48906 (CANB); Lord Howe Island, *H. Streimann* 55838c (CANB); Track to Hayward Peak, *H. Streimann* 54449 (CANB); Nullarbor Plain, *J. A. Curnow & H. Streimann* 4746 (CANB); 19 km from Batemans, *H. Streimann* 50 (CANB); Tilba, *H. Streimann* 38227 (CANB); Weddin Range, *H. Streimann* 31480, 31495 (CANB). **Australian Capital Territory:** Cotter Reserve, *H. Streimann* 1749 (CANB); Ginninderra Ck., *H. Streimann* 4440, 7693, 10362 (CANB); Nass River, *H. Streimann* 9004 (CANB); Glendale Crossing, *H. Streimann* 10257 (CANB); Molonglo Gorge, *H. Streimann* 10679 (CANB); Gudgenby River Gorge, *H. Streimann* 27796 (CANB); Latham, *H. Streimann* 56207 (CANB); Booth Range, *H. Streimann* 35711 (CANB). **Western Australia:** Nullarbor Plain, *J. A. Curnow* 4746 (CANB); Track to Hayward Peak, *H. Streimann* 54449 (CANB). **Queensland:** Balfour Range, *H. Streimann* 9343 (CANB); Paluma Reservoir-Hidden Valley Track, *H. Streimann* 37068 (CANB); Kooraminya Creek, *H. Streimann* 52129 (CANB); Pine Mountain, *H. Streimann* 52426 (CANB); Hervey Range Road, *H. Streimann* 56295 (H); 3 km SW of Kingaroy, *H. Streimann* 9383 (CANB). **Tasmania:** *W. A. Weymouth*. 12/5/1892 (H-BR); *Antarct. Exp. 1839-1843*, from J. D. Hooker, 1860 (FH); Gunner's Quoin, *J. A. Curnow* 4538 (CANB); North East Ansons River Reserve, *A. Moscal* 25617 (HO); Midlands West Head, *A. Moscal* 24169 (HO).

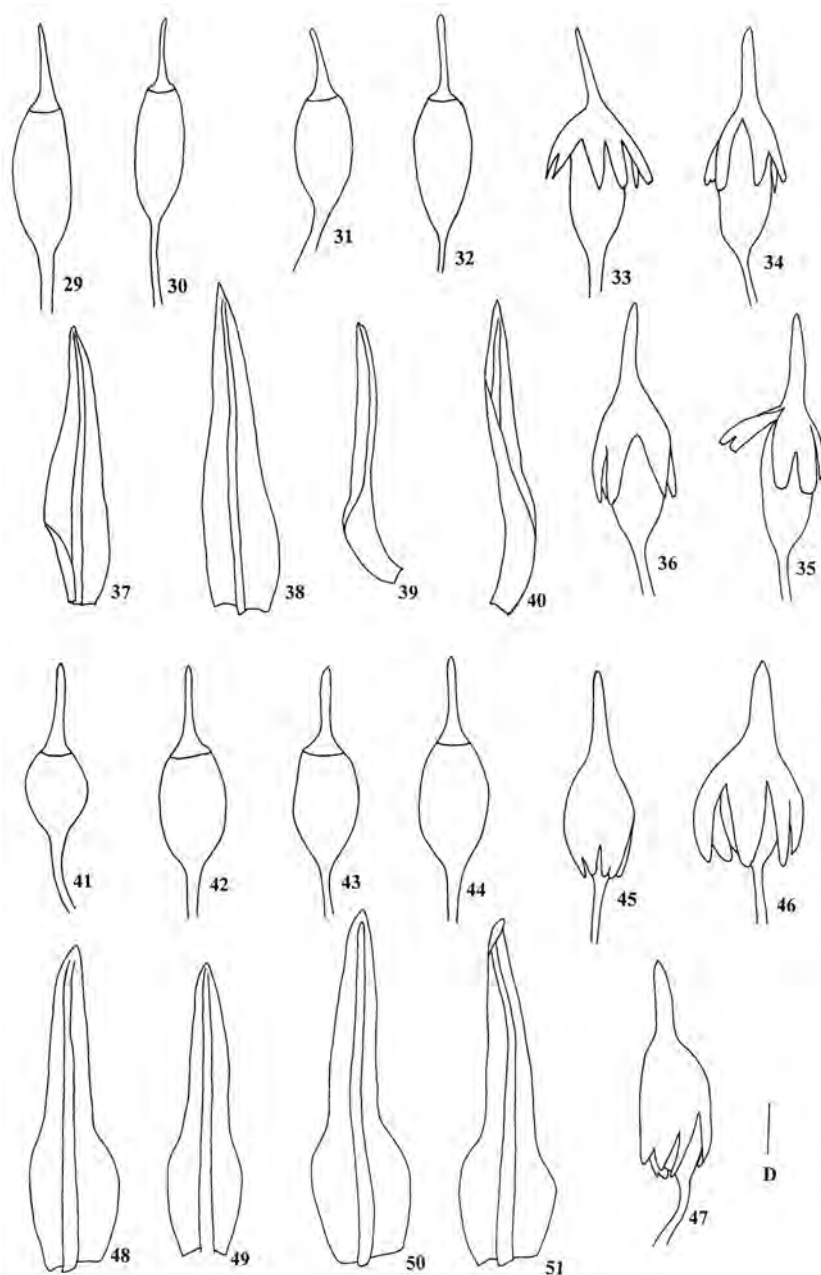
**Representative specimens of *P. australe* examined:** **AUSTRALIA:** **New South Wales:** Hionia, *Brotherus* 320 (FH); Bungonia Lookdown, *H. Streimann* 05856, 6979, 6167 (H-BR), *H. Streimann* 27908, 38541 (FH); Wadbilliga River, *H. Streimann* 3800 (H); Cox Road, *H. Streimann* 6979 (H); Near Ben Lomond, *H. Streimann* 385 (CANB); Mt. Wonbelong, *H. Streimann* 563 (CANB); Weddin Range, *H. Streimann* 3877, 3894, 39582 (CANB); Salt Caves, *H. Streimann* 5646 (CANB); Bungonia Creek Gorge, *H. Streimann* 6205 (CANB); Spring Creek, *H. Streimann* 9973, 9983 (CANB); Barretts Creek Araluen, *H. Streimann* 15422 (CANB); Currowan State Forest, *H. Streimann* 15660 (CANB); Diamond Creek, *H. Streimann* 15899 (CANB); Tathra Head, *H. Streimann* 48105 (CANB); Lord Howe Island, *H. Streimann* 50000, 50086, 50140, 55738, 55923 (CANB); Lookout Road, *H. Streimann* 44265 (CANB); Chaelumdi Creek, *H. Streimann* 47608 (CANB);



