

## ADDITIONS TO THE HYGROPHORACEAE OF LANE COVE BUSHLAND PARK

A.M. Young<sup>1</sup>, R. Kearney<sup>2</sup> & E. Kearney<sup>2</sup>

<sup>1</sup>Bee Cottage, Blackbutt, Qld 4306. Email: tyoung@bigpond.com

<sup>2</sup>Department of Infectious Diseases, The University of Sydney, N.S.W. 2006

### Abstract

Twenty-five taxa within family Hygrophoraceae are now known to occur in the warm temperate gallery rainforest and associated sclerophyll woodlands of the Lane Cove Bushland Park, New South Wales. Previously described taxa that are here listed for the first time from the Park are *Hygrocybe helicoides* A.M. Young, *Hygrocybe irrigata* (Pers. : Fr.) Bon, *Hygrocybe kula* Grgurinovic, *Hygrocybe miniata* (Fr. : Fr.) P. Kumm., *Hygrocybe taekeri* A.M. Young and *Hygrophorus involutus* G. Stev. New taxa for the Park here described are *Hygrocybe collucera* and *Hygrocybe griseoramosa*.

Young, A.M., Kearney, R. & Kearney, E. (2001). Additions to the Hygrophoraceae of Lane Cove Bushland Park. *Australasian Mycologist* 20 (2): 79–86.

### Introduction

Eighteen taxa within the Hygrocybeae were previously known to occur in the Lane Cove Bushland Park (Young 1999). Further collecting in the Park has allowed re-examination of several species, new confirmation of previously described taxa for the Park and the description of new species. Also relevant to the Lane Cove Bushland Park Hygrophoraceae is the recent investigation into the definition of *Hygrocybe kula* Grgurinovic and the consequent new species, *Hygrocybe rubronivea* A.M. Young (Young 2000 [2001]).

The Lane Cove Bushland Park, less than 0.2 km<sup>2</sup> in area, remains remarkable for the large assemblage of species within the family Hygrophoraceae. The majority of the species occur in the warm temperate gallery rainforest centred on the creek banks in the catchment area. In Europe, numbers of species of Hygrophoraceae, in a given location, are used not only as indicators of agricultural pollution because of their high sensitivity to such conditions, but also to determine whether the site ranks of national significance according to Rald's classification for conservation (Boertmann 1995).

For the first time in Australia, the Scientific Committee established by the *NSW Threatened Species Conservation Act, 1995*, determined that the assemblage of more than 20 species of fungi in this family '... is likely to become extinct in NSW unless circumstances threatening its survival cease to operate' (New South Wales Government Gazette, Week No. 9, item No. 32, pp. 1586–1589, 3 Mar. 2000).

A companion application to gazette over six holotype species as Rare Native Species of Hygrocybeae of Lane Cove Bushland Park is at the stage of a Final Determination. In addition, a nomination to register the site on the National Estate has been recommended for gazettal by the Heritage Commission in June this year. These determinations have been model decisions in mycology. The precedent to afford legislative protection of a community of fungi and to register Lane Cove Bushland Park on the National Estate, will be of positive benefit for mycology.

The listings give the Park and its unusual fungal biota the status of a sanctuary. To enshrine mycology in such legislation enables the Courts, as already demonstrated in a landmark decision, to apply penalties to ensure that nominated fungal species are not forgotten but are afforded conservation protection equal to that given to endangered species of plants and animals.

### Hygrophoraceae known to occur in Lane Cove Bushland Park

For simplicity, author citations are not given in this list but full details may be found in the reference documents. For the genus *Hygrocybe*, the species are presented in alphabetical order without any reference to systematic arrangement. This list of 25 species also includes the additions to the Hygrophoraceae of the Park that are added by this paper.

<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>	<i>Hygrocybe kula</i>
<i>Hygrocybe astatogala</i>	<i>Hygrocybe lanecovensisi</i>
<i>Hygrocybe aurantiopallens</i>	<i>Hygrocybe lewellinae</i>
<i>Hygrocybe aurantipes</i>	<i>Hygrocybe miniata</i>
<i>Hygrocybe austropratensis</i>	<i>Hygrocybe reesia</i>
<i>Hygrocybe cantharellus</i>	<i>Hygrocybe rubronivea</i>
<i>Hygrocybe cheelii</i>	<i>Hygrocybe stevensoniae</i>
<i>Hygrocybe chromolimonea</i>	<i>Hygrocybe taekeri</i>
<i>Hygrocybe collucera</i>	<i>Hygrocybe virginea</i> var. <i>virginea</i>
<i>Hygrocybe erythrocala</i>	
<i>Hygrocybe graminicolor</i>	<i>Camarophyllopsis kearneyi</i>
<i>Hygrocybe griseoramosa</i>	
<i>Hygrocybe helicoides</i>	<i>Hygrophorus involutus</i>
<i>Hygrocybe irrigata</i>	