Figs 1-16. *Ptychomitrium acutifolium* Hook. f. et Wils. — 1: Plant; 2: Basal transverse section of leaf costa; 3, 5: Medial leaf cells; 4: Basal leaf cells along costa; 6: Upper leaf cells; 7: Basal leaf cells near margins; 8-9: Leaf apices; 10-11: Leaves; 12: Peristome; 13: Spores; 14: Annulus; 15: Calyptra and opercula; 16: Capsule and calyptra. (Drawn from lectotype of *P. acutifolium*, BM). Line scale: A = 0.5 mm (10, 11, 15, 16); B = 160  $\mu$ m (8, 9, 12, 14); C = 40  $\mu$ m (2-7, 13).



Figs 17-28. *Ptychomitrium australe* (Hampe) A. Jaeger — **17, 24**: Upper leaves; **18-20**: Lower leaves; **21**: Basal leaf cells; **22**: Medial leaf cells; **23**: Upper leaf cells; **25**: Medial transverse section of leaf; **26**: Basal transverse section of leaf; **27**: Calyptra; **28**: Capsule. (Drawn from holotype of *P. australe*, BM). Line scale: A = 0.5 mm (17-20, 24, 27, 28); B = 40  $\mu$ m (21-23, 25, 26).



Figs 29-40. *Ptychomitrium acutifolium* Hook. f. et Wils. — 29-32: Capsules; 33-36: Calyptrae on capsules; 37-40: Leaves. Figs 41-51. *Ptychomitrium australe* (Hampe) A. Jaeger — 41-44: Capsules; 45-47: Calyptrae on capsules; 48-51: Leaves. (29, 33, 37 drawn from *H. streimannii* 38781 (CANB); 30, 34, 38 from *H. Streimann* 48906 (CANB); 42, 46, 49 from *H. Streimann* 50140 (CANB); 32, 35, 40 from *H. Streimann* 54449 (CANB); 31, 36, 39 from Queensland, *H. Streimann* 52421 (CANB); 43, 50 from *H. Streimann* 52415 (CANB); 41, 45, 48 from *H. Streimann* 52151 (CANB); 44, 47, 51 from *H. Streimann* 5560 (CANB).). Line Scale: D = 50  $\mu$ m.