### Materials and methods

Examination of material was completed following Young (2000). A 10 mm scale bar is placed beside all habit sketches or transverse sections; a 10 µm scale bar is placed beside each drawing of a microcharacter. If no collection number is designated by the collector, this is so shown by the abbreviation 's.n.'. Where holotypes for established European taxa do not exist or the author has not yet seen the holotype ('n.v.' is used to indicate this latter situation), the species concepts of Boertmann (1995) are used. Holotypes for the new taxa have been lodged in the Orange Agricultural Institute Herbarium, Orange, New South Wales (DAR). Other material has been deposited with the National Herbarium of Victoria (MEL), the State Herbarium of South Australia (AD) and the Queensland Herbarium (BRI). Holotype material examined during this study was made available by the J.T. Waterhouse Herbarium (UNSW) at the University of New South Wales.

### Taxonomic information

#### New records and information

***Hygrocybe helicoides*** A.M. Young, *Muelleria* 10: 29 (2000)

*Habitat*: gregarious to subcaespitose amongst litter on soil in gallery rainforest.

*Material examined*: New South Wales. Lane Cove Bushland Park, 3.vii.1999, R. & E. Kearney (REK 178/99) (BRI); Lane Cove Bushland Park, 10.vii.1999, R. & E. Kearney (REK 234/99) (MEL 2087765).

*Notes*: This species was previously recorded only from the holotype locality of the Blue Mountains (Young 2000). *Hygrocybe helicoides* is obviously close to the species *Hygrocybe woodii* A.M. Young. However, the latter species has distinctly yellow lamellae, a white stipe and basidia that rarely display very large medallion clamps whereas *Hygrocybe helicoides* has bright green lamellae, a distinctly green stipe and basidia in which the majority display very large medallion clamps. The species only occurs at a single location in the Park, but basidiomata are produced each year. These additional collections have shown that the extremely regular pigment markings present on the walls of the pileal cuticular hyphae in the holotype material may not always be present in other collections. The Park material examined has the pigmented hyphae in the pileipellis; however, the granular lines are sometimes irregular and indistinct and the hyphae are more cylindrical than long-fusiform.

***Hygrocybe irrigata*** (Pers. : Fr.) Bon, *Documents Mycologiques* 6: 41 (1976)

Type: none designated.

*Agaricus irrigatus* Pers., *Synopsis Methodica Fungorum* 361 (1801).

*Agaricus irrigatus* Pers. : Fr., *Systema Mycologicum* 1: 101 (1821).

*Hygrophorus irrigatus* (Pers. : Fr.) Fr., *Epicrisis Systematis Mycologi* 329 (1838), as *H. irriguus*.

## Figure 1A–C.

*Pileus* 15–30 mm diam., dark brown or sooty brown and darker at the centre, campanulate to convex, smooth, thickly glutinous, margins even and striate. *Lamellae* broadly adnate with a decurrent tooth, white to faintly buff-tinted, margins concolorous or paler and even. *Stipe* 30–40 × 3–5 mm, brown but paler towards the base, cylindrical, solid, smooth, thickly glutinous.

*Basidiospores* 7–9 (–10.5) × 4.5–6.0 μm, mean 8.4 × 5.2 μm, Q: 1.3–1.9, mean Q: 1.62, ellipsoidal to broadly ellipsoidal, smooth, hyaline. *Basidia* 39–47 × 7–9.5 μm, mean 43.2 × 8.3 μm, Q: 4.5–5.9, mean Q: 5.22, 4-spored, clamps present and often of medallion form. *Cystidia* absent. *Hymenophoral trama* regular to a little subregular consisting of parallel chains of hyaline, thin-walled, cylindrical, septate elements 17–140 × 5–14 μm, some constriction at the septa, clamps absent or rare. *Pileipellis* an ixotrichoderm up to 120 μm thick, consisting of hyaline, thin-walled, branching, septate hyphae 2.5–5.0 μm diam., clamps absent or very rare. *Stipitipellis* an ixotrichoderm up to 100 μm high and consisting of hyphae similar to those of the pileipellis, clamps either absent or very rare.

*Habitat*: Gregarious on soil amongst moss and leaf litter at gallery rainforest-woodland boundary.

*Material examined*: New South Wales. Lane Cove Bushland Park, 29.v.1999, R. & E. Kearney (REK 59/99) (MEL 2086093).

*Remarks*: Fresh basidiomata are dark brown and extremely glutinous; there is no tint of either yellow or green at any stage on any part of the basidioma. Dried material is greyish to dark brown and is not the brick pink associated with dried material of *Hygrocybe graminicolor* (E. Horak) T.W. May & A.E. Wood. There is never a gluten thread on the lamellar margins which remain fertile.

Dr David Boertmann (pers. comm.) has confirmed that a Tasmanian collection believed by the first author to be *Hygrocybe irrigata* is (apart from slightly larger basidiospores) almost identical to the European taxon which has basidiospores measuring (5–) 6.5–8 (–9) × (3.5–) 4.5–5 (–6) μm. The Lane Cove material is virtually identical to the Tasmanian collection which differed only by being a grey-brown rather than the dark brown of the Lane Cove material. Both colours appear in European material. The Lane Cove collection is the first published record of this taxon for Australasia.

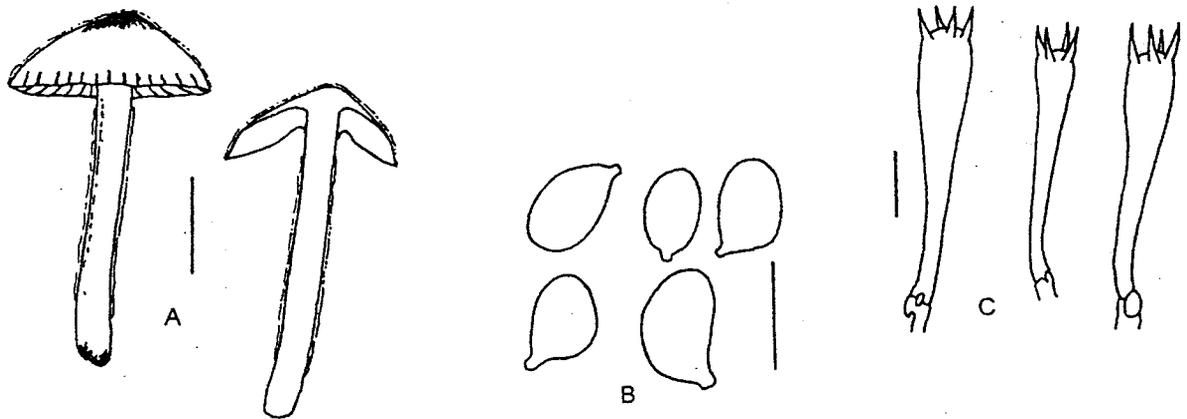


Figure 1. *Hygrocybe irrigata*, A habit sketch and longitudinal section, B basidiospores, C basidia.

***Hygrocybe kula*** Grgurinovic, *Larger Fungi of South Australia* 336 (1997)

Type: New South Wales. Royal National Park, 15.vii.1916, J.B. Cleland (s.n.) (holotype AD 5716).

Figure 2 A–C.

*Pileus* 15–20 mm diam., scarlet, convex but depressed at the centre, sticky to viscid, finely and innately fibrillose; margin yellow-orange, striate, crenulate. *Lamellae* arcuate-decurrent to deeply decurrent, cream-coloured, margins even and concolorous. *Stipe* 25–40 × 2–4 mm, red, smooth, hollow, may be yellow at the base.

*Basidiospores* 5.5–8 × 3.5–4.5 µm, mean 6.9 × 3.9 µm, Q: 1.5–2.0, mean Q: 1.74, ellipsoidal to cylindrical and a few constricted, hyaline, thin-walled; a few spinose basidiospores present and of same dimensions as the normal basidiospores, spines up to 2 µm high. *Basidia* 34–48 × 6–7 µm, mean 40.2 × 6.6 µm, Q: 5.4–7.2, mean Q: 6.08, 4-spored, clamped. *Cystidia* absent. *Hymenophoral trama* regular and consisting of hyaline, thin-walled, inflated, ellipsoidal to cylindrical elements 29–97 × 10–22 µm, clamps present; lactifers present as highly refractive, tortuous hyphae 3–6 µm diam. *Pileipellis* an ixocutis consisting of repent, firmly adpressed, cylindrical, thin-walled hyphae 3–6 µm diam., clamps scattered to occasional. *Stipitellis* a weakly formed ixocutis or cutis 3–5 µm diam., clamps scattered to occasional.