Bingara-Narrabri Road, *H. Streimann* 52994 (H); Robertson, *H. Streimann* 53933 (CANB); Aragummu Bay, *H. Streimann* 59936 (CANB); Adelong Creek, *H. Streimann* 60160 (CANB); Junction of Stony and Bimberamala Creeks, *H. Streimann* 27908 (CANB); Wauchope Trig, *H. Streimann* 38541 (CANB); Lions Road, *H. Streimann* 60901 (CANB); Tooloom Creek, *H. Streimann* 61017 (CANB); North Coast, *H. Streimann* 63652 (CANB). **Victoria:** Crooked River Road, *H. Streimann* 53103 (H); Mitchell River National Park, *H. Streimann* 50241 (H); Kelly Creek, Buldah Road, *H. Streimann* 35652 (FH); Den of Nargun, *H. Streimann* 50223 (CANB); Deadcock Gorge, *H. Streimann* 50241 (CANB); Nyerimilang Homestead, *H. Streimann* 50340 (CANB); Mt. Raymond, *H. Streimann* 35515 (CANB); Kelly Creek, *H. Streimann* 35652 (CANB); Mt. Dromedary, *N. P. Water, Reader* 880, as *Ptychomitrium adamsonii* (G). **Australian Capital Territory:** Weddia Mountain Range, *H. Streimann* 42971 (H); Nass River, *H. Streimann* 9004, 7928 (H), *H. Streimann* 7928 (MO); Murrumbidgee R., *H. Streimann* 1056, 1057, 1058 (CANB); Gudgenby River Gorge, *H. Streimann* 38781 (CANB); Cotter Reserve, *H. Streimann* 057790 (H). **Queensland:** Lake Elphinstone, *R. J. Fensham* 44 (CANB); Undarra, *R. J. Fensham* 53 (CANB); Big Bend, *R. J. Fensham* 67 (CANB); Great Basalt Wall, *R. J. Fensham* 69 (CANB); Lands Table Mountain, *R. J. Fensham* 94 (CANB); Redcliffe Tableland, *R. J. Fensham* 182 (CANB); Doreen, *R. J. Fensham* 194 (CANB); Mt. Coxendean, *R. J. Fensham* 201 (CANB); Browns Falls, *H. Streimann* 226 (CANB); Windsor Tableland, *H. Streimann* 29749, 29760 (CANB); Forty Mile Scrub National Park, *H. Streimann* 46745 (CANB); Track to Baloon Cave, *H. Streimann* 52049, 52151 (CANB); Dawson Highway, *H. Streimann* 52234 (CANB); North Mimosa Creek, *H. Streimann* 52239 (CANB); Two Mile falls. Blackdown Tableland National Park, *H. Streimann* 52287 (CANB); Pine Mountain, *H. Streimann* 52415, 52421 (CANB); Box Creek, *H. Streimann* 52572 (CANB); Robinson Gorge, *H. Streimann* 52683 (CANB); Cabbagetree Creek, *H. Streimann* 52769 (CANB); Paling Yard Creek, *H. Streimann* 52929, 52961 (CANB); Wyberba, *H. Streimann* 52970 (CANB); Millstream Falls National Park, *H. Streimann* 54041 (CANB); Vine Creek, *H. Streimann* & *S. Carver* 16788 (CANB); Mickey Creek, *H. Streimann* 52210 (CANB); *I. R. Telford* 5218, 5560 (CANB). **Tasmania:** East Coast Ridgeway Park, *A. Moscal* 19975 (HO); East Coast MT. Maria, *A. Moscal* 27085 (HO); track to Cape Surville, *J. Jarman* 51114 (HO); North West Cathedral Rocks, *A. Moscal* 24210 (HO); South West Fluted Cape State Reserve, *A. Moscal* 25037 (HO); Central Highlands Forst May of Plains, *A. Moscal* 31200c (HO); Zig-zag road, *A. J. Taylor* 21/8/1886 (HO); On rocks Rose Garland, *W. A. Weymouth* 1655 (HO); North side of Cataract, *W. Archer* 2522 (HO); Risdon on shaded rock, *L. Rodway* 10/1911 (HO); North-on rocks, *W. A. Weymouth* 2899 (HO); "The Sugar Loaf", *W. A. Weymouth* 872 (HO); Hospital Bay, *W. A. Weymouth* 16/4/1892 (HO); Kempton, *L. Rodway* 9/1901 (HO); Reservoir at bottom of Flagstaff Hill, *A. V. Ratkowsky* H380 (HO).

**NEW ZEALAND: North Auckland District:** *A. J. Fife*, 7939 (H).

*Ptychomitrium australe* (Hampe) A. Jaeger is a common species forming small compact cushions on rocks in Australia and New Zealand (Scott & Stone, 1976). Examination of the holotype of *P. australe* at BM, which is the type of *Brachysteleum australe* Hampe ("In alpebus versus Buchan river") (Hampe, 1856), as well as other specimens from Australia and New Zealand showed that this species is different from *P. acutifolium*.

*Ptychomitrium australe* has lanceolate or linear-lanceolate leaves with a widened ovate to oblong base and a more or less cucullate, sub-obtuse apex. The ratio of length over width of leaves is 3 to 4.5 (rarely 5). The calyptrae generally extend to the middle or lower part of the capsules. The capsules are mostly ovoid with length/width = 1.2-1.4. (Figs 17-28, Figs 41-51). Therefore, even though *P. acutifolium* and *P. australe* are somewhat similar in their small plant size, entire leaves and ovoid capsules, our examination of their type specimens in BM and H and additional specimens in FH, BM, CANB, FH, G, H, HO and MO, indicated that *P. acutifolium* could be distinguished from *P. australe* by the following characters:

1) leaves linear-lanceolate from a long narrow elongate base with sharp, not cucullate, leaf tips and a ratio of length to width of mostly between 4.5 to 7.0; 2) capsules mostly oblong-ovoid with length /width ratio of more than 2; 3) calyptrae small, only covering the opercula or the upper part of the capsule (Figs 29-40).

In conclusion, *P. acutifolium* is a distinctive species different from *P. australe*.

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