*Habitat*: In troops on soil amongst litter in open, grassy woodland.

*Material examined*: New South Wales. Lane Cove Bushland Park, 22.v.1999, R. & E. Kearney (REK 25/99) (AD-C 39831) (MEL 2086094).

*Remarks*: The characters of the Lane Cove Bushland Park material match those of the holotype almost perfectly when allowance is made for the normal variability that can occur in any of these species. The Lane Cove basidiomata have basidiospores that are slightly longer than those of the holotype (5–7 × 2.7–4.7 µm, mean 6.2 × 3.8 µm) and basidia that are slightly shorter than the holotype (33–55 × 6–9 µm, mean 41.5 × 6.8 µm) but these slight variations are not considered significant.

The Lane Cove material is the first record of material considered similar to the original collection made by Cleland from the Royal National Park in 1916. That it should have been collected from the Lane Cove Bushland Park is not surprising because the Park floristic structure is that of a warm temperate gallery rainforest with an associated marginal woodland and similarly structured communities occur in the Royal National Park. The Lane Cove material provides good material for future studies if required and it has been divided into two exemplar collections which have been deposited at AD and MEL. Collections of material from the Lane Cove Bushland Park that were previously ascribed to *Hygrocybe kula* (Young 1999) are now known to be a different taxon that has since been published as *Hygrocybe rubronivea* A.M. Young (Young 2000 [2001]).

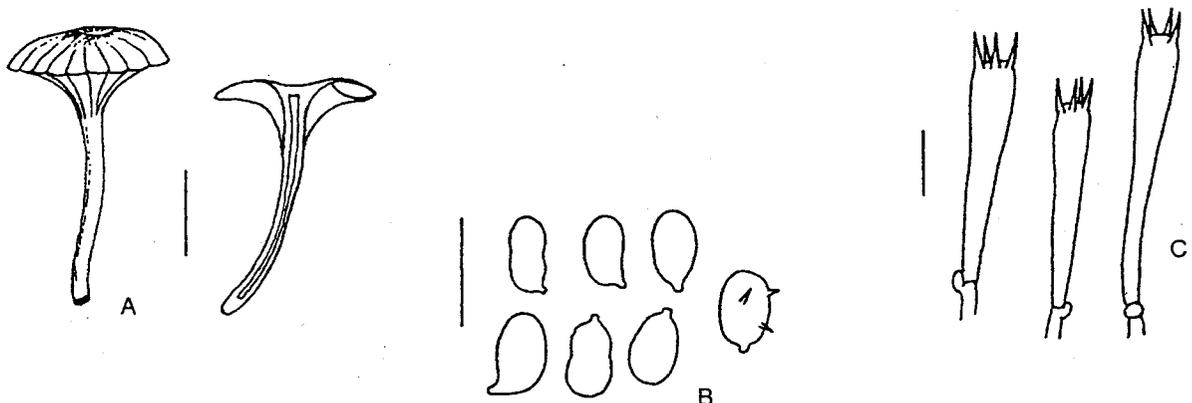


Figure 2. *Hygrocybe kula*, A habit sketch and longitudinal section, B basidiospores, C basidia.

**Hygrocybe miniata** (Fr. : Fr.) P. Kumm., *Die Führer in die Pilzkunde* 112 (1871); *Agaricus miniatus* Fr.: Fr., *Systema Mycologicum* 1: 105 (1821); *Hygrophorus miniatus* (Fr. : Fr.) Fr., *Epicrasis Systematis Mycologi* 330 (1838)

Type: Sweden. Smoland, 21.ix.1980, M. Moser, M. Moser 80/372, [neotype: Austria, Innsbruck. Herbarium IB. n.v.: designated Arnolds (Arnolds 1986, p. 148)].

*Habitat*: In troops on soil amongst leaf litter in gallery rainforest.

*Material examined*: New South Wales. Lane Cove Bushland Park, 18.iv.1999, R. & E. Kearney (REK 209/99) (MEL 2086095).

*Remarks*: *Hygrocybe miniata* is a very widespread taxon in eastern mainland Australia. Macroscopically, the Lane Cove material has redder pilei but is otherwise identical to the colour plate in Boertmann (1995, p. 103). The basidiospores of Australian material differ slightly from those found in European material in that they are mostly ellipsoidal and rarely show the pyriform or constricted forms of the latter. However, they do conform very closely to New Zealand material (Horak 1990). The Lane Cove collections have this taxon's typical trichodermal pileal surface and there is absolutely no doubt as to this taxon's identity.

**Hygrocybe taekeri** A.M. Young, in Young & Wood, *Australian Systematic Botany* 10: 1002 (1997)

Type: New South Wales. Royal National Park (Bola Creek), 14.iv.1984, F. Taeker (s.n.) (holotype UNSW 84/397).

Re-examination of the holotype has led to the following alteration of its characteristics:

*Basidiospores* 5–9.5 (–10.5) × 4–6.5 (–7.5) µm, mean 7.3 × 5.2 µm, Q: 1.1–1.8, mean Q: 1.41, ellipsoidal to subglobose, hyaline, thin-walled. *Basidia* (25–) 36–48 × 6–9 (–11) µm, mean 41.9 × 7.5 µm, Q: (3.1–) 5–6.4 (–7), mean Q: 5.58, (2–) 4-spored, clamped and usually of medallion form.

*Habitat*: In twos or threes on soil amongst litter at gallery rainforest margin.

*Material examined*: New South Wales. Lane Cove Bushland Park, R. & E. Kearney (REK 24/99) (MEL 2086096).

*Remarks*: *Hygrocybe taekeri* was described from Bola Creek (Royal National Park), New South Wales and the Lane Cove Bushland Park collection is the first published record of the taxon outside the holotype locality. The holotype description (Young & Wood 1997) defines this species as having dimorphic basidiospores and basidia, and basidiomata without clamps except at the bases of the basidia where they are often of medallion form. Material collected from Lane Cove Bushland Park was presumed to be *Hygrocybe taekeri* on the basis of its macrocharacters which matched those of the holotype description very well. However, the Lane Cove material did not have dimorphic basidiospores and basidia. Re-examination of the holotype has shown that *Hygrocybe taekeri* does not have dimorphic basidiospores and basidia but instead both have large and continuous ranges. The Lane Cove material is similar. This result transfers *Hygrocybe taekeri* to subgenus *Humidicutis*.

Several reasons probably contributed to the error in the original description: chance in the selection of a basidiospore field to be measured; the possible inclusion of immature basidiospores; and the availability of only the holotype collection for study. The new measurements for the holotype's basidiospores are taken from mature basidiospore deposits made on the stipe surface in addition to those from the lamellae. Only the basidiospore and basidial descriptions and measurement details of the holotype description need alteration.

**Hygrophorus involutus** G. Stev., *Kew Bulletin* 16: 373 (1962)

Type: New Zealand. Butterfly, 2.vi.1958, G. Stevenson (hb. *stevenson* 1347, holotype K).

*Habitat*: In twos or threes or caespitose on soil amongst leaf litter in gallery rainforest.

*Material examined*: New South Wales. Lane Cove Bushland Park, 6.vi.1999, R. & E. Kearney (REK 91/99) (MEL 2086092).

*Remarks*: This is the first record of this species from the Lane Cove Bushland Park. The material in the collection conforms almost precisely with the holotype other than that the basidia are slightly longer (34–49 µm) than the holotype (32–42 µm) but this is not considered significant. *Hygrophorus involutus* is common in the Blue Mountains west of Sydney and appears to be a very widespread taxon.

### New Species

*Hygrocybe collucera* A.M. Young, R. Kearney & E. Kearney, *sp. nov.*

Pileus 8–20 mm, scarlatinus, conico-convexus vel convexus, sub-viscidulus dein siccus, glaber, ad marginem striatus, flavus, sub-crenulatus. Lamellae arcuatae vel decurrentes, canarinus, ad marginem concolores. Stipes 30–50 × 1.5–3.5 mm, scarlatinus ad basim flavus, cylindricus, sub-viscidulus dein siccus, glaber. Sporae 6–8 (–9) × 3.5–5 μm, Q: 1.5–2.2, ellipsoideae vel cylindricae, aliquot constrictae. Basidia (29–) 34–44 × 5.5–8 μm, Q: 4.7–7.0, (2–) 4-sporea, fibulata. Cystidia nulla. Trama hymenophoralis regularis, fibulata. Epicutis pilei sub-ixocutis vel cutis formans. Gregaria in humo sylvestri.

*Holotypus*: New South Wales. Lane Cove Bushland Park, 12.vi.1999, R. & E. Kearney (REK 130/99) (holotypus DAR 74929 hic designatus).

Figure 3 A–C.

*Pileus* 8–20 mm diam., scarlet-red (10A8 or brighter), conico-convex broadly convex, at first distinctly sticky (but not slippery or viscid) then soon dry, smooth but very finely and innately fibrillose at the centre to slightly velvety at the margins; margin striate, yellow (near 2A7) and even to subcrenulate. *Lamellae* arcuate to deeply decurrent, brilliant yellow (near 2A8) but occasional basidiomata may show orange (near 4A4) tints; margins even and concolorous; veins present on pileal undersurface and on the upper faces of the lamellae. *Stipe* 30–50 × 1.5–3.5 mm, brilliant scarlet but yellowish towards the base, cylindrical, dry, smooth or innately finely fibrillose.

*Basidiospores* 6–8 (–9) × 3.5–5 μm, mean 7.4 × 4.2 μm, Q: 1.5–2.2, mean Q: 1.76, ellipsoidal to cylindrical, hyaline, thin-walled, a majority constricted. *Basidia* (29–) 34–44 × 5.5–8 μm, mean 36.9 × 8 μm, Q: 4.7–7.0, mean Q: 6.0, (2–) 4-spored, clamps present. *Cystidia* absent. *Hymenophoral trama* regular and consisting of chains of ellipsoidal or cylindrical elements that are hyaline, thin-walled 15–55 × 4–16 μm, clamps present; lactifers present as translucent, highly refractive, sometimes contorted hyphae 3–7 μm diam. *Pileipellis* a very weak ixocutis or a cutis with some gelatinised hyphae, consisting of repent to slightly interwoven hyphal elements that are thin-walled, hyaline 1.5–10 μm diam., clamps present and usually abundant. *Stipitipellis* a very weak ixocutis or a cutis with some gelatinised hyphae, consisting of repent, hyaline, thin-walled, septate, cylindrical hyphae 1.5–6 μm diam., clamps present.

*Habitat*: Gregarious to subcaespitose on soil and litter, often in troops, in gallery rainforest.

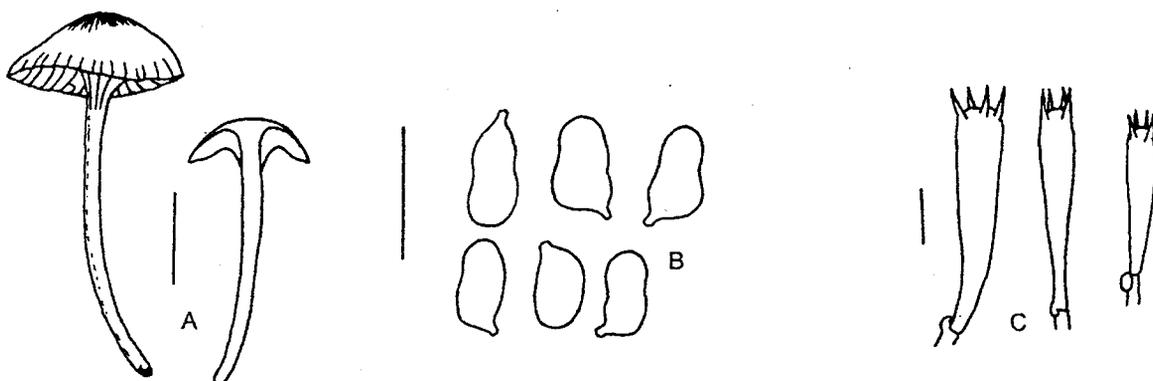


Figure 3. *Hygrocybe collucera*, A habit sketch and longitudinal section, B basidiospores, C basidia.

*Material studied:* Lane Cove Bushland Park, N.S.W. 3.vii.1999, R. & E. Kearney (REK 192/99) (BRI); 6.vi.1999, R. & E. Kearney (REK 115/99) (MEL 2086088); 12.vi.1999, R. & E. Kearney (REK 130/99) (holotype DAR 74929).

*Remarks:* Young (1999) described a small collection of this taxon as species 'LC1'. This original collection (*hb. young 2188*) appears to have been a variant with extremely large basidiospores. However, all other macro- and microcharacters of the original collection agree with later collections. The habit sketches of 'LC1' show the fully developed basidiomata while those shown in Figure 3A are of much younger specimens. The species is quite widespread and has also been recorded from the Blue Mountains west of Sydney and Bola Creek in the Royal National Park.

This taxon obviously approaches *Hygrocybe kula* but the two taxa are considered to be well separated. *Hygrocybe kula* is stated to have cream-coloured lamellae, not the intense canary yellow lamellae present in *H. collucera*. The pileus of the former species becomes depressed (clearly displayed in the holotype watercolour) and the holotype material shows a varnished surface with what is believed to be a well-defined ixocutis; *Hygrocybe collucera* remains distinctly convex at all stages of its development and its surface is sticky at most, then dry, while herbarium material of this taxon does not show the heavily varnished surface of an ixocutis and would normally be considered to have a simple cutis. No other known taxon has the intense red pileus and stipe combined with the brilliantly yellow, decurrent lamellae.

*Etymology:* Latin, *collucere*, to shine brightly; referring to the brilliant and easily visible colours of this species when found in the field.

***Hygrocybe griseoramosa*** A.M. Young, R. Kearney & E. Kearney, *sp. nov.*

Pileus 20–30 mm, sepiaceus deinde sub-roseobubalinus, conico-convexus deinde umbonatus deinde repandus, striatus, siccus, glaber. Lamellae adnatae cum dente decurrente dein decurrentes, canae, ad marginem concolorae. Stipes 20–35 × 2–5 mm, pallidus vel sub-canus, siccus, glaber. Sporae 6.5–8 × 5.5–7 (–7.5) μm, Q: 1.0–1.5, lato-ellipsoideae vel subgloboseae vel globosae, hyalinae. Basidia 42–57 × 7–8.5 μm, Q: (4.9–) 6.0–7.5, (2-) 4-sporea, fibulata. Cystidia nulla. Trama hymenophoralis sub-regularis, fibulata. Epicutis pilei cutis formans. Gregaria vel caespitosa in humo sylvestri.

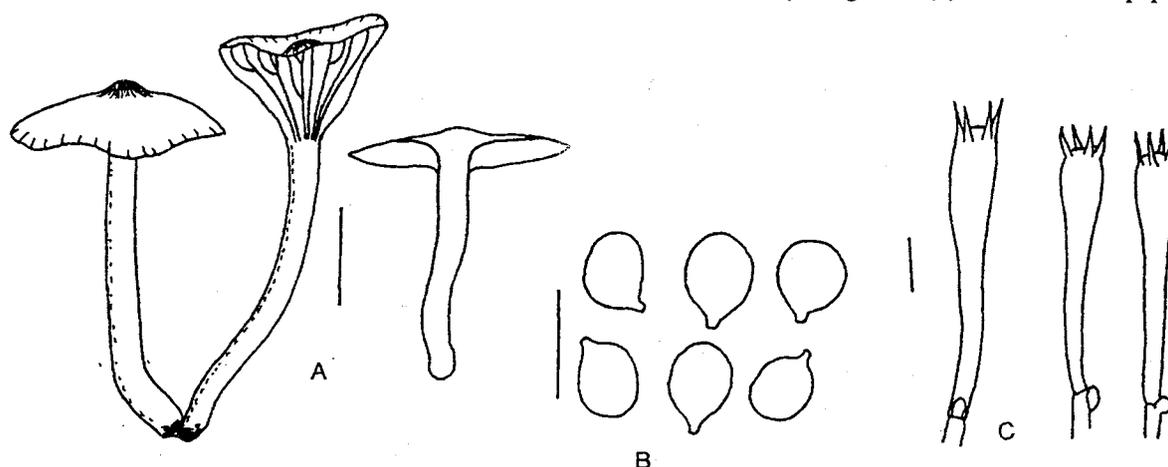
*Holotypus:* New South Wales. Lane Cove Bushland Park, 29.v.1999, R. & E. Kearney (REK 65/99) (DAR 74929 hic designatus).

Figure 4 A–C.

*Pileus* 20–30 mm diam., sepia-brown to chocolate-brown at the centre but becoming light pinkish buff either as the surface dries or with age, conico-convex becoming umbonate, then upturned and repand at the margins, striate when moist, dry, smooth, margins even. *Lamellae* adnate with small decurrent tooth but may appear to be decurrent as the pileus becomes repand, grey, often extensively veined on the lamellar faces and on the pileal undersurface, frequently branching into two near the margins, margins even and concolorous. *Stipe* 20–35 × 2–5 mm, pallid to light grey, smooth but innately finely fibrillose, dry, solid but may become cavernous with age, tapered towards the base. No distinct odour present. *Basidiospore print* white.

*Basidiospores* 6.3–8.0 × 5.3–7.0 (–7.7) μm, mean 7.4 × 6.0 μm, Q: 1.04–1.5, mean Q: 1.24, very broadly ellipsoidal but mostly subglobose, globose or occasionally pyriform, smooth, hyaline, no reaction in iodine solution. *Basidia* 42–57 × 7–8.5 μm, mean 48.6 × 7.4 μm, Q: (4.9–) 6.0–7.5, mean Q: 6.57, 4-spored but occasionally with scattered 2-spored basidia, clamps present. *Cystidia* absent. *Hymenophoral trama* more or less regular near the pileus becoming subregular near the centre and irregular near the margins of the lamellae, consisting of chains of cylindrical or ellipsoidal to long-ellipsoidal elements that are thin-walled, hyaline, inflated, 22–117 × 5–20 μm, clamps present. *Pileipellis* a cutis of repent, hyaline, thin-walled, septate hyphae 3–10 μm, clamps present; pigment granules present on the hyphae surface. *Stipitipellis* a cutis of repent, hyaline, thin-walled, septate hyphae 2.5–5 μm, clamps present.

*Material examined:* New South Wales. Lane Cove Bushland Park. 8.v.1999, R. & E. Kearney (REK 69/99) (BRI); 22.v.1999, R. & E. Kearney (REK 31-33/99) (MEL 2086091); 29.v.1999, R. Kearney (REK 65/99) (holotype DAR 74928).



**Figure 4.** *Hygrocybe griseoramosa*, A habit sketch and longitudinal section, B basidiospores, C basidia.

**Habitat and distribution:** Known only from the holotype locality. Gregarious to caespitose on soil amongst litter or on the litter in gallery rainforest.

**Remarks:** *Hygrocybe griseoramosa* belongs to the subgenus *Cuphophyllus* Donk which contains numerous species with subdued colours and decurrent lamellae. However, the trama of the lamellae is subregular rather than completely irregular. No American taxa have characteristics which are similar to *H. griseoramosa*, but the New Zealand species *Camarophyllus canus* E. Horak is close superficially but produces ellipsoidal basidiospores. (Although Horak (1990) states that *C. canus* has 'ovoid' spores in the text, his drawings very clearly show ellipsoidal spores.) No European taxon has precisely the same characteristics as *Hygrocybe griseoramosa*. The nearest European species, *Hygrocybe cinerella* (Kühner) Arnolds, has a dark grey-brown pileus, narrower ellipsoidal basidiospores which are rarely broadly ellipsoidal to subglobose ( $6.5\text{--}8.0 \times 4.5\text{--}5.5 \mu\text{m}$ ) and is only known from Arctic habitats.

The Australian taxon *Hygrocybe watagensis* A.M. Young, is obviously close to *H. griseoramosa*. Both have broadly ellipsoidal or subglobose to globose basidiospores of more or less the same dimensions, both have brownish pilei with pigment granules on the cuticular hyphae and light grey stipes. They differ in that *H. watagensis* has a distinctly umbilicate pileus, arcuate-decurrent lamellae even when juvenile and a very irregular hymenophoral trama, while *H. griseoramosa* has an umbonate pileus (even when becoming repand), the lamellae are adnate and become 'decurrent' only because the pileus becomes repand, and the hymenophoral trama is regular to subregular for the upper two-thirds and only becomes irregular near the lamellar margins.

**Etymology:** Latin, *griseus*, grey; Latin, *ramosus*, branched; referring to the grey lamellae and their branches near the pileal margins.

#### Acknowledgements

The authors wish to express their thanks to the following people and organisations: Dr David Boertmann of the Department of Arctic Environment, Denmark; and Mrs Jan De Nardi, Curator of the John T. Waterhouse Herbarium, University of New South Wales for making available the material of *Hygrocybe taekeri*. The first author's contribution to this study was undertaken under a grant provided by the Australian Biological Resources Study for an investigation into the Hygrophoraceae of South Eastern Australia.

#### References

- Arnolds, E. (1986). Notes on Hygrophoraceae - VIII. *Persoonia* **13**, 137–160.  
 Boertmann, D. (1995). The genus *Hygrocybe*. *Fungi of Northern Europe* **1**, 1–184.  
 Horak, E. (1990). Monograph of the New Zealand Hygrophoraceae (Agaricales). *New Zealand Journal of Botany* **28**, 255–309.  
 Young, A.M. (1999). The Hygrocybeae (Fungi, Basidiomycota, Agaricales, Hygrophoraceae) of the Lane Cove Bushland Park, New South Wales. *Austrobaileya* **5**, 535–564.  
 Young, A.M. (2000) (published 2001). *Hygrocybe kula* Grgur. revisited. *Australasian Mycologist* **19**, 91–95.  
 Young, A.M. & Wood, A.E. (1997). Studies on the Hygrophoraceae (Fungi, Homobasidiomycetes, Agaricales) of Australia. *Australian Systematic Botany* **10**, 911–1030.